Rook I Project

Environmental Impact Statement

Annex 1 Responses:
Federal Indigenous Review Team Information Requests

Environmental Impact Statement – Federal Indigenous Review Team Information Request Responses

No.	Department	Project Effects Link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement	NexGen Response	Section in EIS
1	CNSC	IMPACT Model	General	The model inputs used to construct the IMPACT model scenario(s) used in the ERA were not summarized in the Appendix to facilitate a comprehensive review.	Provide detailed information on the IMPACT model inputs used in the ERA. Alternatively provide the model scenario file(s).	NexGen notes the reviewer's comment and confirms that detailed model inputs are included in Draft EIS TSD XXI (Environmental Risk Assessment) as well as the IMPACT Model Report (Draft EIS TSD XXI, Appendix A). The IMPACT Model Report was prepared to provide a supporting guiding document on the main data inputs into the IMPACT model. The main data inputs into the IMPACT model include: ▪ bird and mammal body weights and intake rates (Draft EIS TSD XXI, Appendix A, Table 2-4); ▪ occupancy factors (Draft EIS TSD XXI, Appendix A, Table 2-5); ▪ soil model characteristics (Draft EIS TSD XXI, Appendix A, Table 2-6); ▪ human intake rates and local intake fractions (Draft EIS TSD XXI, Appendix A, Table 2-8 and Table 2-10); ▪ human residency assumptions (Draft EIS TSD XXI, Appendix A, Table 2-12); ▪ lake morphometry and surface water flows from the hydrology model (Draft EIS TSD XXI, Appendix A, Table 3-1, Table 3-2, and Table 3-3); ▪ baseline water and sediment concentrations (Draft EIS TSD XXI, Appendix A, Table 3-5); ▪ baseline soil concentrations (Draft EIS TSD XXI, Appendix A, Table 3-7); ▪ water–sediment partitioning coefficients (Draft EIS TSD XXI, Appendix A, Table 3-6); ▪ aquatic bioaccumulation factors (BAFs) (Draft EIS TSD XXI, Appendix A, Table 3-8); ▪ terrestrial plant and earthworm BAFs (Draft EIS TSD XXI, Appendix A, Table 3-11); ▪ ingestion and inhalation transfer factors for birds and mammals (Draft EIS TSD XXI, Appendix A, Table 3-14, Table 3-15, and Table 3-16); and ▪ human and non-human biota dose coefficients (Draft EIS TSD XXI, Appendix A, Table 3-17, Table 3-18, and Table 3-19). The input data provided in Appendix A of Draft EIS TSD XXI are intended to provide all relevant input data needed to set up the IMPACT model. The input data provided were primarily focused on the values that were specific to the Project. The default IMPACT database has additional information; however, the data provided in Appendix A are focused on the Project, and the remaining information in the database is based on the default database consistent with CSA N288.1-20 (CSA Group 2020). No changes are proposed in the revised EIS to address this IR. **References** CSA Group (Canadian Standards Association Group). 2020. CSA N288.1-20: Guidelines for Calculating Derived Release Limits for Radioactive Material in Airborne or Liquid Effluents for Normal Operation of Nuclear Facilities.	n/a
2	MN-S	Environmental Stewardship	Section 1.1.7 Section 17.2.9 Section 18.2.1	Section 1.1.7 of the EIS states: "… working with local Indigenous Groups to implement independent environmental monitoring." Status of independent environmental monitoring as of the draft EIS review period was unclear to MN-S. As a rights holder, MN-S should have the opportunity to contribute to the scoping, development, and implementation of all monitoring programs, not just the independent Indigenous Monitoring programs. While it is acknowledged that an independent Indigenous Monitoring program would be scoped and developed to meet the needs of the Indigenous Nation, NexGen should also be prepared to listen, learn, and apply the learnings of the independent Indigenous Monitoring program into operational practices and adaptive management approach.	NexGen to ensure that MN-S has the opportunity to contribute to the scoping, development, and implementation of all monitoring programs, not just the independent Indigenous Monitoring programs.	NexGen notes the Métis Nation – Saskatchewan's (MN-S's) comment regarding incorporation of MN-S input into compliance monitoring program development is outside the scope of the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012*. However, NexGen values MN-S input on aspects of Project development, and further notes that mechanisms exist under the existing Benefit Agreement with the MN-S to plan for and address activities requested as part of this IR, as required. NexGen supports providing the MN-S opportunities to contribute to Project social and environmental monitoring programs (Draft EIS Section 23.2 [Engagement and Communication]). Opportunities for input on monitoring programs would be provided through the Implementation Committee and Environmental Committee established through the Benefit Agreement with the MN-S. NexGen also agrees that the results from the independent Indigenous monitoring programs would help inform other monitoring programs. It should be noted that the primary objectives of the monitoring programs for the proposed Project are to meet provincial and federal regulatory compliance.	n/a

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						As this IR is out of the scope of the EA and NexGen has committed in the Draft EIS to provide opportunities to the MN-S to contribute to Project social and environmental monitoring programs, no changes are proposed in the revised EIS. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html	
3	MN-S	Local indigenous Groups	Section 1.2.3	Section 1.2.3 of the EIS states: "The NexGen process to determine primary or other engagement requirements for Local Indigenous Groups included consideration of CNSC (2019) ..." NexGen centering its own perspective on "determining" engagement requirements with Indigenous Nations does not align with the spirit of the United Nations Declaration on the Rights of Indigenous People (UNDRIP), which is a part of the ongoing national conversation on Indigenous rights. NexGen deciding who it believes is interested in the Project does not align with current good practice on the recognition of Indigenous rights.	MN-S is requesting that NexGen amend the text on p. 1-24, to provide specifics on how Indigenous Nations expressed their interest in participating in the Impact Assessment process, rather than focusing on NexGen's process to determine Nations that it considered within scope.	NexGen appreciates the Métis Nation – Saskatchewan's (MN-S's) comment; however, NexGen notes that the reviewer's request is misaligned with intent of the discussion within the referenced subsection. Specifically, Draft EIS Section 1.2.3 (Indigenous and Community Setting) outlines how NexGen determined the Indigenous Groups that could be affected by the proposed Project to determine which groups should be engaged and the appropriate level of engagement. This step is a requirement as part of the procedural aspects to consult assigned by the CNSC (in accordance with REGDOC-3.2.2 Version 1.1 [CNSC 2019]) and was also completed in consideration of guidance provided by the Saskatchewan Ministry of Environment through written correspondence with NexGen. More information on how Indigenous Groups expressed their interest in participating in the EA process is provided in Draft EIS Section 2.4.1 (Identification of Indigenous Groups for Engagement). Starting in the exploration stage, NexGen first engaged with communities closest to the Project and then expanded outward to engage with regional communities. Indigenous Groups expressed their interest through these engagements. Details on Indigenous Group engagement and feedback received are presented in Draft EIS TSD I (Indigenous Engagement Report). No changes are proposed in the revised EIS to address this IR. **References** CNSC (Canadian Nuclear Safety Commission). 2019. REGDOC-3.2.2, Indigenous Engagement, Version 1.1. August 2019. ISBN: 978 0 660 04518 4. Available at http://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/REGDOC-3-2-2-Aboriginal-Engagement-version-1.1-eng.pdf	n/a
4	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 1.2.6	The Proponent proposes storing tailings underground as a cemented backfill material. ECCC agrees that storing cemented tailings as backfill material is an environmental design feature. However, it is not clear whether there has been an assessment to determine if there are fractures, faults or other discontinuities underground that may become conduits for seepage or contaminants from the cemented tailings backfill underground to Patterson Lake. It is also not clear what distance separates the reaches of the underground mine and Patterson Lake. This information will help to determine its proximity to Patterson Lake, which will indicate whether contaminants have a possibility of reaching Patterson Lake.	Regarding stored tailings used as cemented backfill material: 1. Confirm whether there has been an assessment for the presence of fractures, faults and other discontinuities underground that could become conduits for seepage and/or contaminant flow to Patterson Lake. 2. Provide information on the distance between the reaches of the underground mine location and Patterson Lake. 3. Demonstrate that no contaminants will migrate or seep into Patterson Lake from the cemented backfill material.	NexGen notes that Draft EIS Section 1.2 (Rook I Project Overview) is intended to provide information at a summary level. NexGen confirms that information addressing the reviewer's IR is included within the Draft EIS submission. Responses to part 1, part 2, and part 3 of this IR are provided below. 1. NexGen generated a geological model that was used to define the hydrostratigraphic units. Within the crystalline basement rock, the model defined shear and fault zones that were mapped as sub-vertical features as they were encountered during borehole drilling. The primary hydraulic pathway applicable on the scale of the proposed mine development is through the fractures related to fault and shear zones (Draft EIS Annex III [Hydrogeology Baseline Report], Section 5.1.3.1). Groundwater modelling presented in Draft EIS TSD XIV (Groundwater Flow and Solute Transport Modelling Report) included the presence of these fault and shear zones and their ability to enhance flow to Patterson Lake. In addition, sensitivity analysis on the mass loading to Patterson Lake was conducted, wherein the hydraulic conductivity of the fault zone was assumed to be five times higher than the values from the calibrated groundwater model. Model predictions of mass loading to Patterson Lake are presented in Section 4 and Section 5 of Draft EIS TSD XIV. Note that fault zones are illustrated in the figures prepared in NexGen's response to IR 266 (Attachment IR 231/264/266/267-1).	n/a

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						2. Figure 10 of Draft EIS TSD VII (Mine Waste Alternatives Assessment Report) and Figure A-15 of Appendix A of Draft EIS TSD XIV both present a visual of the location of the underground mine relative to Patterson Lake. The underground tailings management facility (UGTMF), as shown in both of these figures, is approximately 350 m below Patterson Lake. Vertical raises are located approximately 315 m from Patterson Lake. 3. Figure A-17 of Appendix A of Draft EIS TSD XIV presents a conceptual breakdown of the advective flux from the various underground components to Patterson Lake. Seepage from the UGTMF, primary backfill, secondary backfill, and reflooded mine workings to Patterson Lake is predicted to occur, as presented in Figure A-17. Mass loadings to Patterson Lake are inputs to the surface water quality analysis and effects assessment for Patterson Lake as documented in Draft EIS Section 10 (Surface Water Quality and Sediment Quality), Draft EIS Section 11 (Fish and Fish Habitat), and Draft EIS Section 15 (Human Health), which concluded no significant adverse effects on valued components.	
5	ECCC	Wildlife and Wildlife Habitat	Section 2 Section 3 Section 14 Section 16 Section 20 Section 23 Section 24 Table 20.3-1 Table 23A-5	The Proponent has committed to developing a Caribou Monitoring and Offsetting Plan due to residual effects to caribou. This plan should consider ECCC's Biodiversity Offsetting Approach that is described in the Operational Framework for Use of Conservation Allowances (ECCC, 2012)[1]. ECCC is available to assist the Proponent in the determination of appropriate offsets that would balance against Project effects. Note 1: https://www.canada.ca/en/environment-climate-change/services/sustainable-development/publications/operational-framework-use-conservation-allowances.html	Provide the Caribou Monitoring and Offsetting Plan for review and clearly explain efforts to minimize, avoid, mitigate and offset impacts to caribou. **Suggestions for mitigation and follow-up measures** In the Caribou Monitoring and Offsetting plan, provide details on how severity of disturbance and vulnerability of the caribou population were considered in coming up with offsetting amounts relative to area disturbed. Important factors including time lag (the amount of time from restoration work to when the habitat would be considered caribou habitat) would need to be considered.	NexGen notes the Environment and Climate Change Canada's (ECCC's) request for the Caribou Mitigation and Offsetting Plan (CMOP) is outside the scope of the Project Terms of Reference (Draft EIS Appendix 1A [Concordance Tables for the Terms of Reference and Generic Guidelines for Preparation of an Environmental Impact Statement], Table 1A-2). Information on NexGen's approach to minimizing, avoiding, and mitigating effects to woodland caribou is summarized in the Draft EIS. The CMOP cannot be provided within the EA process as this plan is still in the development stage and requires the involvement of multiple parties. NexGen is in the process of developing the CMOP through engagement with the Saskatchewan Ministry of Environment and primary Indigenous Groups to meet provincial requirements and align with Indigenous goals. NexGen confirms that factors such as population status, vulnerability (resilience), and time lags that are identified by the ECCC in its draft *Offsetting Policy for Biodiversity* (ECCC 2020) and associated operational guidance and decision support tools, should they be provided by the ECCC, will be considered in the offsetting methods and calculations. Draft EIS Section 14.5 (Residual Effects Analysis) provides information on NexGen's approach to minimizing, avoiding, and mitigating effects to woodland caribou, and the specific mitigations measures relating to potential effects to woodland caribou are identified in Table 14.4-1 of Draft EIS Section 14.4 (Project Interactions), including Pathway ID W-01 (Habitat loss), Pathway ID W-02 (Habitat alteration), and Pathway ID W-03 (Sensory disturbance). Information on the mitigation hierarchy level for these mitigation measures is included in Draft EIS Appendix 23A (Summary of Project Environmental Design Features and Mitigation Measures). No changes are proposed in the revised EIS to address this IR. **References** ECCC (Environment and Climate Change Canada). 2020. Draft Offsetting Policy for Biodiversity. [accessed June 2023]. Available at https://www.canada.ca/content/dam/eccc/documents/pdf/offsetting-policy-biodiversity/draft-biodiversity-offsetting-policy.pdf	n/a
6	CNSC	Current use of lands and resources for traditional purposes	Table 2.4-4	**Context:** Under the rationale for Athabasca Chipewyan First Nation (ACFN) being included as an Indigenous group identified for information sharing, the EIS states "Potential overlap with traditional territory but no access link or known residency/land use". It is not clear how this was determined. ACFN provided comments on the Project Description for the Rook-1 Project and identified that they use the land in the vicinity of the project for hunting,	Provide any additional information about any engagement NexGen has done with ACFN to understand their land use in the vicinity of the Project. Please provide additional information available related to ACFN's Lands and Resource use in Section 16.3.3 of the EIS and in the Indigenous Engagement Report (IER).	NexGen acknowledges the reviewer's comment and provides the following rationale for excluding the Athabasca Chipewyan First Nation (ACFN) within the information presented in Draft EIS Section 16.3.3 (Contemporary Indigenous Land and Resource Use). As discussed in Draft EIS Section 2.4.1 (Identification of Indigenous Groups for Engagement), a detailed evaluation was undertaken for the proposed Project to identify the scope of engagement to be completed with Indigenous Groups. This evaluation considered traditional territories; traditional	Section 2; TSD I

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				fishing and trapping. It is not clear if NexGen has discussed this with ACFN to better understand their land use in the vicinity of the Project or how ACFN's comments on the Project Description were considered when making this determination. **Rationale:** Additional information regarding engagement with ACFN and the projects potential impacts on ACFNs Indigenous and/ or Treaty rights and interest is required.		and current land uses; proximity of the Project to Indigenous communities; and potential Project effects on health and safety, the environment, and any potential or established Aboriginal or treaty rights and related interests of Indigenous Groups (REGDOC-3.2.2 Version 1.1 [CNSC 2019]). Through this process, NexGen determined that the ACFN would either not be affected by, or would experience minor effects from, the Project and should be engaged at an information-sharing level (Draft EIS Section 2.4.2 [Identification of Indigenous Groups for Engagement]). NexGen has offered engagement opportunities to, and held meetings with, the ACFN since 2019, including advising the ACFN of the CNSC's public comment period for the Draft EIS and presenting the results of the EA to the ACFN on 13 April 2023. Engagement conducted with the ACFN during the review of the Draft EIS will be updated in the revised EIS. With respect to engagement conducted with the ACFN between Draft EIS submission and revised EIS submission, NexGen will make appropriate edits in revised EIS Section 2 (Indigenous, Regulatory, and Public Engagement) and revised EIS TSD I (Indigenous Engagement Report). NexGen notes that available information, including information provided by the ACFN through Project engagement activities, did not demonstrate that the ACFN have documented traditional land use activities within any of the Project local study areas (LSAs). Map 1 of *Níh boghodi: We are the stewards of our land* (ACFN 2012) shows that the proposed Project location is located outside the ACFN self-declared protection and stewardship zones; the Project location is only within the ACFN self-declared consultation area. This information is consistent with Map 1 of the *Athabasca Chipewyan First Nation Advice to the Government of Alberta Regarding the Lower Athabasca Regional Plan* (ACFN 2010), which shows the proposed Project is located outside of the ACFN Homeland. NexGen acknowledges the ACFN submitted comments on the Project Description that included general concerns related to potential effects on their rights to hunt, trap, and fish; the continuation of their culture; and cumulative effects. However, through engagement activities conducted to date with the ACFN, no specific traditional land uses have been identified within the Project LSA (Draft EIS Appendix 2A [Summary of Indigenous Group Engagement Activities], Table 2A-6; Draft EIS TSD I [Indigenous Engagement Report], Appendix B, Table B-6). Based on the currently known information presented above, NexGen respectfully disagrees with the reviewer's request to provide additional information available related to the ACFN's Lands and Resource use within either revised EIS Section 16.3.3 or the Indigenous Engagement Report (revised EIS TSD I) as the level of information within these documents in the Draft EIS is appropriate. Other than updating engagement records in revised EIS Section 2 and revised EIS TSD I, no changes are proposed in the revised EIS to address this IR. **<u>References</u>** ACFN (Athabasca Chipewyan First Nation). 2010. Athabasca Chipewyan First Nation Advice to the Government of Alberta Regarding the Lower Athabasca Regional Plan. November 2010. ACFN. 2012. Níh boghodi: We are the stewards of our land. April 2012. CNSC (Canadian Nuclear Safety Commission). 2019. REGDOC-3.2.2, Indigenous Engagement, Version 1.1. August 2019. ISBN: 978 0 660 04518 4. Available at http://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/REGDOC-3-2-2-Aboriginal-Engagement-version-1.1-eng.pdf	

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7	CRDN	Indigenous Peoples' health / Socio-economic conditions	Section 2.5.1	Section 2.5.1 General Communication Methods indicates NexGen exploring ways to further develop its use of social media for the Project and does not have a dedicated social media platform for communication in the Local Priority Area (LPA). Social media as mentioned in the EA is the most common form of communication among our entire demographic and this is especially true for Indigenous northern communities.	**Suggestions for mitigation and follow-up measures** CRDN recommends that NexGen hire a social media representative within the community and work with them to create an Instagram, Tik Tok and Facebook account to educate communities and ensure any workshops, presentations, interview selection, and all forms of communications and opportunities are not missed. Creating these social media accounts will help close the gap in sharing and providing important and valuable information in real time, capturing all LPAs.	NexGen notes the Clearwater River Dene Nation's (CRDN's) recommendation to use social media to enhance engagement is outside the scope of the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012*. However, NexGen appreciates the CRDN's recommendation and acknowledges the importance of social media as a tool to communicate with local priority area (LPA) community members, including the provision of Project updates. NexGen also notes that mechanisms exist under the existing Benefit Agreement with the CRDN to plan for and address activities requested as part of this IR, as required. As noted in Draft EIS Section 2.5.1 (General Communication Methods), NexGen is exploring ways to further develop the use of social media. Currently, NexGen operates corporate and Project websites, and LinkedIn, Facebook, and Instagram accounts. Additionally, as part of coordination under the Benefit Agreement, NexGen and the CRDN have already discussed dissemination of Project information through the CRDN's communication application developed by AIVIA Inc. NexGen understands the importance of communicating with LPA communities in a manner that is clear, open, honest, and timely, and will continue updating its communication methods based on recommendations from the Environmental Committees and Implementation Committees as detailed within the Benefit Agreements with each primary Indigenous Group. As this IR is out of the scope of the EA, no changes are proposed in the revised EIS. NexGen notes that this IR response has been collaborated on directly with the CRDN through the CRDN Environmental Committee. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html	n/a
8	MN-S	VC Scoping and Input	Section 2.5.2.1 Section 2.6.3.1.1	The EIS states: "Assist in the identification of valued components (VCs) …" "The VC Survey requested input on identifying the VCs to be evaluated for the Project and ideas about how to avoid or lessen potential Project effects on VCs. Results from these surveys helped to inform future engagement, as well as the selection of VCs for the EIS." The Joint Working Group for MN-S did not have western science advice or individuals with impact assessment experience involved when NexGen approached the group to discuss VCs. MN-S, on several occasions, repeated a request for this conversation to be re-opened with the support of western science advice, beginning with a Joint Working Group meeting in late 2020.	The MN-S input into VCs cannot be considered thorough and meaningful under these circumstances. VC scoping should consider the reviews of this draft EIS by western science advisors, as per MN-S' request.	NexGen acknowledges the reviewer's comment, though maintains that the Métis Nation – Saskatchewan (MN-S) has been given reasonable opportunities to provide thorough and meaningful input into the selection of valued components (VCs). The process undertaken to collect input from Indigenous Groups, including the MN-S, involved methods both prior to submission of and during review of the Draft EIS. A key method implemented to facilitate Indigenous contributions into the Draft EIS was the Study Agreements signed with the primary Indigenous Groups in the fall of 2019 (Draft EIS Section 2.5.2.1 [Study Agreements]). A few of the key focuses of the Study Agreements were to: ▪ develop a Joint Working Group (JWG) structure for each Indigenous Group to support the inclusion of Indigenous Knowledge into the EA process and to facilitate regular, ongoing engagement; ▪ assist in the identification of VCs for the EA; and ▪ support Indigenous Knowledge and Traditional Land Use (IKTLU) Studies in various forms particular to each Indigenous Group. As part of the Study Agreements, NexGen allocated budget for MN-S contributions into the Draft EIS, including funding for participation in the JWG process, technical support (e.g., Western science support), and completion of a self-directed IKTLU Study. The Study Agreement also provided funding for a Community Coordinator appointed by the MN-S for the explicit purpose of fulfilling the commitments within the Study Agreement. With respect to technical support, NexGen reminded the MN-S about available funding in December 2020, January 2021, and March 2021. Multiple VC discussions with the MN-S were either held or offered through the JWG process. Valued components were discussed with the MN-S through the JWG in October 2019, December	n/a

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						2019, and February 2020 (MN-S-JWG 2019a,b, 2020). In December 2020, the MN-S requested a list of proposed VCs for the Project, which NexGen provided in January 2021. In May 2021, the MN-S indicated that they wanted to workshop VCs internally later in the year. At that time, NexGen advised that valuable input on VCs from the MN-S had been provided in 2019 and 2020 and effects assessments were being initiated; NexGen requested that any additional discussions on VCs for the Draft EIS occur in the near future. NexGen followed up on this topic by providing additional offers in June 2021 and September 2021 to discuss VCs. In September 2021, the MN-S had an action item to advise of VC areas of interest; however, the MN-S did not provide any further information prior to the Draft EIS submission. In addition to feedback received through the JWG process, the MN-S IKTLU Study submitted to NexGen in August 2020 provided key information to help inform the selection of VCs for the Project EA. The IKTLU Study included details regarding MN-S physical and cultural heritage, land and resource use, traditional diet, infrastructure and services, employment and economy, and human health, and provided maps of key traditional land use areas. These details were considered during VC selection alongside other information provided by the MN-S and other Indigenous Groups. The MN-S review of the Draft EIS through the FIRT process also offers an opportunity for the MN-S to provide comments on the VCs selected for assessment. NexGen has responded to all IRs submitted through the FIRT and notes that no comments specific to which VCs were selected for the EA have been provided by the MN-S. As detailed above, NexGen notes that key information to inform the selection of VCs was provided by the MN-S through the JWG meetings in 2019 and 2020 and the MN-S IKTLU Study provided to support the Project EA. In addition, funding for Western science technical support has been available since 2019 and reasonable opportunities to provide further information on VC selection have been provided through the JWG process and the Draft EIS review. No changes are proposed in the revised EIS to address this IR. **References** MN-S-JWG (Métis Nation – Saskatchewan-Joint Working Group). 2019a. Meeting Minutes. Meeting #1. 29 October 2019. MN-S-JWG. 2019b. Meeting Minutes. Meeting #2. 10 December 2019. MN-S-JWG. 2020. Meeting Minutes. Meeting #4. 27 February 2020.	
9	MN-S	Indigenous Group Engagement Method Summary	Section 2.5.2.2, Table 2.5-1	As outlined in Table 2.5-1 of the EIS - Summary of Primary Indigenous Group Engagement Methods – the Table indicates that Joint Working Group meetings, Joint Working Group breakout sessions, and information presentations were used to capture "Indigenous Knowledge" Indigenous Knowledge is subject to the First Nations Principles of ownership, control, access, and possession (OCAP®) and Nations' consent. It is unclear from Joint Working Group meeting minutes when NexGen believes there was a discussion of which information sources should be considered Indigenous Knowledge, and how they should be used. Also, "capture" is a verb that leaves open the possibility as to whether "Indigenous Knowledge" was respectfully and accurately documented with Nations' knowledge and consent.	It is unclear from Joint Working Group meeting minutes and other documents when NexGen believes that it validated specific information that it understood to be "Indigenous Knowledge" to be documented in the draft EIS. Please provide additional context in the Joint Working Group meeting minutes to clarify NexGen's validation process.	NexGen notes that the Study Agreement signed between NexGen and the Métis Nation – Saskatchewan (MN-S) in 2019 contains the terms and conditions with respect to the verification and use of Indigenous Knowledge in the Project EA, including the principles of ownership, control, access, and possession of Indigenous Knowledge. While the content of the Study Agreement is confidential, the following information summarizes the details necessary to address the reviewer's comment. As per the Study Agreement with the MN-S, a key purpose of the Joint Working Group (JWG) was to share Indigenous Knowledge for integration into the Draft EIS. In compliance with the terms of the Study Agreement, meeting minutes were captured during the JWG meetings, drafted by an independent consultant, and distributed and reviewed by the JWG, thereby verifying the accuracy of Indigenous Knowledge shared during the JWG meetings. Information from these meetings was then considered within the Project EA, where applicable. The Study Agreement also outlined the specific criteria to be followed with respect to ownership, control, access, and possession of Indigenous Knowledge that was to be used within the Draft EIS.	n/a

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						These processes were specific to both the JWG process and the self-directed Indigenous Knowledge and Traditional Land Use (IKTLU) Study provided by the MN-S. NexGen adhered to the Study Agreement terms and conditions for the use of Indigenous Knowledge provided by the MN-S through both the JWG and the IKTLU Study; therefore, use of information within the Draft EIS follows the principles of ownership, control, access, and possession. NexGen also notes that the use of the term 'capture' in Table 2.5-1 of Draft EIS Section 2.5.2.2 (Indigenous Group Engagement Methods Summary) was intended to represent a simple term associated with the detailed processes for Indigenous Knowledge collection within a summary table and was not intended to disregard the processes associated with the accurate and respectful collection of Indigenous Knowledge as described in the Study Agreements with each of the primary Indigenous Groups.	
10	CRDN	Indigenous Peoples' health / Socio-economic conditions	Section 2.5.4	Under section 2.5.4 Public Engagement Methods there are no Indigenous methodologies being used to access and gain Indigenous insight. For example, when providing the project information packages (under table 2.5-1: Summary of Primary Indigenous Group Engagement Methods)	**Suggestions for mitigation and follow-up measures** CRDN recommends that NexGen consider hiring a community member to contextualize and provide NexGen methodologies for all engagement opportunities including social media -e.g. photovoice, short creative videos, etc. Partnering to provide information updates on the Project, identify opportunities to engage with the Project. E.g., maps and models can be co-created and co-designed to what is culturally appropriate and understood. Providing context for fluent first nation speaking communities/nations. The models, maps and distribution of materials need to be accessible and transmitted in ways that meet the needs of try community engagement through a more inclusive messaging. There are proactive alternatives to cartography (digital technologies by decolonial Indigenous artists, Indigenous indicators of cumulative impacts, etc.) "A better map is one that I am part of, not as an object, but as a subject of my own future" – Alais Ole-Morindat. There are participatory continuums and collaboration quality to be considered.	NexGen notes the Clearwater River Dene Nation's (CRDN's) recommendation on Indigenous engagement and communication methods is outside the scope of the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012*. However, NexGen notes that mechanisms exist under the existing Benefit Agreement with the CRDN to plan for and address activities requested as part of this IR, as required. NexGen's goal is to have engagement practices that are early, often, and lasting (Draft EIS Section 2.5.2 [Indigenous Engagement Methods]). NexGen maintains that the engagement requirements have been met for the EA. Through a collaborative process, NexGen and the CRDN determined the appropriate methods for Project engagement, culminating in the Study Agreement signed in 2019, and NexGen has been respectful in following the terms of the Study Agreement. For example, the Study Agreement included capacity funding for the CRDN to hire a Community Coordinator, with one of the key purposes of the role being to work with NexGen to prepare and coordinate information packages and communications for Project-related engagement activities. In addition to communication protocols specific to the CRDN, NexGen has made several efforts to reach CRDN members through the public engagement program, acknowledging that limitations existed due to the COVID-19 pandemic (e.g., required public safety measures and government restrictions). Efforts to date include: ▪ Materials developed in Dene, which are available on NexGen's Project website (www.saskatchewanuranium.ca). ▪ Online videos generated by NexGen for the Project and for the community (i.e., not specific to the Project) that are available on NexGen's corporate website (www.nexgenenergy.ca). ▪ NexGen hiring a La Loche-based Project Liaison Manager who understands culturally appropriate and meaningful ways to communicate in the local priority area (LPA). ▪ Development of engagement methods by NexGen to specifically share information and communicate in the LPA, including: o quarterly newsletters; o monthly radio addresses on local stations; o NexGen La Loche office being open Monday to Friday; o NexGen membership/representation on regional committees; o maintaining a Project website; and o regular engagement update letters to Indigenous Groups and municipalities. During the Community Information Sessions in 2019, 2022, and 2023, NexGen had Dene-speaking team members available to translate for Dene-speaking residents in the LPA communities. Throughout the lifespan of the Project, NexGen will continue to work with the CRDN to determine the best communication methods for the CRDN and its community members. An example could be the use of CRDN's communication application developed by AIVIA Inc. to provide Project updates. NexGen will continue updating its communication methods based on recommendations from the	n/a

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						Environmental Committee and Implementation Committee as implemented in the Benefit Agreement with the CRDN. As this IR is out of the scope of the EA, no changes are proposed in the revised EIS. NexGen notes that this IR response has been collaborated on directly with the CRDN through the CRDN Environmental Committee. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html	
11	MN-S	Incorporation of Indigenous and Local Knowledge	Section 2.5.5	As stated in the EIS: "Incorporation of Indigenous and Local Knowledge…" "Incorporation" is a term typically not preferred, because it implies a secondary position afforded to Indigenous Knowledge within the draft EIS document. Indigenous Knowledge is a unique, but equal, way of knowing. As a rights holder, MN-S qualitative communication of impacts regarding the quality of resources and/or contamination levels should be acknowledged. Text, at a minimum, should reflect "real or perceived" impacts. The exclusive use of "perceived" implies that this Knowledge is not supported or equal in importance to scientific data collection.	Please revise text in the EIS to ensure MN-S qualitative communication of impacts regarding the quality of resources and/or contamination levels is acknowledged.	NexGen notes that, as discussed in Draft EIS Section 3.6 (Incorporation of Indigenous and Local Knowledge), Indigenous Knowledge was valued equally to Western science in the Draft EIS. The term 'incorporation' is commonly used to describe the process of merging or combining information, rather than implying a secondary position. Qualitative information shared by the Métis Nation – Saskatchewan regarding the quality of resources and/or contamination levels is acknowledged and described in the Draft EIS, and, as an example, is used in the assessment of the potential effects of the Project on Indigenous land and resource use (Draft EIS Section 16.5.1.3 [Quality of the Indigenous Land Use Experience]). No changes are proposed in the revised EIS to address this IR.	n/a
12	MN-S	Incorporation of Indigenous and Local Knowledge	Section 2.5.5	As stated in Section 2.5.5 of the EIS: "… as the Project has developed and provided additional opportunities to incorporate Indigenous and Local Knowledge throughout all phases of the EA." The TLUS is a key element of the Indigenous Knowledge related to the Project.	It is unclear from the draft EIS how specific contents of the TLUS were used in the EA process. It is unclear from Joint Working Group meeting minutes when NexGen believes it may have engaged with MN-S on the contents of the completed TLUS and how they would be used in the EIS. Please provide additional context to clarify.	NexGen notes that the specific terms regarding use of information in the Draft EIS from the self-directed Indigenous Knowledge and Traditional Use (IKTLU) Study provided to NexGen by the Métis Nation – Saskatchewan (MN-S) are contained within the Study Agreement signed between NexGen and the MN-S in 2019. Draft EIS Section 6.2 (Incorporation of Indigenous and Local Knowledge) describes how Indigenous and Local Knowledge was incorporated into the Draft EIS, including the integration of results from the IKTLU Studies completed for the proposed Project. The specific information used from the MN-S IKTLU Study for the Project EA is noted throughout the Draft EIS. As stated in Draft EIS Section 2.5.5 (Incorporation of Indigenous and Local Knowledge), "[w]here Indigenous and Local Knowledge was provided for the Project, NexGen incorporated this information to the extent possible and explained how it has been used in the EA process." Draft EIS Section 3.5.2 (Indigenous Knowledge and Traditional Land Use Studies) identifies the MN-S IKTLU Study as an important source of information utilized in the preparation of the EIS, and Draft EIS Section 3.6 (Incorporation of Indigenous and Local Knowledge) details the methods applied to incorporate the information provided in the IKTLU Studies provided by Indigenous Groups, as well as other sources of Indigenous and Local Knowledge, within the EA. In addition, the "Incorporation of Indigenous and Local Knowledge" subsections of Draft EIS Section 7 (Air Quality, Noise, and Climate Change) through Draft EIS Section 19 (Community Well-Being), Draft EIS Section 21 (Accidents and Malfunctions), and Draft EIS Section 22 (Assessment of Effects of the Environment on the Project) speak to the methods used for the incorporation of Indigenous Knowledge within each section, and summarize how Indigenous Knowledge was incorporated within the assessment. Within sections of the EIS, the MN-S IKTLU Study is noted as TSD IV: Métis Nation – Saskatchewan Northern Region 2 Traditional Land Use & Diet Study for the NexGen Rook I Project (Draft EIS TSD IV: MN-S) and is cited wherever Indigenous Knowledge from the IKTLU Study was used.	n/a

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13	CNSC	Public information and disclosure	Section 2.6	**Context:** NextGen mentions in various areas of section 2.0 "Indigenous, Regulatory and Public Engagement" that it recognizes the importance of feedback from different target audiences including the general public in the LPA communities for the design and development of the proposed Project, the EA process including the selection of VCs. There is information as to how the feedback from Indigenous Groups, stakeholder groups such as JWT, Trappers Associations to name a few, was incorporated where applicable and feasible. There is however no information as to how feedback from the general public was factored in development of the proposed Project, the EA process including the selection of VCs. **Rationale:** The regulatory document REGDOC-3.2.1, *Public Information and Disclosure* and Generic Guidelines for the Preparation of an Environmental Impact Statement pursuant to the Canadian Environmental Assessment Act, 2012 mention the proponent will indicate how the feedback from target audiences and concerns voiced will be incorporated in the design of the project as well as in the EIS, to the extent possible. There is an expectation that the views of the public are likely to influence the proponent's communications tools and information to deliver an effective public information and engagement program.	Provide information as to how feedback from the general public gathered from various engagement activities was factored in the development of the proposed Project, the EA process including the selection of VCs.	To date, NexGen has completed extensive engagement during Project development, and the opportunity to engage has been extended to all identified Indigenous Groups, regulatory agencies, and the public. Engagement activities throughout the EA process have been conducted to both meet regulatory requirements and demonstrate NexGen's values with respect to engagement. Specific to the general public, NexGen has focused engagement towards local priority area communities, as these are the communities that would experience most of the Project effects and for which NexGen would prioritize local training, employment, and business opportunities for the Project. Public engagement activities that informed the EA process and selection of valued components (VCs) are detailed in Draft EIS Section 2.6.3 (Public Engagement) and Draft EIS Appendix 2D (Summary of Public Engagement Activities). For example, Draft EIS Section 2.6.3.1.1 (Summary of Community Information Sessions) describes a survey that was administered during community information sessions to obtain public feedback on the selection of VCs for the Draft EIS. Draft EIS Section 3.5.3 (Sources of Local Knowledge) speaks to the different methods used to collect Local Knowledge. NexGen notes that Local Knowledge was shared during community information sessions, site tours, and other formal and informal meetings, as well as through research conducted as part of environmental and socio-economic baseline data collection. Draft EIS Section 3.6 (Incorporation of Indigenous and Local Knowledge) speaks to the guiding principles and approach to incorporate Indigenous Knowledge and Local Knowledge into the EA. Table 3.8-1 of Draft EIS Section 3.8 (Influence on the Environmental Assessment) documents how shared Indigenous and Local Knowledge was incorporated into the various discipline assessments within the Draft EIS, such as the selection of VCs and intermediate components, component methods, existing conditions, scoping and pathways analysis, and mitigation measures. In addition to the summary information regarding Indigenous and Local Knowledge provided in Draft EIS Section 3 (Indigenous and Local Knowledge) as described above, the 'Incorporation of Indigenous and Local Knowledge' subsections of Draft EIS Section 7 (Air Quality, Noise, and Climate Change) through Draft EIS Section 19 (Community Well-Being), Draft EIS Section 21 (Accidents and Malfunctions), and Draft EIS Section 22 (Assessment of Effects of the Environment on the Project) speak to the methods used for the incorporation of Indigenous and Local Knowledge within each section and summarize how Indigenous and Local Knowledge was incorporated within the assessment. Draft EIS Section 3.7 (Influence on Project Planning and Design) describes how the feedback and Indigenous and Local Knowledge provided during community information sessions, workshops, and key person interviews, among other sources, influenced Project planning and design. A summary of how community values influenced the Project design is provided in Table 3.7-1 of Draft EIS Section 3.7.3 (Summary of Influence on Project Design). Overall, NexGen's engagement program, including the collection of public feedback and Indigenous and Local Knowledge, has been comprehensive and provided a clear path for the development of the Draft EIS, including the VC section process, and this information has been considered within the Project design.	n/a

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14	MN-S CNSC	Reasonably Foreseeable Development Case	Section 2.6.1.2, Section 6.5.3, p. 6-21	As stated in section 2.6.1.2 of the EIS: "Communities noted that the consideration of effects and effects studies completed at other project sites in the area is important in the assessment of the Project. Information about other project activities in the surrounding area was noted as important for better understanding potential cumulative effects that might occur. It was noted that cumulative effects from other industrial activities such as mining, forestry, and hydro-electric power generation and transmission projects should be taken into consideration. Indigenous Groups also noted concerns regarding increased access restrictions to traditional lands due to increasing project developments in the area." The list of Reasonably Foreseeable Developments (RFDs) included in NexGen's draft EIS includes only Fission's proposed Patterson Lake project, and does not include other industrial activities, such as NexGen's own exploration activities. It is also not clear from Joint Working Group meeting minutes when NexGen believes it may have engaged with MN-S	It is clear that the Fission Patterson Lake South Project was designated for the RFD Case, however the section then says "*Additional RFDs were identified and included in the assessment of cumulative effects* for applicable VCs (e.g., woodland caribou)". It would be helpful to clearly list in this section what RFDs were identified and included, potentially through a table. Please provide rationale as to why the list of RFDs does not include other activities. Please provide additional information on when NexGen believes it may have engaged with MN-S on this.	NexGen notes the reviewers' comment and has provided Table 1 in Attachment IR 14-1 that lists the valued components (VCs), intermediate components, and the associated reasonably foreseeable developments (RFDs) considered in the Draft EIS. To clarify, NexGen exploration and other current industrial activities are included in the Base Case, and these activities are carried through the EA into the RFD Case, where applicable; the RFD Case includes all previous and existing activities, the Project, and the RFDs. As noted in Draft EIS Section 6.5.3 (Reasonably Foreseeable Development Case), RFDs were defined as projects and activities that fit any of the first three and both of the last two criteria from the list below: ▪ are currently under regulatory review or have officially entered a formal regulatory application process; ▪ have been publicly disclosed by other proponents; ▪ may be induced by the Project; ▪ have the potential to change the Project or the effects predictions; and ▪ occur in the spatial assessment boundary defined by the VCs and intermediate components. Applying these criteria to the public information available at the time of the Draft EIS resulted in identifying the following RFDs: ▪ Fission Patterson Lake South Property, which is located within the regional study areas (RSAs) for all VCs assessed except for climate change, and most of the intermediate components assessed. ▪ For the woodland caribou VC, the Fission Patterson Lake South Property, which is located within the wildlife RSA; and Carrier Forest Products and Mistik Management Ltd. Forest Management Plan areas, which are located within the southern portion of SK2 West Caribou Administration Unit, south of La Loche, and well outside the wildlife RSA. In response to engagement with the Métis Nation – Saskatchewan (MN-S) on the identification and inclusion of RFDs in the Draft EIS, NexGen notes the following: ▪ Discussion of the Fission Patterson Lake South Property as an RFD occurred with the MN-S on 21 January 2020. ▪ An offer to discuss potential future projects and activities was made on 17 December 2020, and a follow-up discussion regarding RFDs was offered to the MN-S for May 2021 and extended through the engagement update letters sent to the MN-S on 4 June 2021, 30 June 2021, and 6 August 2021. Joint Working Group (JWG) summaries for April 2021, May 2021, and June 2021 were provided to the MN-S and all presented an EA process flowchart, including reference to the consideration of RFDs and cumulative effects. While the specific RFDs were not explicitly stated, these summaries show reference to the topics discussed, combined with the continued NexGen offer to discuss any topics discussed in JWGs.	n/a

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15	CNSC	Current use of lands and resources for traditional purposes	Section 2.6.1.2.2 Other Indigenous Groups	**Context**: The EIS states "To date, no issues or concerns have been identified by ACFN or ERFN". ACFN submitted comments on the Project Description, which included concerns such as potential impact on their rights to hunt, trap and fish, the continuation of their culture and cumulative effects. **Rationale:** Concerns raised by ACFN, including those raised during their review of the Project Description, should to be included in the EIS and IER Summary tables.	Include a summary of issues table for ACFN with information about issues or concerns raised during the review of the Project Description and any issues or concerns ACFN has raised since then. Include information about how the issues have been responded to ACFN and any updates with regards to engagement on the Project with ACFN use of lands and resources for traditional purposes.	NexGen acknowledges that the Athabasca Chipewyan First Nation (ACFN) submitted comments on the Project Description that included concerns related to potential effects on their rights to hunt, trap, and fish; the continuation of their culture; and cumulative effects. However, through engagement activities conducted to date on the Draft EIS with the ACFN, no specific issues or concerns have been raised. Engagement conducted during the review of the Draft EIS, as well as associated concerns, will be updated in the revised EIS. With respect to engagement conducted with the ACFN between Draft EIS submission and revised EIS submission, NexGen will make appropriate edits in revised EIS Section 2 (Indigenous, Regulatory, and Public Engagement) and revised EIS TSD I (Indigenous Engagement Report). With respect to ACFN issues and concerns, revised EIS Section 2.6.1.2.2 (Other Indigenous Groups), and Section 6.2.6 of revised EIS TSD I will be amended to include issues and concerns raised by the ACFN during review of the Project Description (i.e., potential effects on their rights to hunt, trap, and fish; the continuation of their culture; and cumulative effects) as well as any new issues and concerns, should any be raised. In addition, the following new tables will be added to the revised EIS to capture issues and concerns raised by the ACFN: ▪ Table 2B-6 of revised EIS Appendix 2B (Summary of Issues Identified by Indigenous Groups); and ▪ Table C-6 of Appendix C of revised EIS TSD I.	Section 2.6.1.2.2 ; Appendix 2B; TSD I, Section 6.2.6, Appendix C
16	CNSC	Current use of lands and resources for traditional purposes	Section 2.6.1.3 and Appendix 2B	**Context:** The summary of issues tables does not appear to include all key issues identified by the Indigenous Nations and communities For example, some of Indigenous Nations and communities have shared concerns with respect to reduced access to cabins and cultural sites, lack of trust in the process and the road safety of highway #955 that were not captured in the issues and concerns and summary tables in Appendix 2B. The final EIS and IER supporting documentation should include further details on the validation of issues and concerns directly raised by Indigenous Nations and communities, and how NexGen is addressing them as per REGDOC-3.2.2 and CNSC's Generic EIS Guidelines. Particularly, those concerns related to impacts on any potential or established Indigenous and/or treaty rights. **Rationale**: Additional detail is required to understand the status of validation for each issue raised and the response provided.	Update the summary of issues and concerns tables to include all issues and concerns raised by each of the Indigenous Nations and communities to date, including concerns raised in the Traditional Knowledge studies, on the Project Description, and during engagement activities. Demonstrate that each Indigenous Nation and community has reviewed and validated their summary of issues and concerns table and/or a path forward to complete the validation throughout the EIS and the update in the IER. **Suggestions for mitigation and follow-up measures** It is recommended that NexGen creates a commitment tracking table, or adds a column to their issues table, that clearly articulates the specific mitigations that they have committed to for each Indigenous Nations and community to address the issues and concerns they have raised. Validation must be complete by the time the technical review of the EIS is complete, prior to submission of a final EIS. Should the proponent not be able to fully address issues, concerns or feedback raised by any Indigenous Nation or community, this must be clearly documented, and a rationale provided.	NexGen notes that Table 2.6-5 through Table 2.6-8 in Draft EIS Section 2.6.1.2.1 (Primary Indigenous Groups) are intended to present a concise summary of issues and concerns identified by primary Indigenous Groups. Each entry listed in the tables may represent more than one comment received by an Indigenous Group as similar issues and concerns were consolidated. More details regarding issues and concerns raised by Indigenous Groups are presented in Draft EIS Appendix 2B (Summary of Issues Identified by Indigenous Groups), and Appendix C of Draft EIS TSD I (Indigenous Engagement Report). NexGen is confident that Table 2B-1 through Table 2B-5 of Draft EIS Appendix 2A (Summary of Indigenous Group Engagement Activities), and Table C-1 through Table C-5 of Appendix C of Draft EIS TSD I present comprehensive information for the issues and concerns raised by Indigenous Groups noted within the tables (i.e., Clearwater River Dene Nation [CRDN], Métis Nation – Saskatchewan [MN-S], Birch Narrows Dene Nation [BNDN], Buffalo River Dene Nation [BRDN], and Ya'thi Néné Lands and Resources [YNLR]). With respect to the examples raised by the reviewer: ▪ concerns related to reduced access to cabins are contained within Issue IDs CRDN-017, MN-S-001, BNDN-001, BRDN-001, BRDN-005, and YNLR-004; ▪ concerns related to a lack of trust in the EA process are contained within Issue IDs CRDN-001, CRDN-003, and MN-S-011; and ▪ concerns related to road safety are contained within Issue IDs MN-S-009, MN-S-023, BNDN-012, BRDN-007, BRDN-010, BRDN-014, and YNLR-003. For the revised EIS, NexGen will review the engagement record from the Draft EIS, the Indigenous Knowledge and Traditional Land Use Studies, the Project Description, and new engagement records generated since submission of the Draft EIS and include any additional issues and concerns raised in revised EIS Section 2.6.1.2 (Summary of Identified Topics of Interest, Issues, and Concerns), revised EIS Appendix 2B, and Appendix C of revised EIS TSD I. In addition, NexGen will clearly articulate in the revised EIS the key accommodations, including mitigations, proposed to be applied to address issues and concerns raised by the Indigenous Groups. NexGen also acknowledges the reviewer's comment regarding validation, which is consistent with the intent of actions described in Draft EIS Section 2.6.1.3 (Validation of Identified Issues) and Draft EIS Section 2.7.2 (Continuing to Work to Understand Interests and Address Issues). The process to validate Indigenous issues and concerns has been discussed with and agreed upon by four Indigenous Groups. At the time of writing, the issues and concerns validation process has been	Section 2.6.1.2; Appendix 2B; TSD I, Appendix C

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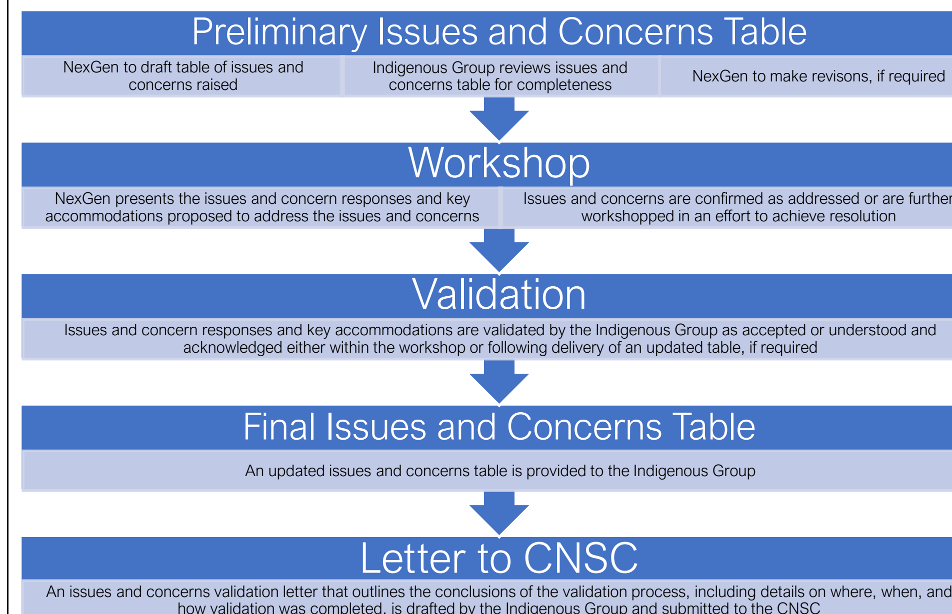
						concluded with the CRDN. The general approach to validate Indigenous issues and concerns with the Indigenous Groups is as follows:  To support the response to this IR, NexGen has provided Attachment IR 16-1, which includes the letter from the CRDN to the CNSC validating that CRDN issues and concerns have been addressed, as well as the final CRDN issues and concerns table. NexGen notes that the issues and concerns validation process may be amended, where necessary, should Indigenous Groups and NexGen agree on modified steps that would better facilitate the validation process.	
17	MN-S	Summary of Trappers Workshop		As stated in the EIS "The N-19 Trappers Association expressed an interest in reviewing the baseline studies and EA results when available." NexGen does not describe what actions it did or did not take to facilitate this review. The EIS' efforts to characterize trappers' activities as commercial are at odds with trapping as a harvesting practice as protected under s. 35 of the Constitution Act (1982).	NexGen should include a detailed response of the actions they took to facilitate trappers' access to baseline studies and EA results, particularly on the understanding that MN-S citizens are among the association's members, and harvest is a constitutionally protected right under s.35 of the Constitution Act.	NexGen has an excellent relationship with the N-19 Trapper's Association and has kept the N-19 Trapper's Association informed throughout the EA process, including five meetings and workshops held between 2018 and 2023 based on topics of interest and at a cadence determined collaboratively between NexGen and the N-19 Trapper's Association. Specific to sharing information with the N-19 Trapper's Association regarding baseline studies and EA results, following a request by the N-19 Trapper's Association during a meeting on 28 February 2022, NexGen prepared a presentation for the N-19 Trapper's Association that included summaries of baseline programs conducted for the Project with relevance to trapping and land use and the EA results. However, due to scheduling challenges, the presentation was delivered in March 2023, after the Draft EIS was submitted. During the March 2023 meeting between NexGen and the N-19 Trapper's Association, the N-19 Trapper's Association workshop participants expressed satisfaction with the engagement process conducted by NexGen to date and indicated that they had no outstanding concerns and would like to stay informed of the Project advancement. NexGen also notes that NexGen staff and subject matter experts were present at community information sessions in June 2022, October 2022, and June 2023 to discuss baseline studies and EA results, which offered local trappers additional opportunities to engage with NexGen regarding the proposed Project.	TBD

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						No changes are proposed in the revised EIS to address this IR; however, updates to engagement records included in the Draft EIS, including applicable updates for the N-19 Trapper's Association, will be added to the revised EIS, as applicable.	
18	MN-S	Summary of indigenous Group Engagement Activities	Table 2A-2	Table 2A-2 Métis Nation – Saskatchewan 5 May 2021 meeting and subsequent email exchanges dated 5 May 2021 and 7 May 2021 regarding MN-S' expectations for engagement. The characterization of the exchange of MN-S' documented expectations for engagement with a formal response from NexGen as answering "many of" MN-S requests regarding engagement is not a faithful summary of the exchange of views. Among the key aspects of engagement that MN-S documented was a discussion of effects and mitigation measures before submission of the EIS. MN-S' expectations documented on May 5, 2021, included community meetings where effects and mitigation measures would be discussed with community members. This expectation is foundational to having a clear understanding of the Project and its potential to affect Métis rights and interests, but its omission gets erased through NexGen's characterization "many of" MN-S' expectations having been met. Not all expectations are equal, nor could NexGen cherry pick the expectations that suit it and call this "collaboration". Understanding that NexGen's timelines for EIS submission were rapidly approaching, MN-S and its consultants instead asked for courtesy copies of the EIS to be sent to MN-S in parallel with submission to regulators. NexGen refused this as well. These are not examples of a collaborative form of engagement but meet a minimum regulatory threshold. This summary also omits the Joint Working Group subcommittee meetings in which MN-S and its consultants gave extensive guidance to NexGen on the nature, pace, and sequence of Joint Working Group meetings. NexGen was ablet o "suggest" to MN-S certain topics because subcommittee meetings were the vehicle for doing so. 19 August 2021, Video conference communication The summary of this meeting omits the fact that the key barrier to collaboration through the Joint Working Group process was building trust, and that this was a primary topic of conversation on this date. The current summary describes the meeting as discussing the procedural aspects of the Joint Working Group process, which is only a partial description of the conversation.	MN-S is requesting that NexGen re-word the 19 August 2021 meeting summary to include trust-building, and introduction of more culturally appropriate ways of sharing such as cultural values and Métis history shares, including the fact that these were introduced at MN-S' request. MN-S also requests that NexGen describe the "remaining 2021 and 2022 funding" accurately in the Table 2A-2 record of engagement.	NexGen appreciates the Métis Nation – Saskatchewan's (MN-S's) comment; however, NexGen would like to provide clarification on engagement information included in the Draft EIS. NexGen agrees with the MN-S that aspects of trust building and cultural considerations were discussed within the 19 August 2021 Joint Working Group (JWG) meeting, though NexGen notes that, for brevity, the information in Table 2A-2 of Appendix 2A (Draft EIS Section 2 [Indigenous, Regulatory, and Public Engagement]) was summarized. These considerations are included under 'processes and protocols for the JWG', which was the general discussion category captured in the meeting minutes reviewed and approved by NexGen and the MN-S. NexGen has reviewed entries in Table 2A-2 of Draft EIS Appendix 2A and confirms that the current descriptions regarding capacity funding are accurate. NexGen will provide additional context for the noted 19 August 2021 entry in Table 2A-2 of revised EIS Appendix 2A to include trust building and the introduction of more culturally appropriate ways of sharing, such as cultural values and Métis history shares.	Appendix 2A
19	MN-S	Public Engagement Materials	2F, all	This appendix and its contents use globalizing language such as "Joint Working Group summary" to imply that any or all of the Joint Working Groups may have advanced through a collaborative conversation on the content described in the summary documents compiled in Appendix 2F. As Appendix 2A notes, each Joint Working Group progressed at different paces on different topics. Appendix 2F provides a misleading picture of the content shared through Joint Working Groups and the dates on which it was shared and with whom.	The content of Appendix 2F should be renamed and repackaged to indicate which Nations engaged on which topics at which times. The globalizing nature of these summaries erases Nation-by-Nation specificity, which is important in establishing an understanding of engagement.	NexGen acknowledges the reviewer's comment though notes that Draft EIS Appendix 2F (Public Engagement Materials) is intended to represent a reference file that shows the content of public engagement materials distributed to communities within the local priority area, including the primary Indigenous Groups (Draft EIS Section 2.1 [Introduction]). Specific details on engagement activities completed with each Indigenous Group are provided in Draft EIS Section 2.6.1.1 (Summary of Indigenous Engagement Activities), Draft EIS Appendix 2A (Summary of Indigenous Group Engagement Activities), Section 5 of Draft EIS TSD I (Indigenous Engagement Report), and Appendix B of Draft EIS TSD I. No changes are proposed in the revised EIS to address this IR.	n/a

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20	MN-S	Gathering Indigenous and Local Knowledge	Section 3.6.2.1	As stated in the EIS :"…Between April and June 2021, NexGen presented information and requested feedback and input from Indigenous Groups on the topics of traffic accidents and malfunctions, EA methods (i.e., pathway analysis, residual effects classification, determination of significance, prediction confidence and uncertainty, and monitoring and follow-up programs). Mail-out documentation on these topics was presented in documents entitled "Joint Working Group Summary" that are included as appendices for Section 2 of the draft EIS but meetings on these topics over this timeframe did not take place with MN-S, based on review of Joint Working Group meeting minutes. Again, the global nature of wording such as “Indigenous Groups” allows NexGen to give the impression that the same approach was followed for all Nations, which as NexGen notes in 2.0 Indigenous, Regulatory, and Public Engagement, is not the case. It is also misleading to indicate that summary documents mailed out, to which MN-S did not provide a detailed response, constitutes "incorporation of Indigenous Knowledge".	MN-S requests that NexGen change the text of Section 3.6.2.1 to indicate what is local knowledge versus Indigenous Knowledge. Indigenous and local knowledge should be described separately. Also, the draft EIS should describe OCAP® processes related to KP interviews.	NexGen notes that the definitions of Indigenous Knowledge and Local Knowledge are provided in Draft EIS Section 3.4 (Defining Indigenous and Local Knowledge); these definitions were developed based on consideration of regulatory guidance, input from Indigenous Groups, and relevant literature. ▪ As stated in Draft EIS Section 3.4.1 (Defining Indigenous Knowledge), “Indigenous Knowledge can generally be understood as the unique and collective knowledge of a group of Indigenous People that is built up through generations of living in close contact with the land and natural environment.” ▪ Local Knowledge is used as a more general term and represents information sourced from a local priority area citizen or representative but without Indigenous Group / Elder sanction. As stated in Draft EIS Section 3.4.2 (Defining Local Knowledge), “[g]iven that approximately 96% of the population in the Project’s LPA [local priority area] communities identify as Indigenous, the inclusion of the term ‘Local’ in ‘Indigenous and Local Knowledge’ is used to recognize the necessity to capture the information provided by locals in the EA, but not as the official Indigenous Knowledge sources provided by Indigenous Groups.” NexGen also notes that sources of Indigenous and Local Knowledge are presented in Draft EIS Section 3.5 (Indigenous and Local Knowledge Sources). The Indigenous Knowledge and Traditional Land Use (IKTLU) Studies completed by the Indigenous Groups provided sources of Indigenous Knowledge (Draft EIS Section 3.5.2 [Indigenous Knowledge and Traditional Land Use Studies]), the Joint Working Group (JWG) meetings primarily provided Indigenous Knowledge, with some Local Knowledge (Draft EIS Section 3.5.1 [Joint Working Groups]), and engagement activities such as key person (KP) interviews, community events (e.g., community information sessions), site tours, workshops, and in-person meetings provided Local Knowledge (Draft EIS Section 3.5.3 [Sources of Local Knowledge]). Indigenous and Local Knowledge sources are cited throughout the Draft EIS. As the KP interviews represented a form of public engagement (Draft EIS Section 2.5.4 [Public Engagement Methods]), the principles of ownership, control, access, and possession of Indigenous Knowledge, as described in the Study Agreements with the Indigenous Groups, do not apply. However, the KP interviews were conducted using accepted qualitative research practices, including acquiring consent for use of information within the Draft EIS and maintaining the confidentiality of any KP interview participants (Draft EIS Section 2.6.3.1.2 [Summary of Key Person Interview Research Program]; Draft EIS Annex X [Socio-economic Baseline Report], Section 4.3.4). In respect to the specific example raised by the reviewer, NexGen attempted to discuss with the Métis Nation – Saskatchewan (MN-S) on all topics raised and provided multiple offers to meet with the JWG; however, the MN-S was unable to participate. In lieu of meetings, the MN-S received the information through the JWG summaries included within engagement update letters provided by NexGen to all of the primary Indigenous Groups, including the MN-S; the engagement update letters included an offer from NexGen to further discuss the topics contained within the JWG summaries, if these topics were of interest to the MN-S. NexGen notes that specific details on engagement topics discussed with each Indigenous Group are provided in Draft EIS Section 2.6.1.1 (Summary of Indigenous Group Engagement Activities) and Draft EIS Appendix 2A (Summary of Indigenous Group Engagement Activities). No changes are proposed in the revised EIS to address this IR.	n/a
21	CNSC **MN-S**	Current use of lands and resources for traditional purposes	Section 3.6.2.2	**Context:** The EIS indicates that sources of Indigenous knowledge were shared with each EA discipline specialist for review and incorporation into their respective assessments and that a coordinator reviewed for accuracy and consistency. It is not clear whether NexGen has validated the inclusion of Indigenous knowledge in the EIS with the Indigenous Nations and Communities.	Provide detail to demonstrate how NexGen has validated the inclusion of Indigenous Knowledge in the EIS with the Indigenous Nations and communities.	NexGen acknowledges the reviewer’s comment though notes that the request to validate how Indigenous Knowledge was incorporated into the Draft EIS is outside the scope of the CNSC Generic Guidelines for the preparation of an EIS (CNSC 2021). Specific to the reviewer’s comment, NexGen provides the following information regarding the processes used in development of the Draft EIS specific to the collection of Indigenous Knowledge, integration of Indigenous Knowledge, and verification of accurate representation of Indigenous Knowledge.	n/a

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				Rationale: Additional detail is required to determine if Indigenous Nations and communities have validated their inclusion of Indigenous Knowledge in the EIS.		<u>Collection of Indigenous Knowledge</u> To facilitate engagement activities and Indigenous contributions to the development of the Draft EIS, Study Agreements were signed between NexGen and each of the primary Indigenous Groups in the fall of 2019. These Study Agreements contain the terms and conditions with respect to the verification and use of Indigenous Knowledge in the Project EA. While the content of the Study Agreements is confidential, two of the key focuses of the Study Agreements were to: ▪ develop a Joint Working Group (JWG) structure for each Indigenous Group to support the inclusion of Indigenous Knowledge into the EA process and to facilitate regular, ongoing engagement; and ▪ support Indigenous Knowledge and Traditional Land Use (IKTLU) Studies in various forms particular to each Indigenous Group (Draft EIS Section 2.5.2.1 [Study Agreements]). As per the Study Agreements, a key purpose of the JWGs was to share Indigenous Knowledge for integration into the Draft EIS. In compliance with the terms of the Study Agreements, meeting minutes were captured during the JWG meetings, drafted by an independent consultant, and distributed and reviewed by the JWGs, thereby verifying the accuracy of JWG meeting minutes, including any Indigenous and Local Knowledge shared. Information from these meetings was then considered within the Project EA, where applicable. In addition to Indigenous and Local Knowledge received through the JWG process, IKTLU Studies completed by Indigenous Groups and submitted to NexGen provided Indigenous Knowledge to help inform the Project EA. As each IKTLU Study was self-directed at the sole discretion of each Indigenous Group, the accuracy of Indigenous Knowledge included within the IKTLU Studies has been verified. NexGen adhered to the Study Agreement terms and conditions for the collection of Indigenous Knowledge provided by the MN-S through both the JWG and the IKTLU Study; therefore, further verification of the accuracy of information used within the Draft EIS was not required. <u>Integration of Indigenous Knowledge into the EA</u> With respect to discussing how Indigenous and Local Knowledge would be integrated within the Draft EIS, in addition to the processes described in the Study Agreements, NexGen offered opportunities to, and held JWG meetings with, the primary Indigenous Groups throughout 2021 to discuss EA methods and discipline-specific assessment approaches (Draft EIS Section 2.6.1.1.1 [Summary of Joint Working Group Activities]; Draft EIS Appendix 2A [Summary of Indigenous Group Engagement Activities]). One of the items discussed at these JWG meetings was the methods that would be used to integrate Indigenous Knowledge into the Project EA. Once Indigenous Knowledge was received by NexGen from the Indigenous Groups and assessments were initiated, the NexGen EA team reviewed the Indigenous Knowledge provided through the JWGs and IKTLU Studies to identify information that should be considered within the Project EA. As stated in Draft EIS Section 3.6.2.2 (Incorporating Indigenous and Local Knowledge), "[t]o guide discipline leads in considering how Indigenous and Local Knowledge influenced their respective assessments, they were asked if Indigenous and Local Knowledge: ▪ confirmed or verified currently known information; ▪ improved or enhanced known information; ▪ contradicted current information, and if so, whether there were any perspectives shared that were critical to the Project assessment; and ▪ informed methods, mitigation, analysis, or the monitoring approach/design." Where Indigenous Knowledge important to the EA was identified, this information was viewed as complementary and influential alongside Western science information (Draft EIS Section 3.6.1 [Guiding Principles]). Where used in the EA, Indigenous Knowledge is appropriately cited throughout the Draft EIS. The use of Indigenous Knowledge within the Draft EIS is also described within the "Incorporation of	

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						Indigenous Knowledge" subsection of Draft EIS Section 7 (Air Quality, Noise, and Climate Change) through Draft EIS Section 19 (Community Well-Being), Draft EIS Section 21 (Accidents and Malfunctions), and Draft EIS Section 22 (Effects of the Environment on the Project), and in Table 3.8-1 of Draft EIS Section 3.8 (Influence on the Environmental Assessment). Verification of Accurate Representation of Indigenous Knowledge within the Draft EIS In late 2021 and early 2022 prior to Draft EIS submission, NexGen offered the primary Indigenous Groups opportunities to discuss EA results (Draft EIS Appendix 2A); unfortunately, NexGen and the primary Indigenous Groups were unable to meet prior to the Draft EIS submission. However, NexGen confirms that results meetings have been held with all primary Indigenous Groups following Draft EIS submission, and no specific comments were received regarding potential misrepresentation of Indigenous Knowledge. Following Draft EIS submission, the FIRT conducted their review of the Draft EIS; this process included participation by certain Indigenous Groups. NexGen notes that through the FIRT process, no specific IRs have been received stating that the interpretation of Indigenous and Local Knowledge provided to NexGen has been conducted incorrectly within the Draft EIS. Summary Through the collection of Indigenous Knowledge properly conducted under the terms and conditions of the Study Agreements signed with the primary Indigenous Groups, the well-defined steps to identify and integrate Indigenous Knowledge into the Project EA, and the opportunities offered and completed to date with Indigenous Groups to verify that their Indigenous Knowledge has been properly characterized within the Draft EIS, NexGen maintains that best efforts have been made to accurately include Indigenous Knowledge within the Project EA and Draft EIS. **References** CNSC (Canadian Nuclear Safety Commission). 2021. Generic Guidelines for the Preparation of an Environmental Impact Statement – Pursuant to the *Canadian Environmental Assessment Act, 2012*. Available at http://cnsc.gc.ca/eng/resources/environmental-protection/ceaa-2012-generic-eis-guidelines.cfm	
22	CRDN	Indigenous Peoples' health / Socio-economic conditions	Section 4.1	Under section 4.1 Indigenous Engagement table 4.1-1: Summary of Primary Indigenous Group Key Engagement Activities, how is CRDN defined? Is the correspondence, meetings, joint working group, site tours data coming directly through engagement with Chief and Council members only? Or does this include CRDN leadership and community members? If community members are included, at what level? Treaty members? Local members? Community members that are considered hunters, trappers, gatherers and/or environmental advocates? On page 78, the job descriptions are identified within community, but they are not categorized with attached numbers/data. I recognize the summary sections of 2.6.3.1.3, 2.6.3.1.4 and 2.6.3.1.5. but believe the data collected under section 4.1 could be categorized into special groups, to show the number of trappers, hunters, gatherers, knowledge keepers, Elders, environmental community advocates, educators, local business owners, local cabin owners, etc. were all considered to provide information in all community engagement aspects/participate in the survey collection, interviews, and workshops. For example: key person interviews conducted with community members to cover health, education, economic development, social services, and community well-being: x amount of trappers participated, x amount of hunters participated, x amount of gatherers participated, x amount of local educators participated. It would be helpful to identify what demographic, educational background, and way of living the data is being generated from and for. This could help identify	Please provide additional information on how CRDN is defined in section 4.1. Please revise section 4.1 so that data collected is categorized, including the identification of demographic, educational background, way of living etc. in order to identify any information gaps.	Through a collaborative process, NexGen and the Clearwater River Dene Nation (CRDN) determined the appropriate methods for Project engagement related to the EA, culminating in the Study Agreement signed in 2019. NexGen has been respectful in following the terms and conditions of the Study Agreement. As examples, the Study Agreement included capacity funding for the CRDN to establish a Joint Working Group (JWG) to support the inclusion of Indigenous Knowledge throughout the EA process, conduct a community-led Indigenous Knowledge and Traditional Land Use Study, and engage independent technical experts and/or consultants. Depending on the engagement mechanism, multiple levels of CRDN membership were engaged, including Chief and Council, Elders, and community members. Participants in the JWG meetings, Indigenous Knowledge and Traditional Land Use Study, and key person interviews were selected by the CRDN. Information in Section 4.1 of Draft EIS Master Executive Summary is presented as introductory text on all communities. This summary information is not intended to be an exhaustive presentation of participants and engagement activities. For this reason, no changes to Section 4.1 of Draft EIS Master Executive Summary are proposed. Further information on the engagement activities conducted with the CRDN is provided in Draft EIS Section 2 (Indigenous, Regulatory, and Public Engagement) and Table 2A-1 of Draft EIS Appendix 2A (Summary of Indigenous Group Engagement Activities). NexGen notes that this IR response has been collaborated on directly with the CRDN through the CRDN Environmental Committee.	n/a

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				real gaps in all types and methods of data collection and land use studies. There may not be enough participants identified and/or considered for both Indigenous and local trappers, hunters, gatherers, etc. that carry Indigenous-local land intelligence no one else can claim (as these are intrinsic, inherent, and diverse ways of knowing) and this would be considered a massive loss and missed opportunity of vital local-traditional knowledge and deep understandings of the geography and biodiversity.			
23	CRDN	Indigenous and Local Knowledge	Section 4.4	Indigenous knowledge has been defined by "input from Indigenous Groups, and relevant literature". This is very vague and there are no sources being cited/referenced to the relevant literature. In 2021, CRDN Elders, language workers, trappers, hunters, gatherers, and community care advocates developed a definition of what Indigenous Traditional Knowledge (ITK) means "a network of knowledges, beliefs, and traditions intended to preserve, communicate, and contextualize Indigenous relationships with culture and landscape over time. Indigenous epistemologies (how knowledge can be known), pedagogies (how knowledge can be taught), and ontologies (our wans of life in the world) include the holistic, empirical data and knowledge in historical, geographical, cultural, spiritual, social economic, environmental, and experiential studies of the natural world. Our diverse knowledges are portable, in that they call for reliance upon local resources and careful observations of the interactions between living beings and natural processes within an ecosystem (any ecosystem) to ensure human survival."	CRDN recommend that NexGen include clear definitions of Indigenous and local knowledge. CRDN recommend NexGen use the definition of what ITK means as developed in 2021 by CRDN Elders, language workers, trappers, hunters, gatherers, and community care advocates.	NexGen notes that the Master Executive Summary provides a high-level summary of information contained within the Draft EIS, including the definition of Indigenous and Local Knowledge. More comprehensive definitions of Indigenous and Local Knowledge are provided in Draft EIS Section 3.4.1 (Defining Indigenous Knowledge) and Draft EIS Section 3.4.2 (Defining Local Knowledge), respectively. Information provided by the Clearwater River Dene Nation (CRDN) in their self-directed Indigenous Knowledge and Traditional Land Use (IKTLU) Study, along with information from IKTLU Studies completed by other Indigenous Groups, were used in defining Indigenous Knowledge used within the EA. NexGen believes the definition of Indigenous Knowledge used within the EA is closely aligned to the definition of Indigenous Knowledge as developed in 2021 by CRDN Elders, language workers, trappers, hunters, gatherers, and community care advocates. For this reason, no changes are proposed in the EA. For context, the bullets below present aspects of the Indigenous Knowledge definition: ▪ Indigenous Knowledge was described by Indigenous Groups in terms of being rooted in living off the land for generations and the intimate relationship with the land and resources that is developed from the long-term practice of traditional activities. ▪ The CRDN described the importance of learning on the land, and how "the land is simultaneously the teacher and the school room". ▪ Indigenous Knowledge was described by members of the CRDN, Métis Nation – Saskatchewan (MN-S), Birch Narrows Dene Nation (BNDN), and Buffalo River Dene Nation (BRDN) as being place based and building on historical connections with specific places used in the past (Draft EIS TSD II: BNDN; Draft EIS TSD III: BRDN; Draft EIS TSD IV: MN-S; Draft EIS TSD V.2: CRDN). ▪ In summary, Indigenous Knowledge can generally be understood as the unique and collective knowledge of a group of Indigenous People that is built up through generations of living in close contact with the land and natural environment. The body of knowledge builds upon the historical experiences of a people and adapts to social, economic, environmental, spiritual, and political change; therefore, it is cumulative and dynamic. ▪ For the purposes of the EA, Indigenous Knowledge is specifically defined as information sanctioned (i.e., authoritative permission or approval given) by an Indigenous Group as an official statement, document, or position. NexGen and the CRDN will continue to work through the Environmental Committee established under the Benefit Agreement with the CRDN to confirm clear designations of Indigenous Knowledge as it applies to the Project moving forward. NexGen notes that this IR response has been collaborated on directly with the CRDN through the CRDN Environmental Committee.	n/a
24	CNSC	Alternative Assessment	Section 4.4.2.1	As outlined in Section 4.2 of the *Generic Guidelines for the preparation of an Environmental Impact Statement pursuant to the CEAA 2012*, the alternative means assessment should take into consideration " the level of concern expressed by the public and Indigenous groups". Section 4.4.2.1 states that the alternative assessment did take into account input from Indigenous nations and communities and members of the public, however this section is	Please revise Section 4.4.2.1 to include details on the feedback that was heard from Indigenous nations and communities and members of the public, and how the alternative means assessment took this feedback into consideration when moving forward with preferred project design/options.	NexGen acknowledges the reviewer's comment though would like to note that Section 4.2 of the CNSC Generic Guidelines for the preparation of an EIS (CNSC 2021) states the following: "The approach and level of effort applied to addressing alternative means is established on a project-by-project basis, taking into consideration: ▪ the characteristics of the project	n/a

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				lacking details on areas of concern, levels of concern and how this information was used in the alternative means assessment.		▪ the environmental effects associated with the potential alternative means ▪ the health or status of VCs that may be impacted by the alternative means ▪ the potential for mitigation and the extent to which mitigation measures may address potential environmental effects ▪ the level of concern expressed by the public and Indigenous groups” NexGen also notes the guidance referenced by the reviewer (CNSC 2021) came into effect in March 2021, one month after the completion of the Project Feasibility Study (NexGen 2021), where the alternative means assessment was completed and the basis of Project design was confirmed. The previous guidance (CNSC 2016) did not include the clause quoted above. Despite the regulatory guidance referenced by the reviewer not being implemented until after the completion of the Project alternative means assessment, NexGen has always prioritized understanding the interests of local Indigenous Groups and communities, including how the Project could be designed to minimize potential adverse effects and maximize potential benefits. As stated in Draft EIS Section 4.4.2.1 (Input from Indigenous Groups and the Public), “NexGen recognizes the importance of community input and continually strives to acknowledge and incorporate key feedback in the design and development of the Project.” With this in mind, NexGen engaged regularly with Indigenous Groups and the public regarding Project design during early Project development and while alternative means of designing the Project were under consideration. Description of these engagement activities is provided in Draft EIS Section 2.6 (Engagement Summary), Draft EIS Appendix 2A (Summary of Indigenous Group Engagement Activities), and Draft EIS Appendix 2D (Summary of Public Engagement Activities). NexGen also notes that Draft EIS Section 4.4.2.1 is intended to summarize concerns by key theme that were received from Indigenous Groups and community members and considered in the alternatives assessment. Additional information on how specific Indigenous Group input, where provided, was considered within the alternative means assessment is presented in Draft EIS Section 4.5 (Alternative Assessments for the Project). Specifically, feedback was received and considered for the following Project design components: ▪ primary mining method (Draft EIS Section 4.5.1 [Primary Mining Method]); ▪ underground mining method (Draft EIS Section 4.5.2 [Underground Mining Method]); ▪ final product type (Draft EIS Section 4.5.5 [Final Product Type]); ▪ mine waste storage (Draft EIS Section 4.5.6 [Mine Waste Storage]); ▪ power supply type (Draft EIS Section 4.5.7 [Power Supply Type]); ▪ effluent treatment technology (Draft EIS Section 4.5.12 [Effluent Treatment Technology]); ▪ treated effluent discharge location (Draft EIS Section 4.5.13 [Treated Effluent Discharge Location]); ▪ conventional waste disposal (Draft EIS Section 4.5.17 [Conventional Waste Disposal]); and ▪ decommissioning demolition waste disposal (Draft EIS Section 4.5.18 [Decommissioning Demolition Waste Disposal]). In addition to the information provided in Draft EIS Section 4.5, Table 3.7-1 of Draft EIS Section 3.7.3 (Summary of Influence on Project Design) provides a summary of how Indigenous and Local Knowledge affected key design considerations, including the selection of the underground storage of tailings, optimization of water management, and site layout to optimize the surface footprint; a cross reference to this information in Draft EIS Section 3.7 (Influence on Project Planning and Design) is also included in Draft EIS Section 4.4.2.1. Through the information presented above, including references to where information is provided in the Draft EIS, NexGen deems that the approach taken for the Project alternatives assessment meets the requirements of the CNSC Generic Guidelines for the preparation of an EIS (CNSC 2021), despite these requirements coming into effect following the completion of Project feasibility study design stage. As a result, no changes are proposed in the revised EIS to address this IR.	

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						References CNSC (Canadian Nuclear Safety Commission). 2016. Generic Guidelines for the Preparation of an Environmental Impact Statement – Pursuant to the *Canadian Environmental Assessment Act, 2012*. Available at https://www.nuclearsafety.gc.ca/eng/pdfs/Environmental-Assessments/CEAA-2012-Generic-EIS-Guidelines-eng.pdf CNSC. 2021. Generic Guidelines for the Preparation of an Environmental Impact Statement – Pursuant to the *Canadian Environmental Assessment Act, 2012*. Available at http://cnsc.gc.ca/eng/resources/environmental-protection/ceaa-2012-generic-eis-guidelines.cfm NexGen (NexGen Energy Ltd.). 2019. Project Description for the Rook I Project. Submitted to Saskatchewan Ministry of Environment and Canadian Nuclear Safety Commission. April 2019. NexGen. 2021. Rook I Project Feasibility Study. Feasibility Study Report. Rev 0. Document No. 0000-BA00-RPT-0001. Prepared by Stantec for NexGen Energy Ltd. 28 April 2021.	
25	CNSC	Alternative Assessment	Section 4.5.4 Process Stripping Method	**Context:** After screening-level assessment, the proponent states that the more preferred alternative for process stripping was strong acid stripping as it would provide better environmental performance for the process plant and reduce health and safety concerns for the Project. A strong acid will be used as the stripping agent in the process plant solvent extraction circuit to extract Uranium and will be transported to the project site. However, the proponent does not provide information on the strong acid, e.g., type and quantity, to be used. **Rationale:** As the strong acid will be transported to the project site, different acid may pose different impacts on the environment and human health and safety when an accident occurs in association with the transportation and/or storage of such an acid.	Provide information on the strong acid to be used for process stripping.	As presented in Table 5.4-1 of Draft EIS Section 5.4.2.1 (Metallurgy and Process Flowsheet), sulphuric acid is the strong acid used for the acid stripping process in the leaching process circuit. Sulphuric acid would be manufactured on site in the acid plant and not transported to site. Additional details on hazardous materials will be provided during the federal licencing processes for the Project, as applicable. No changes are proposed in the revised EIS to address this IR.	n/a
26	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 4.5.6	The Proponent indicates that "One specific underground location, U-4 was carried forward for screening for technology; U-4 is located outside of known major geologic structure and potential areas of mineralization." Looking at figure 4.5.4, ECCC notes that the U-4 location is quite close to, and some portions of it overlap with, parts of Patterson Lake. It is unclear what the actual distance between the U-4 underground storage and Patterson Lake will be upon construction, and the probability that contaminants from the U-4 underground location will seep into Patterson Lake is not stated.	1. Provide the distance from the U-4 underground storage location to Patterson Lake. 2. Demonstrate that no contaminants will migrate or seep into Patterson Lake from the U-4 underground storage location.	Responses to part 1 and part 2 of this IR are provided below. 1. Figure 10 in Draft EIS TSD VII (Mine Waste Alternatives Assessment Report) and Figure A-15 in Appendix A of Draft EIS TSD XIV (Groundwater Flow and Solute Transport Modelling Report) both present a visual representation of the location of the underground mine relative to Patterson Lake. The underground tailings management facility (UGTMF), as shown in both of these figures, is approximately 350 m below Patterson Lake. 2. Figure A-17 in Appendix A of Draft EIS TSD XIV presents a conceptual breakdown of the advective flux from the various underground components to Patterson Lake. Seepage from the UGTMF, primary backfill, secondary backfill, and reflooded mine workings to Patterson Lake is predicted to occur, as presented in Figure A-17. Mass loadings to Patterson Lake are inputs to the surface water quality analysis and effects assessment for Patterson Lake as documented in Draft EIS Section 10 (Surface Water Quality and Sediment Quality), Draft EIS Section 11 (Fish and Fish Habitat), and Draft EIS Section 15 (Human Health), which concluded no significant adverse effects on valued components.	n/a
27	ECCC	Fish and fish habitat	Section 4.5.6.4 Section 4.5.6.4.1	The Proponent selected the option of segregated, non-potential acid generating (NPAG) unlined, potentially acid generating (PAG) engineered source control. The Proponent states that "Source control layers are layers of	Provide details on how the waste rock was characterized to determine PAG and NPAG classifications and provide information on how the U_3O_8 and sulphur cutoff criteria were determined.	Please see the summary provided below and in Attachment IR 27/41/239/242-1, Waste Rock Geochemical Characterization Report, for details on the specific thresholds used to classify potentially acid generating (PAG) and non-potentially acid generating (NPAG) waste rock.	n/a

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		Change to an environmental component due to hazardous contaminants		lower permeability material to control air and water flow through a waste rock pile and reduce potential for material acidification." The Proponent stated that PAG material contains less than 0.03% U_3O_8 (triuranium octaoxide) and greater than or equal to 0.1% sulphur and NPAG is clean material with less than 0.03% U_3O_8 and less than 0.1% sulphur. Besides these criteria, the Proponent did not explain the rationale or the method for how the criteria cutoff was determined. The neutralization potential that was used to determine the segregation of PAG and NPAG was not described by the Proponent, although it is stated that the dominant waste rock units contain limited buffering capacity as they are deficient in carbonate materials. Acid rock drainage (ARD) and metal leaching (ML) may still occur at low sulphur content when there is no buffering material available.		The PAG waste rock threshold was determined using a combination of geochemical static and kinetic testing. Static testing involved acid-base accounting (ABA), which was completed to assess speciated carbon and sulphur content to determine the balance of acid-generating sulphide minerals and acid-neutralizing minerals. Elemental analyses were also completed to determine metal and metalloid chemistry. The acid rock drainage (ARD) potential was evaluated on the basis of neutralization potential ratios (NPRs). Following static testing, kinetic testing was completed for a subset of samples representing the different waste rock types. Humidity cell tests (HCTs) were used to assess long-term weathering rates of sulphide minerals and to determine potential metalloid leaching rates. Mineralogy of HCT samples was conducted to identify trace minerals, including sulphides, and to measure mineral associations and liberations. As noted in the response to IR 53, 0.03% triuranium octoxide (U_3O_8) represents the cutoff between special waste and waste rock, consistent with existing uranium mining and milling operations in Saskatchewan. As noted in IAEA (2000), "a general rule in North America is that material grading less than 0.03% U_3O_8 can be located in normal waste storage areas". According to CNSC (2003), waste rock with less than 0.03% uranium is considered 'benign'. The resulting segregation criteria for waste rock are: ▪ Special waste: o ≥0.03% U_3O_8 and <0.26% U_3O_8. ▪ Potentially acid generating (PAG) waste rock: o <0.03% U_3O_8; o neutralization potential (i.e., NP/AP or TIC/AP) is ≤1; and o sulphur as sulphide is ≥0.1%. ▪ Uncertain ARD potential waste rock (managed as PAG): o <0.03% U_3O_8; o NP/AP or TIC/AP is >1 and ≤3; and o sulphur as sulphide is ≥0.1%. ▪ Non-potentially acid generating (NPAG or clean) waste rock: o <0.03% U_3O_8; and o NP/AP or TIC/AP >3, or total sulphur as sulphide is <0.1%. where: ▪ NP = neutralizing potential; ▪ AP = acid potential; ▪ TIC = total inorganic carbon; ▪ < = less than; ▪ ≤ = less than or equal to; ▪ > = greater than; and ▪ ≥ = greater than or equal to. No changes are proposed in the revised EIS to address this IR. **References** CNSC (Canadian Nuclear Safety Commission). 2003. Canadian National Report for the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. Government of Canada. Available at http://nuclearsafety.gc.ca/pubs_catalogue/uploads/joint-convention-2003-national-report-eng.pdf IAEA (International Atomic Energy Agency). 2000. Methods of Exploitation of Different Types of Uranium Deposits. IAEA-TECDOC-1174. September 2000. Available at https://www-pub.iaea.org/MTCD/publications/PDF/te_1174_prn.pdf	

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28	CNSC	Alternatives Assessment Surface Water Quality	Section 4.5.6.4 TSD XVIII-SWWBM Report-section 5.2.2.4	**Context:** Under section 5.2.2.4-*Sensitivity to Design Alternatives* of TSD XVII, only one design alternative was assessed as part of the sensitivity case to assess how concentrations in the final points of control and treated effluent ponds change when an alternate design option is carried forward for the project. The scenario assessed included an unlined WRSA facility, which showed increased exceedances of environmental release targets compared to the chosen alternative which includes a liner for PAG waste rock. One could expect this would be the case, and it is not clear if there are other alternative assessment scenarios in which the water quality would be improved by choosing different alternatives (for example assessing a dual liner system for PAG waste rock). It is not clear why only this one design option was assessed and why the focus was on WRSA alternatives, and not on any other section of the alternatives assessment (e.g., tailings, gypsum, effluent treatment, waste disposal). **Rationale:** NexGen should justify the choice to only assess the predicted final points of control and treated effluent ponds water quality for one WRSA design alternative, or justify why this one alternative is sufficient to capture the sensitivity of design alternatives for impacts on water quality. NexGen should highlight which design choices throughout the entire alternatives assessment could have the largest potential to impact run off and effluent water quality and include these assessments under section 5.2.2.4.	Provide justification for only assessing one design alternative as part of the “Sensitivity to Design Alternatives” section to assess how concentrations in the final points of control and treated effluent ponds change when an alternate design option is carried forward for the project. Justify the chosen alternative assessed and assess additional alternatives if there are others with potential to impact run off and effluent quality.	The proposed waste rock storage area design, which complies with Saskatchewan Environment and Resource Management *Construction Guidelines for Pollution Control Facilities at Uranium Mining and Milling Operations* (SERM 2000), is expected to have a reduced potential to affect Patterson Lake water quality during Operations and Decommissioning and Reclamation (i.e., Closure) and to require less long-term water treatment compared to the other waste rock storage area design alternatives considered. As described in Section 4.3 of Draft EIS TSD XVIII (Site-Wide Water Balance and Water Quality Modelling Report), several sensitivity scenarios were completed as part of an overall site-wide water balance and water quality model sensitivity analysis to provide information on how variability in various model inputs and assumptions may affect the model results for the proposed Project. These sensitivity scenarios included scenarios intended to evaluate potential variability in climate, water quality source terms, process efficiency, and operational conditions. Within the broader context of this overall model sensitivity analysis, and in particular with respect to variability in assumed water quality source terms, the specific sensitivity scenario presented in Section 5.2.2.4 of Draft EIS TSD XVIII was intended to evaluate a potential conservative or worst-case waste rock storage alternative (i.e., no liner with associated water quality source terms) with respect to modelled water quality at final points of control and in treated effluent ponds. This sensitivity scenario was not intended as a relative comparison of various alternate waste rock storage area designs, nor was it intended to assess how concentrations at final points of control and treated effluent ponds might change if alternative overall Project designs were carried forward for the Project. At a conceptual level however, an alternative overall Project design consisting of open pit mining with associated tailings and waste rock storage on surface, or rehandled and backfilled into pit, would be expected to result in greater potential effects to the receiving environment than the proposed Project. The assessment of alternative overall Project designs, including potential designs for the waste rock storage area, is encompassed within the assessment approach and results presented in Draft EIS Section 4 (Project Alternatives) and Draft EIS TSD VII (Mine Waste Alternatives Assessment Report). NexGen recognizes there are multiple possible permutations to the Project design; however, not all permutations can be considered as viable alternatives owing to interdependencies between individual Project components. As described in Draft EIS Section 4.4.4 (Order of Assessments), the overall Project design, and the order of alternatives assessments, reflects how key components and infrastructure ‘fit together’ to achieve Project objectives, with selected Project components (e.g., mining method, processing methods, mine waste management approach) having a larger influence on Project design and informing the overall development approach of the Project. Therefore, a systematic approach was taken for conducting the alternatives assessments for the Project, with those alternatives assessments that could limit or influence other alternatives assessments considered first. In other words, the proposed Project design was built upon a series of cascading decisions, each of which selected a preferred alternative that best met key environmental, technical, economic, and social criteria, including potential effects on water quality, where applicable. Decisions taken for the initial, more influential Project design components in turn influenced the assessment of subsequent assessments. For example, the decision on mining method (i.e., underground mining), influenced the decision on tailings disposal (i.e., underground tailings management facility), which in in turn influenced the decision on waste rock storage (i.e., on surface). In recognition of the various interdependencies that exist between individual Project components, NexGen believes the alternative assessment approach described in Draft EIS Section 4 has resulted in an overall Project design that best meets the objectives and key environmental, technical, economic, and social criteria for the Project, including consideration of potential water quality at final points of control and in treated effluent ponds. In combination with the sensitivity analyses completed as part of the site-wide water balance and water quality model (Draft EIS TSD XVIII), including a specific case representative of a bounding (i.e., worst-case) alternative for mine waste rock storage, the modelling of additional overall Project design alternatives as sensitivities is not considered warranted. No changes are proposed in the revised EIS to address this IR.	n/a

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						References SERM (Saskatchewan Environment and Resource Management). 2000. Construction Guidelines for Pollution Control Facilities at Uranium Mining and Milling Operations. In draft. October 2000.	
29	ECCC	Alternatives Assessment	Section 4.5.6.4 Waste Rock	**Context**: Pre-screening for general location was conducted for five general locations: underground, in-pit, surface (on site), off-site, and in-lake. Underground, in-pit, off- site, and in-lake general locations were eliminated during pre-screening. The storage of waste rock underground and in-pit were not considered feasible due to volume incompatibility. The only general location, surface (on site) was carried forward for specific location screening and further multiple accounts analysis (MAA). The waste rocks to be stored include potentially acid generating (PAG) waste rock, non-potentially acid generating (NPAG) waste rock, and a smaller quantity of special waste rock that would be processed prior to closure. The PAG waste rock would pose higher risks to the environment and human health due to its potential acid generation. It appears that screening out general location of underground and in-pit by considering the volume of the PAG and NPAG waste rock together is not well justified. The volume of the PAG and the NPAG waste rock is also associated with waste rock segregation criteria (i.e. concentrations of U_3O_8 and sulphur) that appears to have not been rationalized. CNSC staff is of the opinion that pre- screening of general location for waste rock management could separate the PAG waste rock from the NPAG waste rock, and only consider the PAG waste rock to be backfilled. **Rationale**: The PAG waste rock is considered as mineralized/special waste rock [1] and could significantly harm human health or the environment. Therefore, the PAG waste rock should be segregated properly and managed adequately in both short term and long term. CNSC RegDoc 2.11.1 vol 2 requires that the design of mineralized waste rock and tailings management systems shall minimize the reliance on active institutional controls post decommissioning. Management of the PAG waste rock on surface, comparing with underground and in pit, would need more active institutional controls post decommissioning. Section 6.2.5.1.1 of TSD XXI-ERA states that "For arsenic and uranium, the estimated non-radiological dose was highest during Operations, whereas for cobalt and copper, the estimated non-radiological dose was highest during the far-future projection. That is due to the additional load of cobalt and copper from groundwater flows (infiltration and seepage), primarily from the waste rock storage area and secondarily from the UGTMF in the far-future projection." It appears that the waste rock stockpiles are the primary sources of contaminants cobalt and copper that would pose negative impacts on surface water quality in long term. For the waste rock management, it is also not clear what is the opinion of Indigenous Groups and the public. In Section 3.7.2, page 3-31, members of JWGs stated that "….[NexGen] mentioned some will go into the shaft and other places. Any opportunity, even during operations, to store waste rock in mined-out areas should be maximized. (BNDN-JWG 2021)" It appears that Indigenous Groups and the public prefer to manage the waste rock in the mined-out areas.	1. Consider the PAG and NPAG waste rock separately for pre-screening of general location for waste rock management; 2.Conduct alternative means assessment of managing the PAG waste rock underground and in pit with justification of the criteria for waste rock segregation; 3.Provide summary information on the public and Indigenous consultation outcomes for waste rock management.	Responses to part 1, part 2, and part 3 of this IR are provided below. 1. Placing waste rock in separate locations was considered and rejected to reduce potential environmental effects of the Project. For example, creation of multiple waste rock storage area (WRSA) locations would increase disturbance area on surface (e.g., storage area footprints, access roads, water management systems) and associated potential environmental (e.g., air, water, terrestrial) effects. However, as stated in Draft EIS Section 5.4.4.3 (Waste Rock Storage Areas), "[t]he PAG [potentially acid generating] and NPAG [non-potentially acid generating] waste rock would be permanently stored in separate WRSAs: the PAG WRSA and the NPAG WRSA. . . . The PAG WRSA would be located east of the ore storage stockpile . . . and would include the placement of a single HDPE [high-density polyethylene] liner and a self-contained water collection system. . . . The NPAG WRSA would be located south of the ore storage stockpile. . . . Since it would be storing clean (i.e., NPAG) waste rock, the NPAG WRSA would not require a liner." Therefore, NexGen confirms that although PAG waste rock and NPAG waste rock would be located in the same general area, these materials would be stored and managed separately. NexGen also notes that the ability to store waste rock in an underground facility is limited as underground storage is prioritized for tailings, and excavating a purpose-built pit or additional underground volume to store waste rock would increase, not decrease, the volume of waste rock to be stored (i.e., rock increases in volume by approximately 25% on excavation, resulting in design incompatibility). Based on the above, NexGen is not proposing to alter the pre-screening of general locations for waste rock management presented in Draft EIS Section 4.5.6.4 (Waste Rock) and Draft EIS TSD VII (Mine Waste Alternatives Assessment Report). 2. An alternative means assessment for the management of PAG waste rock separately underground or in pit is not necessary, as the excavation required for these options would increase the amount of waste rock to be managed and size of facilities required, and therefore increase the associated potential environmental effects of the Project. As such, these alternatives would be expected to be less preferred. As described in Draft EIS Section 5.5.3.1 (Active Closure Stage), the underground workings and shafts would be backfilled sequentially with designated decommissioning demolition waste until all such materials have been removed from surface. Non-potentially acid generating rock would be used to backfill any remaining space within the shafts to the bottom of the hydrostatic liner, and a concrete plug would then be installed. The potential for rehandling PAG waste rock stored at surface during active closure for long-term disposal underground would be evaluated as Closure designs proceed and a better understanding is available on the potential excess underground storage volume following completion of operations and decommissioning demolition waste backfilling. However, it is expected that there would be insufficient available storage volume to redirect all PAG waste rock generated from the Project underground, and the closure of a PAG waste rock facility remaining on surface would be necessary. By conservatively assuming that all PAG waste generated from Project activities is stored on surface, any future decision to store PAG waste underground would be bounded by the modelling and assessment conducted for the EA. 3. As described in Draft EIS Section 2.6.1.1 (Summary of Identified Topics of Interest, Issues, and Concerns), Indigenous Groups identified a preference for the placement of tailings underground as opposed to the long-term storage of tailings on surface or in a lake. As described in Draft EIS Section 2.6.1.1.2 (Joint Working Group Breakout Sessions), one Indigenous Group also expressed that this approach of underground tailings storage provided a greater sense of safety and security based on the basement rock in which the tailings would be stored. The storage of underground tailings has also generally been well received by communities. As described in Draft EIS Section 3.7.1 (Early Project Decisions), placement of tailings underground was the primary	n/a

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				Reference: 1. RegDoc-3.6, Glossary of CNSC Terminology. May 2022.		driver in the integrated waste storage strategy proposed for the Project, and this underground placement resulted in the preference of storage of waste rock on surface. This message has been conveyed to the primary Indigenous Groups through the Joint Working Group process and other engagement activities. Regarding the quote referenced by the reviewer in the Birch Narrows Dene Nation Joint Working Group (BNDN-JWG 2021) meeting, the member did want to see opportunities to store waste underground, where possible, but acknowledged that placing tailings underground is the priority. No changes are proposed in the revised EIS to address this IR. **References** BNDN-JWG (Birch Narrows Dene Nation-Joint Working Group). 2021. Meeting Minutes. Meeting #8. 24 February 2021.	
30	ECCC	Alternatives Assessment	Section 4.5.7	**Context:** The electricity demand for the Project is estimated to be 24.1 MW. However, there is no information provided on the power ratings for equipment and there is no context around whether the estimate reflects a maximum demand. **Rationale:** Emission effects associated with power generation depend on power demand. The electrical load information will enable independent estimation of the Project's power and energy demand. The information is needed in order to verify the overall power demand information presented in the EIS, and to understand the impacts of the Project on air quality, particularly NOx, and GHG. Including information based on maximum demand will ensure that all impacts are encompassed.	Provide quantitative details of power consumption by equipment operating at the site. Ensure that all equipment is included, and that power consumption at maximum demand is expressed.	Please see Attachment IR 30-1 for the Site-Wide Power Load Summary (by Area) from the Rook I Project Feasibility Study (NexGen 2021). The feasibility study lists all equipment requirements and the resulting nominal power demand for the Project is estimated to be 24.1 MW. The Project peak power consumption at maximum demand is estimated to be 26.5 MW. **References** NexGen (NexGen Energy Ltd.). 2021. Rook I Project Feasibility Study. Feasibility Study Report. Rev 0. Document No. 0000-BA00-RPT-0001. Prepared by Stantec for NexGen Energy Ltd. 28 April 2021.	n/a
31	CNSC	Alternative Assessment	Table 4.5-8	**Context:** Table 4.5-8 contains categories, sub-categories, and set of criteria for four alternatives for tailings storage. For the construction risk and complexity Sub-category of Technical category, the criteria include geotechnical stability considering foundation conditions and waste placement. For the underground tailings storage using the UGTMF, there are concerns of geotechnical stability of the UGTMF caverns as the UGTMF caverns have large dimensions. **Rationale:** Any failures of UGTMF caverns during construction could pose significant risks to workers' safety and might also cause significant underground water inflow and should be considered in the alternative means assessment for underground tailings storage.	Include geotechnical stability of the UGTMF caverns in criteria for construction risk and complexity sub- category and provide supportive information on geotechnical conditions of the UGTMF.	NexGen appreciates the CNSC's comment regarding geotechnical stability of the underground tailings management facility (UGTMF) and confirms that, as presented in Table 4.5-8 of Draft EIS Section 4.5.6.2 (Tailings), geotechnical stability of the UGTMF caverns is included under the 'Technical' category and 'Construction risk and complexity' sub-category in the alternatives assessment. A summary of the UGTMF geotechnical conditions includes: ▪ The UGTMF would be located approximately 350 m into the footwall (i.e., north) of the Arrow deposit and a minimum 240 m below the unconformity in predominantly unaltered basement lithologies, including semi-pelitic gneiss and Intrusives. Approximately one-third of the southern chambers would be located within the Intrusives that exhibit relatively better rock mass quality than the semi-pelitic gneiss. ▪ For both of these lithologies, rock mass conditions within the UGTMF zone typically range from 'Good' to 'Very Good' using standard rock mass classification systems, with intact rock strengths generally greater than 100 megapascals (MPa) (i.e., classified as 'Strong' rock). Rock mass conditions associated with major structural features, such as shears or faults, are classified as 'Fair' to 'Good'. ▪ NexGen has assessed the stability of the UGTMF chambers/pillars using empirical, structural (i.e., kinematic or 'wedge analysis'), and three-dimensional numerical stress modelling methods. ▪ Stress modelling results indicate that the extent of probable rock mass yield is minimal at the designed UGTMF chamber and pillar dimensions and for the planned excavation sequence. NexGen confirms that, during initial development of the UGTMF, instrumentation would be used in the chamber back (i.e., roof) and pillars to monitor rock mass response to confirm design assumptions. NexGen has identified proactive mitigation options to apply if rock mass conditions	n/a

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						are locally poorer than anticipated, rock structure impacts wall/pillar stability, and/or pillar stresses are higher than anticipated. Mitigations may include one or more of the following: ▪ additional cable bolt support; ▪ decreasing UGTMF chamber plan dimensions; and ▪ increasing pillar thickness. No changes are proposed in the revised EIS to address this IR.	
32	CNSC	Alternative Assessment	Section 4.5.9 Camp Location	**Context:** The Rook I project is to be developed as an on-site camp-based operation with the workforce typically working 12-hour shifts on a rotational basis. Three on-site locations were selected for a screening-level assessment for camp location by considering environmental, technical, economic, and social categories. After evaluation of the relative advantages and disadvantages of the range of feasible alternatives, the preferred alternative for camp location for the Project was the west location. The west location is located west of, and adjacent to, mine buildings for the Project, and would be integrated into the general mine and mill terrace areas. The camp location alternative assessment appears to have not considered the workers safety, in particular, the impact of accidents on the workers safety. **Rationale:** In the assessment of accidents and malfunctions, bounding scenario 6-acid plant tail gas scrubber failure, the modeling results show that distance to (Acute Exposure Guideline Level) AEGL-3 is 261 m and to AEGL-2 is 2500 m under worst- case weather conditions, while distance to AEGL-3 is 122 m and to AEGL-2 is 849 m under typical weather conditions. AEGL-3 means that the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals could experience life-threatening health effects or death while AEGL-2 means that the airborne concentrations of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape. Given the close proximity of the camp location to the mine process plant, the likely accident from the mine process plant could pose significant risks to workers' health and safety.	Provide further justification and assessment on camp location by considering workers' health and safety during all phases of the project taking into account accidents and malfunctions.	NexGen acknowledges the importance of protecting workers staying at the Project camp and confirms that worker health and safety would be protected at the chosen camp location. As described in Draft EIS Section 4.5.9 (Camp Location), the alternatives assessment for the camp location included preliminary screening of both off-site vs. on-site accommodations followed by the comparison of three alternative options to identify the preferred alternative that best met a combined set of criteria or sub-categories within environmental, technical, economic, and social assessment categories. Under the social assessment category, the alternatives assessment considered the potential camp location effects to worker safety and human health, particularly with respect to air and noise emissions. The selected camp location represents the preferred alternative for the environmental, technical, and economic assessment categories, and for 8 of the 10 assessment subcategories. While the chosen camp location was less preferred with respect to the social assessment category, any camp location would be required to meet provincial and federal design standards, regulatory guidance, and applicable building codes that require that worker health and safety are protected. As such, confirming worker health and safety is protected was not a differentiating factor between any of the alternatives. Potential effects to workers' health and safety from a potential accident and malfunction in consideration of the relative proximity of the camp to the process plant was not included but would not change the assessment results presented in Table 4.5-21 of Draft EIS Section 4.5.9. The selected camp location (i.e., west location) was already assessed as less preferred with respect to workers' health and safety and would remain a less preferred alternative in consideration of a potential accident at the proposed process plant. In consideration of the combined assessment rankings, NexGen is currently proposing to locate the camp at the west location. Worker health and safety in the camp was considered as part of the human health and risk assessments. As shown in Table 15.2-5 of Draft EIS Section 15.2.8.3 (Exposure Pathways and Conceptual Model), the potential effects on the camp worker were assessed for inhalation of air; incidental ingestion of soil or sediment; ingestion of water and traditional foods; and dermal contact with soil, sediment, and water for both radiological and non-radiological sources. The assessment showed that potential Project effects associated with non-carcinogens (Draft EIS Section 15.5.1.1 [Non-carcinogens]), carcinogens (Draft EIS Section 15.5.1.2 [Carcinogens]), and radionuclides and radon (Draft EIS Section 15.5.1.3 [Radionuclides and Radon]) would not result in a significant adverse effect on human health (Draft EIS Section 15.6 [Risk Characterization and Significance]). With respect to the results of the assessment of accidents and malfunctions, and the reviewer's reference to the use of Acute Exposure Guideline Levels (AEGLs), NexGen notes the assessment of accidents and malfunctions is predominantly conducted to understand and plan for emergency (i.e., non-routine) events and confirm that the resulting risk is tolerable. This approach includes considering if the Project design has appropriately incorporated design features and controls to minimize the probability of occurrence and minimize the consequence of an accident or malfunction, should an event occur. In addition to evaluating whether these design features and controls have mitigated overall risk to levels that are acceptable or as low as reasonably practicable (ALARP), the results of the accidents and malfunctions assessments are used to inform emergency planning. Section 11 of Draft EIS TSD VIII (Accidents and Malfunctions Report) assessed the overall risk to the public for the acid plant tail gas scrubber failure, which also represents the scenario with the greatest potential risk to workers staying at the camp. The probability of this type of accident or	n/a

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						malfunction to occur is likely (i.e., less than or equal to 1 occurrence in 10 years and more than 1 occurrence in 100 years) and the consequence associated with this type of accident or malfunction is minor to moderate, for an overall risk rating of low to moderate (i.e., risk -reduction activities would reduce the risk associated with these scenarios to ALARP; risk may be characterized as tolerable). The modelled exceedance would be short in duration. In addition, since the predominant winds at the Project site are northwest and south-southeast (Figure 7A-1 of Draft EIS Appendix 7A [Air Dispersion Modelling Report]), the likelihood of the acid plant tail gas scrubber failing combined with the likelihood that the wind is blowing in the direction of the camp reduces the overall risk of effects to workers at the camp. While the evaluation did not consider the effect indoors, the risk would be lower indoors as a result of the heating, ventilation, and air cooling system in the camp. NexGen confirms that the accident malfunction probability, consequence, and overall risk rating would be similar between workers staying at the camp and the public. With consideration of conditional probabilities of indoor versus outdoor exposure (i.e., shelter-in-place provisions during short-term releases) and wind direction, the probability of exposure is expected to be reduced to unlikely and the overall risk rating would be reduced to low. With the risk at the ALARP level, the residual risk would be managed through emergency response provisions that would protect the safety of camp occupants during a short-term release of sulphur dioxide (SO_2). Overall, worker health and safety would be protected at the proposed camp location. As the Project design proceeds, NexGen will continue to investigate opportunities to further promote health and safety for workers at the camp. NexGen acknowledges that the Saskatchewan Ministry of Environment (ENV) has expressed concerns regarding the proposed camp location for the Project. Should a change in camp location be required as the result of an approval condition issued by the ENV, NexGen notes that, assuming the amended camp location would occur within the Project maximum disturbance area, the potential effects of the associated footprint alteration would fall within the conservative assumptions utilized for the EA and would not require further assessment. No changes are proposed in the revised EIS to address this IR.	
33	CNSC	Alternatives Assessment Surface Water Quality	Section 4.5.12	**Context:** NexGen has proposed four different effluent treatment technology options in the EIS. NexGen states that all four technologies can meet environmental protection requirements. It is not clear from the EIS the difference in effluent quality the different treatment options were expected to produce. The EIS reads "All treatment alternatives considered in this assessment could meet environmental protection requirements in terms of water quality and discharges to the receiving environment (i.e., Patterson Lake). As such, the overall rankings between the alternatives were driven by relative differences in capital cost, and long-term operational, management, and surveillance costs, as well as factors associated with operational risk/complexity." However, with the proposed two-stage precipitation with lime option, some COPCs are predicted to be above water quality guidelines at the edge of the mixing zone (e.g., chloride, sulphate). **Rationale:** NexGen does acknowledge in this section that CNSC draft REGDOC 2.9.2, *Controlling Releases to the Environment*, was released during the preparation of the Draft EIS, and that the multiple accounts assessment (MAA) is considered preliminary and likely to be refined as part of a forthcoming licensing submission that will meet the requirements of the final REGDOC-2.9.2, when released. However, it is not clear to what degree each effluent treatment technology considered in the assessment could treat each COPC relative to one another.	1.Describe the expected effluent quality in all options assessed in the alternative assessment for effluent treatment technology. 2.Consider other more advanced effluent treatment technologies options in the alternatives assessment that would be considered industry best practices. Describe the expected effluent quality for the more advanced options.	NexGen notes the assessed technologies in the Draft EIS provide the level of mitigation required to protect the receiving environment, recognizing that effluent treatment techniques and technologies have been, and will continue to be, refined with additional work as part of federal licensing activities for the Project. Consistent with the requirements of federal licensing, NexGen has conducted a best available technologies and techniques economically achievable study for effluent treatment during the Construction Phase and will submit this information to the CNSC in support of Project licensing. NexGen confirms that the information requested in this IR for the Project Construction Phase is contained within this study. NexGen also confirms that this work closely followed the requirements of the draft REGDOC 2.9.2, *Environmental Protection, Controlling Releases to the Environment* (CNSC 2021), including an update to relevant source terms and an updated water and mass balance model that describes the expected effluent quality, and supports a best available technologies and techniques economically achievable study in a manner consistent with the draft REGDOC 2.9.2 (CNSC 2021). A similar update regarding effluent treatment technologies and techniques would be competed in support of the federal licensing application for the Project Operations Phase based on any relevant updates at that time, including source characterization, water balance, and applicable technologies. No changes are proposed in the revised EIS to address this IR. **<u>References</u>**	n/a

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				It is also not clear why NexGen has not considered more advanced effluent treatment technologies as part of the alternatives assessment if not all COPCs can meet environmental protection targets, as there are other more advanced treatment options that could have been considered.		CNSC (Canadian Nuclear Safety Commission). 2021. REGDOC-2.9.2, Environmental Protection, Controlling Releases to the Environment. DRAFT. March 2021. Available at https://www.nuclearsafety.gc.ca/eng/pdfs/regulatory-documents/regdoc2-9-2/REGDOC-2_9_2_Controlling_Releases_to_the_Environment.pdf	
34	CNSC	Change to an environmental component due to hazardous contaminants	Section 4.5.12	**Context:** Toxicity testing is a requirement under the *Metal and Diamond Mining Effluent Regulations* and CNSC REGDOC-2.9.1. **Rationale**: The following is an excerpt from REGDOC-2.9.1. The applicant or licensee shall assess for acute lethality any effluents that are released to water frequented by fish and that contain hazardous substances that could be considered deleterious under the Fisheries Act. Meeting existing federal or provincial requirements for toxicity testing shall be considered as satisfying this requirement. The EIS does not appear to show how NexGen plans to demonstrate that the treated discharged effluent is not acutely lethal to rainbow trout and to *Daphnia Magna*.	NexGen must implement measures and programs to ensure that the treated discharged effluent is not acutely lethal to rainbow trout and to *Daphnia Magna* NexGen must demonstrate that the treated discharged effluent is not acutely lethal to rainbow trout and to *Daphnia Magna*.	NexGen confirms that acute toxicity testing of treated effluent released to Patterson Lake via the effluent treatment plant would be completed as a component of the Environmental Protection Program and supporting documentation provided as part of federal licensing. Monitoring requirements related to treated effluent discharge are described at a summary level in Draft EIS Section 10.7 (Monitoring, Follow-Up, and Adaptive Management) and in Draft EIS Appendix 23B (Environmental Assessment Monitoring and Follow-Up Programs Proposed for the Project). As outlined in Draft EIS Section 23.4.1.1 (Environmental Protection Program), effluent sampling would occur in accordance with the requirements of REGDOC-2.9.1 (CNSC 2020), the federal Metal and Diamond Mining Effluent Regulations (MDMER), and provincial permitting and federal licensing requirements. NexGen notes that both acute and sublethal toxicity testing of effluent would be required under MDMER. **References** CNSC (Canadian Nuclear Safety Commission). 2020. Environmental Protection: Environmental Principles, Assessments and Protection Measures. REGDOC-2.9.1, version 1.2. September 2020. Available at https://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/REGDOC-2-9-1-Environmental-Principles-Assessments-and-Protection-Measures-Phase-II.pdf Metal and Diamond Mining Effluent Regulations. SOR/2002-222 under the *Fisheries Act*. Last amended June 18, 2020. Available at https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2002-222/index.html	n/a
35	CNSC	Human health with with respect to hazardous contaminants	Section 4.5.13	**Context:** One of the potential risks of a uranium mine or mill facility is the leakage in the pipes that will be transporting the untreated influent and the treated effluent. **Rationale:** The EIS does not appear to document preventative measures that will in place to prevent a potential spill from the pipes that will be transporting the untreated influent and the treated effluent.	Identify any preventive measures that will be implemented to prevent a potential spill from the pipes that will be transporting the untreated influent and the treated effluent. **Suggestions for mitigation and follow-up measures** NexGen should ensure that the pipes with treated effluent are heat traced to prevent freezing. NexGen should ensure there are programs in place to prevent a potential spill from the pipes that will be transporting the untreated influent and the treated effluent.	NexGen confirms that, as described in Draft EIS Section 5.4.5.2 (Surface Water Management), the pipeline corridors that connect the settling pond, monitoring ponds, and contingency pond to the effluent treatment plant (ETP) would have secondary containment. The Saskatchewan Environment and Resource Management *Construction Guidelines for Pollution Control Facilities at Uranium Mining and Milling Operations* (SERM 2000) state that "[t]he minimum permeability guideline for material to qualify for a secondary containment rating is 1×10^{-7} cm/second." Each pipeline corridor connecting the settling pond, monitoring ponds, and contingency pond to the ETP would include a secondary containment system (e.g., liner) around the pipelines (i.e., the primary containment) that would have a permeability rating equal to, or lower than, the 1×10^{-7} cm/second threshold. Additionally, NexGen will evaluate and incorporate design methods, as appropriate, for preventing potential freezing and/or spills, including heat tracing, as engineering progresses. The designs would also consider the gradient of the pipeline and whether the materials within the pipes would be pumped or conveyed by gravity. Spill protection and prevention processes would be developed under the Environmental Protection Program and Asset Management Program and supporting documentation as part of the broader Project Integrated Management System approach to satisfying provincial permitting and federal licensing requirements. **References** SERM (Saskatchewan Environment and Resource Management). 2000. Construction Guidelines for Pollution Control Facilities at Uranium Mining and Milling Operations. In draft. October 2000.	n/a

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36	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 4.5.16 Section 11.4.2	**Context:** Section 4.5.16 provides an alternatives assessment of sewage treatment technologies and provides the rationale for the selected treatment technology. However, there is no assessment of alternatives or discussion of any treated sewage discharge options. Within Section 11.4.2 the treated sewage discharge location is discussed, but there is no alternatives assessment for potential options such as a combined treated effluent and sewage discharge location and how that may affect the chosen sewage/effluent treatment technologies. **Rationale:** An evaluation of treated sewage discharge that goes beyond location siting and considers potential options, such as combined treated effluent and sewage discharge location, should be completed. This assessment should provide information on how this may affect the chosen effluent and sewage treatment technologies and how this may reduce impacts to surface water quality and fish and fish habitat.	1. Provide an alternatives assessment for treated sewage discharge options, which includes options that investigate a combined treated sewage and effluent discharge. 2. Provide an assessment of how combining treated sewage and effluent may affect the chosen treatment technology and water quality in the receiving environment. 3. Update the surface water quality modelling, effluent and sewage dispersion modelling, environmental risk assessment and aquatic health assessment as needed to reflect any changes that may arise if a combined discharge is selected.	NexGen notes the Environment and Climate Change Canada's (ECCC's) recommendation that a sewage treatment alternatives analysis might reduce effects to surface water quality and fish and fish habitat; however, the currently proposed system with two discharge points represents a conservative assessment of Project environmental effects because this assumption considers two separate discharge disturbances. NexGen maintains that the precautionary approach used in the Draft EIS appropriately captures potential effects associated with sewage treatment and discharge. 1. and 2. Despite the approach undertaken to assess potential effects in the EA, NexGen acknowledges that potential environmental and economic benefits may be realized if the treated effluent and treated sewage discharges could be combined into a single release point. As a part of advancement of Project design, NexGen will evaluate options for combining treated effluent streams from the sewage treatment plant (STP) and effluent treatment plant (ETP), including the option of routing treated STP effluent through the process plant. This evaluation would be used to support any changes to the configuration for the ETP and STP reflected in the Draft EIS, if proposed, which would be included in the applicable licensing documentation. 3. NexGen notes that, using the conservative approach described above, the treated sewage effluent did not adversely affect the surface water quality assessment (Draft EIS Section 10.5.3.1 [Lifespan of the Project]) nor the fish and fish habitat assessment (Draft EIS Section 11.5.4.2 [Significance Determination]). A revised combined discharge design is expected to be within the bounds of the EA and would not require reassessment. However, if the design is revised, the environmental risk assessment would be updated as part of licensing documentation and in consideration of the requirements of REGDOC 2.9.2 (CNSC 2021), as applicable. No changes are proposed in the revised EIS to address this IR. **<u>References</u>** CNSC (Canadian Nuclear Safety Commission). 2021. Environmental Protection: Controlling Releases to the Environment. DRAFT. March 2021. Available at https://www.nuclearsafety.gc.ca/eng/pdfs/regulatory-documents/regdoc2-9-2/REGDOC-2_9_2_Controlling_Releases_to_the_Environment.pdf	n/a
37	CNSC	Alternatives Assessment Mine Waste	Section 4.5.17.3.1	**Context:** NexGen is proposing on-site incineration as the primary industrial waste disposal method for industrial waste. While assessed as a neutral alternative in the MAA due to the relative requirement for on-site infrastructure (i.e., surface disturbance) and emissions potential, this option was selected as the availability of preferred option (off-site facilities) to accept certain waste types or volumes could not be confirmed at the time of the assessment. Both on-site incineration and underground disposal alternatives were considered neutral in the assessment, and it is not clear in the EIS why on-site incineration was chosen as the preferred option over underground disposal. **Rationale**: In the assessment, underground disposal ranked most preferred in the categories change in land use, population at risk, community effect, air quality, and ecological integrity, which are all important topics to stakeholders. NexGen should provide additional justification to why on-site incineration is the preferred option for disposing of industrial waste.	Provide additional justification to why on-site incineration is the best option for industrial waste disposal.	As described in Draft EIS Section 4.5.17.3.1 (Selected Alternative), a conservative (i.e., precautionary) approach was applied when selecting the primary industrial waste disposal method (i.e., incineration) for the purposes of the EA. This approach was applied for industrial waste given the lack of certainty for other waste disposal options (i.e., the identified 'more preferred' option of off-site repurpose/recycle) and over other 'neutral' waste disposal options (e.g., underground disposal) to maintain a conservative assessment (e.g., incineration's increased relative surface disturbance and emissions potential). As described in Draft EIS Section 4.5.17.3.1: ▪ "While assessed as a neutral alternative in the MAA [multiple accounts analysis] due to the relative requirement for on-site infrastructure (i.e., surface disturbance) and emissions potential, this option [on-site incineration] was selected as the availability of off-site facilities to accept certain waste types or volumes could not be confirmed at the time of the assessment." ▪ "…on-site incineration provides greater certainty and flexibility for managing this [industrial] waste stream and was deemed most conservative for the purposes of the EA with the consideration of direct effects of incinerator emissions included as part of the assessment basis for the EIS." As described above, on-site incineration, as opposed to underground disposal, was deemed most conservative from an environmental effects assessment perspective due to the potential footprint requirements and potential air emissions associated with incineration. Incineration was included in the air quality modeling as presented in Draft EIS Section 7.2.5.2.2 (Air Dispersion Modelling Predictions). These predictions were found to have no potential chronic effects to human health or the environment (Draft EIS TSD XXI [Environmental Risk Assessment]).	Section 5.4.6.4 (new); Appendix 5B (new)

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						NexGen confirms that the Project is expected to implement a multi-faceted (i.e., multi-method) approach to conventional waste management that includes on-site material reuse and recycling, incineration, underground disposal, and off-site diversion (i.e., reuse and recycle) and disposal. To the extent practicable, these waste streams would be minimized and segregated at the source of generation to optimize this multi-faceted approach. Should the conventional waste management approach be modified during the Project lifespan (e.g., increased off-site reuse or recycling), environmental effects are expected to be less than predicted in the EA. NexGen notes the justification for selection of on-site incineration for industrial waste disposal is included in the Draft EIS; however, NexGen will include a new subsection, revised EIS Section 5.4.6.4 (Environmental Assessment Assumptions for the Multi-faceted Approach to Conventional Waste Management), to provide summary information on the approach taken to select conventional waste management options, including industrial waste management, for the purposes of the EA. NexGen acknowledges that the Saskatchewan Ministry of Environment (ENV) has expressed concerns regarding the ability to incinerate low-level radioactive waste (LLRW) in a manner that meets provincial air quality objectives. To address these and other potential concerns related to the incineration of conventional waste, NexGen included a new Appendix 5B (Conventional Waste Management Approach and Contingency Options Report) as part of the revised EIS submission to the ENV. The ENV Final EIS Appendix 5B demonstrates that alternative options to industrial waste and LLRW incineration are feasible should NexGen be unable to demonstrate that provincial air quality objectives could be met. NexGen notes that, should alternative approaches to conventional waste be implemented for the Project, potential effects of these approaches would fall within the bounds of the conservative assumptions utilized for the EA and would not require further assessment. NexGen will include Appendix 5B as part of the revised EIS submission to the CNSC.	
38	ECCC	Wildlife and Wildlife Habitat	Section 5 Section 10 Section 14.4.2 Appendix 23A Table 5.4-4 Table 23A-5	**Context and Rationale:** The draft EIS states there will be water management ponds, an effluent treatment plant and a sewage treatment plant on site. The potential toxicity of these waters was not discussed in the context of SAR and aquatic migratory birds. The Proponent states that deterrents will be used to prevent migratory birds from contacting stored water and states wildlife patrols will occur during nesting season (late April to mid-August) to monitor effectiveness of deterrents and apply adaptive management as necessary. Migratory birds may use these stored water ponds outside of the nesting season (i.e., during migration) and it is unclear what mitigation measures will be used to deter migratory birds during other times of year (i.e., outside of the nesting period).	1. Identify the potential toxicity of water management ponds to aquatic migratory birds and SAR. 2. Describe what measures will be taken if the waters are found to be toxic to migratory birds and SAR. 3. Explain how the proposed timing of use of deterrents will reduce risk of migratory birds making contact with treatment waters outside of the nesting season (i.e., during migration and stop over use). D. Explain Which deterrents will be used, which deterrents were considered, and what alternative, adaptive measures will be considered if deterrents are unsuccessful.	NexGen confirms that information on wildlife protection measures related to contact water risks and management measures that address the reviewer's requests are presented in the Draft EIS. 1. and 2. Contact water in water management ponds was assumed to likely be toxic to aquatic birds and species at risk (SAR) and other wildlife. As identified in Table 14.4-1 of Draft EIS Section 14.4 (Project Interactions and Mitigations) and Draft EIS Section 14.4.2 (Secondary Pathways), for Pathway ID W-19 (Wildlife attractants) and Pathway ID W-20 (Direct harm from contact water), potential effects of contact water in water management ponds on aquatic birds, SAR, and other wildlife were addressed through mitigation measures to deter wildlife from the ponds and minimize harm from direct contact with, or ingestion of, water. The following key mitigations would be implemented: ▪ lined contact water ponds would either be fenced or fit with animal egress matting or ramps; ▪ wildlife patrols would be conducted regularly during the waterbird nesting period; ▪ other measures for deterring wildlife from site would be applied, where needed, for human and wildlife protection (e.g., cannons or bangers during migratory bird nesting season); and ▪ regular monitoring would be conducted to evaluate effectiveness of deterrents and water quality, and adaptive management would be applied, as necessary. 3. NexGen commits to extending the deterrents and monitoring of water management ponds to include the northern and southern migration periods. Table 14.4-1 of revised EIS Section 14.4 and revised EIS Section 14.4.2 will be updated to include this mitigation. D. The proposed mitigations and deterrents to be used are provided in response to part 1, part 2, and part 3 of this IR response. Other deterrents are not being proposed at this time. As described in Draft EIS Section 23.5.3 (Adaptive Management), adaptive management is an intentional "learning by doing" method that incorporates continually updated data, technology, and knowledge. As described in Draft EIS Section 14.7 (Monitoring, Follow-Up, and Adaptive	Section 14.4, 14.4.2

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						Management), additional mitigations would be developed if monitoring data indicates the proposed mitigations are not meeting the protection objectives: "The Environmental Monitoring Plan would be implemented to assess effects on wildlife and wildlife habitat and apply adaptive management where necessary. Monitoring results would be used to adjust or adapt mitigation measures or reclamation approaches used to limit Project effects on wildlife (i.e., adaptive management)."	
39	NRCan	Geology	5.2.6 8.3.1.1 5.1.3.2	**Context:** Current interpretations of geology **Rationale:** NRCan recommends the use of Athabasca Supergroup (versus Group versus group) as this is based on current interpretations (Bosman and Ramaekers, 2015) and published in recent journal articles of the regional geology (e.g., Card, 2021; Johnstone et al., 2021; Tschirhart et al., 2021). This is inconsistent within the text (Supergroup vs Group vs group). NRCan also recommends using the modern age constraints on the Athabasca Basin (ca. 1.85 Ga to ca. 1.54 Ga) from Bosman and Ramaekers, (2015). **References**: Bosman, S.A. and Ramaekers, P. (2015): Athabasca Group + Martin Group = Athabasca Supergroup? Athabasca Basin multiparameter drill log compilation and interpretation, with updated geological map; *in* Summary of Investigations 2015, Volume 2, Saskatchewan Geological Survey, Saskatchewan Ministry of the Economy, Miscellaneous Report 2015-4.2, Paper A-5, 13p. https://pubsaskdev.blob.core.windows.net/pubsask-prod/92005/92005-A-5_Bosman_and_Ramaekers.pdf Johnstone, D.D., Bethune, K.M., Card, C.D. and Tschirhart, V., 2021. Structural evolution and related implications for uranium mineralization in the Patterson Lake corridor, southwestern Athabasca Basin, Saskatchewan, Canada. *Geochemistry: Exploration, Environment, Analysis, 21*(1). https://doi.org/10.1144/geochem2020-030 Tschirhart, V., Pehrsson, S., Card, C., Potter, E.G., Powell, J. and Pană, D., 2021. Interpretation of buried basement in the southwestern Athabasca Basin, Canada, from integrated geophysical and geological datasets. *Geochemistry: Exploration, Environment, Analysis, 21*(1). https://doi.org/10.1144/geochem2019-061 Card, C.D., 2021. The Patterson Lake corridor of Saskatchewan, Canada: defining crystalline rocks in a deep-seated structure that hosts a giant, high-grade Proterozoic unconformity uranium system. *Geochemistry: Exploration, Environment, Analysis, 21*(1). https://doi.org/10.1144/geochem2020-007	There is no specific question/or information to ask. **Suggestions for mitigation and follow-up measures** NRCan recommends referencing recent publications for nomenclature and age constraints.	NexGen will update the term 'Athabasca Group' to 'Athabasca Supergroup', and update citations and references as appropriate, in the following revised EIS documents: Section 2 (Indigenous, Regulatory, and Public Engagement): Appendix 2A (Summary of Indigenous Group Engagement Activities), Table 2A-7. Section 5 (Project Description): ▪ Section 5.2.6 (Geology and Mineral Resources); ▪ Section 5.2.6 (Geology and Mineral Resources, Local and Property Geology); ▪ Section 5.2.6 (Geology and Mineral Resources, Mineralization); ▪ Section 5.3.3.2 (Geotechnical Conditions, Surface Geotechnical), Table 5.3-2; and ▪ Section 5.3.3.4 (Hydrogeological Conditions, Groundwater Flow), Table 5.3-4. Section 8 (Hydrogeology): ▪ Section 8 (Executive Summary, Existing Conditions); ▪ Section 8.3.1.1 (Bedrock Geology); and ▪ Section 8.3.2 (Hydrostratigraphy). Annex III (Hydrogeology Baseline Report): ▪ Section 5.1.3.2 (Athabasca Sandstone Bedrock). Annex IV.3 (Geomorphology Characterization Report): ▪ Section 5.1.2.1 (Project Geology). NexGen will also update the age of the Athabasca Basin to be from 1.85 billion years (Ga) to 1.54 Ga, and update citations and references, as appropriate, in revised EIS Section 8.3.1.1 (Bedrock Geology). **References** Bosman SA, Ramaekers P. 2015. Athabasca Group + Martin Group = Athabasca Supergroup? Athabasca Basin multiparameter drill log compilation and interpretation, with updated geological map. In Summary of Investigations 2015, Volume 2, Saskatchewan Geological Survey, Saskatchewan Ministry of the Economy, Miscellaneous Report 2015-4.2, Paper A-5, 13p. Available at https://pubsaskdev.blob.core.windows.net/pubsask-prod/92005/92005-A-5_Bosman_and_Ramaekers.pdf	Appendix 2A; Section 5.2.6, 5.3.3.2, 5.3.3.4; Section 8, Executive Summary, 8.3.1.1, 8.3.2; Annex III, Section 5.1.3.2; Annex IV.3, Section 5.1.2.1

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40	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 5.3.3.5	**Context and Rationale:** The Proponent states, "Based on results from ongoing kinetic (i.e., longer-term tests over many weeks) testing on representative waste rock samples, material with greater than 0.1% sulphur content has been defined as PAG, and material with less than 0.1% sulphur content has been defined as NPAG. Further, a delay to onset of acidic conditions is expected in PAG material with low sulphide content (i.e., below approximately 1% sulphide). Geochemical depletion calculations indicate that acidic conditions are not expected to develop for decades in PAG material with low sulphide content; the low-sulphide PAG material is expected to have near neutral pH during Operations, with acidic conditions forming after Closure." ECCC notes that acidity can occur if there is not enough neutralization potential. As indicated earlier by the Proponent, there is little neutralization potential available (pdf page 651). Therefore, the classification of rocks with less than 0.1 % sulphur content as NPAG appears to be based only on kinetic testing, without any other verification testing. Based on MEND, 2009[2], both kinetic and static tests are the industry norm. Note 2: MEND. 2009. Prediction Manual for Drainage Chemistry from Sulphidic Geologic Material. Mend Report. 1.20.1. 2009.	Provide details on how the cutoff criteria were established for sulphur and if they were based on test results or some other information. If tests were used, provide details on what tests were conducted and the test results.	NexGen confirms the rationale described below is with respect to using only total sulphur content less than 0.1% for acid rock drainage (ARD) (potentially acid generating vs. non-potentially acid generating [NPAG]) classification. Various static geochemical tests, including total metals, acid base accounting, mineralogy, and soluble fractions, have been conducted on waste rock samples, including samples that have less than 1% total sulphur. These results were considered in conjunction with the kinetic test results to support the derivation of the classification criteria. The bulk mineralogy of waste rock samples is consistent with that of the Proterozoic crystalline basement rock, consisting of quartz (39 weight percent [wt%] to 71 wt%), biotite (9.9 wt% to 33 wt%), muscovite (8.8 wt% to 24 wt%), chlorite (up to 12 wt%), anorthosite (up to 8.7 wt%), albite (up to 14 wt%), and clay species (4.5 wt% to 11 wt%). More specifically, only trace carbonate species (i.e., calcite up to 0.028 wt% and siderite up to 0.007 wt%) were identified. The acid potential (AP) of the less than 0.1% total sulphur materials is primarily associated with trace quantities of pyrite. The mineralogical analysis indicates that the bulk of the neutralization potential (NP) of the less than 0.1% total sulphur waste rock is associated with acid-consuming silicate minerals. Because silicate minerals dominate the mineralogy, bulk NP is effectively infinite compared to AP. Therefore, the rate of silicate weathering relative to sulphide oxidation determines the ARD classification of the waste rock materials. Kinetic test results of two waste rock samples containing less than 0.1% total sulphur indicate pH trends suggesting that the rate of sulphide oxidation is lower than the rate of silicate weathering, supporting the use of sulphide content as a management criteria for NPAG material. Based on the details provided above, NexGen is confident the classification of waste rock with less than 0.1% sulphur content as NPAG is appropriate.	n/a
41	CNSC	EIS Geochemical conditions	Section 5.3.3.5 Geochemical conditions, waste rock	**Context:** It is indicated in the EIS that kinetic testing on representative waste rock samples is still ongoing. Delay to onset of acid leaching is expected for the long-term disposal in post-closure stage. **Rationale:** Leachate chemistry analyses, including all significant dissolved cations and anions and parameters like pH, are fundamental model inputs to run geochemical simulations of speciation and mineral saturation. For the geochemical condition of waste rocks, the current EIS and corresponding TSD lack the necessary completeness for type of elements, length of test duration, and description of testing procedures and QA/QC procedures.	Provide further information on static and kinetic leaching testing results (including all significant dissolved cations and anions and parameters like pH). The industrial best practice such as MEND 2009 should be followed. MEND (Mine Environment Neutral Drainage). 2009. Prediction Manual for Drainage Chemistry from Sulphidic Geological Materials. MEND Report. Canada.	NexGen has attached the Rook I Project – Geochemical Characterization of Waste Rock Report (SRK 2023) as Attachment IR 27/41/239/242-1, which details the approach, methods, and data for waste rock characterized in support of the waste rock source term derivation. As cited in that report, the work is consistent with Mine Environment Neutral Drainage (MEND 2009). No changes are proposed in the revised EIS to address this IR. **References** MEND (Mine Environment Neutral Drainage). 2009. Prediction Manual for Drainage Chemistry from Sulphidic Geological Materials. MEND Report. Canada. SRK (SRK Consulting Ltd.). 2023. Rook I Project – Geochemical Characterization of Waste Rock. Prepared for NexGen Energy Ltd. January 2023.	n/a
42	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 5.4.3	**Context:** Approximately 13.7 Mm^3 of waste rock is predicted to be produced over the proposed Project lifespan, which will be processed in the paste plant and then deposited underground within the Underground Tailings Management Facility (UGTMF). The Proponent states that "Three empty chambers would be required when the process plant begins to produce tailings; from this point, chambers would be progressively mined and backfilled."	1. Provide clarification on where tailings will be stockpiled before the mined-out underground spaces are ready to receive backfill, and clarify how tailings will be managed to prevent movement of contaminants 2. Provide clarification regarding how tailings will be managed or stored if there are any issues with the UGTMF, paste delivery system or paste plant (such as	NexGen appreciates the reviewer's comment and understands that the reviewer's reference to 13.7 Mm^3 of waste rock in the IR context and rationale is meant to refer to tailings produced following the processing of ore. In response to the reviewer's IR regarding the tailings management and storage process for the Project, NexGen provides the following clarity: 1. NexGen does not plan to stockpile tailings. Tailings would be prepared in the paste plant on surface for underground deposition in either mined-out areas from ore extraction (i.e., production	n/a

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				It is not clear where the tailings will be stockpiled or how they will be managed before space has been created for backfilling. It is also unclear if there is any storage capacity built into the tailings management system to contain tailings from processing if there are any delays in the mining of chambers within the UGTMF. **Rationale:** It is important to have tailings management system contingency planning in place in the event that there are any issues with the UGTMF or paste delivery system for backfilling the UGTMF. Contingency planning should be considered in the event that there are any delays in the mining of chambers, or issues with the paste tailings delivery system/paste plant.	delays in mining chambers or maintenance required for the paste delivery system/paste plant). 3. Confirm if processing will need to be halted if tailings cannot be deposited into the UGTMF. 4. Confirm if an additional storage contingency system or management plan will be devised in the event there are any issues with depositing tailings into the UGTMF.	stopes) or in the purpose-built underground tailings management facility (UGTMF) chambers. Three UGTMF chambers would be excavated prior to process plant commissioning and the associated generation of tailings. Tailings from the process plant would be directly pumped to the paste plant for processing before being directly pumped to the underground. Thereafter, the rate of storage chamber excavation would be coordinated with the process plant production rate to provide sufficient storage space in advance of tailings production. In addition, the tailings management system, including both the surface infrastructure and underground chambers, has been designed to minimize tailings handling and reduce the potential risk of spills. The paste plant on surface would be located within the mill building, which would act as secondary containment for any potential spill of tailings. The paste plant has been designed with two redundant systems (i.e., mixers and pumps) and boreholes to deliver cemented paste backfill and cemented paste tailings underground to the mined-out production stopes and the UGTMF chambers, respectively. NexGen notes a third interchangeable standby system and borehole would also be included as contingency to be employed if either of the main systems fails to operate. Additionally, tailings storage tanks with a 6-hour buffer time would be included within the design, which would allow the mill to continue to operate for up to 6 hours should there be any issues with the underground tailings delivery system or underground storage areas. 2. As described in part 1 of this IR, NexGen has designed the UGTMF and paste delivery system with redundancy, a standby system, and surface storage tanks to reduce the potential for a disruption in tailings delivery underground and eliminate the requirements for surface stockpiling of tailings. 3. In the highly unlikely event that all the redundant systems fail simultaneously, NexGen would evaluate all options for managing tailings, which could include stopping the process plant temporarily. 4. NexGen has incorporated numerous contingency measures to avoid potential issues associated with depositing tailings in the UGTMF, including having multiple UGTMF chambers available in advance for backfilling, redundant mechanical systems on surface, and 6 hours of buffer time in storage tanks on surface. As engineering advances for the Project, NexGen will continue to conduct review activities (e.g., detailed hazard and operability studies) to analyze the current system and identify any potential opportunities for enhancing operability of the tailings management system.	
43	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 5.4.4	**Context:** This section discusses the ore storage stockpile, the special waste rock stockpile, and the waste rock storage areas. The waste rock storage areas are divided into potentially acid generating (PAG) and non-potentially acid generating (NPAG). There is not enough detail provided in this section to assess the management of contact and non-contact water, flood risk, drainage and leak-detection. Within the main EIS there is no information on how water is intended to flow between the storage stockpiles, where monitoring wells for leak detection will be located, how contact water will be pumped from within storage areas to monitoring ponds/collection areas, or the estimated volume for maximum water capacity within each storage area. A flow diagram is provided in TSD XVIII (Section 3.4 Figure 5 pg. 24) however, this is very difficult to interpret and no reference is made to it in the EIS. There is no information on how the liner system and leak detection systems will be designed.	1. Provide and describe a simplified diagram of the flow of contact and non-contact water from mine rock stockpiles to the monitoring ponds/collection areas and how this system will be designed. 2. Describe how water management within lined stockpiles will be conducted including the volume of water that can be held within each stockpile area, how they will be drained and how the liner systems and leak detection systems will be designed. 3. Describe how monitoring for the leak detection system will be designed. Include details for how monitoring of the leak detection system will be conducted, including how contaminants will be monitored.	NexGen notes that the subsection referenced by the reviewer in the IR (i.e., Draft EIS Section 5.4.4 [Mine Rock Management]) is intended to provide summary information on ore, special waste, and potentially acid generating (PAG) and non-potentially acid generating (NPAG) waste rock facilities. As noted in Draft EIS Section 5.4.4, additional details on water management associated with mine rock stockpiles and storage areas is provided in Draft EIS Section 5.4.5 (Site Water Management), specifically Draft EIS Section 5.4.5.2 (Surface Water Management). NexGen further notes that detailed information on Project design for mine water management (e.g., liner system design, leak detection system design) and monitoring will be submitted to the CNSC as part of the federal licensing process for the Project. Responses to part 1, part 2, and part 3 of this IR are provided below. 1. NexGen notes that a description of the flow of contact water and non-contact water from mine rock stockpiles to the monitoring ponds/collection areas is provided in Draft EIS Section 5.4.5 and is supported by Figure 5.4-13 in Draft EIS Section 5.4.5, which shows the general flow	n/a

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				Rationale: More information would enable the assessment of the sufficiency of the mine rock management in order to understand site water management, containment of contact water, potential for leaks from stockpiles and flood risk potential.	**Suggestions for mitigation and follow-up measures** Include details for how monitoring of the leak detection system will be conducted, including how contaminants will be monitored.	direction for non-contact water as well as collection areas for mine contact water by collection area drainage. To assist the reviewer within the specific context of the IR, a figure developed in support of the Rook I Project Feasibility Study (NexGen 2021) is included as Figure 1 of Attachment IR 43-1, which shows the flow paths of contact and non-contact water from waste rock storage areas to monitoring ponds and collection areas for the Project. In addition, for the specific purposes of responding to this IR, to augment the information contained within Draft EIS Section 5.4.5 (including Figure 5.4-13), a series of simplified diagrams showing the flow of contact and non-contact water from mine waste stockpiles to the monitoring ponds/collection areas is provided as Figure 2 through Figure 5 of Attachment IR 43-1. NexGen notes that these figures are highly simplified diagrams taken from materials used in engagement held with the CNSC in May 2021 during development of the Draft EIS. 2. and 3. NexGen notes that part 2 and part 3 of this IR regarding water management design and leak detection system design and monitoring are outside the scope of the Project Terms of Reference (Draft EIS Appendix 1A [Concordance Tables for the Terms of Reference and Generic Guidelines for Preparation of an Environmental Impact Statement], Table 1A-2). Specifically, as noted in Section 3 of the Project Terms of Reference regarding the Project Description, “[t]he scope of the description will be conceptual and will incorporate reasonable assumptions, as appropriate. Detailed design information will be provided as part of permitting and licensing stage.” NexGen confirms that the additional information requested regarding water management within lined stockpiles and monitoring for the leak detection system will be provided as part of provincial permitting and federal licensing activities for the Project. No changes are proposed in the revised EIS to address this IR. **References** NexGen. 2021. Rook I Project Feasibility Study. Feasibility Study Report. Rev 0. Document No. 0000-BA00-RPT-0001. Prepared by Stantec for NexGen Energy Ltd. 28 April 2021.	
44	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Table 5.4-4	The Proponent states “The west bermed runoff collection area would be located on the west side of the Project site. This collection area would receive runoff from the local contributing area as well as overflow from contact water pond #2, if required. This bermed area would prevent suspended solids entrained in runoff water from entering Patterson Lake by natural filtration through an unlined berm”. The Proponent is reminded that as required by the *Metal and Diamond Mining Effluent Regulations* (MDMER) all effluent and seepage from the mine site that contains deleterious substances needs to be discharged through a final discharge point (FDP). From the description of the west bermed runoff collection area, it is not clear whether runoff that filters through the unlined berm will be discharged through the FDP or go directly to Patterson Lake without being discharged through the FDP.	Confirm that all effluent, as defined in the MDMER, will be discharged through a FDP.	NexGen notes the reviewer’s comments that discharges must be through defined final discharge points as required by the Metal and Diamond Mining Effluent Regulations. NexGen would like to clarify the final discharge details. Contact water from the non-potentially acid generating (NPAG) waste rock storage area (WRSA) would report to site runoff pond #2 (referred to as contact water pond #2 in Figure 5.4-12 of Draft EIS Section 5.4.5 [Site Water Management]), which is sized to the 1:100 year 24-hour precipitation event. Water reporting to site runoff pond #2 is considered the final discharge point (i.e., final point of control) and would be tested to confirm that effluent release criteria are met before water was released to the west bermed runoff collection area, where this water would diffuse passively to Patterson Lake. Water not meeting effluent release criteria would be pumped to the settling pond for treatment in the effluent treatment plant (Draft EIS Section 5.4.5.2 [Surface Water Management]). The treated effluent release criteria would be proposed to the Saskatchewan Ministry of Environment and the CNSC. The outlet of site runoff pond #2 will be proposed as the final point of control. Surface water quality modelling completed for the Draft EIS included loadings from the NPAG WRSA contact water input into Patterson Lake. The modelling indicated that this water release would not result in Project thresholds being exceeded in Patterson Lake during Construction,	n/a

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						Operations, and Decommissioning and Reclamation (i.e., Closure) (Draft EIS Section 10.5.1 [Application Case]). Monitoring would be in place at site water infrastructure (e.g., monitoring at site runoff pond #2) to confirm that waters are suitable for release, in groundwater to monitor the flow pathway, and within Patterson Lake as the ultimate receptor. This monitoring would be developed and specified in detail as part of the Environmental Protection Program and supporting documentation (e.g., Effluent Monitoring Plan and Environmental Monitoring Plan), which would be submitted as part of the applications for provincial permitting and federal licensing, commensurate with the stage of Project development. **References** Metal and Diamond Mining Effluent Regulations. SOR/2002-222 under the *Fisheries Act*. Last amended June 18, 2020. Available at https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2002-222/index.html	
45	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 5.4.4.3 Section 5.5.3.1 Table 11.4-1	The Proponent states that "The top of the finished PAG and NPAG WRSAs would be tied into the hill to the south of the mill terrace, and the overall height would not exceed the highest nearby topography. At closure, an engineered cover system (e.g., growth medium) would overlay the final PAG WRSA and NPAG WRSA landforms." It is unclear how the PAG and NPAG WRSAs would be impacted by wind or water erosion due to their height or elevation. In Section 5.4.4.3 it is stated that "At Closure, an engineered cover system (e.g., growth medium) would overlay the final PAG WRSA and NPAG WRSA landforms." Table 11.4-1 indicates that an "engineered cover of compacted clean material and growth medium layer" will be installed over the PAG WRSA. A growth medium cover will be installed over the NPAG WRSA. It is unclear whether "compacted clean material" may include NPAG waste rock. If NPAG waste rock or other materials are used as cover for the PAG rock, information should be provided on the thickness of the cover so as to ensure that the PAG material is contained within the frozen layer, below the active layer, thereby minimizing ARD. It is also not indicated whether the ditches and the seepage and runoff collection system will be functional or present post-closure.	1. Provide information on how the PAG and NPAG WRSAs will be impacted by wind and water erosion as a function of their height or elevation. 2. Provide clarification on what other types of cover systems have been considered for the PAG rock cover, including whether NPAG may be used as cover. 3. Provide details on what the thickness of the cover system will be to ensure that the PAG rock will be contained in the frozen layer below the active layer. 4. Provide details on how the seepage from the PAG and NPAG WRSA will be managed post-closure if the ditches and runoff collection system are decommissioned.	NexGen acknowledges the Environmental and Climate Change Canada's (ECCC's) request for details on the waste rock storage area (WRSA) cover systems and provides the following details in response: 1. It is expected that there would not be significant wind and water erosion of the WRSAs. The potentially acid generating (PAG) WRSA would be constructed at the closure slope landform angle (i.e., nominally 4H:1V, subject to further stages of engineering) and the non-potentially acid generating (NPAG) WRSA would be resloped to the closure landform angle (i.e., nominally 4H:1V, subject to further stages of engineering) prior to or during the Decommissioning and Reclamation (i.e., Closure) Phase. Closure slope angles are expected to reduce water erosion compared to a steeper design. The waste rock material in both WRSAs would be composed of crystalline basement rock after being blasted, mucked, and transported. Material placed in the WRSAs would be composed mostly of coarse rock material that would not be prone to wind and water erosion. Progressive and final revegetation would also reduce erosion. 2. Non-potentially acid generating or borrow material may be used for a compacted layer overlaying the final PAG WRSA surface at Closure. However, throughout Operations, NexGen would progressively reclaim lower slopes of the PAG WRSA. Throughout this phase, NexGen would assess PAG WRSA system performance and refine closure designs based on these results. For the purposes of the EIS, NexGen assumed a cover system, with the primary purpose of supporting vegetation growth, that had the properties of borrow material found extensively at the Project site; the soil properties for borrows would be as described in Section 5.2 of Draft EIS Annex VI (Terrain and Soils Baseline Report). Borrow material has texture more suitable for plant growth than NPAG waste rock. 3. The cover system and associated mitigation against acid rock drainage (ARD) does not rely on a frozen layer. If the core or layers within the WRSAs do freeze, water in WRSA runoff would be equal to, or lower in, constituent concentrations than has been assessed. 4. Seepage from the WRSAs post-closure is expected to be primarily basal seepage to the shallow groundwater. It is assumed in modelling for the EA that the liner underlying the PAG WRSA would not function post-closure. This assumption was carried forward in the post-closure groundwater and solute transport modelling (Draft EIS TSD XIV [Groundwater Flow Solute Transport Modelling Report]), and subsequently into the environmental risk assessment (Draft EIS TSD XXI [Environmental Risk Assessment]). Information regarding post-closure WRSA seepage is provided in Draft EIS TSD XIV.	n/a

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46	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 5.4.5.2 TSD XVIII, Section 3.4	**Context:** There is not enough information provided within the EIS and site water infrastructure designs to determine if the design will sufficiently contain mine site contact and non-contact water runoff to be protective of the environment. It is stated that contact water ponds and collection areas can contain specified Probable Maximum Precipitation (PMP) events for select ponds/areas, however the actual volume and dimensions of these ponds/areas are not provided. There are no estimates on the total volume of water that may be drained from the overall site infrastructure (i.e. the mine terrace, the camp area etc.) during a 24-hr PMP event and if contact water ponds can contain that drainage. On pg. 1567 a list of potential Project activities that would have the potential to affect surface water quality and sediment quality during the Project lifespan is provided, however runoff from the site airstrip and roads is not included in this list. Runoff from both of these Project activities can have impacts on surface water quality and sediment quality and should be considered as potential effect pathways. The site layout and locations of surface drainage structures including collection ditches, culverts and diversion ditches are not provided on a map. Figure 5 pg. 24 of TSD XVIII was reviewed, however the locations of infrastructure in this flow diagram do not necessarily correspond to geographic locations. Drainage of the site airstrip is not described as part of the infrastructure in the EIS. For lined ponds and collection areas, there is no description of how leak detection monitoring will be completed. For the potentially acid generating (PAG) runoff collection area, it is stated that "The contained water will be tested before release to the environment based on regulatory requirements; water that does not meet the release specifications would report to the ETP for treatment". There are no details provided on how often this water would be tested or how it would be released to the environment (i.e. straight to the Effluent Treatment Plant (ETP) discharge). For contact water pond two, no water volume capacity is provided, and there is no information on frequency of monitoring to determine if water will require treatment or be released to the west bermed runoff collection area. There is also no information regarding water quality monitoring of the west bermed runoff collection area and its capacity. Additionally, the west bermed runoff collection area is described as being unlined to allow natural filtration of collected non-contact water to the environment. However the Metal and Diamond Mining Effluent Regulations (MDMER) pursuant to the Fisheries Act requires all mine effluent and seepage from the mine site that contains deleterious substances be discharged through a final discharge point. **Rationale**: In order to be able to understand site water management and flood risk potential, more information needs to be provided regarding the site water infrastructure designs. More information on the volume of water expected to be captured within the site water management infrastructure during PMP events, and the probability that site infrastructure can contain that water would help ECCC to understand how contact and non-contact water will be conveyed throughout the site. Further information on proposed monitoring locations would assist in the assessment of adverse effects to the receiving environment. Runoff from roads and the site airstrip will contain contaminants from vehicles, heavy machinery, aircrafts and de- icing practices. Additional information on the runoff collection systems for the site airstrip and roads would aid in understanding if the collection of runoff from this site infrastructure is properly managed.	1. Provide the dimensions and maximum volume capacity of each pond and collection area for all site water management infrastructure. 2. Provide a map marking the locations of proposed surface drainage structures including collection ditches, culverts, diversion ditches, perimeter berms and swales. 3. Provide estimated volumes of water to be drained from overall site infrastructure (such as the mine terrace, airstrip, camp area etc.), during a 24-hr PMP event and an analysis of the capacity of the water infrastructure to contain and treat this water. 4. Provide information on how runoff water from the site airstrip will be managed and how monitoring for contaminants within this runoff (ex. hydrocarbons, etc.) will be conducted. 5. Describe how leak detection monitoring from lined ponds and collection areas will be conducted. 6. Provide additional information on the frequency of water quality monitoring and which contaminants will be tested for in the PAG runoff collection area, contact water pond two and the west bermed runoff collection area. 7. Provide further information on how water will be released into the receiving environment from the PAG runoff collection area and west bermed runoff collection area with consideration of MDMER requirements.	NexGen acknowledges the reviewer's requests and notes that many of the requested details are outside the scope of the Project Terms of Reference (Draft EIS Appendix 1A [Concordance Tables for the Terms of Reference and Generic Guidelines for Preparation of an Environmental Impact Statement], Table 1A-2). Specifically, as noted in Section 3 of the Project Terms of Reference regarding the Project Description, "[t]he scope of the description will be conceptual and will incorporate reasonable assumptions, as appropriate. Detailed design information will be provided as part of permitting and licensing stage." The current site water infrastructure design is considered appropriate for the EIS and for the assessment of potential effects of runoff from the area of the Project on surface water quality and sediment quality. As a global response to this IR, the detailed design information requested will be refined and provided in the applicable federal licensing documentation, commensurate with the stage of Project development. However, NexGen has provided the following information to provide additional context for the reviewer. Responses to part 1 through part 7 of this IR are provided below. 1. The maximum storage capacity of individual Project ponds and collection areas incorporated in the site-wide water balance and water quality model are presented in Table C-6 of Appendix C in Draft EIS TSD XVIII (Site-Wide Water Balance and Water Quality Modelling Report). This table has been updated to provide more detailed information in response to part 1 and part 3 of this IR and is provided as Table 1 in Attachment IR 46-2; the reference values used in Table 1 are unchanged from those in the EIS and are provided in Table C-2 of Appendix C in Draft EIS TSD XVIII. 2. NexGen notes that detailed information on locations for surface drainage structures (e.g., collection ditches, culverts, diversion ditches, perimeter berms, swales) will be submitted to the CNSC as part of the federal licensing process for the Project. To assist the reviewer within the specific context of the IR, a figure developed in support of the Rook I Project Feasibility Study (NexGen 2021) is included as Figure 1 of Attachment IR 46/73-1 and provides the locations of proposed surface drainage structures, including ditches, culverts, and swales. 3. An analysis of the capacity of the water infrastructure to contain and treat runoff during design storms was completed under Scenario 6 (i.e., the sensitivity of the site water management infrastructure to extreme summer rainfall events) as described in Section 5.1.2.2 Draft EIS of TSD XVIII. In this scenario, a summer probable maximum precipitation (PMP) event was simulated during each 15 July of the 43-year simulation to assess the capacity of the water management infrastructure under a variety of antecedent conditions. The model results for this scenario confirm that the site water management infrastructure design is appropriate for this stage of the Project, and that operational refinement for flood storage dewatering would be warranted during later stages of Project planning. NexGen confirms that detailed design information will be provided to the CNSC as part of federal licence application activities, as applicable. 4. NexGen confirms that information on runoff water management and monitoring, including the management and monitoring of runoff water from the Project airstrip, will be included in the Environmental Protection Program and supporting documentation developed for the Project in support of federal licensing. A summary of the proposed monitoring and management for water on and around the airstrip is provided below. Runoff from the airstrip would drain to adjacent ditches where the water would report to ground. Ditches associated with the Project airstrip and airstrip apron are shown on Figure 1 in Attachment IR 46-2. With respect to the airstrip area, NexGen notes that:	n/a

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						▪ Consistent with the site water management approach described in Draft EIS Section 5.4.5 (Site Water Management), water that has not been physically, chemically, or radiologically altered by Project activities (i.e., non-contact water) would be diverted to the extent practicable and discharged directly to the receiving environment. ▪ Non-mineralized contact water (i.e., water that has been physically or chemically altered by Project activities and not in contact with mineralized and/or radiologically contaminated surfaces) that is not expected to require treatment and meets release criteria would be managed, monitored, and ultimately directed to the west bermed runoff collection area. Aircraft fuel would be stored within double-walled tanks in accordance with The Hazardous Substances and Waste Dangerous Goods Regulations. These tanks would be located within a dedicated area that would be constructed with a sump designed to capture and contain runoff from de-icing and fuelling activities. A collection area within the apron may be constructed as a gravel pad lined with high-density polyethylene (HDPE) or as a concrete pad. Captured water would be trucked to contact water pond #1 for treatment in the effluent treatment plant (ETP). A groundwater monitoring well would be installed between the airstrip fuel storage pad and Patterson Lake to detect potential leakage of aviation fuel and other potential contaminants along the migration pathway. The specific groundwater monitoring well location has not yet been selected but will be included in the Environmental Monitoring Plan submitted to the CNSC prior to the Project airstrip becoming operational. 5. As part 5 of this IR relates to detailed design, NexGen confirms that detailed design information will be provided to the CNSC as part of federal licence application activities, as applicable. Preliminary information is provided below. The monitoring ponds would be double lined with 80 mm thick HDPE lining for primary and secondary containment. Additionally, the containment system would have perforated leak-detection piping for both the primary and secondary liners, including interconnecting buried HDPE piping connected to leak-detection monitoring wells. Details of the leak detection liner system are shown on Figure 2 of Attachment IR 46-2. The ore storage stockpile area would have a high-perimeter berm and a dual HDPE liner system to prevent non-contact water from entering the ore storage stockpile area. The stockpile would be self-contained and capable of accommodating PMP events. Other liner design features would include perforated leak detection piping routed to leak detection monitoring ponds. Monitoring of the leak detection systems would be conducted through routine inspections and groundwater monitoring. Routine inspections will be described in the Environmental Protection Program and supporting documentation developed and submitted in support of federal licensing. Inspections would be completed to verify containment structures, including berms, retaining walls, sumps, sloped floors, and graded or lined surfaces are maintained in functioning condition to provide the required storage capacities, in accordance with REGDOC 2.9.1, *Environmental Protection: Environmental Principles, Assessments and Protection Measures* CNSC 2020) and The Hazardous Substances and Waste Dangerous Goods Regulations. Groundwater monitoring would include a network of 10 to 15 stations (i.e., wells) situated between Project infrastructure and Patterson Lake to detect the migration of potential contaminants along the flow path. Groundwater quality monitoring is planned to be conducted biannually and would include measurements of pH, temperature, specific conductivity, turbidity, ORP, NH_3 as N, P, alkalinity, HCO_3, CO_3, colour, OH, sum of ions, hardness, TSS, TOC, DOC, Ca, Cl, F, Mg, K, Na, SO_4, TDS, NO_3 + NO_2, NO_3 as N, TKN, dissolved metals (i.e., Al, As, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Mo, Ni, Se, Sr, U, V, Zn), Pb-210, Po-210, Ra-226, and Th-230. 6. Current monitoring plans that are relevant to the potentially acid generating (PAG) runoff collection area, contact water pond #2, and the west bermed runoff collection area are	

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						summarized below. Effluent, emissions, and environmental monitoring is a current topic of engagement with the CNSC and Saskatchewan Ministry of Environment: as such, the monitoring may be further refined beyond what is summarized below. Detailed plans will be provided to provincial and federal regulators through future permitting and licensing processes. Current monitoring plans are as follows: ▪ Monitoring runoff quality at the PAG runoff collection area is not proposed for compliance purposes because this water would not be discharged directly to the environment; instead this water would be contained within lined ponds and conveyances and treated prior to discharge, if required. However, purpose-driven monitoring would be conducted during Operations to validate and refine material source terms, reduce uncertainty in future predictions, and adapt the level of mitigation in response to operational information collected. Frequency and parameters monitored would be informed by the regulatory-approved Environmental Risk Assessment required to be conducted during the transition from Construction to Operations. ▪ Contact water pond #2 is the final point of control before non-mineralized waters are discharged to the west bermed collection area. As such, this location would be designated under Metal and Diamond Mining Effluent Regulations (MDMER) as a Final Discharge Point. Water in this pond would be sampled prior to each batch discharge to verify compliance with licensed release limits. Water quality parameters would include pH, temperature, DO, specific conductivity, turbidity, ORP, alkalinity, HCO_3, CO_3, pH, specific conductivity, sum of ions, hardness, TSS, turbidity, TOC, DOC, Ca, Cl, F, Mg, K, Na, SO_4, TDS, NH_3 as N, NH_3 as N (unionized), NO_3 as N, NO_2 as N, $NO_3 + NO_2$ as N, TP, TN, TKN, Al, Sb, As, Ba, Be, B, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Mo, Ni, Se, Ag, Sn, Sr, Th, Ti, U, V, Zn, Pb-210, Po-210, Ra-226, Th-230, U-234, U-238, TPH, BTEX, and F1-F4 hydrocarbon compounds. If water in contact water pond #2 did not meet licensed release limits, this water would be directed to the ETP for treatment, and would be re-sampled as part of the combined ETP treated effluent in the monitoring ponds to confirm compliance prior to discharge. ▪ Water in contact water pond #2 that is compliant with licensed release limits would be discharged to the west bermed collection area. As this water would have already been verified for compliance with licensed release limits, this water would not be re-sampled in the west bermed collection area. ▪ Relevant to the PAG runoff collection area, contact water pond #2, and the west bermed runoff collection area, groundwater would be monitored between the surface infrastructure and Patterson Lake. Groundwater monitoring would include a network of 10 to 15 stations (i.e., wells) situated between Project infrastructure and Patterson Lake to detect the migration of potential contaminants along the flow path. Groundwater quality monitoring is planned to be conducted biannually and would include measurement of pH, temperature, specific conductivity, turbidity, ORP, NH_3 as N, P, alkalinity, HCO_3, CO_3, colour, OH, sum of ions, hardness, TSS, TOC, DOC, Ca, Cl, F, Mg, K, Na, SO_4, TDS, $NO_3 + NO_2$, NO_3 as N, TKN, dissolved metals (i.e., Al, As, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Mo, Ni, Se, Sr, U, V, Zn), Pb-210, Po-210, Ra-226, and Th-230. Monitoring details, including information on the frequency of water quality monitoring, will be included in the Environmental Protection Program and supporting documentation submitted to the CNSC for approval with each stage of licensing. NexGen confirms that no contact water would be discharged to the environment from any of the facilities listed unless licensed release limits were met. 7. The PAG runoff collection area would receive runoff from the PAG WRSA and the collected water would be pumped to the settling pond for treatment, if necessary. After treatment in the ETP, this water would be pumped to the monitoring ponds. A final discharge point would be designated for the single point of release from the monitoring ponds that hold treated effluent, where water can be monitored and analyzed to confirm all discharge criteria are met, including MDMER requirements. For the west bermed runoff collection area, a final discharge point would be contact water pond #2. Contact water pond #2 represents a final point of control, and a location where water would be monitored and analyzed to confirm all discharge criteria, including MDMER limits excluding	

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						total suspended solids (TSS), are met. As the water in the west bermed runoff collection area would be discharged to ground from contact water pond #2, TSS would be removed from the water before reaching fish habitat. If these remaining limits are not met within contact water pond #2, water from this pond would be pumped to the ETP rather than being discharged to the west bermed runoff collection area. No changes are proposed in the revised EIS to address this IR. **References** CNSC (Canadian Nuclear Safety Commission). 2020. Environmental Protection: Environmental Principles, Assessments and Protection Measures. REGDOC-2.9.1, version 1.2. September 2020. Available at https://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/REGDOC-2-9-1-Environmental-Principles-Assessments-and-Protection-Measures-Phase-II.pdf Metal and Diamond Mining Effluent Regulations. SOR/2002-222 under the *Fisheries Act*. Last amended June 18, 2020. Available at https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2002-222/index.html NexGen. 2021. Rook I Project Feasibility Study. Feasibility Study Report. Rev 0. Document No. 0000-BA00-RPT-0001. Prepared by Stantec for NexGen Energy Ltd. 28 April 2021. The Hazardous Substances and Waste Dangerous Goods Regulations. RRS c E-10.2 Reg 3 under *The Environmental Management and Protection Act, 2010*. Effective April 1, 1989. Available at https://www.canlii.org/en/sk/laws/regu/rrs-c-e-10.2-reg-3/latest/rrs-c-e-10.2-reg-3.html	
47	ECCC	Fish and fish habitat	Section 5.4.5.2 Section 22.6.3	**Context:** The Proponent states in Section 5.4.5.2 that the 24-hour 100-year event will result in 89.4 mm accumulation of precipitation. However, in Section 22.6.3 Major Precipitation Events the value quoted is 75.8 mm, which represents a 15% difference. In Section 5.4.5.2 the Probable Maximum Precipitation (PMP) is quoted as 489.2 mm in 24 hours. In Section 22.6.3 Major Precipitation Events, the PMP value quoted is 490 mm in 24 hours. It is unclear if the PMP values correspond to the 24-hour 2000-year return period. **Rationale**: Based on the discrepancies noted in the values presented for the accumulation of precipitation and for the PMP, it is unclear which datasets were used to generate these values, which values were used in the hydrology and climate change assessments or in which elements of Project design. While the discrepancies may be small, over the long term this could result in much larger differences for predicted effects.	1. Provide details on the dataset used to generate the accumulation of precipitation values (89.4 mm and 75.8 mm), which generated value is used in each of the assessments (hydrology and climate change), and which elements of Project design were informed by these assessments and why. 2. Confirm if the PMP quoted in the draft EIS (489.2mm and 490 mm in 24-hours) correspond to the 24-hour 2000-year return period and clearly show the datasets from which this value was generated.	Responses to part 1 and part 2 of this IR are provided below. 1. The 24-hour probable maximum precipitation (PMP) event value of 489.2 mm presented in Draft EIS Section 5.4.5.2 (Surface Water Management) represents the short duration rainfall compiled for the purposes of hydrological modelling, which is described in detail in Section 5.1.1 of Draft EIS Annex IV.1 (Regional Meteorological and Hydrological Characterization Report). The 24-hour, 100-year event precipitation value of 89.4 mm presented in Section 5.1.1 of Draft EIS Annex IV.1 was derived based on values published by Environment and Climate Change Canada (ECCC 2019) for nearby climate monitoring stations most representative of the Project site. The 24-hour 100-year precipitation event of 75.8 mm presented in Draft EIS Section 22.6.3 (Major Precipitation Events) was compiled from a different data source (Draft EIS Appendix 22A [Climate Change Assessment]) for the purposes of evaluating potential effects of the environment on the proposed Project and evaluating the effects of climate change. For Draft EIS Appendix 22A, detailed, site-specific future climate projections were developed for the Project through analysis of available projections from a multi-model ensemble. The multi-model ensemble consists of available regional-scale projections from several climate models representing different future climate scenarios (e.g., level of greenhouse gas emissions). Further detail on how the standard and climate change values were incorporated throughout the Draft EIS and considered in Project design is provided Draft EIS Appendix 6A (Climate Change Roadmap). 2. The PMP for the Draft EIS is 489.2 mm in 24 hours, which is rounded to 490 mm in Draft EIS Section 22.6.3. The PMP adopted for the Draft EIS is based on values developed by Hopkinson (1999) using a rational method informed by maximum persistent dew-point temperature rather than a statistical approach. The PMP is an upper bound precipitation event and cannot be assigned a valid return period (e.g., 2,000-year return period).	n/a

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						The PMP assessment completed by Hopkinson (1994) was prepared to provide guidance for the safe design of tailings ponds associated with the uranium mining industry in northern Saskatchewan. The data set used by Hopkinson (1994) included hourly dew-point temperatures at 78 stations across western Canada with a focus on the prairie provinces for which sufficient data were available. Statistical approaches to estimating point PMPs in the prairies are usually avoided because of the influence of limited meteorological records on results. In northern Saskatchewan, statistical methods of PMP estimation have been shown (Hopkinson 1994) to yield values much lower than the rational method using persistent dew-point temperature used for the Draft EIS. No changes are proposed in the revised EIS to address this IR. **References** ECCC (Environment and Climate Change Canada). 2019. Environment Canada – Engineering Climate Datasets: Short Duration Rainfall Intensity-Duration-Frequency Data. Accessed November 2019. Available at https://climate.weather.gc.ca/prods_servs/engineering_e.html Hopkinson RF. 1994. Point Probable Maximum Precipitation in Northern Saskatchewan. Environment Canada – Canadian Climate Program. Report No. CSS – R94 – 01. Hopkinson RF. 1999. Point Probable Maximum Precipitation for the Prairie Provinces. Environment Canada Prairie and Northern Region. Report No. AHSD – R99 – 01. 54 p.	
48	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 5.4.5.3	**Context:** This section describes the amount of water expected to be produced within the underground dewatering facilities and sent to the surface for treatment. However, it is unclear if the water from the underground dewatering facilities will go straight to the Effluent Treatment Plant (ETP) for treatment or if it will be held in a contact water pond or settling pond to await treatment. **Rationale:** Understanding how the water from the underground dewatering facilities will be managed will aid ECCC in understanding if the proposed site water management infrastructure can contain this water during a flood risk event and in assessing effects on the receiving environment.	1. Describe if water from the underground dewatering facilities will be sent straight to the ETP or if it will need to be held within a contact water pond or settling pond prior to treatment. 2. Confirm if there is the potential for water from the underground dewatering facilities to be temporarily stored underground if the site water infrastructure or ETP cannot immediately contain/treat that water.	Responses to part 1 and part 2 of this IR are provided below. 1. As described in Table 5.4-3 of Draft EIS Section 5.4.5 (Site Water Management), water that flows into the underground workings (i.e., mine water) would be pumped from the underground to surface and managed as contact water. During Operations, water recovered in the underground mine workings would be collected in underground sumps for preliminary storage and pre-treatment to screen solids and settle total suspended solids before being pumped to the settling pond on surface (Draft EIS 5.4.5.2 [Surface Water Management], Table 5.4-4). Water in this lined settling pond would be treated in the effluent treatment plant (ETP) and then pumped to the monitoring ponds. Once in the monitoring ponds, water would be tested and discharged if appropriate criteria are met; if criteria are not met, the water would be returned to the settling pond for additional treatment. 2. NexGen confirms the settling pond capacity is 16,000 m^3 (Draft EIS 5.4.5.2 [Surface Water Management], Table 5.4-4), which would offer sufficient storage at surface to manage underground water flows. Additionally, storage would be available in underground sumps to accommodate mine water temporarily if site water infrastructure at surface could not immediately contain/treat this water. NexGen highlights that water volumes from the underground are not expected to vary considerably due to high precipitation events at surface. Mine inflow events were assessed in Draft EIS Section 22.6.3.2 (Risk Management and Evaluation) under Hazard ID PR-04 (Mine inflow) and deemed to be low risk.	n/a
49	ECCC	Fish and fish habitat Change to an environmental component due	Section 5.4.5.4	**Context:** There is currently not enough information provided about the Effluent Treatment Plant (ETP) design to determine if the design is sufficient for treating mine effluent. ECCC notes the following information gaps provided within this section: no schematic for the treatment process within the ETP facility; no information on the two-stage treatment process; and no flow rates,	1. Provide a schematic demonstrating flow through the ETP including flow rates, capacity of system tanks and clarifiers, locations and average and maximum treatment capacity of the ETP.	NexGen notes the reviewer's request for detailed information on the effluent treatment plant (ETP) is outside the scope of the Project Terms of Reference (Draft EIS Appendix 1A [Concordance Tables for the Terms of Reference and Generic Guidelines for Preparation of an Environmental Impact Statement], Table 1A-2) and the CNSC Generic Guidelines for the preparation of an EIS (CNSC 2021a). Sufficient information on the ETP is presented in the Draft EIS to enable the assessment of potential adverse effects to water quality and aquatic biota. The information	n/a

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		to radiological contaminants		capacity details, effluent characterization information, proposed effluent discharge targets; no Final Discharge Point (FDP) location information. The Proponent plans to install a pipeline to discharge effluent, but it is unclear where the final discharge point (FDP) will be located. Note that the *Metal and Diamond Mining Effluent Regulations* (MDMER) define the FDP as "in respect of an effluent, means an identifiable discharge point of a mine beyond which the operator of the mine no longer exercises control over the quality of the effluent." **Rationale:** Further information about the proposed ETP will assist ECCC in determining if the design will be sufficient to treat mine effluent and that the capacity of the ETP will be sufficient for the site. Effluent characterization information and proposed discharge targets will enable ECCC to assess adverse effects to water quality and aquatic biota.	2. Provide a more in-depth overview of the treatment processes within the proposed ETP and how the ETP is designed to remove the chemical and radiological constituents from effluent, including the expected efficiency of treatment. 3. Provide the expected effluent characterization and final effluent discharge targets, as well as effluent discharge flow rates and estimated volume per batch release to the environment. 4. Describe how waste generated from the effluent treatment process (ex. Solids and sludge) that is not discharged as treated effluent be managed? 5. Include the effluent monitoring plan details in Section 5.4.5.4 including contaminants that will be monitored for. 6. Provide the specific location of the FDP.	presented below has been provided to assist in the reviewer's understanding of the Project, though no changes are proposed for the revised EIS. 1. and 2. To assist the reviewer within the specific context of the IR, Attachment IR 49-1 has been developed and provides a description of the ETP, which contains the requested information regarding the ETP specifications. submitted to the CNSC. 3. Modelled ETP discharge concentrations are presented in Table G-2 of Appendix G in Draft EIS TSD XVIII (Site-Wide Water Balance and Water Quality Modelling Report) for each year of Construction, Operations, and Decommissioning and Reclamation (i.e., Closure). Preliminary environmental release targets are provided in Appendix H of Draft EIS TSD XVIII. As noted in Table 9 of Draft EIS TSD XVIII, the EA assumed that the 5,000 cubic metre (m^3) monitoring ponds would be released at a maximum rate of 5,000 m^3 over a 6-hour period, which equates to 0.23 cubic metre per second (m^3/s). NexGen notes that effluent quality predictions, environmental release targets, licensed release limits, and related information will be further updated and submitted to the CNSC as part of the Application for a Licence to Operate. 4. During the Construction Phase, before the mill is operational, effluent precipitates from the clarifier underflow would be pumped to geotubes for dewatering, which are long tube made of porous weather-resistant geotextile. At the end of the Construction Phase, the geotubes would be cut open, and the solids would either be deposited in the potentially acid generating (PAG) waste rock storage area (WRSA) or transferred to the paste plant for ultimate disposal underground in cemented paste tailings (CPT) or cemented paste backfill. During the Operations Phase, effluent precipitates would be blended with neutralized leach residue, gypsum, and a binder to create CPT. The CPT would be disposed of in the UGTMF as described in Draft EIS Section 5.4.3.1 (Paste Plant). 5. Effluent monitoring is summarized in Draft EIS Appendix 23B (Environmental Assessment Monitoring and Follow-Up Programs Proposed for the Project) and would be refined and updated as part of the Environmental Protection Program and supporting documentation submitted to the CNSC as part of federal licensing, commensurate with the stage of Project development (e.g., Construction, Operations). During Operations, effluent monitoring would be conducted in the monitoring ponds to confirm compliance with licensed release limits (including Metal and Diamond Mining Effluent Regulations [MDMER] limits) prior to each batch release of treated effluent. A composite sample would be drawn from the monitoring pond water and would analyzed for pH, DO, specific conductivity, turbidity, ORP, Cl, SO_4, NH_3 as N, NH_3 as N (unionized), NO_3, TP, Al, As, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Mo, Ni, Se, Sr, U, V, Zn, TSS, Pb-210, Po-210, Ra-226, Th-230, U-234, and U-238. In addition, monthly samples would be collected and analyzed for a larger suite of parameters that includes alkalinity, HCO_3, CO_3, pH, DO, specific conductivity, sum of ions, hardness, TSS, turbidity, ORP, TOC, DOC, Ca, Cl, F, Mg, K, Na, SO_4, TDS, NH_3 as N, NH_3 as N (unionized), NO_3 as N, NO_2 as N, NO_3 + NO_2 as N, TP, TN, TKN, Al, Sb, As, Ba, Be, B, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Mo, Ni, Se, Ag, Sn, Sr, Th, Ti, U, V, Zn, Pb-210, Po-210, Ra-226, Th-230, U-234, U-238, and acute lethality tests for rainbow trout (*Oncorhynchus mykiss*) and water flea (*Daphnia magna*). 6. The location of the final discharge point for the ETP would be at the monitoring ponds as shown in Figure 5.1-3 of Draft EIS Section 5.1.1 (Project Overview). The specific discharge location will be finalized during detailed design and provided to Environment and Climate Change Canada as part of the MDMER registration. Additional details regarding the ETP and discharge characteristics will be provided in the applicable stages of federal licencing and provincial permitting (e.g., Operations). NexGen will provide any updates regarding the requested ETP design details (i.e., part 1 through part 4 of this IR) as part of	

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						licensing and in accordance with the requirements of REGDOC 2.9.2, *Environmental Protection, Controlling Releases to the Environment* (CNSC 2021b), recognizing this regulatory guidance remains in draft form at this time. Similarly, additional information on the requested effluent monitoring details (i.e., part 5 of this IR) will be provided in the Environmental Protection Program and supporting documentation that will be submitted to the CNSC in support of the applicable stages of federal licensing, commensurate with the stage of Project development. As this IR is out of the scope of the EA, no changes are proposed in the revised EIS. **References** CNSC (Canadian Nuclear Safety Commission). 2021a. Generic Guidelines for the Preparation of an Environmental Impact Statement – Pursuant to the *Canadian Environmental Assessment Act, 2012*. Available at http://cnsc.gc.ca/eng/resources/environmental-protection/ceaa-2012-generic-eis-guidelines.cfm CNSC. 2021b. REGDOC-2.9.2, Environmental Protection, Controlling Releases to the Environment. DRAFT. March 2021. Available at https://www.nuclearsafety.gc.ca/eng/pdfs/regulatory-documents/regdoc2-9-2/REGDOC-2_9_2_Controlling_Releases_to_the_Environment.pdf Metal and Diamond Mining Effluent Regulations. SOR/2002-222 under the *Fisheries Act*. Last amended June 18, 2020. Available at https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2002-222/index.html	
50	ECCC	Air Quality	Section 5.4.7.5 Appendix 7A3.2.10.2	In the EIS the Proponent references the *Off-Road Compression-Ignition Engine Emission Regulations* (previous Regulations). These regulations have been repealed, and replaced by the *Off-road Compression-Ignition (Mobile and Stationary) and Large Spark-Ignition Engine Emission Regulations.* ECCC encourages the Proponent to use engines that meet the most stringent emission standard, which is Tier 4 for compression-ignition engines (mobile and stationary), during all phases of the Project. The Regulations require that all stationary compression-ignition engines in Canada that were manufactured after June 4, 2021 must meet US EPA Tier 4 emission standards, with the exception of backup or emergency engines, and engines used in remote locations[3]. In these cases engines may be Tier 3, or Tier 2 under specific conditions. The Proponent must provide information on whether or not the Project site meets the definition of “remote location”. The Proponent provided the model number of the Jenbacher J620 gas engine, but ECCC has been unable to determine the emission rating of this engine. The mine fleet has a combination of Tier 2, 3 and 4 off-road engines. The Proponent stated that they would use Tier 4 diesel mobile equipment for underground operations whenever practical. The Proponent should provide justification for use of any engine that is lower than Tier 4. The requested information will enable ECCC to better assess project emissions and potential impacts to the environment. Note 3: Remote location means a geographic area that is serviced neither by:	1. Indicate if the Project site is considered “remote” based on the definition in the *Off-Road Compression-Ignition (Mobile and Stationary) and Large Spark Ignition Engine Emission Regulations*. 2. Provide the emission ratings (e.g. Tier 3 or 4) and the air pollutant emission estimates, which includes NOx emissions, of the stationary Jenbacher J620 engine, and any other off-road engines to be used during each phase of the project. 3. Provide justification for the selection of lower-Tier stationary and mobile engines that meet the emission standards of a lower stringency over higher- Tier, cleaner, commercially-available engines.	Responses to part 1, part 2, and part 3 of this IR are provided below. 1. The Project site is located in a geographic area that is served by an electrical distribution network under the jurisdiction of the North American Electric Reliability Corporation; however, the electrical grid does not extend to the Project site as the nearest connection to the electrical grid with available load is at least 175 km away (Draft EIS Section 4.5.7 [Power Supply Type]). Therefore, the site is considered “remote” by the intent and meaning as defined in the federal Off-Road Compression-Ignition (Mobile and Stationary) and Large Spark Ignition Engine Emission Regulations. With respect to the updated regulations referenced by the reviewer, please refer to NexGen’s response to Advice IR, ECCC-08. 2. The Jenbacher J620 gas engines (i.e., gensets) are designed to meet the latest international emission standards, including Canada’s Multi-Sector Air Pollutants Regulations (MSAPR). The nitrogen oxides emissions of the engines are designed to be less than 500 milligrams per normal cubic metre (mg/Nm^3), which is equivalent to 2.2 grams per kilowatt-hour (g/kWh). The MSAPR standard is 2.7 g/kWh. Environment and Climate Change Canada’s natural gas combustion emissions calculator was used to estimate emissions of carbon monoxide, sulphur dioxide, and particulate matter. The emission estimates for these gensets are listed in Table 7A-35 of Draft EIS Appendix 7A (Air Dispersion Modelling Report). The designated emissions tier (i.e., Tier 2, Tier 3, or Tier 4) of the off-road engines presented for the purposes of the Draft EIS are listed in the following tables of Draft EIS Appendix 7A: ▪ surface vehicles during Construction (Table 7A-42); ▪ underground vehicles during Construction (Table 7A-45); ▪ surface vehicles during Operations (Table 7A-48); and ▪ underground vehicles during Operations (Table 7A-51). The emission estimates associated with these off-road engines are listed in the following tables of Draft EIS Appendix 7A: ▪ surface vehicles during Construction (Table 7A-44);	n/a

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				(a) an electrical distribution network that is under the jurisdiction of the North American Electric Reliability Corporation or the main Newfoundland and Labrador electrical distribution networks; nor (b) a natural gas distribution network.		▪ underground vehicles during Construction (Table 7A-47); ▪ surface vehicles during Operations (Table 7A-50); and ▪ underground vehicles during Operations (Table 7A-53). 3. The air modelling assessment conservatively used higher-emitting (i.e., lower tier) engines to demonstrate compliance with ambient air quality criteria under potential worst-case emissions conditions. NexGen confirms the intent to purchase and use the lower-emitting Tier 4 engines if Tier 4 engine options are available. However, flexibility is required in case Tier 4 engine options are not available. If new equipment is to be used, Tier 4 engines are the only option available for purchase in Canada. No changes are proposed in the revised EIS to address this IR. **References** Multi-Sector Air Pollutants Regulations. SOR/2016-151 under the *Canadian Environmental Protection Act, 1999*. Last amended 1 January 2023. Available at https://laws-lois.justice.gc.ca/eng/regulations/SOR-2016-151/index.html Off-road Compression-Ignition (Mobile and Stationary) and Large Spark-Ignition Engine Emission Regulations (SOR/2020-258) under the *Canadian Environmental Protection Act*, 1999. Last amended 3 October 2022. Available at https://laws-lois.justice.gc.ca/eng/regulations/SOR-2020-258/index.html	
51	ECCC	Wildlife and Wildlife Habitat	Section 5.4.7.7	The Proponent states that a communication tower will be erected at the Project site but does not include any details about height of the tower, the support system, or lights. There is no discussion of potential effects of the tower on migratory birds and SAR or the proposed mitigation measures to minimize these effects.	Provide details regarding how the communication tower will be designed, the potential effects to migratory birds and SAR including bats and the mitigation measures that will be used to reduce these effects.	As described in Draft EIS Section 5.4.7.7 (Information Technology and Communications), a communication tower and building would be located near the airstrip for the Project. The communication tower design is not yet complete; however, NexGen confirms that mitigations to avoid and minimize potential effects to migratory birds and species at risk (SAR), including bats, will be considered in the final design. Mitigations include locating the tower away from wetlands and other high suitability habitats for SAR, minimizing guy wires, installing markers to enhance the visibility of guy wires, limiting the tower lighting to only what is required for aviation safety (e.g., flashing light on the top of the tower), and following avian-safe standards in compliance with applicable laws, regulations, permits, and best management practices to prevent electrocution (e.g., cover jumper wires, conductors, equipment) and avoid attraction by lights. Revised EIS Section 14 (Wildlife and Wildlife Habitat) will be updated to include an assessment of the potential effects of the communication tower to migratory birds and SAR, including bats. The assessment in revised EIS Section 14.4 (Project Interactions and Mitigations) will use the assumptions and mitigation measures outlined above.	Section 14, 14.4
52	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 5.5	The Proponent indicated that “clean waste rock” will be permanently stored on the surface and where possible will be used as a source of aggregate material for construction activities. It is not clear what is meant by “clean waste rock.” The segregation criterion indicate that even non-potentially acid generating (NPAG) waste rock may contain some amount of sulphide mineral and/or U_3O_8 (triuranium octaoxide). Clean waste rock could be mistaken to be waste rock devoid of any contaminants, which could lead to potential effects on the environment.	Provide a clear and concise definition of “clean waste rock”, including the segregation criteria.	As described in Draft EIS Section 5.4.4.3 (Waste Rock Storage Areas), clean waste rock is defined as non-potentially acid generating (NPAG) waste rock for the Project. The resulting segregation criteria for waste rock are: ▪ Special waste: o ≥0.03% triuranium octoxide (U_3O_8) and <0.26% U_3O_8. ▪ Potentially acid generating (PAG) waste rock: o <0.03% U_3O_8; o neutralization potential (i.e., NP/AP or TIC/AP) is ≤1; and o sulphur as sulphide is ≥0.1%. ▪ Uncertain acid rock drainage (ARD) potential waste rock (managed as PAG): o <0.03% U_3O_8; o NP/AP or TIC/AP is >1 and ≤3; and o sulphur as sulphide is ≥0.1%.	n/a

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						▪ Non-potentially acid generating (NPAG or clean) waste rock: o <0.03% U_3O_8; and o NP/AP or TIC/AP >3 or total sulphur as sulphide is <0.1%. where: ▪ NP = neutralizing potential; ▪ AP = acid potential; ▪ TIC = total inorganic carbon; ▪ < = less than; ▪ ≤ = less than or equal to; ▪ > = greater than; and ▪ ≥ = greater than or equal to. A cutoff of 0.03% U_3O_8 is used to segregate special waste and waste rock, consistent with existing uranium mining and milling operations in Saskatchewan. As noted in IAEA (2000), "a general rule in North America is that material grading less than 0.03% U_3O_8 can be located in normal waste storage areas". According to CNSC (2003), waste rock with less than 0.03% uranium is considered "benign". Please refer to Attachment IR 27/41/239/242-1 for additional supporting information on the geochemical characterization of waste rock. No changes are proposed in the revised EIS to address this IR. **References** CNSC (Canadian Nuclear Safety Commission). 2003. Canadian National Report for the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. Government of Canada. Available at http://nuclearsafety.gc.ca/pubs_catalogue/uploads/joint-convention-2003-national-report-eng.pdf IAEA (International Atomic Energy Agency). 2000. Methods of Exploitation of Different Types of Uranium Deposits. IAEA-TECDOC-1174. September 2000. Available at https://www-pub.iaea.org/MTCD/publications/PDF/te_1174_prn.pdf	
53	ECCC	Fish and fish habitat Change to an environmental component due to radiological contaminants	Section 5.5.1.5	The Proponent stated that "All mine rock would be analyzed by gamma radiometric scanners, which would measure the radioactivity of the material, and depending on the scan results, the material would be defined as ore, special waste, or waste rock (Table 5.4.2)". As described in table 5.4.2, both potentially acid generating (PAG) and non-potentially acid generating (NPAG) rock contain some amount of U_3O_8 (triuranium octaoxide). It is unclear whether there are any mitigation measures to ensure that the remaining U_3O_8 content in both PAG and NPAG waste rock material poses no danger to the environment, or if the classification of NPAG means that the remaining amount of U_3O_8 does not pose any danger or risk to the environment.	1. Provide clarification as to whether there are any mitigation measures in place to ensure that the remaining U_3O_8 content in the PAG and NPAG WRSAs poses no danger to the environment. 2. Confirm if the classification of NPAG means that the remaining amount of U_3O_8 poses no risk to the environment.	As described in Table 5.4-2 of Draft EIS Section 5.4.4 (Mine Rock Management), special waste is mine rock with greater than 0.03%, but less than 0.26% triuranium octoxide (U_3O_8) whereas waste rock is mine rock with less than 0.03% U_3O_8. All waste rock would be permanently stored in the waste rock storage areas (WRSAs) and not processed. The following text provides a response to both part 1 and part 2 of this IR. The 0.03% U_3O_8 cutoff between special waste and waste rock is consistent with existing uranium mining and milling operations in Saskatchewan. As noted in IAEA-TECDOC-1174, *Methods of Exploitation of Different Types of Uranium Deposits* (IAEA 2000), "a general rule in North America is that material grading less than 0.03% U_3O_8 can be located in normal waste storage areas." According to the CNSC (2003), waste rock with less than 0.03% uranium is considered "benign". Therefore, from a radiological perspective, waste rock in the potentially acid generating (PAG) and non-potentially acid generating (NPAG) WRSAs would pose no unacceptable risk to the environment. Given this classification, waste rock management (including associated mitigations) for the Project focuses primarily on physical and chemical risks, whereas radiological risks are generally managed and mitigated by implementing activities in accordance with the Integrated Management System programs that would be established for the Project as part of provincial permitting and federal licensing requirements:	n/a

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						▪ Physical risks would be managed through geotechnical design as described in Draft EIS Section 5.4.4.3 (Waste Rock Storage Areas), Draft EIS Section 5.5.2.4 (Mine Rock Management), and Draft EIS Section 22.6.7 (Seismic Events). ▪ Geochemical risks would be managed through engineered WRSA design and by capturing, treating, and monitoring all runoff from the PAG WRSA, and by monitoring and treating, if necessary, runoff from the NPAG WRSA as described in Draft EIS Section 5.4.4.3, Draft EIS Section 5.4.5.2 (Surface Water Management), Draft EIS 5.4.5.4 (Effluent Treatment), Draft EIS Section 5.5.1.5 (Mine Rock Management), Draft EIS Section 5.5.2.4, Draft EIS Section 5.5.2.5 (Site Water Management), Draft EIS Section 10.4 (Project Interactions and Mitigations), and Draft EIS Section 10.7.1 (Monitoring of Site Contact Water and Treated Effluent). ▪ Radiological risks for the Project would be managed through the Radiation Protection Program and supporting documents that are required and will be provided as part of provincial permitting and federal licensing. Based on the above response, no changes are proposed in the revised EIS to address this IR. **References** CNSC (Canadian Nuclear Safety Commission). 2003. Canadian National Report for the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. CNSC Catalogue number INFO-0738. Available at http://nuclearsafety.gc.ca/pubs_catalogue/uploads/joint-convention-2003-national-report-eng.pdf IAEA (International Atomic Energy Agency). 2000. Methods of Exploitation of Different Types of Uranium Deposits. IAEA-TECDOC-1174. ISSN 1011-4289. Available at https://www-pub.iaea.org/MTCD/publications/PDF/te_1174_prn.pdf	
54	MN-S	Incorporation of Indigenous Knowledge	Section 6.2	As stated in the EIS: "Indigenous and Local Knowledge was integrated into the development of the Project, including EA process. Indigenous and Local Knowledge was incorporated into the EIS by integrating the results from Indigenous Knowledge and Traditional Land Use (IKTLU) Studies and from engagement with local priority area (LPA) community members."	Please provide an explanation for how knowledge gained during "engagement" was verified as being suitable for use and "integrating" indigenous and Local Knowledge (Indigenous Knowledge). Please provide an explanation on how Indigenous Knowledge was used in the development of the Project. What was the methodology? Did Métis confirm accuracy? Is there a summary of how Indigenous Knowledge influenced Project design or mitigation in the document. Has it been recorded as part in discrete section? If yes, please include this information.	For the purposes of the response to this IR, NexGen assumes that the reviewer is requesting information associated with Project engagement activities and not the self-directed Indigenous Knowledge and Traditional Land Use Studies submitted by the Indigenous Groups. Draft EIS Section 3 (Indigenous and Local Knowledge) focuses on the collection and use of Indigenous and Local Knowledge within the EA. Specific to this inquiry, Draft EIS Section 3.4 (Defining Indigenous and Local Knowledge) provides the definitions of Indigenous Knowledge and Local Knowledge for the purposes of the EA: ▪ Indigenous Knowledge represents the unique and collective knowledge of a group of Indigenous People that is built up through generations of living in close contact with the land and natural environment; Indigenous Knowledge is also required to be sanctioned by an Indigenous Group as an official statement, document, or position. ▪ Local Knowledge represents key information provided by a local priority area (LPA) citizen or representative but without Indigenous Group/Elder sanction. NexGen felt it was a best practice to include Local Knowledge within the EA as approximately 96% of the LPA population identifies as Indigenous. NexGen confirms that the definitions of Indigenous Knowledge and Local Knowledge were followed when determining suitability for use of information within the EA. Draft EIS Section 3.3.2 (Study Agreements) discusses the Study Agreements signed with each of the primary Indigenous Groups. While the contents of the Study Agreements are confidential, among other topics, the Study Agreements describe the parameters for collection, verification, and use of Indigenous Knowledge within the EA. Draft EIS Section 3.6 (Incorporation of Indigenous and Local Knowledge) describes the process for the collection and inclusion of Indigenous and Local Knowledge for the Project EA. Within this subsection, Draft EIS Section 3.6.2 (Incorporating Indigenous and Local Knowledge) presents methods for incorporating Indigenous and Local Knowledge in the EA, and Draft EIS Section 3.6.3 (Documenting Use of Indigenous and Local Knowledge) discusses how Indigenous and Local Knowledge was documented in the Draft EIS and	n/a

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						considered alongside Western science methods. NexGen confirms that the Study Agreement parameters with respect to the collection, verification, and use of Indigenous Knowledge were strictly followed through implementation of the methods described in Draft EIS Section 3.6.2 and Draft EIS Section 3.6.3. As the parameters in the Study Agreement were strictly followed for collecting and incorporating Indigenous Knowledge, and EA best practices were used for considering Local Knowledge, additional verification of the suitability of Indigenous and Local Knowledge considered within the EA is not required. With respect to how Indigenous and Local Knowledge has been considered within the EA, NexGen engagement activities with the Métis Nation – Saskatchewan (MN-S), such as EA results workshops and community information sessions as well as the Draft EIS FIRT review process, have provided opportunities for the MN-S to submit specific comments regarding the accuracy of the Indigenous and Local Knowledge included within the Draft EIS. To date, NexGen has not received comments suggesting Indigenous and Local Knowledge has been used inaccurately. Draft EIS Section 3.7 (Influence on Project Planning and Design) describes how Indigenous and Local Knowledge influenced the Project design, which includes associated environmental design features and mitigations. Examples of Project design influences that mitigate potential adverse effects include the underground storage of tailings, re-routing the planned access road to avoid a wetland, and optimizing the Project footprint and water management approach. No changes are proposed in the revised EIS to address this IR.	
55	ECCC	Fish and fish habitat Change to an environmental component due to radiological contaminants	Section 6.2.3 Section 11.4.2 Section 11.5.1.2 TSD XXI ERA	**Context**: The Proponent followed CSA N288.6-12 for the assessment of risk to aquatic biota from radionuclide and non-radionuclide Constituents of Potential Concern (COPCs). This is the 2012 version, and a more recent 2022 version was publicly released. **Rationale**: The Proponent should review the most up-to-date version of the standard to ensure no changes to the methodology of the COPC exposure assessment are required.	Update the COPC exposure assessment methodology with the most recent CSAN288.6-22.	NexGen notes the reviewer's comment and confirms that the updated CSA N288.6-22 (CSA Group 2022) was reviewed and that no changes to the constituent of potential concern exposure assessment method are required based on the updated standard. NexGen also confirms that TSD XXI (Environmental Risk Assessment) is compliant with CSA N288.6-22. The revised EIS will be updated to reference the 2022 version of the standard, CSA N288.6-22 (CSA Group 2022), in the following documents, where applicable: ▪ Section 11 (Fish and Fish Habitat); ▪ Section 15 (Human Health); ▪ Section 21 (Accidents and Malfunctions); ▪ TSD VIII (Accidents and Malfunctions Report); ▪ TSD IX (Transportation Risk Assessment); and ▪ TSD XXI. **<u>References</u>** CSA Group (Canadian Standards Association Group). 2022. CSA N288.6-22: Environmental Risk Assessments at Nuclear Facilities and Uranium Mines and Mills.	Section 11; Section 15; Section 21; TSD VIII; TSD IX; TSD XXI
56	MN-S	Valued Components-methodology	Section 6.3.1	There is no indication if it was general practice to ask Indigenous groups for their concepts of VCs Good practice would include a step of verifying VCs together with Indigenous Nations. Minutes of Joint Working Group meetings indicate that NexGen presented a draft list of VCs to the Joint Working Group members for comment, but there is no record of an occasion on which NexGen asked open-ended VC questions or validated the VC identification together with MN-S based on engagement and Indigenous Knowledge.	This section should include a description of engagement related to VCs with Métis, as well as a description of Métis concepts of VCs having been confirmed. This will be relevant to the pathways analysis. Text under section 6.3.1, p. 6-9 should be revised to reflect the outcomes of more fulsome engagement between NexGen and MN-S on Valued Components (VCs) and Indigenous Knowledge.	NexGen acknowledges the reviewer's comment and notes the request to provide valued component (VC) process information on a Nation-by-Nation context is outside the scope of the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012*. However, NexGen has made best efforts across the Draft EIS to note where feedback or Indigenous and Local Knowledge from the Métis Nation – Saskatchewan (MN-S) has been considered in the selection of VCs. Draft EIS Section 6 (Environmental Assessment Approach and Methods) presents summary-level information regarding the purpose and approach of the EA, with Draft EIS Section 6.3.1 (Valued Components) presenting a summary of the approach used to select VCs. Table 6.3-1 of Draft EIS Section 6.3.2 (Assessment Endpoints and Measurement Indicators) presents the selection rationale for each VC and includes information regarding where feedback and Indigenous and Local	n/a

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						Knowledge was considered. Table 3.8-1 of Draft EIS Section 3.8 (Influence on the Environmental Assessment) also provides information on where Indigenous and Local Knowledge influenced aspects of the EA, including the selection of VCs. While the general approach on the use of Indigenous and Local Knowledge is provided in Draft EIS Section 6.3 (Assessment Scoping) and Draft EIS Section 3.8 provides a summary of how Indigenous and Local Knowledge was incorporated into the EA, more specific details regarding the VCs selected are more appropriately included within the 'Valued Components' subsections of the EIS discipline assessment sections (i.e., Draft EIS Section 7 [Air Quality, Noise, and Climate Change] through Draft EIS Section 19 [Community Well-Being]). In addition to information within the discipline assessment sections, Draft EIS Section 2.6.1.1.1 (Summary of Joint Working Group Activities) and Draft EIS Appendix 2A (Summary of Indigenous Group Engagement Activities) detail where VCs were discussed with Indigenous Groups, including through the Joint Working Group (JWG) meetings. Specific to the MN-S, more information is provided in Table 2A-2 of Draft EIS Appendix 2A. NexGen notes that multiple VC discussions with the MN-S were either held or offered through the JWG process. Valued components were discussed with the MN-S through the JWG in October 2019, December 2019, and February 2020 (MN-S-JWG 2019a,b, 2020). In December 2020, the MN-S requested a list of proposed VCs for the Project, which NexGen provided in January 2021. In May 2021, the MN-S indicated that they wanted to workshop VCs internally later in the year. At that time, NexGen advised that valuable input on VCs from the MN-S had been provided in 2019 and 2020 and effects assessments were being initiated; NexGen requested that any additional discussions on VCs for the Draft EIS occur in the near future. NexGen followed up on this topic by providing additional offers in June 2021 and September 2021 to discuss VCs. In September 2021, the MN-S had an action item to advise of VC areas of interest; however, the MN-S did not provide any further information prior to Draft EIS submission. As the information requested by the reviewer exists within the Draft EIS and the request to provide VC process information on a Nation-by-Nation basis is outside the scope of the *Canadian Environmental Assessment Act, 2012*, no changes are proposed in the revised EIS to address this IR. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html MN-S-JWG (Métis Nation – Saskatchewan-Joint Working Group). 2019a. Meeting Minutes. Meeting #1. 29 October 2019. MN-S-JWG. 2019b. Meeting Minutes. Meeting #2. 10 December 2019. MN-S-JWG. 2020. Meeting Minutes. Meeting #4. 27 February 2020.	
57	MN-S	Assessment Endpoints and Measurement indicators	Section 6.3.2	It needs to be confirmed the extent to which Indigenous Knowledge was considered in defining these measures and how (or if) Indigenous Nations were part of the definition development. Table 6.3-1 implies that Indigenous Knowledge was not a consideration for indicators and endpoints or separated out as in "changes in availability and quality of fish, plants, ...". This then calls into question the nature of the Indigenous Knowledge integration.	Text under section 6.3.2, p. 6-10 to 6-13 should be revised to reflect the outcomes of more fulsome engagement between NexGen and MN-S on endpoints and indicators.	NexGen acknowledges the reviewer's comment and notes the request to provide information regarding measurement indicators, assessment endpoints, and valued component (VC) selection on a Nation-by-Nation context is outside the scope of the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012*. However, NexGen has made best efforts across the Draft EIS to note where feedback or Indigenous and Local Knowledge from the Métis Nation – Saskatchewan (MN-S) has been considered with respect to measurement indicators, assessment endpoints, and VCs. Draft EIS Section 6 (Environmental Assessment Approach and Methods) presents summary-level information regarding the purpose and approach of the EA, with Draft EIS Section 6.3.2	n/a

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No.	Department	Project Effects Link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement	NexGen Response	Section in EIS
						(Assessment Endpoints and Measurement Indicators) presenting the purpose of assessment endpoints and measurement indicators within the EA. Table 6.3-1 of Draft EIS Section 6.3.2 presents the VCs and their selection rationale as well as the associated measurement indicators and assessment endpoints. Table 6.3-1 of Draft EIS Section 6.3.2 also includes information regarding where feedback and Indigenous and Local Knowledge was considered. Table 3.8-1 of Draft EIS Section 3.8 (Influence on the Environmental Assessment) also provides information on where Indigenous and Local Knowledge influenced aspects of the EA, including the selection of assessment endpoints and measurement indicators. While the general approach on the use of Indigenous and Local Knowledge is provided in Draft EIS Section 6.3 (Assessment Scoping) and Draft EIS Section 3.8 provides a summary of how Indigenous and Local Knowledge was incorporated into the EA, more specific details regarding the VCs, assessment endpoints, and measurement indicators are more appropriately included within the 'Valued Components', 'Measurement Indicators', and 'Assessment Endpoints' subsections of the EIS discipline assessment sections (i.e., Draft EIS Section 7 [Air Quality, Noise, and Climate Change] through Draft EIS Section 19 [Community Well-Being]). In addition to information within the discipline assessment sections, Draft EIS Section 2.6.1.1.1 (Summary of Joint Working Group Activities) and Draft EIS Appendix 2A (Summary of Indigenous Group Engagement Activities) detail where information on EA methods were discussed with or provided to Indigenous Groups, including through the Joint Working Group (JWG) meetings. Specific to the MN-S, more information is provided in Table 2A-2 of Draft EIS Appendix 2A. NexGen offered to meet with the MN-S with respect to EA methods in February 2021, March 2021, April 2021, May 2021, June 2021, and August 2021; however, the MN-S were either unable to attend meetings during this time, or where meetings were held (i.e., May 2021 and August 2021), the MN-S elected to discuss other topics. As the information requested by the reviewer exists within the Draft EIS and the request to provide information regarding measurement indicators, assessment endpoints, and VCs on a Nation-by-Nation basis is outside the scope of the *Canadian Environmental Assessment Act, 2012*, no changes are proposed in the revised EIS to address this IR. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html	
58	CNSC MN-S	Current use of lands and resources for traditional purposes	Section 6.4.1, Section 14	**Context:** It is not clear whether Indigenous Nations and communities were engaged on the spatial boundaries for all VCs of interest. Indigenous and/or traditional knowledge is not listed as one of the criteria for defining spatial boundaries in Section 6.4.1 of the EIS. Some sections of the EIS (such as Fish and Fish Habitat, Indigenous land and resource use) indicate that Indigenous and/or local knowledge was considered when defining the spatial boundaries. However, this is not included in other sections, such as Wildlife and Wildlife Habitat. It is not clear whether Indigenous Nations and communities did not have any comments on the spatial boundaries of these other sections or if they were not engaged on the topic including the wildlife section **Rationale**: CNSC's Generic EIS Guidelines require that spatial boundaries be defined by considering, but not limited to, the following criteria: Community and Indigenous traditional knowledge, ecological and technical considerations.	Provide further detail to demonstrate whether NexGen discussed the spatial boundaries for all valued components of interest (such as Wildlife Section 14) with the Indigenous Nations and communities. Provide detail about how any comments or concerns raised were considered in defining the spatial boundaries with Indigenous Nations and communities.	NexGen acknowledges the reviewer's comment and confirms that a multi-faceted approach to defining spatial boundaries for the assessment (i.e., study areas) of all valued components (VCs) and intermediate components was undertaken for the Project, which included discussions with Indigenous Groups and communities. Study areas for all disciplines were initially based on standard technical approaches. As examples, initial air quality study areas were based on standard modelling approaches and experience with similar projects, while aquatic and terrestrial areas were based on a watershed approach. Following this step, Indigenous Groups and local communities were provided with opportunities to review and provide input on the proposed study areas for VCs and intermediate components. After feedback was received and other sources of Indigenous Knowledge were reviewed (e.g., Indigenous Knowledge and Traditional Land Use [IKTLU] Studies), the initial study areas were reviewed and adjusted, if required. Prior to Draft EIS submission, study areas were presented and discussed multiple times with Indigenous Groups during Joint Working Group (JWG) meetings. Discussions primarily occurred during 2021 JWG meetings (Draft EIS Section 2.6.1.1.1 [Summary of Joint Working Group Activities], Table 2.6-3), though certain meetings occurred earlier in the EA process. The JWG meetings where study areas were presented and discussed are shown below: ▪ Clearwater River Dene Nation (CRDN)	n/a

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No.	Department	Project Effects Link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement	NexGen Response	Section in EIS
						o 31 January 2020 (CRDN-JWG 2020a) and 19 February 2020 (CRDN-JWG 2020b) (air quality local study area [LSA] and regional study area [RSA], aquatic LSA and RSA, terrestrial RSA, socio-economic study areas, and the human health risk assessment study areas); o 10 March 2020 (CRDN-JWG 2020c) (air quality LSA and RSA, aquatic LSA and RSA, and terrestrial RSA); and o 24 March 2021 (CRDN-JWG 2021) (socio-economic study areas). ▪ Métis Nation – Saskatchewan (MN-S) o 29 October 2019 (MN-S-JWG 2019) (air quality LSA and RSA, aquatic LSA and RSA, terrestrial RSA, and socio-economic study areas); and o 2 November 2021 (MN-S-JWG 2021) (caribou study area). ▪ Birch Narrows Dene Nation (BNDN) o 4 December 2019 (BNDN-JWG 2019) (air quality LSA and RSA, aquatic LSA and RSA, terrestrial RSA, and socio-economic study areas); o 27 January 2021 (BNDN-JWG 2021a) (air quality LSA, RSA, and model boundary); o 28 May 2021 (BNDN-JWG 2021b) (Indigenous and land resource use LSA and RSA); and o 4 August 2021 (BNDN-JWG 2021c) (socio-economic study areas). ▪ Buffalo River Dene Nation (BRDN) o 1 November 2019 (BRDN-JWG 2019a) (air quality LSA and RSA, aquatic LSA and RSA, terrestrial RSA, and socio-economic study areas); o 5 December 2019 (BRDN-JWG 2019b) (air quality RSA and LSA, aquatic LSA and RSA, and terrestrial RSA); o 10 February 2021 (BRDN-JWG 2021a) (air quality LSA, RSA, and model boundary); o 27 May 2021 (BRDN-JWG 2021b) (Indigenous land and resource LSA and RSA); and o 5 August 2021 (BRDN-JWG 2021c) (socio-economic study areas). As noted in Draft EIS Section 2.6.1.1.1 (Summary of Indigenous Engagement Activities), primary Indigenous Groups elected to participate in varying numbers of JWG meetings. To help facilitate equal opportunities to access to Project information, including information related to study areas, copies of 2021 JWG presentations were provided to each primary Indigenous Group and offers were made for each Indigenous Group to participate in a meeting for the same topics. Efforts were also made to engage more broadly with communities regarding EA topics such as study areas, though NexGen acknowledges that both required public safety measures and government restrictions during the COVID-19 pandemic significantly limited the ability to meet with community members from March 2020 through finalization of the Draft EIS. During the community information sessions in June 2019, participants were provided with a map of the regional area of the Project and requested to mark areas of importance and describe why these areas were important (Draft EIS Appendix 2E [Summary of Community Information Sessions]). One of the intents of this exercise was to gain insight to areas of use that should be considered within the development of study areas for specific discipline assessments. Another key method utilized to attempt to engage with the broader public was the generation of JWG summaries in 2021, which were created to provide JWG members materials to distribute to community members. While limited study area maps were provided within the JWG summaries, the topics discussed at each meeting were presented and community members were encouraged to contact NexGen with any inquiries (Draft EIS Appendix 2F [Public Engagement Materials]). When finalizing the study areas to be used in the EA, NexGen considered the collective feedback and Indigenous and Local Knowledge provided through engagement activities and the IKTLU Studies. The 'Spatial Boundaries' subsection for each EIS discipline assessment section (i.e., Draft EIS Section 7 [Air Quality, Noise, and Climate Change] through Draft EIS Section 19 [Community Well-Being]) references where feedback and Indigenous and Local Knowledge were considered, if provided to NexGen, in the development of study areas for the specific VC or intermediate	

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						component being assessed. NexGen notes that feedback or Indigenous and Local Knowledge were not received for all VC or intermediate component study areas. NexGen also notes that since the submission of the Draft EIS, EA results presentations, which included information on the study areas used for all VCs and intermediate components, have been conducted with each primary Indigenous Group and at community information sessions in June 2022 and October 2022. No comments specific to study areas were received at any of these events. As referenced in Section 3.3.2 of the CNSC Generic Guidelines for the preparation of an EIS (CNSC 2021), Section 19(3) of the *Canadian Environmental Assessment Act, 2012* states, “the environmental assessment of a designated project may take into account community knowledge and Aboriginal traditional knowledge.” Section 3.3.2 of the Act goes on to state, “the proponent will consider community and Aboriginal traditional knowledge to which it has access or that is acquired through Aboriginal and public engagement activities”. NexGen confirms that feedback and Indigenous and Local Knowledge received through Project engagement activities have been considered in the development of the VC and intermediate component assessment study areas, thereby meeting the recommendations of CNSC Generic Guidelines for the preparation of an EIS (CNSC 2021). No changes are proposed in the revised EIS to address this IR. **References** BNDN-JWG (Birch Narrows Dene Nation-Joint Working Group). 2019. Meeting Minutes. Meeting #2. 4 December 2019. BNDN-JWG.2021a. Meeting Minutes. Meeting #7. 27 January 2021. BNDN-JWG. 2021b. Meeting Minutes. Meeting #12. 28 May 2021. BNDN-JWG. 2021c. Meeting Minutes. Meeting #13. 5 August 2021. BRDN-JWG (Buffalo River Dene Nation-Joint Working Group). 2019a. Meeting Minutes. Meeting #1. 1 November 2019. BRDN-JWG. 2019b. Meeting Minutes. Meeting #2. 5 December 2019. BRDN-JWG. 2021a Meeting Notes. Meeting #7. 10 February 2021. BRDN-JWG. 2021b. Meeting Notes. Meeting #11. 27 May 2021. BRDN-JWG. 2021c. Meeting Notes. Meeting #13. 5 August 2021. MN-S-JWG (Métis Nation – Saskatchewan-Joint Working Group). 2021. Meeting Minutes. Meeting #7. 02 November 2021. *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html CNSC (Canadian Nuclear Safety Commission). 2021. Generic Guidelines for the Preparation of an Environmental Impact Statement – Pursuant to the *Canadian Environmental Assessment Act, 2012*. Available at http://cnsc.gc.ca/eng/resources/environmental-protection/ceaa-2012-generic-eis-guidelines.cfm	

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No.	Department	Project Effects Link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement	NexGen Response	Section in EIS
						CRDN-JWG (Clearwater River Dene Nation-Joint Working Group). 2020. Meeting Minutes. Meeting #1. 31 January 2020. CRDN-JWG. 2020b. Meeting Minutes. Meeting #2. 19 February 2020. CRDN-JWG. 2020c. Meeting Minutes. Meeting #3. 10 March 2020. CRDN-JWG. 2021. Meeting Minutes. Meeting #4. 24 March 2021. MN-S-JWG (Métis Nation-Saskatchewan-Joint Working Group). 2019. Meeting Minutes. Meeting #1. 29 October 2019.	
59	CNSC	Fish and fish habitat Aquatic species Migratory birds	Section 6.3.2, Table 6.3-1, page 6-12 Section 6.4, page 6-18	In section 6.4 states: "**Although additional spatial scales are possible for individual VCs and intermediate components**, spatial scales typically include a minimum of a site study area, a local study area (LSA), and a regional study area (RSA; CNSC 2021)."	It would be helpful to include spatial scales in table 6.3-1, either as it's own column or in relation to specific items. For example, it is unclear from reading the table at what spatial scale habitat and ecosystem availability is considered at.	As indicated in Draft EIS Section 6.1.1 (Purpose and Scope), the purpose of Draft EIS Section 6 (Environmental Assessment Approach and Methods) is to provide the overall general approach and methods of the EA. As identified in Draft EIS Section 6.4.1 (Spatial Boundaries), spatial boundaries considered for valued components (VCs) and intermediate components, and the rationale for the selection of these boundaries, are identified in each discipline section (i.e., Draft EIS Section 7 [Air Quality, Noise, and Climate Change] through Draft EIS Section 19 [Community Well-Being]). If NexGen presented the different spatial scales of the assessment for each VC in Table 6.3-1 of Draft EIS Section 6.3.2 (Assessment Endpoints and Measurement Indicators), this would also require stating the rationale supported by scientific information and community engagement, where available; this information and the associated context is more appropriately provided in each discipline section. No changes are proposed in the revised EIS to address this IR.	n/a
60	CNSC	Indigenous Peoples' health / Socio-economic conditions	Section 6.3.2, Table 6.3-1, page 6-12	Table 6.3-1 includes a "Subsistence harvester" as a VC, which is linked to the rationale for selection including "potential exposure to changes in air quality, soil, surface water, plants, fish and wildlife from Project activities". Furthermore, "traditional and/or current food source security" and "socio-economic/cultural importance" were also included as rationales for selection of this VC. The measurement indicators for this VC included "Hazard quotients, lifetime cancer risk, and radiation dose".	Did NexGen collect information on the current subsistence habits, and traditional foods and wildlife consumption of communities that harvest in areas affected by of the Rook 1 project as baseline information? If so, some information on this topic in this section would be helpful and should link to the appropriate section where it is discussed in more detail. This information could then be used to compare current vs. future habits and consumption once the project is operational to see how the project impacts traditional practices. With the expected psycho-social effects of fear and avoidance of the project, a useful measurement indicator could be current vs. future harvesting and consumption practices.	NexGen would like to clarify that, as described in Table 6.3-1 (and associated footnotes) in Draft EIS Section 6.3.2 (Assessment Endpoints and Measurement Indicators), human health represents a valued component (VC) in the EA while the subsistence harvester is a receptor in the human health risk assessment and ecological risk assessment. NexGen notes that Draft EIS Section 6.3.2 is intended to present the VCs selected for the Project and rationale for selection as well as the associated measurement indicators and assessment endpoints. Specific information regarding community subsistence habits and traditional foods and wildlife consumption is provided in Draft EIS Section 15 (Human Health) and Draft EIS TSD XXI (Environmental Risk Assessment). As stated in Section 3 of Draft EIS TSD XXI, "Indigenous Knowledge, as documented in the IKTLU [Indigenous Knowledge and Traditional Land Use] Studies and JWG [Joint Working Group] meeting minutes, continues to play a key role in developing the assumptions for the ERA [Environmental Risk Assessment], including the specific human and ecological receptors selected for the assessment, and locations and characteristics of these receptors. Where Indigenous Knowledge has been used, this is documented in the relevant section of the ERA report". Section 5.1.1.2 of Draft EIS TSD XXI describes the assumptions for the subsistence harvester in the ERA, including how Indigenous Knowledge informed the assumptions. Receptor locations considered information provided by Indigenous Groups through engagement activities (e.g., JWGs) and IKTLU Studies. NexGen did not collect specific consumption rates of Traditional Foods; however, as discussed in Section 5.1.3.2.2 of Draft EIS TSD XXI, feedback from Indigenous Groups and local communities informed the Traditional Foods dietary assumptions in the EA. NexGen acknowledges the CNSC's comment regarding current versus future consumption and will consider this comment in Project monitoring and follow-up programs. As an example of this kind of activity, NexGen is advancing a Regional Traditional Foods Study in collaboration with primary	n/a

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						Indigenous Groups; the Regional Traditional Foods Study would represent an update to the Traditional Foods diet used in the Draft EIS. Early engagement with primary Indigenous Groups on the Regional Traditional Foods Study design commenced in the last quarter of 2022, with follow-up engagement continuing in 2023. This study is intended to be completed in 2024. NexGen further notes that ongoing monitoring of changes in resource use would be conducted through the independent Indigenous Monitors and programs determined through the Environmental Committees and/or Implementation Committees implemented as part of the Benefit Agreements signed with primary Indigenous Groups. No changes are proposed in the revised EIS to address this IR.	
61	CNSC	Other Potential Emission Sources	Figure 7.1-3, 7.2-4, 7.2-22	There are other potential source of contaminant emissions to air that should be considered and discussed in the EIS (e.g., Sewage Treatment Lagoon, airplanes arriving/departing on airstrip).	Include discussion of other potential releases from the site, or rationale for their exclusion from further assessment.	NexGen notes the reviewer's comment regarding other potential releases from the Project and the Fission Patterson Lake South Property in the Reasonably Foreseeable Development (RFD) Case. NexGen has considered potential sources of constituents of potential concern (COPCs) for air quality and other disciplines (e.g., soil, surface water quality, human health). The COPCs considered include criteria air contaminants, dioxins and furans, radionuclides, radon, and metals. The potential air emissions from the sewage treatment facilities and the airstrips for the Project and the Fission Patterson Lake South Property were excluded from the assessment due to the following rationale: ▪ The Project and RFD sewage treatment facilities are not expected to emit higher than trace amounts of COPCs to the air (US EPA 1998). ▪ Aircraft arriving and departing at the Project and RFD airstrips are expected to emit a small amount of COPCs from jet fuel combustion and fugitive dust. ▪ Aircraft landings or departures occur on a time scale of seconds to a few minutes (i.e., short-term events) and are ephemeral events that would not emit dust or other contaminants continuously for long periods (i.e., an hour or more). Also, winter conditions and treatment of the airstrip runways during the non-winter period with dust suppressants (e.g., chemical, watering), as needed, are expected to mitigate potential dust emissions. The combination of these two factors is anticipated to only produce trace amounts of dust emissions. No changes are proposed in the revised EIS to address this IR. **References** US EPA (United States Environmental Protection Agency). 1998. AP 42, Fifth Edition, Volume I, Chapter 4: Evaporation Loss Sources, 4.3 Waste Water Collection, Treatment and Storage. Available at https://www.epa.gov/sites/default/files/2020-10/documents/c4s03.pdf	n/a
62	HC	Human health with with respect to hazardous contaminants	Section 7.2.3, page 7-30	**Context:** The proponent describes a baseline field and desktop study to characterize air quality within the LSA and RSA. Passive sampling was used to collect data on nitrogen dioxide (NO_2) and sulphur dioxide (SO_2). Two years (2019 and 2020) of sampling from a single monitoring station in Buffalo Narrows were used to establish background conditions. Annex I (Atmospheric Baseline Report) also included 24-hour $PM_{2.5}$ monitoring results at the Buffalo Narrows station, one of the two stations (along with Fort Chipewyan) used to describe air quality at the regional level. The proponent has indicated its intention in Section 7.2.8 of the EIS to continue air quality monitoring for NO2, SO2, Total Suspended Particles (TSP), and fine particulate matter (PM2.5) through all phases of the Project. **Rationale**:	To increase the accuracy of any risk assessment, measured baseline data including the exceedances of 1-hour NO_2 CAAQS, as well as 24-hour SAAQS (Saskatchewan Ambient Air Quality Standards) for PM_{10} and TSP at the location of certain receptors should be collected and input into predictive models to evaluate future potential health risks. Monitoring during project operations can then be used to validate model predictions and monitor/evaluate changes to avoid increasing health risks. If increased health risks are identified, additional mitigation would then be necessary. **Suggestions for mitigation and follow-up measures** Provide a discussion of the potential impacts of exceedances on human health or a description of the mitigation measures to be employed to address any	NexGen acknowledges the reviewer's comments; however, NexGen believes that maximum measurements are not appropriate for use as background in modelling as indicated by the Saskatchewan Air Quality Modelling Guideline (SAQMG) (ENV 2012). The SAQMG provides regional background air contaminant concentrations that are required to be used for each air quality modelling zone in the province (Table B-1 of SAQMG; ENV 2012). This guideline also provides a method to determine background concentrations. For refined modelling, such as the air quality modelling presented in the Draft EIS, the 90th percentile value from the background monitoring data should be used. The background concentrations used in the air quality assessment are a combination of Saskatchewan Ministry of Environment (ENV) prescribed background concentrations for particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), carbon monoxide, nitrogen dioxide, and sulphur dioxide, as well as background concentrations for particulate matter less than 10 microns in diameter (PM_{10}) and total suspended particulates derived from regional monitoring data (e.g., 90th percentile of the PM_{10} data from 2019 at the Buffalo Narrows Station; 14.4 micrograms per cubic metre [µg/m³]).	n/a

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				Table 7.2-7 of the EIS identifies a 24-hour $PM_{2.5}$ maximum daily concentration of 28.5 micrograms per metre cubed (μg/m^3) as background pre-project levels of $PM_{2.5}$ measured at the on-site (Rook I) station in July 2019. The evaluation of COPCs should include project-related emissions and the baseline/background concentrations established in the baseline field study, in order to be more representative of the total expected exposure by nearby human receptors. High baseline conditions should be discussed in order to understand potential exceedances at the monitoring locations.	exceedances or near-exceedances of guidelines based on cumulative effects from the Project combined with baseline exceedances.	Prior to modelling, engagement was conducted with the ENV and CNSC in 2021 regarding using the above-described background concentrations, after which NexGen proceeded to model based on the discussions held during this engagement. The maximum $PM_{2.5}$ concentrations recorded from the baseline program were deemed to be wildfire-related, and are thus considered exceptional events and should be excluded in determining achievement of Canadian Ambient Air Quality Standards (CCME 2012) or background values (ENV 2012). The Draft EIS TSD XXI (Environmental Risk Assessment) was based on the cumulative results of air quality modelling predictions of emissions associated with the Project and the appropriate background concentrations. As discussed in Draft EIS Section 7.2.3.2.2 (Particulate Matter), the baseline exceedances of ambient standards are associated with exceptional events and are not included in the estimation of background conditions for the environmental risk assessment, which included a human health risk assessment. The environmental risk assessment was used to inform the human health effects assessment and mitigation planning presented in Draft EIS Section 15 (Human Health). Air quality monitoring would continue into the Project Construction and Operations phases to validate the model predictions and inform further mitigation measures, if needed. No changes are proposed in the revised EIS to address this IR. **References** CCME (Canadian Council of Ministers of the Environment). 2012. Guidance document on achievement determination Canadian Ambient Air Quality Standards for fine particulate matter and ozone. ENV (Saskatchewan Ministry of Environment). 2012. Saskatchewan Air Quality Modelling Guideline.	
63	HC	Human health with with respect to hazardous contaminants	Section 7.2.4, page 7-37	**Context:** Onsite material handling and transportation is not listed as a project activity, with the potential to affect ambient air quality by generating fugitive dust and other air pollutant emissions, such as from diesel combustion,, during the Project lifespan. **Rationale:** Health Canada notes that expectations of 100% efficiency in dust suppression on haul roads are not realistic. Health Canada considers PM_{10} and $PM_{2.5}$ to be non-threshold substances, meaning that health effects may occur at any level of exposure. The International Agency on Cancer Research (IARC) has recently classified particulate matter as being carcinogenic to humans (Group 1). Health Canada considers that the risk associated with fine particles, particularly $PM_{2.5}$, is higher than the health risks associated with coarse PM or total suspended particulates (TSP) which includes liquid and solid particles, without particle size differentiation.	Health Canada recommends assessing the human health risks due to changes in exposure to project- related dust associated with on-site material handling and transportation. In addition to the health effects of exposure to $PM_{2.5}$ and PM_{10}, dust can have soiling effects that may be of concern to communities and may contribute to deposition of contaminants onto soil and country-foods that can be ingested by nearby receptors. **Suggestions for mitigation and follow-up measures** 1.Health Canada recommends monitoring of $PM_{2.5}$/PM_{10} levels at sensitive receptor locations, and implementing additional mitigation measures if the levels are elevated in comparison with applicable guidelines (e.g. CAAQS, SAAQS). Additional mitigation measures should also be implemented if $PM_{2.5}$/PM_{10} are predicted or measured to be elevated compared to baseline levels, as there is no threshold under which there are no health effects for these air contaminants. 2.According to Table 7.2-10 (p.7-39), the proponent plans to use Tier 4 engines in the underground hauling	As stated in Draft EIS Section 7.2.5.1.1.1 (Project Emission Inventory), material handling and transportation emissions (e.g., dozing operation, material handling on the surface and underground, mine fleet exhaust, road dust from vehicles travelling on surface and underground roads) were included in the air quality model. Therefore, NexGen confirms that Project-related dust associated with on-site material handling and transportation was included in the dust model prediction outputs that were included in the human health risk assessment (Draft EIS TSD XXI [Environmental Risk Assessment]) and assessment of potential effects on soil (Draft EIS Section 12 [Terrain and Soils]). Please see the below points related to the suggested mitigation and follow-up measures: 1. An air quality monitoring station is proposed to be installed prior to the commencement of Project Construction to monitor levels of particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) and particulate matter less than 10 microns in diameter (PM_{10}) at a location north of Patterson Lake where the highest concentrations were predicted in the air quality model. As noted by the reviewer in the IR, 100% efficiency of dust mitigation is not realistic and some increase from baseline levels is inevitable with new activities. As such, NexGen would consider and implement, as appropriate, additional mitigation measures (e.g., further watering or chemical treatment of surface roads, further reducing vehicle speeds) if measured $PM_{2.5}$/PM_{10} were elevated relative to applicable guidelines. 2. The air modelling assessment conservatively used higher-emitting engines to demonstrate compliance with ambient air quality criteria under potential worst-case emission conditions. It is NexGen's intent to purchase and use lower-emitting Tier 4 engines, if available. However,	n/a

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					operations to limit the effects of the project on air quality in the underground workings. Health Canada suggests expanding the use of Tier 4 engines to surface operations as an effective measure for reducing particulate matter associated with diesel emissions.	flexibility is required to account for the possibility that Tier 4 options may not be available for all vehicles and equipment. The Draft EIS assumed that lower tier (i.e., higher-emitting) engines would be used in the air modelling assessment. This assumption was made to demonstrate that even higher-emitting engines would be expected to produce acceptable air quality results relative to the applicable standards. If new equipment is to be used, Tier 4 engines are the only option available for new purchase in Canada. No changes are proposed in the revised EIS to address this IR.	
64	HC	Human health with with respect to hazardous contaminants	Section 7.2.5, page 7-41	**Context:** Concentrations of NO_2, TSP and PM_{10} are predicted to be greater than the short- term (1-hour) SAAQS within a few hundred metres of the maximum disturbance area for the Project, where traditional land users may be present. The human health risks associated with these exceedances are not discussed in the HHERA. The proponent states: *"As discussed in Section 7.2.2.8.2, Comparison to Canadian Ambient Air Quality Standards, the comparison to CAAQS is provided for information only and does not represent a compliance metric or environmental risk."* **Rationale:** NO_2 and PM_{10} are non-threshold pollutants (meaning that any increment in concentrations presents an increased risk for health effects). Health Canada recommends the use of the CAAQS for project-associated air quality assessments, as they are the appropriate comparison targets for measured, modeled or estimated ambient air concentrations. The CAAQS are some of the most stringent air quality criteria, especially for long-term project emissions after 2025. It is recommended that the proponent take into consideration that NO_2 and $PM_{2.5}$ are non-threshold pollutants. The Canadian Air Quality Management System (AQMS) explicitly recognizes that health effects occur below the CAAQS values, and proposes additional management levels in recognition of the health and environmental benefits that can be realized by taking actions to decrease or maintain background levels of air pollution.	Discuss the impacts of these short-term air quality exceedances (NO_2, TSP and PM_{10}) on human health.	The short-term air quality exceedances for nitrogen dioxide, total suspended particulates (TSP), and particulate matter less than 10 microns in diameter (PM_{10}) are discussed in Draft EIS TSD XXI (Environmental Risk Assessment). Specifically, Section 4.3.3.3 of Draft EIS TSD XXI discusses air quality constituents that exceed screening values. As stated in Section 4.3.3.3.1 of Draft EIS TSD XXI, "[a]dverse health effects that are attributed to short-term exposures to ambient nitrogen dioxide include asthma exacerbations and possibly increased risk of cardiopulmonary effects, and to a lesser extent cardiovascular and respiratory mortality (Health Canada 2016b). Individuals with certain pre-existing diseases such as asthma appear to be sensitive to exposure to ambient nitrogen dioxide. If individuals are present during periods when ambient nitrogen dioxide concentrations exceed the screening value, it is possible that they could experience minor irritation of the respiratory system. These effects would be reversible and would subside after exposure." As stated in Section 4.3.3.3.2 of Draft EIS TSD XXI, "[e]levated TSP concentrations are generally not considered to pose significant health risks because these particles are too large to be inhaled deep into the lungs; therefore, TSP was not considered further in the ERA [Environmental Risk Assessment]." With respect to PM_{10} and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), Section 4.3.3.3.2 of Draft EIS TSD XXI states "[e]xposure to elevated concentrations of both PM_{10} and $PM_{2.5}$ are associated with various respiratory and cardiovascular effects in humans. The finer particles that can be inhaled deeply into the lungs are associated with greater risk because they are more chemically active and have more complex characteristics than larger particles (Health Canada 2016c). If individuals are present during short-term periods of elevated PM_{10} and/or $PM_{2.5}$, they may experience respiratory symptoms such as coughing or difficulty breathing, or asthma symptoms and chronic bronchitis. For most individuals, effects would be reversible and subside after exposure." With respect to the Canadian Ambient Air Quality Standards (CAAQSs), as discussed in Draft EIS Section 7.2.2.8.2 (Comparison to Canadian Ambient Air Quality Standards), the CAAQCs are applicable to measured ambient air concentrations over a three-year period and are not specifically applicable to modelled results from a single facility. As the information requested by the reviewer is already contained within the Draft EIS, no changes are proposed in the revised EIS to address this IR. __References__ Health Canada. 2016b. Human Health Risk Assessment for Ambient Nitrogen Dioxide. Healthy Environments and Consumer Safety Branch. Health Canada. 2016c. Human Health Risk Assessment for Coarse Particulate Matter. Healthy Environments and Consumer Safety Branch.	n/a

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65	HC	Current use of lands and resources for traditional purposes	Reference to EIS: Section 7.3.2.5, page 7-99, pdf page 119	**Context:** The Fission Patterson Lake South Property is listed as a Reasonably Foreseeable Development Case. For the assessment, it was assumed that the duration of active decommissioning for the Fission Patterson Lake South Property would be similar to the Active Closure Stage for the Project (i.e., five years). **Rationale:** Health Canada has participated in the Designation Request for Fission Patterson and noted that the Indigenous Groups in the area are concerned about cumulative effects, in particular, acoustic impacts. A nearby project of similar scope could potentially lead to increased noise issues for the public.	Provide evidence that the cumulative noise effects have been considered with regard to nearby Indigenous communities. **Suggestions for mitigation and follow-up measures** Health Canada recommends that the proponent have a community engagement plan in place that includes consulting with the public prior to any particularly noisy activities, understanding work/life schedules and working around those schedules to the extent possible. When the community receives information about expected changes in sound levels through a consultation process, and feels that concerns with respect to noise will be addressed, the incidence of noise-related complaints is frequently reduced (Health Canada, 2017). The proactive community engagement is intended to minimize public complaints and provide an open and transparent means to communicate regularly with potentially impacted receptors.	As stated in Draft EIS Section 7.3.5.2 (Reasonably Foreseeable Development Case), noise from the Fission Patterson Lake South Property was modelled and potential cumulative noise effects were assessed in the Reasonably Foreseeable Development Case. Figure 7.3-9 in Draft EIS Section 7.3.5.2 presents a noise contour map for the Project and the Fission Patterson Lake South Property, Table 7.3-23 in Draft EIS Section 7.3.5.2 assesses potential cumulative noise effects (i.e., Project and Fission Patterson Lake South Property) on key receptors based on the Health Canada (HC) high annoyance (%HA) metric, and Table 7.3-24 and Table 7.3-25 in Draft EIS Section 7.3.5.2 assess potential cumulative noise effects (i.e., Project and Fission Patterson Lake South Property) from continuous noise and intermittent noise, respectively, on key receptors based on HC sleep disturbance thresholds. As stated in Table 7.3-27 in Draft EIS Section 7.3.6 (Residual Effects Classification), changes in noise levels at key receptors resulting cumulatively from the Project and Fission Patterson Lake South Property are expected to be detectable, but remain below all regulatory thresholds considered in the EA. Please see the below points related to the suggested mitigation and follow-up measures: ▪ NexGen notes the closest community to the proposed Project is Descharme Lake, which is located approximately 60 km from the Project site. All other communities are 100 km or farther from the Project site (Draft EIS Section 2.4.1 [Identification of Indigenous Groups for Engagement], Table 2.4-3). Therefore, no noise effects associated with the Project would be noticed in local communities. ▪ As noted in Draft EIS Section 7.3.8 (Monitoring, Follow-Up, and Adaptive Management), follow-up noise monitoring would be conducted in accordance with methods from Alberta Energy Regulator Directive 038 (AER 2007) to compare measured values to model predictions from the EIS and to regulatory thresholds. In addition to this follow-up monitoring, future opportunities for independent Indigenous monitoring at key receptors would be provided through the Environmental Committees formed through implementation of the Benefit Agreements with the primary Indigenous Groups. NexGen is also developing an Indigenous and Public Engagement Program that would communicate results from the Project, including results from monitoring activities. No changes are proposed in the revised EIS to address this IR. **References** AER (Alberta Energy Regulator). 2007. Directive 038: Noise Control.	n/a
66	HC	Change to an environmental component due to hazardous contaminants	Section 7.3.2.8, page 7-106 pdf page 126	**Context:** The proponent did not include the Project airstrip and the Fission Patterson Lake South Property airstrip when analyzing noise effects. While Transport Canada is responsible for regulating airport operations, the noise assessment should include all noise sources, including aircraft noise, as per Health Canada guidance (2017). **Rationale:** Health Canada (2017) provides guidance specific to aircraft noise when evaluating impacts on sleep disturbance, calculating %HA and applying adjustment factors.	1.Evaluate the effects of airplane noise (take-offs and landings) as infrequent but impulsive noise sources at nearby human receptor locations. 2.Discuss the timing of any aircraft noise, particularly if it may impact sleep or result in increased annoyance at receptor locations. The proponent may find the following Transport Canada resources specific to noise from airport operations useful: https://www.tc.gc.ca/en/services/aviation/operatingairports-aerodromes/managing-noise/exposureforecast.html **Suggestions for mitigation and follow-up measures** Health Canada recommends providing aircraft arrival and departure times in advance of their occurrence to any potentially impacted receptors in order to reduce the likelihood of complaints regarding aircraft noise.	As stated in Draft EIS Section 7.3.5.1 (Application Case), noise from the Project airstrip was modelled and assessed in the Draft EIS. Table 7.3-16 in Draft EIS Section 7.3.5.1 presents an assessment of potential Project airstrip noise effects on sleep using the 'impulsive noise' criteria from Health Canada (HC). Also, as stated in Draft EIS Section 7.3.5.2 (Reasonably Foreseeable Development Case), noise from the Fission Patterson Lake South Property airstrip was modelled and assessed as part of the Reasonably Foreseeable Development Case. Table 7.3-25 in Draft EIS Section 7.3.5.2 presents an assessment of potential cumulative noise effects on sleep from the Project and Fission Patterson Lake South Property airstrips using the 'impulsive noise' criteria from HC. Additional details on noise modelling for the Project airstrip, including expected flight schedules, are provided in Section 7B1.4.2 of Draft EIS Appendix 7B (Noise Modelling Summary Report). Please see the below points related to the suggested mitigation and follow-up measures: ▪ NexGen notes the closest community to the proposed Project is Descharme Lake, which is located approximately 60 km from the Project site. All other communities are 100 km or farther from the Project site (Draft EIS Section 2.4.1 [Identification of Indigenous Groups for Engagement], Table 2.4-3). Therefore, no noise effects associated with the Project would be noticed at local communities.	n/a

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						▪ As noted in Draft EIS Section 7.3.8 (Monitoring, Follow-Up, and Adaptive Management), follow-up noise monitoring would be conducted in accordance with methods from Alberta Energy Regulator Directive 038 (AER 2007) to compare measured values to model predictions from the EIS and to regulatory thresholds. In addition to this follow-up monitoring, future opportunities for independent Indigenous monitoring at key receptors would be provided through the Environmental Committees formed through implementation of the Benefit Agreements with the primary Indigenous Groups. NexGen is also developing an Indigenous and Public Engagement Program that would communicate results from the Project, including results from monitoring activities. No changes are proposed in the revised EIS to address this IR. **References** AER (Alberta Energy Regulator). 2007. Directive 038: Noise Control.	
67	ECCC	Air Quality, Noise, and Climate Change	Section 7.4.5	**Context:** In Section 7.4.5 the Proponent states that the land use change emissions include the annual loss of carbon sinks. It is anticipated that there will be 897.8 ha of new disturbance added to the Project area. **Rationale:** While ECCC recognizes that this Project falls under CEAA 2012, the principles of the SACC and Draft Technical Guide should be followed by the Proponent in order to support Canada's ability to meet its environmental obligations and commitments in respect of climate change. There is a distinction between direct GHG emissions from land use change and the effects on carbon sinks. The GHG emissions from land use change should be evaluated, however the effects on carbon sinks should be considered separately. An effect to a carbon sink implies the interruption of the land's natural process that results in the net absorption of carbon from the atmosphere. The Proponent should refer to the Strategic Assessment of Climate Change (SACC) section 5.1.2 and the associated Draft Technical Guide section 4 for guidance on how to perform an assessment of the impact on carbon sinks. This assessment should be qualitative and quantitative.	Provide separate assessments for GHG emissions due to land use change and for GHG emissions due to the effects on carbon sinks. **Suggestions for mitigation and follow-up measures** The Proponent should consider mitigation measures for the disturbance of carbon sinks. The Proponent can refer to the Draft Technical Guide section 3.5.3 for additional guidance.	As noted by both NexGen and the reviewer, the request to provide separate assessments for greenhouse gas (GHG) emissions due to land use change and for GHG emissions due to the effects on carbon sinks is outside the scope of both the *Canadian Environmental Assessment Act, 2012* and the CNSC Generic Guidelines for the preparation of an EIS (CNSC 2021). Greenhouse gas (GHG) emissions associated with the land use changes and the resulting loss of carbon sinks are provided in Table 7.4-8 in Draft EIS Section 7.4.5.1.1 (Project Greenhouse Gas Emissions). The total emissions from land use change presented include separate calculations for the GHG emissions associated with the land use change (i.e., the one-time loss of the carbon sink from the land clearing), as well as the annual emissions associated with the loss of carbon sinks. These emissions were calculated using the approach provided in the Intergovernmental Panel on Climate Change (IPCC 2006) guidelines (Draft EIS Appendix 7C [Greenhouse Gas Emissions Estimation Methodology Report], Section 7C5.4) and are aligned with a Tier 1 approach provided in the draft technical guidance supporting the Strategic Assessment of Climate Change (SACC; ECCC 2021). During development of the Draft EIS, the approach for the carbon sink calculations was presented by NexGen as part of proactive engagement between NexGen, the CNSC, and the Saskatchewan Ministry of the Environment on 14 June 2021. No comments were received at the time related to the approach proposed by NexGen for carbon sinks. Outside of the EA process, NexGen's commitments to environmental, social, and corporate governance and sustainability will be used to guide decision-making on reducing GHG emissions. These commitments can be found on NexGen's Sustainability webpage (https://www.nexgenenergy.ca/sustainability/default.aspx) as well as in Draft EIS Section 1 (Introduction). A mitigation for the disturbance of carbon sinks includes removal of merchantable trees and most of the woody debris with soils that are salvaged, where required (i.e., where not planned for use in future reclamation activities), in order to maintain the carbon stocks and avoid release of carbon through decomposition. This mitigation measure is listed in Table 7.4-7 in Draft EIS Section 7.4.4 (Project Interactions and Mitigation). Other mitigation measures to limit disturbance of carbon sinks include the following measures (Draft EIS Appendix 23A [Summary of Project Environmental Design Features and Mitigation Measures]): ▪ designing an efficient infrastructure footprint (i.e., buildings clustered together); ▪ optimizing the use of cleared areas for Project activity; ▪ using existing road infrastructure, including the existing access road and bridge crossing; ▪ storing tailings underground; ▪ maximizing water diversion away from site facilities through design and the establishment of berms and grading; and	n/a

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						▪ reclaim and revegetate areas where non-permanent Project facilities have been decommissioned. As the reviewer's request is outside the scope of both the *Canadian Environmental Assessment Act, 2012* and the CNSC Generic Guidelines for the preparation of an EIS (CNSC 2021), no changes are proposed in the revised EIS to address this IR. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html CNSC (Canadian Nuclear Safety Commission). 2021. Generic Guidelines for the Preparation of an Environmental Impact Statement – Pursuant to the *Canadian Environmental Assessment Act, 2012*. Available at http://cnsc.gc.ca/eng/resources/environmental-protection/ceaa-2012-generic-eis-guidelines.cfm ECCC (Environment and Climate Change Canada). 2021. Draft Technical Guide Related to the Strategic Assessment of Climate Change. August 2021. Available at https://www.canada.ca/en/environment-climate-change/corporate/transparency/consultations/draft-technical-guide-strategic-assessment-climate-change.html IPCC (Intergovernmental Panel on Climate Change). 2006. IPCC Guidelines for National Greenhouse Gas Inventories, Prepared by the National Greenhouse Gas Inventories Programme, Eggleston HS, Buendia L, Miwa K, Ngara T, Tanabe K (eds). Published: IGES, Japan. Available at https://www.ipcc-nggip.iges.or.jp/public/2006gl/	
68	ECCC	Air Quality, Noise, and Climate Change	Appendix 7A3.1	**Context:** Section 7A3.1.3.2 includes Table 7A-88, which is titled "AERMET Derived Temperature Summary (2012 to 2016)", however the accompanying text indicates the comparison is only for 2016. There are significant differences in the monthly averages of the temperatures; for example, the average February daily minimum temperature is -19.2C for the site but -24.6C and -27.6C for the AERMET data sets. In Section 7A3.1.1.1 the Project-specific AERMET dataset was extracted from the Weather Research and Forecast (WRF) model at the grid 12 km west of the Project location while there are WRF grids with 4 km resolution available. **Rationale:** Given the inconsistency between the title of Table 7A-88 and the accompanying text, it is possible that model averages are in fact for the 2012-2016 period, as average February temperatures for the 2012-2016 period are about 3C colder than normal for just 2016 at Buffalo Narrows and Fort McMurray according to climate.weather.gc.ca. It is more appropriate to compare the average values for 2016 rather than the five-year average for the model. Wintertime minimum temperatures may vary significantly between locations a few km apart due to cold air pooling depending on local terrain. Surface temperature values relative to temperatures aloft influence vertical stability, which in turn affects dispersion and concentrations of surface-based Project emissions.	**Specific Question/ Request for Information:** 1. Clarify which dataset (i.e., 2012-2016 five-year average or average values for 2016) were used for comparison with the model. If the five-year average was used provide the actual 2016 average values. 2. Provide rationale for why the Project-specific AERMET dataset was not extracted from the WRF model for a location closer to the Project location.	Responses to part 1 and part 2 of this IR are provided below. 1. NexGen notes the reviewer's comments on the comparison of temperature data and the Project-specific AERMET dataset. NexGen clarifies that comparison of temperature as listed in Table 7A-88 in Section 7A3.1.3.2 of Draft EIS Appendix 7A (Air Dispersion Modelling Report) was made for 2016 only because this is the only year of overlap between the AERMET dataset and on-site monitoring data. The differences between the AERMET dataset and on-site data, especially in January and February for daily minimum temperature, likely result from the missing on-site data in these two months. 2. As noted by the reviewer and described in Section 7A3.1.1.1 of Draft EIS Appendix 7A, Weather Research and Forecast (WRF) extraction at the grid 12 km west of the Project location was provided and used as the surface and upper air data input for running AERMET to prepare the meteorological data for use in AERMOD modelling. When determining the appropriate data to use for modelling in the EA, NexGen was advised by the Saskatchewan Ministry of Environment (ENV) that there were data issues when extracting data based precisely on the Project site; therefore, the ENV recommended that the WRF data extracted at the grid 12 km west of the Project location were more appropriate and these data were provided for use in the air quality assessment. The Project-specific AERMET datasets were reviewed by the ENV before the modelling, and no recommendations for a change in approach were made by the ENV at that time. NexGen also conducted a comparison among the Project-specific AERMET dataset, the ENV AERMET dataset, and on-site data as shown in Section 7A3.1.3 of Draft EIS Appendix 7A. The comparison indicated that the Project-specific AERMET dataset is appropriate for use in the air quality assessment for the Project. No changes are proposed in the revised EIS to address this IR.	n/a
69	HC	Human health with with respect to	Section 7A3.2.13.3 Table 7A-114,	**Context:** Several tables, such as Table 7A-114 (Page 116), show the predicted concentrations of some metals for the operations phase; however, the	1.Where toxicological reference values are available or could be derived, identify these chemicals as COPCs and carry them into the modelling predictions.	Responses to part 1 and part 2 of this IR are provided below.	n/a

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		hazardous contaminants	Page 116	toxicological reference values (TRVs) used to determine the risk quotient in the HHRA section do not appear in these tables. **Rationale:** To assess health risk, HHRAs compare predicted chemical exposures TRVs defined by regulatory agencies such as Health Canada or US Environmental Protection Agency. TRVs represent the amount of a substance below which adverse effects are not expected to be observed in a population. These are not regulatory limits, but are thresholds meant to be used as a decision aid.	2.Revise the table to include TRVs which are applicable to the general public, including sensitive receptors or provide rationale as to how the selected TRVs provide an adequate level of health protection for the general public including sensitive receptors.	1. The evaluation of air modelling predictions against air quality criteria is presented and discussed in Draft EIS TSD XXI (Environmental Risk Assessment). As discussed in Section 4.3.3 of Draft EIS TSD XXI, the maximum predicted air concentrations at a conservative human and ecological exposure location (i.e., camp location) were compared against air quality criteria to determine constituents of potential concern (COPCs) for further assessment in the environmental risk assessment (ERA). Table 4-6 in Draft EIS TSD XXI identifies the screening values used in the assessment to determine if an air constituent required further quantitative assessment. Section 4.3.4 of Draft EIS TSD XXI concluded that no air COPCs were required for further evaluation in the ERA; however, radionuclides were assessed as part of the total radiological dose. Therefore, the air assessment in the ERA did not progress past a screening phase, and toxicity reference values (TRVs) and subsequent hazard quotients were not calculated for the air pathway. 2. The intent of Draft EIS Section 7.2 (Air Quality) is to present the air modelling results; the interpretation of these results is provided in Draft EIS TSD XXI. Therefore, Table 7A-114 in Draft EIS Appendix 7A (Air Dispersion Modelling Report) presents the predicted metals concentrations during the Operations Phase but does not present the air quality criteria used in the screening assessment in the ERA. These criteria are presented in Table 4-6 in Draft EIS TSD XXI and are health and environment based. The TRVs were not presented for air constituents since no air COPCs progressed passed the screening phase of the ERA; therefore, hazard quotients were not calculated for the air pathway. No changes are proposed in the revised EIS to address this IR.	
70	CNSC	Geology	Section 8.3.1	**Context:** Section 8.3.1 provides a brief description of Bedrock Geology with a statement that “Additional details on the bedrock geology can be found in the Geology Baseline Report (NexGen 2021a).” However, the Geology Baseline Report was not provided. **Rationale:** Information about the geological environment is not sufficiently documented in the EIS especially for a new mine proposal that also proposes to develop an underground TMF. REGDOC 2.9.1 appendices describe the expected geological information to be assessed - B.4.1 baseline geological information; and C.4.1 on the description of any changes to the geology as a result of the project. In addition, the EIS does not assess the geology as a valued component for the Project with no justification for its exclusion.	Provide NexGen 2021a Geology Baseline Report. Assess the geology as a valued component or justify its exclusion as a valued component.	NexGen will include the Geology Baseline Report as a new document in the revised EIS (i.e., Annex XI). NexGen maintains that geology should not be considered as a valued component (VC) in the EA. As described in Draft EIS Section 6.3.1 (Valued Components), VCs are aspects of the biophysical, cultural, and socio-economic environments considered to have scientific, social, cultural, economic, historical, archaeological, or aesthetic importance. The selection of appropriate VCs focuses the EA on those aspects of the biophysical, cultural, and socio-economic environments that are of greatest importance to both society and species conservation. Key factors considered when selecting the list of VCs for the proposed Project included: ▪ potential for interaction with the Project and degree of interaction, including presence, abundance, and amount of spatial overlap of a VC with the Project; ▪ sensitivity of a VC to potential Project effects and level of damage or harm that could be realized should an adverse effect occur; ▪ species conservation status or concern (e.g., rarity, sensitivity, uniqueness); ▪ Indigenous and Local Knowledge; and ▪ ecological and socio-economic/cultural value to communities, government agencies, and the public. Selected VCs were primarily aspects or elements of biological and human environments; VCs did not represent physical aspects or disciplines of the biophysical environment (e.g., air quality, groundwater, surface water) except for climate change (i.e., greenhouse gases), which was selected as a VC based on the importance of climate change to federal and provincial governments and Indigenous communities. It is important to note that VCs are associated with assessment endpoints or significance criteria, while physical elements of the environment do not have assessment endpoints (Draft EIS Section 6.3.2 [Assessment Endpoints and Measurement Indicators]; Draft EIS Section 6.3.3 [Intermediate Components]). This note is important because the significance of changes to physical elements, such as geology, can only be evaluated in context of how those changes affect VCs such as fish, vegetation, wildlife, and people, which are the ultimate receptors of concern.	Annex XI (new)

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						For these reasons, geology was not selected as a VC; however, geology is a key aspect of the hydrogeological assessment. The geological model for the Project contributed to defining hydrostratigraphic units (i.e., geological formations characterized by hydraulic properties). The characteristics defining the hydraulics of each hydrostratigraphic unit included hydraulic conductivity (i.e., ability of water to move through rock), porosity of rock types (i.e., ratio of voids to rock volume), degree of weathering through chemical and mechanical degradation of the rock, natural fracture and foliation (i.e., folding) planes, and shear zones (Draft EIS Section 8.2.6.2 [Hydrostratigraphy]). The hydrogeological assessment provided important supporting information to the assessments of aquatic and terrestrial ecosystems (e.g., surface water quality and sediment quality, fish and fish habitat, vegetation, wildlife and wildlife habitat) and the human environment (e.g., Indigenous land and resource use, human health). Besides the inclusion of the Geology Baseline Report, no changes are proposed in the revised EIS to address this IR. **References** NexGen (NexGen Energy Ltd.). 2021. Geology Baseline Report for the Rook I Project. Prepared by NexGen Energy Ltd. June 2021.	
71	ECCC	Fish and fish habitat	Section 9.2.3 Section 9.2.6 Section 9.3.2 Appendix 9A	**Context**: In Section 9.2.3 Spatial Boundaries of the EIS it is stated "There are five larger lakes in the Local Study Area (LSA) including Broach, Patterson, Forrest, Beet and Naomi lakes, as well as several smaller waterbodies including Lake G, Lake H, and wetlands." It is clearly stated that there are wetlands present within the LSA, and at least two wetlands can be seen within the Project footprint in Section 9.1 Figure 9.1-4 pg. 1337 of the EIS. The location of these wetlands within the Project footprint, as well as the other wetlands existing within the LSA can be confirmed from Annex V11.2: Vegetation Baseline Report 2 (Inventory, Rare Plants and Wetlands), including the wetland classifications. However, beyond the above statement from Section 9.2.3, there is no consideration of wetlands or potential effects to wetland hydrology throughout the remainder of the hydrological assessment and hydrological modelling. Potential effects to flow rates, water levels or sediment transport to wetlands within the LSA are not considered. **Rationale:** There is currently not enough information provided for ECCC to provide advice on the potential risks of the proposed Project to wetland hydrology within the LSA. This pathway of effects is important to assess in terms of potential effects to wetland habitat availability due to changes in flow rates, water levels and sediment transport, and potential effects to terrestrial and aquatic receptors. It is necessary to evaluate if draw down from mine dewatering or changes in surface water runoff flows and routing will affect water levels and habitat availability within wetlands.	Provide baseline information regarding wetland characterization within the LSA, including: locations, wetland type, size, water surface elevation, depth, water flow pathways, and the presence of wildlife receptors including presence of fish/fish habitat within the main body of the EIS. Provide further information on mitigation measures and monitoring that would be applied for the protection of wetlands. If this information is available in annexes or technical supporting documents, summarize it within the main body of the EIS with references to respective documents for review.	Baseline information regarding wetland ecosystem characterization is provided in Draft EIS Section 13.3.2 (Wetland Ecosystems). Table 13.3-3 in Draft EIS Section 13.3.2.1 (Ecosystem Availability) lists the wetland size and type (defined as wetland Ecological Land Classification [ELC] units) within the local study area (LSA) and regional study area (RSA). Figure 13.3-3 and Figure 13.3-4 in Draft EIS Section 13.3.2.2 (Ecosystem Distribution) show wetland ecosystems and rare plant species in the RSA and LSA, respectively. Additional baseline information is also provided in Section 6.3 of Draft EIS Annex VII.1 (Vegetation Baseline Report 1 [Mapping]). For riparian wetlands, water surface elevation (WSE) is anticipated to be strongly influenced by the WSE of adjacent waterbodies since the overburden at surface is highly permeable. Consequently, for riparian wetlands adjacent to waterbodies such as Patterson Lake or Lake G, the WSE in the wetland is expected to be primarily controlled by the WSE of the adjacent waterbody. For the purposes of the EA, it is assumed that these wetlands represent fish habitat; however, the Project is not anticipated to result in disturbance to riparian wetlands. While also not currently expected to be disturbed under the existing Project design, there is one isolated wetland perched on a hillslope in ELC unit BP19(BU) – Black spruce treed bog (Burned). This wetland is located adjacent to the existing exploration access road, approximately 30 m in elevation above Patterson Lake, and is the only wetland located in the LSA that is not a riparian wetland. This perched wetland is not expected to be an area of groundwater discharge under current conditions or during the Project lifespan. This perched wetland is also not expected to serve as fish habitat as it is not connected hydrologically to any fish-bearing waterbodies or watercourses and is only expected to hold ponded water for a short period of time each year during spring freshet. Wildlife that may use wetlands in the LSA and RSA are listed in Table 14.2-1 of Draft EIS Section 14.2.2 (Valued Components, Measurements Indicators, and Assessment Endpoints) and include, but are not limited to, muskrat, rusty black bird, mallard, yellow rail, and Canadian toad. Muskrat, rusty blackbird, mallard, and Canadian toad were detected during baseline surveys. Information on mitigation measures that would be applied for the protection of wetlands is included in Draft EIS Section 10.4 (Project Interactions and Mitigations), Draft EIS Section 11.4 (Project Interactions and Mitigations), Draft EIS Section 13.4 (Project Interactions and Mitigations), Draft EIS Section 14.4 (Project Interactions and Mitigations), and Draft EIS Appendix 23A (Summary of Project Environmental Design Features and Mitigation Measures). Monitoring of three LSA wetlands is discussed in Draft EIS Section 13.7 (Monitoring, Follow-Up, and Adaptive Management)	n/a

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						and Draft EIS Appendix 23B (Environmental Assessment Monitoring and Follow-Up Programs Proposed for the Project) and this monitoring would be included in the Environmental Monitoring Plan developed as part of federal licensing to confirm the predictions of negligible effects to wetlands. As the requested baseline and mitigation measure information is presented within the Draft EIS, no changes are proposed in the revised EIS to address this IR.	
72	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 9.3.2.2 TSD VIII, Section 6.2 Section 7.4 Annex IV.3 Figure 13 Figure C4 Annex IV.2, Table 9	**Context:** In Section 6.2 of the Accidents and Malfunctions report, the width of the Clearwater River at the crossing is 6 m with an average depth of 30 cm and an assumed water velocity of 1 m/s for a flow rate of 1.8 m^3/s. These dimensions and rates do not match the channel widths of the Clearwater River presented in Annex IV.3 Geomorphology Characterization Report. According to Figure 13, Transect #4 is right at the bridge crossing, and field measurements at Transect #4 are presented in Figure C4. The stream width was ~12 m and the average depth ~40 cm in late September/early October 2018. According to measurements reported in table 9 of Annex IV.2 Hydrometric Monitoring Characterization Report, discharge at hydrometric station CR-WC-MS-03, adjacent to Transect #4, on 29 September 2018 was 0.983 m^3/s, which is low for open water at this station. In Section 7.4, potential effects of a diesel spill from the bridge over the Clearwater River are discussed with calculations using the river width, depth and flow ~1.5 km downstream from the spill site, between Forrest and Beet Lakes. In this case a channel width of 100-400 m, a depth of less than 2 m, water velocity of 1 cm/s and flow rate of 2.3 m^3/s are used. These dimensions are close to those found in Section 9.3.2.2 of the Environmental Impact Statement, where the Clearwater River between Forrest and Beet lakes is described as being more like a water body with width ranging from 100 m to 600 m. **Rationale**: Of the six bounding scenarios considered in the Accidents and Malfunctions, two are traffic accidents at the bridge over the Clearwater River on the Project access road, with release of contaminants in the river (uranium concentrate and diesel). The parameters of the river are not the same in both scenarios even though the spill location is the same. Since the stream width is a parameter used in calculating the uranium dissolution rate and long term release rates, doubling its width to match the measured value would increase the potential effects. For the diesel spill scenario, since the stream is narrower and has higher water velocity at the spill location than what was used for calculations, the potential area of impact could be underestimated.	Provide rationale for the accident scenario stream dimensions that differ from the field measurements, or revise the calculations with dimensions reported in the Geomorphology Characterization Report and update the assessment of potential effects.	NexGen notes that the geomorphological data used in the accidents and malfunctions assessment (Draft EIS TSD VIII [Accidents and Malfunctions Report]) were derived from cross-sections taken from aerial imagery at the release locations, which are not necessarily the identical locations highlighted in Draft EIS Annex IV.3 (Geomorphology Characterization Report). However, where relevant, NexGen will update the accidents and malfunctions assessment to incorporate river dimensions presented in Draft EIS Annex IV.3. The accidental release characterization for diesel in Bounding Scenario 2: Traffic Accident (Chemical) (Draft EIS TSD VIII, Section 7.0) considers river channel conditions within the range of river channel conditions reported in Draft EIS Annex IV.3. As such, the results of the assessment of potential effects for an accidental release of diesel fuel in the area of the Clearwater River between Forrest Lake and Beet Lake are reasonably represented in Draft EIS Section 21.6.4 (Bounding Scenario 2: Traffic Accident [Chemical]) and Section 7.4 of Draft EIS TSD VIII and no changes are required to the assessment. As noted in these subsections, the effects for this scenario would be transient, with some adverse effects to aquatic biota and birds expected; however, irreversible population level effects would not be expected, and the consequence of this scenario was judged to be moderate. The accidental release characterization for uranium concentrate in Bounding Scenario 1: Traffic Accident (Uranium Concentrate and Radioactivity) (Draft EIS TSD VIII, Section 6.0) will be updated in the revised EIS to reflect the geomorphological data presented in Draft EIS Annex IV.3. In addition, NexGen notes that the assessment of this bounding scenario used environmental risk assessment (ERA) assumptions that were updated following completion of the accidents and malfunctions assessment. Therefore, the accidental release characterization for uranium concentrate in Bounding Scenario 1 will also be updated to reflect the current ERA assumptions. These assumptions are related to the Project water balance and the amount of time the subsistence harvester spends harvesting food from different areas. The original assessment for Bounding Scenario 1 in Draft EIS Section 21.6.3 (Bounding Scenario 1: Traffic Accident (Uranium Concentrate and Radioactivity) and Section 6.0 of Draft EIS TSD VIII concluded that with implementation of environmental design features and mitigation, and in consideration of the assessed probability for this accident scenario, the likelihood was assessed as highly unlikely. The consequence was assessed as moderate based on the prediction that estimated radiation doses to ecological and human receptors would be below relevant benchmarks, though some potential for short-term, localized exposure of ecological receptors to elevated radiation levels would exist. The overall risk rating for this accident scenario was assessed as low. The updated values from the revised calculations for Bounding Scenario 1 presented in Attachment IR 72-1 yield the same conclusions as those presented in Draft EIS Section 21.6.3 and Section 6.0 of Draft EIS TSD VIII. Both likelihood and consequence are unchanged, and the scenario continues to result in an overall risk rating of low. Revised EIS Section 21.6.3.3 (Assessment of Potential Effects) and Section 6.4 of revised EIS TSD VIII will be modified to incorporate the updated results from the revised calculations as detailed in Attachment IR 72-1.	Section 21.6.3.3; TSD VIII, Section 6.0

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<table>
<tr><th>No.</th><th>Department</th><th>Project Effects Link</th><th>Reference to EIS, appendices, or supporting documentation (if applicable)</th><th>Context and Rationale</th><th>Information Requirement</th><th>NexGen Response</th><th>Section in EIS</th></tr>
<tr><td>73</td><td>ECCC</td><td>Fish and fish habitat

Change to an environmental component due to hazardous contaminants</td><td>Section 9.5
Section 9.5.1
Section 11.4.1</td><td>Context:
The Project effect pathway H-06 Culverts have been designated as a no-effect pathway after implementation of environmental design features and mitigation Table 9.5-2 pg. 1401. In Section 9.5.1 further information is provided about the maintenance of culverts throughout the different life stages of the proposed Project. In Section 11.4.1 the potential effects of drainage infrastructure to fish and fish habitat are discussed, and it is stated that there are 23 locations along the existing access road where culverts may need to be constructed, replaced or extended. Additionally, culverts are to be sized for a 1:100 year 24-hour storm event, but no further details are provided on how this was determined. There currently is not enough information provided to confirm the assessment of no effects.

Rationale:
ECCC requests further information regarding the number, location, design, flow ratings and habitat considerations in order to assess flood risk and potential effects to water quality. There is currently not enough information provided about water flow pathways and conveyance of contact water and run-off water from site infrastructure to make an evaluation of risk to surface waters from potential Constituents of Potential Concern (COPCs) and flooding.</td><td>1. Provide a map demonstrating the number and locations of all proposed culverts for the Project.

2. Provide further information on the design, flow ratings, capacity and habitat considerations for the construction and maintenance of culverts throughout the different phases of the proposed Project.</td><td>Responses to part 1 and part 2 of this IR are provided below.

1. NexGen notes that detailed information on Project design for culvert locations will be submitted to the CNSC as part of the federal licensing process for the Project. To assist the reviewer within the specific context of the IR, a figure developed in support of the Rook I Project Feasibility Study (NexGen 2021) demonstrating the number and location of proposed culverts is included in Attachment IR 73-1.

2. NexGen notes that detailed information on Project design for culverts (e.g., flow ratings, capacity) will be submitted to the CNSC as part of the federal licensing process for the Project. To assist the reviewer within the specific context of the IR, culvert design information is provided below for both on-site (new and upgraded) and off-site (existing and upgraded) roads.

<u>On-Site Roads (i.e., all roads from the gatehouse onward)</u>
New culverts required for new site roads on the proposed Project site to provide conveyance of surface runoff within the Project footprint are shown in Figure 1 in Attachment IR 73-1. Existing culverts on existing site roads would be upgraded with culvert extensions, where necessary. None of the new culverts would cross waterbodies or watercourses that are fish bearing or provide habitat for fish.

Design flow ratings and capacity would meet the Saskatchewan Environment and Resource Management Construction Guidelines for Pollution Control Facilities at Uranium Mining and Milling Operations (SERM 2000) requirements for conveyance structures (i.e., ditches and swales), and are planned as follows:
▪ Design capacity:
o 1:100-year 24-hour storm event; or
o where overflow would be a reportable spill, culverts would be sized for the 24-hour probable maximum precipitation (PMP) event.
▪ Factor: 1.2 increase multiplier applied in design flow to allow for reduced culvert area from silting.
▪ Culvert material: corrugated steel or high-density polyethylene (HDPE) pipe.
▪ Minimum culvert diameter: 400 mm.
▪ Minimum culvert longitudinal slope: 0.50%.
▪ Erosion protection: rip-rap cobbles, armouring, or equivalent.

<u>Off-Site Roads (existing access road from Highway 955 to gatehouse)</u>
There are 23 locations along the existing access road where cross-drainage structures may require replacement or extension in conjunction with planned upgrades to the road.

Upgrades and refinements proposed for these cross-drainage structures would be required to accommodate storm events and are not associated with fish habitat. NexGen did not select any new culvert locations along the existing access road, with the understanding that no new watercourse crossings would be required. Culverts located along the access road and site roads are expected to provide cross-drainage and prevent upstream ponding and do not cross waterbodies or watercourses that are fish bearing or provide habitat for fish. Accordingly, construction, maintenance, and removal activities related to culverts are not expected to directly affect fish-bearing habitats.

Culverts on the existing access road would be maintained to meet to a 1:100-year 24-hour storm event, which meets the design standard for primary access roads in Saskatchewan (MHI 2014).

The information provided in response to this IR is reflective of the current stage of engineering design for the Project. Detailed information regarding culverts such as flow ratings and capacity will be provided to the CNSC and Saskatchewan Ministry of Environment as part of the permitting and licensing processes for the Project.</td><td>n/a</td></tr>
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						References MHI (Saskatchewan Ministry of Highways and Infrastructure). 2014. Hydraulic Manual. Accessed February 2021. Available at http://www.highways.gov.sk.ca/business NexGen. 2021. Rook I Project Feasibility Study. Feasibility Study Report. Rev 0. Document No. 0000-BA00-RPT-0001. Prepared by Stantec for NexGen Energy Ltd. 28 April 2021. SERM (Saskatchewan Environment and Resource Management). 2000. Construction Guidelines for Pollution Control Facilities at Uranium Mining and Milling Operations. In draft. October 2000.	
74	ECCC	Fish and fish habitat	Section 9.5	**Context:** In Table 9.5-2 pg. 1401 H-06 for culverts, the Proponent states that the design cross drainage maximum flow was considered for a 24-hour 100-year event. No rationale was provide for the selection of the maximum instantons flow used for culvert design. **Rationale:** Culverts function primarily as hydraulic conduits but serve the dual purposes of functioning as hydraulic structures as well as acting as load bearing structures. As a result, the amount of precipitation becomes secondary to the intensity of precipitation. Considering the lifetime of the Project, a 100-year return period is not considered conservative. A risk analysis for a shorter event duration and longer return period should be considered for precipitation intensities.	Provide rationale for the selection of the 24-hour 100-year maximum flow used for culvert design considering both the lifetime (i.e., 43 years) of the Project and the likelihood of an extreme precipitation event occurring.	Design flow ratings and capacity for the on-site culverts would meet the Saskatchewan Environment and Resource Management *Construction Guidelines for Pollution Control Facilities at Uranium Mining and Milling Operations* (SERM 2000) requirements for conveyance structures (i.e., ditches and swales), and are planned as follows: ▪ Design capacity: o 1:100-year, 24-hour storm event; or o where overflow would be a reportable spill, culverts would be sized for the 24-hour probable maximum precipitation (PMP) event. ▪ Factor: 1.2 increase multiplier applied in design flow to allow for reduced culvert area from silting. ▪ Culvert material: corrugated steel or high-density polyethylene (HDPE) pipe. ▪ Minimum culvert diameter: 400 mm. ▪ Minimum culvert longitudinal slope: 0.50%. ▪ Erosion protection: rip-rap cobbles, armouring, or equivalent. The design of existing culverts on the access road to a 1:100-year 24-hour storm event meets the design standard for primary access roads in Saskatchewan (MHI 2014). This design standard would be maintained during the Project lifespan. NexGen notes that there is a 35% probability that the 43-year life of the Project will include an event of 100-year return period (TAC 2004). Further rationale for the selection for the design event used for culvert design will be provided to the CNSC and Saskatchewan Ministry of Environment in the Environmental Protection Program and supporting documentation (e.g., water management processes) required as part of permitting and licensing processes for the Project. **References** MHI (Saskatchewan Ministry of Highways and Infrastructure). 2014. Hydraulic Manual. Accessed February 2021. Available at http://www.highways.gov.sk.ca/business SERM (Saskatchewan Environment and Resource Management). 2000. Construction Guidelines for Pollution Control Facilities at Uranium Mining and Milling Operations. In draft. October 2000. TAC (Transportation Association of Canada). 2004. Guide to Bridge Hydraulics 2nd Edition. Pp 181.	n/a
75	ECCC	Fish and fish habitat	Section 9.6 Section 9.7 Annex IV.2, Section 5.3.1	**Context:** Rating curves represent an approximation of the stream discharge at a location based on the water levels. This allows the estimation of streamflow from continuous water levels that are relatively easy to measure. Inconsistencies with best practices (WSC, 2016) used in developing the rating curves, as well as some general inconsistencies, led ECCC to question their	1.Explain why the rating curve formulae for stations CR-WC-MS-02 and CR-WC-MS-06 do not match the plotted lines, specify where this data was used further, and if applicable, discuss effects of correcting the formulae.	Responses to each of the numbered parts of this IR are provided below. However, the following information is noted as being relevant to all of these IR parts: ▪ Additional monitoring in the years since 2020 has improved approaches to and understanding of rating curve development at the watercourse hydrometric stations. Through this process, rating curves have been improved and the observed hydrographs updated. ▪ The adjustments to the observed hydrographs are not of a magnitude that would impact model calibration, hydrological model simulation results for baseline conditions, or the hydrological	Annex IV.2, Section 5.3.1.3

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				accuracy (Section 5.3.1 of Annex IV.2 Hydrometric Monitoring Characterization Report). Specifically: 1. The open water rating curves for hydrometric stations CR-WC-MS-02 and CR-WC- MS-06, plotted in Figures 15 and 27 respectively, do not correspond to the equations printed in the same figures. 2. Different methodologies were used to develop rating curves for different stations without justification. An open water rating curve developed through a HEC-RAS model (as described in Appendix 9B Hydraulic and Sediment Transport Modelling Summary Report) was used for station CR-WC-MS-03. 3. Eight of the ten rating curves developed are preliminary since a subset of two to five data points with the lowest water elevations for discharges were used when WSC (2016) recommends at least six data points for curves with a single segment; 4. Rating curve stage shifts due to aquatic plant growth in the streambed might be expected to follow an increasing pattern through the summer, and to be similar at the same period of different years. Neither of these signals is present in the stage shifts for the hydrometric stations, rather the shifts jump without following a pattern; 5. Rating curve stage shift above the base curve are expected due to backwater, however shifts below the base curve would need to be well documented as these might be caused by scour in the control section. Figure 18 shows three measurements (15-May-19, 18-May-19 and Jun-19) below the base curve at station CR-WC-MS-03 with no explanation offered. The text states that no levelling or discharge error or physical cause was identified for May 2020 and June 2020 readings below the base curve, but they are not plotted below the curve. 6. Rating curve equations are power relationships between the effective depth and discharge with a multiplier and an exponent. The exponent depends on geometry of the control section and is typically between 1.3 and 3 (WSC, 2016), with similar values for control sections with similar shapes. The open water rating curve for CR- WC-MC-04 has an exponent of 4.5, well above the typical range and no explanation has been provided for this unusual value. **Rationale:** The rating curves are used within the hydrologic model to create stream discharge time series. In turn, the model is used to determine baseline conditions and Project effects on water levels and flow. Using more data points to fit the open water rating curve (see point 3), would likely result in lower estimates of baseline flows. If the baseline flows were lower, the proportional increase in flows due to the Project discharging mine water to the surface would be greater, changing the results in tables 9.6-5 to 9.6-7, 9.6-14 to 9.6-16 and 9.6-23 to 9.6-25 of the EIS and potentially the residual effects classification in Section 9.7. The stream width is an important factor when considering the river's navigability and wetted area contributes to describing fish habitat. Changes to both these stream channel parameters are discussed in Sections 9.4.3, 9.6.1.3, 9.6.2.3 and 9.6.3.3 for various scenarios in the EIS. There is no mention of variability of channel parameters due to backwater, so it is not clear if the percent change in wetted area of Tables 9.6-8, 9.6-17 and 9.6-26 account for these effects. The inconsistencies with best practices (WSC, 2016) contribute to larger than expected uncertainty in the rating curves, in subsequent studies that use that information, and ultimately the description of baseline conditions. The effect of this uncertainty on the Project residual effects is unclear.	2. Provide justification for the use of different methods for determining rating curves at different sites, detailing how they are comparable. 3. Clarify if the comment in the text regarding measurements below the open water rating curve in May and June 2020 at station CR-WC-MS-03 refer to those plotted as May and June 2019 in Figure 18 and provide supporting arguments for keeping the station location since there are indications of channel instability. 4. Provide rationale for the inconsistencies with best practices identified in points 3, 4 and 6 in the context and rationale column. Discuss any effects to the confidence in the rating curve. 5. Discuss how backwater effects are integrated into model predictions including lake levels, discharge estimates and wetted stream areas. 6. Discuss how uncertainty from the rating curves propagates in the hydrologic and subsequent models, and influences the confidence in the conclusions on effects. **Suggestions for mitigation and follow-up measures** The hydrometric monitoring program could be made more robust by including: • hydrometric stations to measure lake levels, particularly in Patterson Lake; • a regular schedule of field visits to monitor rating curve applicability and backwater; and under-ice flow measurements where possible, since discharge from the Project occurs year round and currently under ice flows are only estimated. **Discussion Required:** Yes Measurements of water level and discharge will rarely allow a perfectly fitted rating curve, particularly in low gradient streams. However, the noted inconsistencies with best practices (WSC, 2016) contribute to larger than expected uncertainty in the rating curves. The rating curves are at the base of a very complicated model and the impact to overall results is very difficult to ascertain.	effects assessment. Nor would the adjustments propagate to subsequent models or assessments. ▪ Backwater is a persistent challenge and unavoidable at several stations due to the low gradient between lakes in the Upper Clearwater River, where the Project is located. Additional baseline monitoring from 2020 to 2022 has improved the shifts used to address backwater at these stations. Responses to part 1 through part 6 of this IR are provided below. ***1. Explain why the rating curve formulae for stations CR-WC-MS-02 and CR-WC-MS-06 do not match the plotted lines:*** The rating curve at CR-WC-MS-02 is backwatered under most conditions and is influenced by the water level of Patterson Lake downstream. The reach of the Clearwater River between Jed Lake and Patterson Lake is short and of low gradient with little relief. The rating curve at CR-WC-MS-06 is seasonally backwatered by vegetation growth and water levels in the Clearwater River below the Mirror River Confluence. Rating curve formulae are for the base rating curve. The plotted lines represent rating shifts used to account for backwatered conditions. ***Specify where this data was used further:*** The rating curves presented are for converting continuous measurements of water surface elevation at the hydrometric station to discharge. The rating curves presented in Section 5.3 of Draft EIS Annex IV.2 (Hydrometric Monitoring Characterization Report) were not used in the hydrological model. The hydrological model does not calculate flows from watercourse water level using a rating curve for riverine sections. Rating curves were only used in the model at lake outflows as discussed in Section 9A3.7 of Draft EIS Appendix 9A (Hydrological Modelling Summary Report). Therefore, the rating curve equations for CR-WC-MS-02 and CR-WC-MS-06 were not used in the modelling for the Draft EIS. The observed discharge hydrograph that is presented in Figure 16 of Draft EIS Annex IV.2 for CR-WC-MS-02 was used for the purposes of model calibration at CR-WC-MS-02. The observed discharge hydrograph that is presented in Figure 28 of Draft EIS Annex IV.2 for CR-WC-MS-06 was used for the purposes of model calibration at CR-WC-MS-06. ***Discuss effects of updating the formulae:*** Updating the formulae with more recent measured data for CR-WC-MS-02 and CR-WC-MS-06 is not expected to have any effect on the results presented in the Draft EIS. Improvements to approach were made in 2021 and 2022 for the rating curves at both CR-WC-MS-02 and CR-WC-MS-06. Changes to the rating curve in 2021 and 2022 and adjustments to resultant hydrographs are not of a magnitude that would impact model calibration, hydrological model simulation results for baseline conditions, or hydrological effects assessment, nor propagate to other subsequent models. Therefore, updates are not required to the revised EIS. ***2. Provide justification for the use of different methods for determining rating curves at different sites, detailing how they are comparable.*** Different methods for determining rating curves were used at different sites where the ultimate use of the rating curve in further hydrological analysis differed: ▪ At station CR-WC-MS-03, additional information was available in the form of a 1-D HEC-RAS model. Additional data were collected and the model was developed to evaluate potential changes to river hydraulics and sediment transport and because this location was immediately downstream of the Project activities. ▪ Rating curves were developed for watercourse hydrometric stations as described in Section 4.5 of Draft EIS Annex IV.2 for the purpose of developing observed discharge hydrographs. ▪ Rating curves were developed during regional hydrology model development to calculate lake outflow as a function of lake storage.	

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				Reference: WSC - Water Survey of Canada, 2016, Hydrometric Manual – Data Computations, Stage-Discharge Model Development and Maintenance		***3. Clarify if the comment in the text regarding measurements below the open water rating curve in May and June 2020 at station CR-WC-MS-03 refer to those plotted as May and June 2019 in Figure 18 and provide supporting arguments for keeping the station location since there are indications of channel instability.*** NexGen notes that this text in Draft Section 5.3.1.3 of Draft EIS Annex IV.2 should have referred to 2019 rather than 2020. The revised EIS will be updated to correct this text by changing “May 2020 and June 2020” to “May 2019 and June 2019” in Section 5.3.1.3 of revised EIS Annex IV.2 (Hydrometric Monitoring Characterization Report). Given the high importance of Patterson Lake to the Project hydrological effects assessment, it is important to have a watercourse hydrometric station between Patterson Lake and Forrest Lake. Hydrometric station CR-WC-MS-03 is in a straight reach downstream of the Patterson Lake outlet and upstream of the Clearwater River Bridge. Downstream of the bridge, the reach of the Clearwater River between Patterson Lake and Forrest Lake is sinuous, with few straight reaches with laminar flow developed. The existing location is anticipated to the be the most stable location in the reach. ***4. Provide rationale for the inconsistencies with best practices identified in parts 3, 4 and 6 in the context and rationale column. Discuss any effects to the confidence in the rating curve.*** ***In response to part 3 and the need for more data points:*** NexGen agrees and has continued to collect data annually. The number of hydrometric points available at the time of the Draft EIS was subject to the baseline period and external events. Hydrometric monitoring began in August 2018 and continued in 2019 and 2020 following a seasonal schedule. Monitoring in 2020 was completed during exceptional lockdown conditions due to the COVID-19 pandemic. Further baseline hydrometric monitoring has since extended the number of points available; however, these additional data are not anticipated to result in material changes to the hydrological model simulation results for baseline conditions or hydrological effects assessment, nor propagate to other subsequent models that were presented in the Draft EIS. Therefore, updates are not required to the revised EIS. ***In response to part 4 and seasonal shifts to account for vegetation growth:*** At station CR-WC-MS-04, the rating curve is influenced by the water level in Naomi Lake as well as vegetation effects. General conditions in 2018 and early 2019 were dry with associated low flows and water levels. General conditions in 2020 were wet with associated high flows and water levels. The influence of vegetation during these two years specifically is obscured by the variation in magnitudes of flow over this period. Monitoring since 2020 has improved characterization of the seasonal influence of aquatic plant growth, which does follow an increasing pattern through the summer before senescence in September. However, the additional data are not anticipated to result in material changes in the hydrological model simulation results for baseline conditions or the effects assessment, nor propagate to other subsequent models that were presented in the Draft EIS. Therefore, NexGen is confident in the current rating curve and updates are not required to the revised EIS. ***In response to part 6 and the exponent of the base rating curve being higher than the standard values:*** The reviewer is correct; the calibrated value of the exponent exceeds the general range of the exponent b represented in Table 1 of the *Water Survey of Canada hydrometric manual* (WSC 2016). This exceedance remains the case in subsequent years with additional data. The channel is wide, shallow, and impacted primarily by the difference in water surface elevation in the upstream and downstream lakes. In general, rating shifts have been further developed, and advancement of the hydrometric program has increased confidence in the existing results. Therefore, updates are not required to the revised EIS.	

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						5. Discuss how backwater effects are integrated into model predictions including lake levels, discharge estimates and wetted stream areas. Backwater effects were integrated into model predictions for lake outflow and associated lake level due to winter ice effects. Regional flow observations suggested that backwater from ice effects may cause flows to be overestimated by up to 20%. Ice effects were accounted for by applying a linear reduction in discharge with accumulated cold content based on ambient air temperatures following a degree-day threshold. Wetted stream areas were calculated directly from annual average discharge estimates. Backwater was not considered because stream channel parameters were evaluated on an annual average basis. ***6. Discuss how uncertainty from the rating curves propagates in the hydrologic and subsequent models and influences the confidence in the conclusions on effects.*** The uncertainty from the rating curves is not anticipated to have a meaningful effect on the hydrological model, subsequent models, or influence the confidence in the conclusion on effects. Improvements to the approach were made in 2021 and 2022 for all rating curves. Changes to the rating curves in 2021 and 2022 have not changed the resultant hydrograph enough to imply changes to model calibration. The resulting changes to the observed hydrographs are not of a magnitude that would impact model calibration, hydrological model simulation results for baseline conditions, or hydrological effects assessment, nor propagate to other subsequent models. Therefore, updates are not required to the revised EIS. With respect to the reviewer's suggested mitigation and follow-up measures, please see the below points: ▪ Hydrometric stations exist to measure lake levels at nine waterbodies (i.e., lakes), including Patterson Lake. The reviewer is directed to Section 3.0 of Draft EIS Annex IV.2. ▪ Additional baseline hydrometric monitoring has been completed in 2021 and 2022 since submission of the Draft EIS and is ongoing in 2023. ▪ As part of the ongoing baseline program, visits are conducted on a regular schedule including under ice-covered conditions in March. Additional regularly scheduled visits in winter months (i.e., December, January, February, and March) in the future will improve rating shifts required to characterize seasonally changing ice conditions. Revised EIS Annex IV.2 will be updated to correct the dates referenced in part 3 of this IR. As noted above, the adjustments to the observed hydrographs resulting from ongoing monitoring are not of a magnitude that would impact model calibration, hydrological model simulation results for baseline conditions, or the hydrological effects assessment. Nor would the adjustments propagate to subsequent models or assessments. Therefore, no other changes are proposed in the revised EIS to address this IR. **<u>References</u>** WSC (Water Survey of Canada). 2016. Hydrometric Manual – Data Computations, Stage-Discharge Model Development and Maintenance	
76	ECCC	Fish and fish habitat	Appendix 9A3.6.4 Current Climate Total precipitation	**Context:** Clarification on some of the climate input data and methods used in the hydrological assessment would help in understanding the Proponent's predictions for the Project, particularly into the far future. The hydrology assessment describes existing conditions and predicts Project effects on the hydrological regime. A hydrological model, which uses various inputs (e.g., historical climate data, hydrometric data, , precipitation etc.) was used to	1. Confirm if the ERA1, the ERA5 database or a combination of the databases was used for climate data. If both databases were used provide details on how the databases were compiled and where the complied dataset was used throughout the draft EIS.	NexGen notes that the data used in the hydrological assessment were the best available at the time of model preparation, planning, and execution. Site-specific, long-term historical meteorological data were not available near the proposed Project location. Further, in the regional hydrology model, storage and attenuation in soil and lakes throughout the hydrological system mean that the model response to individual daily events is attenuated. The hydrological system and response are more heavily influenced by precipitation totals at a monthly or seasonal scale.	n/a

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			data – model input	characterize the existing conditions and make predictions on future effects in order to inform the assessment of Project effects. Appendix 9A describes the methods used to conduct the hydrology assessment including hydrological modelling. . The following areas is describe where additional information will assist ECCC in assessing the model: -Medium-Range Weather Forecasts (ECMWF) Reanalysis database provides synthetic hourly climate data. The European Reanalysis Interim (ERA1) database consists of data spanning from January 1979 to July 2018 on a 50km spacing grid. The European Reanalysis 5 (ERA5) database consists of data spanning 1950 to present on a 30 km spacing grid. It is unclear which datasets were used, if a combination of the datasets were used or how the datasets were compiled. There was no detail provided on how longer timeframes (e.g., 24-hour) were inferred from the hourly data. -The synthetic data was verified by comparison with a locally collected data set spanning only 2 years but no rationale for the use of this methods was provided. Verification of the synthetic data using available observed data sets in combination with a weighted average algorithm for the Project location will yield more accurate data. -An assembly of climate time series data was also used in the hydrological model. It is not clear if the probability distribution of the sequential times series is the same, if the probability distribution was verified or how the time series distribution errors were considered. Understanding how probability distribution for the times series was verified helps to understand how the bias, which is directly related to time series and probability distribution was addressed. By forcing the modelled future data to maintain the past synthetic data, time series PD statistical errors of the past time series are propagated into the future generated data set model. Without an understanding of the limitations of the past data (which in itself was modeled), it is not possible to understand the limitations in the future modeled data. The same applies for value-biased corrections. -In several areas of the draft EIS both climate points (average over 30 years) and time series analysis were referenced. It is unclear where climate points and where time series analysis were used in the assessments. **Rationale:** The draft EIS does not provide enough detail surrounding the current climate data used in the hydrology assessment for ECCC to assess the predicted effects of the Project particularly into the far future.	2. Describe the procedure by which longer timeframes were obtained from ECMWF Re-analysis data. Provide this information for 12 and 24-hour periods. 3. Provide rationale as to why a data set spanning two years was used for verification of the synthetic data rather than using available observed datasets in combination with a weighted average algorithm for the Project location. 4. Confirm that the sequential time series have the same probability distribution. Confirm if the time series sequences were verified for best fit probability distribution or if they were assumed to have the same probability distribution. 5. Clarify if the potential size of time series probability distribution errors was estimated due to statistical assumptions. 6. Describe where time series analysis versus climate data points were used in the hydrology and climate change assessments. **Discussion Required:** Yes. The hydrology assessment is based on a complicate hydrological model that has a number of inputs sources. Further discussion would help ECCC to assess the potential effects of the Project.	Responses to part 1 through part 6 of this IR are provided below. ***1. Confirm if the ERA1, the ERA5 database or a combination of the databases was used for climate data. If both databases were used provide details on how the databases were compiled and where the complied dataset was used throughout the draft EIS.*** The climate record was developed based on a combination of global reanalysis data, including the European Reanalysis Interim (ERAI) and European Reanalysis 5 (ERA5) datasets (i.e., global climate reanalysis datasets produced by the European Centre for Medium-Range Weather Forecasts) and local observations. The use of reanalysis products permitted the extension of the climate record beyond the measurement period for site data (i.e., 3 to 6 years, depending on parameter) to account for a broader range of natural variability over a 41-year period. Total precipitation, rainfall, and snowfall were based on ERAI data for the Project location from 1 January 1979 to 31 July 2018 and observations from the Rook I Meteorological Station for 1 August 2018 to 31 October 2020. Ambient air temperature, dew point temperature, wind speed, and net all-wave radiation were derived from the ERAI database from 1 January 1979 to 31 August 2019 (i.e., when ERAI was replaced by ERA5 data) and then from the ERA5 database from 1 September 2019 to 31 October 2020. Measured data collected on site were given priority if time series records from multiple sources overlapped. However, in some cases, further verification from stream flow records were used to screen and support selection of alternate data sources during periods of overlap. This compiled database was used in Draft EIS TSD XVIII (Site-Wide Water Balance and Water Quality Modelling Report) and the Draft EIS Appendix 9A (Hydrological Modelling Summary Report), with the results then being used for assessing potential effects in Draft EIS Section 10 (Surface Water Quality and Sediment Quality), Draft EIS Section 11 (Fish and Fish Habitat), Draft EIS Section 15 (Human Health), and Draft EIS TSD XXI (Environmental Risk Assessment). ***2. Describe the procedure by which longer timeframes were obtained from ECMWF Re-analysis data. Provide this information for 12 and 24-hour periods.*** Accumulated precipitation data over 12-hour intervals from 1 January 1979 to 31 August 2019 were downloaded from the Medium-Range Weather Forecasts data using the Python program. Data extraction and processing were completed using the MATLAB program. A similar approach was completed for smaller intervals. The procedure of aggregating data for longer time frames (i.e., 24-hour period data) from more frequent time frames was parameter dependent and completed using MATLAB. ***3. Provide rationale as to why a data set spanning two years was used for verification of the synthetic data rather than using available observed datasets in combination with a weighted average algorithm for the Project location.*** Long-term historical meteorological data are not available near the proposed Project location. Meteorological monitoring at the Project began in 2015, and the Rook I Meteorological Station was expanded in 2018 to include additional parameters. A long-term meteorological record for the Project was developed for the years 1979 to 2017 using a combination of data from meteorological stations near the Project as well as global reanalysis products including ERAI data sourced from a numerical weather prediction system. Historical meteorological data were compiled from Environment and Climate Change Canada (ECCC) stations within 225 km of the Project, including Fort McMurray, Cree Lake, Key Lake, and Cluff Lake. A weighted average algorithm was not anticipated to account for the main geographic factors influencing climate in the region. Draft EIS Annex IV.1 (Regional Meteorological and Hydrological Characterization Report) provides comparisons of ERAI global reanalysis data to nearby stations. The ERA5 data was published following the initial data compilation for the Project. At the time of initial data compilation, only ERAI data were available. The comparison was not reproduced for	

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						ERA5. Differences between ERAI and ERA5 data are not anticipated to result in material changes to the Draft EIS. Therefore, updates are not required in the revised EIS. ***4. Confirm that the sequential time series have the same probability distribution. Confirm if the time series sequences were verified for best fit probability distribution or if they were assumed to have the same probability distribution.*** Where local station data were available, these data were used. The time series sequences were evaluated at the regional station locations based on summary statistics at time scales greater than daily. The sequential time series used for record extension based on global reanalysis data at the geographic location of the site were assumed to have a similar probability distribution. ***5. Clarify if the potential size of time series probability distribution errors was estimated due to statistical assumptions.*** The potential size of time series probability distribution errors due to statistical assumptions was not estimated and was not required for this task. Given the characteristics of hydrological processes dominant in the region (e.g., highly permeable soils, subsurface storage routing lag, lake storage routing lag), potential variation in the probability distribution is expected to be minor and therefore is not expected to influence results of hydrological modelling or effects assessment. ***6. Describe where time series analysis versus climate data points were used in the hydrology and climate change assessments.*** The assessment cases are based on time series analysis rather than climate data points. A combination of time series analysis and event-based data (i.e., climate data points) were used in the site-wide water balance modelling (Draft EIS XVIII). The time simulation modes used for climate in the site-wide water balance model are explained in Section 3.2.2.2 of Draft EIS TSD XVIII, and described briefly for each scenario in Table 8 of Draft EIS TSD XVIII. All site-wide water balance modelling scenarios that provided data for effects assessment were based on time series analysis. ***7. The length of time used for the Time Series Analysis of the observation data resulted in a shorter Time Series used by the Proponent at all locations. This shorter verification period could lead to inaccurate estimations of probable maximum precipitation (PMP), therefore a longer analysis length should be used. If a longer analysis length isn't available the Proponent should use verified site observations using data from nearby weather stations capable of producing results with a longer time series, provide the methodology used to derive the results, and update the PMP definition to match that of the World Met Org (2009) to reflect the change in the time series.*** NexGen notes that the question stated in part 7 of this IR response was not submitted to NexGen as part of the original IR, though has been created to address comments received from ECCC via email on 12 July 2023. These comments were received following additional discussion conducted with the CNSC and ECCC (as requested in the original IR). The probable maximum precipitation (PMP) adopted for the Draft EIS is based on published values conventionally used for uranium mines in northern Saskatchewan but adjusted for the location of the proposed Project. The PMP was adopted based on the PMP rationale from Hopkinson (1994). The PMP does not strictly follow the PMP estimation method using the World Meteorological Organization (WMO 2009) approach based on time series. There is precedent for use of the PMP from Hopkinson (1994), adjusted for location, at all of the operating uranium mines in northern Saskatchewan. Experience suggests that the PMP rationale and value adopted for the Draft EIS is conservative relative to the values that would be derived using the WMO (2009) method. Additional detail is available in NexGen's response to IR 47. No changes are proposed in the revised EIS to address this IR.	

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						References Hopkinson RF. 1994. Point Probable Maximum Precipitation in Northern Saskatchewan. Environment Canada – Canadian Climate Program. Report No. CSS – R94 – 01. WMO (World Meteorological Organization). 2009. Manual on Estimation of Probable Maximum Precipitation (PMP). WMO-no. 1045, 291 pp.	
77	ECCC	Fish and fish habitat	Section 9A3.6.4.5 Historical Climate – model input	**Context and Rationale:** The Proponent states that precipitation is the main input in the watershed and Figure 9A8 shows precipitation variations of 20% (i.e., more 10% in the mean). Based on this, ECCC would expect to see a corresponding variation in surface water elevations, however, Table 9.4-2 shows minimal water surface elevation variations. **Rationale:** A clear understanding of the current hydrological regime would assist ECCC in understanding how predicted changes in precipitation will affect surface water elevations and how the projected climate change will affect hydrology.	Explain the discrepancies between Figure 9A8 and Table 9.4-2. Describe if the discrepancies can be interpreted as a flooding of the natural shoreline.	Comparison of information presented in Figure 9A8 in Draft EIS Appendix 9A (Hydrological Modelling Summary Report) and Table 9.4-2 in Draft EIS Section 9.4.1 (Waterbody Water Surface Elevations) should not be interpreted as flooding of the natural shoreline. NexGen requests the reviewer considers the following: 1. Increases to monthly average water surface elevation (WSE) of the magnitude presented in Table 9.4-2 inf Draft EIS Section 9.4.1 should not be interpreted as flooding of the natural shoreline as these increases are within typical seasonal ranges of water level fluctuation. 2. Table 9.4-2 in Draft EIS Section 9.4.1 expresses the absolute magnitude of change in WSE and Table 9.4-3 in Draft EIS Section 9.4.1 expresses change in WSE as a percentage. The relationship between precipitation and WSE is non-linear. The hydrological model (Draft EIS Appendix 9A) accounts for storage routing at various scales including baseflow routing and reservoir (i.e., lake routing), meaning that response to precipitation inputs is attenuated and WSE response is dampened and spread over time. 3. Further, the change in WSE is also influenced by changes in atmospheric losses resulting from climate change, as well as precipitation. Corresponding variation of the hydrological system in response to changes in precipitation are expected to be more evident in comparison to discharge or water yield rather than WSE.	n/a
78	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 10.2.6 Section 10.4.2 Section 10 Appendix 10A	**Context:** Baseline surface water and sediment quality throughout the Local Study Area (LSA) and Regional Study Area (RSA) are discussed within this section and sampling locations are presented in Figure 10.2-4 pg. 1601 of the EIS. However, no baseline information is provided about wetlands within the LSA and Project footprint. The location of wetlands within the Project footprint, as well as the other wetlands existing within the LSA can be confirmed from Annex V11.2: Vegetation Baseline Report 2 (Inventory, Rare Plants and Wetlands), including the wetland classifications. There is no consideration of wetlands or potential effects to wetland surface water or sediment quality throughout the surface water and sediment quality assessments and surface water quality modelling report in Appendix 10A. **Rationale:** There is currently not enough information provided for ECCC to provide advice on the potential risks of the proposed Project to wetland surface water and sediment quality within the LSA. This pathway of effects is important to assess in terms of potential impacts to wetland habitat availability and effects to terrestrial and aquatic receptors. Potential effects from Constituents of Potential Concern (COPCs) and radionuclides to surface water and sediment, or potential effects to ecological receptors within wetlands have not evaluated.	1. Provide baseline information on wetland surface water and sediment quality characterization for wetlands within the Project footprint, including physiochemical parameters and particle size for sediment. 2. Provide an assessment of potential effects to surface water and sediment quality for wetlands within the LSA and potential effects to ecological receptors during all phases of the proposed Project.	Responses to part 1 and part 2 of this IR are provided below. 1. Water quality and sediment quality baseline information applicable to wetlands within the local area of the Project was not collected for the water quality and sediment quality assessment in the Draft EIS. Within the proposed Project footprint, there are no wetlands that would be physically disturbed; some small wetland areas exist within the southwest portion of the maximum disturbance area; however, NexGen designed the proposed site access road footprint to avoid this wetland area. Therefore, no additional baseline wetland information other than what has been provided in Draft EIS Section 13.3.2 (Wetland Ecosystems) is currently available. 2. The potential for effects on wetland ecosystems in the local study area (LSA) and regional study area (RSA) during all phases of the proposed Project was evaluated in the terrestrial component of the Draft EIS; specifically, Draft EIS Section 13 (Vegetation). Wetlands evaluated in the Draft EIS included those in close proximity to the Project, the largest of which is to the east of the Project and extends from Patterson Lake North Arm – East Basin, through Lake G, across the north end of Forrest Lake, and to the outlet area of Naomi Lake (Figure 13.3-3 of Draft EIS Section 13.3.2.2 [Ecosystem Distribution]). There are additional small wetland areas along the south shore of Patterson Lake North Arm – West Basin that are within the maximum disturbance area. Draft EIS Section 13 assessed the potential for the Project to affect wetland ecosystems in the LSA and RSA through the following pathways: Pathway ID V-01 (Direct loss), Pathway ID V-04 (Fugitive dust and constituent emissions), Pathway ID V-05 (Particulates and acid emissions), Pathway ID V-08 (Surface water flow changes), Pathway ID V-09 (Surface water quality from runoff), Pathway ID V-10 (Treated effluent discharge), and Pathway ID V-13 (Groundwater and soil quality changes from seepage). Direct loss of wetland ecosystems in the RSA was	Appendix 23B

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						determined as a primary pathway; however, effects on wetland ecosystems from changes in surface water flow and/or changes in the quality of surface flows or groundwater, and changes from Project discharges to Patterson Lake, were determined to be no pathways or secondary pathways. The primary effects assessment of the Project on the direct loss of wetland ecosystems through disturbance, alteration, and fragmentation is presented in detail in Draft EIS Section 13.5.2 (Wetland Ecosystems). The analysis of no pathway and secondary pathways for wetland ecosystems is provided in Draft EIS Section 13.4 (Project Interactions and Mitigations). The secondary pathways that describe and analyze the potential effects on wetlands from changes to water levels, runoff quality, air emissions, and discharge of treated effluent, including seepage, from the Project are Pathway ID V-04, Pathway ID V-05, Pathway ID V-08, Pathway ID V-09, and Pathway ID V-10, which are presented in Draft EIS Section 13.4.2 (Secondary Pathways). Changes in surface flows and water quality in wetlands from Project discharges to Patterson Lake were projected to result in measurable minor changes to the condition of wetland ecosystems relative to existing conditions and be limited to the maximum disturbance area. For these pathways, and all other potential secondary effects pathways, the implementation of environmental design features and mitigation measures resulted in a determination of negligible residual effects on wetland ecosystems. Overall, effects to the wetlands ecosystems valued component were predicted to be not significant. To confirm the prediction of negligible effects on wetlands, NexGen will conduct water level, water quality, and sediment quality sampling and monitoring of wetlands within and adjacent to the Project footprint and representative wetlands within the LSA. From the results of these surveys, a detailed recommendation for follow-up monitoring during the life of the Project would be developed, if necessary. This commitment will be added to Table 23B-1 of revised Appendix 23B (Environmental Assessment Monitoring and Follow-Up Programs Proposed for the Project).	
79	ECCC	Fish and fish habitat Change to an environmental component due to radiological contaminants	Section 10.2.8.2.1	**Context:** This section discusses the elimination of chemical constituents from further analysis in water quality modelling for the Project. ECCC acknowledges the rationale provided by the Proponent for eliminating thallium and Dissolved Organic Carbon (DOC) as Constituents of Potential Concern (COPCs) for further assessment in the pathways analysis. Total ammonia is included for assessment, but un-ionized ammonia is not. Despite the provided rationale, due to requirements under the *Metal and Diamond Mining Effluent Regulations* (MDMER) for effluent testing and receiving environment monitoring, it is recommended that thallium, DOC, and un- ionized ammonia be carried forward for a complete assessment of all required monitoring parameters under the MDMER. **Rationale**: ECCC recommends that thallium, DOC and un-ionized ammonia be screened in as COPCs for further assessment in the pathways analysis and water quality modelling due to requirements under the MDMER Schedule 4 and Schedule 5 Sections 4(1), 7(1) and 12(1)(ii) for environmental effects monitoring. ECCC recommends that these parameters, as well as hydrocarbons, be included in the larger set of constituents that surface water quality monitoring would be conducted for.	Assess un-ionized ammonia, thallium and DOC in the pathways analysis and surface water quality modelling for the surface water quality assessment. **Suggestions for mitigation and follow-up measures** Un-ionized ammonia, thallium, DOC and hydrocarbons should be included in follow-up surface water quality monitoring.	NexGen acknowledges that a number of water quality constituents that are typically measured in general or regulated monitoring programs were not carried forward into the surface water quality assessment (Draft EIS Section 10 [Surface Water Quality and Sediment Quality]). NexGen confirms that not carrying these constituents forward does not mean they were not considered or overlooked; the exclusion specifically identifies these constituents are not anticipated to change in the receiving environment as a result of the Project and are predicted to remain below guidelines during the life of the Project and/or into the far-future scenario. Nevertheless, in addressing each of the listed constituents in this IR (i.e., un-ionized ammonia, thallium, dissolved organic carbon [DOC], and hydrocarbons), NexGen confirms: ▪ Un-ionized ammonia was considered in the surface water quality assessment for the Application Case and Reasonably Foreseeable Development Case as a component of total ammonia (Draft EIS Appendix 10A [Surface Water Quality Modelling Report], Attachment 10A-1a and Attachment 10A-2). In the background surface water quality characterization, and near-field and regional surface water quality modelling, total ammonia incorporates the sum of the un-ionized ammonia (NH_3) and ionized ammonia (NH_4^+) species in the measurable concentration, which exist in equilibrium in water. Within the assessment, the un-ionized fraction of the total ammonia was estimated at various instances based on ambient water temperature and pH and vice versa. Therefore, un-ionized ammonia was considered in the assessment, but total ammonia was reported. NexGen will provide additional clarity regarding ammonia and unionized ammonia in the surface water quality assessment in revised EIS Section 10.2.8.2.1 (Surface Water Quality Constituents of Potential Concern) and include both fractions in the assessment figures and tables in revised EIS Appendix 10A (Surface Water Quality Modelling Report), where appropriate.	Section 10.2.8.2.1; Appendix 10A

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						▪ Thallium was evaluated as a constituent of potential concern (COPC) but was not carried forward in the surface water quality assessment (Draft EIS Section 10.2.8.2.1) because: o thallium was not identified as a deleterious substance under Metal and Diamond Mining Effluent Regulations (MDMER); o where source term data were available, thallium concentrations were generally non-detectable and below current applicable guidelines; and o where source term data for thallium were not available, it was assumed based on the available source data that any contributions from other sources would similarly be negligible. NexGen maintains that an update to the surface water quality assessment for the inclusion of thallium in the modelling is not required. ▪ Dissolved organic carbon was not carried forward in the assessment because baseline concentrations were low and the Project is not expected to be a notable source of DOC (i.e., organic carbon is not expected to be an additive in the effluent treatment plant process). Further, DOC is also not a surface water quality constituent that is typically modelled in assessments. NexGen maintains that an update to the surface water quality assessment for the inclusion of DOC is not required. ▪ Hydrocarbons were not included as a COPC given the lack of any background data or likely notable Project source contributions to the receiving environment. NexGen maintains that an update to the surface water quality assessment is not required for hydrocarbons. Despite thallium, DOC, and hydrocarbons not being carried forward as COPCs in the surface water quality assessment (Draft EIS Section 10) and Draft EIS TSD XXI (Environmental Risk Assessment), NexGen confirms that ammonia (both total and un-ionized forms), thallium, DOC, and hydrocarbons would be included in verification and follow-up surface water quality monitoring programs for the Project. Monitoring commitments, such as meeting MDMER requirements, are presented in Draft EIS Section 10.7.2 (Surface Water Receiving Environment Monitoring). As noted above, NexGen will provide additional clarity regarding ammonia and un-ionized ammonia in revised EIS Section 10.2.8.2.1 and in revised EIS Appendix 10A, where appropriate. **References** Metal and Diamond Mining Effluent Regulations. SOR/2002-222 under the *Fisheries Act*. Last amended June 18, 2020. Available at https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2002-222/index.html	
80	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 10.2.8.2.1 Section 10.3.1.2 Section 10.5.1.1.3, Section 10.5.1.1.1	**Context:** In Section 10.2.8.2.1 the Proponent provides the list of Constituents of Potential Concern (COPCs) carried forward for further assessment in the pathways analysis and water quality modelling. Both mercury and sulphate are included as COPCs. In Section 10.3.1.2 pg. 1633 the Proponent states that sulphate is one of the dominant ion concentrations in the Local Study Area (LSA) and Regional Study Area (RSA) for existing conditions. Table 10.3-4 pgs. 1635-1637 provides data on existing water quality conditions for the LSA and RSA, including values for sulphate and mercury. There is no baseline data on methylmercury provided in this table. Due to the existing conditions and expected inputs of both sulphate and mercury to the receiving environment from the proposed Project via liquid and air emissions. Table 10.5-3 pg. 1659-1660 displays the predicted concentrations of metals at the edge of the proposed Effluent Treatment Plant (ETP) Regional Mixing Zone (RMZ) at the beginning and end of operations for the Project Application Case. Table 10.5-3 suggests that mercury concentrations are expected to	1. Provide baseline data on the concentrations of methylmercury in surface water, sediment and fish tissues (i.e. large-bodied sports fish and small-bodied forage fish) in the LSA and RSA receiving environment to establish a baseline prior to potential Project impacts. 2. Provide an assessment of risk from methylmercury to ecological receptors due to changes in sulphate and mercury concentrations in the receiving environment related to Project discharges.	Responses to part 1 and part 2 of this IR are provided below. 1. Methylmercury was not analyzed in any aquatic media (i.e., surface water, sediment, or biota) under baseline conditions for the EA. However, total mercury concentrations were measured in surface water quality and fish tissue chemistry for lake whitefish and northern pike, as well as for aquatic macrophyte shoots, roots, and sediment, in lakes within the local study area (LSA). With respect to baseline surface water quality, average total mercury concentrations in the surface waters of the LSA (i.e., ranging from 0.009 µg/L to 0.0021 µg/L; Table 8 in Draft EIS Attachment 10A-1 [Background Surface Water Quality Characterization]) were substantially less than the constituent of potential concern (COPC) Project threshold for mercury (i.e., 0.026 µg/L). Further, the average total mercury concentration was less than the Canadian Council of Ministers of the Environment (CCME) Protection of Aquatic Life guideline for methylmercury (i.e., 0.004 µg/L; CCME 2023), indicating that where methylmercury may have contributed to the total mercury concentration in the LSA lakes, it would have been present as a fraction of the total mercury. This finding suggests that under current conditions, methylmercury does not present a high potential risk in the surface water to biota.	n/a

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				increase by a degree of magnitude throughout Project operations due to effluent and atmospheric deposition, and Table 10.5-1 pg. 1657 suggests an increase in sulphate concentrations in the receiving environment, which could potentially lead to an increase in mercury methylation rates. **Rationale:** Increased sulphate availability can lead to increased methylation rates of mercury and methylmercury in sediment and surface water. Methylmercury is a toxin that can bioaccumulate within the food chain and present risks to aquatic biota and wildlife consuming aquatic biota. Potential changes to methylmercury concentrations in water quality, sediment and fish tissues should be assessed due to the proposed sulphate and mercury loadings in effluent.		With respect to fish tissue, total mercury analysis was completed for large-bodied fish (i.e., northern pike and whitefish) collected from various LSA lakes (Draft EIS Annex V.1 [Aquatic Environment Baseline Report]). Small-bodied fish, including lake chub, trout perch, and yellow perch, were collected from several LSA lakes; however, these fish were not analyzed (i.e., these fish samples were archived samples for future analysis). Mean total mercury concentrations in fish tissue in northern pike were below the Health Canada (HC) recommended safe level threshold for consumption (i.e., 0.5 µg/g) in fish tissue samples from Patterson Lake, whereas mean concentrations from northern pike fish tissue samples from Naomi Lake, Clearwater River, Lloyd Lake Inlet, and Hodge Lake were higher than other waterbodies in the baseline aquatic study area (i.e., the Patterson Lake watershed downstream to the outlet of Lloyd Lake) and above the HC recommended safe level threshold (Draft EIS Annex V.1, Section 9.3.2.2). Total mercury in all lake whitefish tissue samples collected in the baseline aquatic study area were below HC's recommended safe level threshold (Draft EIS Annex V.1, Section 9.3.2.2). As noted in the *Metal Mining Technical Guidance for Environmental Effects Monitoring* (Environment Canada 2012), methylmercury comprises 95% or more of total mercury in fish muscle tissue, so the baseline fish tissue mercury data are expected to account for methylmercury in fish and provide an indication of existing methylmercury levels. 2. NexGen considers the potential for risk from the projected sulphate concentrations and existing and projected mercury concentrations from the Project to be low. The risk potential is considered low because mercury methylation primarily occurs in sediments and is an anaerobic process (i.e., a microbial process that occurs within the lakebed sediment under anoxic/hypoxic conditions), so sulphate enrichment in the lakes alone while the lakes remain oxygenated is not expected to cause discernable increases in mercury methylation rates. Distinct oxyclines do exist in the deep lakes within the LSA, such as in Patterson Lake where unsaturated dissolved oxygen (DO) levels can exist, but these oxyclines are limited to the lower portions of the water column in winter and occur infrequently in the summer (Draft EIS Annex V.1). Therefore, there may be brief periods in winter and summer in some lakes that the water column overlying regions of the lakebed experience lower DO conditions, which may be conducive to mercury methylation. NexGen also acknowledges that there would be a slight increase in phosphorus to Patterson Like during Operations under the Application Case as a result of the treated effluent discharge, which is anticipated to result in a slight increase in productivity and potential for slightly higher oxygen demand; however, Patterson Lake and the lakes downstream of Patterson Lake are expected to remain oligotrophic. As a result of the slightly higher productivity and potential for a corresponding increase in organic biomass in Patterson Lake, a measurable increase in primary productivity and oxygen demand (i.e., from decomposition and respiration processes) during Operations is not anticipated to result in changes to the seasonal oxic regime of Patterson Lake, or that of the downstream lakes, that would result in an adverse increase in mercury methylation. As such, NexGen considers the potential for risk of increases to methylmercury concentrations in the receiving environment from the projected sulphate concentrations to be low and suggests that further evaluation of methylmercury in the revised EIS Section 10 (Surface Water Quality and Sediment Quality) or revised EIS TSD XXI (Environmental Risk Assessment) is not warranted. Nevertheless, NexGen would undertake aquatic monitoring, including effluent and water quality, sediment quality, and aquatic biota, which will include benthic invertebrates and fish, in Patterson Lake and the downstream lakes during the life of the Project as part of the Project's Environmental Monitoring Plan and the Environmental Effects Monitoring as prescribed by Metal and Diamond Mining Effluent Regulations (MDMER). This monitoring would include mercury, as well as an evaluation of the spatial seasonal and long-term trends. Based on the reported data, and if applicable MDMER triggers are met for mercury concentrations, a study investigating fish tissue mercury would be conducted. NexGen notes that, as part of NexGen's broader, proactive approach to Project engagement and planning (i.e., EA monitoring and follow-up activities), NexGen is conducting a baseline environmental effects monitoring program in 2023. Completing an environmental effects	

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						monitoring program during the baseline period enables a before-after-control-impact (BACI) design to be used for the Project moving forward. This proactive approach would help to distinguish potential treated effluent effects from natural differences between reference and exposure areas that may have existed before the initiation of treated effluent discharge. Components and methods to complete fish population and benthic invertebrate community surveys for the baseline environmental effects monitoring program, along with the collection of necessary supporting information (i.e., water quality and sediment characterization), will follow the metal mining environmental effects monitoring guidance document (Environment Canada 2012). Planning for and initiating this baseline environmental effects monitoring program has also provided an opportunity to engage primary Indigenous Groups on study design; based on Indigenous Group's feedback, non-lethal fish surveys were selected to minimize fish mortality while following the metal mining environmental effects monitoring guidance document (Environment Canada 2012). No changes are proposed in the revised EIS to address this IR. **References** CCME (Canadian Council of the Ministers of the Environment). 2023. Water Quality Guidelines Summary Table. Available at https://ccme.ca/en/summary-table Environment Canada. 2012. Metal Mining Technical Guidance for Environmental Effects Monitoring. ISBN 978-1-100-20496-3. Available at https://www.canada.ca/en/environment-climate-change/services/managing-pollution/environmental-effects-monitoring/metal-mining-technical-guidance/metal-mining-technical-guidance-environmental-effects-monitoring.html Metal and Diamond Mining Effluent Regulations. SOR/2002-222 under the *Fisheries Act*. Last amended June 18, 2020. Available at https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2002-222/index.html	
81	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 10.2.8.2.2 Section 10.3.2	**Context**: The Proponent has provided a list of total metals and radionuclides that were carried forward for the quantitative sediment quality assessment and modelling in the Environmental Risk Assessment (ERA). The Proponent states that these were determined based on the corresponding water quality constituents having the potential to exceed baseline values and availability of guidelines. Due to requirements for environmental effects monitoring under the *Metal and Diamond Mining Effluent Regulations* (MDMER) total Organic Carbon (TOC) must be screened for further assessment and modelling. Additionally, based on baseline condition data provided in Section 10.3.2 for sediment quality, barium, iron, manganese and vanadium should be screened in for further assessment as these metals had the highest concentrations in sediment within Patterson Lake and Naomi Lake. **Rationale:** Due to requirements under the MDMER Schedule 5 Sections 12(1)(ii) for environmental effects monitoring of benthic invertebrate communities, TOC must be screened in for further assessment and modelling. Due to elevated concentrations of barium, iron, manganese and vanadium in sediment concentrations within Patterson Lake and Naomi Lake, it is recommended that these metals be included for further sediment quality assessment and modelling.	1. Include TOC in further assessments in the ERA and sediment quality modelling for the sediment quality assessment. 2. Include barium, iron, manganese and vanadium in further sediment quality assessment and modelling.	NexGen acknowledges the request, and at this time, NexGen maintains that the constituents of potential concern (COPC) screening in the Draft EIS was reasonable and appropriate, and that there is no reason to add total organic carbon (TOC), barium, iron, manganese, or vanadium to a future sediment quality assessment. The screening applied in Draft EIS Section 10.2.8.2 (Constituents of Potential Concern) and in Section 4.2.3 of Draft EIS TSD XXI (Environmental Risk Assessment) indicated negligible risk of the Project to incrementally change the concentration of these sediment constituents in the receiving environment through all phases of the Project to levels that would exceed reference values or guidelines and thus pose a risk to the environment. Specifically, NexGen notes: 1. Total organic carbon was not included in the sediment quality assessment because the Project discharges to Patterson Lake are not expected to be a substantial source of TOC due to the milling and ore processing and water treatment processes on site (i.e., discharges will predominantly be composed of inorganic constituents, and there are minimal organic additives in mine processes/treatment). Therefore, TOC was not identified as having the potential to adversely change sediment quality or surface water quality in the receiving environment, and thus TOC did not screen in as a COPC. Similarly, TOC did not screen in as a COPC for the environmental risk assessment (ERA) (Draft EIS TSD XXI). 2. Based on the aquatic baseline report (Draft EIS Annex V.1 [Aquatic Environment Baseline Report]), the only constituents that exceeded sediment quality guidelines in the background characterization monitoring were arsenic, cadmium, lead-210, polonium-210, and vanadium, the last of which is limited to Naomi Lake and the Clearwater River (Draft EIS Annex V.1, Appendix C, Table 27). With the exception of vanadium, the constituents that exceeded sediment quality guidelines in baseline were considered further in the screening assessment in Section 4.2.3.3 of Draft EIS TSD XXI. Of these constituents, arsenic, molybdenum, lead-210, and polonium-210	n/a

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						screened in as COPCs for quantitative assessment in the ERA (Draft EIS TSD XXI, Section 6). Vanadium was excluded from the screening assessment in the Draft EIS TSD XXI because the only exceedances of the sediment quality guideline occurred in a downstream waterbody that would not have a direct discharge from the Project (i.e., Naomi Lake and downstream) and because Project inputs via the water pathway did not indicate the potential for background levels to change in the receiving environment. At this time, NexGen maintains that the COPC screening was reasonable and that there is no need to add barium, iron, and manganese to future assessments because the screening applied in Draft EIS Section 10.2.8.2 and in Section 4.2.3 of Draft EIS TSD XXI indicated negligible risk of the Project to incrementally change the sediment quality in the receiving environment to levels that exceed reference values or guidelines. However, if future sediment monitoring, including monitoring associated with the environmental effects monitoring of benthic invertebrate communities per Schedule 5 of Metal and Diamond Mining Effluent Regulations (MDMER), indicates different conditions or the effluent treatment system includes substantial amounts of an organic additive, the COPC list will be re-evaluated. As per the MDMER, sediment quality constituents, which include TOC as well as barium, iron, manganese, and vanadium, will be reported in the First Interpretive Report not later than 36 months after the day on which the mine becomes subject to Section 7 of the MDMER. Monitoring commitments, such as meeting MDMER requirements, are presented in Draft EIS Section 10.7.2 (Surface Water Receiving Environment Monitoring). NexGen notes that, as part of NexGen's broader, proactive approach to Project engagement and planning (i.e., EA monitoring and follow-up activities), NexGen is conducting a baseline environmental effects monitoring program in 2023. Completing an environmental effects monitoring program during the baseline period enables a before-after-control-impact (BACI) design to be used for the Project moving forward. This proactive approach would help to distinguish potential treated effluent effects from natural differences between reference and exposure areas that may have existed before the initiation of treated effluent discharge. Components and methods to complete fish population and benthic invertebrate community surveys for the baseline environmental effects monitoring program, along with the collection of necessary supporting information (i.e., water quality and sediment characterization), will follow the metal mining environmental effects monitoring guidance document (Environment Canada 2012). Planning for and initiating this baseline environmental effects monitoring program has also provided an opportunity to engage primary Indigenous Groups on study design; based on Indigenous Group's feedback, non-lethal fish surveys were selected to minimize fish mortality while following the metal mining environmental effects monitoring guidance document (Environment Canada 2012). No changes are proposed in the revised EIS to address this IR. **References** Environment Canada. 2012. Metal Mining Technical Guidance for Environmental Effects Monitoring. Government of Canada, Environment Canada National EEM Office, Science Policy and Environmental Quality Branch, Ottawa, Ontario. Available at https://www.canada.ca/en/environment-climate-change/services/managing-pollution/environmental-effects-monitoring/metal-mining-technical-guidance/metal-mining-technical-guidance-environmental-effects-monitoring.html Metal and Diamond Mining Effluent Regulations. SOR/2002-222 under the *Fisheries Act*. Last amended June 18, 2020. Available at https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2002-222/index.html	

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82	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 10.2.8.3.1 Section 10.3.1.2 Appendix 10A-2	**Context**: Table 10.2-5 pg. 1620-1622 demonstrates Constituents of Potential Concern (COPCs), their respective water quality guidelines from applicable sources, and proposed Project thresholds that have been selected based upon the most stringent guidelines. General parameters such as temperature, pH, conductivity, etc. that would require Project thresholds and monitoring under the *Metal and Diamond Mining Effluent Regulations* (MDMER) have not been provided in this table. Phosphorous and its respective guidelines and Project threshold is missing from this table. All COPCs that require calculations based on other parameters such as hardness, pH, or temperature to derive guidelines (i.e. ammonia, cobalt, zinc, etc.) should be calculated and added to the table, with a note specifying the parameter values used in the calculation. For nitrate (as N) the Canadian Council of Ministers of the Environment (CCME) chronic guideline provided in the table is 3.0 mg/L however, the correct value is 13 mg/L. For molybdenum, the most stringent water quality guideline is the CCME guideline of 0.073 mg/L, not the provincial guideline of 31 mg/L. For vanadium it appears the federal water quality guideline was suggested, however the correct value is 120 ug/L or 0.120 mg/L, not 0.00012 mg/L. In Appendix 10A-2 pg. 1946 modelled surface water concentrations of molybdenum for the application and upper bound modelling scenarios at all downstream lakes are displayed. There is a significant increase in surface water concentrations in the far future, and it is difficult to discern if there are any exceedances of the 0.073 mg/L CCME chronic guideline. There has been no discussion of these increases within the results of the EIS. Table 10.3-3 pg. 1634-1636 displays the existing baseline water quality conditions for all the areas within the LSA and RSA. General parameters (ex. temperature, pH, conductivity, etc.) and nutrients (ex. total and un-ionized ammonia, nitrate, phosphorus etc.) that would require Project thresholds and monitoring under the Metal and Diamond Mining Effluent Regulations (MDMER) have not been provided in this table. **Rationale**: The recommended changes for Table 10.2-5 are based upon providing all the information needed for reviewers to assess the characterization of effects Proposed changes incorporate the usage of correct, up-to-date and the most stringent chronic water quality guidelines. It is difficult to discern if there is an exceedance of the water quality threshold for molybdenum, which should be discussed more in-depth in the results of the EIS. The recommended changes for Table 10.3-3 are based on providing baseline conditions in order for comparisons to determine if there are Project related effects that could cause changes to these parameters over the course of the Project's lifespan.	1. Update Table 10.2-5 to include all general parameters required for environmental effects monitoring: pH, temperature, hardness, alkalinity, and conductivity. 2. Update Table 10.2-5 to include phosphorous and its respective guidelines and Project threshold. 3. Verify that all COPCs that require calculations based upon other parameters such as hardness, pH, temperature, etc. are calculated and input as values into the table with notes specifying the parameter values used in the calculations. 4. Update Project nitrate and vanadium guidelines and thresholds to the correct values, update molybdenum assessments and consider applying the most stringent molybdenum water quality guidelines as the Project threshold. 5. Provide additional information to justify the use of selected water quality guidelines on any water quality guideline exceedances for molybdenum for all Project phases including post-closure. 6. Update Table 10.3-3 to include the baseline data for general water quality parameters and nutrients that would require monitoring under the MDMER. 7. Update assessments as necessary according to changes in thresholds applied as described in ECCC-SW-13.	Responses to part 1 through part 7 of this IR are provided below. 1. NexGen notes that Table 10.2-5 of Draft EIS Section 10.2.8.3.1 (Water Quality Thresholds) is limited to presenting the selected chronic (i.e., long-term) Project thresholds for the constituents of potential concern (COPCs) that apply specifically to the protection of aquatic life. Thus, constituents such as pH, temperature, hardness, alkalinity, and conductivity have not been included in the table because they were not identified as COPCs. Assumptions regarding potential exposure and toxicity modifying factors such as pH, temperature, and hardness, and their influence on guidelines and the selected Project threshold are presented as footnotes to Table 10.2-5 and linked to the relevant constituent to which they apply. These additional constituents have been included in baseline monitoring datasets and tables and would be included in monitoring programs during the life of the Project, including reporting under the Metal and Diamond Mining Effluent Regulations (MDMER). In response to the meeting with the CNSC and Environment and Climate Change Canada (ECCC) on 9 June 2023 to discuss FIRT IRs, NexGen will revise Table 10.2-5 of revised EIS Section 10.2.8.3.1 to broaden the discussion of assumptions regarding pH, temperature, hardness, alkalinity, and specific conductivity, as necessary. 2. Phosphorus is a COPC in the surface water quality assessment but is not listed in Table 10.2-5 of Draft EIS Section 10.2.8.3.1 because it is a COPC that is associated with aquatic productivity limits and not guidelines for the protection of aquatic life. Table 10.2-5 lists the COPCs that are associated with chronic (i.e., long-term) Protection of Aquatic Life Project thresholds. The phosphorus Project threshold is shown in Table 10.2-8 of Draft EIS Section 10.2.8.3.3 (Productivity Status Thresholds). The limit used for setting the Project threshold is based on total phosphorus concentrations and associated trophic conditions at the upper bound of the mesotrophic status per the provincial guidelines (MOEE 1994), which is consistent with the trophic categories based on total phosphorus in Canadian lakes and rivers (Environment Canada 2004; CCME 2004). The Project threshold for phosphorus is discussed and presented separately from the protection of aquatic life COPC Project thresholds in Draft EIS Section 10.2.8.3.3 (Productivity Status Thresholds). No changes are proposed in the revised EIS to address part 2 of this IR. 3. NexGen confirms that for COPCs that have exposure and toxicity modifying factors (ETMFs) such as pH, temperature, and hardness in the derivation of their respective Project thresholds, the ETMFs were applied accordingly. NexGen confirms that the various assumptions used in setting respective Project thresholds are provided in the footnotes of Table 10.2-5 of Draft EIS Section 10.2.8.3.1. No changes are proposed in the revised EIS to address part 3 of this IR. 4. With respect to the nitrate, vanadium, and molybdenum guideline changes requested by ECCC, NexGen responds as follows: ▪ For the nitrate (NO_3) Project threshold, NexGen recommends maintaining the nitrate Project threshold as 3 milligrams nitrogen per litre (mg N/L). This threshold is sourced from the British Columbia Ministry of Environment (BC MOE) water quality guidelines (BC MOE 2009), which includes freshwater species sensitivity in its derivation (i.e., the BC MOE recommended freshwater guideline for nitrate was derived by multiplying the 10-day lowest observed effect concentration of 133 mg NO_3/L [Schuytema and Nebeker 1999] by a safety factor of 0.1 and converting to nitrate as nitrogen [N]). This guideline is considered conservative as NexGen notes that nitrate guidelines have been more recently derived that consider the influence of chloride as a modifying factor that can reduce the potential for nitrate toxicity in freshwater ecosystems (e.g., Soucek and Dickenson 2016). NexGen also acknowledges that this threshold is only slightly above the Canadian Council of Ministers of the Environment (CCME) guideline (CCME 2012), so does not consider the selection of the BC MOE guideline as elevating potential for risk to aquatic life in the assessment.	Section 10.2.8.3.1, 10.3.1.2, 10.3.1.3

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						▪ With respect to vanadium, NexGen acknowledges an error in the vanadium guideline stated in Draft EIS Section 10.2.8.3.1 and will adjust the Project threshold for vanadium (i.e., 0.12 mg/L) in Table 10.2-5 of revised EIS Section 10.2.8.3.1 accordingly. ▪ In the Draft EIS, NexGen used the provincial molybdenum guideline (i.e., 31 mg/L; WSA 2017) preferentially over the more conservative federal guideline (i.e., 0.073 mg/L; CCME 2023) because the CCME guideline remains interim and because the provincial guideline has been derived from recent data, following the CCME (2007) protocol. However, based on feedback from Environment and Climate Change Canada (ECCC) on 9 June 2023, NexGen will change the Project threshold from the province-specific guideline for molybdenum (i.e., 31 mg/L; WSA 2017) to the recently updated BC MOE guideline of 7.6 mg/L (BC MOE 2021) in the revised EIS. The regulatory rationale for this change from the Saskatchewan Water Security Agency (WSA) guideline to the BC MOE guideline is because the BC MOE guideline is more conservative than the WSA guideline and is derived from recent data following the CCME (2007) protocol. The revised EIS will be updated to reflect the changes with regard to thresholds for vanadium and molybdenum outlined in part 4 of this IR. NexGen confirms that the corrected Project thresholds for vanadium and molybdenum would not change the findings of the surface water quality assessment for these constituents. 5. NexGen's preference for the BC MOE guideline for molybdenum is based on uncertainty in the CCME guideline, primarily due to the inability of follow-up studies to reproduce the findings of the source on which the CCME guideline was based. Specifically, the CCME guideline was based on multiplying the lowest chronic toxicity value, the 28-day 50% lethal effect concentration (LC_{50}) of 0.73 mg/L for rainbow trout (*Oncorhynchus mykiss*), by a safety factor of 0.1. The original study by Birge (1978) has not been reproducible, either using the original methods or using standard methods (Davies et al. 2005). 6. With respect to the list of constituents presented in Table 10.3-3 to Table 10.3-6 of Draft EIS Section 10.3.1.2 (Water Quality [Risk to Aquatic Life and Terrestrial Life] and Drinking Water Quality Constituent Concentrations) and Table 10.3-7 to Table 10.3-9 of Draft EIS Section 10.3.1.3 (Productivity Status Constituent Concentration), the tables only include background information for the COPCs selected for the surface water quality assessment. Therefore, the background data for constituents that did not screen in as COPCs for the Project are not included in these tables. A more complete surface water quality background baseline dataset, including those constituents listed as MDMER monitoring constituents, is provided in Attachment 10A-1 of Draft EIS Appendix 10A (Surface Water Quality Modelling Report). However, in response to the meeting with the CNSC and ECCC to discuss FIRT IRs on 9 June 2023, NexGen will revise Table 10.3-3 to Table 10.3-9 of revised EIS Section 10.3.1.2 and Section 10.3.1.3, as necessary, to clarify assumptions for constituents flagged as exceeding Project thresholds where the value or concentration of other measured constituents (e.g., pH, temperature, hardness) contributed to the exceedances under background conditions. These added assumptions will assist the CNSC and ECCC in verifying the identification of the Project thresholds. 7. With respect to the corrected Project thresholds (i.e., vanadium and molybdenum), the surface water quality assessment findings for these constituents would not change. Therefore, no changes are proposed in the revised EIS to address part 7 of this IR. **References**	

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No.	Department	Project Effects Link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement	NexGen Response	Section in EIS
						BC MOE (British Columbia Ministry of Environment). 2009. Water Quality Guidelines for Nitrogen (Nitrate, Nitrite, and Ammonia). Addendum to Technical Appendix. Water Stewardship Division, Ministry of Environment Province of British Columbia. BC MOE. 2021. B.C. Ministry of Environment and Climate Change Strategy 2021. Molybdenum Water Quality Guidelines for the Protection of Freshwater Aquatic Life, Livestock, Wildlife and Irrigation. Water Quality Guideline Series, WQG-07. Prov. B.C., Victoria B.C. Birge WJ. 1978. Aquatic Toxicology of Trace Elements of Coal and Fly Ash. Special Collections, USDA National Agricultural Library. Accessed February 2023, https://www.nal.usda.gov/exhibits/speccoll/items/show/5224 CCME (Canadian Council for the Ministers of the Environment). 2004. Canadian Water Quality Guidelines for the Protection of Aquatic Life: Phosphorus: Canadian Guidance Framework for the Management of Freshwater Systems. In: Canadian Environmental Quality Guidelines, 2004. Winnipeg, MB, Canada. CCME. 2007. A protocol for the derivation of water quality guidelines for the protection of aquatic life. CCME. 2012. Canadian Water Quality Guidelines for the Protection of Aquatic Life: Nitrate Ion. Canadian Environmental Quality Guidelines. Available at https://ccme.ca/en/res/nitrate-ion-en-canadian-water-quality-guidelines-for-the-protection-of-aquatic-life.pdf CCME. 2023. Water Quality Guidelines Summary Table. Available at https://ccme.ca/en/summary-table Davies TD, Pickard J, Hall JK. 2005. Acute molybdenum toxicity to rainbow trout and other fish. Journal of Environmental Engineering & Science 4: 481-485. Environment Canada. 2004. Canadian Guidance Framework for the Management of Phosphorus in Freshwater Systems: Science-based Solutions Report No. 1-8. National Guidelines and Standards Office, Water Policy ad Coordination Directorate, Environment Canada. Pp. 114. Metal and Diamond Mining Effluent Regulations. SOR/2002-222 under the *Fisheries Act*. Last amended June 18, 2020. Available at https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2002-222/index.html MOEE (Ontario Ministry of Environment and Energy). 1994. Water management: policies, guidelines, provincial water quality objectives. Accessed September 2021. Available at https://www.ontario.ca/page/water-management-policies-guidelines-provincial-water-quality-objectives Schuytema GS, Nebeker AV. 1999. Comparative toxicity of ammonium and nitrate compounds to Pacific treefrog and African clawed frog tadpoles. Environmental Toxicology and Chemistry 18:2251-2257. Soucek DJ, Dickinson A. 2016. Influence of chloride on the chronic toxicity of sodium nitrate to *Ceriodaphnia dubia* and *Hyalella azteca*. Ecotoxicology. 2016 Sep;25(7):1406-16. Doi: 10.1007/s10646-016-1691-1. Epub 2016 Jul 7. PMID: 27386878. WSA (Saskatchewan Water Security Agency). 2017. Saskatchewan Water Quality Objective for the Protection of Aquatic Life – Molybdenum. Fact Sheet. Report No. WSA 514.	

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83	CNSC	Radiological Threshold Selection for water quality	Section 10.2.8.3.1	**Context:** The EIS states that thresholds for radionuclides in surface water for risk to aquatic life were calculated from a biota dose benchmark, following the USDOE document: A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota. **Rationale:** Typically, dose is cumulatively assessed from all sources of radiation by applying a recommended dose benchmark (100 µGy/hr for terrestrial biota and 400 µGy/hr for aquatic biota). It is unclear from the text if the selected concentrations for the radiological COPCs is reflective of the concentration of each individual radionuclide required to reach the threshold, or if the cumulative dose from all the radiological COPCs was considered in the calculation when deriving the concentration threshold in water.	1.Provide clarification of which dose benchmarks were considered when deriving the radiological concentration threshold in surface water. 2.Provide clarification on whether the thresholds derived only considered dose from the individual radionuclide or were they derived considering cumulative dose from all radiological COPCs? 3.Provide an example calculation on how these thresholds were derived to understand the process undertaken	Responses to part 1, part 2, and part 3 of this IR are provided below. 1. NexGen clarifies that the dose benchmarks for lead-210, polonium-210, and thorium-230 used for the surface water assessment and the ecological risk assessment are the Biota Concentration Guides (BCGs) from the United States Department of Energy (US DOE 2019), as discussed in Draft EIS Section 10.2.8.3.1 (Water Quality Thresholds). The radium-226 benchmark for surface water is from the Saskatchewan Ministry of Environment (Government of Saskatchewan 2017). These BCGs were derived based on a screening dose benchmark of 400 micrograys per hour (µGy/h) for aquatic organisms from US DOE (2019). 2. NexGen clarifies that the BCGs from the US DOE RESRAD-BIOTA tool (ISCORS 2004) are based on individual radionuclides meeting the dose benchmark. The BCGs were used as overall guidelines and were not used to screen and remove any radionuclides from the assessment. If the BCGs were to be used as a screening approach to remove radionuclides, then as recommended by US DOE, a sum of fractions approach would be used to ensure that all radionuclides cumulatively did not result in a dose above the dose benchmark. 3. Appendix G, Biota Concentration Guides (BCGs) in Water, Sediment, and Soil, in US DOE (2019) provides a detailed description of how radionuclides are selected and associated BCGs are derived, and the calculations required to derive the BCGs for each medium. No changes are proposed in the revised EIS to address this IR. **<u>References</u>** Government of Saskatchewan. 2017. Radium-226 in Surface Water – Fact Sheet. Saskatchewan Environmental Quality Guidelines. EPB #602. Saskatchewan Ministry of Environment. ISCORS (Interagency Steering Committee on Radiation Standards). 2004. RESRAD-BIOTA: A tool for implementing a Graded Approach to Biota Dose Evaluation. ISCORS Technical Report 2004-02 (U.S. Department of Energy report DOE/EH-0676), Washington, D.C. US DOE (United States Department of Energy). 2019. A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota. DOE-STD-1153-2019.	n/a
83a	CNSC	Selected surface water threshold for some COPCs	Section 10.2.8.3.1, 10.2.8.3.2	**Context:** The text in section 10.2.8.3.1 states that the most stringent chronic thresholds were selected for each COPC in the surface water, however it looks like the selected threshold for Molybdenum was the provincial objective of 31 mg/L, instead of the CCME objective of 0.073 mg/L (table 10.2-5). Similarly, table 10.2-7 shows less stringent Health Canada drinking water thresholds were selected for cadmium, selenium, lead-210, and radium-226 when there were lower World Health Organization thresholds available. **Rationale:** There is a disconnect between the stated process for selecting threshold values in section 10.2.8.3.1 and the selected thresholds for some COPCs. The proponent should provide an explanation for the inconsistencies between the process for threshold selection in the EIS and the selected thresholds.	Please explain why the less stringent surface/drinking water quality threshold was selected for molybdenum, cadmium, selenium, lead-210, and radium-226 when more stringent thresholds were referenced.	The Project protection of aquatic life (PAL) and drinking water (DW) thresholds selected for the surface water quality assessment in the Draft EIS were based on the most stringent provincial, federal, or international guidelines, unless otherwise noted. The Project PAL thresholds were based on the most stringent provincial chronic (i.e., long-term) water quality guidelines from either the Canadian Environmental Quality Guidelines (CCME 2023) or Saskatchewan's provincial objectives (WSA 2015, 2017), except for molybdenum. In the Draft EIS, NexGen used the provincial molybdenum guideline (i.e., 31 mg/L; WSA 2017) preferentially over the more conservative federal guideline (i.e., 0.073 mg/L; CCME 2023) as the Project threshold. The rationale for the use of the Provincial guideline for molybdenum over the federal guideline is because the CCME guideline remains interim and because the provincial guideline has been derived from recent data, following the CCME (2007) protocol. More specifically, the Saskatchewan Water Security Agency (WSA) developed the provincial molybdenum water quality objective based on the 5th percentile (HC5) of the species sensitivity distribution (SSD) according to the CCME protocol; 18 data points for 12 different species were used, mainly 10% effect concentration (EC_{10}) data. However, in discussions with Environment and Climate Change Canada (ECCC) on 9 June 2023, NexGen has agreed to revise the molybdenum guideline from the provincial guideline to the British Columbia Ministry of Environment (BC MOE) guideline (BC MOE 2021) in the revised EIS. The regulatory rationale for this change from the WSA guideline to the BC	Section 10.2.8.3.1, 10.5.1.1.3

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						MOE guideline is because the BC MOE guideline is more conservative than the WSA guideline and is derived from recent data following the CCME (2007) protocol. With respect to cadmium, the guideline used to set the Project PAL threshold is the most conservative of the guidelines available (i.e., CCME, WSA); the Project threshold selected for cadmium is the provincial surface water quality guideline (WSA 2017). The guidelines used to set the Project DW thresholds for cadmium, selenium, lead-210, and radium-226 were sourced from the Health Canada (HC) DW guidelines (HC 2022) and not the World Health Organization (WHO) DW guidelines (WHO 2022), unless HC or other Canadian DW guidelines were not available for a constituent of potential concern. Specifically, for the identified constituents in the reviewer's IR: ▪ For the cadmium DW threshold, the HC guideline published in 2020 (HC 2020) was used. ▪ For the selenium DW threshold, the HC guideline published in 2014 (HC 2014) was used preferentially over the WHO guideline, even though the WHO guideline is lower (i.e., 0.04 mg/L). The preference in using the HC DW guidelines is because the WHO selenium guideline is designated as provisional due to uncertainties inherent in the scientific database (WHO 2022). ▪ For lead-210 and radium-226, the HC maximum acceptable concentrations (MACs) were used as the Project DW thresholds. The HC MACs for lead-210 and radium-226 are derived based on not exceeding a dose of 0.1 millisieverts per year (HC 2009); HC states that at this low level, no further actions would be warranted to reduce radioactivity in drinking water. On this basis, even though lower guidelines were available for lead-210 and radium-226 (i.e., WHO 2022), the HC DW MAC guidelines were considered appropriate as Project thresholds. ▪ For polonium-210 and thorium-230, no HC DW guidelines are available. For these radionuclides, the WHO guidelines were used as the Project thresholds for drinking water. Table 10.2-5 in revised EIS Section 10.2.8.3.1 (Water Quality Thresholds) and Table 10.5-3 in revised EIS Section 10.5.1.1.3 (Trace Metals) will be updated to reflect the changes noted in this response related to the Project threshold for molybdenum. No other changes are proposed in the revised EIS to address this IR. **References** BC MOE (British Columbia Ministry of Environment). 2021. B.C. Ministry of Environment and Climate Change Strategy 2021. Molybdenum Water Quality Guidelines for the Protection of Freshwater Aquatic Life, Livestock, Wildlife and Irrigation. Water Quality Guideline Series, WQG-07. Prov. B.C., Victoria B.C. CCME (Canadian Council of Ministers of the Environment). 2007. A protocol for the derivation of water quality guidelines for the protection of aquatic life 2007. In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, 1999, Winnipeg. CCME. 2023. Water Quality Guidelines Summary Table. Available at https://ccme.ca/en/summary-table HC (Health Canada). 2009. Guidelines for Canadian Drinking Water Quality Guideline Technical Document Radiological Parameters. HC. 2014. Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Selenium. Water and Air Quality Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. (Catalogue No H144-13/4-2013E-PDF). HC. 2020. Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Cadmium.	

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						HC. 2022. Guidelines for Canadian Drinking Water Quality—Summary Tables. Water and Air Quality Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. WSA (Saskatchewan Water Security Agency). 2015. Surface Water Quality Objectives, Interim Edition, EPB 356. Saskatchewan Environmental and Municipal Management Services Division, Water Security Agency. June 2015. WSA. 2017. Saskatchewan Water Quality Objective for the Protection of Aquatic Life – Molybdenum. Fact Sheet. Report No. WSA 514. WHO (World Health Organization). 2022. Guidelines for drinking-water quality: fourth edition incorporating the first and second addenda. World Health Organization, Geneva, Switzerland. Licence: CC BY-NC-SA 3.0 IGO.	
84	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 10.2.8.3.4	**Context**: The residual effects analysis measures the effects of the Project on surface water and sediment quality against existing conditions and thresholds. Thresholds were set to identify if projected surface water and sediment quality over the lifespan of the project and the far-future projection had the potential to adversely affect aquatic life and waterbody productivity health. In Table 10.2-9 pg. 1626 it is unclear why several parameters for sediment quality do not have a Project threshold identified despite there being potential sediment quality guidelines available (ex. cadmium, lead, nickel, selenium, vanadium and zinc). It is also unclear why Project thresholds that have been identified for some parameters (ex. arsenic, copper, and molybdenum) are not based upon the most stringent guidelines available with no rationale provided. **Rationale**: The recommended changes for Table 10.2-9 are based upon incorporating the use of the most stringent chronic sediment quality guidelines for the protection of the receiving environment. Use of the most stringent guidelines will allow for the most protective assessment to analyze risks to the receiving environment.	Update Table 10.2-9 to incorporate the selection of the most stringent sediment quality guidelines for all parameters with available sediment quality guidelines. If this cannot be done, provide rationale as to why.	As indicated in Section 4.2.3.3 of Draft EIS TSD XXI (Environmental Risk Assessment) and in Draft EIS Section 10.2.8.3.4 (Sediment Quality Thresholds), Burnett-Seidel and Liber (2013) Reference (REF) values were selected as the preferred source of the Project thresholds for constituents of potential concern (COPCs) in the sediment quality assessment. This selection was because the reported values in Burnett-Seidel and Liber (2013) are specifically applicable to uranium mining operations in Saskatchewan waterbodies. The REF values from Burnett-Seidel and Liber (2013) were preferentially used even if these values were higher than Canadian Council of Ministers of the Environment sediment quality guidelines (i.e., arsenic), which are generic guidelines that are applicable to all waterbodies in Canada. An exception in the sediment quality assessment in the Draft EIS was copper, where the selected Project threshold was sourced from the lowest effect level (LEL) value in the reference values for uranium mining and milling in Canada (Thompson et al. 2005). The Thompson et al. (2005) values are applicable to uranium ore-bearing regions of northern Saskatchewan and Ontario. However, the use of the LEL value for copper was an oversight, as there is a REF value for copper in Burnett-Seidel and Liber (2013); therefore, the Project threshold for copper for the sediment quality assessment will be updated to the Burnett-Seidel and Liber (2013) REF value in the revised EIS. Despite this change, the maximum predicted sediment copper concentrations in Patterson Lake North Arm – West Basin (Draft EIS TSD XXI) in the Application Case and the far-future projection are below the REF copper value. Table 10.2-9 in revised EIS Section 10.2.8.3.4 and Table 4-3 in Section 4.2.3.3 of revised EIS TSD XXI will be updated to correct the Project copper threshold for sediment quality. No other changes to the tables will be made as the purpose of the tables is to identify the sediment COPC Project thresholds for the sediment quality assessment. The selection of COPCs for Project thresholds for sediment quality was driven by the environmental risk assessment (ERA) screening, based on: ▪ if the maximum predicted sediment concentration of a sediment quality constituent in Patterson Lake North Arm – West Basin during the Application Case, including the maximum upper bound scenario and the far-future projection, was greater than a sediment quality guideline (i.e., arsenic, molybdenum, lead-210, and polonium-210); ▪ if the constituent was identified as a COPC in the surface water quality assessment (i.e., cobalt and copper); ▪ if the constituent required an evaluation for toxicity and radiotoxicity (i.e., uranium); or ▪ if the constituent was a Project-focused radionuclide (i.e., uranium-234, uranium-238, thorium-230, and radium-226). Where predicted sediment concentrations did not screen in on the basis of these four conditions, NexGen believes there is a negligible risk of that constituent increasing in the sediment to present a risk to aquatic biota or other users and it was not evaluated further. However, NexGen notes that all of the listed sediment quality constituents in Table 10.2-9 in Draft EIS Section 10.2.8.3.4 not screened in as COPCs, as well as those that did screen in for sediment quality, were carried	Section 10.2.8.3.4; TSD XXI, Section 4.2.3.3

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						forward to the ERA for screening as part of the ERA. The footnotes in Table 10.2-9 in revised EIS Section 10.2.8.3.4 will be updated to provide this clarification. Revised EIS Section 10.2.8.3.4 and Table 4-3 in Section 4.2.3.3 of revised EIS TSD XXI will be updated to reflect the changes outlined in this response. **References** Burnett-Seidel C, Liber K. 2013. Derivation of no-effect and reference-level sediment quality values for application at Saskatchewan uranium operations. Environmental Monitoring and Assessment. 185(11): 9481-9494. Thompson PA, Kurias J, Mihok S. 2005. Derivation and use of sediment quality guidelines for ecological risk assessment of metals and radionuclides released to the environment from uranium mining and milling activities in Canada. Environmental Monitoring and Assessment. 110:71-85.	
85	CNSC	Selected sediment thresholds for some COPCs	Section 10.2.8.3.4	**Context:** The text in section 10.2.8.3.4 states that thresholds from Burnett-Seidal and Liber 2013 were prioritized when selecting thresholds for sediment, as they are reflective of data from Canadian uranium mines. However, there are some COPCs with no threshold selected for the project, even when there is data available (cadmium, lead, nickel, selenium, vanadium). Furthermore, the LEL from Thompson et al. 2005 was selected for copper, when values from Burnett-Seidal and Liber 2013 exist, which is inconsistent with the stated process **Rationale:** Selection of sediment thresholds is inconsistent with the process outlined in the EIS, the proponent should provide an explanation for the exceptions pointed out in the context.	1.Please explain why some sediment COPCs have no project threshold associated with them, even when there is data available. 2. Please explain why the LEL was the preferred threshold for copper instead of the REF value 3.Please explain why the REF value for arsenic is highlighted	1. The constituents listed in Table 10.2-9 in Draft EIS Section 10.2.8.3.4 (Sediment Quality Thresholds) were those constituents that had guidelines and reference values within one or more of the three reference sources (i.e., Burnett-Seidel and Liber 2013; Thompson et al. 2005; CCME 1999); however, not all constituents were identified as sediment quality constituents of potential concern (COPCs). As discussed in NexGen's response to IR 84, the selection of COPCs for sediment quality was driven by Draft EIS TSD XXI (Environmental Risk Assessment) screening, based on: ▪ if the maximum predicted sediment concentration of a sediment quality constituent in Patterson Lake North Arm – West Basin during the Application Case, including the maximum upper bound scenario and the far-future projection, was greater than a sediment quality guideline (i.e., arsenic, molybdenum, lead-210, and polonium-210); ▪ if the constituent was identified as a COPC in the surface water quality assessment (i.e., cobalt and copper); ▪ if the constituent required an evaluation for toxicity and radiotoxicity (i.e., uranium); or ▪ if the constituent was a Project-focused radionuclide (i.e., uranium-234, uranium-238, thorium-230, and radium-226). Where sediment metals or radionuclides from this list did not screen in as COPCs, NexGen believes there is a negligible risk of that constituent increasing in the sediment to present a risk to aquatic biota or other users and it was not evaluated further (i.e., they were not selected as COPCs and therefore did not require a Project threshold). 2. As presented in the response to IR 84, NexGen acknowledges that the use of the lowest effect level value for copper was an oversight, as there is a reference (REF) value for copper in Burnett-Seidel and Liber (2013). As noted in this IR, Table 10.2-9 in revised EIS Section 10.2.8.3.4 and Table 4-3 in revised EIS TSD XXI will be updated to correct the Project copper threshold for sediment quality. 3. In Table 10.2-9 in Draft EIS Section 10.2.8.3.4, NexGen bolded the arsenic concentration under the Saskatchewan Reference Values for Uranium concentrations (Burnett-Seidel and Liber 2013) REF column. This is a typographical error and will be revised in Table 10.2-9 of revised EIS Section 10.2.8.3.4. Besides the changes noted in part 3 of this IR, and in IR 84 with respect to part 2 of this IR, no changes are proposed in the revised EIS to address this IR.	Section 10.2.8.3.4

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						References Burnett-Seidel C, Liber K. 2013. Derivation of no-effect and reference-level sediment quality values for application at Saskatchewan uranium operations. Environmental Monitoring and Assessment. 185(11): 9481-9494. CCME (Canadian Council of Ministers of the Environment), 1999. Canadian Sediment Quality Guidelines for the Protection of Freshwater Aquatic Life (updated September 2007). Thompson PA, Kurias J, Mihok S. 2005. Derivation and use of sediment quality guidelines for ecological risk assessment of metals and radionuclides released to the environment from uranium mining and milling activities in Canada. Environmental Monitoring and Assessment. 110:71-85.	
86	CNSC	Indigenous groups noting decreased water quality from exploratory work	Section 10.3.1	**Context:** It is stated that Indigenous groups noted a decrease in water quality coinciding with exploratory work in the area prior to 2013. **Rationale:** It is possible that exploratory work for the project altered the baseline of Patterson Lake, it is important to know when baseline data was collected to ensure exploratory work did not alter the undisturbed baseline	Please explain when baseline data for water and sediment quality was collected for the project, when compared to other activities carried out on the site. Provide rationale as to how baseline data was uncompromised by other activities or disturbances which have occurred in the project area.	As a point of clarity, NexGen commenced exploration work in the area of the Project in late 2013 (i.e., after the period referenced by the reviewer in the IR, [i.e., "prior to 2013"]). The baseline water quality and sediment quality data, as presented in the Attachment 10A-1 of Draft EIS Appendix 10A (Surface Water Quality Modelling Report) and Draft EIS Annex V.1 (Aquatic Environment Baseline Report), were collected from seasonal surveys conducted in the area of the Project and the local study area (LSA) between November 2015 and October 2020. Subsequent baseline surveys for surface water quality and sediment quality were completed in 2020, 2021, and 2022. Depending on the specific sampling event, Project exploration activities may or may not have been occurring during the sampling events. However, Project exploration activities are not expected to have affected baseline surface water quality or sediment quality data as NexGen implements best management practices such as maintaining buffers from, and making minimal disturbance in proximity to, waterbodies and watercourses; using environmentally friendly additives to facilitate drilling; and centrifuges to remove radioactive materials from drilling fluid return. From the data collected between November 2015 and October 2020 (i.e., the data used in the EIS), the baseline water quality for Patterson Lake and the downstream lakes and watercourses in the LSA can be characterized as high quality and consistent with other undisturbed northern lakes on the Canadian Shield. The waters are clear, possessing low concentrations of major ions, nutrients, metals, and radionuclides. Some metals and radionuclides are present in measurable concentrations, and in some cases, present in higher concentrations compared to other northern lakes; however, this presence is to be expected due to occurrences of naturally elevated concentrations associated with the geology, mineralization potential, and landscape of the localized watersheds (i.e., some metals and the radionuclides would be expected to be associated with the ore deposit), and due to some of the lakes being very deep and subject to more pronounced seasonal processes and dissolved oxygen dynamics, which can enhance the presence of certain metals in the water column (e.g., iron, manganese). Further, Table 8 in Draft EIS Attachment 10A-1 (Background Surface Water Characterization) presents summary data for the list of water quality constituents for all the lakes and watercourses in the LSA. The data presented in this table highlight the similarity of water chemistry in the lakes and watercourses throughout the LSA, which suggests that potential influences from activities or disturbances within the area of the Project are not measurably contributing to changes to water quality in lakes or watercourses adjacent to the area of the Project (e.g., Patterson Lake) relative to the water quality in the other LSA lakes. NexGen considers the baseline setting from these data as presented in the Draft EIS to be appropriate to characterize the undisturbed baseline water quality conditions for the surface water quality assessment in the EIS for the Project.	n/a

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87	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 10.4.2	**Context:** In Table 10.4-2 pg. 1651-1652 for Pathway SWQ-11 (Treated effluent and treated sewage affecting sediment quality), predicted sediment quality concentrations in the Patterson Lake North Arm West Basin are provided for the different modelling scenario cases for the Project in order to compare predicted sediment concentration exceedances of Constituents of Potential Concern (COPCs) to environmental guidelines and Project thresholds established in Section 10.2.8.3.4 Table 10.2-9 pg. 1626. However, the guidelines and Project thresholds have not been included in Table 10.4-2, making it difficult for reviewers to compare the exceedances to guidelines. Additionally, the assessment of exceedances and risk to receptors has not been made against the most stringent sediment quality guidelines for arsenic and molybdenum (see Comment ECCC-SW-14). Arsenic and cobalt were evaluated further within the Environmental Risk Assessment (ERA) but the results are not discussed within this section of the EIS, and molybdenum was not evaluated further. **Rationale**: Arsenic has CCME Interim Sediment Quality Guideline (ISQG) of 5.9 ug/kg dw and a Probable Effect Level (PEL) of 17 ug/kg dw. However, the less stringent Saskatchewan Reference Values for Uranium Operations Reference (REF) value of 20.8 ug/kg dw and No-Effect (NE2) value of 522 ug/kg dw were used as Project thresholds. Molybdenum has a 'Uranium Mining and Milling in Canada guideline' for Lowest Effect Level (LEL) of 13.8 ug/kg dw and Severe Effect Level (SEL) of 1239 ug/kg dw. However, the less stringent 'Saskatchewan Reference Values for Uranium Operations' REF value of 22.6 ug/kg dw and NE2 value of 245 ug/kg dw. The most stringent guidelines, including molybdenum as a parameter for further evaluation in the ERA, and including the results from the sediment quality risk assessment in the ERA should be used in the assessment of potential effects to aquatic biota and wildlife. Use of the most stringent guidelines will allow for the most protective assessment to analyze risks to the receiving environment.	1. Incorporate IR from comment ECCC-SW-12 to consider Total Organic Carbon, barium, iron, manganese and vanadium for further assessment in the ERA and sediment quality modelling for the sediment quality assessment. 2. Incorporate IR from comment ECCC-SW-14 to update Table 10.2-9 to incorporate the selection of the most stringent sediment quality guidelines for all parameters with available sediment quality guidelines. 3. Update the risk assessment of molybdenum in the ERA for sediment quality. 4. Include the ERA results for the quantitative risk assessment for sediment quality in the EIS for review.	Responses to part 1 through part 4 of this IR are provided below. 1. Please refer to NexGen's responses to IR 81, IR 82, and IR 84. 2. Please refer to NexGen's response to IR 84. 3. NexGen and its qualified professionals do not believe that molybdenum needs to be reassessed in Draft EIS TSD XXI (Environmental Risk Assessment). Molybdenum is included in the sediment quality table, Table 4-3 of Draft EIS TSD XXI, and because the maximum predicted sediment concentration (Application Case [far-future projection] and upper bound [far-future projection]) in Patterson Lake West Arm exceeds the Burnett-Seidel and Liber (2013) reference (i.e., the Project sediment threshold for molybdenum) and the Thompson et al. (2005) lowest effect level (LEL), molybdenum was identified as a constituent of potential concern (COPC) for further assessment in the environmental risk assessment (ERA). In the ERA, all estimated hazard quotients (HQs) for molybdenum for all ecological receptors were shown to remain below the HQ benchmark of 1 (HQs are presented in Section 6.4.1.1.1 of Draft EIS TSD XXI). Therefore, for the projected sediment molybdenum concentrations in Patterson Lake, no significant adverse effects on either aquatic or terrestrial populations or communities as a result of Project releases were determined to be likely during Operations and the far-future projection, in the Application Case, reasonable upper bound sensitivity scenario, and Reasonably Foreseeable Developments Case. 4. The assessment of potential effects of Project activities and discharges on sediment quality in the receiving environment is discussed in the Draft EIS Section 10.4.2 (Secondary Pathways), specifically in Pathway ID SWQ-08 (Site drainage and runoff during Construction and Operations), Pathway ID SWQ-09 (Site drainage and runoff during and following Closure), Pathway ID SWQ-10 (Total suspended solids loadings), and Pathway ID SWQ-11 (Treated effluent and sewage affecting sediment quality). A summary of the ERA findings associated with the modelled COPC concentrations in sediment is presented in the discussion of Pathway ID SWQ-11 (Draft EIS Section 10.4.2). The revised EIS will be updated to capture the updates presented in IR 82 and IR 84. No other changes are proposed in the revised EIS to address this IR. **References** Burnett-Seidel C, Liber K. 2013. Derivation of no-effect and reference-level sediment quality values for application at Saskatchewan uranium operations. Environmental Monitoring and Assessment. 185(11): 9481-9494. Thompson PA, Kurias J, Mihok S. 2005. Derivation and use of sediment quality guidelines for ecological risk assessment of metals and radionuclides released to the environment from uranium mining and milling activities in Canada. Environmental Monitoring and Assessment. 110:71-85.	n/a
88	CNSC	Screening out of the sediment pathway in the EIS	Section 10.4.2 and general throughout section 10	**Context:** Interactions between the project and sediment were classified as a secondary pathway and therefore not carried forward in the assessment. The only area looked at in depth in the EIS was therefore the surface water pathway **Rationale:** Screening out the sediment pathway as a means of contamination discounts the inherent interconnectedness of the entire aquatic ecosystem and removes an important aspect of it from analysis. There are several reasons the sediment pathway should not have been screened out of the analysis after pathways screening:	The proponent must apply the precautionary approach, and provide additional analysis of the sediment pathway, commensurate with that conducted for the surface water pathway, or provide strong justification for screening out sediment pathways from the additional analysis like that conducted for surface water. The changes to sediment concentrations from the project also qualify it to be analysed for a residual effects analysis.	NexGen and its qualified professionals maintain that the approach to assessing the potential Project effects on sediment quality within the Draft EIS is appropriate, defensible, and consistent with industry standards. The detailed assessment of potential changes to sediment quality from Project activities was modelled and is described in Section 5 and Section 6 of Draft EIS TSD XXI (Environmental Risk Assessment) and accounted for how changes to water quality during Operations and into the far-future projection in Patterson Lake may affect sediment quality. The model used for the environmental risk assessment (ERA) considered multiple pathways to potential effects and environmental media (e.g., water, sediment). The ERA evaluated the potential for significant adverse effects on aquatic and terrestrial populations and communities resulting from any changes to sediment quality and concluded that there would be limited risk of adverse effects to aquatic life, wildlife, and humans, particularly in Patterson Lake in the vicinity of the treated effluent discharge (i.e., within the proposed regulated mixing zone).	n/a

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				-That discharge to surface water is considered a primary pathway, this should automatically qualify the sediment pathway as requiring additional analysis that was conducted for the surface water environment, given their interconnectedness. -Cobalt and copper are expected to exceed surface water thresholds into the future, mostly from a groundwater pathway, this groundwater must travel through sediment to reach the surface water environment, sediments in the path of the groundwater will most likely increase as well. A groundwater pathway to sediment should be considered. -Several COPCs are expected to increase throughout the life cycle of the project, with some predicted to potentially exceed surface water thresholds into the far- future. It is well established in other uranium mines that as surface water concentrations of COPCs increase in surface water, it will also increase in the sediments due to settling or uptake of plankton which also settle to the sediment after death or are preyed upon by benthic invertebrates. COPCs in sediment can represent a major source of trophic bioaccumulation in aquatic biota. Screening out the sediment pathway discounts the influence COPC concentrations in surface water could have on sediment quality. -Several sources indicate that thresholds in the sediment will be exceeded: - Table 10.4-2 of the EIS indicates molybdenum, lead-210 and polonium- 210 will exceed thresholds in sediment, showing a possible effect to sediment from the project - The ERA indicated copper exceeded relevant hazard quotients for zooplankton, benthic invertebrates, and lake whitefish While these may not inherently indicate effects to aquatic biota, the precautionary approach must be applied and additional analysis of the sediment pathway must be considered.		The detailed assessment completed by the ERA was referenced in the pathways analysis for sediment quality in Draft EIS Section 10.4 (Project Interactions and Mitigations). Two specific pathways were identified between the Project and the potential for change in sediment quality (i.e., Pathway ID SWQ-10 [Total suspended solids loadings] and Pathway ID SWQ-11 [Treated effluent and sewage affecting sediment quality]). The findings of the ERA resulted in the pathways, particularly Pathway ID SWQ-11 (described further below), being characterized as a secondary pathway. The definition of a secondary pathway is a pathway that could result in a measurable but minor environmental change relative to existing conditions or guideline values, which is sufficiently small that it would have a negligible residual effect on sediment quality, and not result in the potential for adverse risks to valued components (Draft EIS Section 10.2.7 [Project Interactions and Mitigations]). The approach for pathway screening (i.e., to define beneficial, primary, secondary, and no pathways) was used consistently across the EIS (Draft EIS Section 6.7.3 [Pathway Screening]). Much of the analysis to understand the potential Project effects on sediment quality and to subsequently support the categorization of the pathways as secondary was presented in Draft EIS TSD XXI rather than Draft EIS Section 10 (Surface Water Quality and Sediment Quality). The analysis of secondary Pathway ID SWQ-11 identified modelled projections from the ERA for arsenic, molybdenum, lead-210, and polonium-210 in the surface sediment during various Project phases and modelling scenarios that could potentially exceed reference (REF) values (i.e., arsenic and molybdenum) and screening-level lowest effect level (LEL) values (i.e., lead-210 and polonium-210). These exceedances do not necessarily indicate that adverse effects on sediment-based aquatic life would occur; however, these projections were assessed in greater detail (similar to the level of effort for a primary pathway analysis) in the ERA, as follows: ▪ Arsenic and molybdenum projections were evaluated in the ERA, along with the projections of all other potential constituents of potential concern, to determine the potential for risk to aquatic life. The ERA concluded that the modelled projections of arsenic and molybdenum are not considered to pose a risk to either aquatic or terrestrial populations or communities or to humans. ▪ All radionuclides in the uranium-238 decay series (i.e., uranium-238, uranium-234, thorium-230, radium-226, lead-210, and polonium-210), despite not all exceeding the LEL, were assessed. The ERA concluded that there would be no radiation dose benchmark constraints or exceedances for aquatic or terrestrial populations or communities or for humans at or near the Project site from the modelled projections, including from the maximum predicted upper bound concentrations of lead-210 and polonium-210. Secondary pathway, Pathway ID SWQ-10, describes the low potential for total suspended solids (TSS) loading to Patterson Lake, and low potential for settlement and lakebed accumulation in and around the vicinity of the discharge location from the discharge of treated effluent. This low potential is because the TSS within the treated effluent would comply with regulatory (e.g., Metal and Diamond Mining Effluent Regulations) limits prior to discharge to Patterson Lake. NexGen agrees that a precautionary approach should be taken in an EA and maintains that a precautionary approach has been taken throughout the assessment, including in the assessment of Project interactions with sediment quality. The assessment of potential effects on sediment quality followed the overall assessment approach and methods described in Draft EIS Section 6 (Environmental Assessment Approach and Methods), which includes identifying key uncertainties and explaining how these uncertainties were addressed to achieve a conservative, precautionary assessment. As a result, the sediment quality assessment addressed uncertainty by identifying the greatest magnitude, duration, and geographic extent of potential adverse effects when a range of possible outcomes was possible. Consequently, NexGen has a high level of confidence that the assessed residual effects on sediment quality in the receiving environment did not underestimate potential effects from Project interactions. NexGen confirms that these predictions will be verified or refined through monitoring that would be conducted as part of the Project Environmental Monitoring Plan. The Environmental Monitoring Plan will include groundwater and sediment sampling that is designed to detect changes and potential effects along the groundwater to sediment pathway.	

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						No changes are proposed in the revised EIS to address this IR. **References** Metal and Diamond Mining Effluent Regulations. SOR/2002-222 under the *Fisheries Act*. Last amended June 18, 2020. Available at https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2002-222/index.html	
89	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 10.5.1.1.1	**Context**: Table 10.5-1 pg. 1657 depicts the chloride and sulphate concentrations in surface water at the edge of the proposed mixing zone for the Application Case. The water quality threshold for Aquatic and Terrestrial Life for sulphate is predicted to change from 128 mg/L at the beginning of operations to 429 mg/L near the end of operations due to changes in hardness levels in Patterson Lake surface water. It is unclear why hardness levels are expected to change over the lifespan of the Project and if this is a Project-related effect. **Rationale**: If Constituents of Potential Concern (COPC) water quality thresholds are dependent on other water quality parameters, such as hardness, and are predicted to change over the course of the Project lifespan, an explanation of why these changes occur must be provided with clarification whether it is a Project-related effect.	1. Clarify if changes to hardness in surface water quality of Patterson Lake is an expected effect of the proposed Project. 2. Confirm if changes to hardness levels will affect any other COPC thresholds such as cobalt over the course of the Project. 3. Confirm if there are any other general water quality parameters that are expected to change over the course of the Project lifespan that may change COPC thresholds? 4. Include, in the potential COPC exceedances, an evaluation against thresholds that are calculated using baseline condition data during assessments of risk if threshold changes are caused by Project effects.	Responses to part 1 through part 4 of this IR are provided below. 1. NexGen clarifies that the changes to hardness in Patterson Lake are an expected effect of the proposed Project (i.e., from treated effluent discharge during Operations). As presented to the CNSC during early engagement meetings (e.g., 24 August 2021), the increase in hardness in the receiving environment (i.e., Patterson Lake and farther downstream in the local study area [LSA]) is an expected change because the primary ions that contribute to hardness (i.e., calcium and magnesium) are elevated in the treated effluent discharge as counter ions to chloride and sulphate. The projected changes to the major ions over the life of the Project and in the far-future projection are presented in Attachment 10A-2 of Draft EIS Appendix 10A (Surface Water Quality Modelling Report). The plots for hardness, chloride, and sulphate in this attachment show a corresponding temporal increase in Patterson Lake North Arm – West Basin due to the Project discharges during Operations, which attenuate downstream through the rest of Patterson Lake and the downstream lakes in the LSA. These elevated major ion concentrations also diminish in parallel when treated effluent discharge ceases at the end of Operations. 2. As discussed with the CNSC during early engagement (i.e., prior to submission of the Draft EIS), the change in hardness during the life of the Project and the far-future projection was accounted for in all other constituents of potential concern (COPCs) that have hardness-dependent guidelines (e.g., sulphate, cadmium, cobalt, copper, lead, nickel) because hardness is an exposure- and toxicity-modifying factor (ETMF) for these constituents. Based on projected change to hardness in Patterson Lake and the downstream lakes, and the magnitude of change to hardness, specifically in Operations during treated effluent discharge, changes to the Project thresholds for these hardness-dependent COPCs only applied to sulphate and cobalt. These changes are illustrated in the modelled projections presented for sulphate, cadmium, cobalt, copper, lead, and nickel in Attachment 10A-2 of Draft EIS Appendix 10A. 3. The Project thresholds that have ETMFs other than hardness include: ▪ ammonia, where the ETMFs are pH and temperature; and ▪ aluminum, where the ETMFs are pH, dissolved organic carbon (DOC), and calcium. For ammonia, threshold modifications were based on measured monthly water temperature and pH as the Project is not expected to measurably change the water temperature and pH in Patterson Lake or any downstream waterbody. For total aluminum, the threshold was set as the uppermost threshold concentration (i.e., 100 µg/L) due to the background DOC concentration being greater than 2 mg/L (i.e., DOC was not modelled as the Project is not expected to be a material source of DOC [see NexGen's response to IR 79]) and the projected calcium concentrations are greater than 4 mg/L over the duration of the Project and into the far future. The resulting total aluminum threshold was the same as the upper-bound Canadian Council of Ministers of the Environment guideline (i.e., 100 µg/L; CCME 2023). 4. NexGen does not agree that the assessment suggested by ECCC constitutes a science-based evaluation because it does not account for the water quality conditions that would be experienced by biota. As hardness is an ETMF for some metals and ions, which means that the potential for one of these metals or ions to exert a toxicity influence on aquatic life decreases with increasing concentrations of the ETMF, it is reasonable and appropriate to consider hardness in the derivation of thresholds to evaluate the potential for adverse risk to aquatic biota. This approach is further supported by the water quality modelling results that show concurrent	n/a

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						increases to each of the metals and ions during Project discharge (i.e., they are each sourced from the Project in the treated effluent discharge to the receiving environment). It is also worth noting that in the far-future projection where the cobalt increases in Patterson Lake are sourced from the groundwater pathway, there is no corresponding hardness increase. Thus, the cobalt projections are evaluated under low hardness conditions, which identifies conditions where the cobalt projections are higher than the Project threshold. No changes are proposed in the revised EIS to address this IR. **References** CCME (Canadian Council of Ministers of the Environment). 2023. Water Quality Guidelines for the Protection of Aquatic Life: Aluminium. Available at http://st-ts.ccme.ca.vsd46.korax.net/en/?lang=en&factsheet=4	
90	CNSC	Increase in sulphate thresholds throughout life of project	Section 10.5.1.1.1	**Context:** Table 10.5-1 indicates that the sulphate increases ~3.3 times from start of operation to end of operation. Sulphate concentrations at the end of operation will also increase above what the threshold would be under baseline conditions. **Rationale:** The sulphate threshold is hardness driven, which is expected to increase throughout the life of the project from effluent, this in turn allows a larger release of sulphate without exceeding thresholds. The modification of hardness represents an effect on the surface water environment, as it is changing it in such a way that more sulphate is allowed into the system than would be sustainable under baseline conditions. This appears to be in contradiction with the pollution prevention principle, which does not seem to have been considered for the control of sulphate.	Please provide information on how the principle of pollution prevention and the application of BATEA has been considered in the control of sulphate. Please provide additional justification, to demonstrate application of the precautionary approach as to why it is appropriate to release an amount of sulphate into the environment that could potentially cause adverse effects under natural conditions. **Suggestions for mitigation and follow-up measures** Principles of pollution prevention and the precautionary approach should be applied for the control of sulphate, with the application of BATEA for wastewater treatment in order to keep environmental concentrations of COPCs ALARA.	NexGen confirms that pollution prevention is a Project objective that was considered within the Draft EIS. This objective will be further refined through future design stages and reflected in the associated Project licensing and permitting phases. As described in the Draft EIS Appendix 10A (Surface Water Quality Modelling Report), a set of water quality models was applied to generate water quality predictions that were compared to regulatory thresholds to assess potential effects of the effluent treatment plant (ETP) discharge. The models applied conservative assumptions, such as those described in Section 3.2.4 of Draft EIS TSD XVII (Waste Rock and Underground Wall Rock Source Term Predictions Report). Similarly, the applied thresholds were conservatively drawn from the lowest applicable guidelines as described in Draft EIS Section 10.2.8.3 (Development of Thresholds). The Project design has considered the results of the EA and has conceptually engineered an ETP that would meet all Project thresholds in the receiving environment. Therefore, the ETP would be capable of producing a treated effluent that would protect all life forms, including from potential effects from the release of sulphate. As the Project proceeds into detailed design, the ETP will be re-evaluated to consider updated input data (e.g., mill effluent predictions, baseline data, other source terms) and as part of a more detailed process of technology evaluation and selection. Through this continued Project engineering and optimization, final treated effluent release targets will be proposed as part of the licensing processes for the Project to meet REGDOC-2.9.2 (CNSC 2021). Consistent with REGDOC-2.9.2 (CNSC 2021), the principles of pollution prevention, best available technology and techniques economically achievable (BATTEA), and as low as reasonably achievable (ALARA) are being applied in the design and engineering of the ETP, especially as it relates to the treatment of constituents such as sulphate that are expected to be a primary constituent in the treated effluent. These principles will be reflected in the applications that will be submitted to the CNSC and other federal agencies for review as part of Project licensing, commensurate with the stage of Project development. Regarding the discharge of sulphate, as noted in the response to IR 89, the changes to hardness in Patterson Lake are an inevitable outcome of the proposed Project discharge. As presented to the CNSC during early engagement meetings (e.g., 24 August 2021), the increase in hardness in the receiving environment is an expected change because the primary ions that contribute to hardness (i.e., calcium and magnesium) are elevated in the treated effluent discharge as counter ions to chloride and sulphate. The projected changes to the major ions over the life of the Project and in the far-future projection are presented in Attachment 10A-2 of Draft EIS Appendix 10A (Surface Water Quality Modelling Report). The plots for hardness, chloride, and sulphate in this attachment show a corresponding temporal increase in Patterson Lake North Arm – West Basin due to Project discharges during Operations, which would attenuate downstream through the rest of Patterson Lake and the downstream lakes in the local study area. These elevated major ion concentrations would also diminish in parallel when treated effluent discharge ceases at the end of Operations.	n/a

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						Hardness is a well-documented exposure- and toxicity-modifying factor (ETMF) for sulphate (Elphick et al. 2011), which is why the applied sulphate guideline varies with hardness (BC MOE 2013). At the time when biota in Patterson Lake would be exposed to elevated concentrations of sulphate, they would also be protected by elevated hardness levels, as shown in Attachment 10A-2 of Draft EIS Appendix 10A. Since the sulphate and hardness both originate in the treated effluent discharge, biota would not be exposed to elevated concentrations of sulphate without the associated elevated hardness levels at any time or under any development scenario for the Project. The applied sulphate guideline was developed based on the most sensitive life stage of the most sensitive species (i.e., rainbow trout during the 21-day eyed embryo to alevin life stage). Additionally, a safety factor of 2 was applied to the lethal concentration endpoint that results in mortality of 20% of test organisms (LC_{20}). Therefore, maintaining sulphate concentrations below the hardness-dependent guideline for Patterson Lake is a precautionary approach that would protect biota in the lake throughout the Project lifespan. No changes are proposed in the revised EIS to address this IR. **References** BC Ministry of Environment. 2013. Ambient Water Quality Guidelines for Sulphate. Technical Appendix. Available at https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/sulphate/bc_moe_wqg_sulphate.pdf CNSC (Canadian Nuclear Safety Commission). 2021. REGDOC-2.9.2, Environmental Protection, Controlling Releases to the Environment. DRAFT. March 2021. Available at https://www.nuclearsafety.gc.ca/eng/pdfs/regulatory-documents/regdoc2-9-2/REGDOC-_9_2_Controlling_Releases_to_the_Environment.pdf Elphick, J.R., M. Davies, G. Gilron, E. C Canaria, B. Lo and H. C Bailey. 2011. An aquatic toxicological evaluation of sulfate: The case for considering hardness as a modifying factor in setting water quality guidelines. Environ. Toxicol. Chem. 30(1):247-53.	
91	CNSC	Exceedances of Copper and Cobalt predicted in the far-future	Section 10.5.1.2.3 and throughout section 10	**Context:** The EIS predicts cobalt will exceed aquatic protection and drinking water quality threshold into the far-future in and downstream from Patterson Lake (potentially into the RSA). Copper will also exceed the aquatic protection threshold in Patterson Lake. The suspected source of this ongoing contamination is from leeching of surface and subterranean waste-rock piles. **Rationale**: The prediction that Patterson Lake and downstream aquatic environments could be impacted for as long as models predict, represents an unacceptable compromise of the environment and violation of the CNSC mandate of protection people and the environment. Every measure should be taken to prevent this outcome and a concrete plan needs to be in place to ensure the environment is able to be returned to baseline conditions after the end of the project. The site must be passively safe after decommissioning, and a permanent leaching of select COPCs into the receiving environment, resulting in long-term exceedances of thresholds, and potential long-term and irreversible impacts to the receiving environment, does not demonstrate a passively safe site.	Propose additional mitigation measures the ensure the potential irreversible contamination of Patterson Lake and downstream does not occur. The EIS currently indicates this will be a source of monitoring, follow-up, and adaptive management activities; however, these conditions are not expected to occur until after decommissioning of the project which could be too late to prevent this from occurring. **Suggestions for mitigation and follow-up measures** Installation of impermeable and long term effective membranes/barriers on waste rock piles or consideration of other waste rock management approaches to control cobalt and copper migration.	NexGen acknowledges the reviewer's comment though disagrees with the statement "the prediction that Patterson Lake and downstream aquatic environments could be impacted for as long as models predict, represents an unacceptable compromise of the environment and violation of the CNSC mandate of protection people and the environment." NexGen is undertaking measures to protect people and the environment, and notes that results presented in the EIS are based on a conservative approach to assessment such that potential effects are not underestimated (Draft EIS Section 6.10 [Prediction Confidence and Uncertainty]). As described in Draft EIS Section 11.5.2.2 (Summary of Ecological Risk Assessment Results), the ecological risk assessment evaluated and presented the estimated risks to aquatic receptors due to releases from the Project to Patterson Lake in the far future once groundwater solutes would reach the Patterson Lake North Arm – West Basin. Estimated hazard quotients for the far future were predicted to be below the benchmark of 1 for all constituents of potential concern (COPCs), except for copper in the Application Case and reasonable upper bound scenario. As a result, an aquatic health assessment was undertaken to further evaluate the potential effects of exposure of aquatic biota in Patterson Lake to elevated copper concentrations (Draft EIS Section 11.5.2.3 [Summary of Aquatic Health Assessment Results]). The aquatic health assessment concluded that at the predicted magnitude of effect, exposure to copper in Patterson Lake would be unlikely to result in adverse effects on aquatic populations and communities. If effects occurred, the predicted magnitude would be within the range of background variability and thus unlikely to be measurable. NexGen notes that predicted effects to fish and fish habitat valued components (VCs) are deemed to be not significant.	n/a

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						As described in Draft EIS Section 15.2.8.2 (Constituents of Potential Concern), copper was a COPC considered in the environmental risk assessment and human health risk assessment. The assessments showed that, although increases in copper concentrations in Patterson Lake in the far future would occur, water quality would remain protective of human health for all receptors (Draft EIS Section 15.5.1.1 [Non-carcinogens]). NexGen notes that predicted effects to the human health VC are deemed to be not significant (Draft EIS Section 11.5.4.2 [Significance Determination]). Although potential effects to human and ecological VCs are predicted to be not significant, NexGen is committed to responsible development that is underpinned by effort and dedication towards environmental protection and health and wellness (Draft EIS Section 1.1.2 [NexGen Vision, Values, and Approach]). With this in mind, NexGen is currently developing an Adaptive Management Plan (AMP) for waste rock seepage (Draft EIS Section 10.8 [Key Findings]; Draft EIS Section 11.7 [Monitoring, Follow-Up, and Adaptive Management]). The scope of the waste rock seepage AMP is to manage closure seepages, though this plan will be implemented in the near term to reduce uncertainties and plan for additional mitigation, if necessary, to protect environmental values. An objective of the waste rock seepage AMP is to identify and implement monitoring during the early stages of waste rock storage area (WRSA) development that will inform mitigations during Operations to avoid any potential requirement for reactive mitigation during decommissioning. Within the development of the mine plan, and in the development of the waste rock seepage AMP, all feasible approaches to managing waste rock seepage are being considered, including the consideration of incorporating long-term, low-permeability barriers in the construction and closure phases of the WRSAs, as well as monitoring and response triggers. A draft version of the waste rock seepage AMP will be provided to the CNSC as available, noting this plan would not form part of the revised EIS. For the purposes of the EA, information regarding NexGen's adaptive management process is provided in Draft EIS Section 23.5.3 (Adaptive Management). No changes are proposed in the revised EIS to address this IR.	
92	CNSC	Potential shift of Patterson Lake North Arm from Oligotrophic to Mesotrophic	Section 10.5.1.2.6	**Context:** The sensitivity analysis indicated that the trophic state of the North Arm of Patterson Lake could temporarily shift from oligotrophic to mesotrophic during the operations phase of the project **Rationale:** Measures should be taken to ensure a trophic shift does not occur in the lake. This was a specific issue raised with local Indigenous groups, who indicated the clear waters of Patterson Lake and surrounding waterbodies was of significant importance to them, as well as noting algae would indicate compromise of water quality.	Provide additional justification and commitments that lake eutrophication will be monitored and prevented during the operation of the project. **Suggestions for mitigation and follow-up measures** Installation of BATEA for the wastewater treatment in order to keep environmental concentrations of COPCs ALARA.	The Draft EIS reported that a change in trophic status in Patterson Lake from oligotrophic conditions to mesotrophic conditions, based on total phosphorus (TP) projections resulting from the discharge of treated effluent, is possible for the Application Case for the Project, but limited to the upper bound scenario only (see the phosphorus plots in Attachment 10A-2 of Draft EIS Appendix 10A [Surface Water Quality Modelling Report]). Note that a trophic level change is not predicted for the Reasonably Foreseeable Development Case. Further, the surface water quality modelling results, especially for the Application Case, are based on conservative assumptions. For example, the Draft EIS models did not account for biological uptake of phosphorus or co-precipitation with aluminum or other elements that are known to reduce in-lake phosphorus concentrations. The potential effects on lake productivity as a result of the projected phosphorus loads from the Project are discussed in detail in the pathway analysis in Draft EIS Section 11.4.2 (Secondary Pathways) under Pathway ID F-14 (Nutrient changes from Project activities). This pathway analysis concluded that the loading of phosphorus from Project activities discharged to Patterson Lake is predicted to result in a minimal increase in TP concentrations in the aquatic receiving environment with no changes to lake trophic status expected for any of the waterbodies assessed. This increase in TP concentrations may result in minor changes to primary productivity and in potentially negligible and non-measurable effects on the productivity of lower trophic level consumers (e.g., zooplankton and benthic invertebrates); therefore, effects on the productivity of fish, particularly piscivorous (i.e., upper trophic level consumers) are not expected. The assessment also reiterated that the regional surface water quality model likely overpredicted the TP concentrations as the model did not account for uptake of the phosphorus by organisms and removal by sedimentation. As stated in Draft EIS Section 11.4.2, the Environmental Protection Program and Environmental Monitoring Plan developed for the Project would result in monitoring data that would be used to calculate the load of constituents of potential concern (COPCs) discharging into Patterson Lake	n/a

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						during Operations when there is treated effluent discharge. These COPCs would include nutrients such as phosphorus so that the potential for corresponding effects on the productivity of aquatic organisms can be evaluated, and if required, the triggering of operational adjustments to reduce the loading. In addition to the water quality monitoring at the discharge point and in the receiving environment, biological monitoring of the aquatic receiving environment would be undertaken in parallel, with the resulting data used to determine the potential for nutrient enrichment effects on fish and lower trophic organisms. The application of best available technology and techniques economically achievable (BATTEA) for wastewater treatment during the life of the Project to keep COPC concentrations (e.g., phosphorus) as low as reasonably achievable is being conducted in accordance with REGDOC-2.9.2 requirements (CNSC 2021). These principles will be reflected in the applications that will be submitted to federal agencies for review as part of facility licensing. **References** CNSC (Canadian Nuclear Safety Commission). 2021. REGDOC-2.9.2, Environmental Protection, Controlling Releases to the Environment. DRAFT. March 2021. Available at https://www.nuclearsafety.gc.ca/eng/pdfs/regulatory-documents/regdoc2-9-2/REGDOC-2_9_2_Controlling_Releases_to_the_Environment.pdf	
93	CNSC	Aquatic environment	Section 10.5.2.1.3 TSD XXI- ERA-section 6.3.1.1	**Context:** The EIS states that in the far future, the average monthly cobalt concentrations are predicted to consistently exceed the threshold value in Patterson Lake North Arm – West Basin and Patterson Lake South Arm, peaking at 0.0015 mg/L (1.5 ug/L) and 0.0011 mg/L (1.1 ug/L), respectively. The threshold for cobalt used is 0.465 ug/L (as can be seen in table 4-2 of the ERA), and is based on the FEQG for cobalt which takes hardness into account. Patterson Lake is considered to have soft hardness (e.g., often less than 25 mg/L $CaCO_3$). Although the EIS predicts exceedances of the cobalt threshold, the ERA does not predict any effects from cobalt on aquatic or terrestrial populations as a result of releases from the project (i.e., all HQ values are below 1). The ERA uses TRVs for cobalt from Stubblefield et al., 2020 that are adjusted to an EC_{20}. It is not clear if these TRVs take the study area's low hardness into account. **Rationale:** The TRVs for cobalt from Stubblefield et al., 2020 presented in table 6-15 of the ERA do not appear to be adjusted to take low hardness into account. For example, table 6 of Stubblefield et al., 2020 indicates that the hardness in the chronic toxicity test results ranges from 27.4 to 250.3 mg/L. Since the project area is known to have low hardness, this would mean that cobalt could be more toxic at lower concentrations, therefore making the TRVs presented in the ERA less conservative. For example, the lowest TRV for cobalt in the ERA is 9.8 ug/L for aquatic plants (based on conversion to EC_{20}) . The SSD curve derived from Stubblefield et al., 2020, calculated a value of 1.8 ug/L for cobalt for 5% of species effected. The FEQG for cobalt (based on a hardness of 52) is 0.78 ug/L, and would be even lower for the project area due to softer waters. Based on the information presented it is not clear if the TRVs for cobalt used in ERA are adequately conservative.	Please provide additional information/justification on the cobalt TRVs chosen for use in the ERA, and ensure the TRVs used to predict effects are conservative and take the soft hardness of the project area into account.	NexGen acknowledges the reviewer's comment and agrees to modify the toxicity reference values (TRVs) used for cobalt for aquatic receptors to account for the far-future water hardness in the area of the Project. In Draft EIS TSD XXI (Environmental Risk Assessment), the TRVs for cobalt were not adjusted for the far-future hardness in Patterson Lake where the lake is expected to return to approximately baseline hardness levels. The TRVs identified for cobalt for the ecological risk assessment in the environmental risk assessment (ERA) (Draft EIS TSD XXI, Section 6.3.1.1, Table 6-15) were 20% effect concentration (EC_{20}) from Stubblefield et al. (2020) with hardness ranging from 27.4 mg/L to 125.2 mg/L. The TRVs used for cobalt in Draft EIS TSD XXI will be adjusted to a lower hardness using the hardness slope from the Federal Environmental Quality Guideline (FEQG) (Environment Canada 2017). The FEQG for cobalt applies to a hardness range from 52 mg/L to 396 mg/L; therefore, the TRVs can only be modified to the lowest hardness in the FEQG range of 52 mg/L. NexGen notes that the test hardness values from Stubblefield et al. (2020) for zooplankton (i.e., 46.7 mg/L) and phytoplankton (i.e., 27.4 mg/L) were below the lowest hardness used in the FEQG hardness slope; therefore, these values do not require further adjustment from Stubblefield et al. (2020). The TRVs for fish, benthic invertebrates, and aquatic plants have been adjusted to the lowest hardness (i.e., 52 mg/L) based on the FEQG hardness slope. The revised EC_{20} values are shown in Table 1 in Attachment IR 93-1. These values were adjusted using the following equation: $EC_{20(normalized)} = 10^{((0.414)\times log\,(normalized\ hardness\ value) - \log(test\ hardness\ value)) + \log\,(test\ EC_{20})}$ Where: ▪ EC_{20} (normalized) is the normalized toxicity value. ▪ 0.414 is the toxicity-hardness slope for cobalt, based on toxicity studies conducted over test hardness levels between 52 mg/L and 396 mg/L (Environment Canada 2017). For cobalt, the normalized hardness value is 52 mg/L. Table 1 of Attachment IR 93-1 summarizes the biotic group, representative species, endpoint, test hardness, toxicity value, and normalized toxicity value. NexGen notes that in the ERA (Draft EIS TSD XXI), the Zebrafish study from Stubblefield et al. (2020) was used as the representative species for the predator fish. Considering the geography	TSD XXI, Section 6.4.1.1, 6.4.1.2

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						and habitat of the Project, the predator fish is better represented by the Rainbow Trout EC_{20} from Stubblefield et al. (2020). As such, revised EIS TSD XXI will be updated to reflect this change. The updated hazard quotients (HQs) for cobalt in the far-future are shown in Table 2 of Attachment IR 93-1. NexGen notes that while TRVs from Stubblefield et al. (2020) were intended to be used in the IMPACT model (Draft EIS TSD XXI, Appendix A), older TRVs for cobalt based on the lowest estimated EC_{20}s from the ECOTOX database were modeled in error rather than Stubblefield et. al (2020). Therefore, the HQs presented in Table 2 in Attachment IR 93-1 represent updated IMPACT model results that considered both the adjusted TRVs with respect to lower water hardness and the required correction to use the Stubblefield et al. (2020) TRVs. The cobalt HQs for all aquatic ecological receptors continue to remain below the HQ benchmark of 1, which continues to support the conclusion of no significant adverse effects on aquatic populations or communities as a result of releases from the Project over the long term. NexGen acknowledges there is uncertainty in the TRVs at a site hardness of approximately 13 mg/L in the far future; however, considering the water at both 13 mg/L and 52 mg/L would be considered soft, there is likely little difference between TRVs at a site hardness of 13 mg/L and 52 mg/L. In addition, as the highest predicted HQ value is only 19.5% of the benchmark of 1 (i.e., macrophyte upper-bound, far-future projection for Patterson Lake North Arm – West Basin), potential changes to TRVs as a result of a further reduction in water hardness would not be expected to result in any HQs exceeding the benchmark. Table 6-24 and Table 6-25 of revised EIS TSD XXI will be updated based on the changes identified in the response to this IR. **References** Environment Canada. 2017. *Canadian Environmental Protection Act, 1999*. Federal Environmental Quality Guidelines Cobalt. May 2017. 9pp. Available at https://www.ec.gc.ca/ese-ees/92F47C5D-24F5-4601-AEC0-390514B3ED75/FEQG%20Cobalt%20Final%20EN.pdf Stubblefield, W.A., Van Genderen, E., Cardwell, A.S., Heijerick, D.G., Janssen, C.R., De Schamphelaere, A.C. 2020. Acute and Chronic Toxicity of Cobalt to Freshwater Organisms: Using a Species Sensitivity Distribution Approach to Establish International Water Quality Standards. Environmental Toxicology and Chemistry 39, 799–811.	
94	CNSC	Aquatic Environment	Section 10.5 TSD XXI- ERA-section 4.2.2	**Context:** It is not clear if the pathway for groundwater to sediment was considered in the EIS/ERA for the far future modelling when exceedances for cobalt and copper are predicted in surface water (caused in large part by WRSA and tailing management seepage and infiltration). The Federal Environmental Quality Guidelines (FEQG) for cobalt states that cobalt binds strongly with sediments and suspended particulate matter and that high sediment-water partition coefficients suggest that cobalt will remain for the most part in bottom sediments after entering this compartment. **Rationale:** It is difficult to follow the methodology used in the EIS/ERA related to the sediment pathway, particularly if sedimentation for copper and cobalt present in surface water (caused by WRSA/tailing management GW seepage/infiltration) was considered for the far future.	Please clarify if the sediment pathway was considered from groundwater in the far future (caused by seepage and infiltration from WRSA and tailing management) for copper and cobalt.	NexGen confirms that the sediment pathway from Project interactions to the receiving environment in the far-future projection was considered in the ecological risk assessment. As noted in Section 4.2.2 of Draft EIS TSD XXI (Environmental Risk Assessment), input sources for the far-future projection for the aquatic environment IMPACT modelling, which included sediment quality, were obtained from the following: ▪ groundwater solute transport model for the release of soluble constituents from mine sources (i.e., mine workings, underground tailings mining facility, and surface waste rock storage areas) to Patterson Lake North Arm – West Basin in the far-future projection; and ▪ regional surface water quality model for water quality after the addition of the groundwater solute transport inputs in the far-future projection. Specifically, predicted mass flux for constituents of potential concern (COPCs) from groundwater, including cobalt and copper, was added in the far-future projection to Patterson Lake North – West Basin. Water and sediment COPC concentrations were then predicted in the receiving environment using the equations in Appendix A of Draft EIS TSD XXI. Modelling for the environmental risk assessment was performed in IMPACT.	n/a
95	CNSC	Surface Water quality	Section 10A6.3.2.2	**Context:**	For the cumulative effects assessment, please apply the precautionary approach, and consider treated mine	For the surface water quality and sediment quality cumulative effects assessment, NexGen applied a precautionary approach with the assumption that management of aerial emissions and water	n/a

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		Cumulative effects		The EIS determined potential cumulative effects on water quality by estimating the combined impacts of the project activities under the Application Case and the activities related to the Fission Patterson Lake South Property. The EIS states that "*as the Fission Patterson Lake South Property has not been approved and expected quality of the discharges is not within the public domain, the treated sewage quality was set equal to the treated sewage discharge quality from the Project.* *Additionally, the treated mine effluent discharge quality during the assumed three- year construction period and six-year operating period of the Fission Patterson Lake South Property was assumed to be equal to the median treated effluent quality predicted for the Project during the corresponding mine life phases. The quality assigned to site surface runoff from the Fission Patterson Lake South Property above-ground tailings management facility and covered waste rock storage facility in the far future was set to equal to the median treated effluent quality predicted for the Project during Operations."* The EIS also states that the cumulative effects from the Project and the Fission Patterson Lake South Property on surface water quality in general would include an increase of COPC concentrations in the South Arm of Patterson Lake compared to the Application Case, however COPCs would remain below water quality thresholds. It is not clear how conservative these assumptions on water quality from the Fission Patterson Lake South Property project are to support this conclusion. **Rationale:** It is not clear from the EIS if the surface runoff from the Fission Patterson Lake South Property above-ground tailings management facility and covered waste rock storage facility will be collected, treated, and released as effluent, or if it is a separate source-term that is not being collected/treated and is being released directly into Patterson Lake, and this distinction will impact what assumptions for predicted water quality should be used. Furthermore, the quality assigned to the treated mine effluent discharge and site surface runoff from the Fission Patterson Lake South Property above-ground tailings management facility and covered waste rock storage facility was set to equal to the median treated effluent quality predicted for the Project during Operations, however the NexGen Project is proposing underground tailings management, and therefore the NexGen effluent quality may not be representative of Fission's effluent or surface water runoff. It is unclear how similar the effluent from the NexGen Project would be to a project that includes an above-ground tailings management facility. In this case, the precautionary approach should be applied, whereby effluent and surface water runoff quality estimates from other operational above-ground tailings management facilities would be more conservative, and hence more appropriate for predicting cumulative effects than using the median treated effluent quality predicted for the NexGen Project.	effluent and surface runoff quality estimates conservatively based on existing operating mines OR include information on how using the assumptions under section 10A6.3.2.2 of the EIS is conservative to determine cumulative effects on water quality, and how it respects the precautionary approach. Please clarify if Fission Patterson Lake South Property surface water runoff will be treated as effluent and provide rationale that the median treated effluent quality predicted for the NexGen Project is appropriate for estimating effluent and run-off from a facility with above-ground tailings management.	would be undertaken to a similar standard as for the Project. The Fission Patterson Lake South Property is a reasonably foreseeable development (RFD), wherein the absence of any project-specific details beyond a broad-based mine plan requires assumptions to be made regarding project activities and their potential to result in changes to surface water quality and sediment quality. In generating assumptions for these Fission Patterson Lake South Property inputs, NexGen considered available data from other active uranium mines in the region to confirm that inputs were reasonable, yet conservative. However, it was identified that these mines do not report data for all the constituents of potential concern (COPCs) used in the Project surface water quality and sediment quality assessment. To fill these gaps, NexGen used source data based on modelled results for the Application Case assessment for the Project. NexGen acknowledges that during engagement with the CNSC during Draft EIS development, the CNSC consistently indicated that it does not consider legacy uranium operations to be suitable indicators of current and future best practices that will pass regulatory approval. Therefore, assuming that a future project will manage environmental effects and produce mine effluents the same as legacy operations is inconsistent with direction provided by CNSC. NexGen also assumes that the CNSC would expect the Fission Patterson Lake South Property to adhere to modern environmental standards, not those of legacy operations. Supporting aspects for the approach used by NexGen in referencing Project inputs for evaluating the Fission Patterson Lake South Property as an RFD in the EA include the following: ▪ The Fission Patterson Lake South Property would occur in the same local region as the Project, so geochemical inputs from ore and mine rock are expected to be similar to the Project. ▪ Similar mitigation and operational management practices, including treated effluent discharge using best available technology and techniques economically achievable (BATTEA) and the principles of pollution prevention and as low as reasonably achievable (ALARA), used for the Project would also be expected to be implemented by the Fission Patterson Lake South Property. ▪ Source water for the Fission Patterson Lake South Property would also be from Patterson Lake. With respect to surface runoff, the quality assigned to site surface runoff from the Fission Patterson Lake South Property above-ground tailings management facility and covered waste rock storage facility in the far future was set to be equal to the median treated effluent quality predicted for the Project during Operations (Section 10A6.3.2.2 of Draft EIS Appendix 10A [Surface Water Quality Monitoring Report]). NexGen considers the use of a median value of treated effluent quality derived from the Project, in lieu of any Fission Patterson Lake South Property-specific information, to be a practical surrogate to apply for the RFD in the EA. This assumption has been deemed to be appropriate as it is anticipated that the quality of any runoff that has the potential to drain into a receiving environment from infrastructure associated with the RFD would be subject to mitigation that would bound the quality of that runoff to be equivalent to the quality of the treated effluent that would be discharged from the Fission Patterson Lake South Property. NexGen believes that the approach used in assessing the RFD is reasonable and defensible, and based on the best available information at the time of completing the Draft EIS. NexGen also recognizes that details specific to the Fission Patterson Lake South Property and additional cumulative effects assessments would be expected to be completed by the Fission Patterson Lake South Property if and when that project moves forward in the review and permitting phases, especially if any new information suggests the potential for substantial differences from the assumptions used in the current RFD Case. No changes are proposed in the revised EIS to address this IR.	
96	ECCC	Fish and fish habitat Change to an environmental component due	Section Appendix 10A7.4.1	**Context**: It is incorrectly stated that only chloride concentrations exceed water quality thresholds at the edge of the mixing zone from the Effluent Treatment Plant (ETP). Table 10A-34 pg. 1777 demonstrates that both sulphate and chloride exceed water quality thresholds at the edge of the mixing zone. Additionally, this table should be updated to include all parameters of interest from the	1. Include all general water quality parameters (ex. pH, temperature, hardness, total suspended solids, etc.) and un-ionized ammonia in Table 10A-34. 2. Include all water quality thresholds for each parameter in Table 10A-34.	Responses to part 1, part 2, and part 3 of this IR are provided below. 1. and 2. The mixing zone modelling results shown in Table 10A-34 in Section 10A7.4.1 of Draft EIS Appendix 10A (Surface Water Quality Modelling Report) are limited to the constituents that screened in as constituents of potential concern (COPCs) in the assessment. Therefore, general constituents such as pH, temperature, hardness, and total suspended solids are not included in	Appendix 10A, Section 10A7.4.1

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		to hazardous contaminants		*Metal and Diamond Mining Effluent Regulations* (MDMER) and their respective water quality thresholds. **Rationale**: ECCC advice is to include the general water quality parameters that influence water quality thresholds in this table and parameters in Schedule 4 of the MDMER, so that any changes over the lifespan of the Project can be reviewed.	3. Update the conclusions on water quality threshold exceedances at the edge of the mixing zone in this section to address sulphate exceedances and any other changes to general water quality parameters over the Project lifespan.	this table as these constituents were not identified as COPCs. However, in response to the meeting with the CNSC and Environment and Climate Change Canada (ECCC) on 9 June 2023, NexGen will update Table 10A-34 in Section 10A7.4.1 of revised EIS Appendix 10A to clarify assumptions for constituents flagged as exceeding Project thresholds where the value or concentration of other measured constituents (e.g., pH, temperature, hardness) contributed to the exceedances. These added assumptions will assist the CNSC and ECCC in verifying the identification of the Project thresholds. NexGen also notes this broader range of constituents would be included in monitoring programs during the life of the Project. 3. With respect to the constituent exceedances identified by ECCC in the near-field mixing model results tables, the identification of sulphate in Table 10A-34 in Section 10A7.4.1 of Draft EIS Appendix 10A for the 'End' period of Operations for the ETP [effluent treatment plant] Reasonable Upper Bound Sensitivity Scenario and the STP [sewage treatment plant] Application Case exceeding its Project threshold at the edge of the mixing zone was an error. During this time, the Project threshold for sulphate would be 429 mg/L in the mixing zone because of the associated higher hardness; the maximum predicted sulphate concentrations at this time for both the ETP Reasonable Upper Bound Sensitivity Scenario and the STP Application Case are below the Project threshold. For this reason, the only predicted exceedance at the edge of the mixing zone is chloride. NexGen notes that the highlighted exceedance of chloride at the edge of the mixing zone is limited to the upper bound modelling scenario, which represents a conservative modelling case. Further, the maximum predicted chloride concentration (i.e., 134 mg/L) is just above the Project threshold (i.e., 120 mg/L), so any aquatic risk associated with exposure to that concentration is considered negligible. This conclusion is additionally supported by recent work by Elphick et al. (2011), which showed hardness is an effective exposure and toxicity modifying factor for chloride, meaning that any possible risk of exposure to the maximum predicted concentration would be mitigated by the corresponding elevated hardness at the edge of the mixing zone at this time. With respect to part 3 of this IR, NexGen will update Table 10A-34 in Section 10A7.4.1 of the revised EIS Appendix 10A to correct the bolded sulphate concentrations. NexGen confirms no other changes to conclusions for general water quality constituents over the Project lifespan are required to address part 3 of this IR. **References** Elphick JRF, Bergh KD, Bailey HC. 2011. Chronic toxicity of chloride to freshwater species: effects of hardness and implications for water quality guidelines. Environmental Toxicology and Chemistry. 30, 239-246.	
97	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Appendix 10A7.4.2	**Context**: This section states that the Total Suspended Solids (TSS) concentration for the Effluent Treatment Plant (ETP) and Sewage Treatment Plant (STP) were set to 25 mg/L for the modelling of the near-field area. The maximum allowable discharge limit under the *Metal and Diamond Mining Effluent Regulations* (MDMER) Schedule 4 is 15 mg/L monthly mean concentration from any final discharge point. **Rationale**: It remains the Proponent's responsibility to adhere to the MDMER to ensure that effluent at the end-of-pipe from the final discharge points meets the requirements of Section 4 and Schedule 4 of the regulations.	1. Update modelling to reflect changes to TSS concentration limits to adhere to MDMER discharge limits. 2. Update conclusions in this section to reflect any changes in results.	Responses to part 1 and part 2 of this IR are provided below. 1. NexGen will update the effluent treatment plant (ETP) discharge total suspended solids (TSS) concentration in the near-field surface water quality modelling in Section 10A7.4.2 of revised EIS Appendix 10A (Surface Water Quality Modelling Report) to be consistent with the maximum allowable discharge limit of 15 mg/L under the Metal and Diamond Mining Effluent Regulations (MDMER) Schedule 4. The modelling input adjustment of TSS concentration from 25 mg/L to 15 mg/L is expected to result in a slightly lower TSS concentration at the edge of the mixing zone compared to what is presented in the Draft EIS. NexGen acknowledges that discharge from sewage treatment plants (STPs) is not regulated by the MDMER; however, NexGen understands that treated sewage effluent would be required to be within 25 mg/L of TSS, particularly if the sewage treatment facility would discharge to water frequented by fish. As part of the modelling update outlined above for the revised EIS stated, the STP treated effluent TSS input will be retained at 25 mg/L.	Section 10.5.1.1; Appendix 10A, Section 10A7.4.2

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						2. As the stated adjustment to the maximum allowable TSS concentration in treated effluent discharge from the ETP will be reduced from 25 mg/L to 15 mg/L, NexGen expects that the conclusions in revised EIS Section 10.5.1.1 (Near-Field Water Quality Model) related to edge of the mixing zone TSS concentrations would remain as stated (i.e., the reduction in the TSS concentrations input to the near-field surface water modelling to reflect the MDMER limits will not affect the overall conclusions of the subsection). The revised EIS will be updated to reflect these changes to TSS concentration limits. **References** Metal and Diamond Mining Effluent Regulations. SOR/2002-222 under the *Fisheries Act*. Last amended June 18, 2020. Available at https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2002-222/index.html	
98	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Appendix 10A7.5.1	**Context**: Modelling results should be provided for all Constituents of Potential Concern (COPCs) and water quality parameters required under the *Metal and Diamond Mining Effluent Regulations* (MDMER) and any parameters expected to have elevated concentrations in effluent or that have elevated baseline concentrations. There is no information provided in this section on effluent concentration inputs used for the modelling. A water quality threshold of 429 mg/L for sulphate has been applied but in Section 10.2.8.3.1 Table 10.2-5 pg. 1620-1622 the proposed threshold for the Project is 128 mg/L. **Rationale**: A review all modelling results of all COPCs under the MDMER will assist ECCC in understanding the potential risks to the receiving environment. Additionally, ECCC advises that all Project thresholds and water quality guidelines are adhered to throughout the lifespan of the Project, with reasoning provided for any changes to those thresholds.	1. Provide modelling results for all COPCs and water quality parameters required under the MDMER and any parameters expected to have elevated concentrations in effluent or elevated baseline concentrations. 2. Provide the expected effluent discharge concentrations for all parameters used as inputs for the modelling. 3. Provide an explanation for the discrepancy in the sulphate water quality threshold.	Responses to part 1, part 2, and part 3 of this IR are provided below. 1. Please refer to NexGen's responses to IR 79, IR 82, and IR 96. 2. The expected effluent treatment plant effluent discharge concentrations used in the regional and near-field surface water quality modelling were based on the preliminary effluent release targets (PERTs) presented in Appendix H of Draft EIS TSD XVIII (Site-Wide Water Balance and Water Quality Modelling Report). These concentrations are expected to be refined through the licensing process for the Project and will be updated and provided to the CNSC as per REGDOC-2.9.2 (CNSC 2021) requirements. 3. NexGen highlights footnote (e) associated with the Project threshold for sulphate in Table 10.2-5 in Draft EIS Section 10.2.8.3.1 (Water Quality Thresholds), which states, "128 mg/L for all lakes excluding Patterson Lake based on hardness in the study areas that is consistently 21 mg/L $CaCO_3$ or less. The COPC [constituent of potential concern] threshold for sulphate in Patterson Lake would therefore vary over time based on the measured hardness in the lake." The Project threshold for sulphate would therefore change in Patterson Lake with changing ambient hardness conditions as explained in NexGen's response to IR 89. To address part 1 of this IR, NexGen will update the revised EIS to reflect the updated thresholds and sulphate concentrations as outlined in responses to IR 79, IR 82, and IR 96. No changes are proposed in the revised EIS to address part 2 and part 3 of this IR. **References** CNSC (Canadian Nuclear Safety Commission). 2021. REGDOC-2.9.2, Environmental Protection, Controlling Releases to the Environment. DRAFT. March 2021. Available at https://www.nuclearsafety.gc.ca/eng/pdfs/regulatory-documents/regdoc2-9-2/REGDOC-2_9_2_Controlling_Releases_to_the_Environment.pdf	n/a
99	DFO	Fish and fish habitat	Sections 11 & 13	**Context:** No mention in Section 11 (Fish and Fish Habitat) or Section 13 (Vegetation) of whether wetlands are providing fish habitat. It could be that the types of wetlands present do not have sufficient standing water or connectivity to waterbodies to provide fish habitat; however, this should be stated explicitly. **Rationale:** Wetlands can provide valuable habitat for fish; therefore, if the wetlands predicted to be impacted have the potential of providing fish habitat, they	Describe whether there is standing water in any of the wetlands that could be providing fish habitat. If there is the potential for wetlands in the study area to support fish, further investigation into fish presence/absence is required. If the wetlands do not have sufficient water to support fish life processes, explicitly state this in the report. **Suggestions for mitigation and follow-up measures**	NexGen confirms that Pathway ID F-08 (Loss or alteration of fish habitat) in Draft EIS Section 11.4.2 (Secondary Pathways) quantifies all direct fish habitat losses, including riparian habitat losses, that are expected to occur as a result of the proposed Project. This evaluation included consideration of fish habitats that are also wetlands, as assessed by the wetland ecosystems valued component (Draft EIS Section 13.3 [Existing Conditions], Figure 13.3-4). For the purposes of the EA, it is assumed that riparian wetlands represent fish habitat; however, the Project is not anticipated to result in disturbance to riparian wetlands.	Section 11.4.2

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				must be evaluated for presence of fish and be appropriately included in the quantification of impacts to fish and fish habitat.	If there are found to be fish in wetlands that will be impacted by the project, the proponent will be required to develop an offsetting plan to counterbalance the loss.	NexGen notes there are other land-based wetland areas that could be affected by the Project through direct loss or disturbance; however, these wetlands are not currently expected to be disturbed under the existing Project design. The land-based wetlands do not have open-water areas or surface connectivity with downstream fish habitats, and therefore do not represent fish habitat (Draft EIS Section 13.5.2 [Wetland Ecosystems]). These wetlands were not considered within the assessment of fish and fish habitat (Draft EIS Section 11 [Fish and Fish Habitat]). Where direct effects on fish habitat cannot be avoided or minimized, including riparian wetland areas with fish habitat, NexGen would determine through engagement with Fisheries and Oceans Canada if fish habitat offsetting measures are required to counterbalance any residual fish habitat losses. The text in Pathway ID F-08 in revised EIS Section 11.4.2 will be updated to clarify that wetlands were considered in the assessment of fish habitat loss, as follows: "The evaluation of direct habitat loss included consideration of fish habitats that are also wetlands, as assessed by the wetland ecosystems valued component (refer to Figure 13.3-4 in Section 13.3.2.2 [Ecosystem Distribution]). Other wetland areas identified in Section 13.5.2 (Wetland Ecosystems) that may potentially be affected by the Project through direct loss or disturbance are not fish habitat (i.e., do not have open-water areas or surface connectivity with downstream fish habitats)."	
100	ECCC	Fish and fish habitat	Section 11.2.2.1 Section 11.5.2.4.1	**Context**: Table 11.2-1 pg. 1997 of the EIS provides the chosen fish species as Valued Components (VC) for further assessment. Lake Whitefish were chosen as a VC and representative species for forage fish species. However, Lake Whitefish are a large- bodied, cold, deep-water, transitory benthivorous fish species that does not share similar life history traits with many small-bodied forage fish species. Lake Whitefish should not be used as the representative species for forage fish. **Rationale**: EEM monitoring recommends using a large-bodied and small-bodied fish species to capture potential effects across different trophic levels within the exposure area. Large-bodied fish species are often very transitory and may not exist within the exposure area for long enough periods of time for effects to be accurately measured (i.e. may not be in exposure area during sampling, may only use exposure area during spawning, etc.), whereas small-bodied forage fish are more likely to be located in large numbers within the exposure area consistently and during monitoring. The additional a small-bodied forage fish species that is well studied as a VC would ensure potential effects across different trophic levels within the exposure area are captured in the assessment.	Include a small-bodied forage fish species as a VC for the risk assessment in the ERA.	NexGen respectfully submits that additional assessment of a small-bodied forage fish species as a valued component (VC) in the fish and fish habitat assessment (Draft EIS Section 11 [Fish and Fish Habitat]) or as a receptor in Draft EIS TSD XXI (Environmental Risk Assessment) is not warranted. Lake whitefish was chosen as a receptor in the environmental risk assessment (ERA) to represent a fish species that was exposed to both sediment and water. A small-bodied fish was not assessed separately in the ERA as the results of modelling of a small-bodied forage fish would be similar to that of lake whitefish. In the ERA, lake whitefish was conservatively assumed to reside 100% of the time in the same location. This assumption of limited movement by lake whitefish is similar to how a small-bodied fish would be assessed. As stated in Section 6.1.1.1 of Draft EIS TSD XXI, the selection of lake whitefish as a receptor in the ERA and VC in the fish and fish habitat assessment (Draft EIS Section 11) was made due to its importance to Indigenous Groups as a food source and to its widespread abundance. Small-bodied fish species that occur in the aquatic local and regional study areas (e.g., slimy sculpin, spottail shiner, lake chub, ninespine stickleback, trout perch) did not have the same importance to Indigenous Groups as lake whitefish. Small-bodied species were not mentioned or were mentioned infrequently by communities during engagement compared to species retained as VCs or ERA receptors. Additionally, the functional role of many small-bodied species possess overlap with lake whitefish. For example, all small-bodied species are also forage species. As recommended by the reviewer, and consistent with Environment Canada's *Metal Mining Technical Guidance for Environmental Effects Monitoring* (Environment Canada 2012), NexGen will consider including a small-bodied fish species as a sentinel species for environmental monitoring should an Environmental Effects Monitoring (EEM) fish population study be triggered under the Metal and Diamond Mining Effluent Regulations. NexGen acknowledges that small-bodied fish are often preferred for this work as they can be abundant and resilient to harvesting pressure, and population performance typically reflects local conditions due to their limited mobility and small home ranges. These small-bodied species are also relatively short lived and show changes in survival, energy storage, and energy use earlier than longer lived large-bodied species (Environment Canada 2012). The identification of sentinel species for future monitoring will be confirmed during development of the first EEM study design. No changes are proposed in the revised EIS to address this IR. **References**	n/a

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						Environment Canada. 2012. Metal Mining Technical Guidance for Environmental Effects Monitoring. Government of Canada, Environment Canada National EEM Office, Science Policy and Environmental Quality Branch, Ottawa, Ontario. Metal and Diamond Mining Effluent Regulations. SOR/2002-222 under the *Fisheries Act*. Last amended June 18, 2020. Available at https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2002-222/index.html	
101	CNSC	Assessment and Measurement Endpoints	Section 11.2.2.3 and 11.2.2.2	Assessment endpoints (e.g., 7.4.2.2.3, 11.2.2.3) should be discussed in the section preceding measurement indicators (e.g., 7.4.2.2.2, 11.2.2.2), since measurement indicators are used to predict overall effects on assessment endpoints.	Reorganize the sections so that assessment endpoints precedes measurement indicators section.	NexGen notes the discussion of measurement indicators and assessment endpoints for each discipline assessment aligns with the approach presented in Draft EIS Section 6 (Environmental Assessment Approach and Methods). Measurement indicators are modelled (where applicable) and analyzed quantitatively (where possible) and qualitatively (where necessary) in the residual effects analysis for the Application Case and Reasonably Foreseeable Development Case (Draft EIS Section 6.8 [Residual Effects Analysis]). The predicted changes in measurement indicators resulting from the residual effects analysis are then used to classify and determine the significance of effects from those changes on valued components in context of associated influences on assessment endpoints (Draft EIS Section 6.3.2 [Assessment Endpoints and Measurement Indicators]). The classification of residual effects also follows the residual effects analysis (Draft EIS Section 6.9.1 [Residual Effects Classification]), which is followed by significance determination (Draft EIS Section 6.9.2 [Significance Determination]). Thus, the organization of the methods in each discipline section (i.e., Draft EIS Section 7 [Air Quality, Noise, and Climate Change] through Draft EIS Section 19 [Community Well-Being]) follows the approach of the assessment described in Draft EIS Section 6.1.2 (Approach). No changes are proposed in the revised EIS to address this IR.	n/a
102	CNSC	Habitat Productivity	Section 11.2.6 (pg 11-29)	**Context and Rationale**: Consider addition of available fish habitat productive capacity metrics in their assessment or provide rationale for exclusion. There are metrics available to measure productive capacity of fish habitat (e.g., Habitat Productivity Index, Index of Biotic Integrity), but during review, only qualitative ranges in the NexGen EIS could be identified. For example: Comparison of a Habitat Productivity Index (HPI) and an Index of Biotic Integrity (IBI) for Measuring the Productive Capacity of Fish Habitat in Nearshore Areas of the Great Lakes - ScienceDirect (Free)	Consider addition of available fish habitat productive capacity metrics in their assessment or provide rationale for exclusion.	The use of fish habitat productive capacity metrics in the fish and fish habitat assessment (Draft EIS Section 11 [Fish and Fish Habitat]) is not warranted as effects on fish habitat productivity are predicted to be minimal. A single primary pathway, Pathway ID F-01 (Changes in surface water quality from WRSAs [waste rock storage areas] and UGTMF [underground tailings management facility] after Closure), was considered in the fish and fish habitat assessment in Draft EIS Section 11.4.3 (Primary Pathways). This pathway is not expected to meaningfully alter fish habitat productivity in Patterson Lake. As outlined in Draft EIS Section 11.5 (Residual Effects Analysis), the assessment of Pathway ID F-01 addressed the potential for effects on fish and fish habitat valued components (VCs) due to exposure to copper in the water column from runoff and seepage from the WRSAs and the UGTMF in the far future. The assessment considered the potential for changes in habitat resulting from effects on the food base for fish (e.g., benthic invertebrates, plankton, forage fish species). The results of the assessment indicated the potential for limited effects on the available food supply for fish due to exposure of lower trophic level organisms (e.g., zooplankton, benthic invertebrates) and forage fish species (e.g., lake whitefish) to predicted copper concentrations. Broadscale changes to the fish food base are not expected to occur. Therefore, changes in habitat quality are considered unlikely to measurably affect fisheries productivity in Patterson Lake. Overall, effects on fish VC habitat availability, survival, and reproduction were predicted to be negligible to low. Similarly, direct fish habitat losses associated with a secondary pathway, Pathway ID F-08 (Loss or alteration of fish habitat), are predicted to result in negligible effects on fish and fish habitat VC habitat availability in Patterson Lake (Draft EIS Section 11.4.2 [Secondary Pathways]). Development of water management infrastructure components in Patterson Lake, including a fresh water intake, treated effluent diffuser, treated sewage outfall, and associated pipelines, are predicted to result in a limited loss of fish habitat along the shoreline of the lake, adjacent to the proposed Project site. The total estimated in-water footprint associated with these developments is small (i.e., approximately 1,258 m^2), representing 0.003% of the surface area of Patterson Lake (i.e., 38 km^2). Although some limited changes in habitat availability may occur due to these in-water	n/a

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						developments, the proposed works are not expected to meaningfully affect VC fish populations (i.e., through effects on growth, survival, or reproduction) or associated fisheries productivity. Losses of habitat would also be considered by Fisheries and Oceans Canada in the Request for Review or *Fisheries Act* Authorization, if required, for the Project. Overall, predicted changes to habitat quality and quantity are minor and not expected to affect the ability of fish VCs to carry out their life history processes. Measurable effects at the population level are not expected. This interpretation is based on experience with other small-scale developments for similar projects. The predicted minor changes in fish VC habitat availability (i.e., 0.003% of Patterson Lake) do not warrant estimating changes in fish habitat productive capacity. No changes are proposed in the revised EIS to address this IR.	
103	CNSC	Lower trophic community sampling	Section 11.2.6.4 (pg 11-36)	**Context and Rationale:** There is currently no discussion identifying species that are resilient and those that are sensitive to chemical or physical stressors. As this information could provide early indicators of potential changes to aquatic community, it should be captured in the EIS.	Consider addition of discussion of resilient and sensitive lower trophic community species and their use as an early indicator of potential changes to aquatic community or provide rationale for exclusion.	NexGen acknowledges the reviewer's comment and confirms that information on sensitive lower trophic community species was considered in the Draft EIS. Information on lower trophic level communities was primarily used in the Draft EIS to support the assessment of the fish habitat availability measurement indicator. Lower trophic organisms, such as plankton and benthic invertebrates, are important prey items for fish and form the base of the aquatic food web. The fish and fish habitat assessment appropriately focused on characterizing potential changes to the quality or quantity of available lower trophic level prey for fish and fish habitat valued components (VCs). Examples are secondary pathways, Pathway ID F-13 (Project activities affecting water and sediment quality and aquatic health) and Pathway ID F14 (Nutrient changes from Project activities) in Draft EIS Section 11.4.2 (Secondary Pathways); and primary pathway, Pathway ID F-01 (Changes in surface water quality from WRSAs [waste rock storage areas] and UGTMF [underground tailings management facility] after Closure), in Draft EIS Section 11.4.3 (Primary Pathways) where potential effects on the lower trophic food base for fish are characterized. In particular, Section 11A3 of Draft EIS Appendix 11A (Aquatic Health Assessment of the Potential for Adverse Effects of Predicted Far-Future Copper Concentrations in Patterson Lake) presents a discussion on the potential aquatic health effects on sensitive species associated with elevated copper concentrations in the water column due to runoff and seepage from the WRSAs and UGTMF in the far future. The analysis integrates the results of the species sensitivity distribution (SSD) curve generated for chronic copper toxicity in Patterson Lake North Arm – West Basin for the Application Case and Reasonable Upper Bound Scenario, and summarizes the available chronic aquatic toxicity data for each sensitive species reflected in the SSD curve (Draft EIS Appendix 11A, Figure 11A-4 and Table 11A-3). The SSD curve and related summary of toxicity data include several lower trophic level species. Based on evaluation of the SSD, adverse effects on fish, invertebrates, and plants are unlikely because predicted copper concentrations are lower than the lowest low-effect concentration for the most sensitive species. This information was used to support the assessment of primary pathway, Pathway ID F-01, in the fish and fish habitat residual effects assessment (Draft EIS Section 11.5 [Residual Effects Assessment]). Monitoring and assessment of lower trophic communities as an early indicator of potential changes to fish habitat is also expected to occur as a component of the Project Environmental Monitoring Program that would be developed in support of federal licensing. If triggered under the Metal and Diamond Mining Effluent Regulations, NexGen will undertake a benthic invertebrate community study as a component of the Project's environmental effects monitoring program. Should the results of monitoring indicate that a change to the aquatic environment has occurred, the data analysis and interpretation methods would consider the responses in resilient and sensitive benthic species, as appropriate, as a line of evidence to understand the nature of the change, and to confirm whether the change is related to the Project. No changes are proposed in the revised EIS to address this IR.	n/a

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						References Metal and Diamond Mining Effluent Regulations. SOR/2002-222 under the *Fisheries Act*. Last amended June 18, 2020. Available at https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2002-222/index.html	
104	DFO	Fish and fish habitat	Section 11.4.1 Pg. 92	**Context**: The EIS states that 'All applicable DFO-recommended measures to avoid causing harm to fish from the use of explosives would be followed for the project Project (DFO 2019b). The DFO guidelines for the use of explosives in or near fish-bearing waters (Wright and Hopky 1998) provide a maximum allowable limit for overpressure (i.e., peak pressure level; 100 kilopascals) and peak particle velocity (i.e., 13 mm/s).' **Rationale**: These guidelines are not currently accepted as a code of practice by DFO, and more recent research suggests the 100 kPa threshold may not be appropriate to ensure that fish are not harmed. DFO's previous Western and Arctic Region has recommended a maximum overpressure threshold of 50kPa (Cott and Hannah 2005). More recent research suggests this value is protective of fish including sensitive life stages (Koden and Aimone 2013). Cott P., and B. Hanna. 2005. "Monitoring explosive-based winter seismic exploration in waterbodies, NWT 2000–2002." In *Offshore Oil and Gas Environmental Effects Monitoring: Approaches and Technologies*, edited by S.L. Armsworthy, P.J. Cranford, and K. Lee, 473-490. Columbus: Batelle Press. http://dx.doi.org/10.13140/2.1.2312.7688. Kolden, K. D., and C. Aimone-Martin. 2013. "Blasting Effects on Salmonids." *Alaska Department of Fish & Game*. https://www.adfg.alaska.gov/static/home/library/pdfs/habitat/blasting_report.pdf.	The blasting assessment should be updated using the 50 kPa threshold. If the threshold is exceeded, mitigation measures should be proposed to reduce harmful effects. If measures to reduce impacts are predicted to be ineffective due to project design or site limitations, the potential impacts should be quantified and accounted for in the offsetting plan. A monitoring plan to confirm predictions and adaptively manage effects from blasting should be developed.	NexGen acknowledges the reviewer's comment and confirms that blasting for the Project is predicted to comply with the maximum overpressure threshold recommended by Fisheries and Oceans Canada in the IR (i.e., peak pressure level [PPL] of 50 kilopascals [kPa]; Cott and Hanna 2005). NexGen will update Pathway ID F-18 (Explosives harming fish) in revised EIS Section 11.4.1 (No Pathway) and revised EIS TSD X (Vibration Effect Analysis Report) to reflect the 50 kPa recommendation. As presented in Section 3 of Draft EIS TSD X, the predicted PPL at all fish receptor locations is well below the 50 kPa recommendation. The maximum predicted PPL for blasting near Patterson Lake is 17 kPa. As all PPL values are predicted to be well below the 50 kPa recommendation, residual effects on fish and fish habitat from blasting are not expected. Therefore, NexGen does not anticipate that blasting would need to be considered in a fish habitat offsetting plan. If separation distances defined in Draft EIS TSD X are approached, site-specific operating mitigations could be implemented, as required, to protect fish and fish habitat. NexGen will update the revised EIS to refer to the recommended 50 kPa threshold, where applicable. **References** Cott P, Hanna B. 2005. Monitoring Explosive-based Winter Seismic Exploration in Waterbodies, NWT 2000-2002. Pages 473-490. In: Proceedings of the Offshore Oil and Gas Environmental Effects Monitoring Workshop: Approaches and Technologies. Battelle Press. Columbus. 601 p + index. 10.13140/2.1.2312.7688.	Section 11.4.1; TSD X, Section 3
105	ECCC	Wildlife and Wildlife Habitat	Table 11.4-1 Table 23A-4	The draft EIS states that water crossing structures will be designed to limit the area disturbed and in a manner that protects the banks from erosion (Table 11.4-1 path ID F-10), particularly when moving equipment across the river using cranes. There was no discussion of the potential effects of these activities to SAR, migratory birds or wetland function.	Describe the methods that will be used to minimize erosion of stream banks and how success of these measures will be evaluated. Explain any risks to migratory birds, SAR and wetland function as a result of these crossings.	NexGen confirms that information regarding methods used to minimize erosion of stream banks is included in the Draft EIS Section 23A (Summary of Project Environmental Design Features and Mitigation Measures). As presented in Table 23A-4 of Draft EIS Appendix 23A, NexGen commits to implementing sediment and erosion control best practices and standard mitigations (e.g., temporary sediment ponds, silt curtains, sediment traps) during all Project phases. Further details on specific erosion control methods and monitoring will be provided during the licensing and permitting processes for the Project, as applicable and commensurate with the stage of Project development. Risks to migratory birds and species at risk (SAR) from Project activities were assessed through the secondary pathway, Pathway ID W-05 (Injury and mortality from clearing), in Draft EIS Section 14.4.2 (Secondary Pathways). The assessment predicted that any adverse interactions between the proposed Project and wildlife, including SAR, are expected to be infrequent and result in negligible residual effects on valued components (VCs). Residual effects to wetlands and associated wetland condition and function from Project construction and infrastructure, such as water crossing structures, were assessed in Draft EIS Section 13.5.2 (Wetland Ecosystems). The assessment predicted that there would be no significant adverse effects to the wetland ecosystem VC. No changes are proposed in the revised EIS to address this IR.	n/a
106	ECCC	Fish and fish habitat	Section 11.4.2	**Context**:	1. Provide further information on the existing conditions and bridge crossing including dimensions, capacity,	NexGen acknowledges the reviewer's request for information on the Clearwater River crossing and movement of equipment and has included information on the existing bridge specifications below,	Section 11.3.1.2

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		Change to an environmental component due to hazardous contaminants		The movement of heavy equipment and infrastructure across the Clearwater River below Patterson Lake at the existing bridge crossing is discussed in this section. The Proponent proposed two options, (1) the use of a crane to maneuver equipment across the river, and (2) upgrading the existing bridge to provide additional capacity. The Proponent's preferred approach is the use of a crane but the bridge will be upgraded in the event that it is deemed necessary. The Proponent concludes that upgrading the bridge will have negligible changes to fish habitat availability and thus is not further assessed. More information on the current bridge crossing would assist in the assessment of the amount of risk to the receiving environment from both options. **Rationale**: Currently there is no information provided on the current bridge crossing for dimensions, capacity and river flows. There is also no information provided regarding the amount of equipment expected to be brought across the river, and which best management practices would be used. Further information on proposed spill management and monitoring would assist in analyzing the options presented.	footprint and information about the Clearwater River at that specific location (i.e., flows, depth, width, etc.). 2. Provide more information on the number and types of equipment that would need to be lifted over the river and the footprint for both options. 3. Provide further information on which best management practices will be applied for spills management and monitoring.	noting that information regarding the physical and biological characteristics of the Clearwater River in the immediate vicinity of the bridge crossing location is already contained within the Draft EIS. NexGen further acknowledges that information regarding the equipment to be transported over the Clearwater River bridge crossing and additional details on spill response is outside the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012.* Responses to part 1, part 2, and part 3 of this IR are provided below. 1. Additional information related to the current bridge size is provided as follows: ▪ dimensions: 27.33 m (long) by 5.53 m (wide); ▪ capacity: 100,000 lbs (45,360 kg); and ▪ footprint: 150 m^2. Information about the physical and biological characteristics of the Clearwater River in the immediate vicinity of the bridge crossing location is provided in the Draft EIS Section 9 (Hydrology) and Draft EIS Section 11 (Fish and Fish Habitat), as well as Draft EIS Annex IV.2 (Hydrometric Monitoring Characterization Report) and Draft EIS Annex V.1 (Aquatic Environment Baseline Report). Draft EIS Section 9.4 (Existing Conditions) and Section 5.3 of Draft EIS Annex IV.2 provide information related to water flows, depths, and widths at the Clearwater River bridge crossing location. Baseline hydrometric station CR-WC-MS-03 is located on the Clearwater River immediately upstream of the bridge, and seasonal information on water surface elevation (i.e., water depth), discharge, and stream channel parameters (e.g., channel width) are summarized for this location. Additionally, Draft EIS Section 11.3.1.2 (Clearwater River Mainstem, Clearwater River below Patterson Lake) and Section 9.3.3.1 of Draft EIS Annex V.1 present a description of fish habitat conditions for the 1-km long section of the Clearwater River between Patterson Lake and Forrest Lake, which includes the bridge crossing location. Revised EIS Section 11.3.1.2 will be updated to indicate that the surveyed section of the Clearwater River below Patterson Lake includes the bridge crossing of the site access road. 2. At the current stage of planning for the Project, detailed information is not available on the types of heavy equipment or infrastructure that would need to be lifted over the river and the size of the work area required for staging and site access. The footprint of staging areas would be limited to the extent practicable to minimize the area of disturbance. Additional information will be provided during licensing activities for the Project, as applicable. 3. Standard best management practices and mitigations related to spills would be implemented in accordance with the Project Environmental Protection Program and supporting documentation. Further details on specific spills management and monitoring approaches that would be applied during this Project activity will be provided during Project licensing, as applicable. **References** *Canadian Environmental Assessment Act, 2012.* SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html	

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107	CNSC	Summary of key information sources considered in the fish and fish habitat residual effects assessment	Figure 11.5-1 (pg 11-117)	For Key Findings it mentions that both cobalt and copper concentrations in Patterson Lake are predicted to exceed surface water quality thresholds for the protection of aquatic life, but in boxes that follow there is no mention of cobalt, only copper.	Revise Figure 11.5-1 to indicate if/how cobalt was removed from further consideration in second step (EcoRA) (Cobalt HQ<1).	NexGen has prepared a revised version of Figure 11.5-1 in Draft EIS Section 11.5.1 (Approach) that is included as Attachment IR 107-1, which clarifies that cobalt was removed from additional assessment of potential aquatic health effects because the ecological risk assessment predicted that hazard quotients for cobalt were below the benchmark of 1. As indicated in Draft EIS Section 11.5.2.2 (Summary of Ecological Risk Assessment Results), although cobalt concentrations were predicted to exceed surface water quality guidelines, estimated hazard quotients for cobalt were less than 1 in all assessment cases and for all aquatic receptors, indicating that health effects from exposure to cobalt are not expected to occur; therefore, cobalt was not considered further in the assessment. Figure 11.5-1 of revised EIS Section 11.5.1 will be updated as per Attachment IR 107-1.	Section 11.5.1
108	CNSC	Surface water quality guidelines	Section 11.5.1.1 (pg 11-118), Table 115-1	Report mentions that surface water quality predictions were compared to CCME guidelines (2021) and SK provincial WQ objectives (WSA 2015), but not upper limit of background.	Provide reference to where in EIS and how the upper limit of background was calculated and taken into consideration.	In the Draft EIS, regional surface water quality model predictions of the screened constituents of potential concern (COPCs) were compared to Project thresholds established for each COPC but not to the upper limit of background concentrations. Project thresholds were primarily based on Canadian Council of Minsters of the Environment guidelines (CCME 2023), Saskatchewan provincial water quality objectives (WSA 2015, 2017), and/or Health Canada (HC) drinking water guidelines (HC 2022), as applicable. Project thresholds for COPCs were set for the surface water quality assessment in the Draft EIS to identify if projected surface water quality and sediment quality during the lifespan of the Project and the far-future projection had the potential to adversely affect aquatic and terrestrial life, drinking water quality, and waterbody productivity health. While comparisons to the upper limit of background concentrations can be useful for evaluating whether water quality concentrations fall within the range of natural variability for a waterbody or watercourse, comparisons to Project thresholds allowed the assessment to provide specific predictions about the potential for adverse effects to the various water uses in the local and regional study areas. NexGen confirms that the upper limit of background surface water quality was calculated for water quality constituents identified as COPCs and taken into consideration for the Draft EIS. Attachment 10A-1a of Draft EIS Appendix 10A (Surface Water Quality Modelling Report) presents measured data for each baseline sampling event representing background conditions and summary statistics for including minimum, average, maximum, and 95th percentile concentrations for all COPCs from the sampled lakes in the local study area. The 95th percentile concentrations presented in the tables in Attachment 10A-1a are considered to be representative of the background conditions. However, regional surface water quality model predictions were not compared to the calculated upper limit of background concentrations. In other words, the upper limit of background was not applied as a benchmark or threshold. NexGen notes that preliminary effluent release targets (PERTs), which formed the basis of expected effluent treatment plant effluent discharge concentrations that were used in the regional and near-field surface water quality modelling, were developed for the Draft EIS. These PERTs were conservatively estimated assuming the 95th percentile background water quality constituent concentrations in the receiving environment for Patterson Lake North Arm – West Basin and Patterson Lake North Arm – East Basin. The PERTs and the method to derive them are presented in Appendix H of Draft EIS TSD XVIII (Site-Wide Water Balance and Water Quality Modelling Report). The PERTs are expected to be refined through the federal licensing and provincial permitting processes. No changes are proposed in the revised EIS to address this IR. Environmental release targets will be refined, updated, and provided to the Saskatchewan Ministry of Environment and the CNSC as part of the applications for provincial permitting and federal licensing, respectively. **References** CCME (Council of the Ministers of the Environment). 2023. Water Quality Guidelines Summary Table. Available at https://ccme.ca/en/summary-table	n/a

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						HC (Health Canada). 2022. Guidelines for Canadian Drinking Water Quality – Summary Table. Water and Air Quality Bureau, Healthy Environments and Consumer Safety Branch, Health Canada. Ottawa: Ontario. WSA (Water Security Agency). 2015. Surface Water Quality Objectives, Interim Edition, EPB 356. Saskatchewan Environmental and Municipal Management Services Division, Water Security Agency. June 2015. WSA. 2017. Saskatchewan Water Quality Objective for the Protection of Aquatic Life – Molybdenum. Fact Sheet. Report No. WSA 514.	
109	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 11.7	**Context**: There is the potential for a low level of risk to aquatic biota in the far future due to elevated copper concentrations in surface water due groundwater inputs from the Potentially Acid Generation Waste Rock Storage Area (PAG WRSA). Forage fish, benthic invertebrates and planktonic species are predicted to be at higher risk than predatory fish species. The Proponent states that they are “developing an adaptive management plan to reduce uncertainty and manage risks related to this pathway”. **Rationale**: Further information on this topic would assist ECCC in assessing the risk to aquatic receptors.	Provide the adaptive management plan, and include details on the monitoring and management of copper loadings to Patterson Lake for all Project stages including post-closure from the PAG WRSA.	NexGen notes the Environment and Climate Change Canada’s (ECCC’s) request is outside the scope the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012*. For the purposes of the EA, information regarding NexGen’s adaptive management process is provided in Draft EIS Section 23.5.3 (Adaptive Management). To assist the ECCC in understanding the risk to aquatic receptors, a draft version of the Adaptive Management Plan (AMP) for copper and cobalt will be provided to the CNSC, as available, noting this plan would not form part of the revised EIS. The draft AMP for copper and cobalt would include mitigation details associated with elevated copper concentrations in surface water due to groundwater inputs from the potentially acid generating waste rock storage area. No changes are proposed in the revised EIS associated with this IR. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html	n/a
110	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 11A2.3	**Context**: Table 11A-2 pg. 2155 provides the input values for the Biotic Ligand Model (BLM) and Multiple Linear Regression (MLR) models for the assessment of copper. Hardness values were predicted based upon predicted calcium and magnesium concentrations rather than baseline values. **Rationale**: As per comment ECCC-SW-16, clarity is would assist in understanding if changes in concentrations of hardness and other parameters are a Project-related effect.	Provide additional information on the parameter inputs used for the BLM and MLR models and if concentrations are related to Project effluent inputs to Patterson Lake.	NexGen acknowledges the reviewer’s comment and confirms that information on the parameter inputs used for the biotic ligand model and multiple linear regression model is presented in Table 11A-2 and Attachment 11A-1 of Draft EIS Appendix 11A (Aquatic Health Assessment of the Potential for Adverse Effects of Predicted Far-Future Copper Concentrations in Patterson Lake). Inputs were derived from the regional surface water quality model predictions. As stated in Attachment 11A-1 of Draft EIS Appendix 11A, elevated copper concentrations in the far-future projection are predicted to exceed the Project threshold value. Section 11A1 of Draft EIS Appendix 11A states that “[t]he primary source of loading for copper in the far future is the slow migration of hydrogeological mass load inputs from the waste rock storage areas and to a lesser extent, the underground tailings management facility.” During the Operations Phase, treated effluent discharge is predicted to increase major ions including calcium and magnesium in Patterson Lake, which was then used to determine the hardness to apply to define the copper objectives. After the cessation of effluent discharge (i.e., Decommissioning and Reclamation [i.e., Closure] Phase), the concentrations of sodium, calcium, and magnesium are predicted to decrease and return to baseline levels. Thus, there are no Project-related effects on sodium, calcium, magnesium, and calculated hardness in the far-future projection. For chloride and sulphate, inputs from the site (mostly groundwater) increase chloride loads by approximately 80% and sulphate loads by approximately 60% over background levels. Thus, the modelled changes in chloride and sulphate in the far-future projection are due to Project-related effects.	n/a

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						No changes are proposed in the revised EIS to address this IR.	
111	ECCC	Wildlife and Wildlife Habitat	Section 12 Table 14.4-1	The draft EIS states that erosion control techniques will be utilized but does not provide details on what these techniques are or how these techniques will prevent sediment from entering waters frequented by migratory birds or SAR.	Provide details on what methods will be used for erosion control and how they will prevent sediment from entering waters frequented by migratory birds and/or SAR. Explain what actions will be taken if the erosion control measures are not successful. **Suggestions for mitigation and follow-up measures** In development of the Environmental Protection Plan, ensure that clearing and grubbing activities are not conducted during the breeding bird season.	NexGen commits to implementing sediment and erosion control best practices and standard mitigations (e.g., temporary sediment ponds, silt curtains, sediment traps) during all Project phases. NexGen confirms that further details on specific erosion control methods and monitoring will be provided during the licensing and permitting activities for the Project, as applicable and commensurate with the stage of Project development. Pathway ID W-03 (Sensory disturbance) and Pathway ID W-05 (Injury and mortality from clearing) in Table 14.4-1 in Draft EIS Section 14.4 (Project Interactions and Mitigations) state that if sensitive species are confirmed in the Project footprint, activity restriction guidelines established by the Government of Saskatchewan (ENV 2017) would be applied for sensitive species; this mitigation is also stated in Table 23A-4 of Draft EIS Appendix 23A (Summary of Project Design Features and Mitigation Measures). The intent is to minimize clearing during the nesting period and follow the Environment and Climate Change Canada (ECCC) guidelines (ECCC 2019); however, flexibility is required for activity timing restrictions due to uncertainties in final design logistical details and permitting timelines. If activities occur during the nesting period, NexGen would engage with the ECCC on required authorizations, as applicable. Examples of monitoring activities for terrain and soils are provided in Table 12.7-1 of Draft EIS Section 12.7 (Monitoring, Follow-Up, and Adaptive Management); these monitoring activities would also apply for monitoring erosion potential. As further noted in Draft EIS Section 12.7, results from monitoring conducted through application of the Environmental Protection Program and supporting documentation would be used to determine the effectiveness of mitigation. If required, additional mitigation measures and/or adaptive management would be applied. No changes are proposed in the revised EIS to address this IR. **References** ENV (Saskatchewan Ministry of Environment). 2017. Activity restriction guidelines for sensitive species. Fish, Wildlife and Lands Branch. Regina Saskatchewan. Accessed January 2020. Available at http://publications.gov.sk.ca/documents/66/89554-Saskatchewan%20Activity%20Restriction%20Guidelines%20for%20Sensitive%20Species%20-%20April%202017.pdf ECCC (Environment Canada and Climate Change). 2019. Guidelines to reduce risk to migratory birds. Accessed July 2021. Available at https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/reduce-risk-migratory-birds.html	n/a
112	ECCC	Wildlife and Wildlife Habitat/Wetland Function	Section 13 Section 14 Table 23A-5	The draft EIS states that the Project will avoid wetlands as much as practical, but there will be a permanent "loss of availability of approximately 28 ha of wetland ecosystems". The mitigation measures propose adherence to the Federal Policy on Wetland Conservation to have no net loss of wetlands, however the draft EIS also states in multiple places that reclamation rarely works or restores original function. The draft EIS also states that offsets may be required to meet the requirements of the Federal Policy on Wetland Conservation, but does not provide clear explanation of how offsets will be applied. It is unclear how the Proponent will ensure no net loss of wetlands with this Project.	Provide a wetland mitigation and offset plan that will describe how no net loss of wetland function will be achieved.	NexGen notes that a wetland offset is not currently required for the proposed Project and would only be developed after detailed design if effects to wetlands could not be avoided. The Project was designed to avoid and minimize effects on wetlands. As described in Draft EIS Section 13.4 (Project Interactions and Mitigations), mitigation during initial Project design included realigning the site access road between the gatehouse and mine terrace to avoid a wetland. NexGen acknowledges that Draft EIS Section 13.5.2.1 (Application Case) identifies that “the combined loss of burned and unburned wetland ELC [Ecological Land Classification] units in the RSA [regional study area] is 27.8 ha”; however, the assessment was conservative in that it defined a maximum disturbance area four times larger than the currently anticipated Project footprint. At this time, the anticipated Project footprint is estimated to affect 0.8 ha of wetlands, with the intention that detailed design would avoid effects to this wetland area, if practicable.	n/a

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						Should detailed design show that disturbance to wetlands would be required, a mitigation and offsetting plan describing how no net loss of wetland function would be achieved would be prepared at that time. No changes are proposed in the revised EIS to address this IR.	
113	MN-S	Assessment Endpoints	Section 13.2.2.3 Table 13.2-1 Valued Components, Rationale, Measurement Indicators, and Assessment Endpoints	Please explain why "ecosystem condition" was not used as a measurement indicator for the traditional use plant species VC. As defined in Section 13.2.2.2[4], ecosystem condition is "primarily affected by changes in the amount of moisture and sunlight, competition with invasive species, and dust deposition". Note 4: EIS, Section 13, p. 13-14.	Please explain how traditional use plant species and their associated ecosystems are not expected to be affected by these changes.	Ecosystem condition was not included as a measurement indicator for the assessment of traditional use plants to limit redundancy in the overall vegetation assessment. Draft EIS Section 13.2.2.2 (Valued Components, Measurement Indicators, and Assessment Endpoints) defines habitat availability and habitat distribution as measurement indicators for traditional use plants. Ecosystem (or habitat) condition was used as an indicator and additional line of evidence in the assessment of effects to upland, wetland, and riparian ecosites or habitats. Traditional use plants occupy many of the upland, wetland, and riparian ecosites (habitat); thus, the inclusion of habitat condition for traditional use plants would be redundant to the assessment of upland, wetland, and riparian valued components. No changes are proposed in the revised EIS to address this IR.	n/a
114	CNSC	Baseline assessment of rare plant species	Sections 13.2.3.1 and 13.2.3.2	**Context:** The spatial boundaries for the vegetation baseline assessment do not cover the extent of the environmental assessment (EA) spatial boundaries, i.e., the baseline study areas are smaller than the EA regional study area (RSA) of 107,491 ha, as depicted in Figure 13.2-1. As a result, it is unclear whether all plant species in the RSA were adequately captured in baseline surveys, in particular with respect to rare species (e.g., federal and provincial species at risk) that may be located in potentially affected downstream waterbodies, wetlands, and riparian areas. Moreover, there appears to be inconsistency between the rare plant species maps in the EIS and the Annex VII.2 (Vegetation Baseline Report 2: Inventory, Rare Plants, and Wetlands). For example, see Figure 13.5-5 in the EIS versus Figure 3.3-1 in Annex VII.2. Lastly, the baseline survey was conducted only in 2018 which may underestimate the presence of certain rare plant species (e.g., annuals). **Rationale:** The VC selection is in part based on observations of plant species in the baseline studies. The limited amount of rare vascular plant observations during the baseline field surveys is used as a rationale to use an ecosystem-based approach to the assessment of rare plants. However, since the surveyed areas for observations do not extend to the RSA boundaries, there is a possibility that not all rare species occurring in the RSA were captured in baseline surveys. Further rationale should be provided to conclude that an ecosystem-based approach is appropriate and conservative for rare plant species. Moreover, in the baseline study presented in Annex VII.2, it is stated that the survey likely underestimates the number of rare species present since only a portion of available habitat was surveyed, and due to plants' variable emergence between years. For example, certain rare annual species have a seed bank and emerge only during specific moisture regimes which may not be available every year.	1.Provide further rationale for the selection of an ecosystem-based approach for rare plant species. 2.Discuss uncertainties related to an ecosystem- based approach for rare plant species. 3.Discuss uncertainties related to limitations of the baseline inventory survey for rare plants. 4.Explain discrepancies between rare plant species mapping in the EIS and Annex VII.2. **Suggestions for mitigation and follow-up measures** Identify any monitoring of rare plants that would be required by other authorities.	Responses to part 1 through part 4 of this IR are provided below. 1. The rationale for the selection of an ecosystem-based approach for rare plant species is presented in Draft EIS Section 13.2.2.1 (Valued Components). In this subsection, the application of both a coarse- and fine-filter approach to the selection of vegetation valued components (VCs) is consistent with feedback received during engagement regarding the value that Indigenous Groups place both on individual components (e.g., plant species) and ecosystems as a whole. At the broadest level, upland, wetland, and riparian ecosystems were selected as VCs to assess the effects on vegetation, wetlands, and overall biodiversity. Assessing and managing biodiversity at the vegetation and wetland ecosystem level means that large numbers of biodiversity elements are addressed together. To complement the assessment of vegetation ecosystems, a fine-filter approach was applied by assessing effects on 28 plant species identified as important by Indigenous Groups (i.e., traditional use plant species) and species of conservation concern (i.e., rare plants). Conducting extensive regional surveys on rare plants would require extensive resources and would not change the mitigations required to minimize indirect effects. Therefore, an ecosystem-based approach provides a means of assessing the level of indirect residual effects. Studies of rare plant species focused on direct effects in the footprint of the Project where specific mitigations should be developed. 2. Different methods were used to address uncertainty associated with including an ecosystem assessment approach for rare plants. Predicted primary effects are related to direct disturbance of ecosites from the Project footprint and are expected to be overestimated due to applying a maximum disturbance area (i.e., an area four times larger than the currently anticipated Project footprint). Predicted secondary effects are largely related to potential effects from air emissions and changes in surface water quality and quantity. As described in Draft EIS Section 7.2.2.10 (Prediction Confidence and Uncertainty), Draft EIS Section 9.2.11 (Prediction Confidence and Uncertainty), and Draft EIS Section 10.2.10 (Prediction Confidence and Uncertainty), the assessments of air quality, hydrology, and surface water quality and sediment quality, respectively, applied a precautionary (i.e., conservative) approach to address uncertainty by identifying the greatest magnitude, duration, and geographic extent of potential adverse effects when a range of outcomes were possible. Under these conservative assumptions, effects to vegetation VCs were still predicted to be negligible. Specifically, NexGen highlights Draft EIS Section 13.4.2 (Secondary Pathways), Pathway ID V-04 (Fugitive dust and constituent emissions) and Pathway ID V-05 (Vegetation changes from particulates and acid emissions), where the results of air quality modelling predict that changes to ecosystem condition and plant health would be negligible and largely confined to the maximum disturbance area. Also, as presented in Draft EIS Section 13.4.2, after implementing mitigation, changes in surface water levels and flows are expected to have negligible and localized effects on vegetation ecosystems.	n/a

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						Similarly, results from Draft EIS TSD XXI (Environmental Risk Assessment) indicated that predicted changes in surface water quality for the upper bound scenario (i.e., precautionary approach) would not cause adverse effects on the health of aquatic plants (i.e., macrophytes, such as sedges and bulrush). 3. Uncertainties associated with the baseline studies were addressed by applying conservative assumptions in air, surface water quantity and quality, and exposure toxicology models, and by applying an overall precautionary approach to the vegetation assessment. Draft EIS Section 13.2.2.1 notes that information from provincial databases and federal assessment and recovery reports have not identified Committee on the Status of Endangered Wildlife in Canada (COSEWIC)- or *Species at Risk Act*-listed plant species or critical habitat in the regional study area. Baseline survey methods for rare vascular plants followed provincial survey standards focusing the intensity of surveys on the anticipated Project footprint where there would be the potential for direct losses. Therefore, there is low uncertainty in the potential for direct loss of rare plants. Additional rare plant studies were conducted in the anticipated Project footprint in 2021. No additional rare plant species were found; therefore, no updates to the revised EIS are required. 4. NexGen acknowledges that there are differences between rare plant species mapping in the Draft EIS sections and Draft EIS Annex VII.2 (Vegetation Baseline Report 2 [Inventory, Rare Plants, and Wetlands]). Rare plants are shown in the Draft EIS figures that correspond with the ecosystem they were observed in. For example, beautiful sedge (*Carex concinna*) was found in upland and riparian ecosystems, and locations are included in Figure 13.5-2 of Draft EIS Section 13.5.1 (Upland Ecosystems) and Figure 13.5-8 of Draft EIS Section 13.5.3 (Riparian Ecosystems). Beautiful sedge was not recorded in wetland ecosystems; therefore, it is not shown in Figure 13.5-5 in Draft EIS Section 13.5.2 (Wetland Ecosystems). Figures in Draft EIS Annex VII.2 present all rare plant species observed in the area, regardless of the ecosystem where they were found (i.e., all rare plants found in upland, wetland, and riparian ecosystems are presented in one figure). With respect to the reviewer's suggested mitigation and follow-up measures, as stated in Draft EIS Section 13.8 (Key Findings), "Rare plants would be clearly marked and avoided, where feasible. Where disturbance to rare plants is unavoidable, the ENV [Saskatchewan Ministry of Environment] would be consulted to determine the most appropriate course of action." If previously unidentified rare plants are found prior to, or during, Construction (i.e., chance find), they would be clearly marked, and the ENV would be consulted to determine the most appropriate course of action. No further monitoring is proposed. No changes are proposed in the revised EIS to address this IR.	
115	CNSC	Regional environmental assessment boundaries	Section 13.2.3.2	**Context**: The regional study area (RSA) for the EA was selected to provide a watershed- based context for interpreting the local effects of the Project. The RSA includes the local study area (LSA), Forrest Lake, Beet Lake, Naomi Lake, and the watershed east and north of the confluence of the Clearwater and Mirror rivers. The Project is located on the western "edge" of the RSA, as depicted in Figure 13.2-1. Since the complete RSA is used to evaluate the availability (e.g., change in area) and distribution of vegetation VCs (i.e., upland, wetland, and riparian ecosystems), the selection of the size and spatial boundaries of the RSA affects the calculated proportions of lost VC areas, which in turn is used for the predicted effects assessment. The conclusion of the magnitude of the effects is in part based on the physical loss (%) compared to the RSA, and the conclusion of e.g. "low magnitude" (e.g., Table 13.5-6) is therefore influenced by the size of the RSA.	1.Provide further rationale for the appropriateness of selecting the size and spatial boundaries of the RSA, and for using a watershed-based approach, for the vegetation VCs. 2.Discuss the conservativeness of using the comparison to the RSA for the determination of effect magnitude. 3.Present effect magnitude based on the LSA for vegetation VCs.	Responses to part 1, part 2, and part 3 of this IR are provided below. 1. NexGen confirms that the spatial boundaries of the regional study area (RSA) were selected to be complementary to the assessments for air and water that potentially affect vegetation ecosystems and associated wildlife and wildlife habitat. The RSA was also used to assess cumulative effects from the Fission Patterson Lake South Property and fire factors, which occur beyond the local study area (LSA) and are more appropriately assessed at a regional scale. 2. NexGen notes the comparison to the RSA (i.e., percent change) of effect magnitude had little effect on the conservatism of the vegetation assessment. The comparison to the RSA helped determine the relative amount of similar ecosystems across the landscape that could be affected by physical effects (e.g., dust, water) from the Project. This comparison helps to determine if the ecosystem would continue to be self-sustaining and ecologically effective on the landscape. As presented in Draft EIS Section 13.2.2.3 (Assessment Endpoints), the endpoint of self-sustaining and ecologically effective ecosystems requires consideration of an RSA to capture	n/a

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				Rationale: Given that the predicted direct loss of upland, wetland, and riparian ecosystems is concentrated nearby the Project area (LSA), the determination of magnitude based on the comparably large RSA may not adequately reflect the potential effects on availability and distribution of vegetation habitat near the Project. For example, for wetland ecosystems, the Project is predicted to contribute to a loss of 26.0 ha (i.e., 21.2% in the LSA) of undisturbed wetland ecosystems (page 13-118), however, the significance rating is "low magnitude" based on the RSA scale. As another example, the uncommon upland ELC Black spruce/Labrador tea/feathermoss (BP14) availability would decrease from 19.1 ha to 7.6 ha in the LSA, which equals a decrease of approx.. 60%.		processes driving forest community patterns and properties (e.g., resilience) to appropriately evaluate the significance of effects from the Project and other developments and natural factors. Draft EIS Section 13.2.9 (Residual Effects Classification and Determination of Significance) also describes the weight-of-evidence approach for determining significance, which considers geographic extent, duration, reversibility, frequency, and probability, in addition to magnitude in terms of both area and percent. Resilience and adaptability are also considered in the determination of significance to provide ecological context. In consideration of the factors discussed above, NexGen confirms that the comparison of effect magnitude had little effect on the conservatism of the vegetation assessment. 3. NexGen confirms that the absolute magnitude of changes in ecosites is provided in the Draft EIS for the LSA and RSA (i.e., Draft EIS Section 13.5 [Residual Effects Analysis]), and does not recommend the presentation of relative (i.e., percent) magnitude based on the LSA. Presenting relative magnitude based on the LSA would not change the conclusions of the vegetation assessment as changes still need to be placed in context of broader scale processes and patterns to be ecologically relevant. No changes are proposed in the revised EIS to address this IR.	
116	MN-S	Traditional Plant Use Plant Species	Section 13.2.6.2	It is not clear how total availability calculations for traditional use plant species considered ELC units with low field sampling effort. Were vegetation field plots comparable between studies (i.e., CanNorth vs. Omnia)? How has accessibility and practicality for harvest (i.e., available at high density) been considered?	Please include additional information how total availability calculations for traditional use plant species considered ELC units with low field sampling effort. Please provide additional information clarifying if vegetation field plots were comparable between studies (i.e., CanNorth vs. Omnia as well as how accessibility and practicality for harvest (i.e., available at high density) has been considered.	NexGen confirms that information regarding how traditional use plant availability was calculated using baseline survey data is provided in the Draft EIS Section 13.2.6.2 (Traditional Use Plant Species). In this subsection, the availability of traditional use plant species was estimated using the relative frequency and percent cover for each species recorded during baseline field surveys. For each species, the relative frequency (i.e., the proportion of the total number of observations recorded) was calculated for each upland and wetland Ecological Land Classification (ELC) unit sampled, which provided an estimate of the potential to encounter a species within an ELC unit. The average percent cover of each traditional use plant species was also calculated based on the percent cover estimated from sample plots. The relative frequency was multiplied by the average percent cover to provide an index of the relative availability (i.e., occupancy) for each traditional use plant species for each ELC unit sampled. The total availability of each species was then estimated by multiplying the relative availability by the area of each upland and wetland ELC unit for the Base Case, Application Case, and Reasonably Foreseeable Development Case within the local study area and regional study area. The focused studies with the highest intensity of survey effort are in the areas with the highest risk of direct effects from the Project (i.e., a risk-based approach was followed). Considerations for traditional use plant species harvest were incorporated in Draft EIS Section 13.3.4 (Traditional Use Plant Species), which describes the combination of Indigenous Knowledge and ELC units to inform the availability, distribution, and practicality for harvest of traditional use plants. Furthermore, changes in traditional use plant species harvest access and availability are assessed as an ecological resource in Draft EIS Section 16.4.2 (Secondary Pathways) and Draft EIS Section 16.5.1.2 (Availability of Fish, Plants, and Wildlife for Harvesting), respectively. In these subsections, the changes in the abundance and distribution of biological valued components are assessed based on the societal or cultural value of resources, which is as important as biological effects on the ecosystem. NexGen clarifies that baseline studies completed by Omnia Ecological Services (Omnia) were used for defining and mapping ELC units, while baseline studies completed by Canada North Environmental Services (CanNorth) focused on protocols for field surveys of vascular rare plants. Baseline data from Omnia and CanNorth were used to inform the availability and distribution of traditional use plants and not necessarily designed to provide equivalent information on the accessibility of traditional use plants. None of the self-directed Indigenous Knowledge and Traditional Land Use (IKTLU) Studies completed by the Clearwater River Dene Nation, Métis Nation – Saskatchewan, Birch Narrows Dene Nation, Buffalo River Dene Nation, or Ya'thi Néné Lands and Resources indicated specific areas of high traditional use plant harvest within the	n/a

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						maximum disturbance area. However, the baseline data collected and information in the IKTLU Studies do provide a reasonable estimate of occurrence and availability of traditional use plants among sampled ecosites. No changes are proposed in the revised EIS to address this IR.	
117	CNSC	Change to an environmental component due to hazardous contaminants	Section 13.4.2	**Context:** The categorizing of "V-04: Fugitive dust and constituent emissions" as a secondary effects pathway is based on the assumption that the spatial extent for the deposition of fugitive dust emissions is concentrated within 500 m of the Project footprint. However, the study of Chen et al. 2017 is cited which concluded that dust generated from a haul road was found to decrease lichen cover up to 1 km. This indicates that lichen is a sensitive species to dust deposition. The Environmental Risk Assessment (ERA) supporting document does not evaluate the air/dust deposition pathway for lichen. The exposure pathway is not included in the ecological conceptual site model (page 6.24 of Technical Support Document (TSD) XXI: Environmental Risk Assessment). **Rationale:** In the ERA (TSD XXI), it was concluded that constituents relevant to fugitive dust and particulates (i.e., total suspended particulates (TSP), particulate matter PM_{10} and $PM_{2.5}$) exceeded screening values, but these were not carried forward in the ERA. Please provide an analysis of predicted effects from dust and particulate matter on lichen.	Evaluate predicted effects on lichen species from atmospheric contact with TSP, PM_{10} and $PM_{2.5}$. **Suggestions for mitigation and follow-up measures** CNSC staff suggest to measure dust deposition at different spatial intervals from the Project site in order to evaluate whether fugitive dust emissions are concentrated within 500 m of the Project footprint, as assumed in the EIS.	NexGen confirms information regarding the predicted effects on lichen species from atmospheric contact with total suspended particulates (TSP), particulate matter less than 10 microns in diameter (PM_{10}), and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) is included in the Draft EIS and details on monitoring dust deposition will be further developed during the licensing and permitting processes for the Project, as applicable. NexGen highlights that Pathway ID V-04 (Fugitive dust and constituent emissions) in Draft EIS Section 13.4.2 (Secondary Pathways) includes references to support the prediction that effects would likely be within the maximum disturbance area. The study by Chen et al. (2017), cited in the discussion of this secondary pathway, was completed in unforested, subarctic tundra, whereas the Project is in forested Boreal Plain where dust would not disperse as far due to the presence of trees. Studies cited in the discussion of Pathway ID V-04 indicated that effects to vascular plants and lichen occurred at dust deposition rates between 0.28 milligrams per square centimetre per 30 days ($mg/cm^2/30$ d) and 7.2 $mg/cm^2/30$ d. The study at the Diavik Mine measured changes in vascular and non-vascular plants, including decreased lichen and bryophyte cover, within 500 m of the mine at deposition rates of 0.28 $mg/cm^2/30$ d to 0.85 $mg/cm^2/30$ d (Watkinson et al. 2021). This study was also completed in the unforested, subarctic tundra (Watkinson et al. 2021). Average annual dust deposition rates from the Project at the boundary of the maximum disturbance area are predicted to range from 0.072 $mg/cm^2/30$ d to 0.095 $mg/cm^2/30$ d during Construction and Operations, which are much lower than the rates reported above to have effects on vegetation, including lichens. In addition, Pathway ID V-05 (Vegetation changes from particulates and acid emissions) in Draft EIS Section 13.4.2 includes predicted effects on vegetation, including lichen species, from deposition of criteria air contaminants (i.e., PM_{10}, $PM_{2.5}$, sulphur dioxide, nitrogen dioxide, and carbon monoxide). Air quality modelling indicates that criteria air contaminants beyond the maximum disturbance area are within Saskatchewan Ambient Air Quality Standards (ENV 2021) for Construction and Operations, including carbon monoxide and sulphuric acid (Draft EIS Section 7.2.5 [Residual Effects Analysis]). Levels of PM_{10} exceed the air quality guideline during both of these Project phases; however, the area of exceedances would occur mostly over Patterson Lake North Arm, and it is anticipated there would be minimal changes to terrestrial vegetation (Draft EIS Section 7.2.5). Further analysis compared established thresholds for effects to plant species and ecosystems, including lichens, from sulphur dioxide (i.e., 10 micrograms per cubic metre [$\mu g/m^3$]) and nitrogen dioxide (i.e., 30 $\mu g/m^3$) to predicted concentrations from the Project. Annual sulphur dioxide emissions from the Project are predicted to be 0.0 $\mu g/m^3$ and 0.1 $\mu g/m^3$ for Construction and Operations, respectively. Nitrogen dioxide emissions would be 9.7 $\mu g/m^3$ and 6.7 $\mu g/m^3$ during Construction and Operations, respectively. Thus, the Project is not expected to have harmful effects on lichens and other plant species from acid-generating emissions. With respect to the reviewer's suggested mitigation and follow-up measures, as presented in Draft EIS Section 7.2.8 (Monitoring, Follow-Up, and Adaptive Management), baseline air quality monitoring, including particulates, would continue into Construction, Operations, and Decommissioning and Reclamation (i.e., Closure) to verify predictions. No changes are proposed in the revised EIS to address this IR. **References** Chen W, Leblanc SG, White HP, Prevost C, Milakovic B, Rock C, Sharam G, O'Keefe H, Corey L, Croft B, Gunn A, van der Wielen S, Football A, Tracz B, Snortland Pellissey J, Boulanger J. 2017.	n/a

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						Does dust from arctic mines affect caribou forage? Journal of Environmental Protection 8(3):258-276. ENV (Saskatchewan Ministry of Environment). 2021. Table 20 Saskatchewan Ambient Air Quality Standards, Saskatchewan Environmental Quality Guidelines. Accessed August 2021. Available at https://envrbrportal.crm.saskatchewan.ca/Pages/SEQS/Table20-SEQS-SAAQS.pdf Watkinson AD, Virgl J, Miller V, Neath MA, Kim J, Serben K, Shapka C, Sinclair S. 2021. Effects of dust deposition from diamond mining on subarctic plant communities and barren-ground caribou forage. Journal of Environmental Quality. Technical Reports: Trace Elements in the Environment. 50:990-1003.	
118	CNSC	Aquatic species	Section 13.4.2	**Context:** The section on the effects pathway “V-08: Surface water flow changes” includes a discussion on how changes in surface water levels, flows, and drainage areas can affect wetland ecosystems, however, it is not acknowledged that seemingly “isolated” wetlands can also be connected hydrologically through groundwater. There is no assessment of potential “downstream” effects to hydrological connectivity of wetlands across the RSA. **Rationale:** Changes in hydrological regimes due to the Project could potentially affect wetland hydrological connectivity, and thereby wetland water levels and indirectly the availability, distribution, and condition of vegetation VCs. In particular, information on wetland connectivity would be relevant regarding the wetlands in close proximity to the Project infrastructure, i.e., the extensive organic wetland (i.e., BP19, BP19[BU], and BP20) to the east of the existing bridge crossing on the existing access road, as well as the wetland west of the proposed airstrip (as described in section 13.5.2.1.2).	Evaluate predicted effects on wetland hydrological connectivity, including with respect to groundwater, in the context of vegetation VCs.	The Project is predicted to have no measurable effect on wetland hydrological connectivity. The glacial drift material at surface in the local study area (LSA) is highly permeable. As a result, for riparian wetlands adjacent to waterbodies, such as Patterson Lake or Lake G, the water surface elevation in the wetland is expected to be primarily controlled by the water surface elevation of the adjacent waterbody. Changes to water surface elevations are provided in Draft EIS Section 9.6 (Residual Effects Analysis). During Operations, there is a predicted 5% reduction in groundwater discharge to riparian wetlands distributed between Patterson Lake, Forrest Lake, and Lake G. However, the reduction in baseflow would be mitigated by increased surface water level in Patterson Lake and the Clearwater River below Patterson Lake, as well as in Forrest Lake. Therefore, changes in water levels are not anticipated to affect wetlands in the LSA or regional study area. One isolated wetland (i.e., Ecological Land Classification unit Black spruce treed bog (Burned) [BP19 (BU)]) is located perched on a hill slope adjacent to the existing access road approximately 30 m above Patterson Lake. This wetland is the only wetland located in the LSA that is not a riparian wetland. Due to the elevation, this wetland is not expected to interact with the Project under current conditions or during the Project lifespan. Monitoring of three LSA wetlands is discussed in Draft EIS Section 13.7 (Monitoring, Follow-Up, and Adaptive Management) and Draft EIS Appendix 23B (Monitoring and Follow-Up) and would be included in the Environmental Monitoring Plan developed for the Project to confirm the predictions of negligible effects to wetlands. As negligible effects are expected to the wetland hydrologic regime, there would also be negligible effects to vegetation VCs associated with wetland hydrological connectivity. No changes are proposed in the revised EIS to address this IR.	n/a
119	CNSC	Upland ecosystem loss	Sections 13.5.1.1.1 and 13.5.1.3.1	**Context:** In the significance determination for upland ecosystem availability, it is stated that effects are permanent and irreversible for upland ELC units that are covered by permanent facilities (e.g., waste rock storage areas, WRSAs). **Rationale:** Certain upland ELC units are uncommon in the LSA and may be affected. For example, within the LSA, the uncommon Black spruce/Labrador tea/feathermoss (BP14) availability is predicted to decrease from 19.1 ha to 7.6 ha. It is unclear if this ELC is present in areas that are proposed to be used for permanent facilities, and therefore cannot be reclaimed (i.e., permanent and irreversible effect).	1.Provide information on which ELCs are located in areas that are planned to be covered by permanent facilities. 2.Assess the magnitude of effect on the ELCs that cannot be reclaimed. **Suggestions for mitigation and follow-up measures** Consider placement of permanent facilities in areas with upland ELC units that remain common within the LSA.	Responses to part 1 and part 2 of this IR are provided below. 1. Information on Ecological Land Classification (ELC) units that are planned to be covered by proposed Project facilities is included in Figure 13.3-2 in Draft EIS Section 13.3.1.1 (Ecosystem Availability) and Figure 13.5-2 in Draft EIS Section 13.5.1.1.1 (Ecosystem Availability). These figures show the locations of the ELC units relative to the Project facilities, including the Black spruce/Labrador tea/feathermoss (BP14) ELC units. 2. NexGen confirms that permanent waste rock storage areas (WRSAs) would be located on the Jack pine/lichen (Burned) (BP02[BU]) ELC unit, which comprises 58% of the local study area (Draft EIS Section 13.3.1.1, Table 13.3-1); therefore, the magnitude of these permanent facilities that could not be reclaimed is considered low. With respect to the reviewer’s suggested mitigation and follow-up measures, an alternatives assessment was conducted for the Project that evaluated the potential options for permanent facilities (e.g., WRSAs). The alternatives assessment considered environmental, technical, economic, and social aspects to determine the best option for the WRSA design, including location.	n/a

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						Therefore, the locations of the WRSAs are not planned to be further evaluated. However, as the currently proposed WRSA locations would be in the common Jack pine/lichen (Burned) (BP02[BU]) ELC unit, ecological effects are expected to be reduced. No changes are proposed in the revised EIS to address this IR.	
120	CNSC	Traditional use plant species	Section 13.5.4.3.2	**Context:** In the context of the significance determination, it is stated that the effects of previous and existing developments and activities in the Base Case have negatively altered habitat availability and habitat distribution of traditional use plant species. Based on this, it is concluded that in the Application Case, the Project contributes to adverse changes of low magnitude. However, the magnitude compared to a "baseline natural state" of the habitat (i.e., before any disturbance) is unclear. Furthermore, it is predicted that traditional use plant species continue to be self- sustaining and ecologically effective, however, it is unclear what the "tipping point" is at which these species are not self-sustaining and ecologically effective anymore, given that they are assessed on an ELC basis. **Rationale:** Indigenous Groups have expressed concerns related to Project activities and potential effects on traditional use plants, their health and availability for gathering (e.g., section 13.5.4.1.1). Concerns were also expressed about the ability to access habitats in the vicinity of the Project site for collecting medicinal plants or berries and how the ability to harvest traditional use plant species is reduced by the cumulative effects of existing disturbances and the Project. Given these concerns, it would be relevant to assess the magnitude of effects with consideration of the already cumulative effects of existing disturbances.	1.Evaluate magnitude of predicted effects on traditional use plant species availability and distribution with respect to a "baseline undisturbed" state, as well as taking into account the cumulative magnitude of existing and proposed disturbances. 2.Define the specific indicators at which traditional use plant species are considered not self-sustaining and ecologically effective.	Responses to part 1 and part 2 of this IR are provided below. 1. NexGen notes that requests regarding the magnitude or state of the environment prior to any disturbance is beyond the scope of the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012* and outside the scope defined in Section 5.1.3.2 of the Project Terms of Reference (Draft EIS Appendix 1A [Concordance Tables for the Terms of Reference and Generic Guidelines for Preparation of an Environmental Impact Statement], Table 1A-2). Draft EIS Section 13.2.5 (Assessment Cases) states that "[t]he temporal boundary of the Base Case includes the combined effects from previous and existing human disturbances and natural factors (e.g., fire, floods, disease, insects) on the environment and vegetation. As such, existing conditions represent the cumulative effects of historical and current environmental pressures that have influenced the observed condition and patterns of the vegetation VCs [valued components] (CEA Agency 2018)." Furthermore, the Reasonably Foreseeable Development (RFD) Case assesses the cumulative effects from previous and existing developments (i.e., Base Case), the Project (i.e., Application Case), future proposed developments (i.e., Fission Patterson Lake South Property), natural factors, and climate change (Draft EIS Section 13.2.5). Despite the request being outside the scope of the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012*, Indigenous Knowledge referencing certain changes to the existing environment over time is provided in Draft EIS Section 13.3.4.1 (Traditional Use Plant Species Availability). 2. Draft EIS Section 13.2.9 (Residual Effects Classification and Determination of Significance) explains that quantitative critical thresholds, such as the amount or distribution of habitat required for self-sustaining and ecologically effective traditional use plant populations, are rarely known with certainty for ecological VCs. Rather, applying resilience, adaptability, and existing conditions provide important ecological context. Therefore, a detailed and transparent account of whether the predicted effects from the proposed Project and other developments would cause the defined significance threshold to be exceeded was prepared for each VC by combining residual effects criteria (e.g., magnitude, geographic extent, duration, reversibility), available scientific literature, data collected in the study areas, and logical reasoning (i.e., a weight-of-evidence approach). Using ecological context combined with residual effects criteria in a reasoned narrative, or rationale, to determine significance is a method accepted by the CEA Agency (2018). By applying this weight-of-evidence approach, it was determined that much of the regional study area (RSA) is undisturbed by human development in the Base Case and that traditional use plants would be self-sustaining and ecologically effective. In the RFD Case, incremental and cumulative effects from the Project and Fission Patterson Lake South Property are predicted to be small and localized to the western portion of the RSA that overlaps previous and existing human disturbance. Thus, habitat for traditional use plants remains abundant, well connected, and distributed in the Application and RFD cases, and it is predicted that traditional use plants would continue to be self-sustaining and ecologically effective (i.e., effects are predicted to be not significant). Examples of changes that might be considered significant using the weight-of-evidence approach include: ▪ Changes in habitat availability and distribution with a sufficiently high magnitude, that occur over a large geographic extent, and where the adverse effects are permanent so there is an	n/a

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						▪ increase in risk to the maintenance of self-sustaining or ecologically effective traditional use plants, would likely be significant. ▪ Exposure to constituents of potential concern that causes permanent changes to survival and reproduction of a large portion of a traditional use plant population would likely be significant. ▪ Habitat loss and fragmentation to a point that disrupts ecosystem processes or plant population connectivity would likely be significant. However, the assessment of traditional use plants indicates that none of these conditions would occur from incremental and cumulative changes to habitat from the Project and other developments (Draft EIS Section 13.5.4.3.2 [Significance Determination]). No changes are proposed in the revised EIS to address this IR. **References** *Canadian Environmental Assessment Act, 2012.* SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html CEA Agency. 2018. Assessing Cumulative Environmental Effects under the *Canadian Environmental Assessment Act, 2012.* Interim Guidance. March 2018 Version 2. Available at http://publications.gc.ca/collections/collection_2018/acee-ceaa/En106-204-2018-eng.pdf	
121	ECCC	Wildlife and Wildlife Habitat	Section 14	As per the CNSC Generic Guidelines for the Preparation of an Environmental Impact Statement pursuant to the Canadian Environmental Assessment Act, 2012: "The EIS will then describe mitigation measures that are specific to each environmental effect identified. Measures will be written as specific commitments that clearly describe how the proponent intends to implement them and the environmental outcome the mitigation is designed to address. The EIS will describe mitigation measures in relation to species and/or critical habitat listed under the Species at Risk Act (SARA). These mitigation measures will be consistent with any SARA permit, applicable recovery strategy and/or action plan." The draft EIS does not list all SAR, or the adverse effects to all SARA-listed species, and does not outline the measures that will be taken to avoid or mitigate these effects	1. Identify all SAR and their critical habitat and describe how they may be adversely affected by the Project. 2. Describe what measures will be taken to avoid or lessen the effects of each Project activity and phase, and how these effects will be monitored to ensure they are minimized or avoided.	NexGen confirms that information on species at risk (SAR) potential effects and mitigation measures are presented in the Draft EIS. 1. In Draft EIS Section 14 (Wildlife and Wildlife Habitat), all wildlife SAR that were confirmed to occur in the regional study area were assessed, including identification of critical habitat and mitigation measures. Selected valued components (VCs) assessed included SAR species woodland caribou (Draft EIS Section 14.5.1.1 [Application Case] and Draft EIS Section 14.5.1.2 [Reasonably Foreseeable Development Case]), little brown myotis (Draft EIS Section 14.5.6.1 [Application Case] and Draft EIS Section 14.5.6.2 [Reasonably Foreseeable Development Case]), olive-sided flycatcher (Draft EIS Section 14.5.7.1 [Application Case] and Draft EIS Section 14.5.7.2 [Reasonably Foreseeable Development Case]), and rusty blackbird (Draft EIS Section 14.5.8.1 [Application Case] and Draft EIS Section 14.5.8.2 [Reasonably Foreseeable Development Case]). Legally defined critical habitat is only applicable for woodland caribou, as presented in Draft EIS Section 14.3.1.1 (Habitat Availability). Species at risk not selected as VCs but assessed included northern myotis, common nighthawk, and barn swallow (Draft EIS Section 14.5.12 [Additional Species at Risk Screening Assessments] and Draft EIS Appendix 14A [Species at Risk Screening Assessment]). As presented in Draft EIS Section 13 (Vegetation), there are no vegetation SAR affected by the proposed Project. NexGen notes that yellow banded bumble bee, gypsy cuckoo bumble bee, transverse lady beetle, and nine-spotted lady beetle were not assessed in the Draft EIS but were identified by Environment and Climate Change Canada in IR 122 as potentially overlapping the regional area of the Project. Please refer to the response to IR 122 for context related to these arthropod SAR. 2. NexGen is committed to implementing the mitigation measures presented in Table 14.4-1 of Draft EIS Section 14.4 (Project Interactions and Mitigations) to avoid and minimize effects on SAR and other wildlife. Additional commitments to mitigation are provided in NexGen's responses to IR 38 and IR 127. Follow-up monitoring programs for all SAR and other wildlife will be developed as required as part of the federal licensing and provincial permitting requirements. No changes are proposed in the revised EIS to address this IR.	n/a

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122	ECCC	Wildlife and Wildlife Habitat	Section 14	ECCC has identified that four SAR arthropods (yellow banded bumble bee, gypsy cuckoo bumble bee, transverse lady beetle, and nine-spotted lady beetle) have ranges overlapping the Project area and these were not mentioned in the draft EIS.	1. Include the four arthropod SAR in the assessment. 2. Explain what mitigation measures will be used to minimize effects to SAR arthropods that could occur in the study area.	Responses to part 1 and part 2 of this IR are provided below. 1. NexGen confirms the four species at risk (SAR) arthropods (i.e., yellow-banded bumble bee, gypsy cuckoo bumble bee, transverse lady beetle, and nine-spotted lady beetle) were not assessed in Draft EIS Section 14.5.12 (Additional Species at Risk Screening Assessments); these four arthropod SAR will be added to the revised EIS through a screening level assessment similar to the assessment completed for the northern myotis, common nighthawk, and barn swallow (Draft EIS Appendix 14A [Species at Risk Screening Assessment]). 2. All four arthropod SAR could occur in the area of the Project; however, there is expected to be little effect from the proposed Project because threats to these species are not due to habitat loss in the Boreal Plain. The primary threats in the northern part of these species' ranges where the Project is located include pesticide use associated with agriculture and introduction of non-native species (i.e., intraguild competition). NexGen is committed to implementing the mitigation measures presented in Table 14.4-1 of Draft EIS Section 14.4 (Project Interactions and Mitigations) to avoid and minimize effects on SAR and other wildlife, but no additional mitigations targeted to these species are planned to be implemented. Revised EIS Section 14.5.12 (Additional Species at Risk Screening Assessments) and revised EIS Appendix 14A (Species at Risk Screening Assessment) will be updated to include the four arthropod SAR (i.e., yellow banded bumble bee, gypsy cuckoo bumble bee, transverse lady beetle, and nine-spotted lady beetle).	Section 14.5.12; Appendix 14A
123	ECCC	Wildlife and Wildlife Habitat	Section 14 Table 14.4-1 Table 23A-3	Light pollution and effects to migratory birds and SAR such as bats and caribou are identified in the draft EIS. Mitigation is described as 'limit light pollution to the extent practical…' but more detail will help ECCC to determine how light pollution will be limited and what mitigation measures will be utilized.	Explain how light pollution will be managed and what specific mitigation measures will be used to minimize effects to migratory birds and SAR birds and mammals.	NexGen recognizes that additional detail on the light pollution mitigation would result in higher confidence in the effectiveness of mitigations that would reduce effects to migratory birds and other species at risk. However, the proposed Project lighting design has not yet been completed. As stated in Table 14.4-1 of Draft EIS Section 14.4 (Project Interactions and Mitigations), Pathway ID W-03 (Sensory disturbance), NexGen is committed to limiting light pollution to the extent practicable for built (i.e., constructed) infrastructure. Additional details on light mitigation will be developed during detailed design of the Project and reflected in documents provided in support of federal licensing, as applicable. No changes are proposed in the revised EIS to address this IR.	n/a
124	ECCC	Wildlife and Wildlife Habitat	Section 14.2 Table 14.2-1	The Proponent has selected VCs to represent multiple Species at Risk (SAR), without providing sufficient detail on overlap of habitat requirements. Olive-sided flycatcher is considered representative of bank swallow, barn swallow and common nighthawk despite these species having very different nesting habitat requirements. Rusty blackbird is considered representative of horned grebe and yellow rail, although these species have different nesting and feeding habitat requirements. The information for rusty blackbird in table 14.2-1 lists that this species is a "representative species for effects on bank swallow, barn swallow, and common nighthawk, which are all aerial insectivores". This is the same rationale used for olive-sided flycatcher being representative for the same species.	1. Provide an explanation to support the use of olive-sided flycatcher as a representative species for bank swallow, barn swallow and common nighthawk or individually assess each species. 2. Provide an explanation to support use of rusty blackbird as a representative species for horned grebe and yellow rail or individually assess each species.	The screening and selection process applied in determining species to be assessed in the Draft EIS provides a robust assessment of the magnitude and extent of wildlife effects while minimizing redundancies, consistent with the requirements for an EA conducted under the *Canadian Environmental Assessment Act, 2012.* Additional species at risk (SAR) were also assessed in Draft EIS Section 14.5.12 (Additional Species at Risk Screening Assessments) to capture any species-specific details that may have been missed in the assessment of representative species and that may require additional mitigations. As stated in Draft EIS Section 14.2.2.1.1 (Selection and Screening Method), several criteria were used to identify species to be assessed in the Draft EIS. Species were excluded if: ▪ there is little likelihood of interacting with the proposed Project (e.g., presence of migratory birds in the area is limited to stopovers during spring and/or fall migration); ▪ the species was not detected in the regional study area, which includes the local study area, during baseline surveys; or ▪ species were represented by other species using similar habitats and predicted to be similarly or less influenced by the Project. 1. Bank swallow, horned grebe, and yellow rail were not detected during baseline studies. However, while barn swallow and common nighthawk were not selected as valued components to minimize redundancy (i.e., olive-sided flycatcher, barn swallow, and common nighthawk use similar	n/a

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						habitats for foraging), these species were assessed in Draft EIS Section 14.5.12 and Draft EIS Appendix 14A (Species at Risk Screening Assessment). This screening level assessment is consistent with the comprehensive assessments completed for valued components (VCs) but focused only on the primary pathways identified in those comprehensive assessments. Project effects were assessed for the Application Case and for the Reasonably Foreseeable Development Case, which includes effects from natural factors and climate change. A residual effects classification and determination of significance was also completed. Bank swallow was not included to limit redundancy as effects would likely be similar to the assessed SAR. Mitigation and monitoring will be implemented to avoid and minimize effects to all SAR and other wildlife, including bank swallow. 2. As stated in Table 14.2-1 in Draft EIS Section 14.2.2.1.1, assessments of rusty blackbird, mallard, common goldeneye, and riparian and wetland ecosystems VCs are representative of effects on horned grebe and yellow rail that use similar habitat. Project effects on horned grebe and yellow rail are expected to be similar to, or less than, effects to rusty blackbird, mallard, and common goldeneye. No changes are proposed in the revised EIS to address this IR. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html	
125	CNSC	Physical stressors (noise and vibration) on wildlife	Table 14.4-1; Appendix 14A	**Context:** During all project phases, sensory disturbances such as but not limited to noise have been identified as stressors for wildlife in the project area. However, this appears to have been assessed for most part from an anthropocentric perspective, such as dispersal of game animals resulting in loss of hunting opportunities for local hunters. While this is valid, there is virtually no consideration of the biology of wildlife species which can be disrupted by sensory disturbances. **Rationale:** Noise has been demonstrated to adversely affect reproductive behaviour (e.g., calling behaviour, mating success, calving, to name a few) in many wildlife species. This is particularly important for protected species (SARA-listed species, migratory species) where successful breeding is inextricably linked to species survival, in addition to other factors such as the availability of critical habitat. Also, there is no consideration of project-related vibrations as a sensory disturbance. Sensitive terrestrial species (specifically, herpetofauna, amphibians, and invertebrates) can be impacted by vibrations emanating from the operation of heavy machinery and blasting activities at the project site.	1.Provide a discussion of impacts of physical stressors (specifically noise and vibrations) on wildlife in the project area. Discussion should focus on protected species (i.e., migratory birds, SARA-listed species) and, if appropriate, mitigation measures and/or monitoring should be considered. 2.Provide project-related vibrations as a sensory disturbance in this assessment.	Responses to part 1 and part 2 of this IR are provided below. 1. Information regarding the effects of physical stressors on wildlife in the area of the Project is included in Draft EIS Section 14 (Wildlife and Wildlife Habitat). As presented in Table 14.4-1 in Draft EIS Section 14.4 (Project Interactions and Mitigations), sensory disturbance including noise, lights, dust, smells, and presence of people was assessed as a primary pathway, Pathway ID W-03 (Sensory disturbance) for all species, including *Species at Risk Act*-listed species. Effects of sensory disturbance on functional habitat loss for species was assessed by applying species-specific and disturbance feature-specific zones of influence (Draft EIS Appendix 14B [Wildlife Habitat Models], Table 14B2-2). In this regard, a 500 m buffer was applied to anthropogenic features for the woodland caribou assessment. Project-related changes in survival and reproduction due to habitat loss and sensory disturbance were evaluated in the wildlife assessment (Draft EIS Section 14.5 [Residual Effects Analysis]). Mitigation measures for noise are summarized in Table 14.4-1 of Draft EIS Section 14.4. Draft EIS Section 14.8 (Key Findings) also provides a summary of mitigations planned to address to potential changes to survival and reproduction associated with sensory disturbance: "[f]urther mitigations such as scheduling work to avoid sensitive areas/periods, enclosing equipment, using noise suppression equipment, and wildlife protection policies would minimize sensory disturbance to wildlife. These measures, combined with minimizing habitat loss, would limit effects on survival and reproduction of wildlife." A Project-specific Environmental Monitoring Plan and supporting documentation would be developed that includes monitoring wildlife use around the Project and applying adaptive management, if necessary. 2. Effects specific to vibration were not considered in the Draft EIS because a lack of literature exists on effects on wildlife from vibration. In addition, the majority of vibration from blasting during Operations would be underground, and these vibrations are not expected to have a measurable effect on wildlife. No changes are proposed in the revised EIS to address this IR.	n/a

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						References *Species at Risk Act*. SC. 2002, c 29. Last amended 6 October 2020. Available at https://laws.justice.gc.ca/eng/acts/s-15.3/	
126	ECCC	Wildlife and Wildlife Habitat	Section 14.4.2 Table 14.4-1 Table 23A-1 Table 23A-5	The Proponent states that vegetation will be cleared during the construction phase to widen the access road and prepare the mine site, however the timing of vegetation clearing windows was mentioned only within the text of the EIS and should be included in the mitigation table and summaries. The Proponent also states that if sensitive periods for nesting migratory birds cannot be avoided, pre-clearance surveys will be conducted and buffers applied. ECCC does not recommend the use of nest searches or pre-clearing surveys for active bird nests during the breeding season as a mitigation, given the difficulty associated with finding nests reliably and the high likelihood of disturbing nesting birds when searching. Instead, ECCC recommends that clearing and grubbing activities not be conducted during the breeding bird season. The draft EIS states that activity restrictions for sensitive species, including nesting migratory birds, will be applied but provides no details on what these restrictions are or when they will be applied. The Proponent commits to including this information in an Environmental Protection Program.	Provide an Environmental Protection Program that includes: ▪ details on how vegetation clearing related to site preparation and road widening/development will be conducted to minimize risk to migratory birds and SAR. ▪ the timing window that will be used for vegetation removal to reduce risk to migratory birds and SAR and ▪ details on what activity restrictions will be implemented for the protection of migratory birds and SAR and when they will be applied.	NexGen notes Environment and Climate Change Canada's (ECCC's) request for the Environmental Protection Program is outside the scope of the Project Terms of Reference (Draft EIS Appendix 1A [Concordance Tables for the Terms of Reference and Generic Guidelines for Preparation of an Environmental Impact Statement], Table 1A-2). An Environmental Protection Program would be provided as part of federal licensing and will describe the supporting processes that would include details regarding scheduling vegetation clearing to comply with activity restrictions to minimize risk to migratory birds and species at risk. Table 14.4-1 in Draft EIS Section 14.4 (Project Interactions and Mitigations) and Table 23A-1 and Table 23A-5 in Draft EIS Appendix 23A (Summary of Project Environmental Design Features and Mitigation Measures) specify the timing for migratory birds is for Nesting Zone B6. Table 14.4-1 of Draft EIS Section 14.4 and Draft EIS Appendix 23A also states if sensitive species are confirmed in the Project footprint, activity restriction guidelines for sensitive species established by the Government of Saskatchewan (ENV 2017) will be applied to the Project, as required. NexGen's intent is to minimize clearing during nesting periods and follow ECCC guidelines; however, flexibility is needed for activity timing restrictions due to uncertainties in final design logistical details and permitting timelines. If activities occur during the nesting period, NexGen would engage with the ECCC on current recommended practice and required authorizations, as applicable. No changes are proposed in the revised EIS to address this IR. **References** ENV (Saskatchewan Ministry of Environment). 2017. Activity restriction guidelines for sensitive species. Fish, Wildlife and Lands Branch. Regina Saskatchewan. Accessed January 2020. Available at http://publications.gov.sk.ca/documents/66/89554-Saskatchewan%20Activity%20Restriction%20Guidelines%20for%20Sensitive%20Species%20-%20April%202017.pdf	n/a
126 a	MN-S	Summary of Significance Determination - Caribou	Section 14.5.1.3.2 Section 14.7	The EIS states "… *even the incremental effects due to the small amount of habitat loss from the Project in SK2 West are predicted to result in a significant adverse effect on caribou in the Application Case.* … Cumulative effects from the Project, Fission Patterson Lake Property, and forest harvest activities are similarly predicted to result in a significant adverse effect on caribou in the RFD Case, …". MN-S has not had the opportunity to evaluate the Caribou Mitigation and Offsetting Plan to date.	Please explain how significant effects, including cumulative effects, on a listed species can be mitigated with the development of a Caribou Mitigation and Offsetting Plan (i.e., no details provided or evidence that such a plan will be effective) for the Project. Please ensure MN-S has the opportunity to evaluate the Caribou Mitigation and Offsetting Plan.	NexGen appreciates the Métis Nation – Saskatchewan's (MN-S's) request for clarification on how the Caribou Mitigation and Offsetting Plan (CMOP) can address effects and the request for engagement on the CMOP. NexGen further notes that engagement with the MN-S on caribou mitigation and management has been ongoing since 2020, that engagement specific to the development of the CMOP was initiated in 2021, and that mechanisms exist under the existing Benefit Agreement with the MN-S to plan for, and address, activities requested as part of this IR, as required. NexGen is in the process of developing the CMOP through engagement with the Saskatchewan Ministry of Environment and primary Indigenous Groups to meet provincial requirements and align with Indigenous goals. By meeting the provincial requirements for caribou mitigation and offsetting, the effects of the Project can be mitigated. However, the primary reason for an assessment of a significant effect from the Project on woodland caribou is because the amount of existing disturbance in the SK2 West Administration Unit range has already exceeded the 65% undisturbed habitat threshold established by Environment and Climate Change Canada for a self-sustaining population. It is acknowledged that the Project CMOP would not address all effects under existing conditions.	n/a

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						As stated in Draft EIS Section 14.5.1.3.2 (Significance Determination), in the Application Case, the Project is expected to result in a loss of 32.4 ha of suitable caribou habitat. Habitat loss from the Project may displace a few individual caribou but is unlikely to have a demographic effect at the population level. As described in Table 2A-2 of Draft EIS Appendix 2A (Summary of Indigenous Group Engagement Activities), engagement with the MN-S on caribou mitigation and management commenced in early 2020. On 5 May 2021, NexGen sent an annotated table of contents for the CMOP to the MN-S requesting feedback and an invitation for the MN-S to participate in NexGen's Caribou Linear Feature Reclamation and Mitigation Trial Program. While the MN-S provided no feedback to NexGen on the annotated table of contents for the CMOP at that time, ongoing engagement with the MN-S regarding caribou continued thereafter (e.g., 2 November 2021 Joint Working Group meeting), including information on how caribou was assessed in the Draft EIS, the requirement to develop a CMOP, and opportunities for the MN-S to participate in development of the CMOP. Moving forward, the MN-S will continue to be engaged on the development of the CMOP through the Environment Committee established under the Benefit Agreement with the MN-S. No changes are proposed in the revised EIS to address this IR.	
127	ECCC	Wildlife and Wildlife Habitat	Appendix 14A Table 20.3-1 Annex VIII.2, Sections 8, 10 Annex VIII.3, Section 3	Myotis species were detected throughout the Site Survey Area (SSA) but there were no descriptions of locations of important habitat such as maternal roosts or hibernacula provided despite identifying that minor hibernacula could exist in the Regional Study Area (RSA).	1. Describe and map locations of suitable myotis hibernacula and/or maternal roost habitat within the LSA and RSA and explain how these habitats may be affected by Project activities. 2. Describe what mitigation measures will be taken to avoid the breeding period for bats.	NexGen notes the reviewer's request for more information on effects and mitigations for myotis species hibernacula and maternal roost habitat. Information on effects and mitigations are provided in the Draft EIS and additional mitigations will be added to the revised EIS as summarized below. 1. Suitable myotis hibernacula and/or maternal roost habitat within the local study area (LSA) and regional study area is described in Draft EIS Section 14.3.6.1 (Habitat Availability), which presents baseline conditions for maternity roosts and hibernacula. A description of how Project activities may affect these habitats is included in Draft EIS Section 14.5.6.1.1 (Habitat Availability), which states that given the low potential for hibernacula in the LSA, the Project would not likely remove hibernacula. The Project is expected to result in a loss of less than 0.1 ha of moderate suitability little brown myotis roosting habitat. 2. Draft EIS Section 14.4 (Project Interactions and Mitigations) includes information regarding mitigation measures to avoid breeding periods for bats. Pathway ID W-05 (Injury and mortality from clearing) in Draft EIS Section 14.4.2 (Secondary Pathways) states that application of timing restrictions for nesting birds also provides mitigation to reduce effects on bat maternity roosting habitat (i.e., bats roost in forested areas during summer months). Table 14.4-1 in Draft EIS Section 14.4 and Table 23A-5 in Draft EIS Appendix 23A (Summary of Project Environmental Design Features and Mitigation Measures) state that if sensitive species are confirmed in the Project footprint, activity restriction guidelines for sensitive species established by the Government of Saskatchewan (ENV 2017) would be applied at the Project, as required. Additional mitigation measures to reduce potential effects to bats will be added to Table 14.4-1 in revised EIS Section 14.4 in Pathway ID W-01 (Habitat loss), Pathway ID W-05 (Injury and mortality from clearing), and/or Pathway ID W-19 (Wildlife attractants): ▪ If in specific situations where the setback distance(s) cannot practically be applied, contact the ENV [Saskatchewan Ministry of Environment] early in the planning stage to minimize effects on sensitive species (Pathway ID W-01 and Pathway ID W-05). ▪ If birds or bats are observed nesting, roosting, or hibernating, do not disturb them, to the extent practicable. Contact the ENV and ECCC [Environment and Climate Change Canada] to discuss measures for removal/relocation and to identify further measures that could prevent future access (Pathway ID W-01 and Pathway ID W-05). ▪ Minimize habitat creation and human-wildlife interactions for the Project through design; specifically, by evaluating opportunities to include screening on vents and entranceways to rafters/attics (Pathway ID W-05 and Pathway ID W-19). ▪ For worker protection and prevention of the spread of rabies and white nose syndrome, contact the ENV and ECCC if any sick, injured, or dead bats are observed. Only trained and	Section 14.4

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						rabies-vaccinated staff or contractors would be allowed to handle bats. Submit bat carcasses for testing of rabies and/or white nose syndrome, as appropriate, based on communications with the ENV and ECCC (Pathway ID W-05 and Pathway ID W-19). <u>**References**</u> ENV (Saskatchewan Ministry of Environment). 2017. Activity restriction guidelines for sensitive species. Fish, Wildlife and Lands Branch. Regina Saskatchewan. Accessed January 2020. Available at http://publications.gov.sk.ca/documents/66/89554-Saskatchewan%20Activity%20Restriction%20Guidelines%20for%20Sensitive%20Species%20-%20April%202017.pdf	
128	CNSC	Human Health with respect to radiation exposure	Human Health Accidents and Malfunction	**Context:** Camp workers at the proposed Project were assessed for both radiological and non-radiological exposures in the Environmental Impact Statement (EIS) for the Rook I Project. However, the potential radiological and non-radiological impacts of the project on the health and safety of all other persons that would be on-site (for example, nuclear energy workers (NEWs) and persons not considered as NEWs (i.e., non-NEWs)), during normal operations and during accidents and malfunctions, were excluded from the EIS. The rationale provided by the proponent is in reference to CSA N288.6-12, as NEWs are not considered in the Standard. The exclusion of NEWs and non-NEWs who may be occupationally exposed to ionizing radiation and non-radiological hazards is contrary to the Project Description for the Rook I Project, which does identify in Section 4.2.5, Human and Ecological Health, the following: *Human and ecological health considerations will be evaluated through all phases of the Project and will consider the various potential impacts that the Project could have to various receptors. For example, specific to the direct operation of the Project, select occupations and personnel on-site could be exposed to radiation sources as part of their daily activities. These would include underground miners, ore and waste rock truck drivers and mill operators.* The proponent is reminded that the scope of the environmental assessment, as outlined in the Project Description for the Rook I Project, which was subsequently accepted by the Commission in its Record of Decision, provides the overarching framework for the EIS. Further, in the Record of Decision, it is stated that … *"CNSC staff submitted a detailed description of the primary project components and that it was satisfied that the project components and activities that NexGen listed in its project description were appropriate."* This would include the receptors identified in Section 4.2.5 as outlined above (i.e., specific to the direct operation of the Project, select occupations and personnel on- site could be exposed to radiation sources as part of their daily activities. These would include underground miners, ore and waste rock truck drivers and mill operators). **Rationale**:	The proponent is requested to assess the potential radiological and non-radiological impacts of the project on the health and safety of all persons on- site, during normal operations and during accidents and malfunctions (persons on-site in this context are NEWs and persons who are not NEWs who may incur occupational exposures). The proponent should identify all associated hazards and screen them as to potential risks for bounding scenarios. All bounding scenarios should be further assessed in detail with adequate consequence criteria for their specific impacts/risks on the environment, human health, and workers' safety.	NexGen appreciates the reviewer's comment and the feedback received from the reviewer during regulatory engagement on this IR. Recognizing that detailed information on this topic will be provided as part of federal licensing, which is being conducted in an integrated manner with the Project EA, NexGen understands the CNSC's request is to provide a summary in the revised EIS (Section 15 [Human Health]) regarding the potential radiological and non-radiological effects of the Project on nuclear energy workers (NEWs) and non-NEWs. NexGen confirms that detailed information on the topic of this IR will be provided as part of the licensing application submission to the CNSC in support of Project Construction, and will include the deliverables for radiological and non-radiological hazards outlined below. For radiological hazards: ▪ radiological exposure assessment for underground workers; ▪ radiological exposure assessment for the process plant and paste tailings preparation workplace; ▪ radiological exposure assessment for the low-level radioactive waste incinerator; and ▪ radiological exposure assessment for accidents and malfunctions. For non-radiological hazards: ▪ workplace exposure to diesel and crystalline silica dust; ▪ hazard analysis reports; and ▪ human factors engineering documentation. Attachment IR 128-1 includes a summary of radiological and non-radiological effects on the health of NEWs and non-NEWs during normal operations and through the potential occurrences of accidents and malfunctions. This attachment will be included as revised EIS Appendix 15A.	Section 15; Appendix 15A (new)

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				NexGen identified the scope of the Rook I Project in its submitted project description. Section 4.2.5, Human and Ecological Health, includes consideration of various potential impacts that the Project could have to various receptors, with examples given including select occupations and personnel on-site that could be exposed to radiation sources and non-radiological hazards as part of their daily activities (*paraphrased by CNSC staff*). CNSC staff note that the CSA standard N288.6-12 addresses environmental risk assessments for Class I nuclear facilities and uranium mines and mills. It is agreed that the standard does state the following in 1.6 (Receptors): *NEWs are covered under the radiation protection program and health and safety program in place at the facility and therefore not considered in the Standard.* However, there is currently no radiation protection program or health and safety program in place; noting that the Rook I Project is currently undergoing the EIS review process. Therefore, there is no information contained in the EIS on the extent of potential radiological and non-radiological impacts the project may have on all persons on- site (NEWs and persons who are not NEWs), including during accidents and malfunctions (also noting that the camp workers included in the HHRA were not advanced to the accidents and malfunctions analyses).			
129	MN-S	Exposure Pathways	Section 15.1, Figure 15.1-3	The linkage diagram is useful; however, it does not include all relevant information. Potentially operative exposure pathways removed through controls, mitigation, or treatment should also be discussed. Any exposure pathways which are assumed to be incomplete will require confirmation with monitoring and should not restrict Traditional Land Uses of MN-S, and the reasoning for excluding exposure pathways should be obvious and transparent.	Please include a conceptual site model or linkage diagram that shows all operational as well as incomplete exposure pathways, as well as justification for exposure pathways being rendered incomplete and not considered further in the assessment.	NexGen notes the reviewer's comment; however, Figure 15.1-3 in Draft EIS Section 15.1 (Introduction) is not meant to be the conceptual site model, rather, this figure provides a high-level overview of linkages between Project activities and the human health assessment. Figure 15.2-5 in Draft EIS Section 15.2.8.3 (Exposure Pathways and Conceptual Model) represents the human health conceptual site model and shows both the direct and indirect exposure pathways. Additionally, Table 15.2-5 in Draft EIS Section 15.2.8.3 shows the exposure pathways, including those pathways that are considered incomplete. No pathways have been removed due to controls, mitigation, or treatment. The only pathway that has been removed is the inhalation pathway during the far-future projection (i.e., for the hypothetical future permanent resident residing at or near the Project site) since there would be no ongoing Project source of air quality constituents of potential concern following Decommissioning and Reclamation (i.e., Closure). As indicated in NexGen's response to IR 263, based on CSA N288.6-22 (CSA Group 2022), the conceptual model does not need to be fully represented in the figure but can be a combination of visual methods or descriptive methods in text, which is how the information is presented in the Draft EIS. For improved clarity, NexGen will add the following statement to revised EIS Section 15.2.8.3 and Section 5.1.3 of revised EIS TSD XXI (Environmental Risk Assessment): "No pathways have been removed due to controls, mitigation, or treatment." **References** CSA Group (Canadian Standards Association Group). 2022. CSA N288.6-12: Environmental Risk Assessments at Nuclear Facilities and Uranium Mines and Mills.	Section 15.2.8.3; TSD XXI, Section 5.1.3

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130	MN-S	Existing Conditions	Section 15.2.6	Some traditional peoples eat burbot—including the liver. There may be the potential for bioaccumulation of COPCs in burbot livers, especially if burbot are ingesting other predator species of fish, as well as benthic organisms. Burbot would be a good species to gather baseline COPC information from because they are distributed throughout the study area; being captured in all but two (2) waterbodies and watercourses (Clearwater River above Beet Lake, and Clearwater River below Beet Lake). One of the reasons that burbot would be a good species to gather baseline COPC information from is because burbot are distributed throughout the study area, being captured in all but 2 waterbodies and watercourses (all except Clearwater River above Beet Lake, and Clearwater River below Beet Lake).	MN-S requests that the site (LSA) information for existing data regarding toxins (metals, and other toxins) include testing burbot (tissue, bile, livers) as a baseline from which to look at cumulative effects.	NexGen acknowledges the reviewer's request to include testing of burbot (i.e., tissue, bile, and livers) in baseline monitoring. In Draft EIS Section 11.2.2.1 (Valued Components), lake whitefish was used as a representative benthic fish as well as invertivore/carnivore in baseline monitoring. Baseline fish tissue samples were collected for both lake whitefish and northern pike; however, baseline monitoring did not include fish liver tissue as this parameter is not typically monitored. Modelling in Draft EIS TSD XXI (Environmental Risk Assessment) for lake whitefish represented fish with both fish-eating and bottom-feeding habits using bioaccumulation factors based on regional data in northern Saskatchewan. NexGen is confident that the modelling results for lake whitefish are representative of the results that would be expected for burbot. NexGen is advancing a Regional Traditional Foods Study in collaboration with Indigenous Groups in the local priority area, including the Métis Nation – Saskatchewan (MN-S). The Regional Traditional Foods Study is planned to include all Métis communities in Northern Region 2 and would represent an update to the Traditional Foods diet used in the Draft EIS. Early engagement with primary Indigenous Groups on the Regional Traditional Foods Study design commenced in the last quarter of 2022, with follow-up engagement continuing in 2023. This study is intended to be completed in 2024. The results of the Traditional Foods Survey will provide an opportunity to determine if burbot liver is a significant portion of the Traditional Foods diet and if there is a need for this parameter to be monitored. NexGen further notes that metals and other toxins in burbot tissue, including bile and livers, could be monitored through the independent Indigenous monitoring programs, should this be an item of interest identified by the Environmental Committee implemented through the Benefit Agreement with the MN-S. If burbot is added to the monitoring program, information collected would be added into the environmental risk assessment model for future iterations during the course of the Project lifespan and after completion of the Final EIS. No changes are proposed in the revised EIS to address this IR.	n/a
131	MN-S	Removal of Exposure Pathways	Section 15.2.7	Removal of exposure pathways through mitigation is only acceptable if mitigative measures are applied at the design stage or if their continued operation are conditions of project approval. If active management, exposure control, or other risk mitigations measures need to be maintained or actively applied/enforced, then the pathway should be considered operative. Any exposure pathway mitigated through this approach will require additional monitoring and validation to ensure that the mitigation is effective. Any mitigation which requires restrictions on Traditional Land Use by MN-S will require additional consultation.	**Suggestions for mitigation and follow-up measures** Please provide confirmation that NexGen will consult with MN-S on any mitigation which requires restrictions on Traditional Land Use by MN-S.	NexGen notes the Métis Nation – Saskatchewan's (MN-S's) suggestion regarding consultation on mitigations restricting Traditional Land Use and supports MN-S engagement on mitigation measures that could potentially affect Traditional Land Use. To date, opportunities for engagement on mitigations have primarily been provided through the Joint Working Group (JWG) process. Feedback received through the JWGs and in the IRs received on the Draft EIS have been, or are being, incorporated into Project design, to the extent possible and as appropriate. Going forward, opportunities for engagement on mitigation would be provided through the Environmental Committee established through the Benefit Agreement with the MN-S. No changes are proposed in the revised EIS to address this IR.	n/a
131 a	MN-S	Subsistence Harvester	Section 15.2.8.1	The EIS states that: "… about 50% of the Traditional Foods for subsistence harvesters were assumed to be sourced from either Patterson Lake South Arm, Beet Lake in the LAS, or Lloyd Lake, and the other 50% from a reference location." The identity of this reference location and potential for additional exposure through country foods (whether naturally occurring or not) is not clear.	Please clarify whether/how COPC exposure from the reference location was incorporated. Please include additional detail on the nature of the "reference location" of the Traditional Food Study and the level of COPC exposure expected through Traditional Resources from there.	NexGen appreciates the reviewer's comment and would like to clarify that the reference location is intended to represent a location that would be unaffected by the proposed Project. The reference location is characterized by the compilation of baseline data in the regional study area; constituents of potential concern exposure at the reference location would be characteristic of the existing environment in the area of the Project. The reference location is represented by Broach Lake (Draft EIS TSD XXI [Environmental Risk Assessment], Section 6.2.1). Expected non-radiological conditions at Broach Lake during Operations are shown in Table 6-10 in Draft EIS Section 6.2.5.1.1 (Non-radiological Dose) and expected radiological conditions at Broach Lake during Operations are shown in Table 6-11 in Draft EIS Section 6.2.5.1.2 (Radiological Dose). When predicting future effects to human health, the environmental risk assessment assumed that 50% of the Traditional Foods for subsistence harvesters would be sourced from an area unaffected by the Project (i.e., Broach Lake) and the other 50% would be sourced from the Patterson Lake South Arm (i.e., area that would experience Project effects). The reviewer is referred to Table 5-4 in Draft EIS TSD XXI for the specific	TSD XXI, Section 5.2.1

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						assumptions by receptor on the fraction of time spent between the exposure location and the reference location. Section 5.2.1 of revised EIS TSD XXI will be updated to clarify the intent and locale of the reference location.	
132	CNSC	Receptor Selection and Characterization	Section 15,2.8.1	**Context:** In the selection of receptors for the Human Health Risk Assessment, "infants" and "toddlers" were grouped together with one-year-olds and assumed to have similar exposures (and effects) to the COPCs in the project area. There are, however, significant differences between these groups with respect to their food intakes, body weights, feeding behaviour, and sensitivities to COPCs, to name a few. An infant's intake of liquids (infant formula reconstituted with water taken from the Patterson Lake, for example) is much greater than a toddler and a one-year-old receptor. A toddler would have much higher hand-to-mouth activity (therefore, higher intake of soil) than an older child. Similarly, the sensitivity of these groups to COPCs will differ significantly given that the immune system and detoxification mechanisms are still developing in the younger age groups. **Rational**: Clause 6.2.3.1 of the CSA Standard N288.6-12 (Environmental risk assessments at Class 1 nuclear facilities and uranium mines and mills) outlines receptor groups divided into age classes to include infants, toddlers, children, teens, and adults. Given the foregoing, it is inappropriate to group infants and toddlers with one-year- olds in this HHRA.	Include, as receptors, an infant and a toddler in the HHRA for the project.	NexGen appreciates the reviewer's comment; however, NexGen confirms that the human health risk assessment (HHRA) in Draft EIS Section 15 (Human Health) and in Draft EIS TSD XXI (Environmental Risk Assessment) has appropriately considered the infant and toddler ages of human receptors in accordance with federal guidance. NexGen notes that the text indicating five age classes (i.e., infants, toddlers, children, teens, and adults) for non-radiological assessment in CSA N288.6-22 (CSA Group 2022) has been removed from the standard. Clause 6.2.3.1 in CSA N288.6-22 is more general and states "receptor groups are typically divided into age classes". Both CSA N288.1-20 (CSA Group 2020) and Health Canada (HC) provide slightly different definitions of an infant. The intent in the HHRA was to harmonize the age classes so the same receptors could be assessed for both the radiological and non-radiological human health assessments. The CSA N288.1-20 guidelines define 'infant' as the one-year-old infant in International Commission on Radiological Protection Publication 71 (ICRP 1996) and represents the age range of zero to five years old, with the nominal age for characteristics and dose coefficients being one year. Health Canada's 2021 Preliminary Quantitative Risk Assessment (PQRA) guidance document, which is also referenced in CSA N288.6-22, defines 'infant' as zero to less than six months and 'toddler' as six months to less than five years old. A comparison between intake rates for the CSA one-year-old and the HC infant and toddler is provided in Table 1 of Attachment IR 132-1. The CSA one-year-old intake rates generally approach or equal the HC toddler values. NexGen maintains that the CSA values for the infant (i.e., one-year-old) are appropriate for both the radiological and non-radiological assessment and utilized these values in the HHRA. No changes are proposed in the revised EIS to address this IR. **References** CSA Group (Canadian Standards Association Group). 2020. Guidelines for modelling radionuclide environmental transport, fate, and exposure associated with the normal operation of nuclear facilities. N288.1:20. March. CSA Group. 2022. CSA N288.6-22: Environmental Risk Assessments at Nuclear Facilities and Uranium Mines and Mills. HC (Health Canada). 2021. Federal Contaminated Site Risk Assessment in Canada: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA). Version 3.0. ICRP (International Commission on Radiological Protection). 1996. Age-Dependent Doses to Members of the Public from Intake of Radionuclides: Part 4, Inhalation Dose Coefficients.	n/a
133	MN-S	Carcinogens - harvester	Section 15.5.1.2	This Section compares the subsistence harvester exposed to Project-related arsenic to a reference subsistence harvester for context. However, the reference harvester is only exposed through foodstuffs and not through other exposure pathways, such as baseline concentrations in soil, air, or water.	To ensure a valid comparison between a subsistence harvester exposed to Project-related arsenic and a reference subsistence harvester, please include total exposure for the reference harvester case.	NexGen appreciates the reviewer's request to include total exposure for the reference harvester but clarifies that the reference subsistence harvester in Draft EIS Section 15.5.1.2 (Carcinogens) is exposed to the same exposure pathways as the subsistence harvester in the Application Case. The difference between the two is that the reference subsistence harvester is only exposed to baseline concentrations and the subsistence harvester in the Application Case is exposed to both baseline and Project-related concentrations. The comparison is valid since both are exposed to the same pathways, though the most important pathways are the Traditional Foods ingestion pathways. The	n/a

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						adult subsistence harvester would be exposed to soil and water; however, those pathways are minor compared to the food ingestion pathway. The subsistence harvester is generally assumed to harvest in the local study area and regional study area, and then bring back the food to their family; therefore, only the adult would be exposed to other pathways (i.e., soil, water) in addition to food pathways. The cancer risk for arsenic is calculated for a composite receptor for various age groups (i.e., toddler, child, teen, adult) representing a person exposed throughout all stages of a lifetime. Air was not considered an exposure pathway as arsenic was not identified as a constituent of potential concern in air. The arsenic soil concentration from the proposed Project represents a small fraction of the background; therefore, the incremental dose and the associated risk to an adult exposed to soil at Patterson Lake South Arm would be negligible. No changes are proposed in the revised EIS to address this IR.	
134	CNSC	Human Health with respect to radiation exposure	Section 15.5.1.3	**Context:** The factor of 60 Bq/m^3 should not be used as a screening level for radon in ambient air. It was not designed for this purpose. **Rationale:** The value of 60 Bq/m^3 is a reference level for environmental radon concentrations based on a calculated effective dose to members of the public. This value was derived from table 5 of section 4.2.1 in ICRP-65. This section of ICRP-65 provides the basis for an action level for intervention in indoor dwellings. The recommendation of the ICRP is that the annual effective dose be in the range of 3 to 10 mSv/year for a member of the public. The corresponding radon concentration would range from 200 to 600 Bq/m^3, assuming an annual occupancy of 7,000 hours and an equilibrium factor of 0.4. The occupancy time of 7,000 hours represents 80% of the outdoor occupancy. UNSCEAR suggests that a value of 60% may be appropriate for the outdoor environment; therefore, the occupancy used in this derivation is conservative for outdoor exposures. The value of 60 Bq/m^3 is based on dividing the ICRP recommended action level of 600 Bq/m3, which corresponds approximately to an annual dose of 10 mSv/year, by a factor of 10 to arrive at a radon concentration of 60 Bq/m^3 corresponding to an annual effective dose of 1 mSv/year.	Identify the local or regional radon background concentrations. **Suggestions for mitigation and follow-up measures:** NexGen should compare the monitored environmental radon concentrations to local or regional background concentrations.	While 60 becquerels per cubic metre (Bq/m^3) (incremental) has been used in CNSC oversight reports for uranium mines and mills, and referenced by Health Canada (HC 2014), NexGen understands from the reviewer's comment that the CNSC's position is that this reference level should no longer be used based on the updated Radiation Protection Regulations. NexGen will remove the reference level of 60 Bq/m^3 from revised EIS Section 15 (Human Health) and revised EIS TSD XXI (Environmental Risk Assessment). Moving forward for the Project, the health effect from radon will be interpreted in terms of radiation dose. The total effective dose, including radon and uranium-238 decay chain radionuclides, will be compared to the dose limit of 1 millisievert per year (mSv/yr). The average concentration of radon from baseline monitoring is 2.94 Bq/m^3 (Draft EIS TSD XXI, Section 4.3.2, Table 4-4). Project radon during Operations at the camp location is predicted to be 44.5 Bq/m^3. For comparison purposes, total radon concentrations will be compared against background concentrations, as well as the HC radon guideline of 200 Bq/m^3 in Section 5.4.1.1.4 of revised EIS TSD XXI. The reference to 60 Bq/m^3 will be removed from the following subsections of revised EIS Section 15: ▪ Section 15.5.1.3 (Radionuclides and Radon); ▪ Section 15.5.2.3 (Radionuclides and Radon); ▪ Section 15.6 (Risk Characterization and Significance Determination); and ▪ Section 15.9 (Key Findings). The reference to 60 Bq/m^3 will also be removed from the following subsections of revised EIS TSD XXI: ▪ Table 5-17 in Section 5.3.2 (Radiation Dose Limits and Targets); ▪ Section 5.4.1 (Risk Estimation); ▪ Section 5.4.1.1.4 (Radon Risk); ▪ Section 5.4.1.2.4 (Radon Risk); and ▪ Section 8.1.2 (Radiological Human Health Risk Assessment). **<u>References</u>** HC (Health Canada). 2014. Radon Reduction Guide for Canadians. Report No. 140040. Radiation Protection Regulations. SOR/2000-203 under the *Nuclear Safety and Control Act*. Last amended 01 January 2021. Available at https://laws-lois.justice.gc.ca/eng/regulations/SOR-2000-203/index.html	Section 15.5.1.3, 15.5.2.3, 15.6, 15.9; TSD XXI, Section 5.3.2, 5.4.1, 5.4.1.1.4, 5.4.1.2.4, 8.1.2

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135	MN-S	Carcinogens – harvesters	Section 15.5.2.2, Table 15.5-6	The discussion and table do not acknowledge predicted ILCRs exceed acceptable levels for three receptor groups, and are over 10x the acceptable level of risk for subsistence harvesters at Patterson Lake South Arm.	Please provide additional context in the EIS regarding predicted ILCRs.	NexGen appreciates the reviewer's comment, though clarifies that the bolded values presented in Table 15.5-6 of Draft EIS Section 15.5.2.2 (Carcinogens) do not represent exceedances of acceptable levels of cancer risk for the applicable receptor groups. Rather, the bolded values acknowledge that the predicted cancer risk is greater than the Health Canada (HC) negligible level of 1 in 100,000 (Health Canada 2021). NexGen notes that context regarding the HC cancer risk levels is provided in Draft EIS Section 15.5.1.2 (Carcinogens). In addition, as presented in Table 15.5-2 of Draft EIS Section 15.5.1.2, the predicted cancer risk for the subsistence harvester at the Patterson Lake South Arm during the Project lifespan for both the Application Case and upper bound sensitivity scenario would be within the 1 in 10,000, or very low risk level (i.e., equivalent to many healthcare interventions), with all other receptors falling within the negligible cancer risk level. Also, for the Reasonable Foreseeable Development Case, as presented in Table 15.5-6 of Draft EIS Section 15.5.2.2, the predicted cancer risk for the camp worker and seasonal resident at the Patterson Lake South Arm during the Project lifespan would be within the 1 in 10,000, or very low risk level; the predicted cancer risk for the subsistence harvester at the Patterson Lake South Arm during the Project lifespan would be within the 1 in 1,000, or low risk level (i.e., equivalent to clinical procedures); and for all other receptors the predicted cancer risk would be within the negligible cancer risk level. As the information requested by the reviewer in the IR is already included within the Draft EIS, no changes are proposed in the revised EIS to address this IR. **References** Health Canada. 2021. Federal Contaminated Site Risk Assessment in Canada: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA). Version 3.0.	n/a
136	CNSC	Current use of lands and resources for traditional purposes	Sections 15.6, 16.6, 17.6, 19.6,	**Context**: It is not clear if NexGen sought input from Indigenous Nations and communities on the potential adverse effects pathway, reasonably foreseeable development (RFD) case, conclusions and significance determination related to potential adverse impacts of the project on the potential or established Indigenous and/or treaty rights and effects of changes to the environment on Indigenous peoples, pursuant to paragraph 5(1)(c) of the CEAA 2012. **Rationale:** More information is required to understand whether Indigenous Nations and communities have provided input or have been engaged on the effects pathways, RFD case, conclusions, and significance determination.	Please provide additional information to demonstrate whether Indigenous Nations and communities were engaged directly with regarding the effects pathways, RFD case, conclusions and significance determination related to potential adverse impacts of the project on the potential or established Indigenous and/or treaty rights and effects of changes to the environment on Indigenous peoples, pursuant to paragraph 5(1)(c) of the CEAA 2012. Provide a rationale if this engagement has not been completed.	While the reviewer's comment appears to be focused on Draft EIS Section 15 (Human Health), Draft EIS Section 16 (Cultural and Heritage Resources and Indigenous Land and Resource Use), Draft EIS Section 17 (Other Land and Resource Use), and Draft EIS Section 19 (Community Well-Being), the following response speaks to NexGen's general engagement approach for the entire Project EA, including the sections referenced by the reviewer. The engagement activities conducted with Indigenous Groups are described in Draft EIS Section 2.6.1 (Indigenous Engagement) and in Draft EIS Appendix 2A (Summary of Indigenous Group Engagement Activities). Joint Working Groups (JWGs) were used as the primary means through which primary Indigenous Groups were directly engaged for feedback on the EA. Several JWGs discussed the EA approach and methods directly with Indigenous Groups, which are summarized below and included in Table 2.6-3 in Draft EIS Section 2.6.1.1.1 (Summary of Joint Working Group Activities): ▪ Modelling approaches for the EA, including effects pathways considered in modelling were discussed in January 2021. ▪ The EA scoping process, including valued components (VCs), intermediate components, assessment endpoints, and the pathways analysis process were discussed in April 2021. ▪ Project effects pathways, including example pathways considered within the EA, and the residual effects analysis process, including an example for community well-being, were discussed in May 2021. ▪ The process to determine significance of residual adverse effects on VCs (i.e., weight-of-evidence approach based on assessment precursors such as the pathways assessment and residual effects analysis) as well as prediction confidence and uncertainty, and monitoring and follow up were discussed in June 2021. ▪ The reference to Fission Patterson Lake South Property as the only reasonably foreseeable development (RFD) for all assessments other than caribou, which also had forestry RFDs, was discussed at multiple JWG meetings.	n/a

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						As noted in Draft EIS Section 2.6.1.1.1 (Summary of Indigenous Engagement Activities), primary Indigenous Groups elected to participate in varying numbers of JWG meetings. To help facilitate equal opportunities to access Project information, copies of 2021 JWG presentations were provided to each primary Indigenous Group and offers were made for each Indigenous Group to participate in a meeting for the same topics. Efforts were also made to engage more broadly with communities regarding EA methods, though NexGen acknowledges that both required public safety measures and government restrictions during the COVID-19 pandemic significantly limited the ability to meet with community members from March 2020 through finalization of the Draft EIS. During the community information sessions in June 2019, posters outlining the EA process, including key steps in EA development (e.g., EA scoping, characterization of existing conditions, VC selection, assessment approach, determining significance of residual adverse effects) were available for attendees to review; these posters were staffed by NexGen representatives, who answered any questions and recorded comments that arose (Draft EIS Appendix 2E [Summary of Community Information Sessions]). In addition, a VC survey was available for community information session attendees to record items of importance that should be considered within the EA. Another key method utilized to attempt to engage with communities was the generation of JWG summaries in 2021, which were created to provide JWG members materials to distribute to community members. The topics discussed at each JWG meeting were presented in these summaries and community members were encouraged to contact NexGen with any inquiries (Draft EIS Appendix 2F [Public Engagement Materials]). An assessment of the potential effects of the Project on rights-based Indigenous land and resource use is provided in Draft EIS Section 16, which is in compliance with Section 5(1) of the *Canadian Environmental Assessment Act, 2012*. The use of Indigenous and Local Knowledge in the assessment is summarized in Draft EIS Section 16.2.1 (Incorporation of Indigenous and Local Knowledge), which notes the influence Indigenous and Local Knowledge had with respect to component methods (i.e., VCs and spatial boundaries), existing conditions, Project interactions and mitigation, residual effects analysis, and monitoring, follow-up, and management. Throughout Draft EIS Section 16, specific engagement activities (e.g., JWG meetings) are referenced where feedback was explicitly considered. Table 3.8-1 in Draft EIS Section 3.8 (Influence on the Environmental Assessment) further details the influence of Indigenous and Local Knowledge in the EA and documents how the information and feedback was incorporated. Environmental assessment results meetings to discuss the findings of the Project EA, including significance of residual adverse effects on VCs, were offered to the Clearwater River Dene Nation (CRDN), Métis Nation – Saskatchewan (MN-S), Birch Narrows Dene Nation (BNDN), and Buffalo River Dene Nation (BRDN) on multiple occasions prior to the submission of the Draft EIS (Draft EIS Appendix 2A); however; unfortunately NexGen and the Indigenous Groups were unable to meet prior to Draft EIS submission. Following Draft EIS submission, EA results were presented to both the primary Indigenous Groups and local communities through multiple engagement events, which were as follows: ▪ Community information sessions held at the CRDN, La Loche, Turnor Lake/BNDN, BRDN, and Buffalo Narrows in June 2022. ▪ MN-S Northern Region 2 Board in September 2022. ▪ La Loche and Buffalo Narrows (Métis-specific sessions) in October 2022. ▪ CRDN Chief and Council and Environmental Committee in October 2022. ▪ BNDN Environmental Committee in November 2022 and Chief and Council and Environmental Committee in December 2022. ▪ BRDN Chief and Environmental Committee in December 2022. NexGen notes that in addition to the specific engagement events held between NexGen and Indigenous Groups and communities, the Draft EIS review process, including the FIRT and public	

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						comment period, also provided an opportunity for Indigenous Groups and communities to be engaged on the Project EA. In consideration of the information provided above, NexGen maintains that appropriate engagement regarding the EA process has occurred with Indigenous Groups and communities, including discussions with respect to effects pathways, the RFD case, conclusions and significance determination related to potential adverse impact of the Project on the potential or established Indigenous and/or treaty rights, and effects of changes to the environment on Indigenous Peoples. No changes are proposed in the revised EIS to address this IR. **References** BRDN-JWG (Buffalo River Dene Nation-Joint Working Group). 2021. Meeting Notes. Meeting #11. 23 June 2021. *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html	
137	CNSC	Indigenous Peoples' health / Socio-economic conditions	Sections 15.8 TSD XXI: ERA Section 8.3 Monitoring and follow-up	**Context:** The EIS states "NexGen would be working with local Indigenous Groups in an effort to complete a targeted traditional foods study to help validate or modify the dietary assumptions made in the HHRA." It is not clear when or how this activity will occur. The level of detail in TSD XXI: ERA section 8.3- Monitoring and Follow-up appears to be insufficient. **Rationale:** Additional information is required to understand the timelines and approach to conducting this engagement activity and study. As outlined in TSD XXI: ERA Section 8.3 , with respect to Far Future Project Effects, ''NexGen would implement an adaptive management throughout the operations.'' There is no explanation how this would be implemented.	Provide further detail in both Section 15.8 of the EIS as well as in Section 8.3 of the TSD XXI: ERA on the status of the targeted traditional food study. Include information about when the Traditional Foods Study would be completed, how Indigenous Nations and communities have and/or will be engaged on this study, how it will be used to help validate the consumption of traditional foods used in the HHRA, and how adaptive management would be implemented for the far future project effects.	To further clarify the information provided in Draft EIS Section 15.8 (Monitoring, Follow-Up, and Adaptive Management) and Section 8.3 of Draft EIS TSD XXI (Environmental Risk Assessment), NexGen confirms that a Regional Traditional Foods Study is being developed in collaboration with local communities as part of NexGen's broader, proactive approach to Project engagement and planning (i.e., EA monitoring and follow-up activities). NexGen provides the following updates with respect to the Regional Traditional Food Study: ▪ Early engagement with primary Indigenous Groups on the Regional Traditional Foods Study design commenced in the last quarter of 2022, with follow-up engagement continuing in 2023. ▪ The study is intended to be completed in 2024. At the date of this response, the study has been introduced to each of the four primary Indigenous Groups to provide an overview of the intent of the study, identify engagement opportunities, identify potential community liaisons, and reinforce the importance of community involvement and capacity building. ▪ The study is intended to be community led and will involve conducting a Food Frequency Questionnaire to collect information on quantity, type, and capture/harvest locations of Traditional Foods consumed. Community liaisons will assist in coordination of all aspects of the program and will aid in dissemination of information. ▪ The goal is to complete the Food Frequency Questionnaire interviews by early 2024. Traditional Foods are also planned to be collected for chemical analyses during 2023 and 2024. Assuming these times align with community availability, all results should be available by late 2024. The communities will determine the best method for sharing summary Regional Traditional Foods Study information to the members of the community during and upon completion of the study. With respect to the information in Draft EIS TSD XXI (Environmental Risk Assessment), the existing Traditional Foods diet used is based on the First Nations Food, Nutrition and Environment Study (FNFNES) (Chan et al. 2018, 2019). The FNFNES does not specifically include the local Indigenous communities; however, the Traditional Foods diet proposed for the environmental risk assessment (ERA) was verified with local communities and appropriate adjustments were made. Further adjustments were made based on additional engagement conducted with the CNSC, Saskatchewan Ministry of Environment (ENV), and Saskatchewan Health Authority in 2021, which was incorporated into the information included in the Draft EIS. The targeted Regional Traditional Foods Study would be used to update the Traditional Foods diet used in the ERA for the subsistence harvester and seasonal resident; this information would be considered for future iterations of the ERA during the course of the Project lifespan after completion of the Final EIS. Information regarding the NexGen adaptive management process is provided in Draft EIS Section 23.5.3 (Adaptive Management). Currently, the adaptive management plan for copper and cobalt is under development. To assist the CNSC in further understanding the how the adaptive management plan for copper and cobalt would be implemented for the proposed Project, a draft	Section 2; TSD I

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						version of the Adaptive Management Plan (AMP) will be provided to the CNSC, as available, noting this plan would not form part of the revised EIS. The draft AMP for copper and cobalt will include mitigation details associated with elevated copper concentrations in surface water due groundwater inputs from the potentially acid generating waste rock storage area. As the existing Traditional Foods diet used in the ERA is appropriate for the revised EIS, no changes are required in revised EIS Section 15.8 or Section 8.3 of revised EIS TSD XXI. NexGen notes that engagement completed in support of the progression of the Regional Traditional Foods Study being proactively undertaken by NexGen in collaboration with primary Indigenous Groups will be documented in revised EIS Section 2 (Indigenous, Regulatory, and Public Engagement) and revised EIS TSD I (Indigenous Engagement Report), as appropriate. **References** Chan L, Receveur O, Sadik T, Schwartz H, Ing A, Fediuk K, Tikhonov C. 2018. First Nations Food, Nutrition and Environment Study (FNFNES): Results from Saskatchewan (2015). Chan L, Receveur O, Batal M, Sadik T, Schwartz H, Ing A, Fediuk K, Tikhonov C. 2019. Erratum to the First Nations Food, Nutrition and Environment Study (FNFNES): Results from Saskatchewan 2015. Ottawa: University of Ottawa, 2018.	
138	MN-S	Executive Summary Section Purpose Section Introductions Incorporation of Indigenous Knowledge	Throughout EIS	The EIS states that : "*The cultural and heritage resources and Indigenous land and resource use assessment used widely accepted scientific practices and incorporated Indigenous and Local Knowledge from a variety of sources, including Joint Working Group meetings and Indigenous Knowledge and Traditional Land Use (IKTLU) Studies completed by First Nations and Métis Groups (collectively referred to Indigenous Groups) for the Project.*" Terminology such as Métis Group (rather than Indigenous Nation) does not align with, or reflect an understanding of, MN-S as a rights holder. The use of "incorporated" does not reflect current best practices that acknowledge Indigenous Knowledge as an equal but different way of knowing (than western science). This terminology implies that Indigenous Knowledge can be absorbed into a scientific approach. Terminology such as "First Nations" and "Indigenous groups" does not reflect current best practices or acknowledge the Rights, Title and Jurisdiction of MN-S. Each Indigenous Nation should be discussed and acknowledged independently.	Please revise EIS terminology accordingly.	NexGen acknowledges the reviewer's comment and notes the requested edits to the Draft EIS, including discussing Indigenous Groups on a Nation-by-Nation basis within assessments, are outside the scope of the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012*. The separate use of the terms 'First Nations' and 'Métis', which collectively are referred to as Indigenous Groups, is in reference to the specific Indigenous Groups identified for engagement and who are potentially affected by the Project (Draft EIS Section 2.4.1 [Identification of Indigenous Groups for Engagement]). The term Métis Groups is not used outside of this context and NexGen recognizes that the Métis are rights-holders. The term 'Indigenous Groups' is used appropriately within the Draft EIS when NexGen is discussing both First Nations and Métis collectively. NexGen notes that the signing of a Study Agreement in 2019 and Benefit Agreement in 2023 with the MN-S reflects a comprehensive understanding and recognition of Métis Rights. As discussed in Draft EIS Section 3.6 (Incorporation of Indigenous and Local Knowledge), Indigenous Knowledge was valued equally to Western science in the Draft EIS. The term 'incorporation' is commonly used to describe the process of merging or combining information, rather than implying a secondary position. NexGen notes that information specific to individual Indigenous Groups is discussed independently throughout the Draft EIS, including when each Indigenous Group's Indigenous Knowledge is referenced, and when a concern specific to an Indigenous Group is discussed. NexGen is confident that proper EA practice was followed when speaking to Indigenous Groups and the incorporation of Indigenous Knowledge when developing the Draft EIS. NexGen maintains that the edits requested by the reviewer, including discussing Indigenous Groups on a Nation-by-Nation basis within assessments, are outside the scope of the *Canadian Environmental Assessment Act, 2012*. As a result, no changes are proposed in the revised EIS to address this IR. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html	n/a

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139	CRDN	Heritage Resources	Section 16?	No heritage resources identified.	NexGen should provide details on the protocol for change finds. CRDN community monitor should be present monitoring during all phases of project development.	NexGen notes the Clearwater River Dene Nation's (CRDN's) request is outside the scope of the requirements of a designated project under the *Canadian Environmental Assessment Act, 2012*. However, NexGen also notes that mechanisms exist under the existing Benefit Agreement with the CRDN to plan for, and address, activities requested as part of this IR, as required. As outlined in Pathway ID HR-01 (Land clearing during all Project phases) in Draft EIS Section 16.4.2 (Secondary Pathways), a chance find procedure would be implemented to manage the risk of disturbing unanticipated heritage resources during clearing. The chance find procedure would be developed in detail during the federal licensing and provincial permitting processes, and prior to Project Construction. An opportunity for the CRDN to review and comment on the chance find procedure will be provided through the Environmental Committee formed as part of the Benefit Agreement with the CRDN. In support of further monitoring and management of heritage resources, the independent CRDN Indigenous Monitor would have unfettered access to the site during all Project phases, subject to the Indigenous Monitor complying with appropriate health and safety and other reasonable site-specific requirements. The exact scope of the independent Ingenious Monitors would be developed through the Environmental Committee formed through implementation of the Benefit Agreement with the CRDN. As this IR is out of the scope of the EA, no changes are proposed in the revised EIS. NexGen notes that this IR response has been collaborated on directly with the CRDN through the CRDN Environmental Committee. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html	n/a
140	CNSC	Current use of lands and resources for traditional purposes	Section 16, 17, 23 and 24	**Context:** It is not clear from this section(s) of the EIS and the Indigenous Engagement Report, whether NexGen provided Indigenous Nations and communities with the opportunity to participate in the development, implementation and review of monitoring and mitigation measures, as per the guidance of REGDOC-3.2.2 and CNSC's Generic EIS Guidelines. This engagement should include: presenting information regarding effects to Indigenous land and resource use and mitigation measures, seeking specific feedback, responding to any feedback and validating this with identified. If needed, NexGen should provide a rationale where information could not be obtained. **Rationale:** More information is required to determine what measures were identified to mitigate or accommodate potential adverse impacts of the project on the potential or established Indigenous and/or treaty rights and effects of changes to the environment on Indigenous peoples, including suggestions raised by Indigenous groups pursuant to paragraph 5(1)(c) of the CEAA 2012.	Provide details about how NexGen engaged with Indigenous Nations and communities on the development, implementation and review and validation of the mitigation measures proposed. **Suggestions for mitigation and follow-up measures** It is recommended that NexGen creates a commitments table, or adds a column to their issues table, that clearly articulates the specific mitigations that they have committed to for each Indigenous Nations and community to address the issues and concerns they have raised.	NexGen acknowledges the reviewer's comment though notes the validation of mitigation measures with Indigenous Groups is outside the scope of the CNSC Generic Guidelines for the preparation of an EIS (CNSC 2021). As stated in Section 7 of these guidelines, "[t]he EIS will include, and the proponent should consider engaging with potentially affected Indigenous groups to obtain their views on the following: . . . measures identified to mitigate or accommodate potential adverse impacts of the project on the potential or established Indigenous or treaty rights and effects of changes to the environment for Indigenous peoples, including suggestions made by Indigenous groups" (CNSC 2021). As per this guidance, NexGen confirms that engagement with Indigenous Groups regarding key Project mitigations has occurred and that all proposed mitigations are contained within the Draft EIS. Although Indigenous Group review and validation of proposed Project mitigation measures are not within the scope of the EA, NexGen has always prioritized gathering feedback from local Indigenous Groups and communities, including information on how the Project could be designed to minimize potential adverse effects on people and the environment. A key method implemented to facilitate engagement with Indigenous Groups for consideration into Project design and the EA was the Study Agreements signed with the primary Indigenous Groups in the fall of 2019. Each Study Agreement formalized an engagement process between NexGen and the individual Indigenous Groups to, among other things, identify and characterize potential effects on Indigenous rights and socio-economic interests resulting from the Project, and to collaboratively identify potential avoidance, mitigation, and accommodation measures related to all identified potential effects on those rights (Draft EIS Section 2.5.2.1 [Study Agreements]).	Appendix 2B; TSD I, Appendix C

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						As part of the Study Agreements, Joint Working Groups (JWGs) were established in late 2019 with each of the Clearwater River Dene Nation (CRDN), Métis Nation – Saskatchewan (MN-S), Birch Narrows Dene Nation (BNDN), and Buffalo River Dene Nation (BRDN) as a means to facilitate regular, ongoing engagement during the EA process. A specific objective of the JWGs, which is outlined in the Study Agreements, was to address topics of specific interest to the communities relative to the Project, including discussion of potential effects resulting from the Project and mitigation of those effects. The JWGs facilitated the incorporation of feedback and Indigenous and Local Knowledge into the EA and included discussions regarding Project design, potential adverse effects, and mitigation measures that could be implemented into Project design to avoid or minimize identified adverse effects. A summary of topics discussed during JWG meetings is provided in Draft EIS Section 2.6.1 (Indigenous Engagement), Draft EIS Appendix 2A (Summary of Indigenous Group Engagement Activities), Section 5 of Draft EIS TSD I (Indigenous Engagement Report), and Appendix B of Draft EIS TSD I. NexGen acknowledges that it was not always possible to conduct JWG meetings with each primary Indigenous Group on all topics discussed. In lieu of being able to conduct JWG meetings, starting in 2021, NexGen provided information discussed at JWG meetings to each of the primary Indigenous Groups, with an open invitation to further discuss the JWG meeting topics (including mitigation measures), if desired. The primary engagement with local communities regarding mitigation measures occurred through community information sessions. The community information sessions allowed community members to directly discuss items such as potential Project effects, monitoring, and mitigation measures with NexGen team members and subject matter experts. Community information sessions were held in June 2019, June 2022, October 2022, and June 2023: ▪ June 2019 community information sessions were held in La Loche, BNDN / Turnor Lake, BRDN, and Buffalo Narrows. ▪ June 2022 community information sessions were held in La Loche, Buffalo Narrows, CRDN, BNDN / Turnor Lake, and BRDN. ▪ October 2022 Métis-member specific community information sessions, scheduled at the request of the MN-S, were held in La Loche and Buffalo Narrows. ▪ June 2023 community information sessions were held in Buffalo Narrows, La Loche, BNDN / Turnor Lake, BRDN, and CRDN. Examples of environmental design features and mitigations that were influenced by engagement with Indigenous Groups and communities include relocating Project infrastructure in order to optimize on-site road routing to avoid a wetland, removal of a second set of water intake infrastructure from Patterson Lake, and a commitment to working with local Indigenous Groups to develop fishing policies for the Project that consider both fisheries protection and traditional use activities. Further information on how Indigenous and Local Knowledge has influenced Project design and conduct of the EA, including the development of mitigation measures, is provided in Draft EIS Section 3.7 (Influence on Project Planning and Design) and Draft EIS Section 3.8 (Influence on the Environmental Assessment), respectively. A full list of the Project environmental design features and mitigation measures to accommodate potential adverse Project effects on the potential or established Indigenous and/or treaty rights and effects of changes to the environment on Indigenous peoples is provided in Draft EIS Appendix 23A (Summary of Project Environmental Design Features and Mitigation Measures). NexGen notes that through the Benefit Agreements signed with each of the primary Indigenous Groups, Environmental Committees composed of representatives from the Indigenous Groups and NexGen would act as an oversight committee to monitor the environmental performance of the Project to verify that parties are implementing the regulatory and environmental commitments made regarding the Project. With the signing of the Benefit Agreements, engagement regarding Project environmental design features and mitigation measures previously conducted with the JWGs has transferred the Environmental Committees.	

NexGen Energy Ltd.

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						NexGen will add a column to the tables in revised EIS Appendix 2B (Summary of Issues Identified by Indigenous Groups) and Appendix C of revised EIS TSD I that outlines the key accommodations, including environmental design features and mitigations, proposed to address the issues and concerns raised by the Indigenous Groups. **References** CNSC (Canadian Nuclear Safety Commission). 2021. Generic Guidelines for the Preparation of an Environmental Impact Statement – Pursuant to the *Canadian Environmental Assessment Act, 2012*. Available at http://cnsc.gc.ca/eng/resources/environmental-protection/ceaa-2012-generic-eis-guidelines.cfm	
141	CNSC	Any structure, site or thing of historical, archaeological, paleontological or architectural significance	Section 16 and 16.4.2	**Context:** It is not clear whether Indigenous Nations and communities were engaged on the results and findings of the Heritage Resources Impact Assessments (HHRIA). **Rationale:** More information is required to understand whether Indigenous Nations and communities have been engaged on; physical and cultural heritage, including any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.	Provide detail to demonstrate whether NexGen engaged with any Indigenous Nations on these surveys and findings on preserving, and managing the archaeological resources identified in the future HHIAs for the site. **Suggestions for mitigation and follow-up measures** The Final EIS submission should include an update on any engagement activities that have taken place with regards to any of the HHRIAs for the Project, or any site or thing that is of historical, archaeological, paleontological or architectural significance.	NexGen notes the CNSC's request for clarification on engagement on the heritage resources effects results. Although there was no Indigenous representation during the heritage resource surveys, the primary Indigenous Groups will be provided opportunities to participate in ongoing field programs and management of cultural and heritage resources through mechanisms in the existing Benefit Agreements. As presented in Draft EIS Section 16.3.1 (Cultural and Heritage Resources) and Draft EIS Annex IX (Heritage Resources Impact Assessment and Cover Letter), the heritage resource study was conducted in conformance with Section 63 of *The Heritage Property Act*. The field programs were carried out by qualified professionals to meet field protocol requirements. No archaeological resources were discovered during the Heritage Resources Impact Assessment (HRIA) for the Project. NexGen confirms that baseline information, including heritage resources, was presented and discussed during Joint Working Group (JWG) meetings. The HRIA was discussed with the Métis Nation – Saskatchewan (MN-S) in the 5 October 2018 JWG meeting, and with the Clearwater River Dene Nation (CRDN) in the 13 December 2018 and 18 February 2019 JWG meetings (Draft EIS Appendix 2A [Summary of Indigenous Group Engagement Activities]). Results from the cultural and heritage resources valued component assessment were presented to the Indigenous communities during results workshops including: ▪ Métis Nation Saskatchewan – Northern Region 2 (NR2) Board on 30 September 2022; ▪ La Loche (MN-S NR2) on 5 October 2022; ▪ Buffalo Narrows (MN-S NR2) on 6 October 2022; ▪ CRDN on 19 October 2022; ▪ Birch Narrows Dene Nation (BNDN) on 22 November 2022; ▪ Buffalo River Dene Nation (BRDN) (Chief/Environmental Committee) on 6 December 2022; and ▪ BNDN (Chief and Council) on 7 December 2022. NexGen also highlights that submission of the Draft EIS and the subsequent public review period and FIRT participation provide opportunities for Indigenous Groups and local communities to comment on the proposed Project, including commenting on topics regarding heritage resources. Going forward, the primary Indigenous Groups will be offered opportunities to be involved in ongoing identification, review, and contribution to management of cultural and heritage resources. Future opportunities for monitoring and management of heritage resources would be provided through the Environmental Committees formed through implementation of the Benefit Agreements with the primary Indigenous Groups. NexGen notes that a summary of engagement with all Indigenous Groups, including engagement with respect to heritage resources, is provided in Draft EIS Appendix 2A. This appendix will be updated in the revised EIS to include any additional engagement activities in regard to HRIAs conducted for the Project or any site or thing that is of historical, archaeological, paleontological, or	TBD

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No.	Department	Project Effects Link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement	NexGen Response	Section in EIS
						architectural significance, should engagement on HRIAs occur or additional HRIAs be conducted prior to the revised EIS submission. **References** *The Heritage Property Act*. SS 1979-80, c H-2.2. Effective November 28, 1980. Available at https://www.canlii.org/en/sk/laws/stat/ss-1979-80-c-h-2.2/latest/ss-1979-80-c-h-2.2.html	
142	CNSC	Indigenous physical and cultural heritage	Section 16 and 16.5.1.3.6	**Context:** The EIS states "The spatial extent of indirect or perceived effects from the Project and potential avoidance or reduced traditional land and resource use surrounding the Project was assumed to be 5 km from the maximum disturbance area, which represents an area where individuals may perceive contamination to exist." It is not clear if NexGen engaged directly with the Indigenous Nations and communities regarding the spatial extent of perceived effects on water, fish, plant, and wildlife resource quality. **Rationale:** More information is required to understand whether Indigenous Nations and communities have provided input or been engaged on the conclusion's regarding the extent of the perceived effects on the lands and resources use and therefore significance determination.	Please provide additional information on how Indigenous Nations and communities were engaged on the 5 km perceived spatial extent selected for the perceived effects on the lands and resources use. It is not clear if NexGen plans to carry out a perception baseline study for the project and area in collaboration with impacted Indigenous Nations and communities? If so, it is recommended that the spatial boundaries of perceived risk of the project by Indigenous Nations and communities be taken into consideration in the measurement indicators and assessment endpoints in the potential impact on cultural and heritage resources and Indigenous land and resource use. **Suggestions for mitigation and follow-up measures** It is recommended that NexGen engage directly with the Indigenous Nations and communities on the spatial extent of perceived effects for their traditional activities including hunting, trapping, and potential impacts on cultural and heritage resources and Indigenous land and resource use.	NexGen confirms that prior to and during Draft EIS review, NexGen offered and conducted EA results workshops with Indigenous Groups throughout 2022 and discussed EA results with local communities during community information sessions in June 2022 and June 2023. These workshops and discussions included conversations on the results of the Indigenous land and resource use assessment, which considered the 5 km spatial extent for perceived effects. Specific to the completed EA results workshops, Indigenous Groups did not provide specific questions or feedback regarding the use of a 5 km spatial extent for perceived effects associated with land and resource use. During EIS development, NexGen also discussed EA methods during several Joint Working Group meetings, though it is acknowledged that the 5 km buffer was defined later in the assessment process to determine how to appropriately assess perceived effects. In the absence of other related information and as noted in Draft EIS Section 16.5.1.3.6 (Perceptions of Water, Fish, Plant, and Wildlife Resource Quality), the 5 km perceived effects spatial extent was utilized in the Draft EIS based on information provided in the Birch Narrows Dene Nation (BNDN) and Buffalo River Dene Nation (BRDN) Indigenous Knowledge and Traditional Land Use Studies (Draft EIS TSD II: BNDN; Draft EIS TSD III: BRDN), which describe 5 km as the local study area for the assessment of traditional values surrounding the proposed Project. This distance was used to provide an approximation of magnitude and geographic extent and to focus mitigations; however, the determination of significance of effects also considered frequency, duration, reversibility, and context for a weight-of-evidence evaluation. As noted in Draft EIS Section 16.6.2 (Significance Determination), NexGen acknowledges that continued land and resource use activities are critical to local Indigenous Groups and communities, and necessary to maintain a social licence to operate. NexGen is committed to engaging directly with the Indigenous Groups throughout the Project lifespan regarding ways to minimize the concerns associated with perceived effects, including potentially through the planned perception survey. It is expected that this engagement will occur through the either the Environmental Committees or Implementation Committees as implemented through the Benefit Agreements signed with the primary Indigenous Groups. Should new information be available prior to the development of the revised EIS, this information will be considered within the EA.	TBD
143	MN-S	Introduction	Section 16.1	The EIS states: "Changes in access to land and traffic patterns could alter Indigenous land user safety." Changes to access have wider ranging impacts to Indigenous land users than just safety concerns. Changes in access may also impact the ability to access Culturally significant locales and/or resources for cultural practices and/or sustenance. This text does not acknowledge MN-S connection to the homeland and the importance and impact of land access to the MN-S culture and practices.	Please revise text to include acknowledgement of MN-S' connection to the homeland and the importance and impact of land access to the MN-S culture and practices.	The potential effect from access changes in the specific text referenced by the reviewer was provided as an example in Draft EIS Section 16.1 (Introduction). NexGen notes that text in Draft EIS Section 16.1 preceding this referenced text states, "Access and travel routes are important for understanding how lands and resources are accessed and the spiritual and cultural relationship with the broader landscape." Revised EIS Section 16.1 will be clarified in the specific text referenced by the reviewer to include the potential for loss of use of land by the Indigenous Groups, which is reflective of how the assessment was conducted. Draft EIS Section 16.3.3.2.1 (Occupancy, Habitation, and Access) discusses the importance of land access to the Métis Nation – Saskatchewan (MN-S) culture and practices. Draft EIS Section 16.5.1.1 (Access to and Area Available for Indigenous Land and Resource Use) provides a more comprehensive discussion and assessment of effects on culture and practices from access changes, and notes the importance and effect of land access to the MN-S through the citation of	Section 16.1

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						the MN-S Indigenous Knowledge and Traditional Land Use Study (Draft EIS TSD IV: MN-S) and a Joint Working Group (JWG) meeting with the MN-S (MN-S-JWG 2020). **References** MN-S-JWG (Métis Nation – Saskatchewan-Joint Working Group). 2020. Meeting Minutes. Meeting #4. 27 February 2020.	
144	MN-S	Assessment Endpoints	Section 16.2.2.3, Table 16.2-1	The EIS states: “Continued ability to participate in Indigenous land and resource use activities.” The ability to participate in an activity is not equivalent to the ability to continue to practice an activity with the same frequency or success as was present prior to Project disturbance. As rights holders, at a minimum, the ability for MN-S to continue Indigenous land and resource use practices, as they currently occur, should be the assessment endpoint.	Please revise assessment endpoints to include the ability for MN-S to continue Indigenous land and resource use practices, as they currently occur.	NexGen appreciates the reviewer’s comment; however, NexGen maintains that the assessment endpoint of “continued ability to participate in Indigenous land and resource use activities” is appropriate and does not recommend the addition of “as they currently occur”. Revising the assessment endpoint to focus only on Indigenous land and resource use practices as they currently occur would represent a more narrow analysis than what is presented in the Draft EIS. This narrower focus would not recognize that Indigenous land use is dynamic and responsive to changes in the environment over time and in keeping with the needs and preferences of Indigenous Peoples. If land is not currently used by Indigenous Peoples, this does not mean it was not used in the past and will not be used in the future. Indigenous land and resource use practices as they currently occur are discussed as existing conditions (Draft EIS Section 16.3.3 [Contemporary Indigenous Land and Resource Use]) and included in the assessment for the Indigenous land and resource use effects pathways (Table 16.4-1 of Draft EIS Section 16.4. [Project Interactions and Mitigations]). The importance and current use of any specific locations identified by each Indigenous Group, such as those locations described in the Indigenous Knowledge and Traditional Land Use Studies provided by the Indigenous Groups, were considered within the assessment of Indigenous land and resource use. A weight-of-evidence approach was used that allowed consideration of context, uncertainty, benefits, and accommodation to be incorporated into the assessment. This approach to assessment aligns with the requirements of the *Canadian Environmental Assessment Act, 2012*. For the reasons described above, it is more appropriate for the assessment endpoint to reflect the broader interest in a continued ability to participate in Indigenous land and resource use activities across the landscape. No changes are proposed in the revised EIS to address this IR. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html	n/a
145	MN-S	Assessment Cases	Section 16.2.5, Figure 16.2-2	Figure 16.2-2 states: "The Fission Patterson Lake South Property, which is planned by Fission Uranium Corp. … was included in the RFD Case (Figure 16.2-2). …The CRDN and MN-S specifically mentioned the potential for cumulative effects from the Project and the nearby proposed Fission Patterson Lake South Property …” The figure does not appear to show the location of the Fission Patterson Lake South Property, which is identified as included within the RFD case and has also been specifically identified for consideration of cumulative effects by MN-S.	Please revise Figure 16.2-2 to include the location of the Fission Patterson Lake South Property.	NexGen confirms that Figure 16.2-2 in Draft EIS Section 16.2.5 (Assessment Cases) currently shows the Fission Patterson Lake South Property in grey, and its footprint is most easily seen in the inset map in the bottom right of the figure. The Fission Patterson Lake South Property is located on the west side of Patterson Lake in the inset map and labelled in the figure legend. No changes are proposed in the revised EIS to address this IR.	n/a

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146	MN-S	Existing Conditions	Section 16.2.6	The EIS states: “Data were validated and supplemented through several means, including discussion during Joint Working Group meetings and review of Joint Working Group records.” It is unclear who completed the validation process for existing conditions for Indigenous Land and Resource Use VC. Third party review of meeting records and notes is not equivalent to data validation by potentially affected parties. Data verification should involve collaboration with MN-S, as rights holders, and Indigenous land and resource users. This includes the opportunity to review, revise and contribute to the characterization of existing land and resource conditions with the MN-S Homeland.	Please update the language regarding data verification to reflect that MN-S requested and was not provided the opportunity to review (and verify) the EIS prior to regulatory submissions.	NexGen acknowledges the reviewer’s comment though does not agree that opportunities to discuss both the approach to EA development and results of the EA, including verification of the manner in which Indigenous and Local Knowledge was incorporated into the EIS, were not provided by NexGen to the Métis Nation – Saskatchewan (MN-S). NexGen also notes this request is outside the scope of the CNSC Generic Guidelines for the preparation of an EIS (CNSC 2021). The Study Agreement signed between NexGen and the MN-S in 2019 contains the terms and conditions regarding the verification and use of Indigenous Knowledge in the Project EA. While the content of the Study Agreement is confidential, a few of the key focuses of the Study Agreements were to: ▪ develop a Joint Working Group (JWG) structure for each Indigenous Group to support the inclusion of Indigenous Knowledge into the EA process and to facilitate regular, ongoing engagement; ▪ assist in the identification of valued components for the EA; and ▪ support Indigenous Knowledge and Traditional Land Use (IKTLU) Studies in various forms particular to each Indigenous Group. The Study Agreement also provided funding for a Community Coordinator appointed by the MN-S for the explicit purpose of fulfilling the commitments within the Study Agreement. As per the Study Agreement with the MN-S, a key purpose of the JWG was to share Indigenous Knowledge for integration into the Draft EIS. In compliance with the terms of the Study Agreement, meeting minutes were captured during the JWG meetings, drafted by an independent consultant, and distributed and reviewed by the JWG, thereby verifying the accuracy of Indigenous and Local Knowledge shared during the JWG meetings. Information from these meetings was then considered within the Project EA, where applicable. In addition to Indigenous and Local Knowledge received through the JWG process, the MN-S IKTLU Study submitted to NexGen in August 2020 provided Indigenous Knowledge to help inform the Project EA. The IKTLU Study included details regarding MN-S physical and cultural heritage, land and resource use, traditional diet, infrastructure and services, employment and economy, and human health, and provided maps of key traditional land use areas. Information within the IKTLU Study was considered alongside other information provided by the MN-S and other Indigenous Groups. NexGen adhered to the Study Agreement terms and conditions regarding the use of Indigenous Knowledge provided by the MN-S through both the JWG and the IKTLU Study; therefore, further verification of the accuracy of information to be used within the Draft EIS was not required. With respect to the incorporation of Indigenous and Local Knowledge within the Draft EIS, NexGen offered opportunities to the MN-S to discuss baseline data results, EA methods, and discipline-specific assessment approaches through the JWG meetings throughout 2021, and discussed these topics with other primary Indigenous Groups during that time (Draft EIS Section 2.6.1.1.1 [Summary of Joint Working Group Activities; Draft EIS Appendix 2A [Summary of Indigenous Group Engagement Activities]). However, the MN-S was unable to meet to discuss these topics. In lieu of being able to conduct JWG meetings, NexGen provided the MN-S the information discussed with other primary Indigenous Groups for review and comment. NexGen has not received any specific comments from the MN-S regarding the information provided. In late 2021 and early 2022, NexGen also offered the MN-S opportunities to discuss EA results (Draft EIS Appendix 2A); however, the MN-S was unable to meet prior to the Draft EIS submission. NexGen confirms that EA results meetings were held with the MN-S in September 2022 and October 2022 (i.e., following Draft EIS submission); no specific comments regarding potential misrepresentation of Indigenous and Local Knowledge provided by the MN-S within the Draft EIS were received during these EA results meetings.	n/a

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						NexGen does acknowledge that a copy of the complete Draft EIS was not provided to Indigenous Groups prior to its acceptance by the CNSC. Providing a copy of the Draft EIS in advance of acceptance for submission was not practicable as the Draft EIS required conformance review by the CNSC to ensure that all federal regulatory requirements were met. Immediately following confirmation of concordance with the applicable federal regulatory requirements, the Draft EIS was accepted for review by the CNSC; at this time, NexGen simultaneously hand-delivered an electronic copy of the Draft EIS to the MN-S at the MN-S office in Saskatoon. NexGen notes that through their participation in the FIRT process, the MN-S have been given the opportunity to review how Indigenous and Local Knowledge has been integrated into the Draft EIS, including information related to existing conditions. No specific comments have been received stating that the interpretation of Indigenous and Local Knowledge provided by the MN-S has been conducted incorrectly within the Draft EIS. NexGen maintains that suitable opportunities have been provided to the MN-S to verify the use of Indigenous and Local Knowledge within the Draft EIS, and to date, no specific comments regarding the accuracy of information used have been provided to NexGen by the MN-S. NexGen reiterates that this request is also outside the scope of the CNSC Generic Guidelines for the preparation of an EIS (CNSC 2021). As a result, no changes are proposed in the revised EIS to address this IR. **References** CNSC (Canadian Nuclear Safety Commission). 2021. Generic Guidelines for the Preparation of an Environmental Impact Statement – Pursuant to the *Canadian Environmental Assessment Act, 2012*. Available at http://cnsc.gc.ca/eng/resources/environmental-protection/ceaa-2012-generic-eis-guidelines.cfm	
147	MN-S	Project Interactions and Mitigations	Section 16.2.7	The EIS states: "A screening-level assessment was applied using Indigenous and Local Knowledge, scientific knowledge, logic, experience with similar developments, and an understanding of the effectiveness of mitigation (i.e., level of certainty that mitigation would work) to assign each pathway to one of the following categories …" While the description of screening includes consideration of Indigenous Knowledge, the definitions for both a secondary and primary pathway only references environmental changes (which is assumed to reference the physical and biophysical environment) as the thresholds for the assessment. The determination of pathways should also consider changes to the human environment, including impacts to the ability to continue Indigenous land and resource use.	Please revise this section of the EIS to include consideration of changes to the human environment, including impacts to the ability to continue Indigenous land and resource use.	NexGen appreciates the reviewer's comment and will update the language associated with pathways in revised EIS Section 16.2.7 (Project Interactions and Mitigations) to refer to social, environmental, and cultural changes relative to existing conditions rather than just environmental change. Clarification of this detail in revised EIS Section 16.2.7 will better reflect the assessment, which was completed in a manner that considered social, environmental, and cultural changes. No additional changes, beyond the pathway descriptions noted above, are required in the revised EIS.	Section 16.2.7
148	MN-S	Residual Effects Classification and Determination of Significance	Section 16.2.9	The EIS states: "This assessment endpoint is qualitatively defined by the continued ability of Indigenous Groups to participate in land-based activities based on similar availability of resources for harvesting, maintenance of access to traditional land use areas, and maintenance of quality of Indigenous land use experience, while acknowledging that traditional activities are dependent on individual preferences and experience. The classification of residual effects criteria provides the foundation for determining if the threshold for significance is exceeded." Indigenous Land and Resource use is intrinsically tied to the land and the specific locale; similar availability of resources does not necessarily reflect the ability to maintain MN-S cultural practices.	Please revise to include as an assessment endpoint the ability for MN-S to continue Indigenous land and resource use practices, as they currently occur.	NexGen appreciates the reviewer's comment; however, NexGen maintains that the assessment endpoint of "continued ability to participate in Indigenous land and resource use activities" is appropriate and does not recommend the addition of "as they currently occur". Revising the assessment endpoint to focus only on Indigenous land and resource use practices as they currently occur would represent a more narrow analysis than what is presented in the Draft EIS. This narrower focus would not recognize that Indigenous land use is dynamic and responsive to changes in the environment over time and in keeping with the needs and preferences of Indigenous Peoples. If land is not currently used by Indigenous Peoples, this does not mean it was not used in the past and will not be used in the future.	n/a

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				The ability to participate in an activity is not equivalent to the ability to continue to practice an activity with the same frequency or success as was present prior to Project disturbance. As rights holders, at a minimum, the ability for MN-S to continue Indigenous land and resource use practices, as they currently occur, should be the assessment endpoint.		Indigenous land and resource use practices as they currently occur are discussed as existing conditions (Draft EIS Section 16.3.3 [Contemporary Indigenous Land and Resource Use]) and included in the assessment for the Indigenous land and resource use effects pathways (Table 16.4-1 of Draft EIS Section 16.4. [Project Interactions and Mitigations]). The importance and current use of any specific locations identified by each Indigenous Group, such as those locations described in the Indigenous Knowledge and Traditional Land Use Studies provided by the Indigenous Groups, were considered within the assessment of Indigenous land and resource use. A weight-of-evidence approach was used that allowed consideration of context, uncertainty, benefits, and accommodation to be incorporated into the assessment. This approach to assessment aligns with the requirements of the *Canadian Environmental Assessment Act, 2012*. For the reasons described above, it is more appropriate for the assessment endpoint to reflect the broader interest in a continued ability to participate in Indigenous land and resource use activities across the landscape. No changes are proposed in the revised EIS to address this IR. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html	
149	MN-S	Monitoring, Follow-Up and Adaptive Management	Section 16.2.11	The EIS states: "The implementation of robust, long-term environmental testing and monitoring has also been requested by Indigenous Groups to verify protection of the environment, including community-led monitoring during Construction and Operations of the proposed Project." In addition to supporting implementation of community-led monitoring, as a rights holder MN-S should be involved in the scoping and development of environmental testing and monitoring programs.	Please revise text to clarify that MN-S will be involved in the scoping and development of environmental testing and monitoring programs.	NexGen notes the Métis Nation – Saskatchewan's (MN-S's) request is outside the scope of the requirements of a designated project under the *Canadian Environmental Assessment Act, 2012*. However, NexGen also notes that mechanisms exist under the existing Benefit Agreement with the MN-S to plan for, and address, activities requested as part of this IR, as required. The MN-S will be engaged in development of monitoring through mechanisms in the Benefit Agreement with the MN-S. Draft EIS Section 16.2.11 (Monitoring, Follow-Up, and Adaptive Management) only provides the overall types of monitoring activities that would be conducted for the proposed Project. Further scoping and development of details of the environmental monitoring programs developed for the Project would occur outside of the environmental assessment process (e.g., during federal licensing and provincial permitting processes) and involve engagement with primary Indigenous Groups, including the MN-S. In addition, scoping and development of community-led monitoring programs would be developed through the Environmental Committee formed through implementation of the Benefit Agreement with the MN-S. As this IR is out of the scope of the EA, no changes are proposed in the revised EIS. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html	n/a
150	CNSC	Current use of lands and resources for traditional purposes	Sections 16.3.2	**Context:** Section 16.3.2 of the EIS provides an overview of CRDN, MN-S, BNDN and BRDN. Publicly available information should be included regarding ACFN and YNLR as well as any relevant information provided during engagement with ACFN/ YNLR to date. **Rationale:** More information is required to understand ACFN and YNLR's history and traditional land use in the vicinity of the project.	Provide an overview for ACFN and YNLR in Section 16.3.2 of the EIS.	NexGen acknowledges the reviewer's comment and provides the following rationale for including information regarding the Clearwater River Dene Nation (CRDN), Métis Nation – Saskatchewan (MN-S), Birch Narrows Dene Nation (BNDN), and Buffalo River Dene Nation (BRDN) in Draft EIS Section 16.3.2 (Overview of Indigenous Groups) while not including information regarding the Ya'thi Néné Lands and Resources (YNLR), Athabasca Chipewyan First Nation (ACFN), and English River First Nation (ERFN) within Draft EIS Section 16.3.2. As discussed in Draft EIS Section 2.4.1 (Identification of Indigenous Groups for Engagement), a detailed evaluation was undertaken for the proposed Project to identify the scope of engagement to be completed with Indigenous Groups. This evaluation considered traditional territories; traditional	Section 16.3.2

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						and current land uses; proximity of the Project to Indigenous communities; and potential Project effects on health and safety, the environment, and any potential or established Aboriginal or treaty rights and related interests of Indigenous Groups (REGDOC-3.2.2 Version 1.1 [CNSC 2019]). Through this process, NexGen identified the CRDN, MN-S, BNDN, and BRDN as Indigenous Groups that would be affected by the Project effects and should be fully engaged on the Project while concluding that the ACFN, YNLR, and ERFN would either not be affected by, or would experience minor effects from, the Project and should be engaged at an information-sharing level (Draft EIS Section 2.4.2 [Identification of Indigenous Groups for Engagement]). With respect to the ACFN, available information did not demonstrate that the ACFN have documented traditional land use activities within the local study area (LSA). Specifically, Map 1 of *Níh boghodi: We are the stewards of our land* (ACFN 2012) shows that the proposed Project location is located outside the ACFN self-declared protection and stewardship zones; the Project location is only within the ACFN self-declared consultation area. This information is consistent with Map 1 of the *Athabasca Chipewyan First Nation Advice to the Government of Alberta Regarding the Lower Athabasca Regional Plan* (ACFN 2010), which shows the proposed Project is located outside of the ACFN Homeland. NexGen acknowledges the ACFN submitted comments on the Project Description that included general concerns related to potential effects on their rights to hunt, trap, and fish; the continuation of their culture; and cumulative effects. However, through engagement activities conducted to date with the ACFN, no specific traditional land uses have been identified within the Project local study area (LSA) (Draft EIS Appendix 2A [Summary of Indigenous Group Engagement Activities], Table 2A-6). With respect to the YNLR, through a Study Funding Agreement, the YNLR conducted and submitted a report for an Indigenous Knowledge and Traditional Land Use (IKTLU) Study completed for the Project for integration into the EA (Draft EIS TSD VI: YNLR). The IKTLU Study showed that traditional activities including big game, small game, furbearer, plant, and fish harvesting occur northeast of the LSA while overnight sites exist to the north and east of the LSA (Draft EIS Section 16.3.3.5 [Athabasca Denesųłiné]; Draft EIS TSD VI: YNLR). No traditional land use activities were identified within the LSA through engagement activities conducted between NexGen and the YNLR (Draft EIS Appendix 2A, Table 2A-7, Table 2A-8, Table 2A-9). With respect to the ERFN, engagement between NexGen and the ERFN did not identify any ERFN traditional land use activities within the LSA (Draft EIS Appendix 2A, Table 2A-5). Based on the information provided above, NexGen maintains that limiting the Indigenous Group overviews within Draft EIS Section 16.3.2 to the CRDN, MN-S, BNDN, and BRDN is appropriate as these are the Indigenous Groups that would experience effects associated with the Project. However, to satisfy this IR, NexGen will add high-level overviews for the ACFN, YNLR, and ERFN in revised EIS Section 16.3.2; NexGen notes the revised EIS will still assert that the Indigenous Groups primarily affected by the Project are the CRDN, MN-S, BNDN, and BRDN. **<u>References</u>** ACFN (Athabasca Chipewyan First Nation). 2010. Athabasca Chipewyan First Nation Advice to the Government of Alberta Regarding the Lower Athabasca Regional Plan. November 2010. ACFN. 2012. Níh boghodi: We are the stewards of our land. April 2012. CNSC (Canadian Nuclear Safety Commission). 2019. REGDOC-3.2.2, Indigenous Engagement, Version 1.1. August 2019. ISBN: 978 0 660 04518 4. Available at http://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/REGDOC-3-2-2-Aboriginal-Engagement-version-1.1-eng.pdf	

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151	MN-S	Gathering	Section 16.3.3.2.3	The EIS states: "A general use area was mapped around the east shore of Forrest Lake and Beet Lake, and Forrest Lake, which overlap the maximum disturbance area ..." MN-S Indigenous land and resource use (gathering) overlaps with the maximum disturbance area; this must be considered and discussed within the assessment.	Please revise the EIS to include details regarding MN-S Indigenous land and resource use (gathering) as it overlaps with the maximum disturbance area.	NexGen confirms that the assessment of Indigenous Land and resource use considered Métis Nation – Saskatchewan (MN-S) Indigenous land and resource use gathering activities. Draft EIS Section 16.3.3.2.3 (Gathering) is representative of the information provided in the MN-S's Indigenous Knowledge and Traditional Land Use Study, which did not identify gathering activities within the maximum disturbance area. Gathering activities within the maximum disturbance area were also not identified during other engagement activities with the MN-S (e.g., Joint Working Group meetings). Draft EIS Section 16.5.1.2.2 (Gathering) discusses potential Project effects on Indigenous Group gathering activities in the maximum disturbance area. In addition, Table 16.5-2 of Draft EIS Section 16.5.1.2.2 provides additional detail on traditional use plant species gathered by each Indigenous Group, including the MN-S. No changes are proposed in the revised EIS to address this IR.	n/a
152	MN-S	Hunting	Section 16.3.3.2.4	The EIS states: "Métis Nation – Saskatchewan citizens hunt throughout the LSA and RSA…. Some MN-S citizens reported that moose have moved farther away because of too much activity in the area of the proposed Project." MN-S Indigenous land and resource use (hunting) overlaps with both the LSA and RSA; this must be considered and discussed within the assessment. The wildlife assessment should include consideration on MN-S qualitative observations on Moose movements. The EIS also states: "Specific hunting areas located in the LSA identified by the MN-S include in the areas of Gedak Lake; Dennis Lake; Derkson, Koops and Gall lakes; and Patterson Lake including within the maximum disturbance area …." MN-S Indigenous land and resource use (hunting) overlaps with the maximum disturbance area; this must be considered and discussed within the assessment.	Please revise the wildlife assessment to include consideration on MN-S qualitative observations on Moose movements. Please revise the EIS to include details regarding MN-S Indigenous land and resource use (hunting) as it overlaps with the maximum disturbance area.	NexGen confirms that the Draft EIS considered Métis Nation – Saskatchewan (MN-S) qualitative observations on moose movements and MN-S Indigenous land and resource use hunting activities. Draft EIS Section 14.3.2 (Moose) includes Indigenous Knowledge from the MN-S regarding moose distribution and movement and the MN-S hunting of moose in the area of the Project. In addition, Draft EIS Section 16.3.3.2.4 (Hunting) presents information regarding MN-S hunting activities, including details from the MN-S Indigenous Knowledge and Traditional Land Use (IKTLU) Study. The MN-S IKTLU Study references hunting activities within the local study area and the regional study area; however, no hunting activities were noted within the maximum disturbance area. Hunting activities within the maximum disturbance area were also not identified during other engagement activities with the MN-S (e.g., Joint Working Group meetings). Draft EIS Section 16.5.1.2.3 (Hunting and Trapping) discusses potential Project effects on Indigenous Group moose hunting activities in the maximum disturbance area. No changes are proposed in the revised EIS to address this IR.	n/a
153	MN-S	Trapping	Section 16.3.3.2.5	The EIS states: "Métis Nation – Saskatchewan citizens trap in the LSA and RSA. In the RSA, MN-S has identified one trapline … In the LSA, the MN-S has identified one trapline that extends from north of Patterson Lake, including within the maximum disturbance area …" MN-S Indigenous land and resource use (trapping) overlaps with the maximum disturbance area; this must be considered and discussed within the assessment.	Please revise the EIS to include details regarding MN-S Indigenous land and resource use (trapping) as it overlaps with the maximum disturbance area.	NexGen confirms that the assessment of Indigenous land and resource use considered Métis Nation – Saskatchewan (MN-S) Indigenous land and resource use trapping activities. Information provided in the MN-S Indigenous Knowledge and Traditional Land Use Study references a trapline and trapping activities within the local study area (LSA) and the regional study area; however, no trapping activities were noted within the maximum disturbance area. Trapping activities within the maximum disturbance area were also not identified during other engagement activities with the MN-S (e.g., Joint Working Group meetings). Draft EIS Section 16.5.1.2.3 (Hunting and Trapping) discusses potential Project effects on Indigenous Group trapping activities. NexGen clarifies that the statement in Draft EIS Section 16.3.3.2.5 (Trapping) referring to an MN-S trapline being located within the maximum disturbance area, is incorrect. Revised EIS Section 16.3.3.2.5 (Trapping) will be amended to state "In the LSA, the MN-S has identified one trapline that extends towards the east from north of Patterson Lake and south of the Gedak Lake and Broach Lake area." Apart from the revision of text in Section 16.3.3.2.5 to correct the error noted above, no changes are proposed in the revised EIS to address this IR.	Section 16.3.3.2.5

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154	MN-S	Culturally Important Sites and Areas	Section 16.3.3.2.6	The EIS states: "Métis Nation – Saskatchewan citizens value the LSA and consider it culturally important to their continued use of the land. They consider the area important not only for harvesting but also for its role in the larger landscape." MN-S Indigenous land and resource use (harvesting and holistically) must be considered and discussed within the assessment.	Please revise the EIS to include consideration of MN- S Indigenous land and resource use (harvesting and holistically) within the assessment.	As stated in Draft EIS Section 16.2.8 (Residual Effects Analysis), the assessment of the changes to the quality of the Indigenous land use experience measurement indicator is intended to support a more holistic understanding of the relationship between Indigenous Groups and the land. Métis Nation – Saskatchewan (MN-S) Indigenous land and resource use information is included in the Draft EIS, including information from the MN-S Indigenous Knowledge and Traditional Land Use Study. Draft EIS Section 16.3.3.2 (Métis Nation – Saskatchewan) discusses MN-S occupancy, habitation, and access; fishing; gathering; hunting; trapping; and culturally important sites and areas. The information provided by the MN-S was then considered in the assessment of Indigenous land and resource use in Draft EIS Section 16.4 (Project Interactions and Mitigations) and Draft EIS Section 16.5 (Residual Effects Analysis). No changes are proposed in the revised EIS to address this IR.	n/a
155	MN-S	Culturally Important Sites and Areas	Section 16.3.3.2.6	The EIS states: "There were no cultural sites and areas identified by the MN-S in the LSA, but several were reported in the RSA, including at lakes directly north of the LSA ..." MN-S identification of cultural sites does not align with the outcomes of the HRIA which identified no heritage resources. Given the pathways analysis determined that "all potential adverse pathways from the Project could be removed from the assessment (page iv)", it is assumed that potential impacts to the heritage resources identified by MN-S have not been assessed or mitigated.	Please revise the EIS to include the Indigenous Knowledge (including the identification of heritage resources) that has been shared with the proponent by MN-S, for the purposes of this study. This information should be considered and applied to the assessment. Given the identification of an MN-S cultural site directly north of the LSA, the rationale for the cultural and heritage resources VC should be evaluated to consider its appropriateness to capture resources potentially impacted by the Project.	NexGen acknowledges the reviewer's comment though disagrees that the findings of the Heritage Resources Impact Assessment (HRIA; Draft EIS Annex IX [Heritage Resources Impact Assessment and Cover Letter]) are misaligned with the information provided within the Métis Nation – Saskatchewan (MN-S) Indigenous Knowledge and Traditional Land Use (IKTLU) Study (Draft EIS TSD IV: MN-S). As per *The Heritage Property Act*, the HRIA assessed areas of the proposed Project footprint, which is within the local study area (LSA) for cultural and heritage resources. Consistent with the reviewer's comment, as stated in Draft EIS Section 16.3.3.2.6 (Culturally Important Sites and Areas) and noted within the MN-S IKTLU Study, cultural sites identified by the MN-S are located within the regional study area outside of the LSA and Project footprint. Therefore, the information provided in Draft EIS Section 16.3.3.2.6 is accurate, and no changes are proposed in the revised EIS to address this IR. **References** *The Heritage Property Act*. SS 1979-80, c H-2.2. Effective November 28, 1980. Available at https://www.canlii.org/en/sk/laws/stat/ss-1979-80-c-h-2.2/latest/ss-1979-80-c-h-2.2.html	n/a
156	CNSC	Current use of lands and resources for traditional purposes	Section 16.3.3.6	**Context:** The EIS states "The EIS states Athabasca Denesųłiné did not identify any specific traditional activities overlapping with the LSA. **Rationale:** More information is required to better understand YNLR's current and traditional land use near the proposed project site.	Please provide additional information about any additional engagement activities that NexGen completed directly with YNLR related to better understanding their current and traditional land use and potential interests near the proposed project site.	Although the Ya'thi Néné Lands and Resources (YNLR) communities do not fall within the Project local priority area (LPA), NexGen conducted appropriate levels of engagement with the YNLR. NexGen confirms that engagement with the YNLR communities included specific activities to facilitate an understanding of YNLR communities' current and traditional land use and potential interests in the Project. Through an evaluation that included the NexGen process for identifying Indigenous Groups to be engaged and the scope of the engagement, mapping identified Indigenous Groups along the consultation activity spectrum based on the potential for adverse effects to Indigenous and/or Treaty rights (REGDOC-3.2.2 Version 1.1 [CNSC 2019]), and considering key information that was provided by the CNSC and ENV in their letters inviting Indigenous Groups to participate in the Project EA process, NexGen identified the Black Lake Denesųłiné First Nation (BLDFN) and Fond du Lac Denesųłiné First Nation (FLDFN) (each represented by the YNLR) for engagement at an information-sharing level (Draft EIS Section 2.4.1 [Identification of Indigenous Groups for Engagement]). Engagement with the YNLR, BLDFN, and FLDFN included written correspondence, in-person and video conference meetings, and the distribution of Project engagement materials. More details regarding engagement with the YNLR are provided in the following Draft EIS locations: ▪ Section 2.6.1.1 (Summary of Indigenous Engagement Activities); ▪ Table 2A-7, Table 2A-8, and Table 2A-9 of Appendix 2A (Summary of Indigenous Group Engagement Activities); ▪ Section 5.7 of TSD I (Indigenous Engagement Report); and	n/a

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						▪ Table B-7, Table B-8, and Table B-9 of Appendix B of TSD I. In addition to the engagement activities conducted with the YNLR, NexGen and the YNLR signed a Study Funding Agreement in 2020 as the YNLR identified an interest in sharing Indigenous Knowledge through an Indigenous Knowledge and Traditional Land Use (IKTLU) Study. This Study Funding Agreement was strictly for funding an IKTLU Study, through which the YNLR formally shared Indigenous Knowledge to inform the EA for the Project. Indigenous Knowledge provided by the YNLR (Draft EIS TSD VI: YNLR) showed that their traditional use area does not overlap the local study area considered in the assessment of Indigenous land and resource use, though there are general land use, fishing, gathering, hunting, and trapping activities that occur in certain areas within the regional study area (Draft EIS Section 16.3.3.5 [Athabasca Denesųłiné]). Through engagement activities and information provided within the IKTLU Study, the YNLR identified interests, issues, and concerns that further facilitated NexGen's understanding of potential YNLR interests near the Project site. These interests, issues, and concerns are provided in the following Draft EIS locations: ▪ Section 2.6.1.2.2 (Other Indigenous Groups); ▪ Table 2B-5 of Appendix 2B (Summary of Issues Identified by Indigenous Groups); ▪ Section 6.1.2.3 and Section 6.2.7 of TSD I; and ▪ Table C-5 of Appendix C of TSD I. No changes are proposed in the revised EIS to address this IR. However, updates to engagement records included in the Draft EIS, including applicable updates with respect to the YNLR, will be added to future revisions of the EIS, as applicable. **References** CNSC (Canadian Nuclear Safety Commission). 2019. REGDOC-3.2.2, Indigenous Engagement, Version 1.1. August 2019. ISBN: 978 0 660 04518 4. Available at http://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/REGDOC-3-2-2-Aboriginal-Engagement-version-1.1-eng.pdf *The Heritage Property Act*. SS 1979-80, c H-2.2. Effective 28 November 1980. Available at https://www.canlii.org/en/sk/laws/stat/ss-1979-80-c-h-2.2/latest/ss-1979-80-c-h-2.2.html	
157	MN-S	Existing Conditions	Section 16.3	Section 16.3 of the EIS states: "Indigenous land and resource use in the LSA is actively pursued by the CRDN, MN-S, and BNDN, and, to a lesser extent, the BRDN." While active Indigenous land and resource use in the LSA by MN-S is acknowledged, best practices that align with an understanding of MN-S as a rights holder would include the opportunity to participate in field programs to support identification of cultural and heritage resources as well as the opportunity to provide review and contribution to the assessment prior to finalization and submission to regulators.	Please provide more context that will provide assurance to MN-S to ensure MN-S is given the opportunity to participate in field programs to support identification of cultural and heritage resources as well as given the opportunity to provide review and contribution to the assessment prior to finalization and submission to regulators	NexGen notes that mechanisms exist under the existing Benefit Agreement with the Métis Nation – Saskatchewan (MN-S) to provide the assurance requested to plan for, and address, activities requested as part of this IR, as required. As the Project advances, the MN-S will be offered opportunities to be involved in ongoing identification, review, and contribution to management of cultural and heritage resources. Such opportunities for monitoring and management of heritage resources would be provided through the Environmental Committee formed through implementation of the Benefit Agreement with the MN-S.	n/a
158	MN-S	Potential Effects and Proposed Mitigation	Section 16.4	Section 16.4 of the EIS states: "Project activities that would have the potential to affect Indigenous land and resource use during the Project lifespan include:" [bullet list] The Project would also impact and change the ability of MN-S to access the homeland due to active mining activities and access restrictions the land.	Please revise bullet list to include "The Project would also impact and change the ability of MN-S to access the homeland due to active mining activities and access restrictions the land."	NexGen notes that the quoted bulleted list referenced by the reviewer is in the Executive Summary of Draft EIS Section 16 (Cultural Heritage Resources and Indigenous Land and Resource Use) and lists Project activities rather than effects pathways; as such, revision of this bulleted list as suggested by the reviewer is not appropriate. Detailed information on Project pathways that have the potential to affect Indigenous land and resource use is included in Draft EIS Section 16.4 (Project Interactions and Mitigations). NexGen does not identify effects specific to the Métis Nation – Saskatchewan (MN-S) in relation to other Indigenous Groups as this request is outside the scope of the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012*. However, as indicated in Table 16.4-1 in Draft EIS Section 16.4, Pathway ID ILU-01 (Changes to access to and	n/a

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						area available for Indigenous land and resource use) evaluates the change to access to and area available for Indigenous land and resource use, which includes consideration of Indigenous land and resource use conducted by the MN-S. The assessment of Project effects for this pathway is presented in Draft EIS Section 16.5.1.1 (Access to and Area Available for Indigenous Land and Resource Use). No changes are proposed in the revised EIS to address this IR. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html	
159	MN-S	Potential Effects and Proposed Mitigation	Section 16.4	Section 16.4 of the EIS states: "Project environmental design features such as the underground tailings management facility and a limited Project footprint were designed to minimize the Project's effects on cultural and heritage resources and Indigenous land and resource use." While underground tailings management would minimize the Project footprint, this benefit must be considered in the context of other environmental concerns such as groundwater quality. This text does not accurately reflect holistic consideration of design changes.	Please provide additional context that includes and reflects holistic consideration of design changes.	NexGen notes that the text quoted by the reviewer is located in the Executive Summary of Draft EIS Section 16 (Cultural and Heritage Resources and Indigenous Land and Resource Use) under the Potential Effects and Proposed Mitigation subsection. In this summary subsection, storing tailings underground is listed as an environmental design feature that would reduce the Project footprint and, as a result, would minimize the Project's effects on cultural and heritage resources and on Indigenous land and resource use. Detailed considerations for design alternatives, such as options for storing tailings, were evaluated and are discussed in Draft EIS Section 4.5 (Alternatives Assessments for the Project). Alternative design features were assessed so that, on balance, the selected alternative best met the set of decision criteria that considered environmental, technical, economic, and social aspects holistically, including consideration of traditional use of land and resources. This approach was completed in accordance with applicable guidelines (CEA Agency 2015; Government of Saskatchewan 2021). The goal of the alternatives assessments was to analyze how alternatives, such as the location and storage of tailings (Draft EIS Section 4.5.6.2 [Tailings]), compare with one another using an integrated approach. Additional details on the Project approach to alternatives assessment is provided in Draft EIS Section 4.4 (Alternatives Assessment Approach). No changes are proposed in the revised EIS to address this IR. **References** CEA Agency (Canadian Environmental Assessment Agency). 2015. Addressing "Purpose of" and "Alternative Means" under the *Canadian Environmental Assessment Act, 2012*. Available at https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/addressing-purpose-alternative-means-under-canadian-environmental-assessment-act-2012.html Government of Saskatchewan. 2021. Guidelines for the Terms of Reference and Environmental Impact Statement. Ministry of Environment, Environmental Assessment and Stewardship Branch. June 2021.	n/a
160	MN-S	Potential Effects and Proposed Mitigation	Section 16.4	Section 16.4 of the EIS states: "With respect to cultural and heritage resources, as spatial overlap between the Project and the Fission Patterson Lake South Property would not exist, pathways between the projects would also not overlap; therefore, only the potential effects of the Project were considered in the subsequent steps of the assessment process."	Please revise the EIS to include the consideration of cumulative impact of the loss of access to these lands and resources and the resulting impact to MN-S cultural practices and Indigenous Land and Resource Use. Text should reference how this is considered within the assessment.	NexGen notes that the text quoted by the reviewer is located in the Executive Summary of Draft EIS Section 16 (Cultural and Heritage Resources and Indigenous Land and Resource Use) under the Potential Effects and Proposed Mitigation subsection and is intended to summarize the more detailed information contained within Draft EIS Section 16.4 (Project Interactions and Mitigations). As described in Draft EIS Section 16.4, the cultural and heritage resources assessment Pathway ID HR-01 (Disturbance of heritage resources) focused only on tangible artifacts (i.e., those that are legally protected as covered under *The Heritage Property Act*). Cumulative effects on Indigenous culture from loss of access to lands and resources were assessed under primary pathway, Pathway ID ILU-03 (Changes to the quality of the Indigenous land and resource use experience), as described in Draft EIS Section 16.5.2.3 (Quality of the Indigenous Land Use Experience), which included an assessment of effects on the cultural landscape (Draft EIS Section 16.5.2.3.7 [Cultural	n/a

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						Landscape]). In addition, Draft EIS Section 19 (Community Well-Being) assessed cumulative effects on cultural resources through primary pathway, Pathway ID CWB-01 (Access restrictions and avoidance), as described in Draft EIS Section 19.5.2.1 (Access Restrictions and Avoidance). As the information requested in this IR is already included in the Draft EIS, no changes are proposed in the revised EIS to address this IR. **References** *The Heritage Property Act*. SS 1979-80, c H-2.2. Effective November 28, 1980. Available at https://www.canlii.org/en/sk/laws/stat/ss-1979-80-c-h-2.2/latest/ss-1979-80-c-h-2.2.html	
161	MN-S	Project Interactions and mitigations	Section 16.4, Table 16.4-1	Table 16.4-1 : ILU-04 Environmental Design Features and Mitigation: "Install a gate at the site entrance (i.e., gatehouse) to control public access." It is unclear how installation of a gatehouse would mitigate changes to the availability of fish, plants, and wildlife for harvesting from increased access and competition for resources. It is expected that the installation of a gatehouse, would be in place to ensure that the Indigenous land and resource users do not accidently enter active mining areas as a safety measure. In practice, restricted access is likely to exacerbate changes to the availability of fish, plants, and wildlife for harvesting as it would further decrease access to support MN-S Indigenous land and resource use.	Please provide further information in the EIS on how the installation of a gatehouse would mitigate changes to the availability of fish, plants, and wildlife for harvesting from increased access and competition for resources.	The gatehouse would represent a mitigation measure to reduce the availability of fish, plants, and wildlife for harvesting by controlling public access to lands beyond the gatehouse location. NexGen notes that Pathway ID ILU-04 (Changes to the availability of fish, plants, and wildlife for harvesting from increased access and competition for resources) (Draft EIS Section 16.4.2 [Secondary Pathways]) focuses on potential Project effects associated with increased access to the area of the Project. Potential Project effects associated with reduced access for Indigenous land and resource use are considered in Pathway ID ILU-01 (Changes to access to and area available for Indigenous land and resource use) (Draft EIS Section 16.4.3 [Primary Pathways]), and are further assessed in Draft EIS Section 16.5.1.1 (Access to and Area Available for Indigenous Land and Resource Use). NexGen acknowledges that details regarding mitigation associated with the gatehouse could have been presented more clearly in the Draft EIS. Pathway ID ILU-04 in revised EIS Section 16.4.2 will be updated to provide details regarding the gatehouse mitigation measure as clarified in this IR response.	Section 16.4.2
162	MN-S	Project Interactions and mitigations	Section 16.4, Table 16.4-1	Table 16.4-1 "ILU-05: Changes to air or water quality The following Project interactions were predicted to result in no pathway to Indigenous land and resource use and were not carried forward in this assessment." The discussion about the assessment of intermediate components and the environmental risk assessment lacks acknowledgement of any real or perceived impacts on fish, plants or wildlife due to air or water quality contamination that have been shared by Indigenous nations. Indigenous Knowledge is a unique, but equal way of knowing. As a rights holder, MN-S qualitative communication of impacts regarding the quality of resources or contamination levels should be acknowledged, discussed, and considered.	Please revise the EIS to include the acknowledgement, discussion and consideration of MN-S qualitative communication of impacts regarding the quality of resources or contamination levels.	NexGen notes that Pathway ID ILU-05 (Changes to air or water quality) (Draft EIS Section 16.4.1 [No Pathways]) focuses on the real predicted changes to air quality and water quality; therefore, the information presented describing the pathway and its potential adverse effects is appropriate. Perceived Project effects are considered through a primary pathway, Pathway ID ILU-03 (Changes to the quality of the Indigenous land and resource use experience) (Draft EIS Section 16.4.3 [Primary Pathways]), and are assessed further in Draft EIS Section 16.5.1.3 (Quality of the Indigenous Land Use Experience). Indigenous Knowledge provided by the Métis Nation – Saskatchewan (MN-S) used in the assessment of changes to the quality of the Indigenous land and resource use experience is cited throughout Draft EIS Section 16.5.1.3 and includes references to information provided by the MN-S through the MN-S Indigenous Knowledge and Traditional Land Use Study (Draft EIS TSD IV: MN-S) as well as through Joint Working Group meetings held with the MN-S. NexGen confirms discussion of Indigenous Knowledge provided by the MN-S specifically regarding perceptions of current environmental quality is included in Draft EIS Section 16.5.1.3.6 (Perceptions of Water, Fish, Plant, and Wildlife Resource Quality) and is cited appropriately. No changes are proposed in the revised EIS to address this IR.	n/a

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No.	Department	Project Effects Link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement	NexGen Response	Section in EIS
163	MN-S	Secondary Pathways: Disturbance of heritage Resources	Section 16.4.2	HR-01: Disturbance of heritage resources The EIS states: "Therefore, a chance find procedure would be implemented during clearing activities. Management options for any unanticipated archaeological materials or features discovered by chance during any land clearly activities for all Project phases would be developed in consultation with the Heritage Conservation Branch." As a rights holder, MN-S should be involved in the scoping, development, and implementation of a Chance Find Procedure and management options for any unanticipated archaeological materials or features, or cultural or heritage resources discovered throughout the Project life cycle.	Please revise the EIS to include MN-S involvement in the scoping, development, and implementation of a Chance Find Procedure and management options for any unanticipated archaeological materials or features, or cultural or heritage resources discovered throughout the Project life cycle.	NexGen notes the Métis Nation – Saskatchewan's (MN-S's) request is outside the scope of the requirements of a designated project under the *Canadian Environmental Assessment Act, 2012*. However, NexGen values MN-S input on aspects of Project development, and further notes that mechanisms exist under the existing Benefit Agreement with the MN-S to plan for, and address, activities requested as part of this IR, as required. As outlined in Pathway ID HR-01 (Land clearing during all Project phases) in Draft EIS Section 16.4.2 (Secondary Pathways), a chance find procedure would be implemented to manage the risk of disturbing unanticipated heritage resources during clearing. The chance find procedure would be developed in detail during the federal licensing and provincial permitting processes, and prior to Project Construction. An opportunity for the MN-S to review and comment on the chance find procedure will be provided through the Environmental Committee formed as part of the Benefit Agreement with the MN-S. In addition, future opportunities for monitoring and management of heritage resources would be provided through the Environmental Committee formed as part of implementation of the Benefit Agreement with the MN-S. As this IR is out of the scope of the EA, no changes are proposed in the revised EIS. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html	n/a
164	MN-S	Residual Effects Analysis	Section 16.5	Section 16.5 of the EIS states: "Nonetheless, the majority of the LSA and RSA would remain intact with similar resources (i.e., water, fish, plants, and wildlife) as the Patterson Lake area …" Indigenous Land and Resource Use is intrinsically tied to the land and the specific locale; similar resources do not necessarily reflect the ability to maintain MN-S cultural practices.	Please provide additional context in the EIS to show how this statement takes into consideration Indigenous land and resource use and the ability for MN-S to maintain cultural practices.	NexGen notes that the statement quoted by the reviewer is from the Executive Summary of Draft EIS Section 16 (Cultural and Heritage Resources and Indigenous Land and Resource Use) under the Residual Effects Analysis subsection and represents a high-level summary of the information contained within Draft EIS Section 16.5 (Residual Effects Analysis). More detailed context regarding similar resource availability in the local study area and regional study area as compared to the resources found within the Patterson Lake area is provided throughout Draft EIS Section 16.5, including recognition that cultural practices tied to the Patterson Lake area would be affected for certain individuals. In addition, Draft EIS Section 16.6.2 (Significance Determination) states "[e]ffects are predicted to be reversible; however, perceptions associated with permanent infrastructure and the history of the cultural landscape would be irreversible for some individuals." No changes are proposed in the revised EIS to address this IR.	n/a
165	MN-S	Access to and Area available for Indigenous Land and Resource use	Section 16.5.1.1	The EIS states: "Access to parts of Patterson Lake may be temporarily restricted during construction of in-lake infrastructure, but unrestricted access to the lake is expected during Operations and Closure." This text does not acknowledge that in-lake infrastructure may affect the ability of MN-S to continue cultural practices and Indigenous land and resource use.	Please revise text to acknowledge that in-lake infrastructure may affect the ability of MN-S to continue cultural practices and Indigenous land and resource use.	The statement quoted by the reviewer from Draft EIS Section 16.5.1.1 (Access to and Area Available for Indigenous Land and Resource Use) is in reference to a loss of access of a portion of Patterson Lake during installation of the proposed Project in-lake infrastructure, which would be temporary and would not occur beyond Construction. In-lake infrastructure would be submerged, with a small lakeshore footprint where the pipes enter the water; therefore, lake access would not be restricted in these areas during Operations and Decommissioning and Reclamation (i.e., Closure). In addition, in-lake infrastructure would not impede use of Patterson Lake for fishing and would not affect the ability of the Métis Nation – Saskatchewan to continue cultural practices and Indigenous land and resource use. Therefore, NexGen confirms the current text in the Draft EIS is accurate. No changes are proposed in the revised EIS to address this IR.	n/a

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166	MN-S	Access to and Area available for Indigenous Land and Resource use	Section 16.5.1.2.2	The EIS states: "There were no culturally important sites and areas identified by Indigenous Groups that overlap with the maximum disturbance area." This text does not acknowledge that culturally important sites were identified by Indigenous Groups (including MN-S) within the Regional Study Area and therefore does not accurately represent the presence of culturally important sites within the assessment areas.	Please revise text to acknowledge that culturally important sites were identified by Indigenous Groups (including MN-S) within the Regional Study Area and therefore does not accurately represent the presence of culturally important sites within the assessment areas.	NexGen notes that the statement quoted by the reviewer is located in Draft EIS Section 16.5.1.1 (Access to and Area Available for Indigenous Land and Resource Use) rather than Draft EIS Section 16.5.1.2.2 (Gathering). As discussed in the Culturally Important Sites and Areas subsections of Draft EIS Section 16 (Cultural and Heritage Resources and Indigenous Land and Resource Use) (Draft EIS Section 16.3.3.1.6, Draft EIS Section 16.3.3.2.6, Draft EIS Section 16.3.3.3.6, Draft EIS Section 16.3.3.4.6, and Draft EIS Section 16.3.3.5.6), culturally important sites were noted within the local study area (LSA) and the regional study area (RSA), though no culturally important sites were noted within the maximum disturbance area. Therefore, the statement "[t]here were no culturally important sites and areas identified by Indigenous Groups that overlap with the maximum disturbance area" is accurate. Specific to the Métis Nation –Saskatchewan (MN-S), Draft EIS Section 16.3.3.2.6 states, "[t]here were no cultural sites and areas identified by the MN-S in the LSA, but several were reported in the RSA, including at lakes directly north of the LSA (TSD IV: MN-S)." Therefore, culturally reported sites within the RSA are correctly noted. No changes are proposed in the revised EIS to address this IR.	n/a
167	MN-S	Gathering	Section 16.5.1.2.2	The EIS states: "The loss of most traditional use plants would be continuous until reclamation has re-established vegetation; however, the loss of traditional use plants in wetland habitat (e.g., pitcher plant) is considered permanent and irreversible. While the availability of traditional use plants would be reduced in the maximum disturbance area of the Project, traditional use plant habitat is predicted to remain abundant across the vegetation RSA, and incremental effects of the Project are expected to remain within the resilience and adaptability limits of traditional use plant species. This would result in a low magnitude change in availability of traditional plants in the Indigenous land and resource use LSA." "However, while the loss of traditional use plants in the Project footprint would range from long-term to permanent depending on the habitat, traditional use plants would remain widespread in the Indigenous land and resource use LSA, and opportunities for traditional gathering could continue." The permanent and irreversible loss of wetland habitat and traditional use plants must be mitigated and compensated. Indigenous Land and Resource use is intrinsically tied to the land and the specific locale; similar availability of resources in adjacent areas does not necessarily reflect the ability to maintain MN-S cultural practices. As such it is not appropriate to assume that abundance in the RSA and LSA is equivalent to the losses incurred due to the Project.	Please provide additional information to confirm that the permanent and irreversible loss of wetland habitat and traditional use plants will be mitigated and compensated.	NexGen acknowledges that Draft EIS Section 13.5.2.1 (Application Case) identifies that "the combined loss of burned and unburned wetland [Ecological Land Classification] ELC units in the RSA [regional study area] is 27.8 ha". However, the vegetation assessment was conservatively defined by a maximum disturbance area (i.e., an area four times larger than the currently anticipated Project footprint). The Project was designed to avoid and minimize effects on wetlands. Table 13.4-1 of Draft EIS Section 13.4 (Project Interactions and Mitigations) states that the "site access road between gatehouse and mine terrace was realigned during Project design to avoid a wetland." The actual anticipated Project footprint is estimated to effect 0.8 ha of wetlands; however, it is intended that detailed design would avoid wetlands to the extent possible. Should wetlands need to be disturbed, a mitigation and offset plan describing how no net loss of wetland function would be achieved would be provided. NexGen highlights that Table 16.4-1 of Draft EIS Section 16.4 (Project Interactions and Mitigations) identifies mitigations including minimizing the footprint and working with the Environmental Committees and independent Indigenous Monitors through implementation of the Benefit Agreements with primary Indigenous Groups to further mitigate effects on, access to, and availability of traditional use plants. Draft EIS Section 13.7 (Monitoring, Follow-Up, and Adaptive Management) states that "NexGen is committed to continuing engagement with Indigenous Groups throughout the lifespan of the Project and providing opportunities for the incorporation of Indigenous Knowledge on the use of traditional plant species as part of reclamation planting prescriptions for the Preliminary Decommissioning and Reclamation Plan." No changes are proposed in the revised EIS to address this IR.	n/a
168	MN-S	Noise	Section 16.5.1.3.1	The EIS states: "However, it is recognized that noise can have an effect on the aesthetics of individual resources users using the LSA, and that individuals may perceive and experience noise differently. Sensitivity to noise may be higher for some individuals, especially when they expect a quiet experience on the land. Tolerance levels may be very different among individual Indigenous land users and are difficult to measure quantitatively. However, it is reasonable to expect that some of the Indigenous land users may be affected negatively and choose not to conduct harvesting activities in the LSA at some locations potentially affect by noise increases."	MN-S requests the opportunity to be engaged in and collaborate on the scoping, development, implementation and analysis of mitigation and monitoring programs associated with Project noise impacts; particularly as it relates to Indigenous land and resource use.	NexGen acknowledges the Métis Nation – Saskatchewan's (MN-S's) request regarding opportunities to collaborate on mitigation and monitoring programs as they relate to Indigenous land and resource use and confirms that opportunities for collaboration on these programs would be provided through the Environmental Committee under the Benefit Agreement with the MN-S. No changes are proposed in the revised EIS to address this IR noting the existing mechanisms for collaboration under the existing Benefit Agreement with the MN-S, and that such collaboration is outside the scope of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012*. **References**	n/a

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No.	Department	Project Effects Link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement	NexGen Response	Section in EIS
						Canadian Environmental Assessment Act, 2012. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html	
169	MN-S	Light	Section 16.5.1.3.2	The EIS states: "The only times when light trespass would be visible is when an Indigenous land user has a direct line of sight on a light source … During Construction and Operations, Project-related illumination would result in skies brighter than the E1 threshold in localized areas for either of the 16 receptors considered in the light analysis ... Sky glow is expected to obscure faint stars for Indigenous land users on clear nights. The change in sky glow may affect the nighttime aesthetics and experience for Indigenous land users spending the night on the land or at a cabin ... Overall, the change of nighttime aesthetics resulting from skyglow would be relatively minor, and changes to the star visibility are expected to be localized." While aesthetics is discussed (16.5.1.3.4) it does not appear that an assessment of visual effects, or predictive modelling of visual effects, has been undertaken to understand the likelihood or frequency that visual effects, including light trespass and sky glow, would impact Indigenous land and resource use. An assessment of visual effects including predictive modelling should be undertaken, and informed by Indigenous land and resource users, including MN-S, to identify appropriate viewing points and determine potential visual impacts (including light trespass and sky glow) associated with the Project.	An assessment of visual effects including predictive modelling should be undertaken, and informed by Indigenous land and resource users, including MN-S, to identify appropriate viewing points and determine potential visual impacts (including light trespass and sky glow) associated with the Project.	NexGen notes the reviewer's request for an assessment of visual effects, including predictive modelling, is outside the scope of the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012*, and outside the scope of the Project Terms of Reference (Draft EIS Appendix 1A [Concordance Tables for the Terms of Reference and Generic Guidelines for Preparation of an Environmental Impact Statement], Table 1A-2). Although a visual effects assessment is not required for the EA, NexGen would be willing to work with the primary Indigenous Groups, including the Métis Nation – Saskatchewan, to conduct visual effects monitoring to evaluate additional future potential mitigation measures that may be considered during the Project lifespan. NexGen notes that this assessment, if of interest to the primary Indigenous Groups, would be developed through the Environmental Committees formed through implementation of the respective Benefit Agreements with each primary Indigenous Group. As this IR is out of the scope of the EA, no changes are proposed in the revised EIS. Also, as stated above, NexGen notes that any decision to conduct additional visual effects assessment work would be a decision taken by NexGen and the primary Indigenous Groups through the respective Environmental Committees. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html	n/a
170	MN-S	Perceptions of Water, Fish, Plant and Wildlife Resource Quality	Section 16.5.1.3.6	The EIS states: "A spatial analysis was completed to provide an indication of the extent of perceived effects on land resources. The spatial extent of indirect or perceived effects from the Project and potential avoidance or reduced traditional land and resource use surrounding the Project was assumed to be 5km from the maximum disturbance area, which represents an area where individuals may perceive contamination to exist. Five kilometres was also selected because it represents a distance that can easily by travelled by foot, out and back, through the bush to carry out traditional activities (e.g., hunting) in a day ... A 5km distance from the Project encompasses Patterson Lake where Indigenous Groups indicated the most concern during Joint Working Group." MN-S was not provided the opportunity to review, discuss or collaborate on an appropriate spatial boundary to represent the area where individuals may perceive contamination to exist. MN-S notes that neither a review of primary sources of Indigenous Knowledge nor Joint Working Group references to an area of importance constitute verification of Indigenous land users' area of perceived impact. Without verification, it is also not appropriate to assume that perceived impacts of quality are directly comparable to the distance an individual can travel on foot.	Please provide additional details regarding the verification with Indigenous Nations that 5 km from the maximum disturbance area represents the area where individuals may perceive contamination to exist. As rights holders and Indigenous land and resource users, data verification should involve collaboration with MN-S, including the opportunity to review, revise and contribute to the characterization of existing land and resource conditions with the MN-S Homeland. MN-S request that the language regarding data verification is updated to reflect that MN-S requested and was not provided the opportunity to review (and verify) the EIS prior to regulatory submissions.	NexGen notes Métis Nation – Saskatchewan (MN-S's) comment regarding lack of verification of the perceived effects buffer is outside the scope of the requirements of Project Terms of Reference (Draft EIS Appendix 1A [Concordance Tables for the Terms of Reference and Generic Guidelines for Preparation of an Environmental Impact Statement], Table 1A-2). Prior to and during EIS review, NexGen has offered results workshops and also discussed methods in Joint Working Group meetings, though it is acknowledged that the 5 km buffer was defined later in the assessment process to determine how to appropriately assess perceived effects. NexGen offered and conducted EA results workshops with Indigenous Groups, including the MN-S, throughout 2022, and discussed EA results with local communities during community information sessions in June 2022 and June 2023. These workshops and discussions included conversations on the results of the Indigenous land and resource use assessment, which considered the 5 km spatial extent for perceived effects. Specific to the completed EA results workshops, Indigenous Groups did not provide specific questions or feedback regarding the use of a 5 km spatial extent for perceived effects associated with land and resource use. In the absence of other related information and as noted in Draft EIS Section 16.5.1.3.6 (Perceptions of Water, Fish, Plant, and Wildlife Resource Quality), the 5 km perceived effects spatial extent was used based on information provided in the Birch Narrows Dene Nation (BNDN) and Buffalo River Dene Nation (BRDN) Indigenous Knowledge and Traditional Land Use Studies (Draft EIS TSD II: BNDN; Draft EIS TSD III: BRDN), which describe 5 km as the local study area for the assessment of traditional values surrounding the proposed Project. This distance was used to provide an approximation of magnitude and geographic extent and to focus mitigations; however, the determination of significance of effects also considered frequency, duration, reversibility, and context for a weight-of-evidence evaluation. As noted in Draft EIS Section 16.6.2 (Significance Determination), NexGen acknowledges that continued land and resource use activities are critical to local Indigenous Groups and communities,	TBD

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						and necessary to maintain a social licence to operate. NexGen is committed to engaging directly with the Indigenous Groups, including the MN-S, throughout the Project lifespan regarding ways to minimize the concerns associated with perceived effects, including potentially through the planned perception survey. It is expected that this engagement will occur through the either the Environmental Committees or Implementation Committees as implemented through the Benefit Agreements signed with the primary Indigenous Groups. Should new information be available prior to the development of the revised EIS, this information will be considered within the EA.	
171	MN-S	Significance Determination	Section 16.6	Section 16.6 of the EIS states: "Indigenous land and resource use is expected to change around Patterson Lake, but overall Indigenous land and resource use in other areas of the LSA and RSA is anticipated to continue. The residual effects on the Indigenous Land and Resource Use VC in the Application Case and the RFD Case are predicted to be not significant."	Please revise this section to take into consideration the following: Indigenous Land and Resource use is intrinsically tied to the land and the specific locale; despite access to other areas, a change in access and cultural practices around Patterson Lake has the potential to affect the ability of MN-S to continue cultural practices associated with the Patterson Lake area.	NexGen notes that Draft EIS Section 16.6 (Residual Effects Classification and Determination of Significance) summarizes the information assessed in Draft EIS Section 16.5 (Residual Effects Analysis) and provides a determination of significance for the Indigenous land and resource use valued component. Context supporting the statement quoted by the reviewer is provided throughout Draft EIS Section 16.5. Draft EIS Section 16.5 examines access to the area available for Indigenous land and resource use and notes that there would be similar resource availability in the local study area and regional study area as compared to the resources found within the Patterson Lake area, though recognizes that cultural practices tied to the Patterson Lake area would be affected for certain individuals. This information is then summarized in Draft EIS Section 16.6.2 (Significance Determination), including the statement "[e]ffects are predicted to be reversible; however, perceptions associated with permanent infrastructure and the history of the cultural landscape would be irreversible for some individuals." No changes are proposed in the revised EIS to address this IR.	n/a
172	MN-S	Prediction Confidence and Uncertainty	Section 16.7	The EIS states: "The primary factors affecting confidence in the predictions made in the assessment for Indigenous land and resource use include: - level of understanding of Indigenous perceptions is based on IKTLU Studies, comments during Joint Working Group meetings, and other perception studies, all of which may not capture the full breadth of individuals' perceptions ..." Determining the significance of impacts to Indigenous land and resource use should be verified by Indigenous land and resource users, and not just be informed by Indigenous Knowledge. MN-S was not provided the opportunity to contribute to the significance determination. MN-S further notes that a neither a review of primary sources of Indigenous Knowledge nor incidental sharing during a Joint Working Group meeting constitute verification of Indigenous land users' perceptions.	MN-S is requesting to be given the opportunity to verify the significance of impacts and to contribute to the significance determination.	NexGen maintains that activities offered and conducted through NexGen's engagement program over multiple years and the Métis Nation – Saskatchewan (MN-S) participation in the FIRT review of the Project Draft EIS have provided the MN-S reasonable opportunities to verify the effects predicted in the EIS and contribute to the significance determination for the Indigenous land and resource use valued component (VC). As specific examples, in late 2021 and early 2022, NexGen offered the MN-S opportunities to discuss EA results (Draft EIS Appendix 2A [Summary of Indigenous Group Engagement Activities]); however, NexGen and the MN-S were unable to meet prior to the Draft EIS submission. NexGen confirms that results meetings have been held with the MN-S in September 2022 and October 2022, following Draft EIS submission; no specific comments regarding potential misrepresentation of effects predicted in the EIS or the significance determination for the Indigenous land and resource use VC were received during these EA results meetings. NexGen also notes that through their participation in the FIRT process, the MN-S have been given the opportunity to review effects predicted in the Draft EIS, including information related to the significance determination for the Indigenous land and resource use VC. No specific comments have been received stating that the effects prediction has been conducted incorrectly within the Draft EIS or that the significance determination for the Indigenous land and resource use VC was incorrect. No changes are proposed in the revised EIS to address this IR.	n/a
173	MN-S	Indigenous Land and Resource Use	Section 17 Section 17.1 Section 17.2	It is unclear why Indigenous land uses associated with commercial or recreational activities has not been considered within the assessment of the Indigenous Land and Resource Use VC. In general, all uses of the land by Indigenous Peoples should be considered Indigenous land and resource use. Section 35(2) of the Constitution Act (1982) outlines Aboriginal rights and Treaty rights and does not distinguish between commercial, recreational, and other uses of the land. As such, assessment of Indigenous land and resource	MN-S is requesting that an assessment of Indigenous land and resource use be considered holistically in the EIS.	NexGen acknowledges the reviewer's comment and confirms that the assessment of all Indigenous land and resource uses, including topics that were considered in Section 17 (Other Land and Resource Use), was conducted in Draft EIS Section 16 (Cultural and Heritage Resources and Indigenous Land and Resource Use). For example, Draft EIS Section 16.5.1.1 (Access to and Area Available for Indigenous Land and Resource), Draft EIS Section 16.5.1.2 (Availability of Fish, Plants, and Wildlife for Harvesting), and Draft EIS Section 16.5.1.3 (Quality of the Indigenous Land Use Experience) each assessed different potential adverse effects to trapping as an Indigenous land and resource use, consistent with trapping being a rights-based activity.	n/a

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				use should be considered holistically. It is not appropriate to separate Indigenous land and resource uses for assessment under two different VCs.		In addition to assessing all uses of the land by Indigenous Peoples, NexGen notes that it is also important to separately assess potential Project effects on other land use activities such as commercial trapping as participation in commercial trapping is not contingent on being Indigenous, and potential effects may exist other than those that are rights related. NexGen recognizes there is considerable overlap between Draft EIS Section 16 and Section 17; however, Draft EIS Section 17 examines commercial and recreational activities regardless of Indigenous status or identity, though it is recognized that most local priority area residents identify as Indigenous. As all Indigenous land and resource uses are assessed in Draft EIS Section 16, no changes are proposed in the revised EIS to address this IR.	
174	MN-S	Spatial Boundaries	Section 17.2.3	"The Other Land and Resource Use LSA (Figure 17.2-1) incorporates: …" Given the inclusion of Indigenous land and resource users within this VC the list of areas considered within the LSA should also consider the LSA for the cultural and heritage and Indigenous land and resource use LSA.	Please revise the EIS to include the list of areas considered within the LSA for the cultural and heritage and Indigenous land and resource use LSA.	NexGen acknowledges the reviewer's comment, though notes that the local study area (LSA) for the other land and resource use valued component (VC) was appropriately delineated based on the criteria described in Draft EIS Section 6.4.1 (Spatial Boundaries). As stated in Draft EIS Section 6.4.1, "[t]he LSAs used within discipline assessments were defined at a scale that contains most or all of the expected effects of the Project on a VC and supporting intermediate components". Following the criteria described in Draft EIS Section 6.4.1, the other land and resource use LSA included the following: ▪ the Project footprint; ▪ the maximum disturbance area defined in the vegetation and wildlife assessments, which provides a conservative spatial estimate of the direct effects; ▪ the terrestrial, aquatic, and human health regional study areas delineated by the Clearwater watershed boundaries where ecosystems could potentially be directly or indirectly affected by the Project; ▪ the area of both the Project and the Fission Patterson Lake Property boundaries, which is considered in the cumulative effects assessment for other VCs and the other land and resource use VC; ▪ areas where access to outfitting allocation areas may change, specifically at Vermeersch and Wickenkamp lakes and areas north of the Project and Forrest, Beet, and Naomi lakes south and east of the Project; ▪ the Highway 955 corridor north of La Loche, where changes to traffic volumes and traffic disturbances may affect land use activities, which is defined as a 1,200 m wide corridor to capture road and roadside effects and includes: o a 100 m buffer on each side of the road centreline for the road allowance; o an additional 200 m buffer each side where hunting should be restricted; and o an additional 300 m buffer on each side where land use activities may occur along the road corridor such as trapping, hunting, and outfitting. ▪ destinations that require travel through Project-affected areas for trapping and other uses, which may result in avoidance from perceived risks or displacement of resource harvest activities, such as areas as far east as the junction of Clearwater and Mirror rivers and adjoining lakes east of the Project. While aligning the other land and resource use and Indigenous land and resource use LSAs is not required, NexGen notes that the other land and resource use LSA (Draft EIS Section 17.2.3 [Spatial Boundaries], Figure 17.2-1) and Indigenous land and resource use LSA (Draft EIS Section 16.2.3 [Spatial Boundaries], Figure 16.2-1) are almost identical except for a small addition to the other land and resource use LSA to the west, which is associated with areas where access to outfitting allocation areas may change. As a result, the other land and resource use LSA is 1,009 ha larger than the Indigenous land and resource use LSA. No changes are proposed in the revised EIS to address this IR.	n/a

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175	MN-S	Existing Conditions	Section 17.2.6	It is unclear from this statement if Indigenous commercial and recreational use was considered through the KP interview process. It is also unclear who determined that key persons were in possession of adequate knowledge and experience. It is unclear who completed the validation process for existing conditions for Other Land and Resource Use VC. Third party review of meeting records and notes is not equivalent to data validation by potentially affected parties. As rights holders and Indigenous land and resource users, data verification should involve collaboration with MN-S, including the opportunity to review, revise and contribute to the characterization of existing land and resource conditions with the MN-S Homeland.	Please provide additional information to clarify the validation process.	NexGen acknowledges the reviewer's comment though notes the request to validate how Indigenous Knowledge was incorporated into the Draft EIS is outside the scope of the CNSC Generic Guidelines for the preparation of an EIS (CNSC 2021). However, NexGen confirms that appropriate efforts were made during the development of the Draft EIS to facilitate both the collection of accurate baseline data and the sharing of EA methodology and results with Indigenous Groups. NexGen confirms that Draft EIS Section 17 (Other Land and Resource Use) does not discuss Indigenous-specific use as this topic is addressed in Draft EIS Section 16 (Cultural and Heritage Resources and Indigenous Land and Resource Use); however, Draft EIS Section 17 does examine all commercial and recreational uses identified through literature review, key person (KP) interviews, and feedback from Indigenous Groups, including feedback provided through the Joint Working Groups (JWGs). The KP interview process is outlined in Draft EIS Section 2.6.3.1.2 (Summary of Key Person Interview Research Program) and Section 4.3.4 of Draft EIS Annex X (Socio-economic Baseline Report), with additional information available in Draft EIS Section 18.2.6.2 (Key Person Interview Program) and Draft EIS Section 19.2.6.2 (Key Person Interview Program). In summary, the KP interview process was approached collaboratively with the primary Indigenous Groups and communities through the Community Coordinators funded as part of the Study Agreements signed between NexGen and the primary Indigenous Groups, including the Métis Nation – Saskatchewan (MN-S). Community Coordinators were trained to assist in identifying participants in the KP interview program and were primarily responsible for initial outreach and scheduling of interviews. Interview guides were developed to seek additional information and provide local context. In other words, Indigenous Group appointees helped determine the key persons that would possess adequate knowledge and experience. Key person interviews were conducted with community members, including business owners, principals and staff of schools, housing clerks, healthcare directors, band councillors, women with knowledge experience with the worker rotation system, and the Royal Canadian Mounted Police (Draft EIS Annex X, Section 4.3.4). With respect to the incorporation of Indigenous and Local Knowledge within the Draft EIS, including the content in Draft EIS Section 17.3 (Existing Conditions), NexGen offered opportunities to the MN-S to discuss baseline studies, baseline data results, EA methods, and discipline-specific assessment approaches through JWG meetings held throughout 2019, 2020, and 2021, and discussed these topics with other primary Indigenous Groups during that time (Draft EIS Section 2.6.1.1.1 [Summary of Joint Working Group Activities]; Draft EIS Appendix 2A [Summary of Indigenous Group Engagement Activities]). NexGen notes that the MN-S was unable to meet to discuss some of these topics; however, in lieu of being able to conduct JWG meetings, NexGen provided the MN-S with the information discussed with other primary Indigenous Groups for review and comment, with the invitation for further discussion if desired. NexGen has not received any specific comments from the MN-S regarding the information provided through this process. In late 2021 and early 2022, NexGen also offered the MN-S opportunities to discuss EA results (Draft EIS Appendix 2A); however, NexGen and the MN-S were unable to meet prior to the Draft EIS submission. NexGen confirms that results meetings were held with the MN-S in September 2022 and October 2022, following Draft EIS submission; no specific comments regarding potential misrepresentation of Indigenous and Local Knowledge provided by the MN-S within the Draft EIS were received during these EA results meetings. NexGen also notes that through their participation in the FIRT process, the MN-S have been given the opportunity to review how Indigenous and Local Knowledge has been integrated into the Draft EIS, including information related to existing conditions. No specific comments have been received stating that the interpretation of Indigenous and Local Knowledge provided by the MN-S has been conducted incorrectly within the Draft EIS. As confirmed above, KP interview participants were selected as part of a collaborative effort between NexGen and the primary Indigenous Groups and an opportunity to review and verify the findings of existing land and resource use conditions has been provided to the MN-S through the JWG process, EA results meetings, and Draft EIS review process. NexGen reiterates that the	n/a

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						request to validate how Indigenous Knowledge was incorporated into the Draft EIS is outside the scope of the CNSC Generic Guidelines for the preparation of an EIS (CNSC 2021). No changes are proposed in the revised EIS to address this IR. **References** CNSC (Canadian Nuclear Safety Commission). 2021. Generic Guidelines for the Preparation of an Environmental Impact Statement – Pursuant to the *Canadian Environmental Assessment Act, 2012*. Available at http://cnsc.gc.ca/eng/resources/environmental-protection/ceaa-2012-generic-eis-guidelines.cfm	
176	MN-S	Residual Effects Classification and Determination of Significance	Section 17.2.9	The activities described include recreational (non-Indigenous) hunting, fishing, commercial trapping, commercial fishing, lodge and outfitting services and ecotourism, cabins, parks and protected area, forestry and wildlife, and mining and exploration. It is unclear from this text how Indigenous land and resource users are considered within this VC and/or the existing conditions content. Section 17.2.1 (See comment 17-009) states "this section focuses more narrowly on uses for commercial or recreational purposes and extends to both Indigenous and non-Indigenous users." This contradicts the text included in Section 17.3.	Please revise the EIS to provide clarity on how Indigenous land and resource users are considered within this VC and/or the existing conditions content. Please revise sections 17.2.1 in relation to section 17.3.	NexGen notes the following response has been developed in reference to Draft EIS Section 17.2.2.1 (Valued Components) and Section 17.3 (Existing Conditions) and that the references to Draft EIS Section 17.2.9 (Residual Effects Classification and Determination of Significance) in the “Reference to EIS, appendices, or supporting documentation (if applicable)” column and Draft EIS Section 17.2.1 (Incorporation of Indigenous and Local Knowledge) in the “Context and Rationale” and “Information Requirement” columns of the IR appear to be incorrect. NexGen appreciates the reviewer’s comment; however, NexGen disagrees that the information presented in Draft EIS Section 17.2.2.1 is inconsistent with the discussion in Draft EIS Section 17.3. The quote from Draft EIS Section 17.2.2.1 in this IR outlines the types of activities considered as ‘other’ land and resource use and is aligned with the information in Draft EIS Section 17.3, which describes the existing conditions relative to the other land and resource use valued component (VC). Indigenous Knowledge is presented in Draft EIS Section 17.3 as it pertains to the other land and resource use VC. The Draft EIS Section 17 assessment did not differentiate based on Indigenous status or identity as the assessment was inclusive of all commercial and recreational users partaking in the activities described in Draft EIS Section 17.2.2.1. Specific Indigenous land and resource use considerations are outside the scope of the other land and resource use VC; these considerations are addressed through the Indigenous land and resource use VC assessed in Draft EIS Section 16 (Cultural and Heritage Resources and Indigenous Land and Resource Use), which solely focuses on Indigenous land and resource use by Indigenous Peoples (refer to NexGen’s response to IR 173). No changes are proposed in the revised EIS to address this IR.	n/a
177	MN-S	No Pathway	Section 17.4.1	Participants of the 2021 trapper’s workshop and LPA community members comments on the potential Project effects on water quality, fish and wildlife in the area of the Project…. No significant adverse effect on any human receptors as a result of releases from the Project is likely during Operations for the Application Case and RFD Case. Therefore, this pathway was determined to have no measurable effects on the health of resource users and was not carried forward in the assessment. While quotes that demonstrate Indigenous Knowledge are included throughout this chapter, with the exception of noting concerns were raised through the 2021 trappers’ workshop, based on the text provided, Indigenous Knowledge does not appear to have been applied and considered in the determination of Project interactions.	Please provide clarity on how Indigenous Knowledge has been applied and considered in the determination of Project interactions.	Based on the context provided by the reviewer, NexGen understands that this IR is in reference to the justification of Pathway ID OLU-04 (Changes to air and water quality) in Draft EIS Section 17.4.1 (No Pathways) being designated as a ‘no pathway’. As noted in Pathway ID OLU-04 in Draft EIS Section 17.4.1, attendees at a trapper’s workshop held in 2021 and members of the local priority area (LPA) communities have provided feedback expressing concerns regarding potential effects to fresh water at Patterson Lake and the Clearwater River from Project-related changes to water quality. NexGen acknowledges that the assessment of Pathway ID OLU-04 resulted in a ‘no pathway’ determination, which could mistakenly be interpreted as potentially dismissing the concerns raised. However, NexGen confirms that feedback from local trappers and LPA community members was considered within the pathway assessment, and through the weight-of-evidence evaluation conducted, it was determined that changes to air and water quality would not have a potential greater-than-negligible effect on other land and resource use. As noted in Draft EIS Section 17.2.7 (Project Interactions and Mitigations), the first step in the pathways analysis was to identify the pathways by which the Project could affect other land and resource use. This step included consideration of Project design details, input from Indigenous Groups, and professional experience, among other items. Comments from trappers and LPA	n/a

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						community members were considered as part of this step. Through this exercise, it was determined that changes to air and water quality could potentially result in adverse effects. Following the confirmation of changes to air and water quality representing a potential pathway to create adverse effects on other land and resource use, proposed mitigations that would minimize potential effects were considered and an evaluation of the pathway was conducted. As noted in Pathway ID OLU-04 in Draft EIS Section 17.4.1, the pathway evaluation considered how potential changes to the quality of fish, vegetation, and wildlife species and human health resulting from changes to air and water quality could affect other land and resource users. This evaluation considered an ecological risk assessment that determined health risks to aquatic and terrestrial wildlife receptors and a human health risk assessment that determined health risks to human receptors. The results of the ecological risk assessment and human health risk assessment showed that there would be no measurable effects on the health of resource users (Draft EIS Section 15 [Human Health]; Draft EIS TSD XXI [Environmental Risk Assessment]). Therefore, there would be no anticipated adverse effects on other resource use associated with this pathway; Pathway ID OLU-04 was determined to be 'no pathway' and was not carried forward for further assessment. In summary, feedback from the LPA community members and local trappers expressing potential concern regarding changes to air and water quality affecting other land and resource use formed part of the rationale for evaluating Pathway ID OLU-04. However, the evaluation process determined that no measurable effects would occur to ecological or human receptors; therefore, there would not be predicted adverse effects to other land and resource use. As a result, Pathway ID OLU-04 was not carried forward for further assessment. NexGen notes that Pathway ID OLU-04 is specific to actual predicted effects to fish, wildlife, or human health. Perceived changes in resource quality were considered in Pathway ID OLU-02 (Quality of resource use experience) in Draft EIS Section 17.4.3 (Primary Pathways).	
178	MN-S	Access to, and Area Available for, Land and Resource use	Section 17.6.2	The EIS states: "Regional initiatives to mitigate access could include promotion of continued use close to the Project to, such initiatives would help maintain the areas as an active landscape for resource users, particularly for trappers from local Indigenous communities." It is unclear what mitigations are being proposed to help maintain the area as an active landscape. Proponent promotion for continued use cannot be assumed to be an effective mitigation measure as it is highly dependent on the level of trust that has been established with local users.	Please provide clarity regarding what mitigations are being proposed to help maintain the area as an active landscape.	NexGen notes that the Project mitigations being proposed to help maintain the area as an active landscape are presented in Pathway ID OLU-01 (Access to and area available for land and resource use), Pathway ID OLU-02 (Quality of resource use experience), and Pathway ID OLU-05 (Safety risk from altered ice conditions) in Table 17.4-1 of Draft EIS Section 17.4 (Project Interactions and Mitigations). With respect to regional initiatives, NexGen agrees that promotion of continued land use would likely only be effective with an established level of trust. Specific to the context presented in Draft EIS Section 17.6.2 (Significance Determination), this trust would need to be developed between NexGen, Fission Uranium Corp., Indigenous Groups, and other land and resource users. Also, while NexGen supports the implementation of future regional initiatives, the exact mitigation measures associated with regional initiatives are not known with certainty at this time. For these reasons, potential regional initiative mitigations were not considered in the weight-of-evidence approach used to determine significance for the other land and resource use valued component (VC). Examples of regional initiatives that could be expanded from Project-specific mitigations include the implementation of additional independent Indigenous monitoring to verify regional environmental effects, implementing collaborative processes to provide safe and coordinated access through non-access-controlled areas associated with regional industrial developments to areas where other land and resource use is practiced, establishment of a regional feedback and grievance mechanism to record and action issues identified by local residents, and expansion of the Ground Transportation Emergency Response Plan to mitigate regional traffic safety risks. NexGen will modify the text in revised EIS Section 17.6.2 (Significance Determination) to clarify that regional initiatives were not considered within the significance determination of the other land and resource use VC. No other changes are proposed in the revised EIS to address this IR.	Section 17.6.2

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179	MN-S	Access Restrictions and Avoidance	Section 19.5.1.1	The EIS states: "Related to cultural continuity, after mitigation, it is anticipated that access restrictions and avoidance of areas near the Project would have an adverse effect on the well-being of some land users. Access would be restricted only within the maximum disturbance footprint past the gatehouse, though perceptions of the Project effects could extend across a broader area. The effect on cultural continuity would be limited to site-specific knowledge that may not be shared among generations and the loss of which may not be replaced." It is unclear how the effect of access restrictions and avoidance of areas near the Project on cultural continuity can be limited to the maximum disturbance of the footprint. While this reflects the access restriction, it is not necessarily reflective of avoidance areas due to the perception of Project effects.	MN-S request that NexGen updates this content, and provide additional detail in the EIS to better reflect how avoidance of areas near the Project has been considered. When considering avoidance of areas for Traditional practices, additional information (and verification by Indigenous Groups) is required to support the statement that the maximum disturbance footprint (i.e., physical Project exclusion) is the only area where the ability to practice cultural continuity would be impacted and further the described outcome that the impact to cultural continuity is reversible.	NexGen agrees with the reviewer that the effects on cultural continuity could extend beyond the maximum disturbance area for individuals who avoid the area due to perceived risks. However, NexGen notes the reviewer's comment suggesting the Draft EIS states that the maximum disturbance area is the only area where the ability to practice cultural continuity would be affected is incorrect. As stated in Draft EIS Section 19.5.1.1 (Access Restrictions and Avoidance), "[a]ccess would be restricted only within the maximum disturbance footprint past the gatehouse, though perceptions of the Project effects could extend across a broader area." Draft EIS Section 19.5.1.1 also notes that the assessment considered the effects of access restrictions and avoidance of areas around the Project site. In addition to the information presented in Draft EIS Section 19.5.1.1, Draft EIS Section 16.5.1.3.6 (Perceptions of Water, Fish, Plant, and Wildlife Resource Quality) considers potential avoidance of areas outside the maximum disturbance area due to perceptions of lessened resource quality. In consideration of the information in Draft EIS Section 16.5.1.3.6, Draft EIS Section 16.5.1.3.7 (Cultural Landscape) discusses changes to the cultural landscape associated with avoidance of areas around the Project site. The information from these Draft EIS subsections informed the assessment of changes to cultural continuity presented in Draft EIS Section 19 (Community Well-Being). NexGen confirms that prior to and during Draft EIS review, NexGen offered and conducted EA results workshops with Indigenous Groups, including the MN-S, throughout 2022 and discussed EA results with local communities during community information sessions in June 2022 and June 2023. These workshops and discussions included conversations on the results of the Indigenous land and resource use assessment, which considered the spatial extent for perceived effects. Specific to the completed EA results workshops, Indigenous Groups did not provide specific questions or feedback regarding the spatial extent considered for perceived effects associated with land and resource use. No changes are proposed in the revised EIS to address this IR.	n/a
180	CNSC	Human health with with respect to hazardous contaminants	Section 21	**Context:** One of the potential risks of a uranium mill is an uncontrolled release from a scrubber. **Rationale:** In the EIS, it doesn't appear that the scenario of an uncontrolled release from a scrubber has been considered. This could be a likely event in a uranium mill given the frequency of handling uranium concentrate. Uranium mills have stacks that are equipped with scrubbers to reduce dust and emissions resulting from the operation. A failure of a scrubber can result in an uncontrolled release of total particulate matter and other contaminants to the environment. This bounding scenario does not appear to be considered in the EIS.	NexGen should consider a bounding scenario of a failure of a scrubber stack in the mill.	The failure of a scrubber stack in the mill (i.e., process plant) was considered in the hazard identification (HI) analysis, specifically HI 8.8 (Process containment and gas cleaning and filtration system failure) and HI 8.9 (Calciner wet scrubber failure), as presented in Table 3-8 in Appendix A of Draft EIS TSD VIII (Accidents and Malfunctions Report). As part of the initial HI screening process, these scenarios were given an overall risk rating of "ALARP, moderate", where ALARP is as low as reasonably practicable, in consideration of both probability and consequence (Draft EIS TSD VIII, Appendix A, Table 3-8). The hazards associated with scenarios HI 8.8 and HI 8.9 would be managed by regular and preventative inspection, testing, and maintenance, and ambient air monitoring. Implementation of these risk-reduction activities would reduce the overall risk associated with these scenarios to a tolerable level (i.e., ALARP). It is further noted that these scenarios were considered to be bounded by the scenario carried forward for detailed assessment that contemplated damage to equipment or vessels containing uranium-bearing solutions resulting in fire or release of uranium concentrate to the environment (HI 9.3 [Solvent extraction fire or explosion] in Draft EIS TSD VIII, Section 8.0 [Bounding Scenario 3: Solvent Extraction or Explosion]). Consistent with the approach in Section 3.0 of Draft EIS TSD VIII and the discussion provided above, a scenario specifically considering a failure of a scrubber stack in the process plant does not need to be added to the assessment as a bounding scenario. No changes are proposed in the revised EIS to address this IR.	n/a

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181	CNSC	Human health with with respect to hazardous contaminants	Section 21	**Context:** One of the potential risks of a uranium mill is a spill of uranium concentrate. **Rationale:** In the EIS, it doesn't appear that the scenario of a spill of uranium concentrate has been considered. This could be a likely event in a uranium mill given the frequency of handling uranium concentrate. This could have impacts since there could be radiation exposure during this malfunction.	NexGen should consider a bounding scenario of a spill of uranium concentrate in the mill.	Several scenarios that included the release of uranium-bearing materials in the process plant were considered in the hazard identification (HI) initial screening process as presented in Table 3-8 in Appendix A of Draft EIS TSD VIII (Accidents and Malfunctions Report). Specifically, scenarios HI 8.1 (Ore spill), HI 8.3 (Process vessel and piping system failure, clarifier overflow), HI 8.4 (Process vessel and piping system failures), HI 8.7 (Facility fire), HI 8.8 (Process containment and gas cleaning and filtration system failure), and HI 8.9 (Calciner wet scrubber failure) are referenced for consideration (Draft EIS TSD VIII, Appendix A, Table 3-8). Scenarios HI 8.1, HI 8.3, and HI 8.4 were rated as overall low risk, where the screening evaluation considered the risk as generally being acceptable; therefore, the scenarios were not carried forward for detailed assessment. As noted in Section 3.2.1 of Draft EIS TSD VIII, low risk scenarios were not carried forward for detailed assessment as the likelihood can be managed through planned controls. Such controls associated with the aforementioned scenarios include ambient monitoring, secondary containment, process sumps, redundant temperature/reagent controls, building ventilation, and spill and emergency response planning. Scenarios HI 8.7, HI 8.8, and HI 8.9 were rated as overall "ALARP, moderate", where ALARP is as low as reasonably practicable, in consideration of both probability and consequence (Draft EIS TSD VIII, Appendix A, Table 3-8). The potential consequences of these scenarios were considered to be bounded by HI 9.3 (Solvent extraction fire or explosion) which was carried forward for detailed assessment as Bounding Scenario 3 (Draft EIS TSD VIII, Section 8.0). Consistent with the approach described both in Section 3.0 of Draft EIS TSD VIII and in the discussion above, a scenario specifically considering a spill of uranium concentrate in the process plant does not need to be added to the assessment either through the HI screening process or as a bounding scenario. Such a concentrate spill would be contained to the process plant and not pose a risk to the public or the environment. No changes are proposed in the revised EIS to address this IR.	n/a
182	CNSC	Accidents and Malfunctions	Section 21.2.2 TSD IX, Section 1.3	**Context:** The spatial extent of the assessment includes two sections of highway, one along Highway 955 and the second along Highway 155. The spatial extent along Highway 955 spans from the intersection of the Project access road and Highway 955 to the intersection of Highway 955 and Highway 155 at La Loche. The spatial extent along Highway 155 spans from the intersection of Highway 955 and Highway 155 to the intersection of Highway 155 and Highway 55 at Green Lake. The proponent states that the spatial extent was informed by evaluation of the existing traffic volumes, identification of incremental increases in traffic associated with the proposed Project, and understanding of transportation emergency response times. The proponent further states that traffic volumes on Highway 155 and Highway 955 are as much as 2 to 20 times less than those on Highway 55, and much lower compared to other provincial highways of comparable size. As such, the incremental increase in traffic volume on these highways due to project-related traffic would be larger than those for other such highways. In addition, the distance of these two highways from major population centres such as Regina or Saskatoon results in slower emergency response to transportation accidents. The emergency response capabilities that can be deployed to the traffic accidents on other major highways is more timely, due to closer proximity to larger population centres. **Rationale**: TSD IX Sections 8.1.1 and 8.1.2 show that the truck accident rate in Saskatchewan between 2007 and 2014 is from 0.81 to 0.98 per million-	Provide further rationale or justification on the spatial extent of not extending the transportation risk assessment beyond the Highway 155 and Highway 55 junction at Green Lake. **Technical Discussion Required**: Yes	NexGen and its qualified professionals maintain that the spatial extent of the transportation risk assessment as described in Draft EIS Section 21.5.1 (Transportation Route) and Section 1.3 of Draft EIS TSD IX (Transportation Risk Assessment Report) is appropriate. As noted in Draft EIS Section 21.5.1 and Draft EIS TSD IX, the spatial extent was informed by evaluation of the existing traffic volumes, identification of incremental increases in traffic associated with the proposed Project, and understanding of transportation emergency response times. The IR suggests that emergency response may only be deployed from the Project emergency response team in the case of a traffic accident involving radioactive materials or uranium and infers that the Project emergency response team would need to be deployed from site (thus resulting in a longer time to respond to accidents farther away from the Project site). NexGen notes that while deploying emergency response from the Project site would be standard practice, support of emergency response activities would also involve resources from locations other than the Project site (e.g., locations south of Green Lake). NexGen further notes that: ▪ As part of the Project emergency response planning, contractors would be retained by NexGen, providing a network of response team resources (i.e., personnel and equipment). This planning would allow for the nearest response team resources to respond in the case of a transportation accident, at the direction of the Project emergency response team. As noted in Draft EIS TSD IX, if responding to an accident south of Green Lake, resources from major population centres and closer proximity than the Project site could be deployed. ▪ Consistent with standard emergency response practice, incident response by qualified first responders within the existing services provided by local municipalities and the Province (e.g., RCMP, fire services) would also occur. While it is acknowledged that the first responders would secure the release location to prevent public access until resources deployed from the Project emergency response team (including contractors retained by NexGen, emergency response	n/a

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				vehicle-kilometer [MVkm]distance travelled, while the truck accident rate on Highway 955 and Highway 155 (SGI 2018) is from 0.8 to 1.16 accidents per MVkm, which is similar to or slightly higher than the provincial truck accident rate. When a traffic accident involves radioactive materials or Uranium, the emergency response that can be deployed may come only from the project emergency response team. If such an accident occurs south of Green Lake, the response time for deploying response team from the project site would take longer time to arrive at the accidental site and the highway with such an accident would need to be blocked for a longer time. Therefore, a traffic accident occurs south of Green Lake may pose higher risks to human health and the environment. It appears the determination of the spatial extent not extending beyond Green Lake is not well justified.		team members from the Project site, or a combination thereof) arrive, securing the release location would serve to lessen potential overall risk to the public. Further consideration of the rationale as to the suitability of the spatial extent for the assessment is provided below. ▪ The key portions of the Project-related transportation route in which incremental increases in traffic are considered important to local communities have been included in the spatial extent of the assessment. ▪ Outside of the spatial extent of the assessment (i.e., within the greater provincial highway/freeway system and beyond), overall risks of Project transportation as a function of likelihood and consequence are deemed to be low. o Accident rates (expressed as number of accidents per distance travelled) on the larger highway/freeway systems are lower than on smaller, rural road and highway networks. Dangerous goods and hazardous chemicals are transported through the highway/freeway system on a national scale with very few reported incidents. o With respect to consequence, effects are expected to be similar to the consequence assessed for Highway 955 and Highway 155. As noted in Section 5.4 of Draft EIS TSD IX, Highway 55 is more accessible than the assessed locations, and response to transportation accidents along the Highway 55 corridor is likely to be more timely than it would be in the assessed locations given the proximity and accessibility to emergency response services. Timely emergency response is key to limiting potential exposure to members of the public and/or environmental effects. In consideration of a lower likelihood of incident occurrence and a similar anticipated consequence, the overall risks associated with accident scenarios considered in Draft EIS Section 21.6 (Assessment of Accidents and Malfunctions) and Draft EIS TSD IX are representative of accident scenarios that may occur beyond Highway 955 and Highway 155. Therefore, the spatial extent considered for the assessment of traffic accident scenarios is appropriate. No changes are proposed in the revised EIS to address this IR.	
183	MN-S	Accidents and Malfunctions	Section 21.5.1	"Based on a review of Project-related information, the following key Project components and activities were identified that form the basis of consideration for the identification of potential hazard scenarios: [bullet list] …" While the list of Project components includes "process plant buildings" there does not appear to be any consideration of in-lake infrastructure and associated discharges, such as the treated effluent and pipe diffuser and the treated sewage pipe and outfall. Given the importance of Patterson Lake and the importance of water and influence of water on Indigenous culture (as discussed in Section 21.4, p. 21-12) these factors should be a consideration in the hazard identification process.	MN-S requests that NexGen consider potential accidents or malfunctions related to in-lake infrastructure through the Hazard Identification process. MN-S also requests that these options are specifically discussed in the EIS; if they are not identified as bounding scenarios, rationale should be provided given the level of importance that Patterson Lake and the associated wildlife and habitat provide to MN-S Culture and practices.	NexGen notes that an accident or malfunction associated with the in-lake infrastructure would result in a release of treated effluent (i.e., treated contact water that has been tested and confirmed as acceptable for release relative to discharge criteria), which is not expected to result in an adverse effect to the environment. As Project components associated with untreated effluent are located well away from the Patterson Lake shoreline (e.g., more than 500 m from Patterson Lake to the process plant), substance release scenarios were represented by Bounding Scenario 4: Tailings Transfer Pipe or Pump Failure (Draft EIS Section 21.6.6; Draft EIS TSD VIII [Accidents and Malfunctions Report], Section 9) and Bounding Scenario 5: Untreated Effluent Transfer Pipe Failure (Draft EIS Section 21.6.7; Draft EIS TSD VIII, Section 10) where it was demonstrated that the released substances would not reach Patterson Lake. No changes are proposed in the revised EIS to address this IR.	n/a
184	CNSC	Accidents and Malfunctions	Section 21.5.1	**Context:** The proponent states that the assessment of accidents and malfunctions began with the initial identification of hazard scenarios. Hazard scenarios were identified using a systematic approach that considered the existence of sources of hazards and initiating events for the Project. The hazard identification was conducted to identify a comprehensive list of potential project-related accident and malfunction scenarios associated with	Assess the hazard of potential traffic accidents that could damage the chemical storage tanks on the mill site.	NexGen notes that releases or fires from containment failure associated with accidents to Project site vessels are addressed (i.e., bounded) through multiple hazards considered within the hazard identification (HI) analysis in Section 3.0 of Appendix A of Draft EIS TSD VIII (Accidents and Malfunctions Report); specifically, as hazards for the: ▪ process plant (HI 8.2 [Process vessel and piping system failure]; HI 8.3 [Process vessel and piping system failure, clarifier overflow]); ▪ solvent extraction building (HI 9.1 [Process vessel and piping system failure]); ▪ acid plant (HI 16.1 [Truck, tanks, reactor, and storage vessels failure, sulphur spill during offloading]); and	n/a

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				the key project components and activities with further details provided in the technical supporting document (TSD) VIII. **Rationale:** In addition to traffic accidents on the Project access road, experience from similar mine operation suggests the incidence of traffic accidents damaging chemical storage tanks on the mill site, which could result in the release of chemicals from the ruptured storage tank and cause risks to human health and safety, and the environment. However, this hazard scenario appears to have not been assessed.		▪ liquified natural gas (LNG) power plant (HI 20.3 [LNG storage failure and release of gas]). Transportation hazards also address an aspect of chemical containment failure (HI 20.1 [LNG transportation accident]; HI 20.2 [LNG transportation accident]). In all instances listed above, the overall risk of these scenarios was determined to be low because any associated accidental release would be contained to the Project site, would be manageable with emergency response procedures, and would not pose an environmental risk. No changes are proposed in the revised EIS to address this IR.	
185	CNSC	Accidents and Malfunctions	Section 21.5.1	**Context:** The proponent states that the assessment of accidents and malfunctions began with the initial identification of hazard scenarios. Hazard scenarios were identified using a systematic approach that considered the existence of sources of hazards and initiating events for the Project. After identifying potential hazard scenarios, a subset (i.e., bounding scenarios) was selected as the focus of the detailed risk analysis. The hazard identification was conducted to identify a comprehensive list of potential project-related accident and malfunction scenarios associated with the key project components and activities with further details provided in the technical supporting document (TSD) VIII. **Rationale:** CNSC staff noted that explosives and detonator storage stations, and strong acid storage facility were not included in the list of key project facilities and the hazards associated with the storage and transportation of explosives, detonators, and strong acid were not identified and their risks to the environment, human health, and workers safety were not evaluated.	1.Include the facilities for storing explosives, detonators, and strong acid in the list of key project facilities; 2.Identify the hazards related to the storage and transportation of explosives, detonators, and strong acid; 3.Assess their potential effects on the environment, human heath, and workers safety from a potential accident/malfunction associated with explosives, detonators, and strong acid.	Responses to part 1, part 2, and part 3 of this IR are provided below, organized by the source of the hazard. <u>Explosives and Detonators</u> The transport, storage, and use of explosives are heavily regulated to minimize risks. Explosive use would be managed as per the *Explosives Act*, as well as the following standards: ▪ CAN/BNQ 2910-500/2015 Explosives – Magazines for Industrial Explosives; and ▪ CAN/BNQ 2910-510/2015 Explosives – Quantity Distances. In accordance with The Mines Regulations, 2018, the location of the explosive or detonator facility would be a minimum of 60 m from any work area, fire hazard, or other vulnerable area, and would not be located on any main travel way (e.g., access ramp). Risks for transport, storage, and use of explosives would always be considered as low as reasonably practicable given the regulatory framework and the controls required (e.g., explosives management planning); therefore, these risks were not included in the hazard assessment. This rationale will be added to revised EIS Section 21.5.1 (Hazard Identification) and Section 3.2 of revised EIS TSD VIII (Accidents and Malfunctions Report). For this reason, further assessment of potential effects to the environment, human health, and worker safety is not required. <u>Strong Acid</u> Strong acid would be produced from molten sulphur on site in the acid plant and piped to the process plant. Strong acid would only be transported to the Project site during scheduled maintenance of the acid plant. For this reason, consideration of accident scenarios associated with strong acid was evaluated relative to activities on site in the hazard identification (HI) analysis in Section 3.0 of Appendix A of Draft EIS TSD VIII, for the acid plant (HI 16.1 [Truck, tanks, reactor, and storage vessel failure, sulphur spill during offloading]) and for the process plant (HI 8.2 [Process vessel and piping system failure]). Controls to minimize risk associated with the above-referenced scenarios include ambient monitoring; a routine and preventative inspection, testing, and maintenance program; secondary containment; process sumps; acid plant and mill buildings containment; redundant temperature/reagent controls; and spill and emergency response planning. These controls result in low risk. Additionally, the transportation risk assessment (Draft EIS Section 21.7 [Assessment of Transportation-Related Risks]) considered transport of hazardous materials along the transportation corridor to the Project site. With these considerations, strong acid spill scenarios would fall within the bounding scenarios in the accidents and malfunctions assessment (Draft EIS Section 21.6.4 [Bounding Scenario 2: Traffic Accident (Chemical)]) and the transportation risk assessment (Draft EIS Section 21.7.2 [Aquatic Release Scenario]; Draft EIS Section 21.7.3 [Terrestrial Release Scenario]). For this reason, further assessment of potential effects to the environment, human health, and worker safety is not required. No changes related to strong acid are proposed in the revised EIS to address this IR.	Section 21.5.1; TSD VIII, Section 3.2

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						References *Explosives Act*. RSC 1985, c E-17. Current to 28 July 2020. Available at https://laws-lois.justice.gc.ca/eng/acts/e-17/ SCC (Standards Council of Canada). 2015. CAN/BNQ 2910-500/2015: Explosives – Magazines for Industrial Explosives. SCC. 2015. CAN/BNQ 2910-510/2015: Explosives – Quantity Distances. The Mines Regulations, 2018. RRS c S-15.1 Reg 8 under *The Saskatchewan Employment Act*. Effective April 6, 2019. Available at https://www.canlii.org/en/sk/laws/regu/rrs-c-s-15.1-reg-8/latest/rrs-c-s-15.1-reg-8.html	
186	MN-S	Accidents and Malfunctions	Section 21.6	The EIS states: "Six hazard scenarios were selected as bounding scenarios for more detailed risk analysis." Given the high importance of Patterson Lake to Indigenous and local Communities, the use of the lake for fishing and sustenance, and the presence of in-lake infrastructure, an accidental release into Patterson Lake has the potential to impacts several VCs and linked VCs.	MN-S requests that NexGen considers an aquatic release to Patterson Lake as a bounding scenario for the assessment of effects of accidents and malfunctions.	NexGen notes that an accident or malfunction associated with the in-lake infrastructure would result in a release of treated effluent (i.e., treated contact water that has been tested and confirmed as acceptable for release relative to discharge criteria), which is not expected to result in an adverse effect to the environment. As Project components associated with untreated effluent are located well away from the Patterson Lake shoreline (e.g., more than 500 m from Patterson Lake to the process plant), substance release scenarios were represented by Bounding Scenario 4: Tailings Transfer Pipe or Pump Failure (Draft EIS Section 21.6.6; Draft EIS TSD VIII [Accidents and Malfunctions Report], Section 9) and Bounding Scenario 5: Untreated Effluent Transfer Pipe Failure (Draft EIS Section 21.6.7; TSD VIII, Section 10) where it was demonstrated that the released substances would not reach Patterson Lake. No changes are proposed in the revised EIS to address this IR.	n/a
187	CNSC	Accident and Malfunction	Section 21.6 TSD VIII	**Context:** In Table 21.6-1, the accident or malfunction for project component NPAG WRSA, it states that "…uncontrolled leachate/seepage release through lining failure." It is understood that the NPAG WRSA has no liner, so the lining failure is an incorrect statement. In Table 21.6-3, the release characterization of Bounding Scenario 2 states that hydrogen peroxide = 11,350 L to 18,900 t. 18,900 t is incorrect and should be 18,000 L. Table 3-1 to Table 3-20 in Appendix A of TSD VIII, -consequences for the hazards ID# 1.1, 1.3, 1.8 2.1, 5.2, 17.2, and 20.1 include occupational major injuries. However, the severity (S) is denoted as number 2 that appears to be inconsistent with consequence rating number in Table 3-2 of TSD VIII. -hazard ID# 4.3 has a likelihood (L)=1 and S=5 and its risk ranking (RR) is Low, but not moderate as defined in hazard risk matrix. -Consequences for hazard ID# 5.5 and 5.7 include fatality, but their S=4, not 5. -Hazard ID# 9.3 has L=1 and S=5, RR is high, not moderate as defined in hazard risk matrix. -Hazard ID#11.4 states uncontrolled leachate/seepage release through lining failure for NPAG waste rock pile. It is understood that NPAG waste rock pile has no liner.	Clarify or correct all inconsistent and/or inaccurate/incorrect information in section 21.6 and in Tables 3-1 to 3-20 in Appendix A of TSD VIII.	NexGen notes the reviewer's comment and will correct the inconsistencies (e.g., units, risk level discrepancies based on product of likelihood and consequence) in revised EIS Section 21.6 (Assessment of Accidents and Malfunctions) and Table 3-1 to Table 3-20 in Appendix A of revised EIS TSD VIII (Accidents and Malfunctions Report). In addition to the noted inconsistencies, the following clarifications are made with respect to elements of the reviewer's comment: ▪ The non-potentially acid generating waste rock storage area (WRSA) would not be lined. ▪ The potentially acid generating WRSA would be single lined. ▪ Hazard identification (HI) 14.3 (Pond lining failure and leakage) will be changed to from 'unlikely' (i.e., L=2) to 'likely' (i.e., L=3). ▪ The HI 16.1 (Truck, tanks, reactor, and storage vessels failure, sulphur spilling during offloading) will be changed to from 'unlikely' (i.e., L=2) to 'likely' (i.e., L=3). NexGen notes that the revisions outlined above do not change the outcome of the accidents and malfunctions assessment.	Section 21.6; TSD VIII, Appendix A

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				-Hazard ID# 12.1 states that dual lined pad with leak detection system, which is not the case for PAG waste rock stockpile. -Hazard ID# 14.3, L=2 for pond lining failure and leakage is not justifiable based on the operation experience at other similar projects in the area. -Hazard ID# 16.1, L=2 for a very common accident/malfunction is not justifiable. **Rationale**: Inconsistent or inaccurate/incorrect information was included in Chapter 21 Accidents and Malfunctions and its supporting TSD.			
188	CNSC	Accidents and Malfunctions	Section 21.6.3.1 TSD VIII, Section 6.2 TSD IX, Section 9	**Context:** The proponent states that based on drum deformations performed in a previous analysis (McSweeney et al. 2004), if a drum experienced a crush force of 100,000 lbs, then the deformation of the drum would cause the lid to detach from the drum. Using this drum failure mechanism, and assuming the drums weigh 450 kg and are arranged four across in the truck, at a speed of 48 km/h (<60 km/h in TSD IX), the front 25% of the drums would fail, at 60 km/h to 97 km/h 55% would fail, at 145 km/h 75% would fail, and at ≥193 km/h all would fail. Given that the speed of the truck would be less than 40 km/h, it was concluded that less than 25% of the drums would fail upon a traffic accident scenario. There are assumed to be 50 drums per shipment, so some stacking or rows of drums should be expected in this scenario. The drums stacked above could be at greater risk of deformation in a traffic accident. It is not clear whether drums stacking was considered in the previous study cited by the proponent and whether 25% fail is still an adequate percentage of drum failures in such traffic accident scenarios. **Rationale:** Drum failure percentage will impact on the release quantity of uranium in such an accident scenario and then impact on the consequence assessment. Therefore, the drum failure should be adequately assessed and supported with sufficient information and justification.	Clarify the speed limit for 25% drum fail; Provide information and/or rationale as to whether drum stacking would impact drum failure at different speeds and confirm whether 25% drum fail for such an accident is still valid. **Requires Technical Discussion**: Yes	NexGen clarifies that the speed limit of the postulated aquatic release scenario is 40 km/h (Draft EIS Section 21.6.3.1 [Scenario Description]; Draft EIS TSD VIII [Accidents and Malfunctions Report], Section 6.2). The referenced speed limit range of less than 60 km/h (Draft EIS TSD IX [Transportation Risk Assessment Report], Section 9.1.2) is referring to the range of speeds where 25% of the uranium concentrate drums would fail in the event of an accident, for which 40 km/h is within this range. NexGen confirms that uranium concentrate drums would not be stacked on transport trucks. This assumption aligns with the analysis provided for drum failure (Draft EIS Section 21.6.3.1 [Scenario Description]; Draft EIS TSD VIII [Accidents and Malfunctions Report], Section 6.2; Draft EIS TSD IX [Transportation Risk Assessment Report], Section 9.0), which assumed that the drums would not be stacked in trucks. This assumption is supported given the number of drums per shipment (i.e., 50), their size (i.e., 2 ft diameter), and the standard truck size (i.e., 26 ft long by 10 ft wide) that can accommodate 13 rows of drums with 5 drums per row; this assumption will be clarified for transparency in the following revised EIS subsections: ▪ Section 21.6.3.1 (Scenario Description); ▪ TSD VIII, Section 6.2; and ▪ TSD IX, Section 9.0. In consideration of this information, a separate assessment for a traffic accident with stacked drums is not required.	Section 21.6.3.1; TSD VIII, Section 6.2; TSD IX, Section 9.0
189	CNSC	Accidents and Malfunctions	Section 21.6.4 TSD VIII, Section 7	**Context:** EIS states that Bounding Scenario 2 consists of the release of fuel and hazardous chemicals into the Clearwater River under the bridge along the project access road due to traffic accidents. Among the chemicals considered for this scenario, the effects of the release of gasoline and solvents are bounded by the effects associated with the release of diesel fuel. **Rationale:** It is understood strong acid will be used as the stripping agent in the process plant solvent extraction circuit to extract Uranium and will be transported to the site. The strong acid is not considered in this scenario. Explosives will be used for the project construction and operation and will be transported to the site as well. It is not clear whether bounding scenario 2 could bound the potential effects of a traffic accident for aquatic release of strong acid and explosives.	Provide information whether Bounding Scenario 2 would bound the potential effects of an aquatic release of strong acid and explosives from a traffic accident and conduct assessment, if not bounded, of the aquatic release of strong acid and explosives from a traffic accident.	Please see NexGen's response to IR 185 regarding accidents and malfunctions associated with strong acid and explosives. No changes are proposed in the revised EIS to address this IR.	n/a
190	CNSC	Accidents and Malfunctions	21.6.4	**Context:**	Strengthen discussion on emissions to air from the accidental release of this scenario.	Additional discussion regarding air emissions and potential effects on air quality due to the accidental release of diesel fuel will be provided in Bounding Scenario 2: Traffic Accident (Chemical) in revised EIS Section 21.6.4.3 (Assessment of Potential Effects) and Section 7.4 of	Section 21.6.4.3;

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			TAD VIII, Section 7	Bounding Scenario 2 is for traffic accident release of fuel and hazardous chemicals into the Clearwater River under the bridge along the Project access road. Based on the release characterization, the release of diesel fuel would bound other releases. The scenario of release of diesel fuel considered that 45% of the fuel released will be lost due to evaporation and dissolution. While the aquatic release of the fuel was further assessed in the effect assessment, emissions to air from the spills was not discussed/assessed in the EIS. **Rationale:** Emissions to air through evaporation of the fuel releases/spills would impact on the air quality and should be discussed in the EIS.		revised EIS TSD VIII (Accidents and Malfunctions Report). Note that the intent is not to complete predictive modelling; rather, a qualitative assessment will be added commensurate with the likely level of risk. This additional discussion will consider the nature of air emissions that would be derived through evaporation/volatilization of the diesel fuel and the fact that the air emissions would be localized to the release location and would be of short duration. Discussion of potential risks associated with worker heath and safety for crews dispatched to respond to a potential incident will be described. Risk-managed activities will be discussed focusing on the use of personal protective equipment and adherence to appropriate safety protocols, as examples. The risk management discussion will also highlight how response to such an event would be facilitated through, and be consistent with, the emergency response planning, including spill response planning and procedures, which would be developed and implemented prior to the initiation of licensed Project activities.	TSD VIII, Section 7.4
191	CNSC	Accidents and Malfunctions	Section 21.6.5 TSD VIII, Section 8	**Context:** Bounding Scenario 3 involves damage to equipment and vessels containing uranium-bearing solutions in the solvent extraction building, resulting in fire and release of uranium to the environment. The effects of this scenario were evaluated with the Areal Locations of Hazardous Atmospheres (ALOHA) model. The details of the assessment are provided in TSD VIII. In TSD VIII, the airborne source term for this scenario is estimated with equation developed by the United States Department of Energy (USDOE) where the respirable faction is assumed to only include particles of 10 µm and smaller. **Rationale:** No rational was provided to support the consideration of only 10 µm and smaller particles. For material at risk, the total volume of the uranium-rich solvent of 100 m3 was used without explanation. It is also not clear where is the maximum uranium concentration of 8 g/L in the loaded solvent from. The calculation of leak path factor involves several factors either calculated or assumed (i.e. the volume of air of 210 m^3, 14 air changes, maximum air flow of 27 m^3, burning rate of 2.6 L/s), which are not clearly stated. As the airborne source term is an important factor for the effect assessment and should be calculated with transparent and justified information/data.	Provide rationale for why only 10 µm and smaller particles were considered for respirable fraction and explanation for the values of factors used for leak path factor calculation. **Requires Technical Discussion**: Yes	As noted in Section 8.2 of Draft EIS TSD VIII (Accidents and Malfunctions Report), a 10 µm diameter particle size, or smaller, is a commonly assumed size fraction as an inhalable particle as referenced by various organizations, including the United States Environmental Protection Agency (US EPA 2023). Uranium particles emitted from a solvent fire would be particles or aerosols that are formed during the fire. In most cases, these aerosols are sub-micron in size. In consideration of this typical size, the 10 µm diameter assumption is conservative since it assumes that all the particles are therefore inhalable. Additionally, as noted in Section 8.2 of Draft EIS TSD VIII, the value '1' has been used for the respirable fraction to develop the exposure source term. This value is conservative because it assumes that all the uranium content formed as particles is inhalable. With respect to the calculation of the leak path factor (LPF) for a confined building fire, the basis of the LPF was as follows: ▪ The American Society of Heating, Refrigerating, and Air-Conditioning Engineers Ventilation Standard 62.1 (ASHRE 2022) indicates that air exchange for closed industrial buildings is 4 air changes per hour (ACH). ▪ In case of fire, due to stack effects, the ACH is 3 to 4 times greater, and therefore 3.5 × 4 = 14 ACH was selected. NexGen also notes that the analysis was repeated for an unconfined fire assuming an LPF of 1 in the unconfined fire scenario, which had a similar minor to moderate consequence rating within a relatively short distance from the release as the confined scenario that assumed an LPF of 0.128. No changes are proposed in the revised EIS to address this IR. **<u>References</u>** ASHRE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers). 2022. ANSI/ASHRAE Standard 62.1-2022, Ventilation and Acceptable Indoor Air Quality. Available at https://www.ashrae.org/technical-resources/bookstore/standards-62-1-62-2 US EPA (United States Environmental Protection Agency). 2023. Particulate Matter (PM) Basics. Last updated July 2023. Available at https://www.epa.gov/pm-pollution/particulate-matter-pm-basics	n/a

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192	MN-S	Accidents and Malfunctions	Section 21.7	The EIS states: "After the detailed risk analysis was complete, the resultant risk level rating was assessed to be Low for all scenarios except for the transportation accident scenario involving a vehicle-pedestrian collision, which was deemed to be a Moderate risk. The Moderate risk scenario was deemed to represent a tolerable level of risk in consideration of proposed safeguards that reduce the risk level to ALARP." It is unclear if NexGen has verified the outcomes of this assessment with potentially affected Peoples (i.e., land users who may be pedestrians along the transportation routes), who may not support this outcome.	MN-S requests additional detail about verification undertaken regarding the MN-S outcomes. If no verification was undertaken, MN-S requests additional text to acknowledge verification was not undertaken and to further acknowledge the limitations of the assessment in this regard.	NexGen notes that a requirement to verify the results of the accidents and malfunctions assessment with Indigenous Groups is outside the scope of the CNSC Generic Guidelines for the preparation of an EIS (CNSC 2021). However, NexGen notes that multiple attempts were made to engage the Métis Nation – Saskatchewan (MN-S) regarding the accidents and malfunctions assessment. The approach for the accidents and malfunctions assessment and the traffic assessment (Draft EIS Section 21 [Accidents and Malfunctions]) was discussed with primary Indigenous Groups through the Joint Working Groups (JWGs) in April 2021. Unfortunately, the MN-S was unable to attend a JWG meeting at that time. A subsequent letter was sent to the MN-S on 30 June 2021 that provided a copy of the April 2021 presentation, a summary of the hazard identifications, and a map for the MN-S to identify potential areas of concern associated with traffic accidents along local highways. At that time (i.e., 30 June 2021), the MN-S was offered another opportunity to meet on this topic and was requested to complete the identification of areas of concern on the map by mid-July 2021 for inclusion in the Draft EIS; however, no reply regarding this topic was provided by the MN-S. A letter sent to the MN-S on 6 August 2021 reiterated NexGen's desire for the MN-S to identify potential areas of concern for accidents and spills and areas of cultural significance, to which no information was provided by the MN-S. In addition to the activities noted above, NexGen also presented EA results to the MN-S in September 2022 and to the Métis communities through community information sessions in La Loche and Buffalo Narrows in October 2022. Also, the Draft EIS regulatory review phase provides an opportunity for the MN-S to provide specific comments on the outcomes of the assessment. To date, no specific comments on the outcomes of the accidents and malfunctions assessment have been provided by the MN-S. As multiple attempts were made to discuss the accidents and malfunctions assessment with the MN-S and the requirement to verify the results of the accidents and malfunctions assessment with Indigenous Groups is outside the scope of the CNSC Generic Guidelines for the preparation of an EIS (CNSC 2021), no changes are proposed in the revised EIS to address this IR. **References** CNSC (Canadian Nuclear Safety Commission). 2021. Generic Guidelines for the Preparation of an Environmental Impact Statement – Pursuant to the *Canadian Environmental Assessment Act, 2012*. Available at http://cnsc.gc.ca/eng/resources/environmental-protection/ceaa-2012-generic-eis-guidelines.cfm	n/a
193	CNSC	Accidents and Malfunctions	Section 21.7 TSD IX	**Context:** The analysis of the potential transportation accident involving hazardous materials requires information regarding the type, quantity, transportation method, and characteristics of the hazardous materials transported from/to the site. The following hazardous materials were selected for the assessment: uranium concentrate, hydrogen peroxide, diesel fuel, liquidized natural gas (LNG), and molten sulphur. **Rationale:** The project will need significant amount of strong acid and explosives that will be transported to the site. The strong acid and explosives are considered as either hazardous or dangerous materials. However, they were not considered in the transportation risk assessment.	Include strong acid and explosives in the transportation risk assessment.	Please refer to NexGen's response to IR 185 for discussion related to the assessment of explosives and strong acid hazards. No changes are proposed in the revised EIS to address this IR.	n/a

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194	CNSC	Accidents and Malfunctions	Section 21.7 TSD IX	**Context:** While the EIS states that six transportation hazard scenarios were selected as the focus of the transportation risk assessment, only five scenarios were included in Tables 21.7.1 and 21.7.3. In TSD IX, while five scenarios were stated in Section 6: Transportation Accident Scenarios, six accident scenarios were presented in summary Table 11-1. **Rationale:** Inconsistent information on the transportation hazard scenarios was provided in the EIS.	Clarify the hazard scenarios for transportation risk assessment and provide consistent information in the EIS.	NexGen acknowledges there was an error in the Draft EIS text referenced by the reviewer. For clarity, a total of five transportation scenarios were selected and evaluated as the focus of Draft EIS TSD IX (Transportation Risk Assessment Report): ▪ aquatic release; ▪ terrestrial release; ▪ atmospheric release; ▪ vehicle-human accident; and ▪ vehicle-wildlife accident. The inconsistencies noted by the reviewer will be corrected in revised EIS Section 21.7 (Assessment of Transportation-Related Risks) and Section 11 of revised EIS TSD IX.	Section 21.7; TSD IX, Section 11
195	CNSC	Accidents and Malfunctions	Section 21.7.2.1	**Context:** For the aquatic release scenario, of the 33 water features that are crossed by or occur in the direct vicinity of the project's transportation route, 4 were selected as the focus of the scenario for transportation risk assessment. **Rationale:** Stakeholders need to understand why only four features were selected for this scenario assessment as this might impact on the overall transportation-related risk assessment.	Provide rationale or criteria for selecting only 4 water features for transportation risk assessment of the aquatic release scenario. **Requires Technical Discussion**: Yes	As noted by the reviewer, four locations were considered as potential aquatic environment release scenarios within Draft EIS Section 21.7.2 (Aquatic Release Scenario). Three locations were chosen to represent a range of release conditions (i.e., small river to large river and lake) and span the spatial extent of the study area. The fourth location (i.e., Buffalo Narrows location) was selected to consider an event within a community along the transport route. The results of the assessment at these four varied locations are generally expected to apply broadly to similar settings across the study area. That is, the results of the assessment of the releases at these locations would be expected to be representative of all crossings along the transport route since the key endpoint in the assessment is overall risk, as defined for the assessment process as likelihood multiplied by consequence. It is not necessary, nor practicable, to individually assess each crossing that has been identified in Draft EIS TSD IX (Transportation Risk Assessment Report). The approach used is consistent with past practice for comparable assessments for uranium projects in the province. NexGen notes that feedback on the selection of locations used in the transportation risk assessment was specifically sought from primary Indigenous Groups through Joint Working Group (JWG) meetings in April 2021 and follow-up correspondence in June 2021 and July 2021 (Draft EIS Section 2.6.1.1.1 [Summary of Joint Working Group Activities], Table 2.6-3; Draft EIS Appendix 2A [Summary of Indigenous Group Engagement Activities]). For those Indigenous Groups that elected to provide feedback, there were no specific comments or concerns noted with respect to the locations selected for the aquatic environmental release scenarios. In addition to the activities noted above, NexGen also presented EA results, including information on the transportation risk assessment, during community information sessions held in 2022 (Buffalo Narrows, Clearwater River Dene Nation, Birch Narrows Dene Nation / Turnor Lake, Buffalo River Dene Nation) and 2023 (Buffalo Narrows, La Loche, Birch Narrows Dene Nation / Turnor Lake, Buffalo River Dene Nation, Clearwater River Dene Nation). During the 2022 and 2023 community information sessions, no specific comments on the locations selected for the transportation risk assessment scenarios were received. No changes are proposed in the revised EIS to address this IR.	n/a
196	CNSC	Accidents and Malfunctions	Section 21.7.2.2 TSD IX, Section 9.1	**Context:** It states in Section 21.7.2.2 that "Based on these analyses, the hypothetical maximum concentrations of uranium in water and sediment ranged between 121 µg/L (i.e. downstream of Churchill Lake) and 516 µg/L (i.e. Clear River), and 2,760 µg/g (i.e. Clearwater River) and 3,760 µg/g (i.e., Canoe River), respectively."	Clarify maximum concentrations of uranium in sediment for aquatic release scenario.	NexGen acknowledges the reviewer's comment and agrees that the information regarding maximum uranium concentrations in water and sediment resulting from postulated releases to aquatic environments presented in Draft EIS Section 21.7.2.2 (Assessment of Potential Effects) was incorrectly transferred from Section 9.1.4.2, Section 9.1.5.2, Section 9.1.6.2, and Section 9.1.7.2 of Draft EIS TSD IX (Transportation Risk Assessment Report). The second paragraph of revised EIS Section 21.7.2.2 (Assessment of Potential Effects) will be replaced with the paragraph below, which includes the correct information presented in Draft EIS TSD IX. NexGen notes that the interpretation of the results on the analysis of the postulated releases to	Section 21.7.2.2

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				However, in Section 9.1 of TSD IX, maximum concentrations of uranium in sediment for the Clearwater River release is 2.76x104 μg/g (dry wet) or 27,600 μg/g (dry wet) in Table 9-1; maximum concentrations of uranium in sediment for the Canoe River release is 3.76x104 μg/g (dry wet) or 37,600 μg/g (dry wet) in Table 9-3. It appears that 37,600 μg/g is not the maximum concentrations of uranium in sediment for the aquatic release of uranium as maximum concentrations of uranium in sediment for the Beaver River Crossing release appears to be 4.11x104 μg/g (dry wet) (also refer to CNSC AM-17). **Rationale:** Inconsistent/incorrect information on maximum concentrations of uranium in sediment under aquatic release scenario is provided in the EIS.		aquatic environments presented in the fifth paragraph of Draft EIS Section 21.7.2.2 remains unchanged since it reflects the results presented in Draft EIS TSD IX: "Uranium concentrations in surface water were predicted based on an understanding of hydrologic conditions for the assessed water features and published information on the solubility of uranium in water. Predicted surface water concentrations at each of the four locations for the aquatic release scenario were developed under different flow conditions (i.e., minimum, mean, and maximum), different degrees of relative mixing in the receiving environment (i.e., 5%, 25%, and 100%), and varying durations (short term [i.e., seven days] and long term [i.e., post-remediation]). Predicted sediment concentrations were estimated based on the results of a particle dispersion analysis, which considered settling of particles in the water column to the sediments. Predicted sediment concentrations at each of the four locations for the aquatic release scenario were developed for different flow conditions (i.e., minimum, mean, and maximum). Predicted sediment porewater concentrations were based on weighted-average concentrations in sediment and using a sediment-to-water partition coefficient. Predicted sediment porewater concentrations at each of the four locations for the aquatic release scenario were developed for different flow conditions (i.e., minimum, mean, and maximum). The numeric predictions associated with surface water, sediment, and sediment porewater for the aquatic release scenario is provided in Section 9.1.4.2, Section 9.1.5.2, Section 9.1.6.2, and Section 9.1.7.2 of TSD IX, respectively."	
197	MN-S	Incorporation of Indigenous Knowledge	Section 22.3	The EIS states: "The leadership of each Indigenous Group selected their Joint Working Group participants with consideration of group diversity; where possible, members included Elders, youth, different genders, a range of ages, and land users around Patterson Lake." It is unclear how MN-S's input was considered in section 22.	Please revise the EIS to provide additional context as to how MN-S' input was considered in this section.	NexGen notes that Draft EIS Section 22.3 (Incorporation of Indigenous and Local Knowledge) is intended to provide information on the available sources of Indigenous and Local Knowledge and the methods for incorporation of Indigenous and Local Knowledge into the effects of the environment on the Project assessment; the use of specific Indigenous and Local Knowledge provided by Indigenous Groups, including the Métis Nation – Saskatchewan, is cited where appropriate in the other subsections of Draft EIS Section 22 (Effects of the Environment on the Project). No changes are proposed in the revised EIS to address this IR.	n/a
198	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	Section 22.6	**Context:** In Section 22.6, the Proponent provides risk level determinations for various natural hazards based on their likelihood of occurrence and potential consequences. This relies on the climate information and projections detailed in Appendix 22A wherein the potential for future increases in the frequency/magnitude of short-duration precipitation events and Probable Maximum precipitation (PMP) are noted. This potential is also noted in section 22.6.3. – Major Precipitation Events. **Rationale:** In Section 22.6 under "Water Management Infrastructure" (p.22), the Proponent notes "*Self-containment for runoff from mineralized materials has been sized to contain PMP events*". It is not clear if that PMP considers potential climate change.	Describe how future climate change has been factored into the consideration of the risk levels related to extreme precipitation, including possible increases in frequency and magnitude, for all of the Hazard Scenarios identified in Table 22.6.3. **Suggestions for mitigation and follow-up measures** Monitor all pumps and availability of contingency pumps. Redundant pumps may be necessary when the failure threatens the environment.	The following points outline how climate change has been factored into the consideration of the risk levels in Table 22.6-3 of Draft EIS Section 22.6.3.2 (Risk Measurement and Evaluation): ▪ A detailed climate change analysis was completed (Draft EIS Appendix 22A [Climate Change Assessment], Attachment 22A-1) to understand future climate variables. As outlined in Section 22A.5.1.3 of Draft EIS Appendix 22A, climate projections for a range of variables were identified at various percentiles (i.e., 5%, 10%, 50%, 75%, 90%, 95%, and 99%). The climate projections provided across various percentiles have been considered for all climate variables, including extreme weather events such as a probable maximum precipitation (PMP) event. The PMP was projected for climate change scenarios in the 2050s and 2080s (Draft EIS Appendix 22A, Section 22A5.3). ▪ The climate information provided in Draft EIS Appendix 22A has been applied to the Project design through design criteria and management practices (i.e., environmental design features and mitigation). The detailed climate change dataset (Draft EIS Appendix 22A, Attachment 22A-1) was developed for the Project to compare the climate projections with design parameters to evaluate the resiliency of the Project. ▪ The climate information provided in Draft EIS Appendix 22A has also been applied to various disciplines, including hydrology, and has been used throughout the effects assessment. How the disciplines considered climate projections from Draft EIS Appendix 22A in the individual effects assessments are summarized in Table 6A-1 of Draft EIS Appendix 6A (Climate Change Roadmap). ▪ NexGen confirms that Table 22.6-3 of Draft EIS Section 22.6.3.2 considers the detailed climate change analysis (i.e., the Project has been designed to withstand a PMP event, which includes consideration of climate change), as well as the consideration of climate change in the effects assessment by the relevant disciplines (refer to Table 6A-1 of Draft EIS Appendix 6A [Climate Change Roadmap]).	n/a

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						▪ Given that climate change is occurring but there remains uncertainty in the future projections of climate change, NexGen would consider climate risks as a part of the continual improvement process, as outlined in the Climate Adaptation Framework (Draft EIS TSD XXII). With respect to the reviewer's suggested mitigation and follow-up measures, details regarding pump monitoring and the sizing of pumps, requirement for contingency pumps, and considerations for other related Project infrastructure will be provided to the CNSC as part of the licence application.	
199	ECCC	Fish and fish habitat Migratory birds Current use of lands and resources for traditional purposes	Section 22.6 Appendix 22A	**Context:** In Section 22.6, the Proponent indicates that they have considered the median in an ensemble of climate change projections for a number of climate parameters in their hazard scenario assessment. **Rationale:** Best practice for addressing the inherent uncertainty in future climate projections is to consider the range of projected changes in an ensemble of projections from a range of future emission scenarios and models. Evaluating the risk level based only on the median does not address the inherent uncertainty. A probability of occurrence has not been ascribed to the different future emission scenarios and they diverge increasingly beyond ~2040. The median projected change from the ensemble may not be the most likely to occur, which would result in unreliable predictions and the subsequent assessment of effects of the Project.	Describe how the overall risk levels (based on likelihood and consequence) for the various hazard scenarios that relate to climate outlined in the various tables in Section 22.6 would differ if more extreme projected future changes were considered (i.e., not just the median).	As outlined in Section 22A.5.1.3 of Draft EIS Appendix 22A (Climate Change Assessment), climate projections for a range of variables were identified at various percentiles (i.e., 5%, 10%, 50%, 75%, 90%, 95%, and 99%). The climate projections provided across various percentiles have been considered for climate variables, including extreme weather events such as probable maximum precipitation and World Meteorological Organization indices. The climate information provided in Draft EIS Appendix 22A has been applied to the Project design through design criteria and management practices (i.e., environmental design features and mitigations). The detailed climate change dataset (Draft EIS Appendix 22A, Attachment 22A-1 [Detailed Climate Change Methodology]) was developed for the Project to compare the climate projections with design parameters to evaluate the resiliency of the proposed Project. The likelihood and consequence rankings shown in the various tables in Draft EIS Section 22.6 (Assessment of Effects of Natural Hazards) are accurate because the current Project design criteria and management practices incorporates climate change, which is based on the climate change assessment (Draft EIS Appendix 22A) and considered the range of variables identified at various percentiles as noted above (i.e., not just the median). Consequently, the risk ranking, which is the product of likelihood and consequence ratings assigned for each hazard scenario, is appropriate and would remain unchanged with more extreme projected future climate changes. The climate information provided in Draft EIS Appendix 22A has also been used by various discipline effects assessments (e.g., hydrology, surface water quality and sediment quality, fish and fish habitat, vegetation, wildlife) as described in Table 6A-1 of Draft EIS Appendix 6A (Climate Change Roadmap). As described in the discipline effects assessments, additional percentiles beyond the median have been considered to better understand climate related effects, especially for extreme events. A summary of the median (i.e., 50th) percentile projections has only been provided for a general context on future climate. Given that climate change is occurring but there remains uncertainty in the future projections of climate change, NexGen would consider climate risks as a part of the continual improvement process, as outlined in the Climate Adaptation Framework (Draft EIS TSD XXII).	n/a
200	CNSC	Assessment of Effects of the Environment on the Project	Section 22.6.2 Drought	**Context:** Drought conditions affecting revegetation was assessed in this section. The proponent claims that drought conditions may still affect the successful establishment of some vegetation used in reclamation of the site, particularly if the drought corresponds to an immature standing crop although native, drought- resistant vegetation species would be used for reclamation. The proponent indicates that the probability of drought conditions affecting reclamation efforts is assessed as unlikely, as adaptive management would be applied to certify reclamation objectives are met, and closure would be managed for several years after mining ceases. However, it is not clear what are the reclamation objectives and what are the criteria to be used to certify such reclamation objectives are met. The proponent further states that the consequence for unsuccessful revegetation is assessed as negligible as there would be no stoppage in Project activity and revegetation of disturbed areas	Provide further information to demonstrate the negligible consequence for unsuccessful revegetation with clear reclamation objectives and criteria for certifying the reclamation objectives are met.	As indicated in Draft EIS Section 5.5.3 (Decommissioning and Reclamation [Closure]), NexGen's preliminary objective for Closure is to design the landscape to allow for unrestricted traditional use by Indigenous Groups and local communities, and for functional, self-sustaining, locally common ecosystems on the reclaimed landscape as soon as practicable. Decommissioning, reclamation, and end land use objectives are also described in Draft EIS Section 5.3.2 (Design Objectives and Guiding Principles) and include establishing a closure landscape that would be: ▪ geotechnically, geochemically, and radiologically stable and remain stable under a natural disturbance regime typical for the Project location; ▪ able to support the sustainable management of surface water and groundwater quantity and quality on and off site such that it safely sustains fish and wildlife populations and is safe for human use; ▪ capable of supporting a functioning, self-sustaining ecosystem with diverse fish and wildlife habitats that retains the landscape and its function as designed over time and that requires no or minimal maintenance post-closure;	Appendix 5A (new)

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				would be repeated. However, there is no further information to support the negligible consequence. **Rationale:** It is understood that waste rock stockpiles will be managed and reclaimed on surface. Lack of a vegetation cover on the waste rock stockpiles will increase the erosion potential of the waste rock stockpiles and the net infiltration into the waste rock stockpiles, and then enhance the contaminant migration, which may pose more significant impacts on the surrounding environment. It is not clear whether vegetation cover is relied on for waste rock stockpile reclamations.		▪ accessible for unrestricted traditional use by Indigenous Groups and local communities; and ▪ integrated with the adjacent natural landforms and drainage systems in the Patterson Lake watershed and have a natural appearance. The primary objective of revegetation activities conducted for the Project would be to support desired end land uses (e.g., meeting traditional land use objectives, facilitate successful reclamation of local wildlife habitats). While revegetation activities would also support other aspects of reclamation objectives for the Project (e.g., mitigation of erosion potential), key aspects of Project design and planning have been adopted to reduce the reliance on the success of revegetation conducted during Closure such that the negligible consequence for unsuccessful revegetation is appropriate. These Project design and planning measures include: ▪ Incorporation of key elements of progressive reclamation into the underground mine design (e.g., progressive closure of underground areas and underground tailings management facility chambers) and the design of the waste rock storage areas (WRSAs). Additionally, any other areas that may be disturbed during the Construction or Operations phases, but that are not required for the continued operation of the Project, would be identified as candidates for progressive reclamation. Progressively reclaimed sites would be closely monitored, maintained by on-site personnel, and provide mitigations for environmental effects as well as lessons learned that would allow for improved reclamation success over time, including revegetation. ▪ Specific to WRSA design, alternating lifts of potentially acid generating (PAG) waste rock and engineered source control layers would be placed in the PAG WRSA during the Construction and Operations phases. This engineered source control design represents a progressive reclamation concept that includes the use of prescribed waste rock and control layer placement to reduce oxygen ingress to the waste rock, which minimizes the development of acid rock drainage and metal leaching and, for the purposes of long-term geochemical stability, eliminates the need for an engineered cover system on the PAG WRSA during decommissioning. The PAG WRSA would also be constructed at the final design slopes of 4H:1V during Construction and Operations to facilitate progressive reclamation (i.e., revegetation) of the lower slopes, which would allow NexGen to monitor revegetation success and adapt as needed. Additional best practice measures could be taken to stabilize slopes, if required. As presented in Draft EIS Section 5.5.3.1 (Active Closure Stage), at Closure, both the PAG and non-potentially acid generating WRSAs would be graded to blend into the surrounding topography, and an engineered cover system (e.g., growth medium) would overlay the final WRSA landforms. As described under Hazard ID DR-02 (Drought Conditions Affecting Revegetation) in Draft EIS Section 22.6.2.2 (Risk Measurement and Evaluation), native vegetation, composed in part of drought-resistant species, would be used for reclamation. If drought conditions were to affect the successful establishment of vegetation used in reclamation of the site, revegetation of disturbed areas would be repeated until decommissioning criteria are met. Key documents in planning for the effective closure of the Project would include future iterations of decommissioning and reclamation plans. A conceptual preliminary decommissioning and reclamation plan for the proposed Project will be included as revised EIS Appendix 5A (Conceptual Preliminary Decommissioning and Reclamation Plan). The formal Preliminary Decommissioning and Reclamation Plan will be provided as part of licensing processes for the Project. Further details on the WRSA engineered cover design and reclamation objectives and criteria would be detailed during licensing, and optimization of the Closure design would occur during Operations to address uncertainties associated with drought conditions.	

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201	CNSC	Assessment of Effects of the Environment on the Project	Section 22.6.6 Extreme Temperatures	**Context:** The EIS states that "The NPAG and PAG WRSA cover systems would be designed to withstand cold climates and increasing temperatures. They would follow design and construction recommendations in guidance manuals such as MEND Report 2.21.4A Design, Construction, and Performance Monitoring of Cover Systems for Waste Rock and Tailings (O'Kane 2004)." **Rationale:** MEND report 2.21.4A discusses such issues as freeze/thaw cycling and snowpack measurements, but the majority of the design and monitoring methodologies are based on experiences in more temperate climate, while the guidance manual - MEND report 1.16.5c (2012) [2] is based on more experiences in cold climates and should be followed for cover system design. Reference: MEND Report 1.16.5c, 2012. Cold Regions Cover System Design Technical Guidance Document.	Follow more adequate guidance, such as MEND Report 1.16.5c (2012), for the NPAG and PAG WRSA landform and cover system designs.	NexGen notes the CNSC's request to follow the Mine Environment Neutral Drainage (MEND) guidance for cold region cover systems. NexGen will update revised EIS Section 22.6.6 (Extreme Temperatures) to also refer to recommendations in the MEND Report 1.16.5c (2012). **References** MEND (Mine Environment Neutral Drainage). 2012. Cold Regions Cover System Design Technical Guidance Document. MEND Report 1.16.5c, July 2021.	Section 22.6.6
202	CNSC	Assessment of Effects of the Environment on the Project	Section 22.6.7 Seismic events	**Context:** The EIS states that "The estimated peak ground acceleration (PGA) with a return period of 4,975 years is less than 0.036g at a probability of 2% over 50 years (Golder 2020)." **Rationale:** An event with a probability of 2% over 50 years would have a return period of 2,500 years, but not 4,975 years.	Correct the inconsistent information on probability and return period for the seismic event considered for the Project.	The reviewer is correct that the event with a probability of 2% over 50 years would have a return period of 2,475 years, not 4,975 years as stated in Draft EIS Section 22.6.7.1 (Hazard Scenario Identification). NexGen will update the return period in revised EIS Section 22.6.7.1 to address this error.	Section 22.6.7.1
203	NRCan	Seismic hazards	Section 22.6.7.1	**Context:** The National Building Code (NBC) (including seismic provisions) has been updated as of 2020. **Rationale:** Natural Resources Canada (NRCan) points out that the 2015 NBC has been updated (including seismic provisions) and the 2020 National Building Code is most current.	Please clarify as to which National Building Code may be used? **Suggestions for mitigation and follow-up measures** NRCan suggests using the 2020 NBC for mitigation purposes.	NexGen confirms the 2015 National Building Code was applied, including seismic provisions, in the Draft EIS. The following documents of the revised EIS will be updated to reference the 2020 National Building Code (NRCC 2020): Section 5 (Project Description): ▪ Section 5.9 (References). Section 21 (Accidents and Malfunctions): ▪ Section 21.6.5.2 (Environmental Design Features and Mitigation); and ▪ Section 21.9 (References). Section 22 (Assessment of Effects of the Environment on the Project): ▪ Section 22.6.1.1 (Hazard Scenario Identification); ▪ Section 22.6.3.1 (Hazard Scenario Identification); ▪ Section 22.6.4.1 (Hazard Scenario Identification); ▪ Section 22.6.4.2 (Risk Measurement and Evaluation); ▪ Section 22.6.5.1 (Hazard Scenario Identification); ▪ Section 22.6.7.1 (Hazard Scenario Identification); ▪ Section 22.6.7.2 (Risk Measurement and Evaluation); ▪ Section 22.8 (References); ▪ Appendix 22B (Climate-Infrastructure Interactions), Section 22B4, Table 22B-3; and ▪ Appendix 22B, Section 22B6. TSD VII (Mine Waste Alternatives Assessment Report): ▪ Section 2.3.9 (Seismicity).	Section 5.9; Section 21.6.5.2, 21.9; Section 22.6.1.1, 22.6.3.1, 22.6.4.1, 22.6.4.2, 22.6.5.1, 22.6.7.1, 22.6.7.2, 22.8; Appendix 22B, Section 22B4, 22B6; TSD VII, Section 2.3.9; Abbreviations and Units of Measure, Glossary, and References, Section 5, 21, 22

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						NexGen will also update the Abbreviations and Units of Measure, Glossary, and References for the following sections in the revised EIS: Section 5, Section 21, and Section 22. NexGen confirms that the 2020 National Building Code (NRCC 2020) will be used for mitigation purposes. **References** NRCC (National Research Council of Canada). 2020. National Building Code of Canada, Volume 1. Canadian Commission on Building and Fire Codes. ISBN 978-0-660-37912-8.	
204	NRCan	Seismic Hazards	22.6.7.1	**Context:** Seismic events due to mining have been evaluated and are considered highly unlikely. **Rationale:** Section 22.6.7.1 of the draft EIS states that seismic events are unlikely due to mining activities.	Please provide additional information or references on how the proponent came to this conclusion.	As general context, mining conducted for the Project would occur at shallow to moderate depths, to a maximum of approximately 700 m below ground surface, which has low to moderate in situ stresses. These in situ stresses are similar to stresses experienced at mines operating at these depths in northern Saskatchewan, which have not encountered significant mining-induced seismicity. The NexGen team has direct experience at several analogous past and present mining operations in the mining district with similar geo-structural conditions and to greater depths than proposed for the Project. For example, direct experience in back-analyzing failure mechanisms at Eagle Point Mine suggest that the horizontal stress is equal to, or approximately 20% greater than, the vertical stress; the 'base-case' used for the Project assumes the horizontal stress to be 50% greater than the vertical stress. Mining-induced stress is managed through effective mine design and planning (e.g., by selecting the appropriate excavation size and sequencing), and importantly, by monitoring for stress response due to mining and adjusting the mine plan, as required. This monitoring is an essential part of the ground control management philosophy for mining the Arrow deposit (i.e., the source of the uranium ore for the Project). Key considerations and findings regarding Project mine design and planning conducted to date include: ▪ A design approach guiding principle for the underground tailings management facility (UGTMF) chamber excavation sequence is to maintain pillar thicknesses as wide as possible and as long as possible (i.e., managing mining-induced stress through effective mine planning) (Cai 2013). The UGTMF chamber geometry and sequencing has been modelled at variable pillar widths (i.e., 10 m, 15 m, and 20 m) and sequencing to optimize the UGTMF design in a manner where mining-induced stress has a low likelihood of creating mining-induced seismicity that would materially increase risk to the operation or workers. ▪ The development sequence for production stopes and UGTMF chambers has been simulated using three-dimensional (3-D) elastic and plastic finite element stress models. A sensitivity analysis approach has been used for the input parameters to the 3-D stress models, including ranges for in-situ stress magnitude and orientation and intact and rock mass material properties, as well as the inclusion of non-linear plastic material input parameters (Hoek and Brown 2018). ▪ In general, the models predict stable and serviceable conditions for a reasonable range of anticipated rock mass conditions, mining scenarios, and in-situ stress conditions. Further, the models predict that mining-induced stress and strains would not result in seismicity that would materially increase risk to the operation or workers. As the Project advances to detailed design, further stress modelling will aim to quantify the likelihood of mining-induced seismicity, at which time NexGen will consider the need to employ micro-seismic systems or similar advance instrumentation for stress monitoring, as required. During detailed design and future operations, the need for adjusting ground support requirements or excavation methodology/sequence would also be considered, as appropriate. **References**	n/a

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205						Cai, M. 2013. Principles of rock support in burst-prone ground. Tunnelling and Underground Space Technology 36(6):46-56. 10.1016/j.tust.2013.02.003. June 2013. Hoek, E and ET Brown. 2018. The Hoek-Brown failure criterion and GSI – 2018 edition. Journal of Rock Mechanics and Geotechnical Engineering 11(3). 10.1016/j.jrmge.2018.08.001. August 2018.	
205	ECCC	Fish and fish habitat Migratory birds Current use of lands and resources for traditional purposes	Section 22.7 TSD XXII	**Context:** In Section 22.7 - the conclusions to the Assessment of the Environment on the Project chapter – the Proponent indicates that: *"The potential risks associated with natural hazards and future climate change would continue to be considered in engineering design on an ongoing basis as a part of the continual improvement process and through implementation of the Climate Adaptation Framework (TSD XXII)."* The quote above indicates that the Climate Adaptation Framework will be implemented. The Climate Adaptation Framework document does not include sufficient detail. It reads more as a Proposed framework in development than a concrete plan. There are a series of suggested measures and approaches and the verb "could" rather than "will" is used throughout **Rationale:** .Providing additional detail in the Climate Adaptation Framework will allow ECCC to assess the Proponent's conclusions on the potential risks associated with natural hazards and future climate change.	Provide an updated version of the Climate Adaptation Framework for review, if available.	The following points outline the role and intention of the climate adaptation framework provided in the Draft EIS and referenced in Draft EIS Section 22 (Assessment of Effects of the Environment on the Project): ▪ The climate adaptation framework provided in Draft EIS TSD XXII (Climate Adaptation Framework) goes beyond the requirements of the *Canadian Environmental Assessment Act, 2012*. The framework has been developed based on recent guidance from the Mining Association of Canada (MAC 2021). The framework is organized to first provide an understanding of existing processes and systems developed for the Project and relevant climate-related Draft EIS work. The supporting information is then mapped to the proposed framework to show how existing information from the Project could be used to develop a climate adaptation strategy. ▪ The climate adaptation framework is a proposed approach for developing a living document focused on climate resilience, which would be updated as a part of NexGen's continual improvement process. This approach is aligned with NexGen's vision and values as outlined in Draft EIS Section 1 (Introduction). The initial Project continual improvement process would be in place during the Construction Phase. ▪ The continual improvement processes and climate adaptation framework are anticipated to be completed as part of the Operations Phase for the Project. Sufficient information is not available to make firm commitments during the current design stage of the Project. As the continual improvement processes are developed for the Project, the climate adaptation framework would be updated. ▪ Additional information on NexGen's sustainability and environmental, social, and governance commitments is provided in the *2022 Sustainability Report* (NexGen 2022). These commitments will also be used to inform continual improvement related to climate resilience. No changes are proposed in the revised EIS to address this IR. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html MAC (Mining Association of Canada). 2021. Guide on Climate Change Adaptation for the Mining Sector. Available at https://mining.ca/resources/guides-manuals/guide-on-climate-change-adaptation-for-the-mining-sector/ NexGen (NexGen Energy Ltd.). 2022. 2022 Sustainability Report. Available at https://www.nexgenenergy.ca/sustainability/default.aspx	n/a
206	ECCC	Fish and fish habitat	Appendix 22A Appendix 22A2.2 Appendix 22A4.1.1	**Context:** The Climate Change Assessment describes the current climate and provides projections of how climate is likely to change under future climate conditions. Climate variables including temperature and precipitation are input to a multi-model ensemble (multiple models and scenarios) and the output is used to describe how current climate conditions may change in the future. Appendix 22A describes the methods used to conduct the climate assessment, however, clarification on some of the datasets and methods used in the assessment would assist ECCC in understanding future climate projections.	1. Describe how all the Annual Maximum Series used in Appendix 22A were generated. 2. Provide the percentage of climate data that comes from satellite observations, the percentage of data from ground-based observations and if there are data gaps in the datasets.	Responses to part 1, part 2, and part 3 of this IR are provided below. 1. The approach for generating the annual maximum series for estimating extreme rainfall statistics for both daily precipitation and multi-day precipitation is outlined in Attachment 22A-1 of Draft EIS Appendix 22A (Climate Change Assessment) in Section 1.1.5.1 and Section 1.2.5.2, respectively. ▪ Daily Precipitation:	n/a

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				It is unclear which climate datasets were used throughout the EIS to determine the Annual Maximum Series described in Appendix 22A and if a Model Output Statistics model was used to generate the data. To establish existing climate conditions for the Project area, reanalysis data from Modern-Era Retrospective analysis for Research and Application Version 2 (MERRA-2) were used. However, it is not clear how missing satellite observations due to cloud cover were addressed. It is also unclear if projected changes under future climate conditions provided for the 2 scenarios, 2050 and 2080 were treated as climate points or a time series analysis. **Rationale:** The climate change assessment is used to assess the effects of the environment on the Project that may occur due to future climate change. A clear understanding of the climate variable datasets and methods used in the climate assessment will enable a better understanding how projected future changes in climate may affect the Project over its lifespan.	3. Describe how the 2050 and 2080 scenarios used to project climate change were included in the assessment (i.e., as climate points or time series analysis).	"The peak one-day duration rainfall events were estimated for each year of the current climate baseline period. The method of moments was used to estimate parameters for the Gumbel Distribution (Hogg et al. 1989), which is used by Environment and Climate Change Canada to describe the annual return period precipitation depths for the one-day rainfall duration. The analysis included the results for various return periods (2, 5, 10, 20, 50, 100, 200, 500, 1,000, and 2,000 years)." ▪ Multi-Day Precipitation: "Multi-day precipitation depths were estimated by deriving multi-day running totals for precipitation (using 1, 2, 3, 4, 5, 10, 20, 30, 50, 75, 90, and 120-day durations) and then applying the method described in Section 1.1.5.1, Daily Precipitation, for the annual maximum and Gumbel distribution." 2. Approximately 30% of the climate data comes from satellite observations and 70% comes from ground-based observations. Combining this information resulted in a complete current climate baseline with no gaps in the dataset for the period of 1981 to 2019 that was used in the EA. 3. Section 22A2.2 of Draft EIS Appendix 22A defines how the time horizons of the 2050s and 2080s are relevant to Project phases and activities and provides a description of the long-term climate averages centred on the 2050s and 2080s. No time series analysis was provided as part of Draft EIS Appendix 22A. Where appropriate, these projections have been carried forward into the valued component (VC) and intermediate component assessments as outlined in Draft EIS Appendix 6A (Climate Change Road Map). This climate change road map provides a description of how the 2050s and 2080s scenarios were included in the assessment for each VC or intermediate component, as well as the justification. **References** Hogg WD, Carr DA, Routledge B. 1989. Rainfall Intensity–Duration–Frequency Values for Canadian Locations. Environment Canada, Atmospheric Environment Service: Ottawa.	
207	ECCC	Wildlife and Wildlife Habitat	Section 23	The Proponent states they are committed to developing the following plans: Environmental Monitoring Plan Environmental Protection Program Biodiversity Action Plan Effluent Monitoring Plan Decommissioning and Reclamation Plan	Provide the Environmental Monitoring Plan, Environmental Protection Program, Biodiversity Action Plan, Effluent Monitoring Plan, and Decommissioning and Reclamation Plan for review and provide detail on how these plans and programs will ensure the protection of SAR and migratory birds and their nests and wetland function, including how any residual effects will be mitigated.	NexGen notes the request for the provision of the Environmental Monitoring Plan, Environmental Protection Program, Biodiversity Action Plan, Effluent Monitoring Plan, and Decommissioning and Reclamation Plan is outside the scope of the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012*. This request is also outside the scope of the Project Terms of Reference (Draft EIS Appendix 1A [Concordance Tables for the Terms of Reference and Generic Guidelines for Preparation of an Environmental Impact Statement], Table 1A-2), specifically as defined in Section 10. NexGen confirms that the Environmental Protection Program and supporting documentation (e.g., Environmental Monitoring Plan) and processes will outline considerations for the protection of species at risk, migratory birds and their nests, and wetlands. Examples of information that will be included within the Environmental Protection Program and supporting documentation specific to these topics will include: ▪ Minimizing and managing interactions for the safety of wildlife and workers, which will be described in processes (e.g., procedures) and include information on avoiding, minimizing, and documenting wildlife interactions, as well as requirements for documenting wildlife sightings. ▪ Describing the risk-based set of integrated facilities, processes, and activities utilized to monitor various environmental media as they relate to the Project, including wildlife monitoring to verify compliance with the *Migratory Birds Convention Act, 1994* and *Species at Risk Act*, as well as surface water and groundwater monitoring to evaluate wildlife function. Detailed environmental management and monitoring plans, including the Environmental Monitoring Plan, Environmental Protection Program, Biodiversity Action Plan, Effluent Monitoring Plan, and Decommissioning and Reclamation Plan, will be developed and submitted to the CNSC and other	Appendix 5A (new)

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						regulatory authorities as part of the licensing and permitting processes for the Project, and reflect information commensurate with the stage of Project development. NexGen notes that a conceptual preliminary decommissioning and reclamation plan for the proposed Project will be included as revised EIS Appendix 5A (Conceptual Preliminary Decommissioning and Reclamation Plan). As this IR is out of the scope of the EA, no changes are proposed in the revised EIS other than the addition of Appendix 5A. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html *Migratory Birds Convention Act, 1994*. SC 1994, c 22. Last amended 12 December 2017. Available at https://laws-lois.justice.gc.ca/eng/acts/m-7.01/ *Species at Risk Act*. SC. 2002, c 29. Last amended 12 August 2021. Available at https://laws-lois.justice.gc.ca/eng/acts/s-15.3/	
208	CNSC	Follow-Up Monitoring Program	Section 23.5.1	Section 23.5.1 of the EIS includes a very high level summary of what will be included in the Environmental Assessment Follow-Up Monitoring Program (EAFMP) and refers the reader to Sections 7-19 for details that would be implemented as part of the EAFMP. This makes it difficult to see the overall picture of the proposed EAFMP as a whole and it would be best to summarize all of this information in this section so that the reader can get a better idea of what the EAFMP will entail as a whole. It would also be helpful to include a summary of how Indigenous and Local knowledge helped form the basis of the preliminary EAFMP to date. The updated information should also clarify the roles and responsibilities of the different participants in the EAFMP.	1. Please revise Section 23.5.1 to include a table that summarizes the details (as outlined in Sections 7-19 of the EIS) of the proposed preliminary EAFMP for all phases of the Project. also please include a summary explaining how indigenous nations and communities were involved and how Indigenous and local Knowledge helped influence the development of the preliminary EAFMP. 2. As outlined in Section 11 of the *Generic Guidelines for the preparation of an Environmental Impact Statement pursuant to the CEAA 2012*, please include roles and responsibilities to be played by the proponent, regulatory agencies, Indigenous people, local and regional organizations and others in the design, implementation and evaluation of the EAFMP program results.	Responses to part 1 and part 2 of this IR are provided below. 1. The implementation of robust and long-term environmental testing and monitoring has been requested by Indigenous Groups to verify protection of the environment, including community-led monitoring during Construction and Operations of the proposed Project (Draft EIS TSD IV: MN-S; Draft EIS TSD V.2: CRDN; Draft EIS TSD VI: YNLR). Currently, the monitoring programs are conceptual, and a summary table of follow-up monitoring is included in Table 23B-1 of Draft EIS Appendix 23B (Environmental Assessment Monitoring and Follow-Up Programs Proposed for the Project). The information provided within this summary table is consistent with feedback provided by Indigenous Groups during engagement (i.e., Joint Working Groups, Indigenous Knowledge and Traditional Land Use Studies, and Environmental Committees) (Draft EIS Section 2 [Indigenous, Regulatory, and Public Engagement]; Draft EIS Appendix 2A [Summary of Indigenous Group Engagement Activities]; Draft EIS TSD I [Indigenous Engagement Report]; Draft EIS TSD I, Appendix B). As described in Draft EIS Section 3.8 (Influence on the Environmental Assessment), detailed environmental management and monitoring plans will be developed and submitted to the CNSC and other regulatory authorities, as required, as part of the licensing and permitting processes for the Project. Detailed programs will continue to incorporate Indigenous and Local Knowledge through the following means: ▪ considering feedback provided by Indigenous Groups during engagement, including recommendations, in the development of monitoring and follow-up activities; ▪ considering ongoing feedback from Indigenous Groups on the effectiveness of mitigations when updating monitoring and management plans; and ▪ independent Indigenous Monitors chosen by each primary Indigenous Group, who will have opportunities to participate in environmental monitoring programs for the Project. 2. As described in Draft EIS Section 23.5.1 (Environmental Assessment Follow-up Monitoring), the ultimate responsibility for the Project would lie with the NexGen executive. NexGen would be responsible for implementing the various monitoring and follow-up programs, which would be developed to include monitoring requirements documented within the Final EIS, and to comply with any approval conditions, permits, or authorizations for the Project. As described in Draft EIS Section 23.4 (Management Program and Plans), provincial and federal regulatory requirements are generally linked to environmental management programs. As further described in Draft EIS Section 23.4:	n/a

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						"Monitoring and follow-up programs and management plans would be further developed as the Project, if approved, progresses through the permitting and licensing process. Further Project refinements may influence the nature, frequency, and locations of monitoring required. In addition, input from Indigenous Groups, regulatory agencies, and the public would be considered. These programs and plans would then become 'living' documents throughout the Project lifespan and would be altered, as required, as the mine development progresses through Operations and Closure [Decommissioning and Reclamation]. The future revisions of these programs and plans would specify the responsible and accountable parties within each respective plan, as well as the scope of control for each functional area or individual." Specific examples of roles and responsibilities that regulatory agencies, Indigenous Groups, and local and regional organizations could hold in relation to EA follow-up monitoring program development and implementation are noted below: ▪ As part of the CNSC's regulatory oversight, CNSC staff conduct compliance verification activities, which include reviews of the licensees' environmental protection programs as well as regular inspections to confirm the programs are being implemented accordingly. The CNSC has also implemented an Independent Environmental Monitoring Program (IEMP) to verify that the public and the environment around licensed facilities are safe. The IEMP involves taking samples from public areas around the facilities and measuring and analyzing the amount of radiological and hazardous substances in those samples. ▪ The Saskatchewan Ministry of Environment (ENV) has established a Compliance Audit Program, through which the ENV conducts audits to confirm compliance with applicable acts and regulations and permitting requirements to protect human heath, safety, and the environment. These audits are completed for mining and industrial operations to help identify areas that are, or may become, non-compliant so that appropriate action can be taken. ▪ Regional programs such as the Community Vitality Program, in partnership with the Northern Mines Monitoring Secretariat (NMMS) and the Northern Saskatchewan Environmental Quality Committee (NSEQC) also contribute to independent monitoring programs. The NMMS is a body consisting of federal and provincial ministries, agencies, and departments and the three northern health authorities to facilitate assessment and monitoring initiatives of uranium mines. In addition, the NMMS provides technical and scientific assistance to the NSEQC. The NSEQC is a Saskatchewan provincial government advisory committee of municipalities and Indigenous communities, representing a broad cross-section of First Nations and Métis across the north. ▪ NexGen is working with local Indigenous Groups to implement independent environmental monitoring. In combination with standard Project monitoring processes, independent monitoring by Indigenous Groups would be used to verify Project performance and to determine if mitigations and controls are effective in protecting the receiving environment. The intent of the independent Indigenous monitoring program is to provide unfettered access to the site during all Project phases, subject to the Indigenous Monitor complying with appropriate health and safety and other reasonable site-specific requirements, and would allow for environmental monitoring opportunities, including independent environmental sampling. ▪ NexGen has proposed the formation of an Environmental Committee with each of the four primary Indigenous Groups. Each Environmental Committee would be composed of representatives from the Indigenous Group and representatives from NexGen and act as an oversight committee to monitor the environmental performance of the Project and to verify that the parties (i.e., NexGen and the Indigenous Group) are implementing the regulatory and environmental commitments made in respect of the Project. No changes are proposed in the revised EIS to address this IR.	
209	ECCC	Wildlife and Wildlife Habitat	Appendix 23A Table 23A-4 Table 23A-5 Table 23B-1	The use of a liner for the PAG (potentially acid generating) waste rock storage area to "limit seepage from the special waste storage area with double liner and leak detection system" is new technology used to reduce risk of contamination of water run-off and seepage. However, it is unclear how the liner efficacy will be monitored, what will occur if a leak is detected and how	1. Provide details on how the liner's effectiveness will be monitored.	NexGen clarifies that the quote referenced by the reviewer is with respect to the special waste storage area and not the potentially acid generating (PAG) waste rock storage area. Responses to part 1 and part 2 of this IR are provided below.	n/a

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				migratory birds and SAR will be protected during this process. The Proponent has committed to describing surface water/contact water monitoring in the Environmental Protection Program.	2. Describe what measures will be taken if a leak is detected and how the actions will protect migratory birds, SAR and their habitat from effects of a spill or leak.	1. NexGen notes that a double liner with a leak detection system is a technology used and proven effective extensively in the mining industry. The liner and leak detection system would be in the foundation of the special waste rock storage area and part of the contact water management system for the Project. As noted in the Project Terms of Reference (Draft EIS Appendix 1A [Concordance Tables for the Terms of Reference and Generic Guidelines for Preparation of an Environmental Impact Statement], Table 1A-2) in Section 3.0 with reference to the Project Description, “The scope of the description will be conceptual and will incorporate reasonable assumptions, as appropriate. Detailed design information will be provided as part of permitting and licensing stage.” Consistent with these requirements, information regarding the monitoring the liner’s effectiveness is out of scope for the EA and will be provided as part of the licensing process of the Project, commensurate with the stage of Project development. 2. Mitigation measures to reduce direct harm to wildlife and wildlife habitat from contact water, including contact water from potential leaks, and to deter wildlife from approaching water collection areas are presented in Table 14.4-1 in Draft EIS Section 14.4 (Project Interactions and Mitigations) under Pathway ID W-20 (Direct harm from contact water) and Pathway ID W-19 (Wildlife attractants), respectively. These mitigation measures would protect migratory birds, species at risk (SAR), and both of their habitats from effects of a spill or leak. Key mitigations would include: ▪ Lined contact water ponds would either be fenced or fit with animal egress matting or ramps. ▪ Wildlife patrols would be conducted regularly during the waterbird nesting period. ▪ Other measures for deterring wildlife from site would be implemented, where required, for human and wildlife protection (e.g., cannons or bangers during migratory bird nesting season). ▪ Regular monitoring would be conducted to evaluate effectiveness of deterrents, and adaptive management would be applied, as necessary. Mitigation measures for an accidental release and/or spill are also presented in Draft EIS Section 21.6.6 (Bounding Scenario 4: Tailings Transfer Pipe or Pump Failure) and Draft EIS Section 21.6.7 (Bounding Scenario 5: Untreated Effluent Transfer Pipe Failure). The conditions reflected in Bounding Scenario 4 and Bounding Scenario 5 would bound the conditions that would be encountered should a special waste storage area liner leak occur. The key environmental design features and mitigations implemented for these scenarios that would provide protection to migratory birds, SAR, and wetland function include the following: ▪ The tailings transfer piping systems would primarily be routed underground, with only limited sections of pipe above ground. ▪ Secondary containment would be provided for the sections of the tailings transfer pipe that runs above ground. ▪ For the untreated effluent transfer pipeline, the interconnecting pipeline corridor between the monitoring ponds and the effluent treatment plant on the mill terrace would be single lined with high-density polyethylene (HDPE) liner. ▪ A comprehensive pipeline monitoring and leak detection system would be included in the design of the untreated effluent transfer piping system. ▪ A maintenance and inspection program would be developed to monitor and address any potential issues related to the tailings transfer pipeline (e.g., corrosion) and the untreated effluent transfer pipeline (e.g., pipe integrity) and pump that could contribute to a potential failure. ▪ A wildlife fence and/or deterrents could be employed during spill clean-up to keep wildlife away from the area, if warranted (i.e., if there is an identified risk of wildlife contact with contaminated materials or soils). For all leaks or spills, an Environmental Protection Program and an Emergency Preparedness and Response Program would be implemented for the Project and would include mitigation and emergency response measures related to the potential for a leak or spill. In the event of a leak or spill, appropriate spill response measures would be implemented and would address site-specific	

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						conditions (e.g., soil type, chemical properties of the spill material). Any spill, release, or emergency that may harm the environment or pose a risk to public health or safety would be reported immediately, and managed and remediated in accordance with Saskatchewan's *Environmental Management and Protection Act, 2010* and The Saskatchewan Environmental Code (Government of Saskatchewan 2014). No changes are proposed in the revised EIS to address this IR. **References** Government of Saskatchewan. 2014. Saskatchewan Environmental Code - Moving Forward in Partnership. Available at https://pubsaskdev.blob.core.windows.net/pubsask-prod/86816/86816-Z_Consolidated_Code_Chapters.pdf *The Environmental Management and Protection Act, 2010*. SS 2010, c E-10.22. In force since 30 May 2018. Available at https://www.canlii.org/en/sk/laws/stat/ss-2010-c-e-10.22/latest/ss-2010-c-e-10.22.html	
210	ECCC	Wildlife and Wildlife Habitat	Table 23A-4	The draft EIS states that discharge waters "meets discharge quality criteria prior to release into the environment" but this is not discussed in the context of potential effects to migratory birds, SAR and wetland function.	Describe what the discharge quality criteria are and provide context on how these criteria will reduce effects to migratory birds and SAR.	NexGen has engaged with the CNSC regarding effluent discharge targets and will propose discharge criteria as part of the licensing and permitting processes for the Project. Discharge criteria would be set according to the procedures and requirements described in REGDOC-2.9.2 (CNSC 2021) and in accordance with the environmental protection principles described in REGDOC-2.9.1 (CNSC 2020). Licensed release limits would be set such that the environment, including species at risk (SAR), is protected. Mitigation measures for wildlife protection are presented in Draft EIS Section 14.4 (Project Interactions and Mitigations) and are intended to avoid and minimize effects of treated effluent discharge. The controls and mitigations to protect wildlife, including migratory birds and SAR, are summarized in Pathway ID W-12 (Treated effluent discharge) and include the following key mitigations: ▪ Install and operate an effluent treatment plant to reduce release of constituents of potential concern (e.g., major ions, metals, radionuclides) to the environment and discharge treated effluent to Patterson Lake. ▪ Locate the proposed treated effluent diffuser away from sensitive or unique habitats to the extent practical. ▪ Design the treated effluent diffuser to provide effective mixing and dilution of the effluent to limit the area of the receiving environment affected by mine discharge and protect aquatic life and wildlife. ▪ Design the diffuser/outfall such that discharged flow does not interact with sediment. ▪ Treat ore processing water and monitor site contact water, treating if necessary, before discharge into the receiving environment. ▪ Monitor treated effluent flow and quality. ▪ Implement a Project-specific Environmental Monitoring Plan that includes monitoring water quality, sediment quality, and aquatic organisms, and applying adaptive management, if necessary. ▪ Perform routine monitoring of process parameters to provide optimal treatment. No changes are proposed in the revised EIS to address this IR. **References** CNSC (Canadian Nuclear Safety Commission). 2020. REGDOC-2.9.1, Environmental Principles, Assessments and Protection Measures, Version 1.2. September 2020. ISBN 978-0-660-06255-6. Available at http://nuclearsafety.gc.ca/eng/pdfs/REGDOCS/REGDOC-2-9-1-Environmental-Principles-Assessments-and-Protection-Measures-eng.pdf	n/a

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						CNSC. 2021. REGDOC-2.9.2, Environmental Protection, Controlling Releases to the Environment. DRAFT. March 2021. Available at https://www.nuclearsafety.gc.ca/eng/pdfs/regulatory-documents/regdoc2-9-2/REGDOC-2_9_2_Controlling_Releases_to_the_Environment.pdf	
211	ECCC	Wildlife and Wildlife Habitat	Table 23A-5	The Proponent states they will implement best management practices (BMPs) and mitigation such as spill prevention.	1. Explain in more detail what BMPs and mitigation will be utilized for spill prevention. 2. Explain what risks exist for migratory birds, SAR, and wetland function if a release occurs and what actions will be taken if a spill occurs.	Responses to part 1 and part 2 of this IR are provided below. 1. Best management practices associated with spill prevention will be included in more detail as part of the Environmental Protection Program and supporting documentation that will be provided during the licensing and permitting processes for the Project, as applicable and commensurate with the stage of Project development. Examples of best management practices would likely include, but not be limited to, the following: ▪ proper segregation of materials; ▪ use of secondary containment, where required; ▪ areas where hazardous materials are stored or used would be clearly labelled and marked; ▪ regular equipment maintenance; ▪ worker training; ▪ regular inspections; ▪ job hazard assessments; ▪ field-level risk assessments; ▪ spill kits would be available for quick deployment; and ▪ adherence to legal and other requirements such as the Saskatchewan Environmental Code; Hazardous Substances and Waste Dangerous Goods Regulations; *Transportation of Dangerous Goods Act, 1992;* and applicable Safety Data Sheets. 2. Mitigation measures for wildlife protection are presented in Draft EIS Section 14.4 (Project Interactions and Mitigations) and are intended to, among other things, avoid and minimize wildlife presence near the Project site, including exposure to contact water, so that effects are reduced should a spill occur. Applicable mitigations include those summarized under Pathway ID W-19 (Wildlife attractants) and Pathway ID W-20 (Direct harm from contact water) in Draft EIS Section 14.4, and include the following: ▪ Lined contact water ponds would either be fenced or fit with animal egress matting or ramps. ▪ Wildlife patrols would be conducted regularly during the waterbird nesting period. ▪ Other measures for deterring wildlife from site would be implemented, where required, for human and wildlife protection (e.g., cannons or bangers during migratory bird nesting season). ▪ Regular monitoring would be conducted to evaluate effectiveness of deterrents, and adaptive management would be applied, as necessary. Mitigation measures for an accidental release and/or spill are also presented in Draft EIS Section 21.6.6 (Bounding Scenario 4: Tailings Transfer Pipe or Pump Failure) and Draft EIS Section 21.6.7 (Bounding Scenario 5: Untreated Effluent Transfer Pipe Failure). Environmental design features and mitigations implemented for these two scenarios that would provide protection to migratory birds, species at risk, and wetland function include the following: ▪ The tailings transfer piping systems would primarily be routed underground, with only limited sections of pipe above ground. ▪ Secondary containment would be provided for the sections of the tailings transfer pipe that runs above ground. ▪ For the untreated effluent transfer pipeline, the interconnecting pipeline corridor between the monitoring ponds and the effluent treatment plant on the mill terrace would be single lined with high-density polyethylene (HDPE) liner. ▪ A comprehensive pipeline monitoring and leak detection system would be included in the design of the untreated effluent transfer piping system. ▪ A maintenance and inspection program would be developed to monitor and address any potential issues related to the tailings transfer pipeline (e.g., corrosion) and the untreated	n/a

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						effluent transfer pipeline (e.g., pipe integrity) and pump that could contribute to a potential failure. ▪ A wildlife fence and/or deterrents could be employed during spill clean-up to keep wildlife away from the area, if warranted (i.e., if there is an identified risk of wildlife contact with contaminated materials or soils). For all leaks or spills, an Environmental Protection Program and an Emergency Preparedness and Response Program would be implemented for the Project and would include mitigation and emergency response measures related to the potential for a leak or spill. In the event of a leak or spill, appropriate spill response measures would be implemented that would address site-specific conditions (e.g., soil type, chemical properties of the spill material). Any spill, release, or emergency that may harm the environment or pose a risk to public health or safety would be reported immediately, and managed and remediated in accordance with Saskatchewan's *Environmental Management and Protection Act, 2010* and The Saskatchewan Environmental Code (Government of Saskatchewan 2014). No changes are proposed in the revised EIS to address this IR. **References** Government of Saskatchewan. 2014. Saskatchewan Environmental Code - Moving Forward in Partnership. Available at https://pubsaskdev.blob.core.windows.net/pubsask-prod/86816/86816-Z_Consolidated_Code_Chapters.pdf *The Environmental Management and Protection Act, 2010*. SS 2010, c E-10.22. In force since 30 May 2018. Available at https://www.canlii.org/en/sk/laws/stat/ss-2010-c-e-10.22/latest/ss-2010-c-e-10.22.html The Hazardous Substances and Waste Dangerous Goods Regulations. RRS c E-10.2 Reg 3. Effective 1 April 1989. Available at https://publications.saskatchewan.ca/#/products/671 *Transportation of Dangerous Goods Act, 1992*. SC 1992, c 34. Last amended 28 August 2019. Available at https://laws-lois.justice.gc.ca/eng/acts/t-19.01/	
212	CNSC	Terrestrial environment	Section 23-Appendix 23B	**Context:** Appendix 23B summaries the environmental assessment monitoring and follow-up programs proposed for the project. There is no mention of doing follow up monitoring to confirm soil quality is not impacted by project activities such as air deposition of COPCs to soil, or contact water contamination of soil pathways. **Rationale:** Although there is a plan to monitor air quality, there is no follow up monitoring planned to confirm there are no impacts on soil quality around the site from project activities. This monitoring is required to confirm the EA predictions that soil quality impacts from project activities will not exceed any soil quality guidelines.	Please include a soil quality monitoring plan in the EA follow up monitoring for any contaminants that may impact soil quality through project activities (air deposition, water contact, etc). **Suggestions for mitigation and follow-up measures** Soil quality environmental monitoring	Table 12.4-1 in revised EIS Section 12.4 (Project Interactions and Mitigations) and Table 23A-1 in revised EIS Appendix 23A (Summary of Project Environmental Design Features and Mitigation Measures) will be updated to commit to a soil quality monitoring program, as part of the Environmental Protection Program and supporting documentation, to determine if Project activities (e.g., dust generation, other air particulate generation) is influencing soil chemistry.	Section 12.4; Appendix 23A

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213	ECCC	Wildlife and Wildlife Habitat	Table 23B-1	The draft EIS states that noise monitoring will be conducted to verify models but it is unclear what measures will be taken if noise levels are higher than anticipated or exceed thresholds.	Explain what measures will be taken if noise levels exceed thresholds.	Following the hierarchy of controls approach (e.g., elimination, substitution, engineering, administrative, personal protective equipment), measures taken if a threshold is exceeded may include focused monitoring, specific studies to identify causes, and modifications to or incorporating additional mitigation measures. These measures could be part of an adaptive management approach. Draft EIS Section 23.5.3 (Adaptive Management) describes the framework of the adaptive management plans that will be included as part of the Project Integrated Management System. Key steps in the adaptive management process could include assessing the problem, designing an adaptive management approach, engaging with Indigenous Groups and/or local communities, and implementing, monitoring, and evaluating the results of the adaptive management approach.	n/a
214	MN-S	Joint Working Group	Section 4.2.1.1	"Traditional Foods study" A traditional food study had not been completed at the time the EIS was submitted, as this EIS states. MN-S submitted a food study budget to NexGen on May 26, 2022. NexGen approved the traditional food study budget by email on August 8, 2022, almost two months after the EIS was submitted. Therefore, reference to the traditional food study as being completed is not accurate.	Please correct this inaccuracy and revise the EIS.	NexGen appreciates the reviewer's comment; however, NexGen would like to correct certain statements in the IR provided. Specifically, the Traditional Foods Study referenced in Draft EIS TSD I (Indigenous Engagement Report) is Draft EIS TSD IV (Métis Nation – Saskatchewan Northern Region 2 Traditional Land Use & Diet Study for the NexGen Rook I Project), which the Métis Nation – Saskatchewan (MN-S) provided to NexGen on 24 March 2020 as agreed to in the Study Agreement. This study was used as an information source in the development of a tailored Traditional Foods diet used within the Draft EIS. The Traditional Foods diet used in the Draft EIS to inform assumptions in Section 15 (Human Health) is based on: ▪ assumptions from the First Nations Food, Nutrition and Environment Study (Chan et al. 2018, 2019); ▪ discussions held during Joint Working Group meetings; ▪ information from Indigenous Knowledge and Traditional Land Use Studies, which is included in Draft EIS TSD IV; and ▪ discussions with the Saskatchewan Ministry of Environment, Saskatchewan Health Authority, and the CNSC (Draft EIS Section 15.8 [Monitoring, Follow-Up, and Adaptive Management]). NexGen notes that the 2022 correspondence referred to in the IR reflects a request made by the MN-S in mid-April 2022 to use funding remaining under the Study Agreement to conduct additional work regarding MN-S Traditional Food use (i.e., above and beyond the MN-S Traditional Food Study submitted in 2020 that was used to inform the Draft EIS as per the terms of the Study Agreement) and for use by the MN-S outside of the requirements of the Project EA. NexGen agreed to fund this work after receipt of a proposed budget from the MN-S on 20 June 2022. As an additional note, NexGen is advancing a Regional Traditional Foods Study in collaboration with Indigenous Groups in the local priority area, including the MN-S. The Regional Traditional Foods Study is planned to include all Métis communities in Northern Region 2, and would represent an update to the Traditional Foods diet used in the Draft EIS. Early engagement with primary Indigenous Groups on the Regional Traditional Foods Study design commenced in the last quarter of 2022, with follow-up engagement continuing in 2023. This study is intended to be completed in 2024. No changes are proposed in the revised EIS to address this IR. **References** Chan L, Receveur O, Sadik T, Schwartz H, Ing A, Fediuk K, Tikhonov C (University of Ottawa). 2018. First Nations Food, Nutrition and Environment Study (FNFNES): Results from Saskatchewan (2015). Chan L, Receveur O, Batal M, Sadik T, Schwartz H, Ing A, Fediuk K, Tikhonov C (First Nations Food, Nutrition & Environmental Study (FNFNES). University of Ottawa. 2019. Erratum to the First Nations Food, Nutrition and Environment Study (FNFNES): Results from Saskatchewan 2015. Ottawa: University of Ottawa, 2018.	n/a

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215	MN-S	Primary Indigenous Groups	Section 6.1.1	Combining all topics of interest in a global fashion and ascribing them to all Indigenous Nations does not facilitate review for understanding of how an individual Nation's interests may or may not have been addressed in the assessment.	Please rewrite Section 6.1.1 on a Nation-by-Nation basis. Verbiage such as "communities said" is unhelpful to understand how NexGen may have understood and addressed issues that affect individual Nations' rights and interests.	NexGen notes the request to draft sections of the EIS on a Nation-by-Nation basis is outside the scope of the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012*. Draft EIS Section 6.1.1 (Purpose and Scope) provides an introduction to the purpose and scope of Draft EIS Section 6 (Environmental Assessment Approach and Methods); the remainder of Draft EIS Section 6 describes the scope and general approach and methods applied for the Project EA. There are no specific references to Indigenous Group or community input in Draft EIS Section 6.1.1. If the reviewer was referencing Section 6.1.1 of Draft EIS TSD I (Indigenous Engagement Report), NexGen notes the following: ▪ As stated in Section 6.1.1 of Draft EIS TSD I, this subsection provides a summary of topics of interest raised during discussions with primary Indigenous Groups in consideration of the fact that "…there were significant similarities regarding many of the topics of interest raised by each individual Indigenous Group…" ▪ Summaries of key issues, presented for each Indigenous Group, are included in Section 6.2 of Draft EIS TSD I, with items specific to the Métis Nation – Saskatchewan (MN-S) included in Section 6.2.2 of Draft EIS TSD I. ▪ Summaries of key issues and concerns, including how these items were addressed in the Draft EIS and a summary of NexGen's response to the issue or concern are presented for each Indigenous Group in Appendix A of Draft EIS TSD I, with those specific to the MN-S included in Table C-3 of this appendix. No changes are proposed in the revised EIS to address this IR. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html	n/a
216	CNSC	Alternative Assessment	TSD VII, Section 3.5 Multiple Accounts Analysis and Table B-7	**Context:** Multiple accounts analysis (MAA) was performed to quantitatively evaluate alternatives carried out forward from screening by following the ECCC guidelines for the assessment of alternatives for mine waste disposal (ECCC 2016). The preferred alternative was selected with the highest score ranking of the alternatives assessed with the MAA. One of the steps for the MAA is scoring and weighting in which scoring scales were developed for each indicator with values ranging from 1 to 6 following ECCC (2016) guidelines. When scoring alternatives, a value of 1 always assigned to indicate the least favorable alternative while a value of 6 was always assigned to indicate the most favorable alternative. **Rationale**: In Table B-7, for the indicator "Potential for impact to plant, fish, and other wildlife population and habitat during construction, operation, and closure" in which indicator measurement is "Distance" that states "Measurement as distance from tailings facility centroid to Patterson Lake, with the longest distance preferred for lowest potential impact." Based on the ECCC guidelines, Underground Location U-4 Paste has a shortest distance of 0.2 km to Paterson Lake, which should be least preferred for this indicator and a lowest value of 1 should be assigned, while a highest value of 6 should be assigned to Surface Location S-1 Paste. However, in Table B-7, reverse number of indicator values were assigned to different alternatives. In addition,	1.Provide an explanation for why reverse number of indicator values were used for the indicator "Potential for impact to plant, fish, and other wildlife population and habitat during construction and, operation, and closure" and correct them as necessary and evaluate whether the correction will impact on the alternative ranking for tailings management; 2.Provide an explanation of how non-integral number of indicator values were used for different alternatives.	Responses to part 1 and part 2 of this IR are provided below. 1. NexGen notes the reviewer's comment and acknowledges that the indicator values for the "potential for impact to plant, fish, and other wildlife population and habitat during construction and, operation, and closure" indicator were reversed in error in Table B-7 of Appendix B of Draft EIS TSD VII (Mine Waste Alternatives Assessment Report). These values will be updated in the revised EIS to address the comment, with a lower distance from the tailings facility centroid to Patterson Lake reflecting in a lower score. NexGen highlights that this update of indicator values would not result in a change in the alternative rankings for tailings management. Table 4.5-10 of revised EIS Section 4.5.6.2 (Tailings), Figure 14 in Section 5.1 of revised EIS TSD VII, and Table B-7 and Table B-8 in Appendix B of revised EIS TSD VII will be updated to reflect this change. 2. NexGen clarifies that non-integral indicator values resulted from scaling. As described in Section 3.5 of Draft EIS TSD VII, "quantitative, measurable indicators were then normalized on a scale of 1 to 6, such that the best alternative scored 6, the lowest scored 1, and the remaining alternatives scores were calculated in proportion to the measured indicator value." The apparent difference in score between Surface Location S-3 Paste and In Pit Location P-3 Slurry is due to rounding of values. The distances used in the analysis of these two alternative options were 862 m and 911 m, respectively, which were rounded for presentation as 0.9 km. Besides edits to Table 4.5-10 (revised EIS Section 4.5.6.2), Figure 14 (revised EIS TSD VII), and Table B-7 and Table B-8 (revised EIS TSD VII, Appendix B) outlined above, no changes are proposed in the revised EIS to address this IR.	Section 4.5.6.2; TSD VII, Section 4.4.2, Appendix B

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				a non-integral value was used for some alternatives with no explanation, e.g. in Table B-7, Surface Location S-3 Paste and In Pit Location P-3 Slurry have same distance to Patterson Lake, but 1.9 indicator value was assigned to Surface Location S-3 Paste while 1.6 was assigned to In Pit Location P-3 Slurry.			
217	CNSC	Accidents and Malfunctions	TSD VIII	**Context:** In the assessment of some accident scenarios, the terms "very unlikely" and "extremely unlikely" were used for probability, which are different from the terms used in Table 3-1. Similarly, the terms "very severe" and "low" were used for consequences, which are different from the terms used in Table 3-2. The terms and linkage between these terms and the associated tables needs to be clarified. **Rationale:** Inconsistent terms were used for the probability and consequences of the bounding scenario assessment.	Clarify the linkage between the terms mentioned in Context and the terms in Tables 3-1 and 3-2.	NexGen acknowledges that in some cases, more general language such as 'very unlikely', 'extremely unlikely', 'very severe', and 'low' was used within Draft EIS TSD VIII (Accident and Malfunctions Report) when providing context to the assessment, in describing scenarios, and in characterizing releases. The applicable terminology in the following Draft EIS TSD VII subsections will be updated in the revised EIS to align with the definitions in Table 3-1 and Table 3-2 in Section 3.2 of Draft EIS TSD VIII: ▪ Section 2.1; ▪ Section 3.2; ▪ Section 9.1; ▪ Section 9.2; ▪ Section 9.4; ▪ Section 10.4; and ▪ Section 11.1. It is noted that these revisions would not change the outcome of the accidents and malfunctions assessment.	TSD VIII, Section 2.1, 3.2, 9.1, 9.2, 9.4, 10.4, 11.1
218	CNSC	Accidents and Malfunctions	TSD VIII, Section 6.2	**Context:** When assessing the release characterization of Bounding Scenario 1, the proponent assumed that 95% of the released uranium concentrate can be recovered from the release location without sufficient justification, and that different water column depths, i.e. 10 cm, 30 cm, 5 cm at the release location were assumed without explanation. **Rationale:** As the release characterization of the uranium concentrate would impact on the assessment of its potential effects, CNSC staff, the public, and Indigenous Groups need to understand the adequacy of the release characterization of this bounding scenario.	Provide further rationale for assuming 95% recovery rate and for using different water column depths for uranium concentrate release characterization.	NexGen notes that the rationale for the 95% recovery is more fully explored in Section 9.1.1 of Draft EIS TSD IX (Transportation Risk Assessment Report), where a hypothetical uranium concentrate release is also examined. As described in Section 9.1.1 of Draft EIS TSD IX, the density of uranium concentrate particles is high (i.e., 8.3 g/cm^3) and settling of these particles in the aquatic environment is expected to be rapid (US DOE 2001). Therefore, the uranium concentrate is not expected to be transported far from the incident/release location. Figure 9-3 of Draft EIS TSD IX shows the modelled distribution of deposited uranium concentrate from the release location at the Clearwater River under different flow scenarios and is reproduced below for reference. As shown in the figure, most (i.e., approximately 98% of the mass) of the uranium concentrate would settle within a short distance of the release, even under high (i.e., maximum) flow conditions. This finding indicates that the hypothetical release would be confined to a small area. Given the relatively small area affected, it is reasonable to assume that the affected area could be successfully remediated and that there would be a high level of uranium recovery.	TSD VIII, Section 6.2

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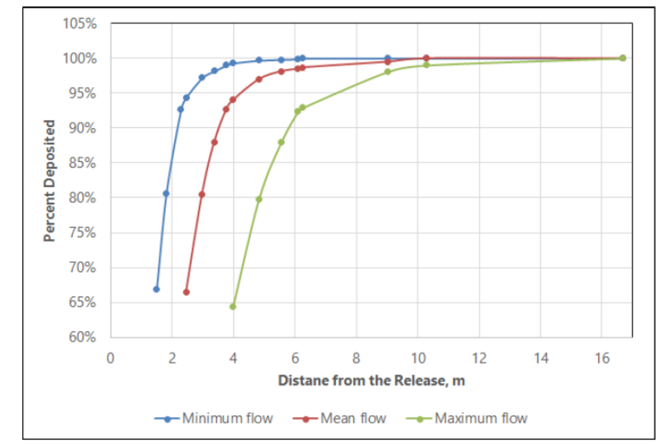
						Figure 9-3: Distribution of Deposited Uranium Concentrate by Distance Downstream of the Clearwater River Crossing  Source: Figure 9-3, TSD IX. For the reasons stated above, it is believed the 95% recovery rate is a reasonable assumption. With respect to water column depth, NexGen confirms that only one water column depth was considered with respect to uranium concentrate recovery. The assumption of a 10 cm water column depth (Draft EIS TSD VIII [Accidents and Malfunctions Report], Section 6.2) is in reference to the bottom 10 cm of the water column where uranium concentrate that would be deposited on the river bottom is assumed to interact with the receiving environment (i.e., where uranium concentrate dissolution is assumed to occur in Clearwater River). The average depth of 0.3 m (Draft EIS TSD VIII, Section 6.2) is in reference to the assumed average depth of the river where the release is postulated to occur. NexGen notes that the final sentence of Section 6.2 of Draft EIS TSD VIII states ". . . and a water column depth of 5 cm"; this statement is erroneous and will be amended in Section 6.2 of revised EIS TSD VIII (Accidents and Malfunctions Report) to state ". . . and a water column depth of 10 cm." **References** US DOE (United States Department of Energy). 2001. Characteristics of Uranium and Its Compounds. U.S. Department of Energy, Office of Environmental Management, Depleted Uranium Hexafluoride Management Program, Fall 2001. Available at https://documents.deq.utah.gov/legacy/businesses/e/energysolutions/depleted-uranium/performance-assessment/compliance-report/docs/2014/07Jul/supinfo/appreferences/DOE2001.pdf	
219	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	TSD VIII, Section 7.2	**Context:** A hydrogen peroxide spill at the site-access bridge over the Clearwater River was not analyzed further based on the Proponent's release characterization. The Proponent indicated that most species of fish tolerated hydrogen peroxide at greater than a 1000 ppm concentration with no adverse effects. The Proponent then further explained that the concentration of 1000 ppm requires a dilution of 1 to 1000 which means that 18 m^3 should be diluted to 18 000 m^3. Ultimately, it was concluded that this would occur in a stretch of less than 200 m of the Clearwater River and therefore will not affect a large fish population.	1. Provide the tanker truck capacity that will be used to transport corrosive liquids. 2. If trucks of greater than 18 m^3 will be utilized, update the risk evaluation. 3. Provide details on the measures that will be used to reduce the risk from this hazard.	Responses to part 1, part 2, and part 3 of this IR are provided below. 1. Truck tank capacities between approximately 11 m^3 and 18 m^3 would be used to transport corrosive liquids to the Project site. 2. Given that the planned truck tank capacity range would not exceed 18 m^3, it is not necessary to revisit the result of the assessment as referenced from Section 7.2 of Draft EIS TSD VIII (Accidents and Malfunctions Report). 3. Measures to reduce the risk of this hazard were identified in hazard identification 3.3 (traffic accident at bridge crossing) of Table 3-3 in Appendix A of Draft EIS TSD VIII, including traffic	n/a

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				Rationale: Corrosive liquids are typically transported in TC412 tanker trucks, which have a capacity of 40 m^3. If TC412 tanker trucks will be utilized, the distance any spilled contaminants will travel downstream in the Clearwater River will increase resulting in an underestimation of the risk to the receiving environment. It is not clear why the Proponent is considering 18 m^3 as a possible spill volume of hydrogen peroxide. Clarification would assist ECCC in understanding the potential effects on the receiving environment.		control measures, travel management planning, spill and emergency response planning, and personnel training. In addition, the mitigation measures to reduce the risk of transportation accident scenarios (i.e., the hypothetical event for this hazard) were identified in Section 4.0 of Draft EIS TSD IX (Transportation Risk Assessment Report), and include the development of management system processes related to: transportation planning and management; driver training; traffic control, such as speed limits and signage; spill and emergency response; environmental monitoring; regulatory notification and external communication; and transportation emergency response. No changes are proposed in the revised EIS to address this IR.	
220	CNSC	Human Health with respect to radiation exposure	TSD VIII – Accidents and Malfunctions Report, Section 8.0	**Context:** Bounding scenario 3 (Solvent extraction fire or explosion): Results of air concentration predictions for uranium and U_3O_8 are compared to the Emergency Response Planning Guides (ERPG), which are based on chemical toxicity only. Radiological exposure was not considered in this accident scenario. **Rationale:** An estimate of the annual effective dose is required to determine whether the expected doses meet the dose limits set out in the *Radiation Protection Regulations*.	Provide an estimate of the radiological dose to workers and to members of the public resulting from bounding scenario 3.	NexGen appreciates the reviewer's comment and the feedback received from the CNSC during regulatory engagement on this and other similar IRs. Recognizing that detailed information on aspects of this topic will be provided as part of federal licensing, which is being conducted in an integrated manner with the Project EA, NexGen understands the CNSC's request is to provide a summary in the revised EIS (Section 15 [Human Health]) regarding the potential radiological and non-radiological effects the Project on nuclear energy workers (NEWs) and non-NEWs, including potential effects under accident and malfunction scenarios. NexGen confirms that for the Draft EIS, the accidents and malfunctions assessment focused on environmental and public receptors, with chemical toxicity considered as the basis for the risk assessment. NexGen further confirms that detailed information on aspects of this IR will be provided as part of the licensing application submission to the CNSC, which will include a radiological exposure assessment for postulated accidents and malfunction scenarios, including for a solvent extraction fire or explosion scenario. With respect to the information requested by the reviewer, NexGen provides the following response: ▪ Specific to public risk, radiological risk was not considered a realistic pathway of exposure since there is little chance of exposure to members of the public from a solvent extraction fire or explosion scenario. This scenario is postulated to occur on site in an area that the general public would be restricted from accessing. Moreover, even in the case of the unconfined fire under typical weather conditions, the Areal Locations of Hazardous Atmospheres model results indicate that the air plume would not extend beyond the Project site (Draft EIS TSD VIII, Section 8.4 [Assessment of Potential Effects]). ▪ With respect to dose to workers, NexGen confirms that a 5-minute exposure to uranium particles generated during a solvent extraction fire or explosion would result in an effective radiological dose of 2.17 millisieverts (mSv), which is much less than both the annual average dose limit (i.e., 20 mSv/yr) and the maximum one-year dosimetry period dose limit (i.e., 50 mSv/yr) for nuclear energy workers. Revised EIS Section 15 will be updated to include a summary of the radiological exposure assessment for accidents and malfunctions conducted in support of Project licensing.	Section 15
221	CNSC	Human Health with respect to radiation exposure	TSD VIII – Accidents and Malfunctions Report, Section 9.0	**Context:** Bounding scenario 4 (Tailings transfer pipe of pump failure): Occupational exposure from this accident scenario could occur, however, these have not been considered in this TSD. The potential for radiological doses off site has not been addressed. **Rationale:** An estimate of the annual effective dose is required to determine whether the expected doses meet the dose limits set out in the *Radiation Protection Regulations*.	Provide an estimate of the potential radiological dose on-site and off-site resulting from bounding scenario 4.	NexGen appreciates the reviewer's comment and the feedback received from the CNSC during regulatory engagement on this and other similar IRs. Recognizing that detailed information on aspects of this topic will be provided as part of federal licensing, which is being conducted in an integrated manner with the Project EA, NexGen understands the CNSC's request is to provide a summary in the revised EIS (Section 15 [Human Health]) regarding the potential radiological and non-radiological effects of the Project on nuclear energy workers (NEWs) and non-NEWs, including potential effects under accident and malfunction scenarios. NexGen confirms that for the Draft EIS, the accidents and malfunctions assessment focused on environmental and public receptors, with chemical toxicity considered as the basis for the risk	Section 15

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						assessment. NexGen further confirms that detailed information on aspects of this IR will be provided as part of the licensing application submission to the CNSC, which will include a radiological exposure assessment for postulated accidents and malfunction scenarios, including for a tailings transfer pipe or pump failure scenario. With respect to the information requested by the reviewer, NexGen provides the following response: ▪ Specific to public risk, radiological risk was not considered a realistic pathway of exposure since there is little chance of exposure to members of the public from a tailings transfer pipe or pump failure scenario. This scenario is postulated to occur within the piping in the mine shaft and underground workings, where the public would be restricted from accessing (Draft EIS TSD VIII, Section 9.1 [Scenario Description]). Therefore, there would be no exposure to members of the public. ▪ With respect to dose to workers, NexGen confirms that a 4-hour exposure to a tailings transfer pipe or pump failure would result in an effective radiological dose of 0.068 millisieverts (mSv), which is much less than both the annual average dose limit (i.e., 20 mSv/yr) and the maximum one-year dosimetry period dose limit (i.e., 50 mSv/yr) for nuclear energy workers. Revised EIS Section 15 will be updated to include a summary of the radiological exposure assessment for accidents and malfunctions conducted in support of Project licensing.	
222	CNSC	Human Health with respect to radiation exposure	TSD IX – Transportation Risk Assessment Report	**Context:** Radiological dose to human receptors from transport accidents and the annual dose to the truck driver from the uranium concentrate being transported have not been assessed. **Rationale:** An estimate of the annual effective dose is required to determine whether the expected doses meet the dose limits set out in the *Radiation Protection Regulations*.	Provide an estimate of the annual radiological dose to a truck driver while transporting uranium concentrate from the Rook I site (upon accessing route 955 from the site access road) to the final destination of the uranium concentrate, due to external gamma exposure from the load for the duration of the trip. The number of such trips a driver would typically be expected to complete in one year should be factored into the calculation of the annual dose. In addition, the radiological dose due to accident scenarios should be addressed in the TSD.	NexGen notes that transportation of uranium concentrate would not occur until Operations, and this Project phase would not commence for several years after Project approvals and would require a process to obtain a Licence to Operate from the CNSC. For this reason, details regarding transportation of uranium concentrate have not been confirmed at this time and likely would not be confirmed until greater certainty is achieved regarding Project approvals and development. NexGen further notes that the issues raised in this IR are outside the scope of the Project Terms of Reference (Draft EIS Appendix 1A [Concordance Tables for the Terms of Reference and Generic Guidelines for Preparation of an Environmental Impact Statement], Table 1A-2) and beyond the scope of Draft EIS TSD VIII (Accident and Malfunctions Report), which focuses on environmental and public receptors. As noted in the CNSC Generic Guidelines for the preparation of an EIS (CNSC 2021), accidents and malfunctions are reviewed in detail through the *Nuclear Safety and Control Act* as part of the licensing process. In alignment with this guidance, worker health associated with the scope of this IR would be assessed as part of the Project licensing process. NexGen confirms that for the Draft EIS, the accidents and malfunctions assessment (Draft EIS TSD VIII) focused on environmental and public receptors, with chemical toxicity considered as the basis for the risk assessment. NexGen further confirms that detailed information on aspects of this IR will be provided as part of the applications submitted to the CNSC in support of Project licensing, commensurate with the stage of proposed Project activities. With respect to the IR (i.e., potential dose to a truck driver in an accident and malfunction scenario), NexGen confirms that a 5-minute exposure to uranium concentrate dust would result in an effective radiological dose of 0.70 millisieverts (mSv), which is less than the regulatory dose limit for members of the public of 1 mSv/year. As the IR is outside the scope of the Project Terms of Reference (Draft EIS Appendix 1A, Table 1A-2) and is considered as part of the Project licensing process, no changes are proposed in the revised EIS to address this IR. However, NexGen notes that the revised EIS will include a general summary regarding potential radiological exposures to workers (refer to NexGen's response to IR 128).	n/a

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						References CNSC (Canadian Nuclear Safety Commission). 2021. Generic Guidelines for the Preparation of an Environmental Impact Statement – Pursuant to the *Canadian Environmental Assessment Act, 2012*. Available at http://cnsc.gc.ca/eng/resources/environmental-protection/ceaa-2012-generic-eis-guidelines.cfm *Nuclear Safety and Control Act*. SC 1997, c 9. Last amended 1 January 2017. Available at https://laws-lois.justice.gc.ca/eng/acts/n-28.3/	
223	CNSC	Accidents and Malfunctions	TSD IX, Section 1.3	**Context:** Section 1.3 states that "The transportation risk assessment, which is a part of the assessment of accidents and malfunctions, is intended to provide a clear identification of potential transportation-associated hazards that fall outside the range of "typical" day-to-day events." **Rationale:** Highway 955, known locally as the Semchuk Trail, is an all-season highway that is almost entirely unpaved, except for an approximately 4.5 km section of paved highway from La Loche to the turn off to the CRDN reserve. Highway 955 is designated as a secondary highway with the narrowest portion of 7m in width, shoulder to shoulder. When engaging with Joint Working Groups, Joint Working Groups expressed concerns of the poor conditions of the highway north of Green Lake. The poor conditions of Highway 955 could result in a higher accidental rate when traffic rate is increased. While the reviewers understood that TSD IX deals only with the transportation risk related to Accidents and Malfunctions, the transportation risks/hazards due to the increased traffic rate (e.g., vehicle-vehicle accidents and vehicle-individual accidents), during day-to-day operations should also be assessed.	Provide information whether/where the transportation risk/hazard during day-to-day operation is assessed.	NexGen confirms that the assessment of day-to-day operations associated with changes to traffic in the area of the Project has been completed within Draft EIS Section 19 (Community Well-Being). Pathway ID CWB-07 (Road transportation of materials and workforce) in Draft EIS Section 19.4.3 (Secondary Pathways) considered the effects to local infrastructure and safety of road travel as a result of Project activities. The pathway evaluation acknowledged that increases in traffic volume would result in increased maintenance requirements and potential changes to public safety. However, mitigations such as the implementation of a Ground Transportation Emergency Response Plan, traffic safety education for workers, and a communications process to raise public awareness in communities of potential Project effects, as well as NexGen's commitment to hold discussions, as required, with the Government of Saskatchewan on provincial road use, maintenance, and upgrades to inform provincial planning purposes, are expected to result in negligible changes to community well-being.	n/a
224	CNSC	Accidents and Malfunctions	TSD IX, Section 5.2	**Context:** It states that "The traffic Impact Study Report prepared by Stantec (2019) calculated the trip generation divided into expendables, labor, and construction equipment or materials categories. Stantec 2019, Appendix B, contains a detailed list of category inclusions and breaks down trips per item. These trip generation data are summarized in Table 5-5, Table 5-6, Table 5-7, below, for all Project phases." **Rationale:** Traffic generation for different project phases is one of the bases for transportation risk assessment. However, the Stantec 2019 report was not submitted and no explanation of the values in Tables 5-5 to 5-7 was provided. Reviewers can not understand the numbers in the tables without the supporting report and additional explanation (e.g. why Trips/Day is more than Trips/Week?)	Provide the Stantec report (2019) or additional explanation on traffic generation for different project phases.	As noted by the reviewer, the Project traffic data by Project phase cited in Section 5.2 of Draft EIS TSD IX (Transportation Risk Assessment Report) were obtained from the Stantec (2019) traffic impact study report. NexGen confirms that the determination of site-generated traffic was developed using estimates of trip generation based on expected activity levels for the Project as determined by the NexGen Project Development Team. This exercise considered the various activities and needs associated with each Project phase. Following an assessment of the Project needs, traffic estimates were modelled for Construction (Draft EIS TSD IX, Section 5.2, Table 5-5), Operations (Draft EIS TSD IX, Section 5.2, Table 5-6), and Decommissioning and Reclamation (i.e., Closure) (Draft EIS TSD IX, Section 5.2, Table 5-7). As the Project would require numerous types of shipments and services, traffic activities were combined into the following categories for ease of reference: expendables, labour, construction equipment/materials, one-time equipment deliveries, and exports. The data for each of these high-level categories was then further broken down by trips per day, trips per week, and one-time trips. NexGen clarifies that, to avoid overestimating traffic volumes, the breakdown of the traffic schedule into trips per day, trips per week, and one-time trips were all reported independent of one another in Table 5-5, Table 5-6, and Table 5-7 in Draft EIS TSD IX, respectively. As an example, daily trips were not included in number of weekly trips or one-time trips. In general, daily trips represent regularly scheduled activities that occur on a daily basis, weekly trips represent regularly scheduled activities that occur on a weekly basis, and one-time trips represent trips associated with deliveries	TSD IX, Section 5.2

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						or services that would not be required on a regular basis. NexGen notes that there are a relatively high number of estimated one-time trips (i.e., 1,970) during the Construction Phase; these individual one-time trips represent deliveries of site infrastructure components that would be constructed on site, as well as all supporting equipment required for Construction. NexGen acknowledges that context regarding the generation of Project traffic estimates was not clearly presented in Section 5.2 of Draft EIS TSD IX. Revised EIS Section 5.2 of TSD IX will be updated to include further clarification regarding the generation of Project traffic estimates, reflective of the information provided above. **References** Stantec. 2019. Transportation and Logistics Study, Traffic Impact Study Report, Revision B, Document No. 0000-DY00-RPT-0010, November 2019.	
225	CNSC	Accidents and Malfunctions	TSD IX, Section 9.1.1	**Context:** On page 9.2 of TSD IX, it states that "If the remediation criteria is set at no-effect uranium concentration of 2,296 µg/g, the residual uranium content in the 5 cm of sediments in an area of 15 m by 15 m is about 26 kg." The proponent claimed that this is a very small fraction of the total amount released, which was used to demonstrate that 95% recovery is a reasonable assumption. However, it is unknown how the 26 kg release amount is calculated. **Rationale:** Since 95% recovery rate was used to support the assessment of aquatic uranium release scenario, it is important that this assumption is supported with correct residual release amount of 26 kg uranium concentrate.	Provide calculations or information to support the 26 kg of residual uranium concentrate in the sediment for aquatic uranium release scenario.	The calculation related to the 26 kg of residual uranium in sediments in Section 9.1.1 of Draft EIS TSD IX (Transportation Risk Assessment Report) was based on the following relationship: ▪ Quantity of uranium (U) in sediment (kg) = [Volume of affected sediments (15 m × 15 m × 0.05 m) * bulk density of sediment (1,000 kg/m^3) * uranium concentration of affected sediments (2,296 µg U/g or 2,296 mg U/kg)] = 25,830,000 mg U or approximately 26 kg of residual uranium. The above calculation was based on results of the uranium release modelling that showed deposition of the majority of uranium concentrate would occur within 15 m of the release location (refer to NexGen's response to IR 218). The above calculation was also based on the assumption that the surficial sediments are porous, and the surficial sediment bulk density is close to the bulk density of water (Stringer et al. 2016). No changes are proposed in the revised EIS to address this IR. **References** Stringer CE, Trettin CC, Zarnoch SJ. 2016. Soil properties of mangroves in contrasting geomorphic settings within the Zambezi River Delta, Mozambique. Wetlands Ecol. Manage. 24, 139–152.	n/a
226	CNSC	Accidents and Malfunctions	TSD IX, Section 9.1.6.2	**Context:** It states on page 9.15 that "Sediment quality results are shown in Table 9-5 for post-remediation conditions. The results presented in the table are a summary of the three flow conditions for the predicted concentrations in Beaver River sediments. In general, using the results of the assessment, the minimum predicted uranium concentrate concentrations in the river sediments occurred under high flow conditions, where the smaller particles (less than 5 µm) are deposited over a larger area." **Rationale:** In Table 9-5, the minimum predicted uranium concentrate concentration in the river sediments did not occur under high flow conditions, rather under average flow condition. It appears that in Table 9-5, the values for average concentration in sediment and average concentration in pore water are switched between the average flow condition and the maximum flow condition.	Clarify the values in Table 9-5 under average and maximum flow conditions.	NexGen acknowledges there is an error in the Draft EIS text referenced by the reviewer. For clarity, the values presented in Table 9-5 in Section 9.1.6.2 of Draft EIS TSD IX (Transportation Risk Assessment Report) are correct and the associated text in Section 9.1.6.2 of Draft EIS TSD IX will be updated in the revised EIS to state that the minimum predicted uranium concentrate concentrations in river sediments would occur under average flow conditions. The higher uranium concentrate concentration values in the maximum flow scenario compared to the average flow scenario reflect the fact that the released uranium concentrate would be spread over a wider area in the maximum flow scenario. As a result, remediation efficiency would be lower than for the average flow scenario. Greater remediation efficiency in the average flow scenario would result in lower post-remediation concentrations than for the maximum flow scenario.	TSD IX, Section 9.1.6.2

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227	CNSC	Accidents and Malfunctions	TSD IX, Section 9.1.7	**Context:** The transportation route of highway 155 crosses the Kisis Channel at the Village of Buffalo Narrows. However, the location where a hypothetical truck accident may occur is assumed at a small bay in the southern part of the lake next to Buffalo Narrows. The bridge crosses the Kisis Channel was not considered for a hypothetical truck accident. **Rationale:** The bridge crossing the Kisis Channel is the bottleneck for highway 155 transportation through the Village of Buffalo Narrows and could have a higher potential for truck accidents.	Provide rationale or information for not selecting the bridge crossing the Kisis Channel for a hypothetical truck accident for the assessment of release to Church Lake.	As shown in Appendix A of Draft EIS TSD IX (Transportation Risk Assessment Report), the location selected for the scenario that contemplated a release to Churchill Lake corresponds to the sharp turn on Highway 155 just north of the bridge crossing at the Kisis Channel coming from the Project site (photo labelled "Water Feature No 18 – Churchill Lake"). Given the sharp turn at the location selected for the scenario in Section 9.1.7 of Draft EIS TSD IX, it was deemed as the more likely location for an incident to occur rather than the bridge that is within a relatively straight stretch of road (Draft EIS TSD IX, Appendix A, photo labelled "Water Feature No 19 – Kisis Channel & Bridge"). An incident at either location would result in a release to Churchill Lake in approximately the same geographic location.	n/a
228	CNSC	Accidents and Malfunctions	TSD IX, Section 9.2.2	**Context:** On page 9.24, it states that based on the above discussion on water penetration rate, a conservative penetration time for 15 min was made. No further information was provided why 15 min penetration time is conservative. **Rationale:** It is understood that the response time to a transportation accident could be much longer depending on the accident location and the occurrence time. The accidentally spilled liquid could have much longer time to penetrate soil for a terrestrial release.	Clarify why 15 min was considered as a conservative penetration time for terrestrial release scenario.	For the purposes of the assessment, it was assumed that the accidental release of diesel fuel would pool thinly over the affected area. It was further assumed that within 15 minutes of the release, there would be little, if any, pooled free product on the ground surface. Within this window of time, the diesel would penetrate into the soil. As noted in Section 9.2.2 of Draft EIS TSD XI (Transportation Risk Assessment Report), Simmons and Keller (2005) completed a series of experiments that evaluated penetration rates of spilled liquids into soils. The results of their evaluation showed that in most cases, penetration rates ranged from 0.07 cm/s to 0.1 cm/s. Given this information, it was assumed that pooled diesel fuel on surface would have a penetration rate of 0.1 cm/s with a pooled depth of 30 cm. Under these conservative assumptions, pooled diesel would be expected to fully penetrate the ground surface in 300 seconds (i.e., 5 minutes). It would be expected that once full penetration of diesel into the soil had occurred, further penetration beyond the depth calculated in Section 9.2.2 of Draft EIS TSD IX would not be expected since there would be no significant hydraulic pressure / hydraulic head differential to drive such movement in the short term, assuming that clean up would be initiated within 24 to 48 hours of the postulated event. The depth of the contamination is more dependent on the volume of release than the duration of potential soil penetration. If the penetration were to be faster, the contamination would occur faster but would be limited by volume; therefore, the deeper penetration of contaminants would not occur. In consideration of this information, the assumed penetration time of 15 minutes is conservative since full penetration of thinly pooled diesel fuel into the soil would be expected within approximately 5 minutes. No changes are proposed in the revised EIS to address this IR. **References** Simmons, C, Keller, J. 2005. Liquid Spills on Permeable Soil Surfaces: Experimental Confirmations, A report Prepared for the U.S. Department of Energy, PNNL-15408 400403909; TRN: US200618%%300, PNNL-15408, Available at https://www.pnnl.gov/main/publications/external/technical_reports/pnnl-15408.pdf	n/a
229	CNSC	Accidents and Malfunctions	TSD IX, Section 10.3	**Context:** Section 10.3 states that "The assessment results shown in Section 9.3, Atmospheric Release Scenarios, indicated that the AEGL-2 or ERPG-2 concentrations would be exceeded within a 238 m distance from the release location for uranium concentrate particle and within 124 m for carbon monoxide in the downgradient wind direction." And "…Under these conditions, the AEGL-2 or ERPG-2 concentrations would be exceeded within a 367 m distance from the release location for uranium concentrate particle, and within 510 m for carbon monoxide in the downgradient wind direction."	Clarify the distance values stated in section 9.3 and section 10.3.	The second and third paragraphs in Section 10.3 of Draft EIS TSD IX (Transportation Risk Assessment Report) should read as follows and will be updated in Section 10.3 of revised EIS TSD IX (Transportation Risk Assessment Report): "The assessment results shown in Section 9.3, Atmospheric Release Scenarios, indicated that the AEGL [Acute Exposure Guideline Level]-2 or ERPG [Emergency Response Planning Guidelines]-2 concentrations would be exceeded within 91 m of the release location for uranium concentrate particles and within 132 m for carbon monoxide in the downgradient wind direction.	TSD IX, Section 10.3

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				Rationale: The distance value used in 10.3 appears to be inconsistent with the distance values in section 9.3 (i.e. in Tables 9-10 and 9-11), where, for example, 238 m distance is for carbon monoxide, but not for uranium concentrate, and there are no values of 124 m and 367 m.		The probability of release occurring during stability class F (nighttime, overcast with very low wind speed) is one order of magnitude lower and is highly unlikely. Under these conditions, the AEGL-2 or ERPG-2 concentrations would be exceeded within a 245 m distance from the release location for uranium concentrate particles, and within 510 m for carbon monoxide in the downgradient wind direction. Under both conditions, the exceedance period would be shorter than one hour. Based on the length of the corridor and sparseness of population centres, the probability of such release close to a population centre is highly unlikely.”	
230	ECCC	Climate Change	TSD XII	**Context:** The Proponent provided a net-zero framework document, which was “developed based on the guidance provided in the *Draft Technical Guide Related to the Strategic Assessment of Climate Change*” (SACC). This net-zero framework indicates technologies and practices that could be implemented to reduce GHG emissions from the Project, including information on technical feasibility and GHG reduction potential, which constitutes steps 1-3 of the SACC’s 6-step BAT/BEP Determination process. The net-zero framework is incomplete, in that it does not provide information on the complete BAT/BEP Determination, and does not demonstrate how the Project’s net GHG emissions will equal 0 t CO2 eq by 2050 and thereafter for the remainder of the Project lifetime. Furthermore, the Proponent states “emissions associated with land use change, stationary combustion, waste incineration, industrial processes, and explosives have a relatively small combined contribution of 12.6% of annual emissions, and therefore have not been evaluated in the net-zero framework at this early stage”. The final row in Table 5 (electrification) of the net-zero framework, the Proponent lists several projects where electrification of on-site mobile equipment is being planned or implemented. The upcoming Jansen underground potash mine, which has placed an order for electric vehicles[5] was not included in the table. **Rationale:** While ECCC recognizes that this Project falls under CEAA 2012, the principles of the SACC and Draft Technical Guide should be followed by the Proponent in order to support Canada’s ability to meet its environmental obligations and commitments in respect of climate change. The requested information will assist the Proponent in selecting appropriate mitigation measures to reduce GHG emissions from the Project. Note 5: https://im-mining.com/2022/06/20/sandvik-secures-major-bev-loader-order-for-bhps-jansen-potash-mine/	1. Update the net-zero framework to align with the principles of sections 3.1 and 3.5.1 of the Draft Technical Guide, by including the following: ▪ The information requirements outlined in section 3.5.2 of the Draft Technical Guide, including completion of the full 6-step BAT/BEP Determination process; ▪ Consideration of all main emission sources defined in the Draft Technical Guide as those that are anticipated to contribute to 1% or more of total Project GHG emissions. 2. Include the upcoming Jansen underground potash mine in the preliminary alternative technologies and practices assessment, which is summarized in Table 5.	NexGen notes the reviewer’s comment and acknowledges that guidance is available for completing a net-zero plan according to the requirements of the *Impact Assessment Act*. However, the reviewer’s request is outside the scope of the requirements of an EA of a designated project under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012), and the Project is not subject to the Strategic Assessment of Climate Change (SACC) guidance (ECCC 2020, 2021). To show commitment to being net-zero by 2050, NexGen has gone above and beyond the CEAA 2012 requirements by providing additional information related to the options available to move towards a net-zero commitment. The net-zero framework provided in Draft EIS TSD XII (Net-Zero Framework) is appropriate to the early stage of the Project and outlines how the SACC guidance has been used to inform this framework. The net-zero framework is outside of the scope of the climate change effects assessment and would not change the conclusions of Draft EIS Section 7.4 (Climate Change). Outside of the EA process, NexGen’s commitments to environmental, social, and corporate governance, and sustainability will be used to guide decision-making related to achieving net-zero by 2050. These commitments are not included in regulatory process for the Project but can be found on NexGen’s sustainability webpage (https://www.nexgenenergy.ca/sustainability/default.aspx) as well as in Draft EIS Section 1 (Introduction). NexGen acknowledges that the Jansen underground potash mine is planning on the electrification of its mining fleet. This information will not be included in Table 5 in revised EIS TSD XII as it does not change the conclusions of this framework, and multiple examples of implementation of electrification are already provided. Table 5 in Draft EIS TSD XII is intended to be a preliminary list of technologies and practices and is not meant to provide an exhaustive list of all examples for each technology option. As important context to supporting Canada’s ability to meet its environmental obligations and commitments in respect of climate change, as described in Draft EIS Section 4.2 (Purpose of the Project), the Project represents a substantial and consistent potential source of uranium for meeting the expected growing global demand for electricity. The Project could contribute to the Government of Canada’s ability to meet its environmental obligations and commitments with respect to climate change by displacing high-greenhouse gas (GHG) intensity, fossil fuel (i.e., coal and natural gas) electrical generation in favour of low-GHG emitting, renewable energy options. No changes are proposed in the revised EIS to address this IR. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html ECCC (Environment and Climate Change Canada). 2020. Strategic Assessment of Climate Change. October 2020. Available at https://www.strategicassessmentclimatechange.ca/	n/a

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						ECCC. 2021. Draft Technical Guide Related to the Strategic Assessment of Climate Change. August 2021. Available at https://www.canada.ca/en/environment-climate-change/corporate/transparency/consultations/draft-technical-guide-strategic-assessment-climate-change.html *Impact Assessment Act*. SC 2019, c 28, s1. Last amended 28 August 2019. Available at https://laws-lois.justice.gc.ca/eng/acts/I-2.75/	
231	CNSC	Groundwater flow modeling	TSD XIV, Section 2.3	**Context and Rationale:** Section 2.3.1 states that "the model was constructed based on a rectangular mesh ……, with the northwest portion of the model domain situated along a high and the southeast portion of the model situated along a topographic low (i.e., with drainage to the Clearwater River)". It is not clear how the topographic high/low was determined, considering that the rectangular mesh is not coincident with the surface water watershed (as shown in Figure A-2). Section 2.3.2 indicates that fixed head boundary nodes were specified along the southeast lateral boundary on slices 6 to 39. It is not clear why the southeast boundary was specified as fixed head boundary while all the other three boundary conditions were assumed as no-flow boundary. Additionally, it is not clear why the fixed head was assigned to slice 6 to 39, and what the stratigraphic units of slice 6 to 39 are. Section 2.3.1 described the discretization of the model domain. A figure showing the model mesh would help understand the model domain discretization along the horizontal and vertical direction, and the discretization of each hydro-stratigraphic unit. topographic	1.Provide clarification as to why the northwest and southeast portions are topographic high and low, since they are not coincident with the surface water watershed. 2.Provide a justification of the boundary conditions (i.e., why the southeast portion was specified as fixed head while all the rest were assigned as no-flow boundary conditions?). 3.Show the model domain discretization along the horizontal and vertical directions along with the hydro-stratigraphic units on the same figure to illustrate the discretization of each hydro- stratigraphic unit.	Please see Attachment IR 231/264/266/267-1 for NexGen's response to this IR. No changes are proposed in the revised EIS to address this IR.	n/a
232	CNSC	Solute transport modeling	TSD XIV, Section 3.3.1	Equation (2) is Fick's Second Law, but it is not equal to the diffusive flux. Diffusive flux is represented by Fick's First Law.	Please correct Equation (2).	NexGen appreciates the reviewer's comment and confirms that Equation 2 presented in Section 3.3.1 of Draft EIS TSD XIV (Groundwater Flow and Solute Transport Modelling Report) should have referenced Fick's First Law, not Fick's Second Law. The text in Section 3.3.1 of revised TSD XIV will be updated to reference Fick's First Law as follows: "Diffusive flux out of the source mass and into the groundwater flow zone was calculated by applying Fick's First Law: Diffusive flux (J) = $-D \times \frac{\partial c}{\partial x}$ Where: J = diffusive flux (M/T per unit area [L^2]); *D* = effective diffusion coefficient (L^2/T), which accounts for the molecular diffusivity (L^2/T) of the fluid and porosity (-) and tortuosity of the medium; *C* = solute concentration (M/L^3); *X* = position (L); M = mass; L= length; and T = time."	TSD XIV, Section 3.3.1
233	CNSC	Infiltration rate on the waste rock storage areas	TSD XIV, Section 3.3.1	Section 3.3.1 (page 13) indicates that, for the post-closure, infiltration was reduced relative to operation conditions due to the cover-in-place. However, no further information is provided about the reduced infiltration (e.g., the extent that infiltration was reduced due to the cover-in-place).	Please provide additional information on the reduced infiltration, including the infiltration rate assumed due to the cover-in-place, or provide reference (such as other TSD) for the reduced infiltration.	NexGen's response to this IR is included in Attachment IR 233/240/243-1. No changes are proposed in the revised EIS to address this IR.	n/a

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234	CNSC	Groundwater inflow	TSD XIV, Section 4.1	This section presents the predicted groundwater inflow for the base case, as well as other two scenarios. In one scenario, the hydraulic conductivity of the fault zone was increased by a factor of 5, while in another scenario, the hydraulic conductivity of the basement rock was increased by a factor of 2. It is not clear if the predicted flow rate for the scenario with increased hydraulic conductivity for the fault zone represents the potential maximum inflow rate under non-routine conditions (e.g., flow rate induced by ground collapse along high-conductive features). It is a good practice to estimate the potential maximum inflow rate under non-routine conditions, and provide mitigation measures.	Please estimate the potential maximum inflow rate under non-routine conditions. **Suggestions for mitigation and follow-up measures** Mitigation measures should be developed to minimize the likelihood for non-routine conditions to occur.	NexGen notes that the sensitivity runs presented in Section 5 of Draft EIS TSD XIV (Groundwater Flow and Solute Transport Modelling Report) were developed to assess the uncertainty in groundwater inflows in consideration of the uncertainty associated with the groundwater model input parameters and to assign a level of conservatism into design; these sensitivity scenarios are not intended to address specific non-routine conditions, though the conservative design would cover some contingencies. For the simulated sensitivities, inflows were predicted to be up to 2.4 times higher than the base case predictions. Although not simulated in the groundwater model, the potential ground collapse along a high hydraulic conductivity feature would not be expected to significantly increase the flow, as the collapse would only result in a small increase in underground void volume and the flow to the underground workings would still be controlled by the hydraulic conductivity of the permeable features. This is the reason why a sensitivity run was selected with a five-times increase in the fault zone hydraulic conductivity. In response to this IR, a non-routine scenario was evaluated where-in a 4-inch exploration borehole was assumed to be intersected by the underground tailings management facility (UGTMF). The borehole was simulated to be intersected in year 2033, which corresponds to a year with significant lateral expansion of the UGTMF at depth. The exploration borehole was conservatively assumed to connect the UGTMF to the permeable sandstone unit through a fault zone under a hypothetical situation in which the end-of-hole grouting program were to be compromised. The predicted flow rate to the underground with this borehole intersection increased by approximately 2,000 m^3/day. Assuming the borehole is not grouted or plugged, flow from this borehole could persist and increase the peak base case flows from 3,852 m^3/day to 5,852 m^3/day. This peak flow rate is similar to the peak flow rate predicted in the sensitivity scenario assuming a five-times increase in fault zone hydraulic conductivity (i.e., 6,246 m^3/day). Considering the similar peak flow rates and that flow from an intersected borehole may be mitigable with a plug placement or grouting, the sensitivities considered in Section 5 of Draft TSD XIV are representative of a realistic inflow that could occur during a non-routine event. Other non-routine inflows were considered as part of the Accidents and Malfunctions hazard identification (HI) analysis as provided in Appendix A of Draft EIS TSD VIII (Accidents and Malfunctions Report). The HI 2.3 (Groundwater ingress) (Draft EIS TSD VIII, Appendix A, Table 3-2) evaluated the potential of groundwater ingress during shaft sinking that would result in underground flooding. Through the implementation of mitigation measures, this risk was deemed to be low and was not carried forward for further assessment. The HI 7.2 (High flow – groundwater ingress, surface flooding) (Draft EIS TSD VIII, Appendix A, Table 3-7) evaluated the potential of groundwater ingress and surface flooding during high water flow events that would result in underground flooding. Through the implementation of mitigation measures, this risk was also deemed to be low and was not carried forward for further assessment. Non-routine inflows due to extreme precipitation events were evaluated with regards to effects of the environment on the Project (Draft EIS Section 22.6.3 [Major Precipitation Events]). Hazard ID PR-04 (Draft EIS Section 22.6.3.2 [Risk Measurement and Evaluation], Table 22.6-3) evaluated the potential of mine inflow events during major precipitation occurrences. In consideration of proposed environmental design features and mitigation (Draft EIS Section 22.6.3.1 [Hazard Scenario Identification]), the risk was deemed to be low and was not carried forward for further assessment. As mine inflow events associated with a potential intersection of the UGTMF and the permeable sandstone, accident and malfunction scenarios, and major precipitation event scenarios have been evaluated and are considered to be manageable through both the current Project design and the implementation of mitigation measures, NexGen maintains that further evaluation of potential maximum inflows is not required. With respect to water management, NexGen has designed the underground dewatering infrastructure with contingency capacities available to respond to non-routine conditions. These contingencies include: ▪ Pump capacity has been sized to pump 7,080 m^3/d in a 24-hour period using a single pump, which provides spare capacity over the assumed 5,310 m^3/d of combined process water and	n/a

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						groundwater with the groundwater inflow being predicted with a five-fold increase in fracture zone hydraulic conductivity. ▪ Pumps could be run 24 hours per day rather than the assumed 18 hours per day to provide additional capacity during upset conditions. ▪ An additional parallel main dewatering pump is available for responding to upset conditions, if necessary. ▪ In an upset condition, non-essential process water use would also be stopped, which represents over 2,000 m^3/d of inflow into the dewatering station pumps, allowing for additional capacity for groundwater inflows. These contingency design aspects and measures provide a high level of conservatism in NexGen's dewatering system, and further mitigations are not deemed necessary.	
235	CNSC	Tailings source term derivation	TSD XV, Section 3.3.1.2 Base case and upper case source term calculations	**Context:** The representative materials for CPB and CPT were proportioned to develop a base case and an upper case. Table 3-2 illustrates the methods used for development of both cases. However, no future justification was given with respect to why such methods were adopted. **Rationale:** The upper case seems to demonstrate the worst scenario as maximum leachate concentrations were chosen for each constituent. However, for the upper case scenarios the EIS used the highest pH for source term calculations. Higher pH can enhance dissolution of certain minerals, but will reversely precipitate other elements that are major COPCs. Therefore, it is controversial to simply choose the highest pH as a conservative assumption.	Provide further justification of the methodology for determination of the geochemical assumptions for the base and upper cases.	NexGen agrees that solution pH affects the dissolution or precipitation of minerals that control the concentrations of constituents of potential concern (COPCs), and particularly trace metals, in solution. NexGen further confirms several bounding arguments and conservative assumptions were made in the source term derivation (Draft EIS TSD XV [Tailings Source Term Derivation Report], Section 3.4) that resulted in overestimation of both the base and upper cases. More specifically, for the upper case, COPCs were conservatively considered in the source term derivation by choosing the maximum concentration value of the COPCs, irrespective of whether the maximum concentration was achieved under the low-bound or high-bound pH conditions (Draft EIS TSD XV, Section 3.3.1.2). The potential for dissolution and precipitation reactions, and solution pH, to influence the upper case source term were evaluated using geochemical speciation modelling (Draft EIS TSD XV, Section 3.4.1). Several potential secondary mineral phases were identified that could control (i.e., lower) the concentrations of selected parameters: uranium, aluminum, barium, calcium, iron, lead, manganese, molybdenum, nickel, nitrogen species, and sulphur. These controls were conservatively assumed to be absent in the estimated upper case solution. Selecting COPC concentrations for the upper case source term derivation, irrespective of secondary mineral and pH effects, is therefore considered to be conservative. No changes are proposed in the revised EIS to address this IR.	n/a
236	CNSC	Tailings source term derivation	TSD XV, Section 3.4.1 Evaluation of secondary mineral controls	**Context:** Temperature sensitivity was not evaluated, and solutions were assumed to be at 25ºC in order to be consistent with thermodynamic data for geochemical simulations. **Rationale:** Most geochemical reactions and sorption/desorption processes are dependent on temperature. The test data obtained under laboratory conditions may not represent the in-situ condition if temperature varies. For ground surface storage or disposal of waste rock, a scaling factor is usually applied for derivation of source term by considering various factors including temperature. The current EIS lacks information about geothermal condition of the underground tailings repository.	Provide geothermal profile of the site, or at least the geothermal condition of the underground tailings management facility, and adjust the source term derivation as necessary.	NexGen agrees that reaction kinetics are affected by temperature. The reaction kinetics of dissolution and precipitation reactions, oxidation reactions, and sorption reactions are directly proportional to temperature (i.e., the lower the temperature, the lower the reaction rate). No specific geothermal data currently exist for the proposed Project. Given the depth of the deposit and associated underground tailings management facility (i.e., approximately 1 km), combined with expected geothermal gradients representative of the Western Canadian Sedimentary Basin of 25°C/km to 35°C/km (Scott and Guoxiang 2014), rock temperatures in the underground could be in the 20°C to 30°C range. The geochemical characterizations of cemented paste tailings and cemented paste backfill material were purposely designed to reduce the requirement for scaling of laboratory measured kinetic rates to field rates. The source term derivation approach relied on the direct measurement of pore water within the tailings materials. These tests were run at laboratory temperatures in the order of 20°C to 22°C, which are expected to be within the anticipated range of long-term temperatures and therefore do not requiring scaling for temperature purposes. No changes are proposed in the revised EIS to address this IR. **<u>References</u>**	n/a

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						Scott, R. and Guoxiang, C., 2014. Abnormal geothermal gradients and development of calcic brine in the Athabasca Basin and their importance for unconformity-type uranium mineralization. ResearchGate.	
237	CNSC	Tailings source term derivation	TSD XV, Section 3.4.1 Evaluation of secondary mineral controls	**Context:** A range of oxidation-reduction potential values (-250 mV ~ 500 mV) were reported to be investigated as representative of the oxidized nature of the CPB and CPT and anticipated groundwater conditions at depth. However, no further data or information is available in the EIS or its corresponding TSD. **Rationale:** As clearly stated in Section 3.1.1.1 (Key Chemical Reactions), changes in redox can lead minerals to precipitate or dissolve, and elements to sorb or desorb. A wide range of redox potential will affect the leaching behaviour of major COPCs (e.g. U and As), and will thus introduce uncertainty to the derived source terms. Given its importance in understanding the uncertainty in source term, and how this uncertainty has been managed in the EIS, the geochemical simulation results used to determine the oxidation-reduction potential values should be provided to support the EIS review.	Provide geochemical simulation results about the effect of varying redox potentials, and discuss the potential influences on source terms.	NexGen confirms that the effect of changes in redox on solution pH and chemistry was evaluated using geochemical speciation modelling as described in Section 3.4.1 of Draft EIS TSD XV (Tailings Source Term Derivation Report). Results of the redox sensitivity analyses indicated the potential for several secondary mineral phases to precipitate from solution and lower the concentrations of those constituents of potential concern (COPCs) in the simulated solutions. Postulated secondary mineral phases controlling COPCs in solution included: ▪ Uranium – calcium diuranite ($CaU_2O_7{\bullet}3H_2O$), becquerelite ($Ca(UO_2)_6O_4(OH)_6{\bullet}8H_2O$), and uranonite ($UO_2$). ▪ Calcium and aluminum – Friedel-salt ($Ca_2Al(OH)_6(Cl,OH){\bullet}2H_2O$) and monosulfoaluminate ($Ca_4Al_2[SO_4][OH]_{12}{\cdot}6H_2O$). ▪ Lead – lead molybdate ($PbMoO_4$). ▪ Manganese – manganese dioxide (MnO_2). Calculated solution pH values (i.e., pH 11.3 to 12.2 for stopes and pH 10.4 to 12.1 for the underground tailings management facility) were within the lower and upper bound pH values selected for the base and upper cases. Therefore, it is reasonable to expect that these mineral controls would be present as groundwater migrates through the cemented paste tailings and cemented paste backfill material and into the surrounding groundwater in the long term, resulting in lower concentrations of redox and pH-sensitive COPCs. Excluding these controls from the source terms, as was done in this case, is expected to result in an overestimated (i.e., conservative) source term. No changes are proposed in the revised EIS to address this IR.	n/a
238	CNSC	Conceptual geochemical models for waste rock	TSD XVII WR and UG Source Term Report Section 2.2 Geochemical weathering concepts	**Context:** Geochemical weathering is conceptualized as oxidation of pyrite and dissolution of calcite. Release mechanisms of COPCs from waste rock were also discussed briefly. **Rationale:** Uranium and radionuclide release is assumed to result primarily from dissolution. Therefore, source terms for uranium and radionuclides are derived differently from other species. However, it is unclear how such a special treatment was implemented. Uraninite dissolves under oxidative conditions in the presence of carbonate by formation of carbonate complexes. From the current form of the TSD, it is unclear how these dissolution mechanisms are taken into consideration. Therefore, the exact release mechanism for uranium should be given.	Provide detailed information on the considered release mechanisms of uranium from waste rock.	Based on the evaluations below, NexGen confirms that dissolution is the primary release mechanism for uranium. NexGen agrees that dissolution of primary uranium minerals is determined by solution redox, the primary uranium mineral solubility, solution pH, and the presence of carbonate in the solution. The conceptualization of uranium dissolution was developed by evaluating the mineralogy of the waste rock, determining kinetic dissolution rates for uranium under oxidative leaching conditions (i.e., humidity cells), and considering potential mineral solubility controls on dissolved uranium, as described below. <u>Mineralogy of the waste rock</u> The bulk mineralogy of waste rock samples is consistent with that of the Proterozoic crystalline basement rock, consisting of quartz (39 weight percent [wt%] to 71 wt%), biotite (9.9 wt% to 33 wt%), muscovite (8.8 wt% to 24 wt%), chlorite (up to 12 wt%), anorthosite (up to 8.7 wt%), albite (up to 14 wt%), and clay species (4.5 wt% to 11 wt%). More specifically, only trace carbonate species (i.e., calcite up to 0.028 wt% and siderite up to 0.007 wt%) were identified. Primary uranium mineral species were below the analytical method detection limit and postulated to be uraninite (UO_2). <u>Dissolution rates for uranium under oxidative leaching conditions</u> Dissolution rates for primary uranium minerals associated with the waste rock were measured in the humidity cells, which represents an optimized oxidative leaching environment. The leaching conditions in the humidity cells also represent carbonate dissolution (i.e., trace carbonate species) and the effect it will have on uranium mineral dissolution. <u>Mineral solubility controls</u>	n/a

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						Potential controls on uranium mobility after it has been mobilized (i.e., dissolved) were considered by evaluating secondary mineral controls using geochemical speciation modelling. Geochemical speciation modelling did not indicate significant controls on uranium mobilization. No changes are proposed in the revised EIS to address this IR.	
239	CNSC	Waste rock and underground wall rock source term prediction	TSD XVII, Section 3.2.2	**Context:** It is stated that "Samples with an NPR greater than 3 were classified as NPAG, and samples with an NPR less than 1 classified as PAG. Samples with NPR between 1 and 3 were classified as uncertain (UC). Further details on the ARD classification will be provided in a baseline geochemistry report currently in draft." Based on this statement, it is still unknown how the waste rock with samples that have NPR between 1 and 3 is classified. **Rationale:** As the waste rock classification will impact on the quantity of both PAG and NPAG waste rocks and their management in both short-term and long-term. This might also impact on their potential effects on the environment.	Provide further details on ARD classification to support the EIS.	National and international best practices (MEND 2009; INAP 2009) classify acid rock drainage (ARD) potential based on net potential ratio (NPR), (i.e., the ratio of neutralization potential [NP] to acid potential [AP]) as follows: ▪ potentially acid generating (PAG) if NP/AP is less than 1; ▪ non-potentially acid generating (NPAG) if NP/AP is greater than 2; and ▪ uncertain if NP/AP is between 1 and 2. As a precautionary measure, an additional safety factor was applied to the NPR in the Project waste rock classification to overcome assessment uncertainties, which resulted in a more conservative NPAG classification of NPR greater than 3. Since the waste rock material is carbonate deficient and ARD classification is primarily driven by AP (i.e., calculated from the total sulphur content of the waste rock), a more simplified ARD classification was used that is based only on total sulphur content. A low sulphur content criterion of less than 0.1% total sulphur was used to classify waste rock as NPAG. Waste rock with this lower total sulphur content is expected to generate sufficient NP through acid-consuming silicate minerals (i.e., dominant waste rock mineralogy) that the NP is effectively infinite and acid conditions will not form. NexGen has attached the Rook I Project – Geochemical Characterization of Waste Rock Report (SRK 2023) as Attachment IR 27/41/239/242-1, which details the approach, methods, and data for waste rock characterized in support of the waste rock source term derivation. No changes are proposed in the revised EIS to address this IR. __**References**__ INAP (International Network for Acid Prevention). 2009. Global Acid Rock Drainage (GARD) Guide. 473 p. MEND (Mine Environment Neutral Drainage). 2009. Prediction Manual for Drainage Chemistry from Sulphidic Geological Materials. MEND Report. Canada. SRK (SRK Consulting Ltd.). 2023. Rook I Project – Geochemical Characterization of Waste Rock. Prepared for NexGen Energy Ltd. January 2023.	n/a
240	CNSC	Waste rock and underground wall rock source term prediction	TSD XVII, Section 3.2.2, Table 3-4	**Context:** Table 3-4 provides a summary of the infiltration rates, surface area and annual flows rates for each source term. However, no further details how they are obtained, in particular, the net infiltration rate. **Rationale:** Net infiltration will impact on the contaminant leaching and migration and then the loading to the surrounding environment and should be well justified.	Provide further details how net infiltration rates for different source terms are determined. **Suggestions for mitigation and follow-up measures** Monitor the net infiltration rate during operation and reclamation of waste rock stockpiles	NexGen's response to this IR is included in Attachment IR 233/240/243-1. No changes are proposed in the revised EIS to address this IR.	n/a
241	CNSC	Waste rock and underground wall rock source term prediction	TSD XVII, Section 3.2.2, Table 3-9 and Table 3-10	**Context:** Tables 3-9 and 3-10 contain model input loading rates for various parameters for operations and closure by Lithological Grouping. It is noted that during operations, for Segregated PAG Source Term 3&5, parameter SO4 in INT-Mine and SPGN-Mine is greater than that in INT-UGTMF and SPGN-UGTMF.	Provide further information why model input loading rates for parameter SO4 and others as appropriate by Lithological Grouping are reverse in values for operations and closure for Segregated PAG Source Term 3&5.	NexGen appreciates the reviewer's comment and confirms that the sulphate loading rate estimates are correctly presented in Table 3-9 and Table 3-10 in Draft EIS TSD XVII (Waste Rock and Underground Wall Rock Source Term Predictions Report).	n/a

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				However, during closure, it is reverse, i.e., parameter SO4 in INT-Mine and SPGN-Mine is smaller than that in INT- UGTMF and SPGN-UGTMF. No further information is provided why this is the case. **Rationale:** The input loading rate will impact on the output loading rate and would then impact on the source loadings to the surrounding environment and should be determined adequately.		NexGen confirms that acidic drainage conditions are conceptually expected to develop after closure of the potentially acid generating (PAG) waste rock storage area (WRSA). Sulphate production rates are typically higher under acidic drainage conditions due to higher oxidation rates of sulphide minerals from aqueous ferric iron mediated oxidation. To represent the acidic drainage conditions for the PAG WRSA, kinetic data for sulphate production rates were selected from waste rock humidity cell tests (HCTs) that recorded acidic drainage conditions. The mixture of HCTs used to define Decommissioning and Reclamation (i.e., Closure) sulphate production rates for the PAG WRSA were therefore different to the mixture used for Operations sulphate production rates for the PAG WRSA, resulting in higher sulphate production rates for Closure source-terms. Furthermore, the selected mixture of HCTs also resulted in differences between calculated sulphate production rates based on the geological unit (i.e., Intrusive [INT] versus Semi-pelitic gneiss [SPGN]) it represents and the proportion of PAG material for each lithological grouping. These differences resulted in relative different sulphate production rates between lithological units in each Project phase. Details of the HCT mixtures for all lithologies for Operations and Closure are provided in Table 3-6 and Table 3-7 of Draft EIS TSD XVII. No changes are proposed in the revised EIS to address this IR.	
242	CNSC	Source term model inputs and assumptions	TSD XVII WR and UG Source Term Report Section 3.2.2 Table 4.1, 4.3	**Context:** The source terms for waste rock and underground wall rock were predicted from the kinetic leaching test results (HCT) of corresponding samples. Model input has been provided in table format. However, neither reference document nor evidence of kinetic leaching test results was provided in the report. In addition, several elements were observed to be identical in values for different study scenarios in the predicted WRSA concentrations (Tables 4-1, 4-3). For instance, Uranium concentration in the predicted leachate is found to be identical in different scenarios. However, no explanation was provided. **Rationale:** NexGen's current methodology to predict source term relies on leachate concentration of major elements from HCT tests. Since no test results were available for review, it is hard to justify whether the adopted model input is representative of the rocks to be encountered in the operation. Variability of geochemical properties is not fully addressed in the current form. As the HCT test condition could be designed to represent the field condition, uncertainty in variables could affect the leaching behaviour. Information is missing with regards to proportion of chemicals leaching from solid phase. This is partly because of lack of information on total concentration/quantity of chemicals in waste rock samples. In order to achieve this, a detailed quantification of wholerock elemental analyses for waste rock is required. With an in-depth understanding of the total elemental composition, it will enable a better reactive geochemical speciation and transportation modelling for source term predictions.	Provide a separate geochemical characterization report for representative waste rock, which should include total elemental analyses of waste rock typical of the geological formations for future development. Provide complete dataset of HCT leaching test results to support the source term predictions. This will provide a comprehensive dataset about the baseline characteristics of the waste rocks as result of the operation, and will facilitate developing corresponding geochemical models for derivation of source terms for both short-term operation and long- term disposals. **Suggestions for mitigation and follow-up measures** Assess the comparative proportion of the leachable elements in the solid phase.	NexGen notes the CNSC's request for detailed information to support the source term prediction and confirms that this information was not included in the Draft EIS. The Geochemical Characterization of Waste Rock report is provided in Attachment IR 27/41/239/242-1. Acid-base accounting and elemental results for waste rock are presented in Appendix B and summary statistics are presented in Table 5-8 and Table 5-9 in Attachment IR 27/41/239/242-1. Section 4, Section 5, and Section 6 of Attachment IR 27/41/239/242-1 include details regarding leachable elements in the solid phase. Appendix B, Appendix C, and Appendix D of Attachment IR 27/41/239/242-1 provide the complete dataset of humidity cell test (HCT) leaching test results used to derive the source term predictions. The geochemical characterization included typical solid phase trace element enrichment using multi-acid digestion followed by inductively coupled plasma mass spectrometry (ICP-MS). The data were used for enrichment calculations/indications to support source term derivation. No changes are proposed in the revised EIS to address this IR.	n/a

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243	CNSC	Conceptual geochemical models for waste rock	TSD XVII WR and UG Source Term Report Section 3.2.2 Model inputs & assumptions, Oxygen transport modelling	**Context:** Oxygen transport modelling was completed by Okane to assess oxygen availability for sulfide oxidation in the waste rock stockpile. The Okane (2020) report was heavily relied upon for the development of source terms under different scenarios, in particular, the designs with engineered layers. **Rationale:** The current EIS and TSD XVII have limited to no information on how the engineered layers in the PAG waste rock stockpile are designed. The methodology and simulation results of oxygen transport in waste rock stockpiles are unavailable in the current report.	Provide the referenced Okane (2020) reports: Okane (2020a). Rook I WRSA Options Analysis. Memorandum provided to NexGen Energy Ltd. Okane (2020b). Rook I WRSA – 1-Dimensional Numerical Modelling of WRSA End-Members, Internal Memorandum provided to NexGen Energy Ltd., March 24, 2020.	NexGen's response to this IR is included in Attachment IR 233/240/243-1. No changes are proposed in the revised EIS to address this IR.	n/a
244	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	TSD XVIII, Section 4.1.2	**Context**: Seepage from site water ponds is described as a model input based on whether ponds are lined or unlined. **Rationale**: In accordance with comment ECCC-SW-04, ECCC reminds the Proponent that the *Metal and Diamond Mining Effluent Regulations* (MDMER) requires all mine effluent and seepage from the mine site that contains deleterious substances be discharged through a final discharge point.	Provide additional information on how water will be released into the receiving environment from the west bermed runoff collection area with consideration of MDMER requirements and update modelling as necessary.	NexGen notes that the west bermed runoff collection area would receive runoff from the local contributing area (i.e., non-contact water) as well as water from site runoff pond #2 (referred to as contact water pond #2 in Draft EIS Section 5.4.5 [Site Water Management], Figure 5.4-12) that is suitable release to the environment (i.e., release water) (Draft EIS Section 5.4.5; Draft EIS TSD XVIII [Site-Wide Water Balance and Water Quality Modelling Report], Section 4.4.1.4). NexGen would apply to designate the outflow from contact water pond #2 as a final discharge point. This location represents a final point of control, and a location where water would be monitored and analyzed to confirm all discharge criteria, including Metal and Diamond Mining Effluent Regulations limits excluding total suspended solids (TSS), are met. As the water in the west bermed runoff collection area would be discharged to ground from contact water pond #2, TSS would be removed from the water before reaching fish habitat. If these remaining limits are not met within contact water pond #2, water from this pond would be pumped to the effluent treatment plant rather than being discharged to the west bermed runoff collection area. This added context will be included in Section 10A3.3 of revised EIS Appendix 10A (Surface Water Quality Modelling Report) and in Section 3.4 and Section 4.4.1.4 in revised EIS TSD XVIII (Site-Wide Water Balance and Water Quality Modelling Report). **References** Metal and Diamond Mining Effluent Regulations. SOR/2002-222 under the *Fisheries Act*. Last amended June 18, 2020. Available at https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2002-222/index.html	Appendix 10A, Section 10A3.3; TSD XVIII, Section 3.4, 4.4.1.4
245	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	TSD XVIII, Section 5.1.1	**Context**: Flow rate values for the west and east surface runoff appear abnormally high in Figure 9 pg. 46. **Rationale**: Values approach 1000 m^3/day during the transitional monitoring period for runoff, which seems very high considering it is runoff and not an active discharge.	Verify the values/units for east and west surface runoff and provide a rationale if the values currently stated are correct.	NexGen confirms the monthly daily average values / units for east and west surface runoff shown in Figure 9 in Section 5.1.1 of Draft EIS TSD XVIII (Site-Wide Water Balance and Water Quality Modelling Report) have been verified and are appropriate. For context, a value of 1,000 m^3/d is equivalent to approximately 0.01 m^3/s, or 11.6 L/s. During the Transitional Monitoring Stage (i.e., the nominally 10-year period after the 5-year Active Closure Stage that would commence post-Operations), the west surface runoff and east surface runoff would convey runoff from reclaimed, revegetated, and covered surfaces that would have formerly drained to site runoff pond #2. The discharge rates are expected to increase in magnitude during the Transitional Monitoring Stage as the cumulative area reporting to the west surface runoff discharge (i.e., Q01 in Draft EIS TSD XVIII) is larger than during Operations. Although the area of the west surface runoff discharge (i.e., 0.77 km^2) in the Transitional Monitoring Stage would be close to baseline conditions, translation of precipitation to runoff in this area would be more efficient than during baseline, with a weighted runoff coefficient (RC) of 0.76 owing to planned reclamation activities. This is a relatively high RC because most of the area draining to Q01 (i.e., west surface runoff discharge) is coming from R22 (i.e., non-potentially acid generating	n/a

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						waste rock storage area), which would be reclaimed and covered to discourage infiltration and has an RC of 0.95.	
246	ECCC	Fish and fish habitat	TSD XVIII, Section 5.1.2.3 Section 7	**Context:** The Site-Wide Water Balance Report (SWWBR) describes in Section 5.1.2.3 the vulnerability of the water management system to the extended failure of any one of the various pumps on-site in an average year (1993 in the historical data). The Proponent states in Section 5.1.2.3 that in a 7-day failure, overflow may occur in the settling pond and effluent treatment. **Rationale:** Freshwater supply to the processing plant and groundwater sumps in the mine may also be affected in an extended pump failure, but these do not lead to effects on the environment. The evaluation of pump failure in an 'average year' may mask the potential for pump failures at inopportune times, such as above average precipitation or storm conditions. Additional information would assist ECCC in assessing the potential effects of the Project to the receiving environment.	1. Explain whether or not an analysis of pump failure in storm conditions (e.g. 24-hour 100-year rainfall) would identify the same vulnerable areas. If new vulnerable areas are identified, discuss the mitigation measures that would be used to address this. 2. Discuss whether pump failures at certain nodes may be more important in terms of valued components.	NexGen notes that, as described in Section 5.1.2.3 of Draft EIS TSD XVIII (Site-Wide Water Balance and Water Quality Modelling Report), the sensitivity scenario referenced in the IR and included as Scenario 15 in Draft EIS TSD XVIII was intended to simulate reasonably foreseeable upset conditions associated with pump failures throughout the site water management system that could be repaired, replaced, or recommissioned within a reasonable period of time. With this context, responses to part 1 and part 2 of this IR are provided below. 1. The simulations assessed the highest risk pumps under reasonably foreseeable conditions (Draft EIS TSD XVIII, Section 5.1.2.3 [Sensitivity to Upset Conditions]). Anticipated contingency measures include the design storm return period and the design standard for containment adopted in design. This assessment provided the necessary information to assess risks in the Draft EIS. Further analysis of pump failures in storm conditions would be conducted through future design phases and the licensing process for the proposed Project, as applicable and commensurate with the stage of Project development. 2. Additionally, as part of the hazard identification (HI) evaluation for the accidents and malfunctions assessment, risks of surface flooding and failure of the underground dewatering system were considered (Draft EIS TSD VIII [Accidents and Malfunctions Report], Appendix A): ▪ Surface flooding was considered as part of the HI evaluation of both the 'mine dewatering system' node and 'pond and retention berm' node as represented by HI 7.2 (High flow – groundwater ingress, surface flooding) and HI 14.4 (Surface flooding) in Table 3-7 and Table 3-14, respectively. ▪ Failure of the underground dewatering system was considered as part of the HI evaluation of the 'mine dewatering system' node as HI 7.1 (Main underground dewatering system failure). The HI evaluation conducted in support of the accidents and malfunctions assessment (Draft EIS TSD VIII) identified similar vulnerable areas (e.g., overflow of underground water management areas and surface water management ponds) as Scenario 15 of Draft EIS TSD XVIII. The HI evaluation for surface flooding and failure of the underground dewatering system in the accidents and malfunctions assessment determined that design features such as appropriate design and pump capacity, water management system redundancy (e.g., additional pumps), preventative and routine maintenance, monitoring, and emergency response planning would result in an overall low risk level. These mitigations are consistent with, and augment the mitigation measures described in, Section 7 of Draft EIS TSD VIII (i.e., the same mitigation measures applicable to the HIs evaluated as part of the accidents and malfunctions assessment would also apply to and address the reasonably foreseeable upset conditions). An assessment of pump failures was completed within Scenario 15 in Section 5.1.2.3 of Draft EIS TSD XVIII. This scenario was used to evaluate the sensitivity of the site water management infrastructure to reasonably foreseeable upset conditions. A total of 24 pumps were included in the assessment. This assessment concluded that changes to the containment of water within the mine-controlled area were not anticipated (Draft EIS TSD XVIII, Appendix F, Table F-10). As a result, there are expected to be no implications for valued components. Further analysis of pump failures in storm conditions would be conducted through future design phases and federal licensing, as applicable and commensurate with the stage of Project development.	n/a

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247	CNSC	Human health with with respect to hazardous contaminants	TSD XVIII, Appendix H	**Context:** The CNSC has a draft REGDOC-2.9.2 about controlling releases to the environment from nuclear facilities. REGDOC-2.9.2 clarifies the CNSC's requirements and provides guidance for controlling releases to the environment, through: • applying the concept of best available technology and techniques, economically achievable (BATEA) • establishing and implementing licensed release limits and action levels for releases to the environment • commissioning of new treatment systems and confirming their performance • implementing adaptive management where required NexGen has been hosting workshops with CNSC staff. NexGen also acknowledged in their EIS that they will have to be in compliance with REGDOC-2.9.2. **Rationale:** As stated in the draft REGDOC-2.9.2, environmental release targets are used as criteria to inform the design of wastewater treatment systems to constrain the quantity and concentration of contaminants and physical stressors released into the environment. Environmental release targets are established using an exposure- based approach and a technology-based approach. In the EIS, it is unclear how the environmental release targets were used to identify the water treatment plant technology and design.	CNSC's expectation is that NexGen demonstrate to the CNSC that the requirements in draft REGDOC-2.9.2 are met, including: • BATEA assessment • Establishing and implementing licensed release limits and action levels for releases to the environment • Commissioning plan NexGen must clearly demonstrate how the Rook I Project meets the requirements in draft REGDOC- 2.9.2.* NexGen must use the environmental release targets to inform the selection of the treatment technology. *Note that although REGDOC-2.9.2 is still in draft form, CNSC staff expects proponents to follow this document in conjunction with REGDOC-2.9.1	NexGen confirms that the requirements in REGDOC-2.9.2 (CNSC 2021) will be applied within the licensing activities for the Project. No changes are proposed in the revised EIS to address this IR. **References** CNSC (Canadian Nuclear Safety Commission). 2021. REGDOC-2.9.2, Environmental Protection, Controlling Releases to the Environment. DRAFT. March 2021. Available at https://www.nuclearsafety.gc.ca/eng/pdfs/regulatory-documents/regdoc2-9-2/REGDOC-2_9_2_Controlling_Releases_to_the_Environment.pdf	n/a
248	CNSC	Human health with with respect to hazardous contaminants	TSD XVIII, Appendix H	**Context:** The CNSC has a draft REGDOC-2.9.2 about releases to the environment from nuclear facilities. REGDOC-2.9.2 clarifies the CNSC's requirements and provides guidance for controlling releases to the environment, through: • applying the concept of best available technology and techniques, economically achievable (BATEA) • establishing and implementing licensed release limits and action levels for releases to the environment • commissioning of new treatment systems and confirming their performance • implementing adaptive management where required It is acknowledged that NexGen has been having frequent workshops with CNSC staff about draft REGDOC-2.9.2. It is also acknowledged that NexGen stated in the EIS that the final release targets will be proposed to the CNSC as part of the licence application submission to the CNSC. **Rationale:** It is not clear in the submission whether NexGen has considered whether any applicable technology-based performance standards exist in Canada or internationally, and would be relevant as effluent discharge targets, in order to ensure principles of pollution prevention are applied. Consideration of this would help ensure that the proposed effluent discharge targets harmonize with existing federal, provincial/territorial, and/or municipal requirements. For example, there are release limits for radium-226, TSS, and pH outlined in the	NexGen should harmonize the proposed Effluent Release Targets with the technology-based performance standards that exist in the *Metal and Diamond Mining Effluent Regulations* where applicable.	In the surface water quality assessment of the Draft EIS, NexGen derived preliminary effluent release targets (PERTs) that would protect the receiving environment from adverse effects to aquatic life as well as protect human and wildlife uses during Operations when the Project would be actively discharging to Patterson Lake. NexGen understands that refinements to water management and water treatment will likely occur through the Project design process and during Project licensing activities, which may result in refinements to the PERTs. These refinements would incorporate any update of applicable technology improvements that would allow NexGen to achieve and maintain final licensed release limits that comply with applicable technology-based standards listed in the Metal and Diamond Mining Effluent Regulations (MDMER). This outcome will be reflected in both applications made as part of Project licensing activities and the MDMER registration. No changes are proposed in the revised EIS to address this IR. **References** Metal and Diamond Mining Effluent Regulations. SOR/2002-222 under the *Fisheries Act*. Last amended June 18, 2020. Available at https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2002-222/index.html	n/a

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				federal *Metal and Diamond Mining Effluent Regulations*, which have been demonstrated to be achievable in the uranium mine and mill industry.			
249	CNSC	Human Health with respect to radiation exposure	TSD XVIII, Appendix H	**Context:** As per REGDOC-2.9.1, effluent release targets are an important part of the design of the water treatment plant. Therefore, the development of the effluent release targets must be conservative, consider all possible exposure pathways, and protective of human health and aquatic biota. **Rationale:** It is noted that the proposed effluent release targets for radionuclides are derived based on the thresholds provided by Ecometrix (2021). The basis behind these thresholds don't appear to be provided in Appendix H of TSD XVIII. In addition, it is not clear how the proposed effluent release targets for radionuclides correspond to a dose to a member of the public or to biota. It is also not clear how exposure pathways (such as immersion and ingestion of water) were considered in the development of the proposed effluent release targets for radionuclides.	NexGen should provide more information on how the thresholds for radionuclides are derived. NexGen should clarify how the proposed effluent release targets for radionuclides correspond to a dose to a member of the public or to biota. NexGen should clarify how the proposed effluent release targets for radionuclides considered potential exposure pathways.	NexGen clarifies the thresholds for radionuclide constituents of potential concern (COPCs) for aquatic and riparian biota exposure were principally derived based on aquatic dose exposure, and for humans, the thresholds were derived based on drinking water guidelines. The thresholds provided in Table 4 in Appendix H of TSD XVIII (Site-Wide Water Balance and Water Quality Modelling Report) for lead-210, polonium-210, and thorium-230 are Biota Concentration Guides (BCGs) developed by the US DOE (2019). The BCGs represent a back-calculated value from the limiting receptor (i.e., either aquatic animal or riparian animal) based on an aquatic dose benchmark of 400 micrograys per hour and factored in both the internal and external dose. The specific BCGs were 22 becquerels per litre (Bq/L) for lead-210, 13.5 Bq/L for polonium-210, and 95 Bq/L for thorium-230, and based on aquatic organisms being the limiting receptors. For radium-226, the threshold was derived from the Government of Saskatchewan (2017) guidelines. These thresholds are protective of ecological receptors only. For the surface water quality assessment in the Draft EIS, the projected COPC predictions were evaluated against drinking water quality constituent concentrations as part of the drinking water quality measurement indicator evaluation. Project thresholds for drinking water quality were based on Health Canada's guidelines for Canadian drinking water quality (HC 2022). For parameters with no federal guidelines (i.e., polonium-210 and thorium-230), the World Health Organization guidelines for drinking water quality were selected (WHO 2017). Table 10.2-7 of Draft EIS Section 10.2.8.3.2 (Drinking Water Quality Thresholds) provides a summary of the drinking water quality guidelines considered for the assessment as well as the selected Project threshold. As part of licensing activities for the Project, effluent release targets will be updated according to REGDOC-2.9.1 (CNSC 2020) and REGDOC-2.9.2 (CNSC 2021). As part of this process, licensed release limits and action levels will be derived and proposed to the CNSC and Saskatchewan Ministry of Environment. It is anticipated that the proposed limits will differ from those presented in the Draft EIS, which were used for screening risks and not necessarily as proposed effluent release limits. No changes are proposed in the revised EIS to address this IR. **<u>References</u>** CNSC (Canadian Nuclear Safety Commission). 2020. Environmental Protection: Environmental Principles, Assessments and Protection Measures. REGDOC-2.9.1, version 1.2. September 2020. Available at https://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/REGDOC-2-9-1-Environmental-Principles-Assessments-and-Protection-Measures-Phase-II.pdf CNSC. 2021. REGDOC-2.9.2, Environmental Protection, Controlling Releases to the Environment. DRAFT. March 2021. Available at https://www.nuclearsafety.gc.ca/eng/pdfs/regulatory-documents/regdoc2-9-2/REGDOC-2_9_2_Controlling_Releases_to_the_Environment.pdf Government of Saskatchewan. 2017. Radium-226 in Surface Water. Saskatchewan Environmental Quality Guidelines. Fact Sheet. EPB #602. August 2017. HC (Health Canada). 2022. Guidelines for Canadian Drinking Water Quality – Summary Table. Water and Air Quality Bureau, Healthy Environments and Consumer Safety Branch, Health Canada. Ottawa: Ontario.	n/a

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						WHO (World Health Organization). 2017. Guidelines for drinking-water quality: fourth edition incorporating the first addendum. Licence: CC BY-NC-SA 3.0 IGO. Geneva: World Health Organization. US DOE (United States Department of Energy). 2019. A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota. DOE-STD-1153-2019.	
250	CNSC	Human health with with respect to hazardous contaminants	TSD XVIII, Appendix H	**Context:** In the EIS, NexGen states that the development of water quality used in the proposed effluent release targets does not include the September 2020 data from Patterson Lake. **Rationale**: It is not clear in the EIS whether including the September 2020 water quality data from Patterson Lake would significantly impact the development of the proposed effluent release targets.	Provide justification that the addition of the September 2020 water quality data will not significantly impact the proposed effluent release targets	NexGen confirms that the addition of baseline surface water quality data collected after November 2019, including the data collected from the September 2020 baseline survey, is not expected to notably affect the preliminary effluent release targets (PERTs) that were developed for the Draft EIS. The surface water quality data presented in Table 8 in Draft EIS Attachment 10A-1 (Background Water Quality Characterization), which includes a broad range of water quality constituents including the constituents of potential concern for all the lakes and watercourses in the local study area (LSA) collected between 2015 and 2019, highlights the similarity of water chemistry in the lakes and watercourses throughout the LSA. This temporal similarity suggests that the inclusion of the 2020 data is unlikely to change the baseline setting used for the derivation of the PERTs. No changes are proposed in the revised EIS to address this IR.	n/a
251	CNSC	Wildlife, wildlife habitat	TSD XXI- ERA- section 2.3.3.2	**Context:** The ERA defines the occupancy factors for both fish and wildlife species spent in various media. These factors are used in the IMPACT model to calculate risk. Table 2-5 of TSD XXI contains the occupancy factors used in the IMPACT model for the ERA. **Rationale:** How these factors were decided is unclear from reading the ERA. For instance, muskrat, beaver, American mink, mallard and common loon are assigned a factor of 1 for occupancy in air, and 0.5 for occupancy in soil/sediment surface. Riparian mammals and birds also spend time in water, but this is not captured in the occupancy factor table or calculations.	Please explain the choice of occupancy factors for riparian mammals and birds in the ERA, and how it is conservative for the exposure and risk assessments.	NexGen notes the reviewer's comment and would like to clarify that, as noted in Section 2.3.3.2 of the IMPACT Model Report (Draft EIS TSD XXI [Environmental Risk Assessment], Appendix A), "the occupancy factors are based on the experience and judgment of the risk assessor and the known behaviour of the receptor". The water component of the external dose for riparian mammals and birds while using the shoreline environment is minor relative to the sediment component of external dose and therefore is not accounted for in the terrestrial dose equation in CSA N288.6-22 (CSA Group 2022). The sediment dominates the external dose for radionuclides that partition to sediment because the concentrations in sediment are much higher than water concentrations, while the external dose coefficients are similar for water and sediment sources. The same approach was taken by the International Atomic Energy Agency (IAEA) in developing generic dose factors for discharge to a river, where the included pathways were ingestion of water and fish and external exposure to shoreline sediment (IAEA SRS-19, cl. I-2.2.2). A sample dose calculation for the water shrew in CSA N288.6-22 (Annex F, cl. F.4) illustrates how the water external pathway is minor relative to sediment external and various ingestion pathways. In this example, the water external pathway accounts for less than 1% of total dose. The radiological dose to riparian mammals and birds is calculated using the terrestrial dose equation from Brown et al. (2003) (per CSA N288.6-22, cl. 7.3.4.1.3), which is shown in Section 2.3.5 of Appendix A (Draft EIS TSD XXI) and provided below: $D_{int} = C_t \cdot DC_{int}$ $D_{ext} = D_{ext,s} + D_{ext,ss}$ $D_{ext,s} = C_{soil} \cdot DC_{ext,s} \cdot OF_s$ $D_{ext,ss} = C_{ss} \cdot DC_{ext,ss} \cdot OF_{ss}$ where: ▪ C_t = whole body tissue concentration (Bq/kg fw); ▪ C_{soil} = soil concentration (Bq/kg dw) ; ▪ C_{ss} = surface soil concentration (Bq/m^2) ; ▪ D_{int} = internal radiation dose (µGy/h); ▪ DC_{int} = dose coefficient for radionuclide in tissue ([µGy/h]/[Bq/kg fw]); ▪ $D_{ext,s}$ = external radiation dose in soil (µGy/h);	n/a

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						▪ $D_{ext,ss}$ = external radiation dose on soil surface (µGy/h); ▪ $DC_{ext,s}$ = dose coefficient for radionuclide in soil ([µGy/h]/[Bq/kg dw]); ▪ $DC_{ext,ss}$ = dose coefficient for radionuclide on soil surface([µGy/h]/[Bq/m^2]); ▪ OF_s = fraction of time spent immersed in soil (unitless); and ▪ OF_{ss} = fraction of time spent on the soil (unitless). where: ▪ Bq/kg = becquerels per kilogram; ▪ fw = fresh weight; ▪ dw = dry weight; ▪ Bq/m^2 = becquerels per square metre; and ▪ µGy/h = micrograys per hour. As the approach used in the Draft EIS aligns with the established practices outlined above, NexGen is confident that adequate conservatism has been incorporated into the exposure and risk assessments. No changes are proposed in the revised EIS to address this IR. **References** Brown J, Strand P, Hosseini A, Borretzen P. 2003. Handbook for Assessment of the Exposure of Biota to Ionising Radiation from Radionuclides in the Environment. CSA Group (Canadian Standards Association Group). 2022. CSA N288.6-22: Environmental Risk Assessments at Nuclear Facilities and Uranium Mines and Mills. IAEA (International Atomic Energy Agency). 2001. Generic Models for Use in Assessing the Impact of Discharges of Radioactive Substances to the Environment. Safety Reports Series No. 19.	
252	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	TSD XXI, Section 4.2.3.1	**Context**: Table 4-1 pg. 43 provides water quality objectives used for the Environmental Risk Assessment (ERA). There are discrepancies between the selected guidelines in this table and the selected Project thresholds used in the main EIS for cadmium and manganese. Additionally, the most stringent molybdenum guideline should be applied. **Rationale**: The Proponent should ensure the most stringent environmental water quality objectives are used and that consistency is maintained across different assessments in the EIS. Use of the most stringent guidelines will allow for the most protective assessment to analyze risks to the receiving environment.	1. Update the ERA using the water quality objectives for cadmium and manganese that were used in the main EIS. 2. Update the ERA applying the most stringent molybdenum water quality guidelines.	Responses to part 1 and part 2 of this IR are provided below. 1. The screening value used for cadmium in Table 4-1 in Draft EIS TSD XXI (Environmental Risk Assessment) was 4 × 10^{-05} mg/L, which is the Canadian Council of Ministers of the Environment (CCME) water quality guideline for protection of aquatic life for hardness greater than 0 mg/L and less than 17 mg/L (CCME 2017). Saskatchewan has adopted the CCME value for cadmium as per the Environmental Portal Saskatchewan Environmental Quality Guidelines (Government of Saskatchewan n.d.). No change to the environmental risk assessment (Draft EIS TSD XXI) is proposed; however, Table 10.2-5 in revised EIS Section 10.2.8.3.1 (Water Quality Thresholds), Table 10.5-3 in revised EIS Section 10.5.1.1.3 (Trace Metals), and Table 10A-2, Table 10A-15, and Table 10A-27 in revised EIS Appendix 10A (Surface Water Quality Modelling Report) will be updated to reflect the updated Saskatchewan and CCME guidelines. 2. The screening values used for manganese in Table 4-1 in Draft EIS TSD XXI are 2.6 × 10^{-01} mg/L, which is sourced from the CCME water quality guideline for protection of aquatic life (CCME 2017), and 1.2 × 10^{-01} mg/L, which is sourced from the Health Canada drinking water quality guidelines for protection of human health (Health Canada 2020). In Draft EIS TSD XXI, the lowest value of the ecological and human health guidelines was used for a conservative screening process. The same ecological value was adopted in Table 10.2-5 of the Draft EIS Section 10.2.8.3.1, and the same human health value was adopted in Table 10.2-7 of Draft EIS Section 10.2.8.3.2 (Drinking Water Quality Thresholds). NexGen appreciates the reviewer's comment; however, NexGen believes that the appropriate guideline for molybdenum was used in Draft EIS TSD XXI. For protection of human health, a	Section 10.2.8.3.1, 10.5.1.1.3; Appendix 10A, Section 10A4.1, 10A6.4.1.4, 10A6.4.2.4 TSD XXI, Section 4.2.3

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						drinking water guideline from the World Health Organization of 0.07 mg/L was selected (WHO 2017). For protection of aquatic life, the Saskatchewan Environmental Quality Guideline of 31 mg/L was selected to be the most appropriate for the Project (ENV 2021). This guideline value was derived from recent data following the CCME (2007) protocol. The molybdenum water quality objective was based on the 5th percentile (HC_5) of the species sensitivity distribution according to the CCME protocol; 18 data points for 12 different species were used, mainly 10% effect concentration (EC_{10}) data (WSA 2017). The CCME guideline of 0.073 mg/L is identified as an interim guideline and was based on multiplying the lowest chronic toxicity value (i.e., the 28-day 50% lethal concentration [LC_{50}] of 0.73 mg/L for rainbow trout [*Oncorhynchus mykiss*]), by a safety factor of 0.1 following the CCME 1991 protocol. This original study by Birge (1978), for which the CCME 1991 protocol is based on, has not been reproducible, either using the original methods or using standard methods (Davies et al. 2005). However, in discussions with Environment and Climate Change Canada on 9 June 2023, NexGen has agreed to revise the molybdenum guideline from the provincial guideline to the BC MOE guideline of 7.6 mg/L (BC MOE 2021) in the revised EIS. The regulatory rationale for this change from the Saskatchewan Water Security Agency (WSA) guideline to the BC MOE guideline is because the BC MOE guideline is more conservative that than the WSA guideline and is derived from recent data following the CCME (2007) protocol. Table 4-1 and Table 4-2 in Section 4.2.3 of revised EIS TSD XXI will be updated to include the BC MOE guideline for molybdenum. Besides Table 10.2-5 in revised EIS Section 10.2.8.3.1; Table 10.5-3 in revised EIS Section 10.5.1.1.3; Table 10A-2, Table 10A-15, Table 10A-27 in revised EIS Appendix 10A; and Table 4-1 and Table 4-2 in Section 4.2.3 of revised EIS TSD XXI, no other changes are proposed in the revised EIS to address this IR. **<u>References</u>** BC MOE (B.C. Ministry of Environment and Climate Change Strategy). 2021. B.C. Ministry of Environment and Climate Change Strategy 2021. Molybdenum Water Quality Guidelines for the Protection of Freshwater Aquatic Life, Livestock, Wildlife and Irrigation. Water Quality Guideline Series, WQG-07. Prov. B.C., Victoria B.C. Birge WJ. 1978. Aquatic Toxicology of Trace Elements of Coal and Fly Ash. Special Collections, USDA National Agricultural Library. Accessed 16 February 2023. Available at https://www.nal.usda.gov/exhibits/speccoll/items/show/5224 CCME (Canadian Council of Ministers of the Environment). 2007. A protocol for the derivation of water quality guidelines for the protection of aquatic life. Davies TD, Pickard J, Hall KJ. 2005. Acute molybdenum toxicity to rainbow trout and other fish. Journal of Environmental Engineering & Science 4: 481-485. ENV (Saskatchewan Ministry of the Environment). 2021. Saskatchewan Environmental Quality Guidelines. Available at https://envrbrportal.crm.saskatchewan.ca/seqg-search/ Government of Saskatchewan. n.d. Saskatchewan Environmental Quality Guidelines. Available at https://environment-quality-guides.saskatchewan.ca/ Health Canada. 2020. Guidelines for Canadian Drinking Water Quality - Summary Table. September 2020. Available at https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/ewhsemt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/summary-table-EN-2020-02-11.pdf WHO (World Health Organization). 2017. Guidelines for drinking-water quality.	

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No.	Department	Project Effects Link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement	NexGen Response	Section in EIS
						WSA (Saskatchewan Water Security Agency). 2017. Saskatchewan Water Quality Objective for the Protection of Aquatic Life – Molybdenum. Fact Sheet. Report No. WSA 514.	
253	ECCC	Fish and fish habitat Change to an environmental component due to hazardous contaminants	TSD XXI, Section 4.2.3.2	**Context**: Un-ionized ammonia and Total Suspended Solids (TSS) have not been included in Table 4-2 pg. 46, which makes it unclear if risk from un-ionized ammonia and TSS have been assessed. **Rationale**: Un-ionized ammonia and TSS are prescribed deleterious substances under Schedule 4 of the *Metal and Diamond Mining Effluent Regulations* (MDMER) and therefore should be put forward for assessment.	Provide an assessment of TSS and un-ionized ammonia.	NexGen appreciates the reviewer's comment and clarifies that un-ionized ammonia predictions are provided in Table 10A-11 and Table 10A-12 in Draft EIS Appendix 10A (Surface Water Quality Modelling Report) for Patterson Lake during the Project lifespan and in the far future. All predictions of un-ionized ammonia are below the Canadian Council of Ministers of the Environment water quality guideline (CCME 2010) used for the Project (at a pH of 7 and temperature of 15°C). Total suspended solids was not assessed in Draft EIS TSD XXI (Environmental Risk Assessment); however, total suspended solids was assessed in Draft EIS Section 10.5 (Surface Water Quality). No changes are proposed in the revised EIS to address this IR. **References** CCME (Canadian Council of Ministers of the Environment). 2010. Canadian Water Quality Guidelines for the Protection of Aquatic Life: Ammonia. Accessed August 2023. Available at https://ccme.ca/en/res/ammonia-en-canadian-water-quality-guidelines-for-the-protection-of-aquatic-life.pdf	n/a
254	ECCC	Fish and fish habitat Change to an environmental component due to radiological contaminants	TSD XXI, Section 4.2.3.3	**Context:** It is unclear from this section and Table 4-3 pg. 50 that the selection of sediment Constituents of Potential Concern (COPCs) has taken into consideration elevated baseline concentrations of arsenic, barium, iron, lead, manganese, zinc, lead-210, polonium-210 and radium-226 that were found during baseline monitoring. Inconsistencies between the sediment quality thresholds applied and the thresholds chosen within the EIS are noted. **Rationale**: The Proponent should ensure the most stringent environmental sediment quality objectives available are used and consistently maintained across different assessments for the EIS. Use of the most stringent guidelines will allow for the most protective assessment to analyze risks to the receiving environment.	Provide further information regarding if elevated baseline sampling concentrations for sediment COPCs were considered as part of the screening process. Update the results of the assessments if required.	NexGen appreciates the reviewer's comment and clarifies that based on Draft EIS Annex V.1 (Aquatic Environment Baseline Report), the only constituents that exceeded sediment quality guidelines in baseline monitoring were arsenic, cadmium, lead-210, polonium-210, and vanadium (in Naomi Lake and Clearwater River only). With the exception of vanadium, the other constituents that exceeded sediment quality guidelines at baseline were considered further in the screening assessment in Section 4.2.3.3 and Table 4-3 of Draft EIS TSD XXI (Environmental Risk Assessment). The results of predicted vanadium concentrations in surface water are shown in Attachment 10A-2 of Draft EIS Appendix 10A (Surface Water Quality Modelling Report). The maximum projected vanadium concentration in Patterson Lake North Arm – West Basin during Project phases is approximately 0.0002 mg/L, which is well below the Project threshold of 0.12 mg/L. With respect to sediment, the predicted sediment concentrations in Table 4-3 in Section 4.2.3.3 of Draft EIS TSD XXI are total concentrations, inclusive of baseline concentrations. Based on the upper-bound concentration of vanadium in treated effluent (i.e., 2.07 x 10^{-03} mg/L) shown in Table 4-2 in Section 4.2.3.2 of Draft EIS TSD XXI, which represents far-future conditions, the upper-bound water concentration for vanadium in Patterson Lake North Arm – West Basin is predicted to be 1.3 x 10^{-04} mg/L in the Application Case, which considers existing baseline concentrations and the Project's treated effluent discharge. The predicted maximum sediment concentration of vanadium would be 9.5 mg/kg dry weight (dw), which is well below the sediment quality guideline of 31.8 mg/kg dw from Burnett-Seidel and Liber (2013). As stated in Section 4.2.3.3 of Draft EIS TSD XXI, "Burnett-Seidel and Liber (2013) was selected as the preferred source, as the reported NE2 [no-effect] and REF [reference] values are specifically applicable to Saskatchewan waterbodies." Burnett-Seidel and Liber (2013) guideline values were used even if these values were higher than Canadian Council of Ministers of the Environment guideline values because the former have been developed specifically for assessing the effects of uranium mining in the region. NexGen confirms that the results of the assessment remain unchanged based on this IR; therefore, no changes are proposed in the revised EIS. **References**	n/a

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No.	Department	Project Effects Link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement	NexGen Response	Section in EIS
						Burnett- of Seidel C, Liber K. 2013. Derivation of no-effect and reference-level sediment quality values for application at Saskatchewan uranium operations. Environ. Monit. Assess. 185, 9481 – 494.	
255	CNSC	Human Health with respect to radiation exposure	TSD XXI – Environmental Risk Assessment/ Section 5.1.3.2.1 (page 5.11)	**Context:** No rationale has been given why the seasonal resident and lodge operator's diet reflects an average annual food consumption rate, while the other receptors are assigned higher consumption rates. **Rationale:** Clarification is requested so that CNSC staff may determine whether the dose estimate for the offsite receptors is adequate.	Clarification for the choice of the receptor diets should be provided, specifically why the seasonal resident and lodge operator's diet reflects an average food consumption rate, while the other receptors are assigned higher consumption rates.	NexGen notes the reviewer's comment; however, NexGen clarifies that the distinction between the choice of receptor diets for the seasonal resident / lodge operator versus the subsistence harvester is an assumption based on how different people may use the land and was meant to validate that dose and risk estimates would be realistic as well as conservative. The intent was to select diets that reflect different ways people may obtain Traditional Foods from the local study area (LSA) and regional study area (RSA); therefore, it was desired to have an average diet to reflect a person who would be ingesting a typical portion of Traditional Foods diet and a high diet to reflect a person who would be ingesting a higher proportion of Traditional Foods. A detailed description of the types of receptors is provided in Section 5.1.1.2 and Section 5.1.1.3 of Draft EIS TSD XXI (Environmental Risk Assessment). By definition, the subsistence harvester is intended to gather more regionally sourced Traditional Foods and would spend more time in the area. The seasonal resident / lodge operator is intended to represent an individual that would occasionally come to the LSA and RSA to harvest Traditional Foods and in general would be representative of people who consume less Traditional Foods. Overall, the diets are considered to be representative of traditional land use. As noted in Section 5.1.3.2.2 of Draft EIS TSD XXI, NexGen notes that the establishment of the food consumption rates within the Traditional Foods diet was informed by engagement held during development of the Draft EIS with primary Indigenous Groups and communities (e.g., Joint Working Groups) in 2019 and 2020, and with the CNSC, ENV, and Saskatchewan Health Authority in 2021. No changes are proposed in the revised EIS to address this IR.	n/a
256	CNSC	Human Health with respect to radiation exposure	TSD XXI – Environmental Risk Assessment/ Section 5.3.2 (page 5.77)	**Context:** Exposures to radon progeny have been assessed separately from exposures due to other radionuclides. On page 5.77 the TSD states that "The limit established by the CNSC for radon above background for sites licensed by the CNSC is 60 Bq/m^3 (*Radiation Protection Regulations* SOR/2000-203). For this project, the incremental radon concentration of 60 Bq/m^3 was adopted". The *Radiation Protection Regulations* do not stipulate a limit for radon above background for sites licensed by the CNSC. The effective dose limits for NEWs and persons that are not NEWs are listed in section 13 of these regulations, and in subsection 1(3) for the general public. The annual effective dose from all sources combined must be compared to the applicable effective dose limit. For members of the public this limit is 1 mSv per year. In addition, since the total dose is about 0.6 mSv (including radon progeny, ingestion, inhalation, and external exposures), i.e., 60% of the public effective dose limit, the conservatism built into the dose assessment should be discussed further in particular in relation to the radon dose assessment. **Rationale:** The reason of the requested changes is to ensure consistency with the *Radiation Protection Regulations*. Additional information on conservatism would help put the total dose in context in the Environmental Assessment Report and provide insight on whether the annual dose could approach the dose limit.	The TSD should be aligned with the *Radiation Protection Regulations* by: 1. Removing the reference to a 60 Bq/m^3 limit. 2. Reporting the assessment results as the total dose, from all radionuclides combined including radon progeny, and by comparing this annual effective dose to the effective dose limit. Also provide a summary of the conservative assumptions that have been included in the dose calculations.	Responses to part 1 and part 2 of this IR are provided below. 1. While 60 becquerels per cubic metre (Bq/m^3) (incremental) has been used in CNSC oversight reports for uranium mines and mills, and referenced by Health Canada (HC), NexGen understands (based on CNSC's comment in IR 134) that the CNSC's position is that this reference level should no longer be used based on the updated Radiation Protection Regulations. NexGen will remove the reference level of 60 Bq/m^3 from revised EIS Section 15 (Human Health) and revised EIS TSD XXI (Environmental Risk Assessment). For comparison purposes, total radon concentrations will be compared against background concentrations as well as the HC radon guideline of 200 Bq/m^3 in Section 5.4.1.1.4 (Radon Risk) of revised EIS TSD XXI. 2. NexGen agrees that, moving forward for the Project, the health effect from radon will be interpreted in terms of total radiation dose. The total effective dose, including radon and uranium-238 decay chain radionuclides, will be compared to the dose limit of 1 millisievert per year (mSv/yr). However, the tables in Section 5.4.1.1.3 and Section 5.4.1.2.3 of Draft EIS TSD XXI will be retained to show total dose without radon and new tables for the total dose with radon will be added to Section 5.4.1.1.3 and Section 5.4.1.2.3 of revised EIS TSD XXI for the camp worker. The total dose to the camp worker during Operations (including radon) for the Application Case is predicted to be 0.57 mSv/yr, which is below the dose limit of 1 mSv/yr. The following points are provided in response to the reviewer's request for information on the conservative assumptions that have been included in the dose calculations: ▪ The assumptions included in the radon dose calculation are included in Section 5.2.4.1.4 of Draft EIS TSD XXI. For calculation of radon dose, it was conservatively assumed that the camp worker spends 100% of their time indoors when on site. ▪ It was assumed that receptors are exposed to the maximum exposure concentrations at their location for each model scenario and Project phase (Draft EIS TSD XXI, Section 5.2.4.1).	TSD XXI, Section 5.4.1.1.3, 5.4.1.2.3

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						Additionally, a discussion on conservatism from combining the dose from radon and other radionuclides will be included in Section 5.4.1.1.3 and Section 5.4.1.2.3 of revised EIS TSD XXI. The added information will include discussion on combining the conservative assumption of the camp worker spending all their time indoors for radon exposure while also spending time outdoors being exposed to other pathways for exposure to other uranium-238 decay chain radionuclides. **References** Radiation Protection Regulations. SOR/2000-203 under the *Nuclear Safety and Control Act*. Last amended 01 January 2021. Available at https://laws-lois.justice.gc.ca/eng/regulations/SOR-2000-203/index.html	
257	ECCC	Fish and fish habitat	TSD XXI, Section 6.1.1	**Context:** Table 6 pg. 186 provides information on the selected ecological receptors for the Environmental Risk Assessment (ERA). However, no information has been provided on which species (found within the Project local or regional study areas) that these selected receptors are representing. **Rationale:** A list of which species the selected ecological receptors are representing should be provided within this table.	**Specific Question/ Request for Information:** 1. Update Table 6 to include a list of each species that each selected ecological receptor is representing.	1. NexGen appreciates the reviewer's comment and will update Table 6-1 in Section 6.1.1.1 of revised EIS TSD XXI (Environmental Risk Assessment) to include an additional column showing the species that each selected ecological receptor is representing.	TSD XXI, Section 6.1.1.1
258	CNSC	COPC concentration in macrophytes	TSD XXI: ERA, Table 6-1	**Context:** In Table 6-1 of the ERA supporting document, it is stated that for aquatic vegetation, shoot, root, and sediment samples were collected at Lloyd Lake for metal and radionuclide analysis. The macrophyte data does not appear to be discussed beyond a comparison of modelled and measured concentrations (Figure 3-4 in Appendix A of TSD XXI: ERA). Information appears to be missing on the sampling campaign. In particular, it would be of relevance to include which species were sampled as COPC uptake is species-specific, as well as where and when sampling was performed. **Rationale:** Aquatic vegetation can accumulate COPC in their shoot and root tissues, and therefore it is relevant to discuss this data in the EIS. Moreover, in the ERA supporting document, it is unclear how this data were used in the ecological risk assessment. CSA N288.6-12 states that measured concentrations of COPCs should be used, where possible, in the exposure assessment (clause 7.3.6), and that bioaccumulation factors (BAFs) should only be used if measured tissue concentrations are not available (clause 7.3.4.3.1). Please clarify how measured COPC data from macrophytes were used in the ERA.	1.Present information on the macrophyte sampling campaign. 2.Present a summary of measured COPC data in macrophyte shoots and roots. 3.Clarify how measured COPC data from macrophytes were used in the ERA, and consequently considered in the EIS.	NexGen notes the reviewer's comment, and clarifies the following: 1. Details regarding the baseline aquatic macrophyte sampling is provided in Draft EIS Annex V.1 (Aquatic Environment Baseline Report). As described in Section 8.0 of Draft EIS Annex V.1, samples were collected from Lloyd Lake, Broach Lake, Jed Creek, Patterson Creek, Beet Creek, and Clearwater River. The genera *Carex* sp. (sedge) shoots and roots were collected. 2. The baseline measured data on constituents of potential concern in macrophyte shoots and roots are provided in Table 36 and Table 37 in Appendix C in Draft EIS Annex V.1. 3. The measured baseline data for aquatic macrophytes were used to validate the bioaccumulation factors (BAFs) used in the IMPACT Model Report (Draft EIS TSD XXI [Environmental Risk Assessment], Appendix A). The measured baseline data were compared against the predicted macrophyte concentrations using the BAFs from publicly available regional data from other uranium mines in northern Saskatchewan. The comparison of modelled and measured data for macrophytes is presented in Figure 3-4 in Appendix A of Draft EIS TSD XXI. The graphs in Figure 3-4 show generally good agreement between modelled and measured macrophyte data and did not warrant any changes to the BAFs used. As indicated, for the BAFs used, the values were considered site-specific, with the exception of lead, which was a literature value taken from International Atomic Energy Agency Technical Report Series No. 472 (IAEA 2010) and can be further validated as more data become available during future phases of the Project. No changes are proposed in the revised EIS to address this IR. **References** IAEA (International Atomic Energy Agency). 2010. Handbook of Parameter Values for the Prediction of Radionuclide Transfer in Terrestrial and Freshwater Environments. Technical Report Series No. 472.	n/a

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259	CNSC	Aquatic Environment	TSD XXI- ERA- section 6.3.1.1	**Context:** The ERA defines water concentration-based TRVs for aquatic biota from chronic effects from long term COPCs exposures. In the ERA, TRVs were selected that were 20% Ecs (EC_{20} values). As chronic EC_{20} values are not always available, the ERA uses a protocol described in Table 6-14 to derive EC_{20} values from available data. **Rationale:** Although the protocol described in Table 6-14 may be adequate, there is no reference provided to support its use.	Please provide a reference or justification for the calculations used to derive EC_{20} values showing it is a conservative method.	As noted by the reviewer, Draft EIS TSD XXI (Environmental Risk Assessment) uses a protocol described in Table 6-14 in Draft EIS TSD XXI to derive 20% effect concentration (EC_{20}) values from available data. The derivation of EC_{20} values from toxicity test data is often based on professional judgment and previous experience. The adjustment from chronic 50% lethal concentration (LC_{50}) to chronic EC_{20} (i.e., a ¼ factor) was a typical factor based on review of available toxicity test data, determined as a geometric mean of ratios computed for each chemical and test species. This factor was developed in a 2010 report to Cameco by Ecometrix and Senes: *A Compilation and Critical Review of Toxicity Reference Values for Use in Ecological Risk Assessments for Cameco Facilities in Canada*. As the approach used in the Draft EIS aligns with established protocol, professional judgment, and previous experience as outlined above, NexGen is confident that adequate conservatism has been incorporated into the environmental risk assessment (Draft EIS TSD XXI). No changes are proposed in the revised EIS to address this IR. **References** Ecometrix and Senes. 2010. A Compilation and Critical Review of Toxicity Reference Values for Use in Ecological Risk Assessments for Cameco Facilities in Canada.	n/a
260	CNSC	Wildlife, wildlife habitat and SAR	TSD XXI- ERA- section 6.4.1.1.1	**Context:** In accordance with Clause 7.2.4.3 of CSA N288.6-12, species at risk (SAR) should be assessed at the individual level as effects on a few individuals are not considered acceptable, and not assessed at a population level. It is unclear how SAR were assessed in the ERA. **Rationale:** It appears lowest-observed-adverse-effect levels (LOAEL) were used for benchmarks for SAR. The assessment appears to compare SAR doses to LOAELs and if there were no HQ values above 1, then SAR were considered protected. SAR are often assessed using no observable adverse effect level (NOAEL), and not LOAEL, to ensure there are no effects on individual species at risk.	Please justify the method used to assess SAR within the EIS and ERA, ensuring that SAR were assessed at the individual level.	NexGen appreciates the reviewer's comment; however, NexGen disagrees that species at risk (SAR) should be assessed at the no observable effects level (NOAEL). CSA N288.6-22 (CSA Group 2022) does not require that a NOAEL be used for SAR assessments. All SAR were assessed at the individual level consistent with Clause 7.2.4.3 of CSA N288.6-22. The requirement for assessing SAR at the individual level (CSA N288.6-22, Clause 7.2.4.3) does not imply use of a special SAR benchmark. This clause states that the assessment endpoint must be at the individual level rather than at the population level. Thus, for SAR, it cannot be concluded that any adverse effects are acceptable on the basis that they are spatially limited, which could be an appropriate finding for non-SAR. As such, different toxicity reference values are not justified for SAR. No changes are proposed in the revised EIS to address this IR. **References** CSA Group (Canadian Standards Association Group). 2022. CSA N288.6-22: Environmental Risk Assessments at Nuclear Facilities and Uranium Mines and Mills.	n/a
261	CNSC	Level of details (QA/QC,)	TSD XXI: ERA Section 7.1 - QA/QC	**Context:** Overall, the information in the HHRA is straightforward and clearly presented. However, the level of details in section 7.1- QA/QC appears to be insufficient/unclear to allow a comprehensive evaluation of compliance with CSA N288.6 and associated/interlinked documents. **Rationale:** As per CSA N288.6 (Clause 10) Appropriate QA/QC requirements shall exist for all aspects of the ERA and should be specified prior to conducting the ERA. If these requirements already exist as part of a facility's overall QA program, that program may be applied to the ERA process. In section 7.1 of the ERA report, it is stated that the planning, preparation, and work was performed under the ECOMETRIX ISO-9001-2015 certified quality management system.	Provide clarifications if the proponent has reviewed and accepted the TSD XXI-ERA report, and how the ECOMETRIX QA/QC satisfy the proponent quality standard requirements.	NexGen acknowledges the CNSC's request for clarification on conformance with quality requirements per Canadian Standards Association (CSA) N288.6-12 (Clause 10) for the environmental risk assessment (ERA) (CSA Group 2012a). NexGen confirms that Ecometrix Incorporated (Ecometrix) completed the Draft EIS TSD XXI (Environmental Risk Assessment) in alignment with CSA N288.6-12 guidelines including specific quality assurance / quality control (QA/QC) requirements in Clause 10.2 and 10.3 of the standard. The ERA followed the Ecometrix Quality Management System for review and verification validating that the modelling results were correct and accurate. The ERA utilized environmental monitoring data collected as part of baseline monitoring, which followed other subcontractors' QA/QC programs. The ERA report was also reviewed and verified by Ecometrix senior technical staff and underwent a thorough review from WSP Canada Inc. (formerly Golder Associates Ltd.) staff and NexGen qualified staff. Based on these internal and external reviews, NexGen also accepts the Draft EIS TSD XXI.	n/a

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				CSA N286-12 clause 9.5.7, Verification of Services, states that Purchased services shall be verified in accordance with the planned verification. This clause is applicable with other clauses of CSA N286-12. For example, clause 4.8 on work management. Clause 4.8 addresses planning the work including the verification and using controlled documents. CSA N286-12 clause 9.5.5 specifies that "the selected supplier's technical documents that are required to be submitted shall be reviewed and accepted". Additionally, CSA N288.4-19, Clause 10.1.2 (note 1): "The QA program should be commensurate with the management system principle set out in N286, CSA-ISO- 9001, or other recognized quality standards." It is not clear how the current information provided satisfies these requirements Providing this information will improve understanding how the QA/QC program fits within the organizations management system and meeting these requirements will ensure that the proponent has control of the purchased services as a future licence applicant.		As part of preparing to become a future licensee, NexGen has built a robust contracts and procurement process following CSA N286-12 Management System Requirements of Nuclear Facilities (CSA Group 2012b). **References** CSA Group (Canadian Standards Association Group). 2012a. CSA N288.6-12: Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills. CSA Group. 2012b. CSA N286-12: Management System Requirements of Nuclear Facilities.	
262	CNSC	Level of details (Sensitivity analysis)	TSD XXI: ERA Section 7.2- Sensitivity analysis	**Context:** The level of detail in section 7.2- Sensitivity Analysis appears to be insufficient to allow a comprehensive review. **Rationale:** Section 7.2 presents the sensitivity analysis of the key model parameters used for annual weather patterns, deposition of COPCs, food consumptions and climate change. The level of details is insufficient to illustrate how the calculations of sensitivity analysis are performed for the different parameters. Providing a sample calculation would illustrate how the sensitivity analysis was calculated for the different parameters.	Provide sample calculations to illustrate how the sensitivity analysis are performed for the different parameters.	NexGen appreciates the reviewer's comment, as well as clarifications provided by the CNSC during a follow-up meeting on 6 June 2023. Since it is not practical to provide a sample calculation for a sensitivity analysis that was completed in a complex model software package, it was agreed with the CNSC that NexGen will update revised EIS TSD XXI (Environmental Risk Assessment) to provide further explanation on how the sensitivity analysis was conducted and the input values that were used or changed in the sensitivity analyses compared to the Application Case. NexGen confirms that the calculation methods for the sensitivity analyses were the same as for the assessment, with certain input values being changed in the sensitivity analyses. The remainder of the calculations utilize the equations and input data already described in Draft EIS TSD XXI and Appendix A of Draft EIS TSD XXI. The following changes will be made in revised EIS TSD XXI: ▪ Section 7.2.1 (Effects of Annual Weather Patterns) considers the annual average flows versus the average monthly flows. A table will be added that provides the annual average flows versus the average monthly flows. ▪ Section 7.2.2 (Deposition of Constituents of Potential Concern on Soil and Plants) considers different dry and wet deposition values. A table will be added outlining the deposition values used. ▪ Section 7.2.3 (Traditional Food Assumptions for Subsistence Harvesters) considers changes in arsenic bioavailability and occupancy of the subsistence harvester. A table will be added showing the changes in bioavailability assumptions, as well as the local intake fractions for the subsistence harvester. NexGen notes that no changes will be made to Section 7.2.4 of revised EIS TDS XXI. The discussion in this subsection was qualitative with reference to the surface water quality assessment in Draft EIS Section 10 (Surface Water Quality and Sediment Quality). The level of detail provided in Section 7.2.4 of Draft EIS TSD XXI is considered sufficient for the assessment.	TSD XXI, Section 7.2.1, 7.2.2, 7.2.3
263	CNSC	Level of details (conceptual model)	TSD XXI: ERA Figure 5.5- Conceptual model	**Context:** The level of detail in Figure 5.5 Conceptual Model appears to be insufficient. **Rationale:** CSA N288.6, clause 6.2.7.3 Site-specific conceptual models should include representations of: (a) the identified COPCs and physical stressors, and	Provide the identified COPCs and the associated pathways into the conceptual model illustrated in Figure 5.5.	NexGen notes the reviewer's comment; however, based on CSA N288.6-22 (CSA Group 2022), the conceptual model does not need to be fully represented in the figure but can be a combination of visual methods or descriptive methods in text, which is how the information is presented in the Draft EIS. The constituents of potential concern (COPCs) are summarized in Table 4-11 in Draft EIS TSD XXI (Environmental Risk Assessment) and, therefore, are not required to be added to Figure 5-5 in Draft EIS TSD XXI. The intent of Figure 5-5 is to be used as a public communication tool; therefore, including all model details would likely be difficult to interpret for a public reviewer.	TSD XXI, Section 4.4, 5.1.4

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No.	Department	Project Effects Link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement	NexGen Response	Section in EIS
				(f) relevant transport pathways/modes (e.g., dispersion and deposition) and transformations (e.g., photo-degradation and biodegradation), as applicable. Figure 5.5 shows most of relevant information, but missing representations of the identified COPCs, and transport pathways. Considering this information, the conceptual model will provide valuable representations of the exposure settings considered in the site-specific model for this assessment.		As described in the figure legend, the associated transport pathways shown in Figure 5-5 of Draft EIS TSD XXI are represented by 'D' for deposition, 'P' for partition, 'U' for uptake, 'C' for contact, 'ING' for ingestion, and 'INH' for inhalation. Additionally, a more detailed description of the exposure pathways is provided in Section 5.1.3.1 of Draft EIS TSD XXI. NexGen recognizes that the media in which COPCs may be conveyed through (e.g., air, water) could have been more clearly described in the Draft EIS. Table 4-11 in Section 4.4 of revised EIS TSD XXI (Environmental Risk Assessment) and Section 5.1.4 of revised EIS TSD XXI will be updated using information already provided elsewhere in Draft EIS TSD XXI to provide a clearer description of which COPCs are applicable to the different media types. **References** CSA Group (Canadian Standards Association Group). 2022. CSA N288.6-22: Environmental Risk Assessments at Nuclear Facilities and Uranium Mines and Mills.	
264	CNSC	Calculation of bedrock hydraulic conductivity through Packer test analysis	Annex III, Section 5.2.2.2, Appendix G	**Context:** Section 5.2.2.2 indicates that hydraulic conductivities were calculated using the Thiem equation. However, Appendix G shows that some tests were analyzed using the Lugeon unit, some were analyzed using the Theis recovery curve analysis, and some were based on the Thiem equation. For the Thiem equation, radius of influence were assumed instead of measured. It is stated in Section 5.2.2.2 that "These assumptions were: R0=1 m; where Q≤0.1 L/min R0=10 m; where 1.0 L/min≤Q≤0.1 L/min R0=1 m; where Q≤0.1 L/min" **Rationale:** There are apparent typos in these assumptions, and they impact the understanding of the content. Additionally, justification (i.e., references) should be provided for these assumptions.	Provide all the theories used in the packer test analysis (i.e., Lugeon test analysis, Theim recovery curve analysis, etc.), and ensure text in Section 5.2.2.2 is consistent with Appendix G. Please clarify the assumptions related to the radius of influence, and provide justification for the assumptions.	Please see Attachment IR 231/264/266/267-1 for NexGen's response to this IR. As noted in this attachment, text in Section 5.2.2.2 of revised EIS Annex III (Hydrogeology Baseline Report) will be modified to provide the theories used for the best estimates of hydraulic conductivity presented in Appendix G of Draft EIS Annex III.	Annex III, Section 5.2.2.2
265	CNSC	Groundwater flow modeling	Annex III, section 6.1	It is stated in Section 6.1 that "Within the bedrock, measured hydraulic gradients indicate that under existing conditions the primary groundwater flow direction is upwards and to the north-northwest (i.e., towards Patterson Lake). In the glacial drift deposits, the groundwater flow direction is downwards and to the north- northwest (i.e., towards Patterson Lake)." It is not clear if this is applicable to the whole modeling domain, or just to the local area around the mine site. A comparison of Figure 19 with Figure 35 indicates that the measured hydraulic heads show an upward gradient within the bedrock, while the simulated hydraulic heads do not. It is not clear what the impact of this inconsistency on the accuracy of the modelled results	Please clarify if this statement in Section 6.1 is applicable for the whole modeling domain. Please provide a discussion on the implication of the inconsistency between the measured and simulated gradients in the bedrock.	NexGen clarifies that the statement in Section 6.1 of Draft EIS Annex III (Hydrogeology Baseline Report) is not specific to the whole modelling domain, but rather to the area of the underground mine. Specifically, within the bedrock in the area of the underground mine adjacent to Patterson Lake, measured hydraulic gradients indicate that under existing conditions, the primary groundwater flow direction is upwards (i.e., towards the sandstone and the surface) and to the north-northwest (i.e., towards Patterson Lake). In the glacial drift deposits near the underground mine adjacent to Patterson Lake, the groundwater flow direction is downwards (i.e., away from the surface) and towards the north-northwest (i.e., towards Patterson Lake). The gradient in the bedrock farther inland may be downward, which would be consistent with recharge from precipitation moving from higher elevations to lower elevations (i.e., Patterson Lake). Overall, predicted hydraulic gradients show a flow direction consistent with flow directions indicated in Figure 19 in Draft EIS Annex III. The underground tailings management facility (UGTMF) is projected onto the section, but near the UGTMF and underground mine, hydraulic gradients indicate groundwater flow in the bedrock is generally upward towards Patterson Lake (i.e., if a particle of water were to be released in the underground mine, it would flow towards Patterson Lake). To the southeast of the UGTMF, downward flow through the bedrock towards the underground is predicted, which is consistent with recharge from precipitation at higher elevation and resulting discharge to lakes at lower elevation. The downward flow direction switches to upward at approximately the location of the underground mine.	n/a

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No.	Department	Project Effects Link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement	NexGen Response	Section in EIS
266	CNSC	Fault zone distribution	Annex III, Section 6.3.3	Section 6.3.3 describes the fault zone and shear zone derived based on the geological model and geophysical survey data. Figures 28, 20 and 30 illustrate the cross sections of the fault zone. But it is not clear how the fault zone extends in the horizontal direction.	Please illustrate the plan view of the fault zone and shear zone in a figure.	Please see Attachment IR 231/264/266/267-1 for NexGen's response to this IR. No changes are proposed in the revised EIS to address this IR.	n/a
267	CNSC	Groundwater flow model calibration	Annex III, Section 6.4, Section 6.5 TSD XIV	1.Figure 31 (Annex III) shows the calibration statistics, but there is no information about the water balance. The model should demonstrate an accurate water balance. The water balance error is the difference between total predicted inflow and total predicted outflow. 2.Section 6.5 (paragraph 4 on page 68) (Annex III) cited (Golder 2022b, Regional Meteorological and Hydrological Characterization Report for the Rook I Project) as the source of the estimates of baseflow. Section 2.4 (in TSD XIV) referenced Annex IV.2, Hydrometric Monitoring Characterization Report. It is not clear which one is the correct source. 3.Section 6.5 (paragraph 4 on page 68) (Annex III) states that "Using the catchment areas for Patterson Lake, this baseflow corresponds to an equivalent recharge rate of approximately 110 mm/yr (3.5 L/s/km^2)". It is not clear where this estimate comes from (i.e., appropriate reference is not clear). If this is a calculation in this modeling exercise (i.e., Annex III), an explanation of how this is calculated should be provided. 4.(Annex III) Paragraph 2 on page 68 references Figure 32 and Figure 35. However, they should be Figure 31.	1.Provide the water balance as a model performance measure. 2.Clarify which reference is the correct reference to obtain the baseflow. 3Explain how to determine the equivalent recharge rate corresponding to the baseflow. 4.Please correct the references to Figure 31.	Responses to part 1 through part 4 of this IR are provided below. 1. Please see Attachment IR 231/264/266/267-1 for NexGen's response to part 1 of this IR. 2. NexGen confirms the document to obtain the baseflow information is Draft EIS Annex IV.1 (Regional Meteorological and Hydrological Characterization Report), which is the Golder 2022b report. NexGen will update the citations in Section 2.4 of revised EIS TSD XIV (Groundwater Flow and Solute Transport Modelling Report) and Section 6.5 of revised EIS Annex III (Hydrogeology Baseline Report) to clear identify that this baseflow information is sourced from revised EIS Annex IV.1. 3. The baseflow estimate for Patterson Lake of 3.5 L/s per km^2 of catchment area is estimated from the March winter low flow rate (Draft EIS Annex IV.1). A unit conversion calculation was then used to convert this baseflow estimate to an equivalent recharge rate of 110 mm/yr: $3.5\,\frac{L}{s * km^2} * \frac{31536000\,s}{year} * \frac{m^3}{1000\,L} * \frac{km^2}{1000 * 1000\,m^2} * \frac{1000\,mm}{m} = 110\,\frac{mm}{year}$ The model average recharge rate of 93 mm/yr (i.e., 2.9 L/s/km^2) is similar to the calculated estimate based on baseflow, and as such is considered to be reasonable. 4. NexGen appreciates the reviewer's comment and confirms the Figure 32 and Figure 35 citations in the first bullet in Section 6.5 of Draft EIS Annex III should both be Figure 31. NexGen will update the first bullet in Section 6.5 of revised EIS Annex III to state: "The calibrated model achieved a normalized root mean squared (nRMS) error of 8.1%, with a root mean square error of 3.7 m and a residual mean error of -0.3 m (Figure 31), which are considered to be reasonable. A strong spatial bias was not observed in the simulated groundwater elevations, as shown on the residual error distribution map in Figure 31."	TSD XIV, Section 2.4; Annex III, Section 6.5
268	ECCC	Wildlife and Wildlife Habitat	Annex VIII.2, Section 3 Section 8 Section 10	Given the potential impact of the Project on caribou, the baseline caribou data is insufficient to understand Project effects to this species. Presence/absence detection was provided by camera traps, incidental observations, winter track and pellet survey. There are no dates associated with the locations of caribou observations from incidental or camera trap surveys, and no explanation of seasonal use of the Project area by caribou. Indigenous knowledge of caribou use in the area is referenced in Section 3 Indigenous and Local Knowledge, but should be summarized in Section 14 and used to determine potential Project effects on caribou.	1. Provide more details on the baseline caribou data including: • dates of all observations; and • a summary of seasonal use of LSA, RSA and caribou home range. 2. Explain how caribou use of the area could be affected by the Project throughout all seasons and life stages (e.g., calving, breeding, travel). 3. Provide a summary of Indigenous knowledge of caribou use of the Project area, including seasonal use.	Responses to part 1, part 2, and part 3 of this IR are provided below. 1. As described in Draft EIS Annex VIII.1 (Wildlife Baseline Report 1 [Mammals, Waterfowl, and Raptors]) and Draft EIS Section 14.3 (Existing Conditions), all available baseline information on caribou in the study area and in SK2 West Administration Unit is included in the Draft EIS. Draft EIS Annex VIII.1 provides dates for track surveys and pellet counts. Seasonal data could be presented from the covert camera captures; however, caribou occur in the area during all seasons, so the additional data would likely add little information and would not change the effects conclusions. Methods used to evaluate caribou use of the area around the Project followed provincial survey and habitat mapping standards. Knowledge of site-specific seasonal use of the study areas is limited by the provincial government's accepted survey methods. Therefore, seasonal habitat use is based on historical collar data, federal and provincial recovery documents, and from peer-reviewed literature. Due to the limited available data, seasonal caribou use of the area around the Project was inferred through the provincial habitat suitability mapping as described in Draft EIS Section 14.2.6.2 (Habitat Mapping). As presented in Draft EIS Section 14.3.1.1 (Habitat Availability), habitat suitability mapping used provincial standards, which apply a combined suitability rating for all seasons for suitable habitat	n/a

Environmental Impact Statement – Federal Indigenous Review Team Information Request Responses

No.	Department	Project Effects Link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement	NexGen Response	Section in EIS
						surrounding the Project in a caribou home range of 435 km^2 estimated by McLoughlin et al. (2016). Habitat values were assigned to land cover types based on the forest ecosite classification system (McLaughlan et al. 2010) and account for varying seasonal habitat values associated with foraging, calving, and predator refuges (ENV 2014). 2. Draft EIS Section 14.5.1 (Woodland Caribou) describes effects specific to the more sensitive late winter, calving, and post-calving periods. 3. Draft EIS Section 14.3.1 (Woodland Caribou) integrates Indigenous Knowledge regarding overall and seasonal use of the study areas, and Draft EIS Section 14.5.1 (Woodland Caribou) incorporates Indigenous Knowledge into the assessment of effects. No changes are proposed in the revised EIS to address this IR. **References** McLaughlan MS, Wright RA, Jiricka RD. 2010. Field Guide to the Ecosites of Saskatchewan's Provincial Forests. Prince Albert, SK: Saskatchewan Ministry of Environment, Forest Service. 338 p. McLoughlin PD, Stewart K, Superbie C, Perry T, Tomchuk P, Greuel R, Singh K, Truchon-Savard A, Henkelman J, Johnstone JF. 2016. Population dynamics and critical habitat of woodland caribou in the Saskatchewan Boreal Shield. Interim Project Report, 2013-2016. Department of Biology, University of Saskatchewan, Saskatoon. 162 pp. ENV (Saskatchewan Ministry of Environment). 2014. Range assessment and range planning for Boreal Plain SK2. PowerPoint presentation from Government of Saskatchewan. 37 slides.	
269	ECCC	Wildlife and Wildlife Habitat	Annex VIII.2, Section 8 Section 10	There is potential for some SAR (e.g., myotis species, barn or bank swallows, common nighthawk) to be attracted to and use mine infrastructure (buildings, roads etc.) for nesting, roosting, or foraging. This carries an increased collision risk.	For all Project phases, describe the mitigation measures and responses to prevent and minimize effects on SAR that may utilize mine infrastructure.	Draft EIS Section 14.4 (Project Interactions and Mitigations) includes information about mitigation measures and responses to prevent and minimize effects on species at risk that may utilize proposed Project infrastructure. Specifically, in Table 14.1-1 of Draft EIS Section 14.4, mitigation is described to apply activity restriction guidelines for sensitive species established by the Government of Saskatchewan (ENV 2017) at the Project, as required. Draft EIS Table 14.4-1 and discussion in Pathway ID W-18 (Vehicle injury and mortality) in Draft EIS Section 14.4.2 (Secondary Pathways) includes mitigations to minimize risk of vehicle injury and mortality, such as awareness training, giving wildlife the right of way, identifying wildlife use areas, reporting observations, and adjusting speed limits. NexGen has also committed to additional mitigations to minimize habitat creation and human/bat interactions in the mine through design, specifically by evaluating opportunities to include screening on vents and entranceways to rafters/attics. As outlined in NexGen's response to IR 127, these commitments will be added to Table 14.4-1 in revised EIS Section 14.4. **References** ENV (Saskatchewan Ministry of Environment). 2017. Activity restriction guidelines for sensitive species. Fish, Wildlife and Lands Branch. Regina Saskatchewan. Accessed January 2020. Available at http://publications.gov.sk.ca/documents/66/89554-Saskatchewan%20Activity%20Restriction%20Guidelines%20for%20Sensitive%20Species%20-%20April%202017.pdf	n/a

Environmental Impact Statement – Federal Indigenous Review Team Information Request Responses

No.	Department	Project Effects Link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement	NexGen Response	Section in EIS
270	ECCC	Wildlife and Wildlife Habitat	Annex VIII.2, Section 10	Surveys confirm common nighthawk occupies the SSA and the LSA. Aerial foraging and road-roosting behavior make this species susceptible to collision.	Provide a mitigation plan to address potential mortality risk to common nighthawk.	Table 14.4-1 in Draft EIS Section 14.4 (Project Interactions and Mitigations) and discussion in Pathway ID W-18 (Vehicle injury and mortality) in Draft EIS Section 14.4.2 (Secondary Pathways) describe mitigations to reduce potential mortality risk to common nighthawk. Key mitigations that would be included as part of the Project Environmental Protection Program and supporting documentation that will be developed in support of federal licensing include providing awareness training, giving wildlife the right of way, identifying wildlife use areas, reporting observations, and adjusting speed limits. No changes are proposed in the revised EIS to address this IR.	n/a
271	ECCC	Wildlife and Wildlife Habitat	Annex VIII.2, Section 10	Surveys confirm that barn swallows and myotis species were detected in association with bridge crossings (e.g., Patterson Creek Bridge). The Wildlife Baseline Report 2 states (with respect to myotis species) that "This infrastructure could serve to provide habitat for both maternal colonies and/or mixed sex groups that often congregate at night when cool temperatures persist" and that barn swallow "breeding habitat within the area of the Project was likely limited to areas with existing infrastructure...".	1. Develop a mitigation plan to reduce risk to myotis species and barn swallows utilizing any bridges or existing infrastructure as a maternal roost and/or roost site or as breeding habitat (nest site), including avoidance of collisions and disturbance. Demonstrate how the planned mitigation activities will result in no residual effects. 2. Explain what mitigation will be used to ensure no damage occurs to barn swallow nests if any bridge or existing infrastructure maintenance or upgrades are required.	NexGen notes reviewer's request for information regarding mitigations for myotis species and barn swallow effects at bridges. Information on mitigations is provided in the Draft EIS and additional mitigations for myotis species will be added to the revised EIS as summarized below. 1. Draft EIS Section 14 (Wildlife and Wildlife Habitat) includes information regarding mitigations to reduce the risk of Project effects to myotis species and barn swallows. Table 14.4-1 in Draft EIS Section 14.4 (Project Interactions and Mitigations) and Draft EIS Appendix 23A (Summary of Project Environmental Design Features and Mitigation Measures) state that if sensitive species are confirmed in the Project footprint, activity restriction guidelines for sensitive species established by the Government of Saskatchewan (ENV 2017) would be applied to the Project, as required. If in specific situations where the setback distance(s) cannot practically be applied, NexGen would contact the Saskatchewan Ministry of Environment (ENV) early in the planning stage to minimize effects on sensitive species. Additional mitigation measures to reduce potential effects to myotis species will be added to Table 14.4-1 in revised EIS Section 14.4 in Pathway ID W-01 (Habitat loss), Pathway ID W-05 (Injury and mortality from clearing), and/or Pathway ID W-19 (Wildlife attractants): ▪ If in specific situations where the setback distance(s) cannot practically be applied, contact the ENV early in the planning stage to minimize effects on sensitive species (Pathway ID W-01 and Pathway ID W-05). ▪ If birds or bats are observed nesting, roosting, or hibernating, do not disturb them, to the extent practicable. Contact the ENV and ECCC [Environment and Climate Change Canada] to discuss measures for removal/relocation and to identify further measures that could prevent future access (Pathway ID W-01 and Pathway ID W-05). ▪ Minimize habitat creation and human-wildlife interactions for the Project through design; specifically, by evaluating opportunities to include screening on vents and entranceways to rafters/attics (Pathway ID W-05 and Pathway ID W-19). ▪ For worker protection and prevention of the spread of rabies and white nose syndrome, contact the ENV and ECCC if any sick, injured, or dead bats are observed. Only trained and rabies-vaccinated staff or contractors would be allowed to handle bats. Submit bat carcasses for testing of rabies and/or white nose syndrome, as appropriate, based on communications with the ENV and ECCC (Pathway ID W-05 and Pathway ID W-19). As noted in Draft EIS Section 14.5.6.3.2 (Significance Determination) and Section 14A2.2 of Draft EIS Appendix 14A (Species at Risk Screening Assessment), no significant residual adverse effects are expected for little brown myotis and barn swallow, respectively. The wildlife monitoring program would be used to demonstrate the effectiveness of the Project mitigations. 2. Mitigations to reduce potential effects on barn swallows focus on preventing barn swallows from building nests or entering structures during the nesting season. The following mitigation measures will be added to Table 14.4-1 in revised EIS Section 14.4 in Pathway ID W-01, Pathway ID W-05, and/or Pathway ID W-19: ▪ If birds or bats are observed nesting, roosting, or hibernating, do not disturb them, to the extent practicable. Contact the ENV and ECCC to discuss measures for removal/relocation and to	Section 14.4

Environmental Impact Statement – Federal Indigenous Review Team Information Request Responses

No.	Department	Project Effects Link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement	NexGen Response	Section in EIS
						identify further measures that could prevent future access (Pathway ID W-01 and Pathway ID W-05). ▪ Minimize habitat creation and human-wildlife interactions for the Project through design; specifically, by evaluating opportunities to include screening on vents and entranceways to rafters/attics (Pathway ID W-05 and Pathway ID W-19). **References** ENV (Saskatchewan Ministry of Environment). 2017. Activity restriction guidelines for sensitive species. Fish, Wildlife and Lands Branch. Regina Saskatchewan. Accessed January 2020. Available at http://publications.gov.sk.ca/documents/66/89554-Saskatchewan%20Activity%20Restriction%20Guidelines%20for%20Sensitive%20Species%20-%20April%202017.pdf	

TBD = to be determined (i.e., specific section updates in the revised EIS will be determined after further consideration); n/a = not applicable (i.e., no changes required in the revised EIS).

NexGen Energy Ltd.

Rook I Project

Environmental Impact Statement

Annex 1 Responses: Supplemental Information

Attachment IR 14-1

Table 1: Valued Components and Intermediate Components, and Associated Reasonably Foreseeable Developments

<table>
<tr><th>Valued Components and Intermediate Components</th><th>Reasonably Foreseeable Developments</th></tr>
<tr><td>Woodland caribou (Rangifer tarandus caribou)</td><td>▪ Fission Patterson Lake South Property
▪ Forestry within SK2 West Caribou Administration Unit (SK2 West):
- Carrier Forest Products has been allocated the Term Supply Licence for the Northwest Area for a 20-year period (2016 to 2036).
- Mistik Management Ltd. has been allocated a Forest Management Area for a 20-year period (2019 to 2039).</td></tr>
<tr><td>Air quality</td><td rowspan="2">Fission Patterson Lake South Property</td></tr>
<tr><td>Noise</td></tr>
<tr><td>Climate change</td><td>Not applicable</td></tr>
<tr><td>Hydrogeology</td><td rowspan="32">Fission Patterson Lake South Property</td></tr>
<tr><td>Hydrology</td></tr>
<tr><td>Surface water and sediment quality</td></tr>
<tr><td>Lake trout (Salvelinus namaycush)</td></tr>
<tr><td>Lake whitefish (Coregonus clupeaformis)</td></tr>
<tr><td>Walleye (Sander vitreus)</td></tr>
<tr><td>Northern pike (Esox lucius)</td></tr>
<tr><td>Terrain and soils</td></tr>
<tr><td>Upland ecosystems</td></tr>
<tr><td>Wetland ecosystems</td></tr>
<tr><td>Riparian ecosystems</td></tr>
<tr><td>Traditional use plants</td></tr>
<tr><td>Moose</td></tr>
<tr><td>Wolf (Canis lupus)</td></tr>
<tr><td>Black bear (Ursus americanus)</td></tr>
<tr><td>Beaver (Castor canadensis)</td></tr>
<tr><td>Little brown myotis (Myotis lucifugus)</td></tr>
<tr><td>Olive-sided flycatcher (Contopus cooperi)</td></tr>
<tr><td>Mallard (Anas platyrhynchos)</td></tr>
<tr><td>Goldeneye (Bucephala clangula)</td></tr>
<tr><td>Rusty blackbird (Euphagus carolinus)</td></tr>
<tr><td>Canadian toad (Anaxyrus hemiophrys)</td></tr>
<tr><td>Human health:
▪ Camp worker
▪ Subsistence harvester
▪ Seasonal resident / lodge operator
▪ Future permanent resident of the Patterson Lake North Arm area</td></tr>
<tr><td>Cultural and heritage resources</td></tr>
<tr><td>Indigenous land and resource use</td></tr>
<tr><td>Other land and resource use</td></tr>
<tr><td>Economy</td></tr>
<tr><td>Community well-being</td></tr>
</table>

Attachment IR 16-1

CLEARWATER RIVER DENE NATION TREATY 8

September 22, 2023

Nicole Frigault
Environmental Assessment Specialist, Technical Support Branch
Canadian Nuclear Safety Commission

RE: Rook I Project – Issues and Concerns Validation

Dear Nicole,

On behalf of the Clearwater River Dene Nation (CRDN) and a primary community stakeholder, please accept this letter as our formal notice that the manner in which NexGen has responded to our issues and concerns raised during Rook I Project (Project) development and environmental assessment (EA) process has been accepted by the CRDN. In addition, the CRDN through our community consultative working approach confirms that all issues and concerns identified at this time have been reviewed and resolved, and for issues and concerns that can only be addressed during the Project lifespan, NexGen and CRDN have developed a meaningful approach to ensure collective resolution methods are in place through our established and recognized working process.

Considering our mutual commitments of the engagement activities completed to date, the CRDN have conveyed to NexGen issues and concerns associated with the proposed Project and its development, where and as applicable. Engagement between NexGen and the CRDN has been ongoing since early Project exploration activities and continued through Project design, and during conduct of the EA by NexGen, which has provided CRDN opportunities to convey our issues and concerns to NexGen, and for NexGen to address them. In addition, during the EA process, representatives of the CRDN participated in the technical review of NexGen's Draft Environmental Impact Statement (EIS) conducted by the Federal-Indigenous Review Team (FIRT). In parallel to the CNSC-led FIRT process, the CRDN have continued to meaningfully engage directly with NexGen by jointly participating in committees formed in connection with the Project and its ongoing EA, which have provided additional opportunities to convey our issues and concerns.

I would also like to mention, NexGen and CRDN have sought to understand proactively and transparently, with collaborate efforts, resolve issues and concerns as they have been raised. It is our understanding that as part of the Federal EA process the CNSC requires confirmation of the process undertaken by CRDN and NexGen to identify, discuss, and resolve key issues and concerns in relation to the Project. By way of this letter, CRDN is confirming that this process has been completed for the purpose of the Federal EA process.

As noted above, CRDN and NexGen have invested countless committed years proactively to address issues and concerns related to the Project as they have arisen, since 2013. To support the Federal EA requirement to validate that issues and concerns have been adequately captured and addressed, NexGen and the CRDN completed a validation process through the Environmental Committee established under the Impact Benefit Agreement between CRDN and NexGen. As part of this process through the Environmental Committee, a

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consolidated list of issues and concerns, along with NexGen's response and the mutually agreed upon key accommodations and mitigations that either have been or will be implemented to resolve the issues and concerns, underwent review through a series of meetings and activities undertaken by the Environmental Committee. Final validation of the consolidated list of issues and concerns, responses provided by NexGen, and mutually agreed upon key mitigations and accommodations occurred during an online workshop conducted between NexGen and CRDN on 25 April 2023. The final issues and concerns documentation resulting from this validation workshop has been provided as an attachment to this cover letter. CRDN's understanding is that this documentation will also be provided within NexGen's Final EIS submission to the CNSC.

In context of our solidified community support, CRDN is completely satisfied that NexGen has addressed or responded to all of CRDN's issues and concerns in a manner acceptable inclusively within the CRDN community and members. Accordingly, through this letter, we formally acknowledge and confirm to the CNSC that the way in which NexGen has addressed or responded to the CRDN's key issues and concerns has been accepted by CRDN.

Should you require further information on this item and file, please contact our Engagement Lead Camm Willier at: cammer7@shaw.ca and on cell at (403) 505-6319.

Marci chó,

Chief Teddy Clark

Cc: CRDN Council Elect
CRDN Engagement Team
Leigh Curyer, President of NexGen
Adam Engdahl, Vice President – Community, NexGen
Luke Moger, Vice President – Environment, Permitting & Licensing, NexGen

Table 5.3-1 Summary of Issues and Concerns Received from Clearwater River Dene Nation and Responses

Issue ID	Topic (or Theme)	CRDN Key Interests and Concerns	Summary of Response	Where Interest or Concern is Reflected in EIS	Key Accommodations
CRDN-001	Engagement	Concern about how NexGen would balance engagement activities among communities and Indigenous Groups.	Engagement with local Indigenous Groups is foundational to the responsible development of the Project. NexGen has always valued and respected the culture, interests, and aspirations of the communities where it operates and will continue to do so. NexGen established the LPA based on feedback from Indigenous Groups and communities to focus NexGen engagement on the communities who will be directly affected by the Project. A variety of engagement methods and activities have been implemented to monitor and validate NexGen's approach, with the goals of achieving the objectives of the engagement program and optimizing Project outcomes for Indigenous Groups and communities. Engagement with Indigenous Groups and communities will continue to take place throughout the Project lifespan. Engagement programs will continue to evolve in collaboration with Indigenous Groups and communities and consider engagement approaches and protocols already developed or being developed. Engagement will continue to be tailored to the unique needs of each Indigenous Group, which includes regular evaluation to verify that the engagement program is meeting their needs.	Section 1 (Introduction): Section 1.1.6 (Working with People). Section 2 (Indigenous, Regulatory, and Public Engagement): Section 2.3 (Engagement Framework), Section 2.5.2 (Indigenous Engagement Methods), Appendix 2A (Summary of Indigenous Group Engagement Activities), Appendix 2B (Summary of Issues Identified by Indigenous Groups)	▪ Signed Study Agreements with all four primary Indigenous Groups that, among other things, include the following: – Develop a JWG structure for each Indigenous Group to support the inclusion of Indigenous Knowledge into the EA process and to facilitate regular, ongoing engagement. – Explore special interest topics for each Indigenous Group. – Establish a Community Coordinator position in each Indigenous Group to act as the primary contact between NexGen and the Indigenous Group. ▪ Develop customized engagement strategies for Indigenous Groups and stakeholders. ▪ Implement an Indigenous and Public Engagement Program to share information on Project plans and activities. ▪ Implement Benefit Agreements that include the establishment of an Implementation Committee to communicate regularly and to reach early resolution of issues and/or disputes that may arise.
CRDN-002	Engagement	Concern that NexGen would not conduct thorough engagement with Indigenous Groups.	Engagement with local Indigenous Groups is foundational to the responsible development of the Project. NexGen has always valued and respected the culture, interests, and aspirations of the communities where it operates and will continue to do so. Engagement with Indigenous Groups began prior to commencement of the preparation of the EIS and has continued to the present; engagement will continue through all phases of the Project. A variety of engagement methods and activities have been implemented to monitor and validate NexGen's approach, with the goals of achieving the objectives of the engagement program and optimizing Project outcomes for Indigenous Groups.	Section 1 (Introduction): Section 1.1.6 (Working with People) Section 2 (Engagement): Section 2.3 (Engagement Framework), Section 2.5.2 (Indigenous Engagement Methods), Appendix 2A (Summary of Indigenous Group Engagement Activities), Appendix 2B (Summary of Issues Identified by Indigenous Groups)	▪ As a foundational principle, NexGen acknowledges and values the community interests and aspirations of those potentially affected by the Project. NexGen fosters trusting relationships that facilitate collaboration and optimize benefits to Indigenous Groups and Project stakeholders by: – respecting the diverse cultures and perspectives of those with whom the Project interacts; – proactively and transparently engaging with Project-affected communities; – enhancing workers' awareness of the history, traditions, and rights of Indigenous Peoples; – supporting the economic participation of local communities; – seeking to provide opportunities resulting from Project benefits to local communities, especially opportunities with the ability to last beyond the Project lifespan; and – providing clear and timely information to those who have a direct interest in the Project. ▪ Implement Benefit Agreements that include the establishment of an Implementation Committee and any necessary subcommittees to communicate regularly and to reach early resolution of issues and/or disputes that may arise. ▪ Engagement with Indigenous Groups will continue to take place throughout the Project lifespan. Engagement programs have been and will continue to evolve in collaboration with Indigenous Groups and consider engagement approaches and protocols already developed by the communities. ▪ Engagement will continue to be tailored to the unique needs of each Indigenous Group, which includes regular evaluation to verify that the engagement program is meeting their needs.

CRDN-003	Cumulative Effects	Concern about cumulative effects, especially with two proposed uranium mines in close proximity to Patterson Lake. Desire to understand the methods used for cumulative effects assessments and if the predicted results can be trusted.	The EIS explains the methodology of how potential cumulative effects of the Project; previous, existing, and approved projects; and RFDs were assessed. The potential cumulative effects of the Project and RFDs were considered throughout the EIS. Individual disciplines (Sections 7, 9 to 11, and 13 to 19) further describe the assessment of potential cumulative effects specific to each discipline. These sections also describe the uncertainties associated with the assessment of cumulative effects, where appropriate. The RFD Case assessed the residual effects from the Project plus the effects from other previous, existing, approved, and future projects and activities. The rationale for completing or not completing an RFD Case is provided in each discipline section. In slight contrast to the effects analyses for the Base and Application cases, which are largely quantitative, the analysis for the RFD Case was quantitative where possible and qualitative where necessary, based on the information available. As a scenario within the RFD Case (where applicable), potential effects from climate change were considered within the EIS.	Section 6 (Environmental Assessment Approach and Methods: Section 6.5.3 (Reasonably Foreseeable Development Case) Section 7 (Air Quality, Noise, and Climate Change): Section 7.2.5.2 (Reasonably Foreseeable Development Case), Section 7.3.5.2 (Reasonably Foreseeable Development Case), Section 7.4.5.2 (Reasonably Foreseeable Development Case) Section 9 (Hydrology): Section 9.6.2 (Reasonably Foreseeable Development Case), Section 9.6.3 (Reasonably Foreseeable Development Case [including Climate Change]) Section 10 (Surface Water and Sediment Quality): Section 10.5.2 (Reasonably Foreseeable Development Case) Section 11 (Fish and Fish Habitat): Section 11.5.3 (Reasonably Foreseeable Development Case) Section 13 (Vegetation): Section 13.5.1.2 (Reasonably Foreseeable Development Case), Section 13.5.2.2 (Reasonably Foreseeable Development Case), Section 13.5.3.2 (Reasonably Foreseeable Development Case), Section 13.5.4.2 (Reasonably Foreseeable Development Case) Section 14 (Wildlife and Wildlife Habitat): Section 14.5.1.2 (Reasonably Foreseeable Development Case), Section 14.5.2.2 (Reasonably Foreseeable Development Case), Section 14.5.3.2 (Reasonably Foreseeable Development Case), Section 14.5.4.2 (Reasonably Foreseeable Development Case), Section 14.5.5.2 (Reasonably Foreseeable Development Case), Section 14.5.6.2 (Reasonably Foreseeable Development Case), Section 14.5.7.2 (Reasonably Foreseeable Development Case), Section 14.5.8.2 (Reasonably Foreseeable Development Case), Section 14.5.9.2 (Reasonably Foreseeable Development Case), Section 14.5.10.2 (Reasonably Foreseeable Development Case), Section 14.5.11.2, (Reasonably Foreseeable Development Case) Section 15 (Human Health):	▪ The RFD Case includes the Base Case, Application Case, and RFDs. This case was used to identify and assess potential cumulative effects on VCs and intermediate components (i.e., relative to existing conditions) derived from the addition of the proposed Project and RFDs. For the purposes of the EA, RFDs are defined as projects and activities that fit any of the first three and both of the last two criteria from the list below: – are currently under regulatory review or have officially entered a formal regulatory application process; – have been publicly disclosed by other proponents; – may be induced by the Project; – have the potential to change the Project or the effects predictions; and – occur in the spatial assessment boundary defined by the VCs and intermediate components. ▪ A key criterion for selecting other projects to include in the EA for a discipline is that those projects must cause similar effects on the same VCs or intermediate components influenced by the Project (Hegmann et al. 1999). Accordingly, an RFD Case was not required for all VCs and intermediate components as it depended on whether or not effects from the RFDs would have the potential to overlap with the selected VCs and intermediate components within the spatial and temporal assessment boundaries defined for the Project. – The Fission Patterson Lake South Project (i.e., another proposed uranium mine in close proximity to Patterson Lake) was deemed an RFD based on the criteria listed above.

Table 5.3-1 Summary of Issues and Concerns Received from Clearwater River Dene Nation and Responses

Issue ID	Topic (or Theme)	CRDN Key Interests and Concerns	Summary of Response	Where Interest or Concern is Reflected in EIS	Key Accommodations
				Section 15.5.2 (Reasonably Foreseeable Development Case) Section 16 (Cultural and Heritage Resources and Indigenous Land and Resource Use): Section 16.5.3 (Reasonably Foreseeable Development Case) Section 17 (Other Land and Resource Use): Section 17.5.2 (Reasonably Foreseeable Development Case) Section 18 (Economy): Section 18.5.2 (Reasonably Foreseeable Development Case) Section 19 (Community Well-being): Section 19.5.2 (Reasonably Foreseeable Development Case)	
CRDN-004	Project Information	The CRDN expressed a lack of understanding about Project Construction, Operations, and Closure phases. A desire to learn more about the Project as information became available was conveyed.	Through a collaborative process, NexGen and the CRDN determined the appropriate methods for Project engagement, culminating in the Study Agreement signed in 2019. NexGen has been respectful in following the terms of the Study Agreement. For example, the Study Agreement included capacity funding for the CRDN to hire a Community Coordinator, with one of the key purposes of the role to work with NexGen to prepare and coordinate information packages and communications for Project-related engagement activities. Project information was provided during the engagement process and is detailed within the EIS. The EIS describes the Project phases and design components and activities, including the extraction process and the decommissioning and reclamation plans at Project Closure. NexGen is committed to continue meeting with the CRDN to ensure Project information is properly conveyed and understood.	Section 2 (Indigenous, Regulatory, and Public Engagement): Section 2.5.2 (Indigenous Engagement Methods), Section 2.6.1.1 (Summary of Indigenous Engagement Activities) Section 5 (Project Description): Section 5.4 (Project Components), Section 5.5 (Project Activities)	▪ NexGen and the CRDN collaboratively determined the appropriate methods for engagement, culminating in the Study Agreement signed in 2019. ▪ Through mechanisms such as the JWGs and June 2022 community information sessions, information on the Project was shared with CRDN members, including discussion of activities conducted through each of the Construction, Operations, and Closure Phases. ▪ Additional communication methods were established based on feedback received from Indigenous Groups, including the CRDN, to promote understanding of the Project through the broader community. These included developing JWG summaries for Indigenous Groups to share with community members, developing and circulating Community Newsletters, and conducting radio announcements providing Project updates. ▪ Establish an Implementation Committee to provide a forum for regular communication and information exchange between NexGen and communities. ▪ NexGen will continue to work with the CRDN to implement the best methods to convey Project information to the community and execute these methods accordingly.
CRDN-005	Community Well-being	Potential for increased social and family issues due to an influx of workers and capital (i.e., gambling, drinking, substance abuse, and family violence).	Amplification of community issues from increased disposable income was considered in the EA through potential changes to societal and cultural well-being and health well-being, which were two of the measurement indicators for the community well-being VC.	Section 19 (Community Well-Being): Section 19.2.2 (Valued Components, Measurement Indicators, and Assessment Endpoints), Section 19.4 (Project Interactions and Mitigations) Table 19.4-1 (Effects Pathways for Community Well-Being), Pathway ID CWB-04, Section 19.4.3 (Secondary Pathways)	▪ Provide employment readiness training for employees. ▪ Develop and implement human resource policies (e.g., EFAP) to assist workers in finding information and referral services for family-related resources, as required. ▪ Develop and implement a pre-Construction communications process to raise public awareness in communities of potential Project opportunities and effects. ▪ Establish an Implementation Committee to provide a forum for regular communication and information exchange between NexGen and communities for effective management of Benefit Agreement commitments and for the early resolution of issues and/or disputes that may arise.

Table 5.3-1 Summary of Issues and Concerns Received from Clearwater River Dene Nation and Responses

Issue ID	Topic (or Theme)	CRDN Key Interests and Concerns	Summary of Response	Where Interest or Concern is Reflected in EIS	Key Accommodations
CRDN-006	Human Health	Concern about human health (e.g., cancer) and radiation risks for workers, and how these would be monitored.	Uranium mines and mills are required to satisfy licence and permitting requirements from the CNSC and provincial authorities. For this reason, radiation risks for nuclear energy workers were not assessed within the EIS; rather, these risks are managed through the Radiation Protection Program and Health and Safety Program. The incremental radiation doses to all human receptors during the Project lifespan and the far-future projection were assessed.	Section 5 (Project Description): Section 5.7 (Integrated Management System) Section 15 (Human Health): Section 15.2.2 (Valued Components, Measurement Indicators, and Assessment Endpoints), Section 15.4 (Project Interactions and Mitigations), Table 15.4-1 (Potential Effects Pathways for Human Health), Pathway ID HH-01, Section 15.5.1.2 (Carcinogens), Section 15.5.1.3 (Radionuclides and Radon), Section 15.8 (Monitoring, Follow-up, and Adaptive Management)	▪ The management system approach for the Project would include a Radiation Protection Program to keep worker radiological exposures as low as reasonably achievable. The Radiation Protection Program would include dosimetry and contamination monitoring: – Exposures to gamma radiation, long-lived radioactive dust, radon progeny, and radon gas would be routinely monitored for workers designated as nuclear energy workers. – Chemical, physical, or biological health and safety hazards encountered by workers during all phases of the Project would be monitored in accordance with established sample collection and analysis methods to quantify exposure and risk to workers and confirm the effectiveness of applicable controls. ▪ In addition, NexGen would implement the Environmental Protection Program, which would describe the processes required to monitor and characterize emissions from Project facilities and activities, monitor and characterize the quality of the environment to assess the effectiveness of mitigations, and to continually improve environmental protection performance throughout all Project phases.
CRDN-007	Access, Indigenous Land and Resource Use	Increased development and access will result in increased competition from non-Indigenous recreational hunters and land users.	Changes to the availability of fish, plants, and wildlife for harvesting was a measurement indicator for assessing potential effects on Indigenous land and resource use, and effects from increased access and competition for resources was considered in the EA.	Section 16 (Cultural and Heritage Resources and Indigenous Land and Resource Use): Section 16.2.2 (Valued Components, Measurement Indicators, and Assessment Endpoints), Section 16.4 (Project Interactions and Mitigations) Table 16.4-1 (Potential Adverse Effects Pathways for Indigenous Land and Resource Use), Pathway ID ILU-04, Section 16.4.2 (Secondary Pathways)	▪ Install a gate at the site entrance (i.e., gatehouse) to control public access. ▪ Use existing road infrastructure, including existing access road and bridge crossing. ▪ Implement a Security Program to provide safe and coordinated access via the access road to locations where other land and resource use is practiced. ▪ Identify Indigenous land users in Security Program supporting documentation and outline the process to allow continued access to areas of importance. ▪ Develop and implement a Preliminary Decommissioning and Reclamation Plan with government and Indigenous communities to decommission and transfer the site to the province under the Institutional Control Program.
CRDN-008	Country Foods, Community Well-being	Concern about ability to harvest country foods and associated implications surrounding food security and community well-being.	Changes to the availability of fish, plants, and wildlife for harvesting was a measurement indicator for assessing potential effects on Indigenous land and resource use, and changes in abundance and distribution was considered in the EA. The importance of traditional diets and food security for Indigenous Groups is acknowledged as an important component of community well-being. In the EA, country foods was considered in a secondary pathway related to the involvement in Project-related employment potentially reducing opportunities for resource harvesting, which could affect the amount of country foods in a traditional diet.	Section 16 (Cultural and Heritage Resources and Indigenous Land and Resource Use), Section 16.2.2 (Valued Components, Measurement Indicators, and Assessment Endpoints), Section 16.4 (Project Interactions and Mitigations), Table 16.4-1 (Potential Adverse Effects Pathways for Indigenous Land and Resource Use), Pathway ID ILU-02, Section 16.5.1.2 (Availability of Fish, Plants, and Wildlife for Harvesting) Section 19 (Community Well-being): Section 19.2.2 (Valued Components, Measurement Indicators, and Assessment Endpoints), Section 19.4 (Project Interactions and Mitigations), Table 19.4-1 (Effects Pathways for Community Well-being), Pathway ID CWB-03, Section 19.4.3 (Secondary Pathways)	▪ Limit the Project footprint to the extent practical using practices such as: – optimizing use of cleared areas for Project activity – using existing road infrastructure, including existing access road and bridge crossing – storing tailings underground – designing an efficient infrastructure footprint (i.e., buildings clustered together) ▪ Implement progressive reclamation and revegetation of disturbed areas no longer required. ▪ Reclaim and revegetate areas where non-permanent Project facilities have been decommissioned. ▪ Work with local communities to develop culturally sensitive employment policies to facilitate involvement in resource harvesting activities. ▪ Support and promote Indigenous community participation and employment in the traditional economy. ▪ Work with local Indigenous Groups and communities to develop fishing policies that consider both fisheries protection and traditional use activities. ▪ Implement Benefit Agreements, including: – funding and human resources to support community-related initiatives including but not limited to cultural and traditional values; and – the establishment of the Implementation Committee to communicate regularly and to reach early resolution of issues and/or disputes that may arise. ▪ Establish an Environmental Committee to monitor environmental performance of the Project. ▪ Provide funding for full-time independent Indigenous Monitors to enable unrestricted environmental monitoring, subject to the Indigenous Monitor complying with appropriate health and safety and other reasonable site-specific requirements.

Table 5.3-1 Summary of Issues and Concerns Received from Clearwater River Dene Nation and Responses

Issue ID	Topic (or Theme)	CRDN Key Interests and Concerns	Summary of Response	Where Interest or Concern is Reflected in EIS	Key Accommodations
CRDN-009	Human Health, Harvested Resources	Potential for human health risk from consuming harvested resources (i.e., vegetation, animals, and fish) that may be contaminated.	Emission and deposition of fugitive dust, radon, criteria air contaminants, and suspended solids as well as discharge of treated effluent and site runoff were assessed as potential effects that may adversely affect human health receptors through food ingestion. Emissions and effluent discharges will be in accordance with provincial standards and licence/permit conditions criteria established by regulators through provincial permitting and federal licensing processes.	Section 15 (Human Health): Section 15.4 (Project Interactions and Mitigations), Table 15.4-1 (Potential Effects Pathways for Human Health), Pathway ID HH-01, HH-02, HH-03, HH-04, Section 15.5.1.1 (Non-carcinogens), Section 15.5.1.2 (Carcinogens), Section 15.5.1.3 (Radionuclides and Radon)	▪ Optimize haul routes to reduce fuel consumption and emissions from equipment. Apply water and/or suppressants to site roads, access road, and airstrip, as necessary. Use dust suppressants that minimize environmental risk and are government-approved for use. ▪ Primarily use liquid natural gas for power generation, which generates lower emissions per unit of energy produced than diesel, for on-site power generation. ▪ Install and operate an ETP and a STP to reduce release of COPCs (e.g., major ions, metals, radionuclides) to the environment and discharge treated effluent and treated sewage to Patterson Lake. ▪ Monitor treated effluent and treated sewage flow and quality. ▪ Collect, store, and routinely monitor contact water to confirm discharge water meets water quality criteria appropriate for release. ▪ Collect and monitor contact water to determine whether treatment is required prior to release to the environment. Implement a Project-specific Environmental Protection Program. ▪ Implement a Project-specific Industrial Air Source Environmental Protection Plan. ▪ Implement a Project-specific Effluent Monitoring Plan that includes monitoring the quality of treated effluent prior to release to the environment. ▪ Implement a Project-specific Environmental Monitoring Plan that includes ambient air monitoring and adaptive management based on ambient air quality standards, and water quality monitoring and adaptive management if necessary.
CRDN-010	Noise, Indigenous Land and Resource Use	Potential for loss of aesthetic appreciation due to noise disturbance.	Key Project aspects such as an underground mining method and underground disposal of tailings reduce the amount of required infrastructure and equipment on surface. The reduced surface infrastructure results in a smaller footprint, and subsequently, smaller-sized surface equipment is required. These elements contribute to lower potential for the creation of noise disturbance. Changes to the quality of the Indigenous land use experience related to sensory disturbance was considered in the EA and was a measurement indicator for Indigenous land and resource use.	Section 16 (Cultural and Heritage Resources and Indigenous Land and Resource Use): Section 16.2.2 (Valued Components, Measurement Indicators, and Assessment Endpoints), Section 16.4 (Project Interactions and Mitigations), Table 16.4-1 (Potential Adverse Effects Pathways for Indigenous Land and Resource Use), Pathway ID ILU-03, Section 16.5.1.3.1 (Noise)	▪ Implement procedures to reduce noise levels such as: enclosing or dampening equipment in process buildings where the total sound power level is expected to be more than approximately 80 dBA, where feasible; and using noise suppression (i.e., mufflers) on vehicles and inspect regularly to make sure noise suppression systems are functioning properly. ▪ Implement Benefit Agreements including the establishment of an Environmental Committee to monitor environmental performance of the Project. ▪ Provide funding for full-time independent Indigenous Monitors to enable unrestricted environmental monitoring, subject to the Indigenous Monitor complying with appropriate health and safety and other reasonable site-specific requirements. ▪ Implement an Indigenous and Public Engagement Program that includes both engaging Indigenous land users to share Project information and address any issues as they arise and sharing environmental monitoring results with local communities. The program would include a Project feedback and grievance mechanism to record and action issues identified.
CRDN-011	Surface Water, Fishing	Concern about Project effects on waterbodies affecting the ability to harvest fish, including commercial harvests.	Changes to access and the area available for land and resource use were assessed in the EA and changes to the availability and quality of fish for harvesting were assessed in the pathway analyses. Both the access and the area available for land and resource use and availability of fish and wildlife for harvesting were measurement indicators in the assessment of Indigenous land and resource use and other land and resource use. NexGen is committed to maintaining diverse, open, and transparent two-way communication channels that build trust and confidence of local Indigenous Groups and the public; and monitoring and assessing against indicators and targets based on science and Indigenous and Local knowledge.	Section 16 (Cultural and Heritage Resources and Indigenous Land and Resource Use): Section 16.2.2 (Valued Components, Measurement Indicators, and Assessment Endpoints), Section 16.4 (Project Interactions and Mitigations), Table 16.4-1 (Potential Adverse Effects Pathways for Indigenous Land and Resource Use), Pathway ID ILU-01, ILU-02, Section 16.4.3 (Primary Pathways), Section 16.5.1.1 (Access to and Area Available for Land and Resource Use), Section 16.5.1.2.1 (Fishing) Section 17 (Other Land and Resource Use): Section 17.2.2 (Valued Components, Measurement Indicators, and Assessment Endpoints), Section 17.4 (Project Interactions and Mitigations), Table 17.4-1 (Potential Adverse Effects Pathways for Other Land and Resource Use), Pathway ID OLU-01, OLU-03, Section 17.4.2 (Secondary Pathways), Section 17.5.1.1 (Access to and Area Available for Land and Resource Use)	▪ Implement mitigations that avoid and limit effects on fish, such as: – Install and operate an ETP and a STP to reduce release of COPCs (e.g., major ions, metals, radionuclides) to the environment and discharge treated effluent and treated sewage to Patterson Lake. – To the extent practical, construct work areas to avoid critical or sensitive habitat (e.g., riparian zones) following best practices and regulatory requirements. – Install appropriate erosion and sediment control measures, as required. Regularly inspect erosion and sediment control measures to confirm they are functioning as planned, and perform any required maintenance, as needed. – Establish appropriate site drainage. – Apply DFO's *Measures to Avoid Causing Harm to Fish and Fish Habitat* (DFO 2019b) to minimize potential adverse effects on aquatic resources. ▪ Implement a Project-specific Environmental Monitoring Plan. ▪ Implement a Project-specific Effluent Monitoring Plan. ▪ Implement a Project-specific Groundwater Protection and Monitoring Plan. ▪ Implement Indigenous and Public Engagement Program to share information on Project plans and activities. The program would include a Project feedback and grievance mechanism to record and action issues identified. ▪ Establish an Environmental Committee to monitor environmental performance of the Project. ▪ Provide funding for full-time independent Indigenous Monitors to enable unrestricted environmental monitoring, subject to the Indigenous Monitor complying with appropriate health and safety and other reasonable site-specific requirements. ▪ Implement Benefit Agreements including the establishment of the Implementation Committee to communicate regularly and to reach early resolution of issues and/or disputes that may arise.

Table 5.3-1 Summary of Issues and Concerns Received from Clearwater River Dene Nation and Responses

Issue ID	Topic (or Theme)	CRDN Key Interests and Concerns	Summary of Response	Where Interest or Concern is Reflected in EIS	Key Accommodations
CRDN-012	Navigability	Project effects limiting the ability to travel along the waterways within CRDN traditional territory.	For the EA, the changes in access to and areas available for Indigenous land and resource use was a measurement indicator and was assessed, including consideration for potential changes in access to waterways or surface water elevations because of the Project.	Section 16 (Cultural and Heritage Resources and Indigenous Land and Resource Use): Section 16.2.2 (Valued Components, Measurement Indicators, and Assessment Endpoints), Section 16.4 (Project Interactions and Mitigations), Table 16.4-1 (Potential Adverse Effects Pathways for Indigenous Land and Resource Use), Pathway ID ILU-01, Section 16.5.1.1 (Access to and Area Available for Land and Resource Use)	• N/A
CRDN-013	Water Quality	Potential for Project effects on water quality in the region, especially Patterson Lake and the Clearwater River.	Several effects pathways assessed Project components/activities effects on local and regional waterbodies and watercourses. Primary effects pathways that were assessed included deposition of fugitive dust emissions on waterbodies, deposition of criteria air contaminant emissions on waterbodies, discharge of treated effluent, discharge of treated sewage, seepage from the waste rock storage areas during construction and Operations, and runoff and seepage from the waste rock storage areas and underground tailings management facility following Closure. In addition, a number of secondary pathways were considered in the EA.	Section 10 (Surface Water Quality and Sediment Quality): Section 10.4 (Project Interactions and Mitigations), Table 10.4-1 (Potential Adverse Effects Pathways for Surface Water Quality and Sediment Quality), Pathway ID SWQ-01, SWQ-02, SWQ-03, SWQ-04, SWQ-05, SWQ-06, SWQ-08, SWQ-09, SWQ-10, Section 10.4.2 (Secondary Pathways), Section 10.5.1 (Application Case)	▪ Collect, store, and routinely monitor contact water to confirm discharge water meets water quality criteria appropriate for release. ▪ Monitor treated effluent flow and quality. ▪ Treat sewage to appropriate release limits in accordance with provincial standards and licence/permit conditions. ▪ Monitor treated sewage flow and quality. ▪ Implement a Project-specific Industrial Air Source Environmental Protection Plan. ▪ Implement Project-specific monitoring programs (e.g., Effluent Monitoring Plan, Environmental Monitoring Plan) that include ambient air monitoring, surface water quality monitoring, sediment quality monitoring and adaptive management, if necessary. ▪ Implement a Project-specific Environmental Protection Program. ▪ Implement a Project-specific Groundwater Protection and Monitoring Plan. ▪ Implement a Project-specific Mine Waste Management Plan and site water management procedures.
CRDN-014	Water	Concern regarding the capture, management, and treatment of water, including high-water events.	Through the Project design phases, NexGen has consolidated the surface infrastructure layout (i.e., buildings clustered together) to minimize the footprint, and subsequently, the volume of contact water requiring capture and/or treatment. The EIS describes the infrastructure, management, and treatment of water and effluent. The potential risks to the Project associated with major precipitation events were also assessed and determined that all scenarios had a low risk level.	Section 5 (Project Description): Section 5.4.5 Site Water Management Section 22 (Effects of the Environment): Section 22.6.3 Major Precipitation Events	▪ Reduce fresh water consumption to minimize fresh surface water usage and withdrawals. ▪ Divert non-contact water to the extent practicable and allow for discharge directly to the receiving environment. Manage non-contact water that cannot be diverted away as contact water. ▪ Collect, capture, and contain contact water. Reuse contact water where possible. Treat and manage water quality relative to environmental release targets as required before release to the environment. ▪ To maintain channel integrity, both diversion ditches and collection ditches would be provided with erosion control measures reflective of ditch slopes and flows rates, where required. ▪ The Emergency Preparedness and Response Program would include processes for responding to and mitigating the effects of major precipitation events as required. In addition, site water management processes would be developed and implemented that include direction for monitoring effectiveness of site water management infrastructure. ▪ During Construction and Operations, a Preliminary Decommissioning and Reclamation Plan would be developed and periodically updated to reflect changing site-specific conditions and effects of major precipitation events on engineered cover systems for the potentially acid generating and non-potentially acid generating waste rock storage areas, as required.

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Issue ID	Topic (or Theme)	CRDN Key Interests and Concerns	Summary of Response	Where Interest or Concern is Reflected in EIS	Key Accommodations
CRDN-015	Safety, Tailings	Concern regarding the safety of storing tailings in the UGTMF.	NexGen is dedicated to minimizing potential effects on the environment throughout all phases of the Project through incorporating proven best practices and designs around mine planning and tailings management. The safety of mine tailings storage on people and the environment was considered and assessed in the EIS: • potential for seepage from the UGTMF after Closure; • potential for the Project to cause adverse effects on human health from various Project sources, including the UGTMF; • potential accident and malfunction scenarios that could affect the UGTMF; and • potential effects of a seismic event on the Project, including the UGTMF.	Section 8 (Hydrogeology): Section 8.4 (Project Interactions and Mitigations), Table 8.4-1 (Potential Effects Pathways for Groundwater Quantity and Quality), Pathway ID HG-04, Section 8.4.3 (Primary Pathways), Section 8.5.1 (Application Case) Section 10 (Water Quality and Sediment Quality): Section 10.4 (Project Interactions and Mitigations), Table 10.4-1 (Potential Adverse Effects Pathways for Surface Water Quality and Sediment Quality), Pathway ID SWQ-06, Section 10.4.3 (Primary Pathways), Section 10.5.1 (Application Case) Section 11 (Fish and Fish Habitat): Section 11.4 (Project Interactions and Mitigations), Table 11.4-1 (Potential Effects Pathways for Fish and Fish Habitat), Pathway ID F-01, Section 11.4.3 (Primary Pathways), Section 11.5.2 (Application Case) Section 13 (Vegetation): Section 13.4 (Project Interactions and Mitigations), Table 13.4-1 (Potential Effects Pathways for Vegetation), Pathway ID V-11, Section 13.4.2 (Secondary Pathways) Section 14 (Wildlife and Wildlife Habitat): Section 14.4 (Project Interactions and Mitigations), Table 14.4-1 (Potential Effects Pathways for Wildlife and Wildlife Habitat), Pathway ID W-14, Section 14.4.2 (Secondary Pathways) Section 15 (Human Health): Section 15.4 (Project Interactions and Mitigations), Table 15.4-1 (Potential Effects Pathways for Human Health), Pathway ID HH-06, Section 15.4.3 (Primary Pathways), Section 15.5.1 (Application Case) Section 21 (Accidents and Malfunctions): Section 21.6.2 (Selection of Bounding Scenarios), Table 21.6-2 (Bounding Scenarios Considered in the Accidents and Malfunctions Assessment and Associated Mitigations), Section 21.6.6 (Bounding Scenario 4) Section 22 (Effects of the Environment), Section 22.6.7 (Seismic Events)	▪ The design of the tailings transfer system would be completed in accordance with the American Society of Mechanical Engineers B31.2 - 2020, Process Piping code. American Society of Mechanical Engineers B31.3 is a mechanical code that deals mostly with mechanical safety to prevent sudden release of energy (e.g., pipe bursts). ▪ An Environmental Protection Program and an Emergency Preparedness and Response Program would be implemented for the Project and would include mitigation and emergency response measures related to the potential for a leak or spill associated with the tailings transfer pipe. ▪ Use engineered cemented paste backfill and tailings to control source concentrations. ▪ Apply binder to reduce permeability in backfill and tailings. ▪ Engineer the tailings geochemistry to control source concentrations. ▪ Develop and implement a Detailed Decommissioning and Reclamation Plan to decommission and transfer the site to the Province under the Institutional Control Program.

Table 5.3-1 Summary of Issues and Concerns Received from Clearwater River Dene Nation and Responses

Issue ID	Topic (or Theme)	CRDN Key Interests and Concerns	Summary of Response	Where Interest or Concern is Reflected in EIS	Key Accommodations
CRDN-016	Wildlife	Potential for Project effects on moose (*Alces alces*) populations and moose habitat.	The assessment of potential Project effects on moose included the measurement indicators of habitat availability, habitat distribution, and survival and reproduction. Primary pathways assessed included habitat loss, habitat alteration, and sensory disturbance. A number of no pathways and secondary pathways were also assessed in the EA.	Section 14 (Wildlife and Wildlife Habitat): Section 14.2.2 (Valued Components, Measurement Indicators, and Assessment Endpoints), Section 14.4 (Project Interactions and Mitigations), Table 14.4-1 (Potential Effects Pathways for Wildlife and Wildlife Habitat), Pathway ID W-01, W-02, W-03, W-04, W-05, W-06, W-07, W-08, W-09, W-10, W-11, W-12, W-13, W-14, W-15, W-16, W-18, W-19, W-20, W-21, W-22, W-23, W-24, W-25, Section 14.4.1 (No Pathways), Section 14.4.2 (Secondary Pathway), Section 14.5.2.1 (Application Case)	▪ Limit the Project footprint to the extent practical using practices such as: − optimizing the use of cleared areas for Project activity − using existing road infrastructure, including the existing access road and bridge crossing − storing tailings underground − designing an efficient infrastructure footprint (i.e., buildings clustered together) ▪ Implement an Environmental Protection Program that includes no harassing, feeding, or approaching wildlife. ▪ Establish an Implementation Committee that will discuss the appropriate level of opportunity for the workforce to conduct land and resource use activities while on shift. ▪ Minimize areas of vegetation clearing and soil disturbance. ▪ Implement progressive reclamation and revegetation of disturbed areas no longer required. ▪ Reclaim and revegetate areas where non-permanent Project facilities have been decommissioned.
CRDN-017	Access, Knowledge Transmission	Concern regarding limitation of access to land, including the effect that this may have on transferring traditional knowledge to younger generations.	One of NexGen's preliminary decommissioning and reclamation objectives for the Project is to establish a closure landscape that would be accessible for unrestricted traditional use by Indigenous Groups and local communities. Changes to access to and area available for Indigenous land and resource use was assessed as an effects pathway and was a measurement indicator in the EA. Continued ability to participate in Indigenous land and resource use activities was included as an assessment endpoint, which considered the importance of intergenerational transmission of knowledge.	Section 5 (Project Description): Section 5.3.2 Design Objectives and Guiding Principles Section 16 (Cultural and Heritage Resources and Indigenous Land and Resource Use): Section 16.2.2 (Valued Components, Measurement Indicators, and Assessment Endpoints) Section 16.4 (Project Interactions and Mitigations), Table 16.4-1 (Potential Adverse Effects Pathways for Indigenous Land and Resource Use), Pathway ID ILU-01, Section 16.5.1.1 (Access to and Area Available for Indigenous Land and Resource Use)	▪ Limit the Project footprint to the extent practical using practices such as: − optimizing use of cleared areas for Project activity − using existing road infrastructure, including existing access road and bridge crossing − storing tailings underground − designing an efficient infrastructure footprint (i.e., buildings clustered together) ▪ Install a gate at the site entrance (i.e., gatehouse) to control public access. ▪ Implement progressive reclamation and revegetation of disturbed areas no longer required. ▪ Reclaim and revegetate areas where non-permanent Project facilities have been decommissioned. ▪ Implement a Security Program to provide safe and coordinated access via the access road to locations where other land and resource use is practiced. ▪ Develop and implement a Preliminary Decommissioning and Reclamation Plan with government and Indigenous communities to decommission and transfer the site to the province under the Institutional Control Program. ▪ Implement Benefit Agreements, including: − funding and human resources to support community-related initiatives including but not limited to cultural and traditional values − the establishment of the Implementation Committee to communicate regularly and to reach early resolution of issues and/or disputes that may arise ▪ Establish an Environmental Committee to monitor environmental performance of the Project. ▪ Provide funding for full-time independent Indigenous Monitors to enable unrestricted environmental monitoring, subject to the Indigenous Monitor complying with appropriate health and safety and other reasonable site-specific requirements.

Attachment IR 27/41/239/242-1

FINAL

Rook I Project – Geochemical Characterization of Waste Rock

Rook I, Saskatchewan, Canada

NexGen Energy Ltd.

SRK Consulting (Canada) Inc. ▪ CAPR001771 ▪ January 2023

srk consulting

FINAL

Rook I Project – Geochemical Characterization of Waste Rock

Rook I, Saskatchewan, Canada

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Useful Definitions

This list contains definitions of symbols, units, abbreviations, and terminology that may be unfamiliar to the reader.

ABA	acid base accounting
AP	acid potential
ASST	Athabasca Group sandstone
BSE	back-scattered electron
$CuFeS_2$	chalcopyrite
CRET	Cretaceous cover deposits (Manville Group)
DEVO	Devonian cover deposits (La Loche Formation)
EC	electrical conductivity
EDS	energy-dispersive X-Ray spectroscopy
HCl	hydrochloric acid
HCT	humidity cell test
ICP	inductively coupled plasma
INT	orthogneiss intermediate intrusive
LITL	glacial lodgement till
ML/ARD	metal leaching and acid rock drainage
MS	mass spectrometry
MST	mudstone
NexGen	NexGen Energy Ltd.
NORM	naturally occurring radioactive material
NP	neutralization potential
NPAG	non-potentially acid generating
NPR	neutralization potential ratio
OES	optical emission spectrometry
Okane	Okane Consultants Ltd.
OVB	overburden
PAG	potentially acid generating
PEG	pegmatite dykes
Project	Rook I Project
QA/QC	quality assurance and quality control
QEMSCAN	Quantitative Evaluation of Material by Scanning Electron Microscopy
RPA	Roscoe Postle and Associates Inc.
RPD	relative percent difference

SGS	SGS Laboratories
SPGN	semi-pelitic gneiss
SPGN/FLT	faulted semi-pelitic gneiss
SRC	SRC Geoanalytical Laboratories
SRK	SRK Consulting (Canada) Inc.
SST	sandstone
TIC	total inorganic carbon (carbonate)
U_3O_8	triuranium octoxide
UDRL	unconditional derived release limits
UGTMF	underground tailings management facility
UO_2	uraninite
WRSA	waste rock storage area
XRD	X-Ray Diffraction

1 Introduction

The Rook I Project (Project) is a proposed uranium mining and milling operation in northern Saskatchewan that is 100% owned by NexGen Energy Ltd. (NexGen). The proposed Project is subject to both provincial and federal Environmental Assessment processes, would be licensed as a nuclear facility by the Canadian Nuclear Safety Commission, and would be subject to various provincial and federal permits and approvals.

The development of the mine would require management of various mine waste materials, including waste rock, special waste, and exposed wall rock in the underground developments. NexGen proposes to store the waste rock and special waste produced from development of the proposed underground mine workings and the underground tailings management facility (UGTMF) at surface in waste rock storage areas (WRSAs). The waste rock, special waste, and exposed wall rock in the underground workings would produce mine-affected drainage that may require management as part of site-wide water management. Additionally, potential effects of the drainage need to be considered in the Environmental Assessment.

NexGen retained SRK Consulting (Canada) Inc. (SRK) to assess the metal leaching and acid rock drainage (ML/ARD) potential of waste rock and special waste materials that would be handled as part of the development of the Project and to develop source term water quality predictions of waste rock and underground wall rock. The source term report titled *Waste Rock and Underground Wall Rock Source Term Predictions – Rook I Project* is provided under separate cover (SRK 2022, which was filed with the Draft Environmental Impact Statement (NexGen 2022) as Technical Support Document XVII.

This report summarizes the methods and results of the geochemical characterization of waste rock and special waste materials.

2 Background

2.1 Proposed Development

The following is synthesized from the *Rook I Project Feasibility Study* (NexGen 2021).

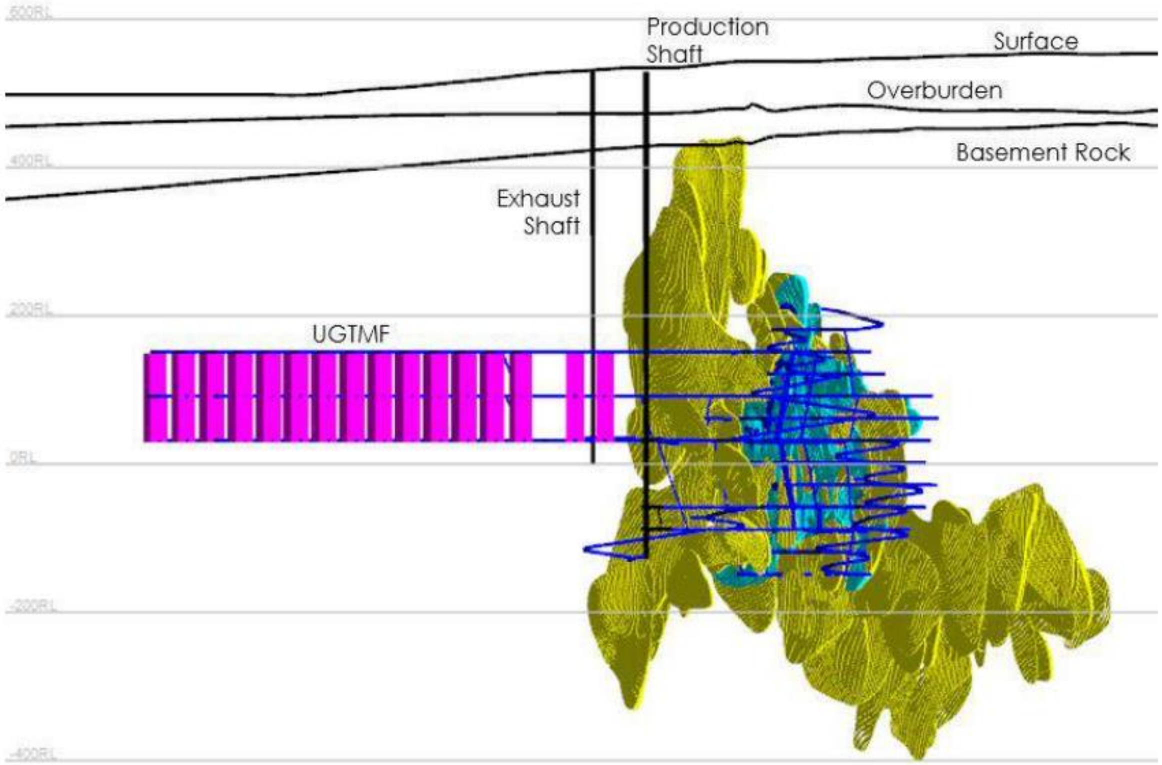
NexGen plans to develop the Project using underground mining methods with the proposed developments relative to the ore bodies shown in Figure 2-1. The deposit would be accessed by two shafts, with further development of 13 underground levels. The ore would be extracted by stope mining in areas of wider stopes and longitudinal retreat stope mining in areas of thinner stopes.

NexGen has proposed to develop the UGTMF for storage of cemented paste tailings or cemented paste backfill. The UGTMF design involves development of internal mine access, wing and chamber access, and a series of chamber excavations nominally measuring 25 m wide x 25 m long x 60 m high. Underground developments would be used to access the UGTMF from the mine development area. The underground workings would be dewatered during mine construction and operations and allowed to flood following mine closure.

Waste rock produced from underground mining would be managed in surface WRSAs.

In total, 5.9 Mm^3 of waste rock would be generated throughout the life of the Project.

Special waste, with 0.03% to 0.26% triuranium octoxide (U_3O_8), would be processed prior to the end of mine life, with tailings from processing of special waste placed in the UGTMF as backfill.



Source: NexGen 2021.

Note: Yellow represents mineralized shear zones; pink represents the UGTMF chambers and blue shows the mine development area stopes and workings.

Figure 2-1: Proposed Underground Mine Developments

2.2 Waste Rock Management

NexGen is considering different waste rock placement methods to mitigate ML/ARD potential. To inform the waste rock management multiple accounts analysis completed for the Project, SRK developed source terms for each of the WRSAs representing placement methods being considered (SRK 2022). The different WRSA options are presented by Okane Consultants Ltd. (Okane) in an options analysis of waste rock placement strategies (Okane 2020a).

The conventional placement methods considered in the options analysis included placement of waste rock by end-dumping. The WRSAs constructed by conventional end-dumping are expected to have a high degree of advective oxygen transport for sulfide oxidation due to the high degrees of particle size segregation and low water contents, allowing oxygen to freely move through the WRSA (Okane 2020a). The two conventional end-dumping options considered included co-mingling and segregation of potentially acid generating (PAG) and non-potentially acid generating (NPAG) waste rock.

Segregation and co-mingling of PAG and NPAG waste rock was also considered using engineered source controls, with design of horizontal layering to limit oxygen ingress into the WRSA (engineering layering). The engineered source control concept was developed by Okane. For this concept, the WRSAs would be constructed from the bottom up, with a sequence of 5 m lifts of waste rock followed by 0.5 m thick engineered layers of finer textured material (Okane 2020b). Okane modelled oxygen transport in this design, which indicated oxygen ingress would be limited to a surficial “skin” in the WRSA. Limiting oxygen ingress would reduce the reactive mass and limit oxidation of sulfide minerals. Limiting sulfide oxidation would reduce the potential for formation of acidic conditions in PAG materials.

Use of a liner to capture leachate for potential treatment was also considered in the options analysis.

2.3 Geology

The geological description for the Project provided in this subsection is summarized from Roscoe Postle and Associates Inc. (RPA 2016).

The Arrow uranium deposit is the primary uranium-hosting deposit at the Project site. The Arrow deposit is located within the western margins of the Athabasca Basin in northern Saskatchewan. The geology in the area of the Project is underlain by the Proterozoic Taltson Magmatic Zone, which is composed of granitic, granodioritic, tonalitic, dioritic, and local gabbroic gneisses. The Arrow deposit occurs within the Proterozoic basement rocks. Overall, the dominant lithology at the Project site is quartz-feldspar-garnet-biotite semi-pelitic gneiss (SPGN) with lesser orthogneiss intermediate intrusive (INT) which is described as quartz monzodiorite to quartz diorite (Figure 2-2). Other minor lithologies are recognized, including pelitic gneiss and pegmatite. The basement rocks have been metamorphosed to upper amphibolite to granulite facies.

The Proterozoic basement units are covered by thin Devonian mudstone of the La Loche Formation, Cretaceous rocks of the Mannville Group, sandstone of the Athabasca Group, and overburden. These units overlying the basement units are collectively referred to as the cover units. The majority of the Project underground development is planned within the basement Proterozoic rocks (SPGN and INT).

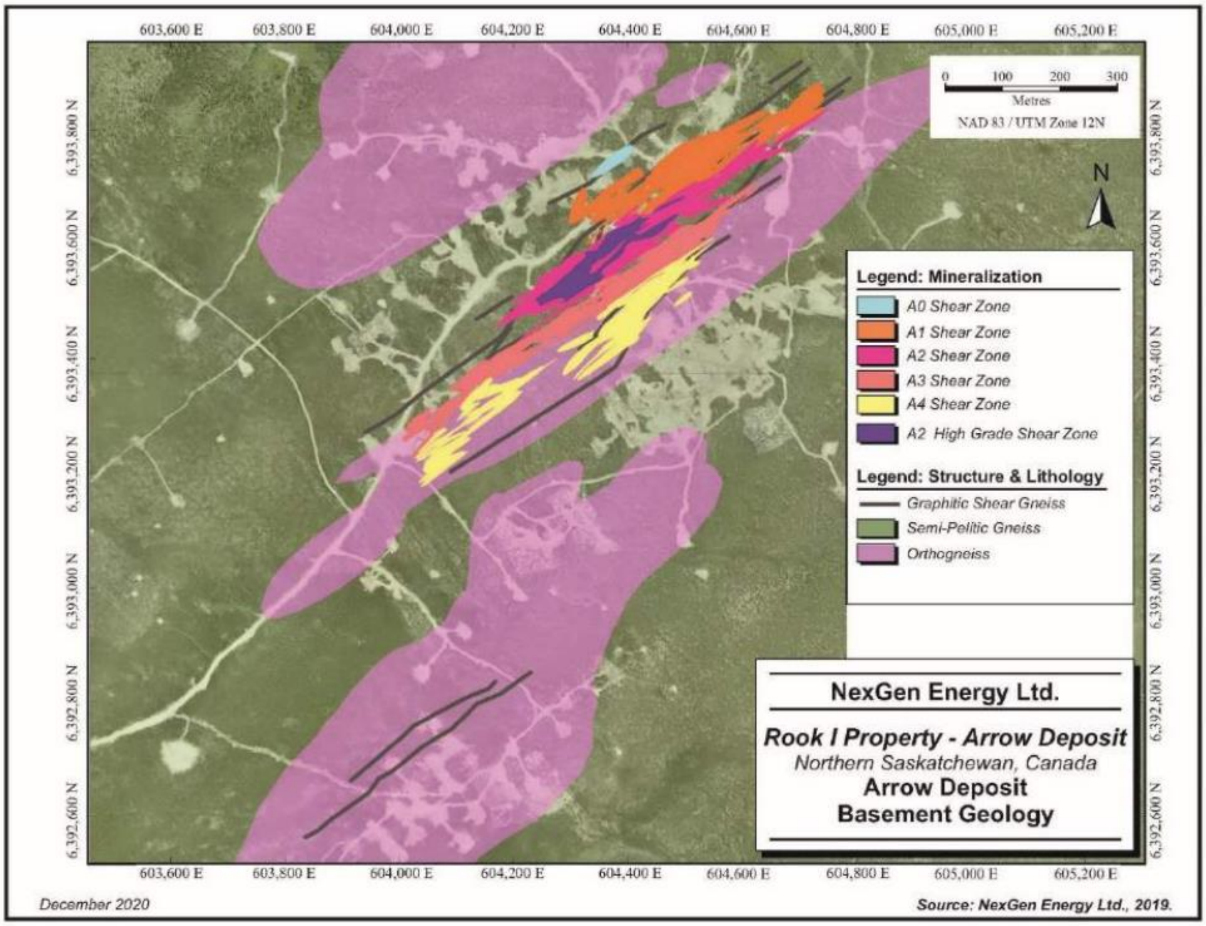
Uranium mineralization at the Arrow deposit is closely associated with narrow, strongly graphitic pelitic, and graphitic semi-pelitic gneiss lithologies thought to represent discrete shear zones. High-grade uranium zones often occur immediately adjacent to heavily sheared and strongly graphitic zones, but not within them. The gneiss units hosting mineralization are silicified.

Hydrothermal alteration that occurs at the Arrow deposit is extensive and occurs as distinct assemblages including the following:

- pervasive quartz-sericite-sudoite-illite replacement;
- pervasive brick-red hematite;
- dravite occurring as thin breccia veins occurring within tens of metres from high-grade uranium mineralization; and
- drusy quartz occurring as thin veins occurring ubiquitously at the deposit.

Uranium is predominantly present as uraninite (UO_2).

The development of the UGTMF is proposed within SPGN and INT basement rocks. Graphitic shear zones and alteration assemblages associated with uranium mineralization at the Arrow deposit are not observed in waste rock in the proposed UGTMF development area.



Source: NexGen 2019.

Figure 2-2: Arrow Deposit Basement Geology

3 Conceptual Geochemical Model

Conceptual geochemical models were developed to synthesize the current understanding of the geochemical characteristics of waste rock, special waste, and underground wall rock, thereby providing the basis for design of a site-specific geochemical characterization program for these materials for the Project.

The development of the Project would require excavation and handling of ore, PAG and NPAG waste rock, as well as special waste. The development of underground workings would also result in the temporary exposure of wall rock prior to backfilling or flooding of mine workings at closure.

Although the development is considered a single Project, underground development would entail excavation of waste rock from two distinct areas: the mine development area and the UGTMF. The workings near the mine development area would access the ore, whereas those at the UGTMF are designed to store cemented paste tailings. Construction of the mine development area has potential to excavate waste rock in proximity to the uranium-hosting mineralized shear zones and within the waste rock that may be hydrothermally altered, whereas the development of the UGTMF is distal from any known uranium mineralization and well outside of the immediate hydrothermally altered zone. As a result, there is expected to be higher enrichment of constituents associated with uranium mineralization (e.g., uranium, molybdenum, selenium) in waste rock at the mine development area in comparison to waste rock handled from the UGTMF.

A review of the geological setting of the Project indicates the following general observations on geochemical performances of waste rock, special waste, and underground wall rock:

- Waste rock materials that would be excavated for development of the Project from the mine development area and UGTMF host sulfide minerals, primarily as pyrite.
- A component of the waste rock is classified as PAG with potential to form acidic conditions.
- Overall carbonate content is generally low, with the potential for formation of acidic conditions primarily dependent on sulfide content.
- Silicates may contribute to acid neutralization for materials with low sulfide content (<0.1%) having low rates of acid production.
- Uranium likely occurs primarily as UO_2 with release of uranium likely from simple dissolution of uraninite.
- Special waste would be enriched in uranium and likely have elevated solid-phase content for trace elements associated with uranium mineralization (e.g., molybdenum, selenium).
- Special waste and waste rock with elevated uranium content is expected to have higher leaching potential for radionuclide species that are decay products of uranium, primarily radium-226.
- Sulfide minerals would weather to leach acidity, sulfate, iron, and other elements (e.g., copper, cobalt) contained in the sulfide minerals.
- Sulfarsenide and arsenide enrichment is low; therefore, nickel, cobalt, and arsenic enrichment is low in comparison to other uranium deposits in the Athabasca Basin.

- The development of acidic conditions would result in increased metal mobility of cation species (e.g., copper, cobalt) and some oxyanion species (e.g., uranium).
- Elements that form oxyanion species (including uranium, molybdenum, selenium, and arsenic) may leach at neutral pH conditions.
- Overall, waste rock from the UGTMF is expected to have lower elemental enrichment and lower metal leaching potential for constituents that are recognized to occur in association with uranium mineralization at the Project (e.g., uranium, molybdenum, selenium) in comparison to waste rock from the mine development area.
- In a conventional WRSA facility, weathering of waste rock on surface would occur under well-oxygenated conditions, with movement of oxygen into the facility driven by diffusive, convective, and advective processes. The waste rock would also be in contact with precipitation infiltrating the WRSA. Engineered source control layers of fine-textured material within the WRSA would be expected to limit oxygen ingress, and hence rates of sulfide oxidation (Okane 2020a), in turn limiting development of acidic conditions.
- The underground developments would expose wall rock to oxygenated conditions with the potential to develop acidity from sulfide oxidation. Backfilling or flooding of mine workings is expected to limit oxygen and prevent further sulfide oxidation and formation of acidity.

4 Methods

4.1 Material Classification

The NexGen exploration drilling geochemistry database was used to support sample selection. At the time of sample collection in February 2019, waste rock was defined as having <0.03% triuranium octoxide (U_3O_8), and special waste was defined as having between 0.03% and 0.3% U_3O_8. Drill core intervals with greater than 0.3% U_3O_8 were classified as ore and not included as candidate samples. Since the samples were collected, the definition of special waste and ore for the Project has been modified whereby special waste is defined as having between 0.03% and 0.26% U_3O_8 and ore defined as having greater than 0.26% U_3O_8. As the difference in the special waste cut-off criteria is minor, there is no appreciable effect to the interpretation of the results of special waste samples specific to ML/ARD potential (Section 5.4). In addition, the results included in this report related to special waste rock cut-off criteria are conservative given the threshold has been lowered.

4.2 Static Test Program (Phase 1)

As part of the geochemical characterization program, a static test program was completed to assess the ML/ARD potential of waste rock and special waste that would be excavated and handled as part of the development of the Project. The static test program was designed to characterize all lithology types from both the mine development area and UGTMF.

4.2.1 Sample Selection

The approach to sample collection for the static test program is summarized in Section 4.2.1. Images showing locations of samples collected in comparison to proposed underground developments are shown in Figure 4-1 and Figure 4-2.

A summary of the sample locations and lithology is summarized in Table 4-1. A summary of the lithology codes used in the report and corresponding lithology descriptions is provided in Table 4-2.

Table 4-1: Summary of Samples Selected for Static Testing

Location	Material Type	Lithology Type	Samples
UGTMF	Waste Rock	SPGN	57
		INT	49
Mine Development Area	Waste Rock	SPGN	79
		INT	25
		OVB	2
		SST	2
		MST	1
	Special Waste	SPGN	24
		SPGN/FLT	6

Location	Material Type	Lithology Type	Samples
		INT	1
Shaft and Portal Areas	Waste Rock	INT	13
		SPGN	12
		ASST	4
		DEVO	4
		CRET	4
		LITL	4
		OVB	2

Source:https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/03_Results_Processing/[1CN034.002_NexGen_GeochemCharacterization_jcc_mc_jac_rev014.xlsx]

Note: Lithology type codes and descriptions are provided in Table 4-2.
UGTMF = underground tailings management facility.

Table 4-2: Lithology Codes and Descriptions

Lithology Code	Lithology Description
SPGN	Semi-pelitic gneiss
INT	Orthogneiss intermediate intrusive
OVB	Overburden
SST	Sandstone
MST	Mudstone
SPGN/FLT	Faulted semi-pelitic gneiss
ASST	Athabasca Group sandstone
CRET	Cretaceous cover deposits (Manville Group)
DEVO	Devonian cover deposits (La Loche Formation)
LITL	Glacial lodgement till

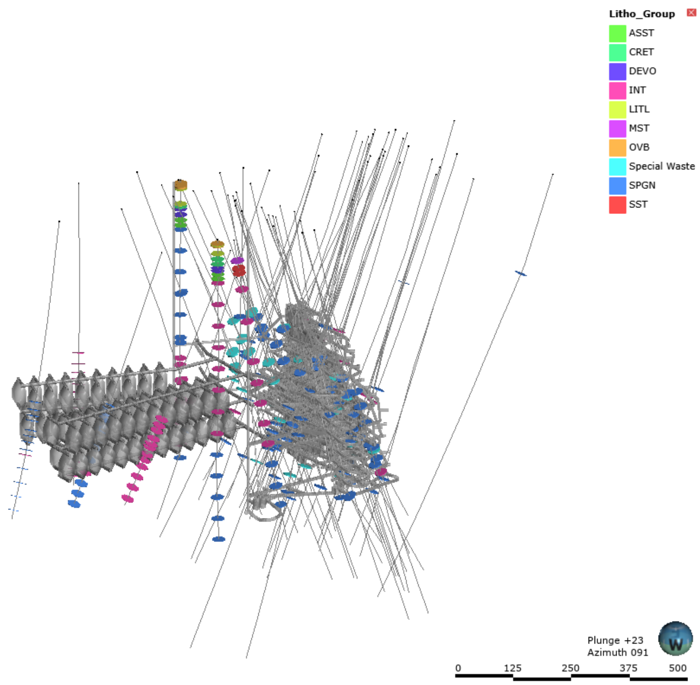


Figure 4-1: Oblique View Looking Southeast of Drill Hole Sample Locations with Drill Traces Relative to Proposed Underground Developments

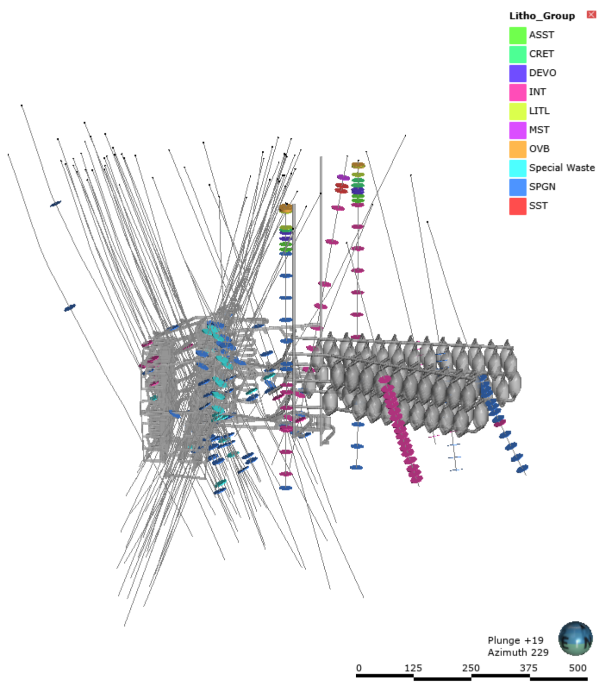


Figure 4-2: Section View Looking Northwest of Drill Hole Sample Locations with Drill Traces Relative to Proposed Underground Developments

SRK Sampling

As part of the Phase 1 geochemical characterization program, 193 drill core samples were selected from proposed developments, including 138 samples from the mine development area and 55 samples from the proposed development at the UGTMF. The sampled drill core was from drilling completed between 2015 and 2019. Prior to sampling, the drill core had been stored outside under covered core racks and protected from contact with precipitation. Overall, the sampled drill core showed little weathering.

Phase 1 of sampling was completed by SRK in February 2019.

Underground Tailings Management Facility

Drill core from four geotechnical holes drilled near and into UGTMF development rock were available for sampling. The drill holes were plotted with the proposed development area of the UGTMF using Leapfrog 3D software and the interval for each drill hole that intersected the proposed depth of the UGTMF developments was identified. Within this interval, samples were collected at 15 m spacing, with each sample comprising 1 m intervals of full HQ drill core.

Of the 55 samples collected from the proposed UGTMF development, 31 were from the INT unit and 24 from the SPGN unit. No other lithologies were encountered in the drill holes available for sampling at the UGTMF.

Mine Development Area

Sample selections for the mine development area leveraged the available geological logs and exploration assay results to select representative samples. The following workflow was used:

- Samples from the exploration dataset were classified as waste rock, special waste, or ore based on the criteria defined in Section 4.1.
- The planned underground development and drill traces with exploration samples were plotted in 3D software (Leapfrog) with samples outside of the developments excluded from the selections.
- A random number generator function was used in Excel to randomly select candidate samples.
- The selected samples were reviewed by SRK to verify they provided appropriate representation of lithology types and spatial coverage of the proposed development areas through plotting the samples using Leapfrog 3D software.
- Following a review of the spatial coverage, additional samples were selected manually to improve sample density and spatial coverage.
- Additional samples were selected from the cover units from two available geotechnical drill holes near the proposed shaft developments. As no assay data was available for these, the samples were selected manually following a review of the geological logs.
- In general, exploration assay results used to select samples were from 0.5 m sampling intervals. The sample intervals for the static testing were increased to up to 2.5 m, while verifying the extended assayed intervals were classified as waste rock and within the same lithology unit. The

intervals were extended to verify sufficient materials were available for kinetic testing as part of Phase 2 of the characterization program.

Of the 138 samples collected from the mine development area, 133 were from basement units including 101 from the SPGN unit, 26 from the INT unit, and 6 from faulted semi-pelitic gneiss (SPGN/FLT), which were grouped with the SPGN samples for interpretation. Two samples from the SPGN were from narrow pegmatite dykes (PEG) that occur within the SPGN and were grouped with the SPGN samples for the interpretation. In total, five samples were collected from cover units including 2 from overburden (OVB), 1 sample from mudstone (MST), and 2 samples from the Athabasca Group sandstone (ASST).

NexGen Sampling

Shafts and Portal

An additional sampling program near the proposed production and exhaust shafts and portal was completed by NexGen in 2020. The purpose of this sampling was to supplement the existing samples near the proposed shaft and portal areas which represents the materials that would be excavated early in the development of the Project. This sampling included the collection of 43 samples from two geotechnical drill holes near the proposed shafts and portal (i.e., the shaft pilot holes).

Of the 43 samples collected from the shaft pilot holes, 18 were collected from cover units and 25 were collected from basement units. The samples collected from the cover units included 2 of OVB, 4 of glacial lodgement till (LITL), 4 from Cretaceous cover deposits (CRET), 4 from Devonian cover deposits (DEVO) and 4 from the ASST. The samples collected from basement units included 13 from the INT unit and 12 from the SPGN unit.

Underground Tailings Management Facility

In 2020, NexGen supplemented the sampling at the proposed UGTMF development with samples collected from five geotechnical drill holes that had not been drilled when SRK completed sampling in 2019. For each drill hole, a 0.5 m length of drill core was collected at approximately 50 m intervals within the depth of the planned developments.

The supplemental sampling of the UGTMF development rock included 51 samples comprising 33 samples of the SPGN unit and 18 samples of the INT unit.

4.2.2 Analytical Methods

All samples (i.e., both those from SRK and NexGen programs) were submitted to SRC Geoanalytical Laboratories (SRC) in Saskatoon. All samples were prepared at SRC. Following air drying, the samples were first crushed to <1/4” with a split of each sample retained as candidate material for kinetic cell testing. A split of the crushed materials was pulverized to 85% passing 200 mesh.

The samples were analyzed with static testing at SRC for the following parameters:

- **Acid base accounting (ABA):** Used to assess speciated carbon and sulfur content to determine the balance of acid-generating sulfide minerals and acid-neutralizing minerals. The ABA analysis included:
  - total sulfur and carbon by LECO furnace;
  - sulfur as sulfate by hydrochloric acid (HCl) leach;
  - modified Sobek neutralization potential (NP) (Modified NP) (MEND 1991);
  - total inorganic carbon (TIC) by measurement of evolved CO_2 following HCl leach; and
  - paste pH and electrical conductivity (EC) (MEND 1991).
- **Elemental analysis:** Used to identify elements that are enriched in the solid phase using a multi-acid digest and inductively coupled plasma (ICP), mass spectrometry (MS), and optical emission spectrometry (OES) analyses to determine metal and metalloid chemistry.
  - For waste rock samples, the elemental results were reported from ICP-MS analysis following aqua regia (partial) digestion and ICP-MS analysis following four-acid (near-total) digestion.
  - For samples with higher uranium content representing special waste, elemental results were reported from ICP-OES analysis following aqua regia digestion and ICP-MS analysis following four-acid digestion.
- **Solid-phase radionuclide analysis:** Analysis of selected samples including radionuclides on the uranium-238 decay chain (including radium-226, thorium-230, lead-210, polonium-210) and radionuclides on the thorium-232 decay chain (including thorium-228, thorium-232, and radium-228).
- Uranium-238 activities were calculated from measured uranium results from both solid phase and analysis of leachate using the following conversion provided by SRC:
  - uranium-238 Bq/g = U mg/kg x 0.0124; and
  - uranium-238 Bq/L = U mg/L x 12.4.

The calculations assume that all uranium measured by ICP-OES or ICP-MS is present as uranium-238. These assumptions are valid because in naturally occurring materials, uranium is composed of 99.274% to 99.275% uranium-238 (Ovaskainen 1999).

4.3 Kinetic Test Program (Phase 2)

Following review of the static test results, a subset of samples were selected for longer-term kinetic testing with humidity cell tests (HCTs).

Kinetic testing with HCTs was initiated to simulate water-rock interactions and measure leachate characteristics of the waste rock and special waste materials as they weather over time. The leachate characteristics were used for predicting rates of sulfide mineral oxidation and associated acid generation and metal release rates.

Kinetic samples also underwent mineralogical characterization as described in Section 4.3.2.

4.3.1 Sample Selection

The static data were used to select a subset of samples representing the waste rock types and range of solid-phase geochemical characteristics for kinetic testing with HCTs to assess the long-term weathering rates of sulfide minerals and to determine potential metal(loid) leaching rates. The approach used to select samples for the HCTs included the following steps:

- Select a representative number of samples from the main waste rock lithologies in the UGTMF and mine development areas available from the sampling completed in 2019.
- Target the 25th to 95th percentile range for total sulfur content for the main lithologies in the UGTMF and mine development areas while providing coverage of materials classified as PAG, uncertain, and NPAG (Section 4.4.3). By targeting a range of sulfur contents, the sample selection also captured the range of trace element content for constituents associated with sulfide (e.g., copper, cobalt).
- Target the 5th to 95th percentile of uranium concentrations for the various lithologies representing waste rock, as well as the selection of two samples with uranium concentrations representing special waste.
- Plot the selected samples in Leapfrog 3D software to verify the selections provide spatial representation of the proposed development areas (Figure 4-1 and Figure 4-2).

Using the results of the ABA and multi-element testwork from the Phase 1 analysis, 11 samples representing waste rock were selected for the HCT program. This included 6 samples from the UGTMF and 5 samples from the mine development area. An additional 2 samples representing special waste were selected from the mine development area to give a total of 13 samples for the HCT program. Two HCTs were operated for quality assurance and quality control (QA/QC) purposes (one duplicate cell and one blank cell).

All HCTs were initiated on 10 June 2019. Nine of the cells continue to operate. A summary of the rationale for termination of terminated cells is provided in Section 6.5. A summary of the HCT samples and testing status is provided in Table 4-3.

Table 4-3: Summary of Humidity Cell Tests

HCT ID	Material Type	Lithology Type	Location	Sample Interval			Start Date	End Date	Test Status
				Drill Hole ID	From (m)	To (m)			
39003	Waste Rock	INT	UGTMF	GAR-19-018	454	455	10 July 2019	-	Ongoing
39010	Waste Rock	SPGN	UGTMF	GAR-19-020	481.3	482.3	10 July 2019	-	Ongoing
39015	Waste Rock	SPGN	UGTMF	GAR-19-020	406	407	10 July 2019	-	Ongoing
39023	Waste Rock	SPGN	UGTMF	GAR-19-022	410.4	411.4	10 July 2019	2 March 2022	Terminated at week 138
39032	Waste Rock	INT	UGTMF	GAR-19-019	498	499	10 July 2019	-	Ongoing
39038	Waste Rock	INT	UGTMF	GAR-19-019	578.5	579.5	10 July 2019	-	Ongoing
39076	Waste Rock	SPGN	Mine Area	GAR-18-006	550	551.5	10 July 2019	-	Ongoing
39137	Waste Rock	SPGN	Mine Area	AR-16-080C4	502	504	10 July 2019	-	Ongoing
39140	Waste Rock	SPGN	Mine Area	AR-16-085C1	407.5	410	10 July 2019	2 March 2022	Terminated at week 138
39186	Waste Rock	INT	Mine Area	AR-18-208C1	560	562	10 July 2019	17 June 2020	Terminated at week 49
39181	Waste Rock	SPGN	Mine Area	AR-18-187C1	388	390	10 July 2019	17 June 2020	Terminated at week 49
39130	Special Waste	SPGN	Mine Area	AR-16-059C5	554.5	557	10 July 2019	17 June 2020	Terminated at week 49
39172	Special Waste	SPGN	Mine Area	AR-17-126C1	749.5	752	10 July 2019	17 June 2020	Terminated at week 49
39015 DUP	QA/QC Cell - duplicate	SPGN	UGTMF	GAR-19-020	406	407	10 July 2019	-	Ongoing
Blank	QA/QC Cell - blank	-	-	-	-	-	10 July 2019	-	Ongoing

Source:https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/03_Results_Processing/[1CN034.002_NexGen_GeochemCharacterization_jcc_mc_jac_rev014.xlsx]

Note: Lithology type codes and descriptions are provided in Table 4-2.

HCT = humidity cell test; UGTMF = underground tailings management facility; DUP = duplicate; QA/QC = quality assurance and quality control.

4.3.2 Analytical Methods

Mineralogy

Pulp material from the samples selected for HCT analysis were submitted for detailed mineralogy by X-Ray Diffraction (XRD) with Rietveld refinement at SRC. The XRD analysis was completed to determine the dominant and trace mineral species including sulfides and carbonates, although the method is typically limited to quantifying minerals with greater than 0.5% to 1% abundance.

Detailed mineralogy by Quantitative Evaluation of Material by Scanning Electron Microscopy (QEMSCAN) was completed on a subset of waste rock samples from the UGTMF to support the definition of trace mineral species that may not be detectable with XRD. The QEMSCAN results were used to identify trace minerals (those with less than 1 weight percent [wt. %] abundance) and to assess sulfide liberation. QEMSCAN is an automated form of scanning electron microscopy designed to identify and quantify solid phases, and grain-particle spatial associations. QEMSCAN defines grains by back-scattered electron (BSE) imaging and classifies each measurement point by mineralogy by energy-dispersive X-Ray spectroscopy (EDS).

The following were measured by QEMSCAN:

- Modal mineralogy, which is calculated from the combined analysis of the BSE images and mineral identification from the EDS data.
- Sulfide mineral associations, which is a measure of the degree to which sulfides are adjacent to other minerals based on the internal relationship between mineral grains in each particle.
- Sulfide liberation, which is a measure of the extent to which sulfides are exposed at the grain surface.

The sulfide mineral association and liberation assessments were completed to assess the degree of sulfide liberation which would represent the proportion of sulfide exposed to oxic conditions. Sulfides that are locked within resistive mineral phases (e.g., quartz) would be expected to have limited exposure to oxic conditions, potentially preventing sulfide oxidation.

Sulfide liberation is described as “Free” (>90% surface exposure), “Liberated” (60% to 90% surface exposure), “Trapped” (30% to 60% surface exposure), “Enclosed” (10% to 30% surface exposure), and “Locked” (<10% surface exposure).

Although the QEMSCAN analysis was conducted on crushed and pulverized materials, the assessment provides a preliminary estimate of the degree of sulfide minerals that may be liberated from processing and placement of waste rock.

Table 4-4: Summary of Samples Selected for Mineralogy

Sample ID	Location	Lithology Type	XRD	QEMSCAN
39003	UGTMF	INT	Yes	Yes
39010	UGTMF	SPGN	Yes	Yes
39015	UGTMF	SPGN	Yes	Yes
39023	UGTMF	SPGN	Yes	Yes
39032	UGTMF	INT	Yes	Yes
39038	UGTMF	INT	Yes	Yes
39076	Mine	SPGN	Yes	Yes
39137	Mine	SPGN	Yes	No
39140	Mine	SPGN	Yes	No
39186	Mine	INT	Yes	Yes
39130	Mine	SPGN-Special waste	Yes	No
39172	Mine	SPGN-Special waste	Yes	No
39181	Mine	SPGN	Yes	No

Source:https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/Mineralogy/[XRD_Results_Compilation_1CN034.002_JAC.xlsx]Sheet

Note: Lithology type codes and descriptions are provided in Table 4-2.

UGTMF = underground tailings management facility; XRD = X-Ray Diffraction; QEMSCAN = Quantitative Evaluation of Material by Scanning Electron Microscopy.

Humidity Cell Tests

The HCTs were operated at SGS Laboratories (SGS) in Lakefield, Ontario, according to the standard ASTM D5744 - 13e1 test method (ASTM 2013) with the closedown procedure following MEND 2009. Under ASTM methodology, the test follows a seven-day cycle. This cycle consists of three days circulating dry air and three days circulating humid air (at 25°C) followed by a leach day in which the column is flooded with deionized water prior to draining and leachate collection. Following overnight draining, the cycle is restarted. The cycles are designed to simulate and accelerate the water-rock interactions and chemical weathering rates typically observed under field conditions.

The HCT testing program consisted of the following schedule of analysis:

- pH and EC
  - Weekly from week 0 – 149 (week 149 on 18 May 2022 with testing continuing for ongoing HCTs)
- Alkalinity and acidity
  - Weekly from week 0 – 40
  - Bi-weekly from week 40 – 148 (week 148 on 11 May 2022 with testing continuing for ongoing HCTs)

- Sulfate
  - Weekly from week 0 – 40
  - Bi-weekly from week 40 – 148 (week 148 on 11 May 2022 with testing continuing for ongoing HCTs)
- Chloride
  - Weekly from week 0 – 5
  - Bi-weekly from week 7 – 39
  - Monthly from week 44 – 140 (week 140 on 16 March 2022 with testing continuing for ongoing HCTs)
- N-species (nitrate, nitrite, total ammonia, total Kjeldahl nitrogen)
  - Weekly from week 0 – 5
  - Bi-weekly from week 7 – 39
  - Discontinued after week 39
- Low-level mercury
  - Weekly from week 0 – 5
  - Bi-weekly from week 7 – 39
  - Discontinued after week 39
- Trace-elements (Ag, Al, As, Ba, Be, B, Bi, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Sr, Sn, Ti, Tl, U, V, W, Y, Zn)
  - Weekly from week 0 – 5
  - Bi-weekly from week 0 – 39
  - Every 4 weeks from week 44 – 140
  - Every 8 weeks from week 140 – 148 (week 140 on 16 March 2022 with testing continuing for ongoing HCTs)
- Total dissolved phosphorous
  - Every 4 weeks from week 96 – 140
  - Every 8 weeks from week 140 – 148 (week 140 on 16 March 2022 with testing continuing for ongoing HCTs)

Radionuclide Analysis

Radionuclide analysis was completed on leachate samples from the HCT program for radionuclide species that are decay products of uranium-238 (including radium-226, polonium-210, lead-210, and thorium-230) and decay products of thorium-232 (thorium-228 and radium-228). The radionuclide analysis was completed at SRC.

As the radionuclide analyses required relatively high sample volumes of leachate to achieve sufficiently low detection limits; samples were composited from four weekly cycles for the radionuclide analyses. Samples representing special waste or waste rock with elevated uranium concentrations in solid phase were selected for routine analysis of all radionuclide parameters listed, whereas samples with lower uranium content (including those from the UGTMF) were analyzed for radium-226 only.

For samples selected for the full suite of radionuclide analyses, analytical frequency was as follows:

- Full suite of radionuclide analysis on composites representing weeks 0-4, 5-8, 17-20, 37-40, 73-76, 97-100, and 117-120; and
- Radium-226 analysis on 4-week composites from weeks 0-136.

For samples with low uranium content from solid-phase analysis, analytical frequency was as follows:

- Radium-226 analysis on 4-week composites from weeks 0-4, 5-8, 17-20, 37-40, 73-76, 97-100 and 117-120.

4.4 Data Interpretation Methods

4.4.1 General

For static and kinetic results that were reported below detection limits, the value of the detection limit was used for calculations and plotting.

4.4.2 pH

The pH results from static and kinetic testing were considered alkaline (pH>8), circum-neutral (pH between 6 and 8), mildly acidic (pH between 5 and 6), and acidic (pH<5).

4.4.3 Acid Rock Drainage Classification

The ARD potential was evaluated on the basis of neutralization potential ratios (NPRs), i.e., the ratio of neutralization potential (NP) to acid potential (AP).

Acid potential was calculated from sulfur as sulfide where:

$$AP\ (kg\ CaCO_3/t) = Sulfur\ as\ Sulfide\ (\%S) \times 31.25$$

The results for both Modified NP and TIC were used to evaluate the NP.

ARD potential was classified as follows:

- PAG if NP/AP or TIC/AP ≤1, and sulfur as sulfide ≥ 0.1%;
- Uncertain ARD potential if NP/AP or TIC/AP is >1 and ≤3, and sulfur as sulfide ≥ 0.1%; and

- NPAG if NP/AP or TIC/AP >3, or total sulfur as sulfide <0.1%.

A low sulfide criterion of <0.1% total sulfur as sulfide was used to classify material as NPAG regardless of the NPR. This assumes that the meteoric weathering of silicate minerals contributes sufficient alkalinity to offset ARD potential from material with low rates of acid production.

The use of a low sulfide cut-off of 0.1% to classify all material as NPAG is supported by work conducted by Day and Kennedy (2015) on the Duluth Complex, which demonstrated that in carbonate-deficient systems, the rate of acid generation from low-sulfide geological material can be sufficiently buffered by bicarbonate produced through meteoric weathering of silicate minerals. Furthermore, Day and Kennedy (2015) indicate that when rates of acid generation are sufficiently low, the Modified NP method underestimates the silicate mineral reservoir potentially available long term to neutralize acidity generated by low sulfide geological materials. The low sulfide criterion of <0.1% total sulfur as sulfide can be assessed through kinetic testing (discussed further with the kinetic results in Section 6).

4.4.4 Trace Element Enrichment

As a preliminary assessment of metal leaching potential, trace element results from the aqua regia digestion methods were compared with average crustal abundances of comparable rock types from Price (1997), where elements exceeding 10 times the average crustal abundance were classified as being enriched and having higher potential for metal leaching.

For this assessment, samples from the INT unit were compared to the average crustal abundance of basalt from Price (1997), while all other lithologies (i.e., SPGN, MST, OVB, sandstone [SST], LITL, CRET, DEVO, ASST) were compared with shale from Price (1997).

Only parameters with regulated water quality criteria were considered in the assessment of elemental enrichment.

4.4.5 Radionuclide Activity

Radioactivity potential was investigated by comparing the radionuclide results from each sample with the unconditional derived release limits (UDRL) for diffuse naturally occurring radioactive materials (NORM) sources issued by Health Canada (2011). The listed concentrations in the UDRL for diffuse NORM sources are concentrations that would deliver a maximum effective dose of 0.3 millisieverts per annum (mSv/a), below which the radioactive hazard associated with this dose is considered insignificant with no further control on the material needed. As more than one long-lived radionuclide was identified as being present in the waste rock samples, a summation formula is used where the activity of each detectable radionuclide divided by its UDRL are summed. As per Health Canada (2011), summations must not exceed 1 to have unrestricted classification.

Materials that exceed the UDRLs may require a specific site review to determine if the UDRLs may be released without further consideration or if a more restrictive NORM classification is needed (Health Canada 2011).

4.4.6 Evaluation of Factors Controlling Rates of Element Release

Element release rates (in mg/kg/week) were calculated from all HCTs using the following equation:

$$\text{Element release rate (mg/kg/week)} = \frac{\text{Cp x V}}{\frac{\text{M}}{t}}$$

Where:

Cp = the leachate concentration (in mg/L) by parameter (p);

V = the volume of leachate recovered from a leach (in litres);

M = the mass of the materials in the humidity cell (in kilograms); and

t = the elapsed time since the previous sample (in weeks).

The release rates were calculated from the stable period of weathering in the HCTs. The stable period was defined where pH and elemental concentration trends showed no overall increase or decrease with little variation for a minimum of four cycles.

The HCT data were interpreted as follows to evaluate factors which may control element release:

- stable release rates were plotted against leachate pH to evaluate if pH controlled stable leaching rates;
- stable release rates were plotted against solid-phase content of the sample to evaluate if solids content of the material was a control on leaching rates; and
- stable release rates of parameters were plotted against stable sulfate release rates to evaluate whether sulfide oxidation was a control on release rates.

4.4.7 Depletion Calculations and Timing to Onset of Acidic Conditions

Acid onset occurs when the NP (either represented by Modified NP or TIC) is depleted or is unable to neutralize acid at the rate the acid is produced. The rate acid is produced is primarily a function of the sulfide oxidation rate inferred by the stable sulfate release rates.

The time to deplete sulfide is calculated using the stable rate of sulfate release (from kinetic testing) and the initial solid-phase sulfide concentrations (from static testing) using the following equation:

$$Time\ to\ Sulfide\ Deletion\ (Year) = \frac{(100\ -\ Sd)}{100\ \times Ss\ \times (\frac{10000\ mg/kg}{\text{Sr}})}$$

Where:

S_d = S as sulfide depleted (%);

S_S = S as sulfide in solid phase (%); and

S_r = Rate of sulfur depletion (mg/kg/year).

Where the rate of sulfur depletion is calculated as follows:

$$Rate\ of\ sulfur\ depletion\ (\frac{\frac{mg}{kg}}{year}) = \frac{Stable\ Sulfate\ Relese\ \left(\frac{\frac{mg}{kg}}{week}\right) \times \frac{32\frac{g}{mol}\ (Molar\ Mass\ of\ Sulfur)}{96\frac{g}{mol}(Molar\ Mass\ of\ Sulfate)}}{52.2\ weeks/year}$$

The rate of NP depletion was calculated in a scenario that assumed NP was sourced only from carbonate (as measured by TIC) and a scenario where, in addition to carbonate, silicate dissolution also provided a component of NP (as measured by Modified NP).

For the scenario where carbonate was the only effective source of NP, the timing to deplete NP was calculated using the stable release rates of calcium (assuming calcite is the effective carbonate) and carbonate content as measured by TIC. The time to deplete TIC was calculated as follows:

$$Time\ to\ Deplete\ TIC\ (Year) = \left(1 - TIC\ (\%)\right) \times \frac{TIC\ kg\ CaCO3/tonne}{Rate\ of\ TIC\ Depletion\ (kg\frac{CaCO3}{t}/Year)}$$

In this equation, the rate of TIC depletion is calculated from the rate of calcium depletion and is represented in kg $CaCO_3$/t per year.

The time to deplete NP as measured by Modified NP was calculated as follows:

$$Time\ to\ Deplete\ NP\ (Year) = \left(1 - TIC\ (\%)\right) \times \frac{Modified\ NP\ kg\ CaCO3/tonne}{Rate\ of\ Modified\ NP\ Depletion\ (kg\frac{CaCO3}{t}/Year)}$$

In this equation, the rate of Modified NP depletion is calculated from the rate of combined calcium, magnesium, and potassium depletion (based on molar abundance of Ca+Mg+0.5K) and is represented in kg $CaCO_3$/t per year. In this calculation, it is assumed that NP is provided by carbonate and silicate dissolution.

For HCTs where the timing to deplete sulfide is greater than the time needed to deplete TIC or Modified NP, the samples are predicted to develop acidic conditions. The timing to onset of acidic conditions is represented by the time to depletion of TIC or Modified NP. The calculated timing to onset of acidic conditions based on depletion times is representative of laboratory conditions.

4.5 Quality Assurance and Quality Control

4.5.1 Static Tests

In addition to SRC Geoanalytical Laboratories QA/QC programs, all work was performed in line with SRK's *Expectations for Laboratory Geochemical Data Quality* (SRK 2011), which is used at SRK as the basis for review of all incoming data.

The QA/QC of the static results included the following:

- Comparison of total sulfur with sulfur by ICP-MS or ICP-OES where values within +/- 20 relative percent difference (RPD) were accepted.
- Comparison to standard reference material where values within +/- 20 RPD or within range of accredited tolerance were accepted.
- Laboratory replicates where sample values which were >10X detection limit were within +/- 20 RPD were accepted.
- Method blanks where results which were <5X detection limit were accepted.

A summary of the QA/QC results for the samples collected by SRK in 2019 is provided in Appendix A.

For the static testing, several samples were identified as having sulfur (from ICP-OES) of +/- 20 RPD in comparison to the results for total sulfur by LECO furnace. Rechecks on these samples were completed. Results which were reproducible were not changed, whereas recheck results which showed improvements to the RPD between sulfur from ICP and total sulfur were used in the data interpretation. In total, results from 7 of 16 samples that were reanalyzed for sulfur were replaced with the recheck results.

Following recheck of the selected samples for sulfur content, the static data were considered acceptable.

4.5.2 Humidity Cell Tests

SRK completed QA/QC on HCT results reported by SGS. The QA/QC criteria were as follows:

- **Ion balance:** Where electrical conductivity (EC) was greater than 100 µS/cm, ion imbalance does not exceed 10%.
- **Trend analysis:** Anomalous data and/or deviations from usual trends were flagged and submitted for recheck if suspected to be an analytical error.
- **Duplicate HCT:** Duplicate HCT (39015-DUP) trends were reviewed to confirm it followed similar trends to the parent HCT (39015). No significant deviations from the trends were identified requiring rechecks.
- **Lab leachate duplicates:** Where results are above 10 times the detection limit, laboratory leachate duplicates RPD should be within +/-20%.

- **Method blank HCT (Blank):** Results are to be within two times the detection limit. If outside these criteria, results were subject to evaluation and explanation by the laboratory.

Leachates that failed SRK's criteria were submitted for recheck. Following rechecks, the overall dataset met SRK's acceptance criteria and was considered suitable for use in the geochemical evaluation.

5 Results - Static Geochemical Characterization

5.1 Underground Tailings Management Facility

A total of 106 samples were collected from the UGTMF area and submitted for ABA and multi-element analysis. The samples collected were from the SPGN material type (57 samples) and INT material type (49 samples). A subset of samples was selected for mineralogy with results presented in Table 5-1 and Table 5-2. A statistical summary of ABA and elemental results for UGTMF samples by rock type is presented in Table 5-3 and Table 5-4. The complete data set is provided in Appendix B.

5.1.1 Mineralogy

Mineralogy by XRD and QEMSCAN was completed on the six samples from the UGTMF selected for humidity cell testing as part of Phase 2 of the geochemical characterization program.

The XRD results identified the dominant mineral phase in all samples as quartz (39 wt. % to 54 wt. %), biotite (18 wt. % to 33 wt. %), and muscovite (9.3 wt. % to 24 wt. %). Feldspar species included anorthite (up to 8.7 wt. %) and albite (up to 14 wt. %). Chlorite and kaolinite were identified in three of six samples at up to 11 wt. % and 4.5 wt. %, respectively. Sulfide was identified only in sample 39010, representing the SPGN unit, occurring as pyrite at 3.8 wt. %. No carbonate minerals were identified with XRD.

The results from QEMSCAN analysis showed the dominant phases to be quartz (up to 43 wt. %), biotite (up to 25 wt. %), and muscovite (up to 19 wt. %). Chlorite species were subdivided as chamosite, sudoite, and clinochlore, which were identified in all samples with up to 19 wt. % chlorite identified in sample 39038. Feldspar species identified in all samples include anorthoclase (up to 11 wt. %), oligoclase (up to 8.3 wt. %), orthoclase (up to 8.6 wt. %), and albite (up to 2.9 wt. %). Clay species illite and kaolinite were identified in all samples with up to 4.5 wt. % and 5 wt. %, respectively.

Sulfide was identified in all samples occurring primarily as pyrite (0.04 wt. % to 2.7 wt. %), with trace chalcopyrite (up to 0.014 wt. %) identified in four of six samples. Trace carbonate was identified in all samples. The primary carbonate species in five of six samples was calcite (up to 0.028 wt. %) with trace siderite identified in all samples (up to 0.007 wt. %).

Other trace mineral phases with less than 2 wt. % identified by QEMSCAN in all samples include Fe-oxide, ilmenite, rutile, apatite, monazite, and zircon.

The results for sulfide association, which is a measure of the degree to which sulfides are adjacent to other minerals based on the internal relationship between mineral grains in each particle, are presented in Figure 5-1.

Sulfide association as “free” indicates the particle is completely liberated and not in contact with other mineral phases. Sulfide association described as complex indicates sulfide grain contact with two or more distinct mineral phases.

The results show that the majority of sulfide grains are free or defined as having complex grain contact. Despite being the dominant mineral present, association with quartz was a minor component of the sulfide grain contact (up to 4.6%) (Figure 5-1).

Sulfide liberation is a measure of the extent to which sulfides are exposed at the grain surface and is categorized based on the criteria defined in Section 4.3.1. The results of the sulfide liberation assessment show that there is a range of grain liberation from “Free” to “Locked”. The proportion of surface exposure as “Locked” ranged from 20% to 34% (Figure 5-2).

The results from the liberation assessment indicate there is potential to have sulfide grains that are locked in resistive silicate phases (i.e., quartz) that may prevent sulfide oxidation which would reduce the portion of reactive sulfide that could form acidity from the sulfide reservoir. However, for the assessment of AP (Section 4.4.3), it is assumed that all sulfide measured by analytical methods would contribute AP.

Table 5-1: X-Ray Diffraction Results from UGTMF Samples

Sample ID	Location	Lithology Type	Quartz (wt. %)	Anorthite (wt. %)	Albite (wt. %)	Muscovite (wt. %)	Biotite (wt. %)	Pyrite (wt. %)	Chlorite (wt. %)	Kaolinite (wt. %)
39003	UGTMF	INT	45	2.7	14	11	28	-	-	-
39010	UGTMF	SPGN	39	-	-	24	24	3.8	9.6	-
39015	UGTMF	SPGN	54	7.1	-	9.5	26	-	3.4	-
39023	UGTMF	SPGN	40	4	7.3	14	31	-	-	4.5
39032	UGTMF	INT	39	8.7	7.2	9.3	33	-	-	3.2
39038	UGTMF	INT	54	3.1	-	14	18	-	11	0.7

Source:https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/Mineralogy/[XRD_Results_Compilation_1CN034.002_JAC.xlsx]Sheet

Note: Lithology type codes and descriptions are provided in Table 4-2.

UGTMF = underground tailings management facility; wt. % = weight percent.

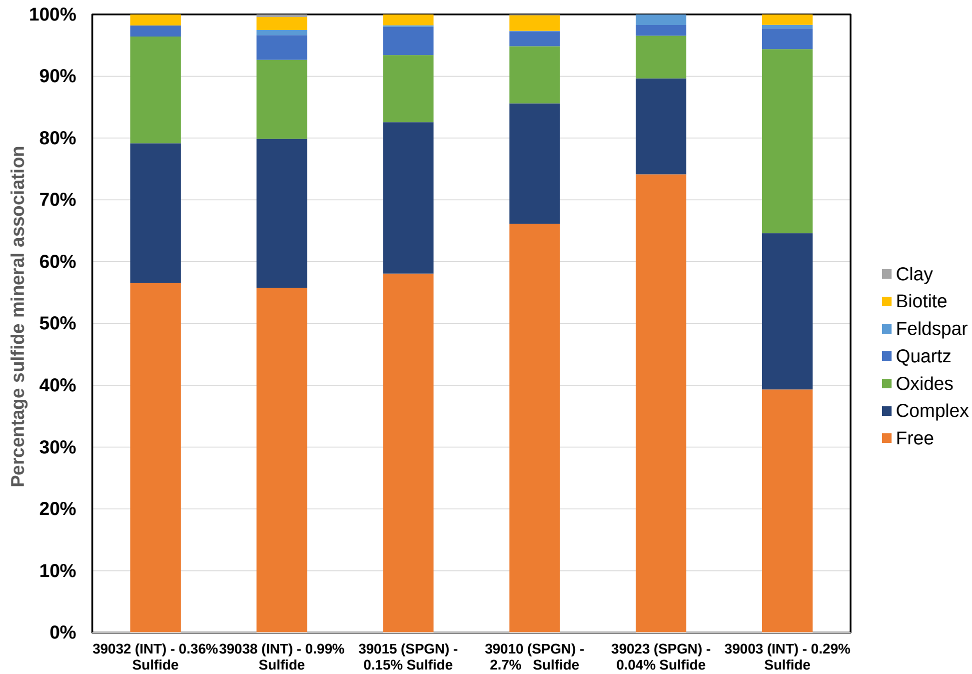
Table 5-2: QEMSCAN Results from UGTMF Samples

HCT Sample ID	Location	Lithology Type	Quartz (wt. %)	Muscovite (wt. %)	Illite (wt. %)	Kaolinite (wt. %)	Biotite (wt. %)	Chamosite (wt. %)	Sudoite (wt. %)	Clinochlore (wt. %)	Fe-oxide (wt. %)	Ilmenite (wt. %)	Rutile (wt. %)	Albite (wt. %)	Anorthoclase (wt. %)	Oligoclase (wt. %)	Orthoclase (wt. %)	Calcite (wt. %)	Siderite (wt. %)	Pyrite (wt. %)	Chalcopyrite (wt. %)	Apatite (wt. %)	Crandallite (wt. %)	Monazite-(Ce)	Zircon
39003	UGTMF	INT	43	7.9	1.1	2.9	18	2.8	0.39	0.005	0.56	0.99	0.13	1.7	11.0	8.3	0.16	0.028	0.003	0.29	-	0.12	-	0.057	0.08
39010	UGTMF	SPGN	43	19	3.6	2.9	15	4.7	4	0.37	1.7	0.004	0.74	0.011	0.015	0.57	1.4	0.001	0.002	2.7	0.014	0.052	0.001	0.006	0.18
39015	UGTMF	SPGN	37	13	3.9	4.1	24	2.5	0.8	0.048	1	0.01	1.2	1.3	4.3	6.0	0.38	0.004	0.001	0.59	0.005	0.04	-	0.006	0.06
39023	UGTMF	SPGN	38	10	1.5	3.0	25	6.8	0.7	0.025	0.79	0.27	0.72	2.4	4.1	5.6	0.26	0.016	0.007	0.04	-	0.056	-	0.022	0.11
39032	UGTMF	INT	33	14	2.1	3.6	20	4.7	0.85	0.015	0.56	0.73	0.16	2.9	6.7	8.5	1.6	0.075	0.003	0.35	0.002	0.054	0.001	0.01	0.047
39038	UGTMF	INT	32	6.6	4.5	5.0	13	16.6	1.8	0.23	1.7	0.042	1.2	1.9	2.7	2.7	8.6	0.013	0.017	0.99	0.002	0.019	-	0.015	0.041

Source:https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/Mineralogy/[XRD_Results_Compilation_1CN034.002_JAC.xlsx]Sheet

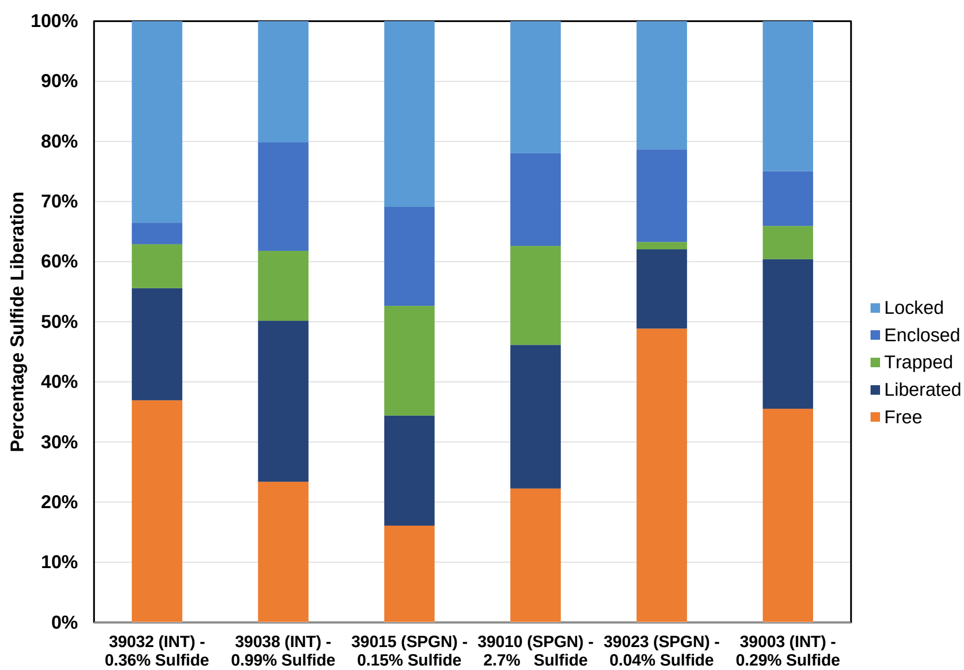
Note: Lithology type codes and descriptions are provided in Table 4-2.

QEMSCAN = Quantitative Evaluation of Material by Scanning Electron Microscopy; HCT = humidity cell test; UGTMF = underground tailings management facility; wt. % = weight percent.



https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/Mineralogy/[QEMSCAN_Results_Compilation_1CN034.002_JAC_REV01.xlsx]Sheet

Figure 5-1: Sulfide Mineral Association from QEMSCAN Results of UGTMF Samples



https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/Mineralogy/[QEMSCAN_Results_Compilation_1CN034.002_JAC_REV01.xlsx]Sheet

Figure 5-2: Sulfide Mineral Liberation from QEMSCAN Results of UGTMF Samples

5.1.2 Sulfur Speciation

The ABA results indicated that total sulfur ranged from a minimum of <0.01% to a maximum of 6.6%, with a median value of 0.19%. Median sulfur values were comparable for the INT and SPGN units with 0.18% and 0.19%, respectively. The results for sulfur as sulfate were at or below the detection limit (0.0017%S) in the majority of samples. Sulfur as sulfate concentrations ranged from <0.0017%S to 0.001%S, with a median value of 0.0017%S. The results show that sulfur occurred primarily as sulfide in all samples (Figure 5-3).

Paste pH of the samples from the UGTMF were circum-neutral to slightly alkaline, ranging from pH 7.3 to 9.3, with an average of pH 8.8. Sulfate sulfur showed a slight increase in concentrations as pH decreased indicating slight weathering in some samples, with oxidation of some sulfides producing soluble sulfate minerals and slightly depressing the pH (Figure 5-4). Most samples had low sulfate content indicating the samples had limited weathering.

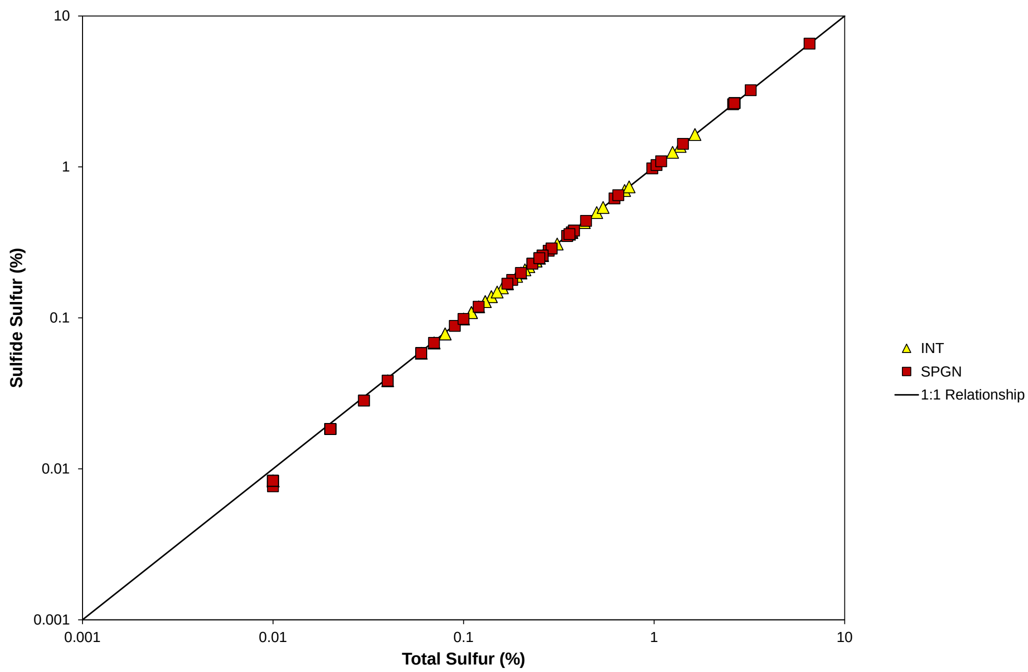


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Figure 5-3: Total Sulfur vs. Sulfur as Sulfide by Lithology for UGTMF Samples

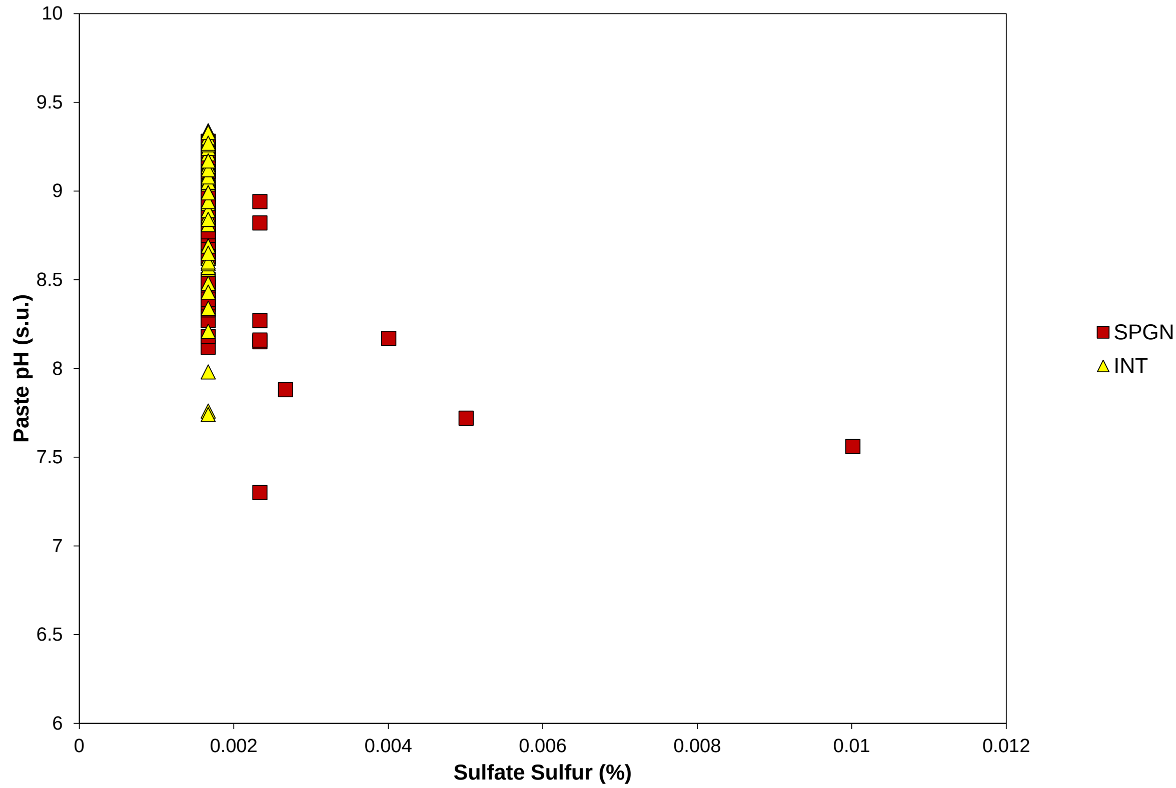

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Figure 5-4: Sulfate Sulfur vs. Paste pH for UGTMF Samples

5.1.3 Neutralization Potential

Overall neutralization potential as measured by both the Modified NP and TIC methods was generally low (<10 kg $CaCO_3$/t).

The results for Modified NP ranged from 2.3 kg $CaCO_3$/t to 58 kg $CaCO_3$/t, with a median value of 6.1 kg $CaCO_3$/t for waste rock in the UGTMF. Modified NP from the SPGN (median of 5.1 kg $CaCO_3$/t) was comparable to the results from the INT (median of 6.5 kg $CaCO_3$/t).

Carbonate content (as measured by TIC) ranged from <0.83 kg $CaCO_3$/t to 52 kg $CaCO_3$/t, with a median value at the detection limit of 0.83 kg $CaCO_3$/t. Like the results for Modified NP, TIC was comparable between the SPGN and the INT both with a median of 0.83 kg $CaCO_3$/t.

The results for Modified NP were higher than TIC, on average by a factor of 5 to 6 times higher, indicating the Modified NP method is dominated by neutralization potential from silicate dissolution (Figure 5-5).

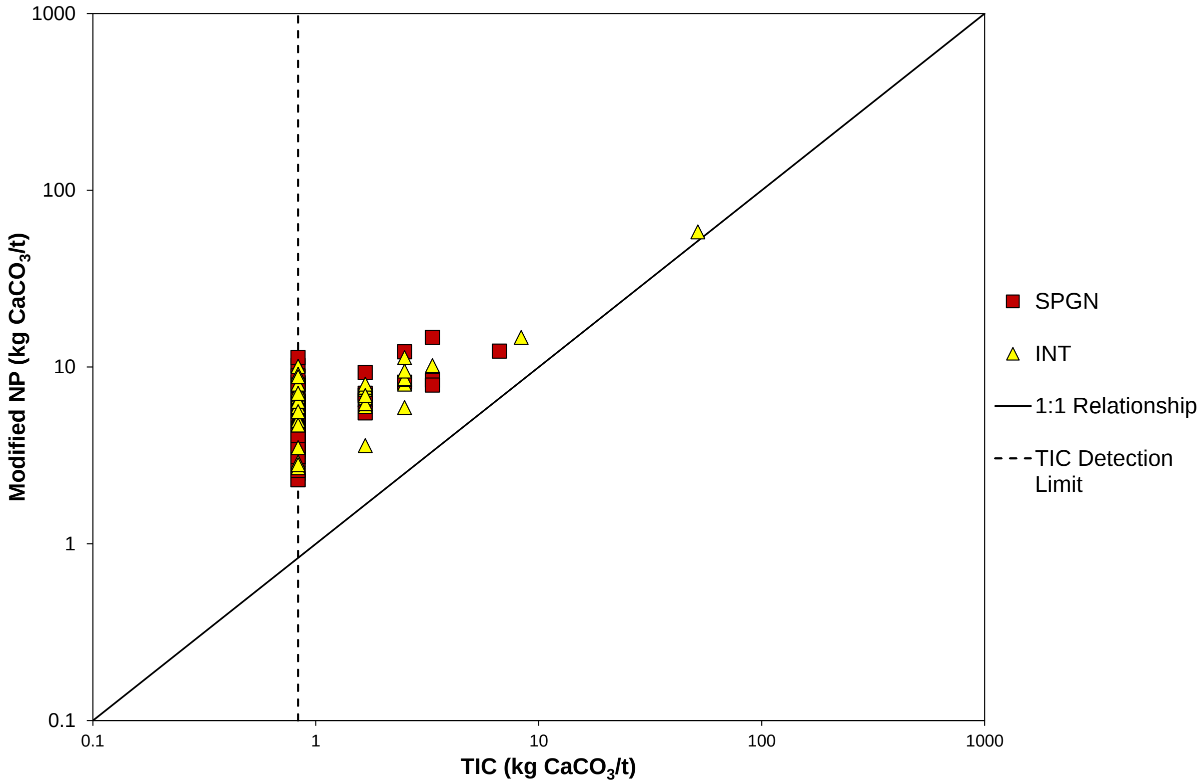

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Figure 5-5: TIC vs. Modified NP by Lithology for UGTMF Samples

5.1.4 Acid Rock Drainage Potential

The ARD classification criteria described in Section 4.4.3 for NP/AP is shown in Figure 5-6 and TIC/AP is shown in Figure 5-7.

Based on the ARD classification using NP/AP criteria, 46 samples (43%) were classified as PAG and 21 samples (20%) were classified as uncertain, with the remaining 39 samples (37%) classified as NPAG. Of the samples classified as PAG, 21 (46%) were from the INT material type and 25 (54%) were from the SPGN.

The ARD classification criteria based on TIC/AP shows 67 samples (63%) were classified as PAG, 1 sample (1%) was classified as uncertain, and the remaining 38 samples (36%) were classified as NPAG. Of the PAG samples, 36 (54%) were from the INT material type and 31 (46%) were from the SPGN unit.

The difference in the distribution of PAG, uncertain, and NPAG samples between the NP/AP and TIC/AP criteria is due to lower TIC content compared to Modified NP. The laboratory Modified NP analysis predominantly represents NP from slow-reacting silicate minerals rather than fast-reacting carbonates. Modified NP is likely to be less effective (than carbonates) in the field at providing acid neutralization; therefore, ARD classification based on TIC/AP is considered more applicable.

The majority of samples classified as NPAG based on the TIC/AP criteria were classified as such due to having sulfur as sulfide content of <0.1% rather than having TIC/AP of greater than 3.

Ongoing kinetic testing with HCTs will provide additional information to determine the effectiveness of NP provided from silicate dissolution. Defining the effective NP from silicate dissolution can be used to refine the low sulfide cut-off criterion for the Project for classification of materials as NPAG and determine the suitability of using NP/AP versus TIC/AP to determine ARD classification.

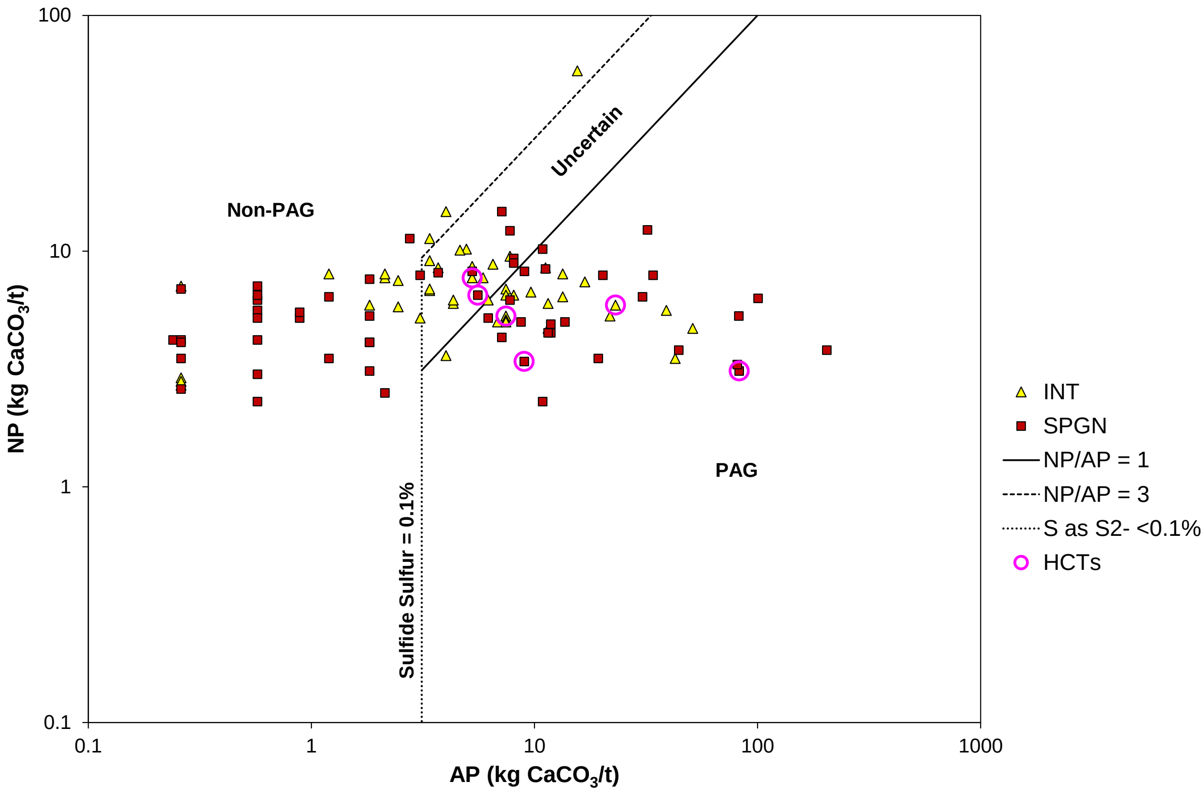

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Figure 5-6: AP vs. NP by Lithology for UGTMF Samples Showing HCT Selections

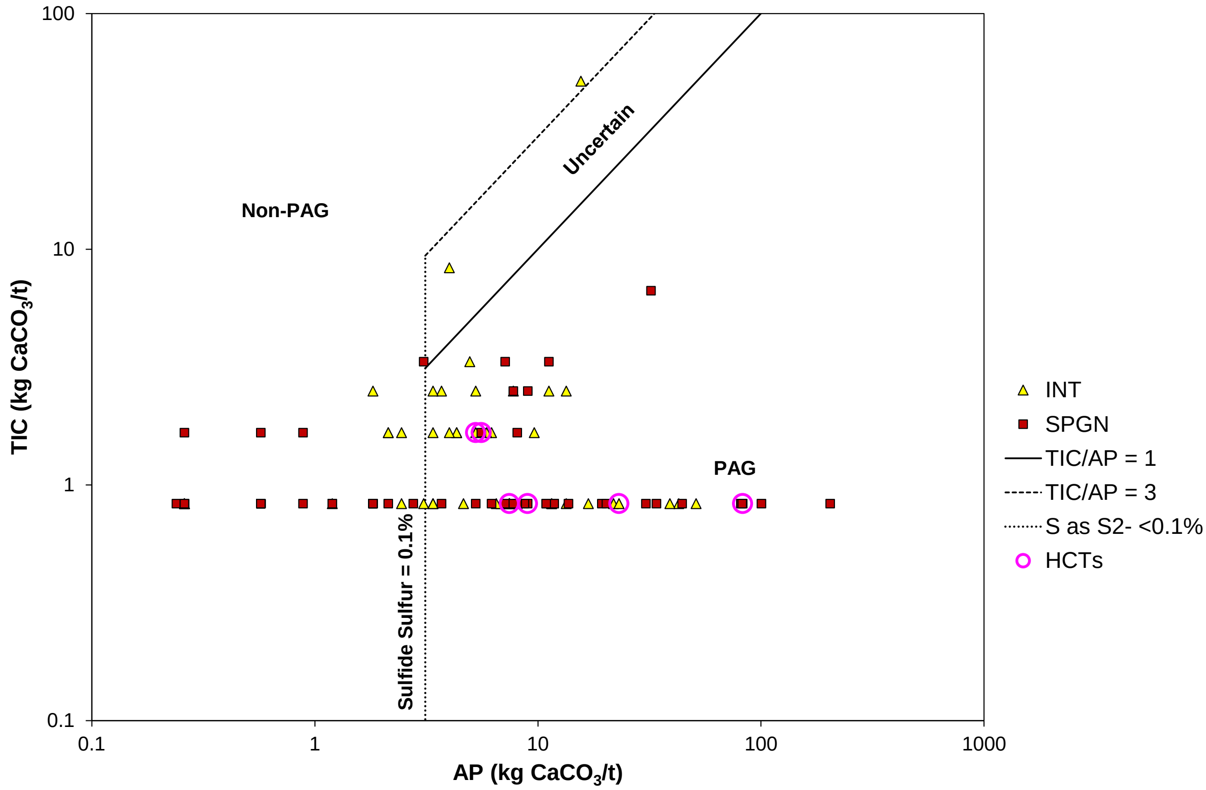

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Figure 5-7: AP vs. TIC by Lithology for UGTMF Samples Showing HCT Selections

Table 5-3: Summary of Acid Base Accounting Results for UGTMF Area Samples

Lithology	Analyte	Paste pH	Mod. NP	AP	Total Carbon	Total Sulfur	S as Sulfate	S as Sulfide	TIC	NP/AP	TIC/AP
	Unit	pH units	kg $CaCO_3$/t	kg $CaCO_3$/t	wt. %	wt. %	wt. %	wt. %	kg $CaCO_3$/t	-	-
	Detection	-	0.5	0.5	0.01	0.01	0.0017	Calc.	Calc.	Calc.	Calc.
INT (n=49)	Min	7.7	2.7	0.26	<0.01	<0.01	<0.0017	0.008	<0.83	0.082	0.016
	P05	8.1	3.1	0.26	0.034	0.01	<0.0017	0.008	<0.83	0.18	0.03
	P50	9.0	6.5	5.9	0.15	0.19	<0.0017	0.19	<0.83	1.4	0.3
	Average	8.9	7.8	8.9	0.17	0.29	<0.0017	0.29	2.5	0.9[1]	0.3[1]
	P75	9.2	8.0	9.6	0.19	0.31	<0.0017	0.31	1.7	2.7	0.7
	P95	9.3	11	33	0.34	1.0	<0.0017	1.0	3.0	11	3
	Max	9.3	58	51	0.88	1.6	<0.0017	1.6	52	27	3
SPGN (n=57)	Min	7.3	2.3	0.24	0.010	0.010	<0.0017	0.0077	<0.83	0.019	0.004
	P05	7.8	2.6	0.26	0.038	0.010	<0.0017	0.008	<0.83	0.058	0.010
	P50	8.8	5.2	5.6	0.19	0.18	<0.0017	0.18	<0.83	1.6	0.3
	Average	8.7	5.9	16	0.22	0.53	0.0020	0.52	1.2	0.36[1]	0.07[1]
	P75	9.0	7.6	12	0.27	0.37	<0.0017	0.37	<0.83	5.3	1.5
	P95	9.2	11	82	0.50	2.6	0.0029	2.6	3.3	16	3
	Max	9.3	15	204	0.69	6.6	0.01	6.5	6.7	27	6

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Notes: 1 – Average NP/AP and TIC/AP are represented by average NP/average AP and average TIC/average AP.
Lithology type codes and descriptions are provided in Table 4-2.

UGTMF = underground tailings management facility; Mod. NP = modified neutralization potential; AP = acid potential; S = sulfur; TIC = total inorganic carbon; kg $CaCO_3$/t = kilogram of calcium carbonate per tonne; wt. % = weight percent.

5.1.5 Trace Element Enrichment

Trace element enrichment as a preliminary assessment of metal leaching potential was assessed based on the criterion defined in Section 4.4.4.

Results for selected trace elements are shown in Table 5-4.

Of the 49 samples representing INT, 1 sample (2%) was enriched in each of arsenic, cadmium, and lead, and 2 samples (4.1%) were enriched in selenium. Of the 57 samples representing SPGN, 1 sample (1.8%) was enriched in copper.

Overall, the results show that waste rock from the UGTMF does not have appreciable trace element enrichment in the solid phase.

Table 5-4: Trace Element Results from Aqua Regia Digestion and ICP-MS Finish for Selected Parameters from UGTMF Samples

Lithology	Analyte	Ag	As	Be	Bi	Cd	Co	Cu	Hg	Mo	Ni	Pb	Rb	Sb	Se	Sn	Te	Th	U	V	W	Y	Zn
	Unit	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
	Detection	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.001**	**0.01**	**0.01**	**0.1**	**0.01**	**0.01**	**0.01**	**0.01**	**0.1**	**0.1**	**0.01**	**0.1**
10X ACA Basalt		*1.1*	*20*	*10*	*0.07*	*2.2*	*480*	*870*	*0.9*	*15*	*1300*	*60*	*300*	*2*	*0.5*	*15*	*-*	*40*	*10*	*2500*	*7*	*210*	*1050*
10X ACA Shale		*0.7*	*130*	*30*	*-*	*3*	*190*	*450*	*4*	*26*	*680*	*200*	*1400*	*15*	*6*	*60*	*-*	*120*	*37*	*1300*	*18*	*260*	*950*
INT (n=49)	Min	<0.01	<0.01	0.03	<0.01	<0.01	0.55	0.7	<0.01	0.06	3.1	0.69	1.4	<0.01	<0.1	0.03	<0.01	6.2	0.32	5.6	<0.01	0.29	1.5
	P05	0.014	0.088	0.034	0.01	0.01	3	1	<0.01	0.24	9.2	2.2	9.6	0.01	0.1	0.03	0.01	7.1	0.45	16	<0.01	2.2	13
	P50	0.04	0.58	0.08	0.03	0.04	11	17	<0.01	0.6	28	5.4	49	0.01	0.1	0.1	0.01	11	0.66	43	<0.01	4.3	51
	Average	0.049	1.4	0.14	0.049	0.1	10	22	<0.01	1.1	28	7.8	45	0.012	0.16	0.081	0.017	12	0.78	41	<0.01	4.8	62
	P75	0.05	1	0.17	0.05	0.06	12	24	<0.01	1	33	7.4	57	0.01	0.1	0.1	0.02	15	0.93	49	<0.01	5.5	62
	P95	0.13	4	0.41	**0.15**	0.3	17	57	<0.01	3.3	47	12	70	0.03	**0.5**	0.12	0.05	17	1.2	55	<0.01	9.8	130
	Max	0.16	**25**	0.59	**0.32**	**2.2**	24	87	<0.01	7.7	53	**82**	78	0.05	**0.9**	0.15	0.06	20	2.6	60	<0.01	14	480
SPGN (n=57)	Min	0.01	0.01	0.01	0.01	0.01	3.3	1.4	<0.01	0.18	4.8	0.87	1.8	0.01	0.1	0.01	0.01	4.5	0.27	11	<0.01	0.88	7.6
	P05	0.01	0.01	0.01	0.01	0.01	6.2	2.9	<0.01	0.22	14	1.5	4.9	0.01	0.1	0.02	0.01	5.9	0.29	17	<0.01	1.3	15
	P50	0.03	0.75	0.11	0.05	0.02	10	18	<0.01	0.75	27	3.8	38	0.01	0.1	0.06	0.02	13	0.7	38	<0.01	2.9	38
	Average	0.044	1.3	0.23	0.19	0.035	12	38	<0.01	1.3	31	6.2	36	0.011	0.23	0.064	0.03	12	0.71	36	<0.01	3.4	39
	P75	0.05	1.6	0.24	0.13	0.04	13	30	<0.01	1.4	35	8.3	55	0.01	0.1	0.08	0.03	14	0.85	45	<0.01	4.4	49
	P95	0.13	4.2	0.85	0.92	0.094	24	100	<0.01	4.7	61	15	63	0.02	0.62	0.12	0.082	20	1.3	54	<0.01	7.7	66
	Max	0.23	8.8	1	2.1	0.25	57	**740**	<0.01	9.7	130	32	80	0.03	3.4	0.13	0.25	22	1.6	61	<0.01	8.3	83

Source: https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/03_Results_Processing/[1CN034.002_NexGen_GeochemCharacterization_jcc_mc_jac_rev014.xlsx]

Notes: Values in **bold** exceed 10X the average crustal abundance of comparable rock types; results reported to 2 significant figures.
Lithology type codes and descriptions are provided in Table 4-2.

ICP-MS = inductively coupled plasma-mass spectrometry; UGTMF = underground tailings management facility; mg/kg = milligram per kilogram; ACA = average crustal abundance.

5.1.6 Radionuclides

Radionuclide activities from waste rock samples from the UGTMF are presented in Table 5-5, with results for uranium also provided for reference. None of the individual radionuclide results exceeded the UDRL for diffuse NORM sources (Health Canada 2011) for the radionuclides that were analyzed; however, the summed ratios of the radionuclide to corresponding UDRL show that two samples (39015 and 39032) have values greater than 1. The results indicate that a component of the waste rock material sourced from the UGTMF is likely to fall within a restricted NORM classification and require a site review to determine NORM management program requirements.

Table 5-5: Solid-Phase Radionuclide and Uranium Results from Selected UGTMF Samples

Sample ID	Lithology Type	Uranium-238 Decay Chain					Thorium-232 Decay Chain			Sum of Ratios
		U-238[1]	Lead-210	Polonium-210	Radium-226	Thorium-230	Thorium-232	Thorium-228	Radium-228	
		Bq/g	Bq/g	Bq/g	Bq/g	Bq/g	Bq/g	Bq/g	Bq/g	Unitless
39015	SPGN	0.01	<0.04	0.02	0.2	<0.02	0.08	0.1	0.2	**1.7**
39032	INT	0.0077	<0.04	0.03	0.1	0.02	0.06	0.08	0.2	**1.3**
39038	INT	0.006	<0.04	0.01	0.12	<0.02	0.03	0.03	0.1	0.84
Unconditional derived release limits diffuse NORM sources (Health Canada 2011)		*10*	*0.3*	*-*	*0.3*	*10*	*10*	*0.3*	*0.3*	*1*

Source:https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/HCT/[Rook1_Radionulcides_1CN034.002_JAC_RTC_REV01.xlsx]

Notes: 1 – U-238 calculated from solid-phase U results from aqua regia digestion and ICP-MS/OES finish.

2 – **Bold** values exceed UDRL.

Lithology type codes and descriptions are provided in Table 4-2.

UGTMF = underground tailings management facility; Bq/g = becquerels per gram; NORM = naturally occurring radioactive material; ICP-MS/OES = inductively coupled plasma-mass spectrometry/optical emission spectrometry; UDRL = unconditional derived release limits.

5.2 Mine Development Area

A total of 109 samples were collected from samples representing waste rock at the mine development area. Most samples (104) were collected from the basement units where the majority of the development is planned. This includes 79 samples from the SPGN unit and 25 samples from the INT unit. Samples collected from cover units include MST (one sample), OVB (two samples) and SST (two samples). A subset of samples was selected for mineralogical analysis with results presented in Table 5-6 and Table 5-7. A statistical summary of ABA and elemental results for the mine development area samples by rock type is presented in Table 5-8 and Table 5-9. The complete data set is provided in Appendix B.

5.2.1 Mineralogy

Mineralogy by XRD was completed on all samples selected for HCTs as part of Phase 2 of the geochemical characterization program with QEMSCAN completed on two samples (39076 and 39181).

The XRD results identified the dominant mineral phase in all samples as quartz (60 wt. % to 71 wt. %), biotite (9.9 wt. % to 19 wt. %), and muscovite (identified in four of five samples) (8.8 wt. % to 11 wt. %). Anorthite and chlorite were identified in all samples with up to 6 wt. % and 12 wt. %, respectively. Pyrite was identified in two samples from the SPGN unit (39137 and 39140) at 6.1 wt. % and 3 wt. %, respectively. Graphite was identified in two samples representing the SPGN unit (3.7 wt. % in sample 39137 and 1.3 wt. % in sample 39140). No carbonate minerals were identified with XRD.

The results from QEMSCAN analysis of the two samples analyzed showed the dominant phases to be quartz (up to 41 wt. %), muscovite (up to 22 wt. %), and biotite (up to 7.7 wt. %). Chlorite species (as chamosite, sudoite, and clinochlore) were identified in both samples, with up to 16 wt. %. Feldspar species identified in all samples include anorthoclase (up to 5.3 wt. %), oligoclase (up to 6.9 wt. %), orthoclase (up to 0.65 wt. %), and albite (up to 5.6 wt. %). Sample 39186 from the INT unit had comparatively higher feldspar content in comparison to sample 39076 representing the SPGN unit. Clay species illite and kaolinite were identified in both samples at up to 2.8 wt. % and 7.7 wt. %, respectively.

Trace sulfide was identified in both samples analyzed with QEMSCAN, occurring as pyrite (0.28 wt. % and 0.14 wt. %).

Trace carbonate was identified in both samples as calcite (0.001 wt. % and 0.007 wt. %) and siderite (0.007 wt. % and 0.009 wt. %).

Iron oxide was identified in both samples at 2.8 wt. % and 1.4 wt. %. Other trace mineral phases with less than 1 wt. % identified by QEMSCAN included ilmenite, rutile, apatite, crandallite, monazite, and zircon.

The results for sulfide association are presented in Figure 5-8.

The results show that the majority of sulfide grains are free or defined as having complex grain contact. Despite quartz being the dominant mineral, sulfide association with quartz was a minor component of the grain contact with 5.6% in sample 39076 and 5.8% in sample 39186 (Figure 5-8).

The results of the sulfide liberation assessment show that there is a range of grain liberation from “Free” to “Locked”. The proportion of surface exposure as “Locked” was 14% in sample 39076 and 22% in sample 39186 (Figure 5-9).

The results from the liberation assessment indicate there is potential to have a minor component of the sulfide grains that are locked in resistive silicate phases (i.e., quartz) that may prevent sulfide oxidation. However, for the calculation of AP (Section 5.2.2), it is assumed that all sulfide measured by analytical methods would contribute AP.

Table 5-6: X-Ray Diffraction Results from Mine Development Area Samples

Sample ID	Location	Lithology Type	Quartz (wt. %)	Anorthite (wt. %)	Muscovite (wt. %)	Biotite (wt. %)	Pyrite (wt. %)	Chlorite (wt. %)	Kaolinite (wt. %)	Graphite (wt. %)
39079	Mine	SPGN	71	3.8	10	9.9	-	4.8	0.4	-
39137	Mine	SPGN	60	4.8	10	12	6.1	3.1	-	3.7
39140	Mine	SPGN	64	4.6	11	11	3	4.7	-	1.3
39186	Mine	INT	63	6		19	-	12	-	-
39181	Mine	SPGN	66	2.6	8.8	17	-	6.4	-	-

Source:https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/Mineralogy/[XRD_Results_Compilation_1CN034.002_JAC.xlsx]Sheet

Note: Lithology type codes and descriptions are provided in Table 4-2.

wt. % = weight percent.

Table 5-7: QEMSCAN Results from Mine Development Area Samples

HCT Sample ID	Location	Lithology Type	Quartz (wt. %)	Muscovite (wt. %)	Illite (wt. %)	Kaolinite (wt. %)	Biotite (wt. %)	Chamosite (wt. %)	Sudoite (wt. %)	Clinochlore (wt. %)	Fe-oxide (wt. %)	Ilmenite (wt. %)	Rutile (wt. %)	Albite (wt. %)	Anorthoclase (wt. %)	Oligoclase (wt. %)	Orthoclase (wt. %)	Calcite (wt. %)	Siderite (wt. %)	Pyrite (wt. %)	Apatite (wt. %)	Crandallite (wt. %)	Monazite-(Ce) (wt. %)	Zircon (wt. %)
39076	Mine	SPGN	41	22	1.8	0.93	15	11	4.5	0.29	2.8	0.007	0.59	0.032	0.003	0.044	0.05	0.001	0.007	0.28	0.076	0.001	0.046	0.2
39186	Mine	INT	36	6.5	2.8	7.7	14	10	1.8	0.22	1.4	0.008	0.84	5.6	5.3	6.9	0.65	0.007	0.009	0.14	0.041	0.001	0.015	0.09

Source:https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/Mineralogy/[QEMSCAN_Results_Compilation_1CN034.002_JAC_REV01.xlsx]Sheet
Note: Lithology type codes and descriptions are provided in Table 4-2.

QEMSCAN = Quantitative Evaluation of Material by Scanning Electron Microscopy; HCT = humidity cell test; wt. % = weight percent.

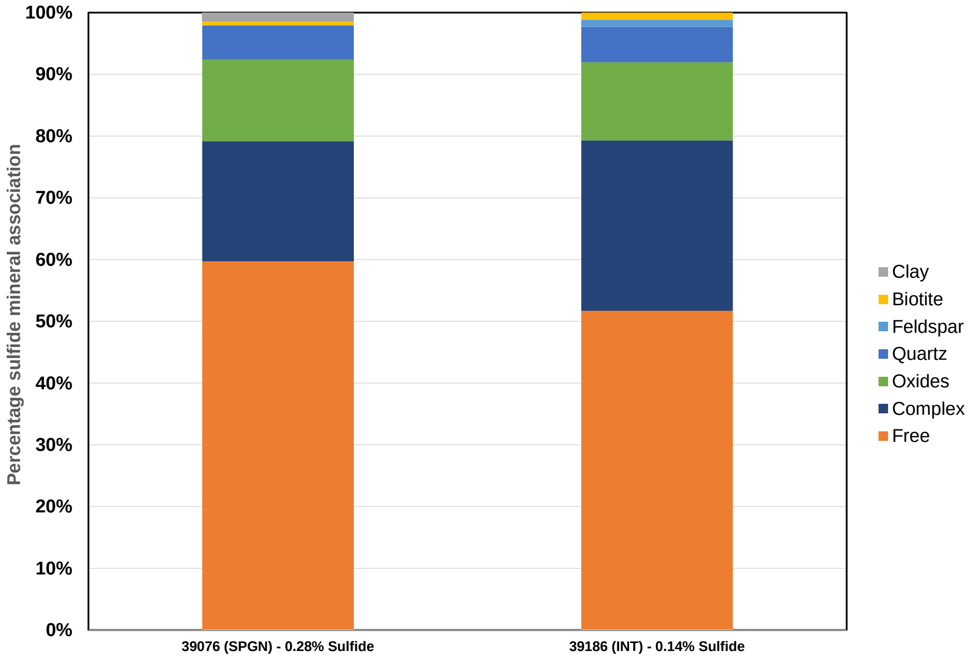

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Figure 5-8: Sulfide Mineral Association from QEMSCAN Results of Mine Development Area Samples

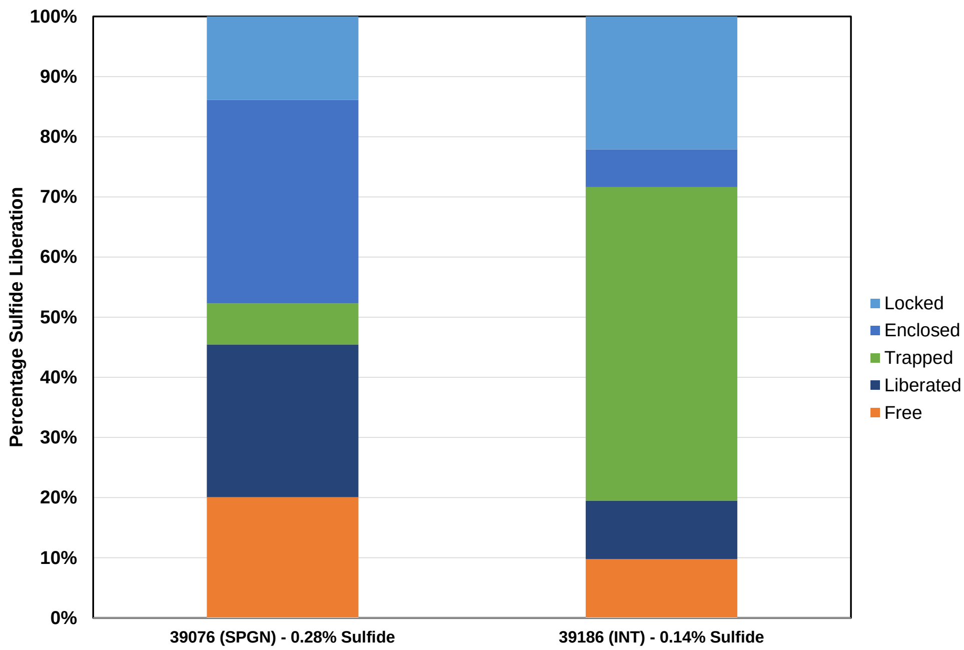

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Figure 5-9: Sulfide Liberation from QEMSCAN Results of Mine Development Area Samples

5.2.2 Sulfur Speciation

A statistical summary of ABA results for mine development area waste rock samples by rock type is presented in Table 5-8 and the complete data set is provided in Appendix B.

The results for total sulfur ranged from <0.01% to 3.3%, with a median of 0.03% for all samples. The median sulfur value of the INT unit (0.17%) was higher than the median sulfur value of the SPGN unit (0.02%). Sulfur content in the overburden, MST, and SST cover units was comparatively low with up to 0.03%, 0.12%, and 0.05%, respectively.

The results for sulfur as sulfate were relatively low ranging from <0.0017%S to 0.032%S. The results show that sulfur occurs primarily as sulfide in the waste rock samples from the mine development area (Figure 5-10).

Samples with higher concentrations of sulfur were observed from sheared or faulted materials in the SPGN (SPGN/FLT) that occur in proximity to the mineralized shear zones.

All samples from basement units (SPGN and INT) had circum-neutral to alkaline pH ranging from 6.3 to 10. The two samples of overburden material had mildly acidic paste pH (5.1 and 5.5). Sulfate sulfur values show a slight increase with as pH decreased, indicating slight weathering in some samples with oxidation of some sulfides producing soluble sulfate minerals and slightly depressing the pH (Figure 5-11). Most samples had low sulfate content (<0.01%), indicating the samples had limited weathering.

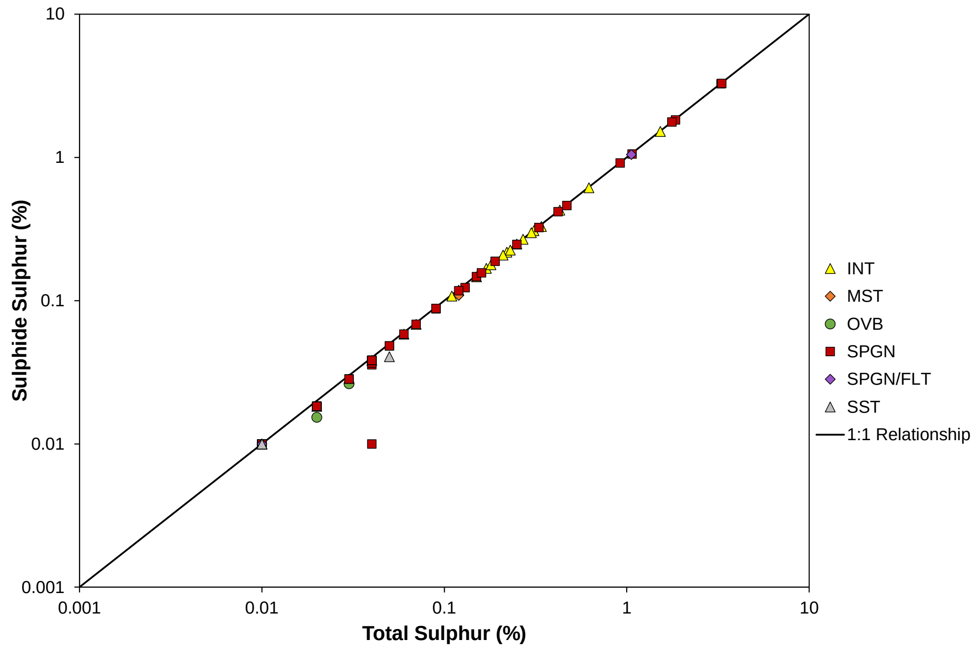

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Figure 5-10: Total Sulfur vs. Sulfur as Sulfide for the Mine Development Area Samples

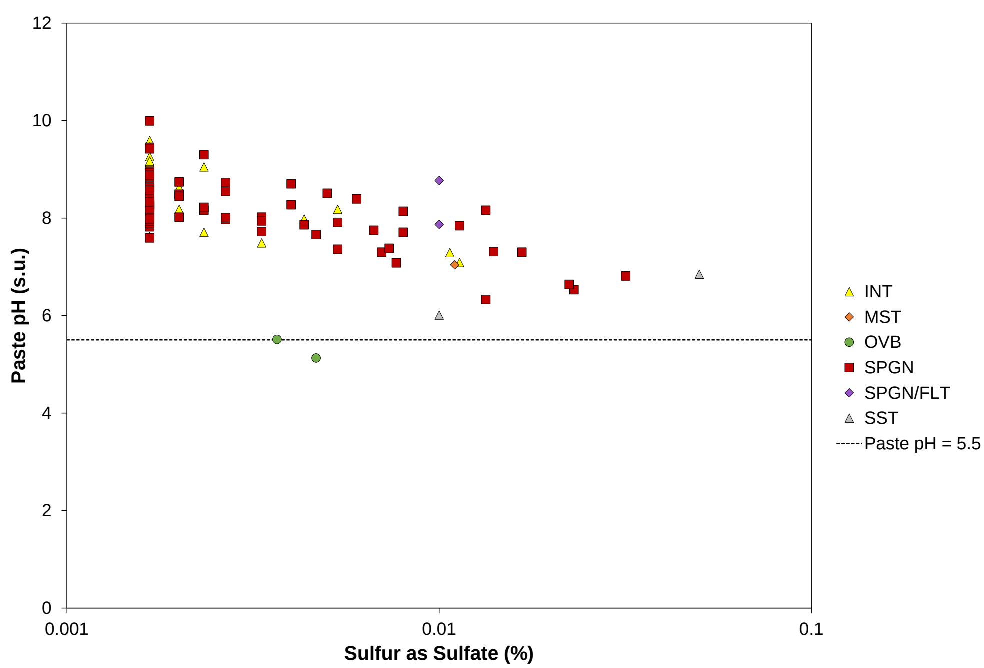

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Figure 5-11: Sulfate Sulfur vs. Paste pH for Mine Development Area Samples

5.2.3 Neutralization Potential

Overall neutralization potential as measured by both the Modified NP and TIC methods were generally low (<10 kg $CaCO_3$/t).

The results for Modified NP from waste rock samples in the mine development area ranged from <0.5 kg $CaCO_3$/t to 25 kg $CaCO_3$/t with a median of 4 kg $CaCO_3$/t. The Modified NP values from the SPGN unit with a median of 3.5 kg $CaCO_3$/t were comparable to the results from the INT unit with a median of 6.1 kg $CaCO_3$/t. The results from Modified NP in the overburden, MST, and SST cover units were also low with a maximum of 1.4 kg, 0.5 kg, and 3 kg $CaCO_3$/t, respectively.

Carbonate content (as measured by TIC) ranged from <0.83 kg $CaCO_3$/t to 7.5 kg $CaCO_3$/t with a median of <0.83 kg $CaCO_3$/t. Like the results for Modified NP, TIC was comparable in the SPGN unit and the INT unit with median values of <0.83 kg $CaCO_3$/t and was low in all samples from cover units (all below detection limit of 0.83 kg $CaCO_3$/t).

Like the samples from the UGTMF, the results for Modified NP were generally higher than TIC, which combined with the large proportion of samples having carbonate below detection, indicates the Modified NP method is predominantly measuring NP from silicate dissolution (Figure 5-12).

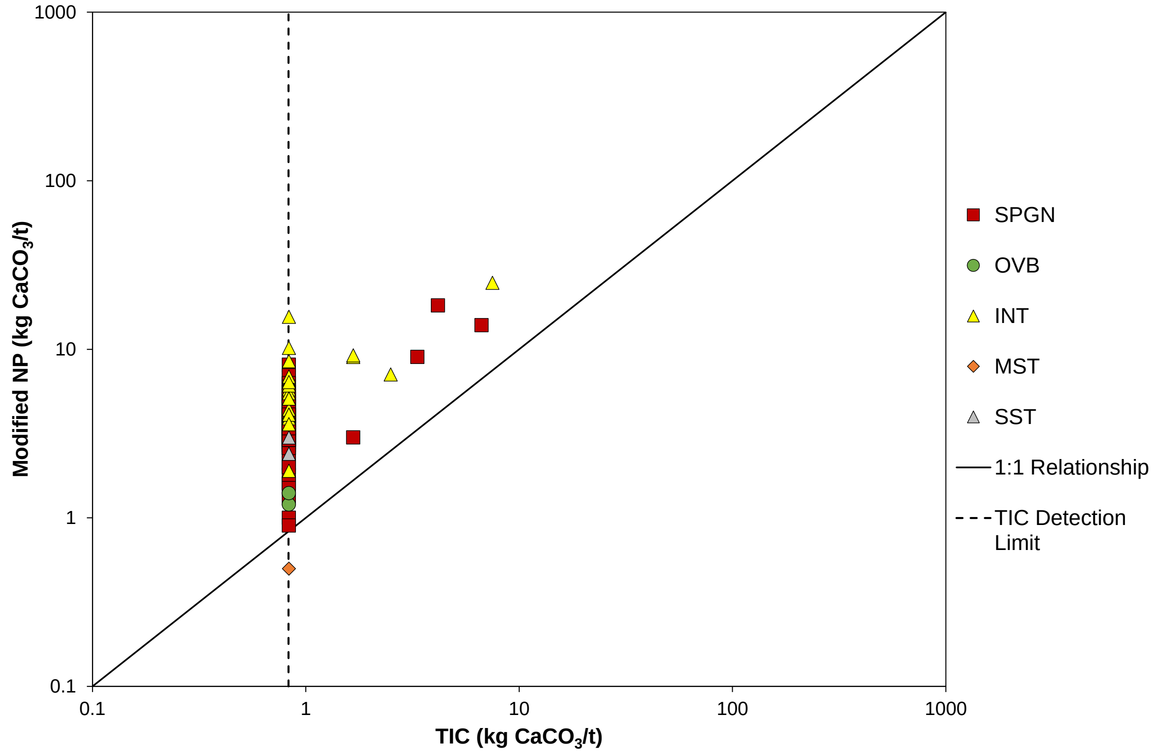

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Figure 5-12: Comparison of Carbonate (TIC) and Modified Neutralization Potential (NP) by Lithology for Mine Development Area Samples

5.2.4 Acid Rock Drainage Potential

The ARD classification criteria described in Section 4.4.3 for NP/AP is shown in Figure 5-13 and TIC/AP is shown in Figure 5-14.

Based on the ARD classification using NP/AP, 26 samples (24%) were classified as PAG, 7 samples (6.4%) were classified as uncertain, and 76 samples (70%) were classified as NPAG. Samples classified as PAG included 9 of 25 (36%) samples from the INT unit, 16 of 79 samples from the SPGN (20%), and 1 sample from the MST.

The ARD classification based on TIC/AP was similar to using NP/AP, with 33 samples (30%) classified as PAG, 1 sample (1%) classified as uncertain, and 75 samples (69%) classified as NPAG. Samples classified as PAG included 16 of 25 (64%) samples from the INT unit, 16 of 79 samples from the SPGN (20%), and 1 sample from the MST.

The majority of samples classified as NPAG based on the TIC/AP criteria were classified as such due to having sulfur as sulfide content of <0.1%S rather than having TIC/AP of greater than 3.

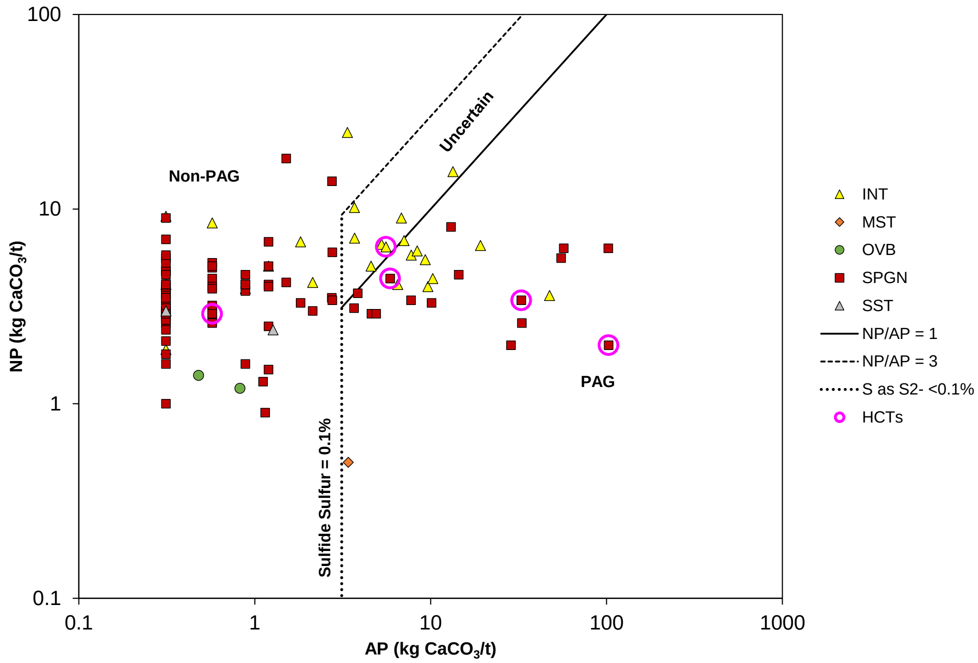

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Figure 5-13: AP vs. NP by Lithology for Mine Development Area Waste Rock Samples showing HCT Selections

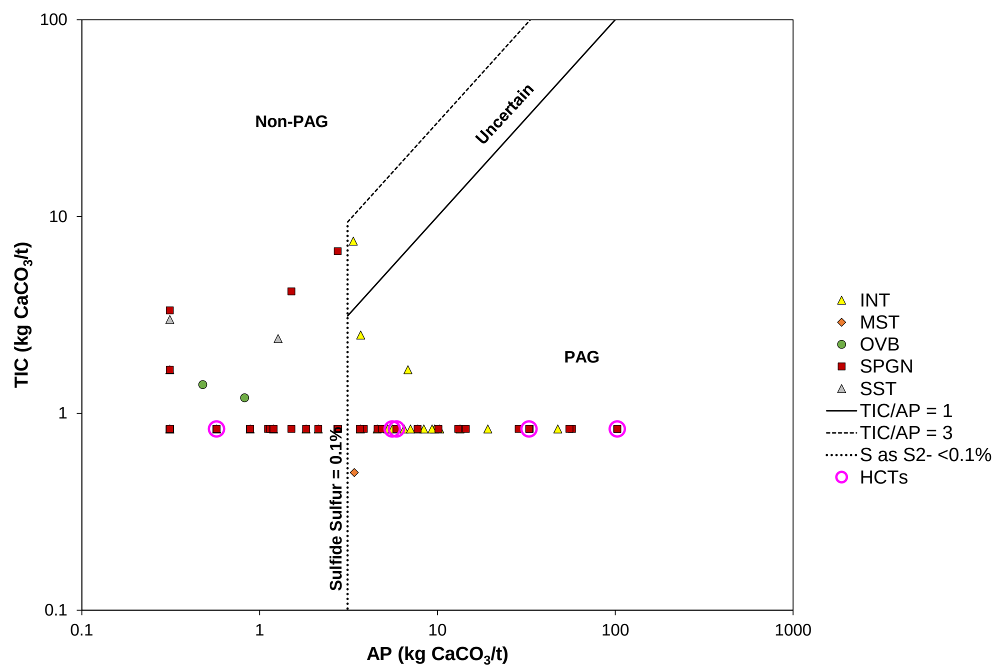

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Figure 5-14: AP vs. TIC by Lithology for Mine Development Area Waste Rock Samples showing HCT Selections

Table 5-8: Summary of Acid Base Accounting Results of Waste Rock Samples from the Mine Development Area

Lithology or Waste Type	Analyte	pH, Paste	Mod. NP	AP	Total Carbon	Total Sulfur	S as Sulfate	S as Sulfide	TIC	NP/AP	TIC/AP
	Unit	pH Units	kg $CaCO_3$/t	kg $CaCO_3$/t	wt. %	wt. %	wt. %	wt. %	kg $CaCO_3$/t	--	-
	Detection	--	0.5	0.5	0.01	0.01	0.0017	Calc.	Calc.	Calc.	Calc.
INT (n=25)	Min	7.1	1.9	0.31	<0.01	<0.01	<0.0017	0.01	<0.83	0.076	0.018
	P05	7.3	3.7	0.31	<0.01	<0.01	<0.0017	0.01	<0.83	0.35	0.05
	P50	8.6	6.1	5.3	0.11	0.17	<0.0017	0.17	<0.83	1.3	0.2
	Average	8.5	7.0	7.2	0.14	0.23	0.003	0.23	1.2	1.0[1]	0.2[1]
	P75	9.0	7.1	8.4	0.16	0.27	0.002	0.27	<0.83	4.3	0.7
	P95	9.4	15	18	0.49	0.58	0.0096	0.58	2.3	14	3
	Max	9.6	25	47	0.85	1.5	0.011	1.5	7.5	29	5
MST (n=1)	Sample ID: 39072	7.0	0.5	3.4	2.1	0.12	0.011	0.11	<0.83	0.15	0.24
OVB (n=2)	Sample ID: 39190	5.5	1.2	0.82	1.3	0.03	0.0037	0.026	<0.83	1.5	1.0
	Sample ID: 39191	5.1	1.4	0.48	0.70	0.02	0.0047	0.015	<0.83	2.9	1.7
SST (n=2)	Sample ID: 39071	6.0	3.0	0.31	<0.01	0.01	0.0023	0.01	<0.83	9.6	2.7
	Sample ID: 39073	6.9	2.4	1.3	0.01	0.05	0.0093	0.041	<0.83	1.9	0.7
SPGN (n=79)	Min	6.3	0.9	0.31	0.02	<0.01	<0.0017	0.01	<0.83	0.019	0.008
	P05	7.4	1.6	0.31	0.07	<0.01	<0.0017	0.01	<0.83	0.099	0.024
	P50	8.3	3.5	0.57	0.26	0.02	<0.0017	0.018	<0.83	5.1	1.5
	Average	8.3	4.1	6.7	0.39	0.22	0.0032	0.21	0.99	0.6[1]	0.1[1]
	P75	8.6	4.6	2.4	0.41	0.08	0.002	0.078	<0.83	9.6	2.7
	P95	9.0	7.1	35	0.95	1.1	0.012	1.1	0.92	17	3
	Max	10	18	103	4.0	3.3	0.032	3.3	6.7	29	11

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Notes: 1 – Average NP/AP and TIC/AP are represented by average NP/average AP and average TIC/average AP.

Lithology type codes and descriptions are provided in Table 4-2.

Mod. NP = modified neutralization potential; AP = acid potential; S = sulfur; TIC = total inorganic carbon; kg $CaCO_3$/t = kilogram of calcium carbonate per tonne; wt. % = weight percent.

5.2.5 Trace Element Enrichment

Trace element enrichment as a preliminary assessment of metal leaching potential was assessed based on the criteria defined in Section 4.4.4. Results for selected trace elements are shown in Table 5-9.

Of the samples representing the INT unit, 1 of 24 (4.2%) was enriched in selenium and 2 of 24 (8.3%) were enriched in uranium. Of the samples representing SPGN, 15 of 79 (19%) were enriched in uranium, 8 of 79 (10%) were enriched in molybdenum and 1 of 79 (1.3%) was enriched for each of silver, cobalt, copper, and selenium. The two samples of overburden were enriched in silver.

In general, the samples from the SPGN showed a wider range in concentrations in comparison to the INT unit. Several of the parameters identified as being enriched are recognized to occur in association with uranium mineralization at the Project (including uranium, molybdenum, selenium, and silver). Overall, concentrations of these elements were higher in waste rock samples near the mineralized shear zones.

The results for cobalt show a positive relationship with total sulfur, indicating it is associated with sulfide, possibly as a substitution in pyrite (Figure 5-15).

Copper and total sulfur shows a weak positive relationship. In general, samples with higher sulfur concentrations (>0.5%) have elevated copper (>50 mg/kg), suggesting copper occurs as a trace component of pyrite (as the dominant sulfide mineral). However, several samples have lower sulfur (<0.5%) and slightly elevated copper (>50 mg/kg), indicating copper may also occur in association with other minerals. The ratio of copper to sulfur in the lower sulfur samples indicates that copper could occur as trace chalcopyrite ($CuFeS_2$) whereas the ratio of copper to sulfur in the higher sulfur samples indicates copper occurs primarily as a trace constituent in pyrite (Figure 5-16). A pyrite line with trace copper (0.003%) is presented in Figure 5-16, which shows a population of samples plotting near this line. These samples likely have copper occurring primarily in association with pyrite. Samples that plot between the chalcopyrite and pyrite with trace copper lines in Figure 5-16 likely host copper as a combination of chalcopyrite and as trace constituent in pyrite.

Molybdenum (Figure 5-17) and selenium (Figure 5-18) show a weak positive relationship with samples with elevated sulfur (>0.5%), indicating that enrichment can occur in association with sulfide minerals. The ratio of molybdenum to sulfur in the higher sulfur samples indicate that molybdenum may occur as a trace constituent in pyrite (Figure 5-17) and possibly also as trace molybdenite. The ratio of selenium to sulfur in the higher selenium samples shows that selenium may also occur as a trace constituent in pyrite, likely as substitution of sulfur (Figure 5-18). However, a few samples with elevated concentrations of both molybdenum (>10 mg/kg) and selenium (>1 mg/kg) had low sulfur (<0.1%), indicating these constituents may occur in association with non-sulfide mineral sources (Figure 5-17 and Figure 5-18).

Uranium concentrations show no correlation with sulfur (Figure 5-19). Uranium likely occurs primarily as uraninite (UO_2).

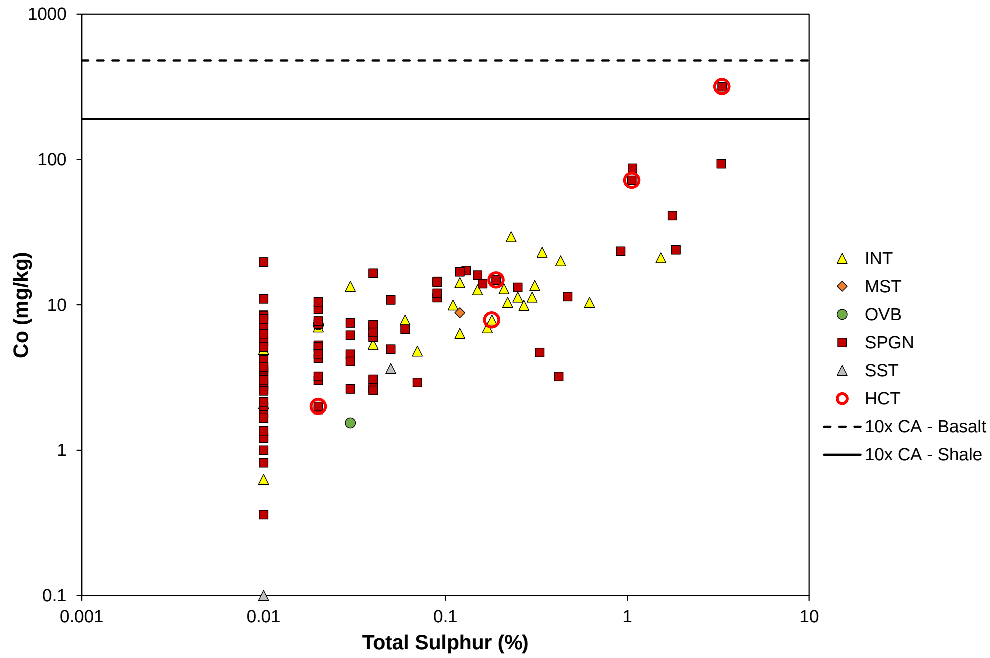

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Figure 5-15: Total Sulfur vs. Cobalt from Aqua Regia Digestion for Mine Development Area Samples showing HCT Selections

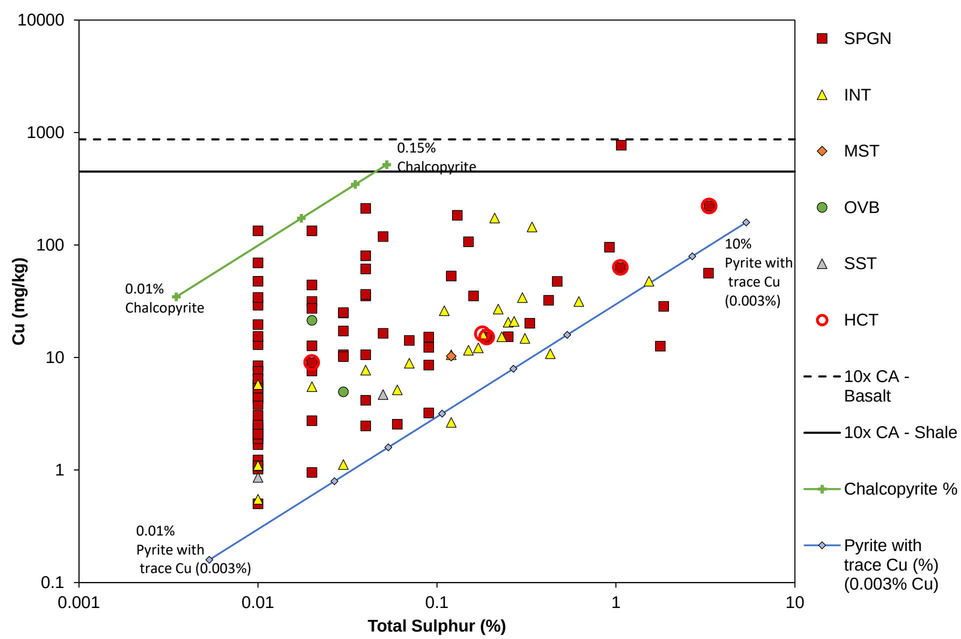

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Figure 5-16: Total Sulfur vs. Copper from Aqua Regia Digestion for Mine Development Area Samples Showing HCT Selections

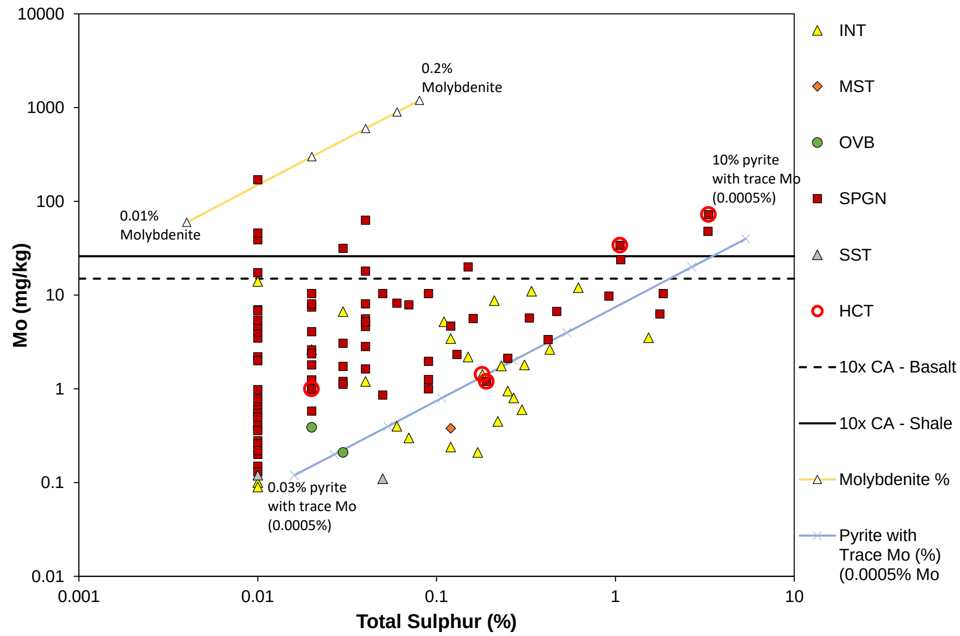

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Figure 5-17: Total Sulfur vs. Molybdenum from Aqua Regia Digestion for Mine Development Area Samples showing HCT Selections

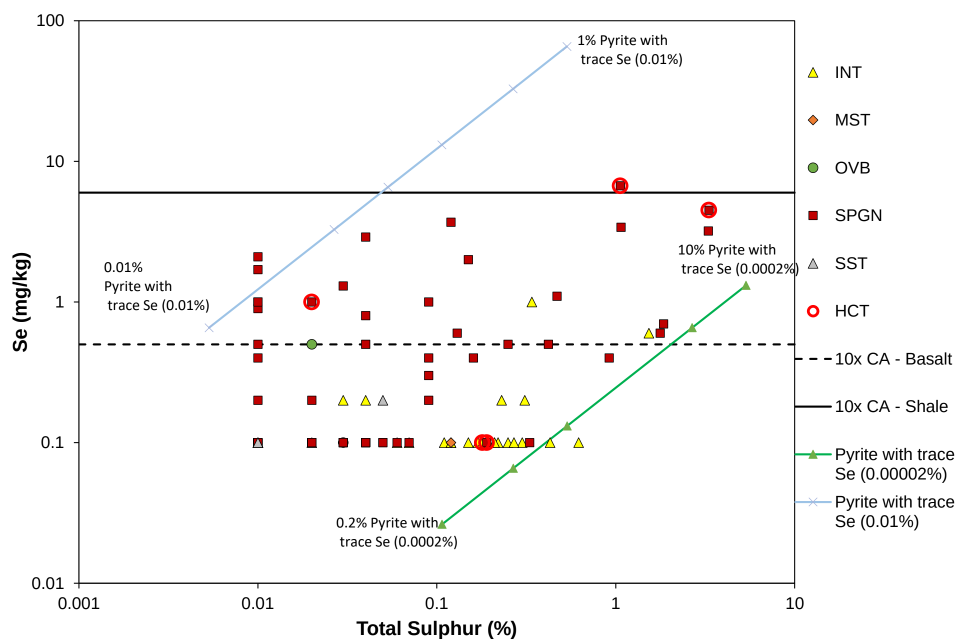

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Figure 5-18: Total Sulfur vs. Selenium from Aqua Regia Digestion for Mine Development Area Samples showing HCT Selections

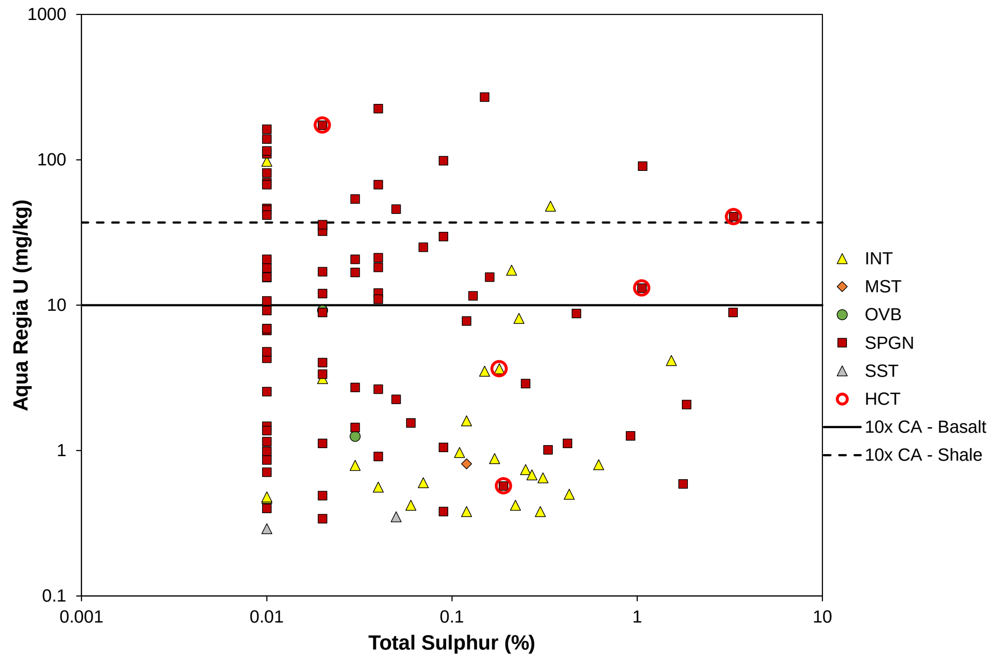

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Figure 5-19: Uranium (from Aqua Regia Digestion) vs. Total Sulfur for Mine Development Area Samples showing HCT Selections

Table 5-9: Trace Element Results from Aqua Regia Digestion and ICP-MS Finish for Selected Parameters from Mine Development Area Samples

Lithology or Waste Type	Analyte	Ag	As	Be	Bi	Cd	Co	Cu	Hg	Mo	Ni	Pb	Rb	Sb	Se	Sn	Te	Th	U	V	W	Y	Zn
	Unit	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
	Detection	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.001**	**0.01**	**0.01**	**0.1**	**0.01**	**0.01**	**0.01**	**0.01**	**0.1**	**0.1**	**0.01**	**0.1**
10X ACA Basalt		*1.1*	*20*	*10*	*0.07*	*2.2*	*480*	*870*	*0.9*	*15*	*1300*	*60*	*300*	*2*	*0.5*	*15*	*-*	*40*	*10*	*2500*	*7*	*210*	*1050*
10X ACA Shale		*0.7*	*130*	*30*	*-*	*3*	*190*	*450*	*4*	*26*	*680*	*200*	*1400*	*15*	*6*	*60*	*-*	*120*	*37*	*1300*	*18*	*260*	*950*
INT (n=25)	Min	<0.01	0.18	0.05	<0.01	<0.01	0.63	0.55	<0.01	0.09	2.7	1.2	1.1	<0.01	<0.1	0.02	<0.01	0.5	0.38	11	<0.1	0.55	1.1
INT (n=25) MST (n=1)	P05	<0.01	0.24	0.06	<0.01	<0.01	2.5	1.1	<0.01	0.12	12	1.3	2.5	<0.01	<0.1	0.02	<0.01	1.1	0.39	18	<0.1	1.4	2.5
	P50	0.03	0.75	0.49	**0.1**	0.02	10	12	<0.01	1.6	26	3.8	12	<0.01	<0.1	0.07	<0.01	7	0.77	33	<0.1	3.4	21
	Average	0.03	0.92	0.59	**0.25**	0.03	11	21	0.01	3	27	4.2	18	<0.01	0.14	0.09	0.02	8.8	6.2	36	0.18	3.8	23
	P75	0.04	1.1	0.92	**0.42**	0.04	13	22	<0.01	3.5	36	5.5	35	<0.01	<0.1	0.1	0.02	9.9	3.2	40	0.2	4.4	36
	P95	0.06	1.6	1.6	**0.73**	0.07	21	46	<0.01	12	50	10	49	<0.01	0.2	0.3	0.02	18	**16**	83	0.49	9.3	47
	Max	0.08	3.8	1.8	**0.86**	0.1	29	170	0.02	14	54	12	50	0.01	**0.6**	0.37	0.15	38	**98**	100	0.7	11	56
	Sample ID: 39072	0.09	2.5	0.66	0.19	0.07	8.8	10	0.04	0.38	16	9.3	11	0.04	<0.1	0.38	0.02	5.4	0.81	11	0.2	7.9	36
OVB (n=2)	Sample ID: 39190	**1.2**	0.6	0.5	0.1	0.04	1.5	5	0.03	0.21	3	6.8	1.8	0.03	<0.1	0.13	<0.01	4.8	1.3	4.2	1.2	2.4	11
OVB (n=2) SST (n=2)	Sample ID: 39191	**4.4**	1.2	0.9	0.15	0.1	7.3	21	0.3	0.39	12	19	6.1	0.03	0.5	0.57	0.01	30	9.2	8.3	19	7.6	26
	Sample ID: 39071	0.02	0.31	0.03	0.02	0.01	0.1	0.86	<0.01	0.12	0.56	0.62	0.12	<0.01	<0.1	0.03	<0.01	1	0.29	0.3	<0.1	0.71	0.4
SST (n=2) SPGN (n=79)	Sample ID: 39073	0.01	0.73	0.14	0.04	0.02	3.7	4.7	<0.01	0.11	28	2.2	2.9	0.06	0.2	0.19	<0.01	3.8	0.35	2	<0.1	1.1	130
	Min	<0.01	0.11	0.02	0.02	<0.01	0.4	0.5	<0.01	0.13	2.3	0.56	1.1	<0.01	<0.1	<0.01	<0.01	0.82	0.34	2.6	<0.1	0.53	0.6
SPGN (n=79) 10X ACA Basalt	P05	<0.01	0.28	0.10	0.06	<0.01	1.3	1.2	<0.01	0.25	5.2	1.1	1.5	<0.01	<0.1	<0.01	<0.01	2.2	0.55	5.5	0.1	0.69	1.4
	P50	0.03	1.8	0.24	0.43	0.02	5.3	13	<0.01	2.8	17	3.9	2.6	<0.01	<0.1	0.02	0.02	7.1	9.2	15	0.1	1.6	11
	Average	0.07	3.3	0.29	0.98	0.05	15	40	0.01	10	22	8.4	7.2	0.03	0.59	0.03	0.05	8.5	23	17	0.14	2.2	18
	P75	0.06	3.2	0.31	1.2	0.04	11	35	<0.01	8	24	6.3	5	0.02	0.5	0.03	0.06	11	27	22	0.1	2.6	19
	P95	0.41	14	0.57	4.1	0.19	50	150	0.02	**47**	68	30	34	0.08	3.3	0.09	0.16	18	**93**	47	0.3	4.7	56
	Max	**0.8**	22	2	6.5	0.4	**320**	**770**	0.1	**170**	130	130	62	0.18	**6.7**	0.32	0.7	36	**230**	62	1.3	17	200

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Notes: Values in **bold** exceed 10X the average crustal abundance of comparable rock types; results reported to 2 significant figures.
Lithology type codes and descriptions are provided in Table 4-2.

ICP-MS = inductively coupled plasma-mass spectrometry; mg/kg = milligram per kilogram; ACA = average crustal abundance.

5.2.6 Radionuclides

Radionuclide analysis from selected samples from the mine development area is presented in Table 5-10, with results for uranium also provided for reference. Three samples exceeded the UDRL for diffuse NORM sources (Health Canada 2011) for the radionuclides that were analyzed, including radium-226 in three samples and lead-210 in two samples. The three samples that exceeded the UDRL for radium-226 had summed ratios of the radionuclide to corresponding UDRL greater than 1. The results indicate that a component of the waste rock material sourced from the mine development area is likely to fall within a restricted NORM classification and require a site review to determine NORM management program requirements.

All samples with exceedances were classified as having solid-phase enrichment for uranium.

Table 5-10: Solid-Phase Radionuclide and Uranium Results from Selected Samples from the Mine Development Area

Sample ID	Lithology Type	U-238 Decay Chain					Th-232 Decay Chain			Sum of Ratios
		U-238	Lead-210	Polonium-210	Radium-226	Thorium-230	Thorium-232	Thorium-228	Radium-228	
		Bq/g	Bq/g	Bq/g	Bq/g	Bq/g	Bq/g	Bq/g	Bq/g	Unitless
39076	SPGN	0.0071	<0.04	0.04	0.04	<0.02	0.08	0.07	0.1	0.71
39137	SPGN	0.5	**1.2**	1.1	**0.8**	0.56	0.09	0.09	0.1	**3.4**
39140	SPGN	0.16	0.25	0.3	**0.32**	0.17	0.1	0.07	0.1	**1.7**
39181	SPGN	2.1	**3.4**	3.1	**2.5**	1.3	0.7	0.09	0.09	**9.3**
39186	INT	0.045	0.08	0.08	0.12	0.06	0.09	0.08	<0.09	0.69
Unconditional derived release limits diffuse NORM sources (Health Canada 2011)		*10*	*0.3*	*-*	*0.3*	*10*	*10*	*0.3*	*0.3*	*1*

Source:https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/HCT/[Rook1_Radionulcides_1CN034.002_JAC_RTC_REV01.xlsx]

Notes: 1 – U-238 calculated from solid-phase U results from aqua regia digestion and ICP-MS/OES finish.
2 – **Bold** values exceed UDRL.

Lithology type codes and descriptions are provided in Table 4-2.

UGTMF = underground tailings management facility; Bq/g = becquerels per gram; NORM = naturally occurring radioactive material; ICP-MS/OES = inductively coupled plasma-mass spectrometry/optical emission spectrometry; UDRL = unconditional derived release limits.

5.3 Shafts and Portal

A total of 43 samples were collected for ABA and multi-element analysis from two geotechnical drill holes near the proposed shafts and portal. This includes 21 samples collected from drill hole GAR-18-013 and 22 samples collected from drill hole GAR-18-015. The samples were predominantly from the basement lithology units including 13 samples from the INT unit and 12 samples from the SPGN unit. These two holes also intersected cover units with samples collected from each of the LITL (4 samples), CRET (4 samples), DEVO (4 samples), ASST (4 samples), and overburden (2 samples). A statistical summary of ABA and elemental results for shaft and portal samples is presented in Table 5-11 and Table 5-12. The complete data set is provided in Appendix B.

5.3.1 Sulfur Speciation

The results for total sulfur ranged from <0.01% to 1.2%, with a median of <0.01% for all samples. For samples collected from basement units, the samples from the INT unit had higher median sulfur content (0.07%) (n=13) in comparison to the median sulphur content of the SPGN unit (<0.01%) (n=12). For the samples of the cover units, sulfur content was highest in the samples of the Cretaceous cover deposits (CRET) (up to 0.7%). Total sulfur in samples collected from the other cover units including overburden, DEVO, ASST and LITL were generally low with up to 0.01%, 0.03%, 0.01%, and 0.17% sulfur, respectively.

The results for sulfur as sulfate were low ranging from <0.0017%S to 0.08%S. Sulfur occurs primarily as sulfide in the waste rock samples from the shaft and portal locations (Figure 5-20).

All samples from basement units (i.e., SPGN and INT) had slightly alkaline pH ranging from 8.2 to 9.6. Samples of cover units (i.e., OVB, CRET, DEVO, ASST, LITL) had mildly acidic to circum-neutral pH (range of 5 to 7.7). There was no clear relationship between sulfate and paste pH (not shown). The sample with mildly acidic paste pH had low total sulfur of 0.01%; therefore, the pH likely reflects the pH of deionized water added, and a lack of buffering capacity, rather than the presence of acidic sulfate minerals.

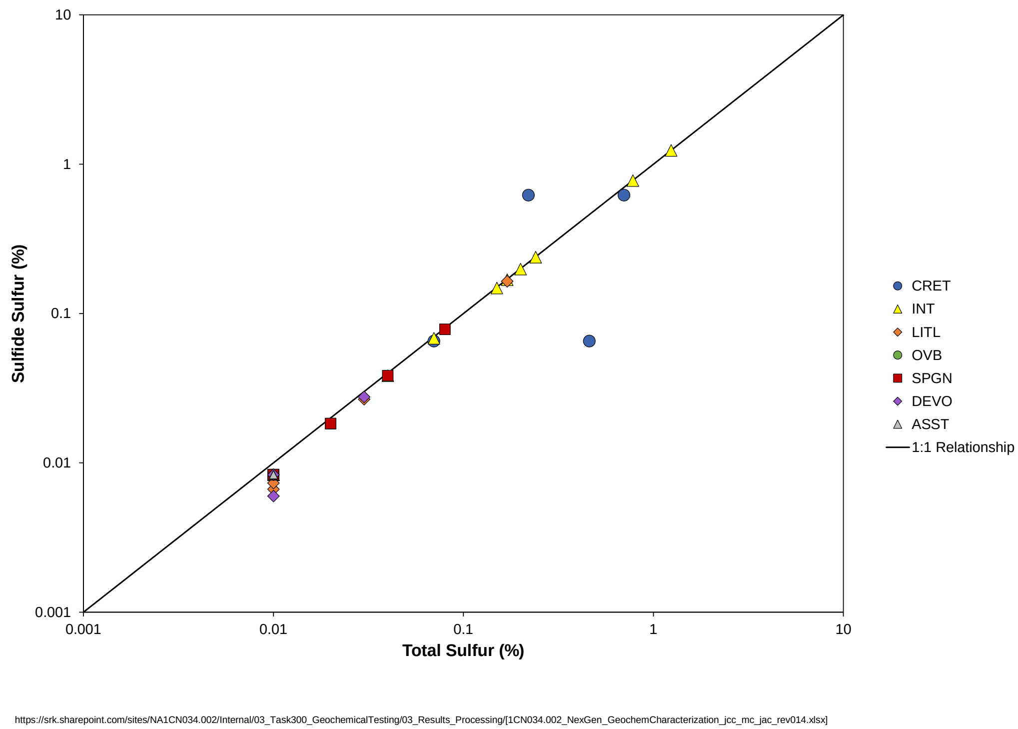

Figure 5-20: Total Sulfur vs. Sulfur as Sulfide by Lithology Type for Shaft and Portal Samples

5.3.2 Neutralization Potential

Neutralization potential as measured by both the Modified NP and TIC methods were low for all samples (<20 kg $CaCO_3$/t).

The results for Modified NP from waste rock samples collected from the shaft and portal area ranged from 0.5 kg $CaCO_3$/t to 20 kg $CaCO_3$/t, with a median of 4.5 kg $CaCO_3$/t for all samples. The Modified NP values from the SPGN (median of 5.6 kg $CaCO_3$/t) were comparable to the results from the INT (median of 6.9 kg $CaCO_3$/t). The results for Modified NP were low for all samples of the cover units with a maximum of 5.2 kg $CaCO_3$/t from a sample of the CRET unit.

The TIC values ranged from <0.83 kg $CaCO_3$/t to 3.33 kg $CaCO_3$/t, with a median of <0.83 kg $CaCO_3$/t from all samples.

The results for Modified NP were generally higher than TIC (on average by a factor of 5), which combined with undetectable carbonate in the majority of samples, indicates that the Modified NP method is predominantly measuring NP from silicate dissolution (Figure 5-21).

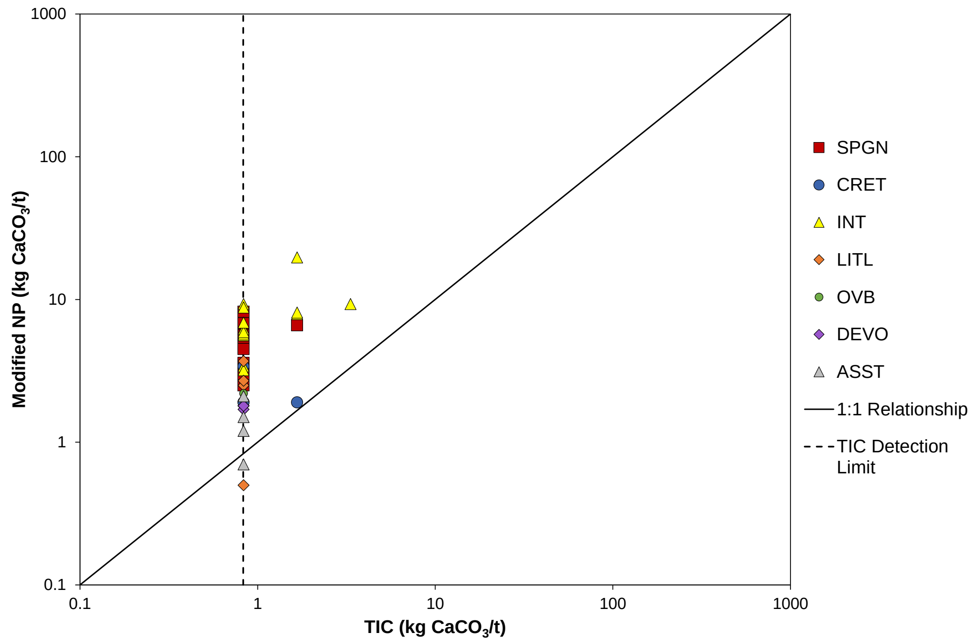

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Figure 5-21: TIC vs. Modified NP by Lithology Type for Shaft and Portal Samples

5.3.3 Acid Rock Drainage Potential

The ARD classification criteria described in Section 4.4.3 for NP/AP is shown in Figure 5-22 and TIC/AP is shown in Figure 5-23.

Based on the ARD classification using NP/AP, 7 samples (16%) were classified as PAG, 2 samples (4.6%) were classified as uncertain, and 34 samples (79%) were classified as NPAG. Samples classified as PAG from the basement units include three of 13 samples (23%) from the INT unit with all samples from the SPGN classified as NPAG. From the cover units, 3 of 4 samples from the CRET unit and 1 of 4 samples sample from the LTIL were classified as PAG.

The ARD classification based on TIC/AP had 10 samples (23%) classified as PAG, no samples classified as uncertain, and 33 samples (77%) classified as NPAG. Samples classified as PAG included 6 of 13 (46%) from the INT unit, 3 of 4 samples from the CRET and 1 of 4 samples from the LITL.

The majority of samples classified as NPAG based on the TIC/AP criteria were classified as such due to having sulfur as sulfide content of <0.1%S rather than having TIC/AP of greater than 3.

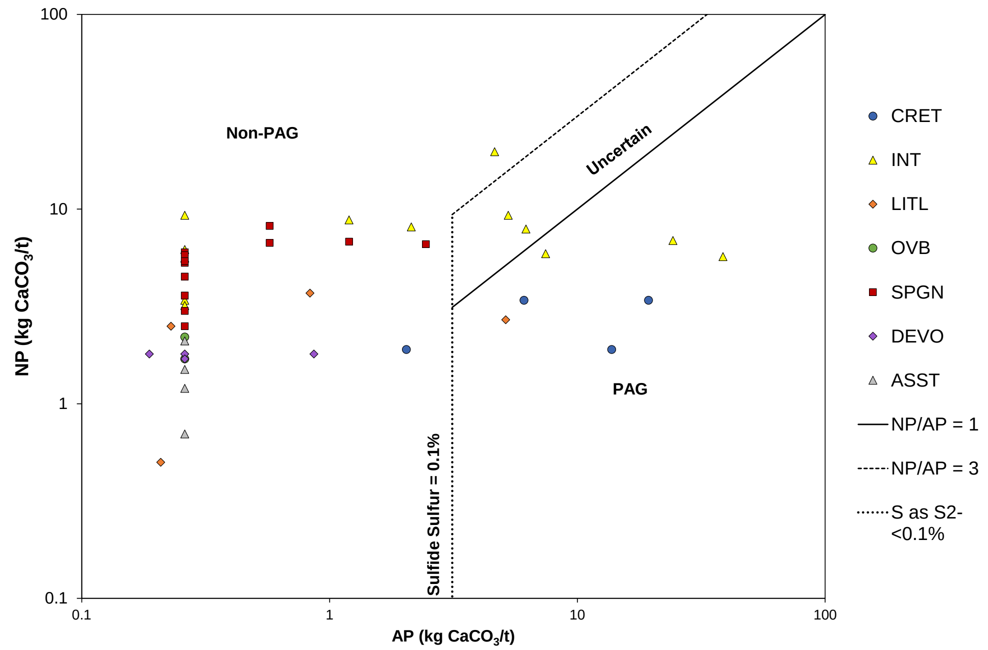

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Figure 5-22: AP vs. Modified NP by Lithology Type for Shaft and Portal Samples

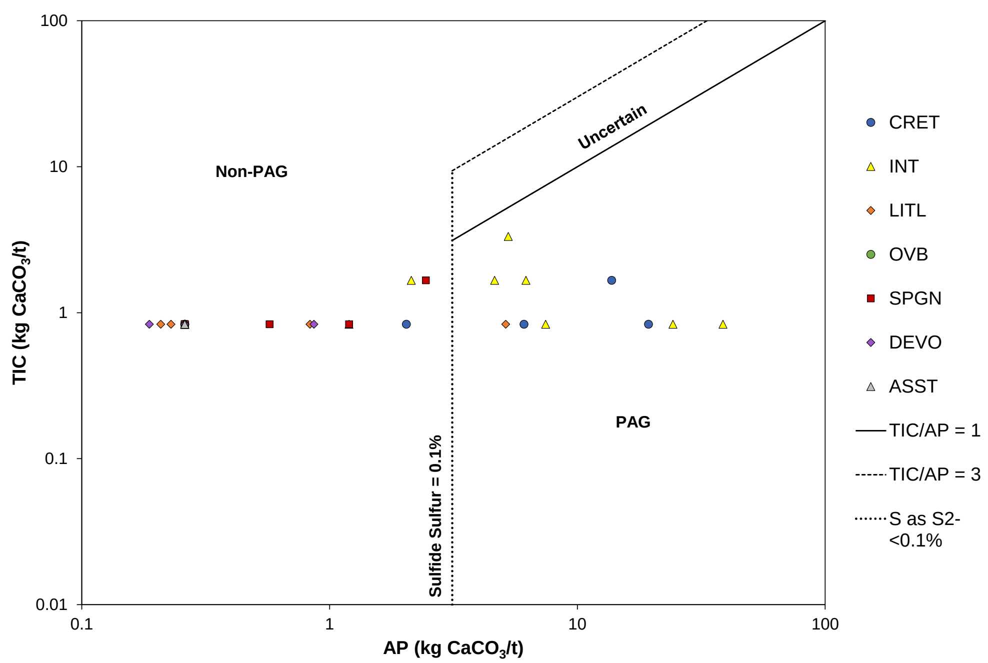

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Figure 5-23: AP vs. TIC by Lithology Type for Shaft and Portal Samples

Table 5-11: Summary of Acid Base Accounting Results for Shaft and Portal Samples

Lithology or Waste Type	Analyte	pH, Paste	Mod. NP	AP	Total Carbon	Total Sulfur	S as Sulfate	S as Sulfide	TIC	NP/AP	TIC/AP
	Unit	pH Units	kg $CaCO_3$/t	kg $CaCO_3$/t	wt. %	wt. %	wt. %	wt. %	kg $CaCO_3$/t	--	-
	Detection	--	0.5	0.5	0.01	0.01	0.0017	Calc.	Calc.	Calc.	Calc.
INT (n=13)	Min	8.2	3.2	0.26	<0.01	<0.01	<0.0017	0.0083	<0.83	0.15	0.02
	P05	8.3	3.3	0.26	<0.01	<0.01	<0.0017	0.0083	<0.83	0.23	0.03
	P50	8.9	6.9	2.1	0.12	0.07	<0.0017	0.068	<0.83	4.2	0.7
	Average	8.9	7.7	7.0	0.15	0.23	0.0018	0.22	1.2	1.1[1]	0.2[1]
	P75	9.5	8.8	6.2	0.21	0.20	<0.0017	0.20	1.7	13	3
	P95	9.5	13	30	0.34	0.96	0.0025	0.96	2.3	29	3
	Max	9.6	20	39	0.47	1.2	0.0027	1.2	3.3	36	3
CRET (n=4)	Sample ID: 143104	7.4	5.0	14	1.7	0.46	0.02	0.44	1.7	0.36	0.12
	Sample ID: 143105	6.6	5.2	6.1	3.0	0.22	0.025	0.19	0.83	0.9	0.1
	Sample ID: 143126	7.2	1.9	2.0	0.63	0.07	0.0047	0.065	<0.83	0.9	0.4
	Sample ID: 143127	6.8	3.4	19	2.1	0.70	0.080	0.62	<0.83	0.18	0.04
OVB (n=2)	Sample ID: 143101	5.9	2.2	0.26	0.02	<0.01	<0.0017	0.0083	<0.83	8.45	3.2
	Sample ID: 143123	6.8	1.7	0.26	0.01	<0.01	<0.0017	0.0083	<0.83	6.53	3.2
DEVO (n=4)	Sample ID: 143106	7.3	1.8	0.19	0.06	0.01	0.004	0.0060	<0.83	9.6	4.4
	Sample ID: 143107	7.4	1.8	0.26	0.05	0.01	<0.017	0.0083	<0.83	6.9	3.2
	Sample ID: 143128	7.5	1.7	0.26	0.07	0.01	<0.017	0.0083	<0.83	6.5	3.2
	Sample ID: 143129	7.7	1.8	0.86	0.06	0.03	0.0023	0.028	<0.83	2.1	1.0
ASST (n=4)	Sample ID: 143108	6.4	2.1	0.26	<0.01	<0.01	<0.0017	0.0083	<0.83	8.1	3.2
	Sample ID: 143109	5.9	1.5	0.26	0.01	<0.01	<0.0017	0.0083	<0.83	5.8	3.2
	Sample ID: 143130	6.9	1.2	0.26	0.02	<0.01	<0.0017	0.0083	<0.83	4.6	3.2
	Sample ID: 143131	7.4	0.70	0.26	0.01	<0.01	<0.0017	0.0083	<0.83	2.7	3.2
LITL (n=4)	Sample ID: 143102	5.0	0.50	0.21	2.1	0.01	0.0033	0.007	0.83	2.4	4.0
	Sample ID: 143103	7.4	3.7	0.83	1.6	0.03	0.0033	0.027	0.83	4.4	1.0
	Sample ID: 143124	6.4	2.5	0.23	0.30	0.01	0.0027	0.0073	0.83	10.9	3.6
	Sample ID: 143125	6.4	2.7	5.1	1.4	0.17	0.0057	0.16	0.83	0.53	0.16
SPGN (n=12)	Min	8.3	2.5	0.26	0.010	<0.01	<0.0017	0.0083	<0.83	2.7	0.7
	P05	8.5	2.8	0.26	0.049	<0.01	<0.0017	0.0083	<0.83	4.3	0.7
	P50	8.7	5.6	0.26	0.15	<0.01	<0.0017	0.0083	<0.83	14	3
	Average	8.9	5.4	0.57	0.18	0.02	<0.0017	0.018	0.90	9.4[1]	1.6[1]
	P75	9.2	6.6	0.57	0.25	0.02	<0.0017	0.018	<0.83	20	3
	P95	9.4	7.4	1.8	0.38	0.058	<0.0017	0.056	1.2	23	3
	Max	9.5	8.2	2.4	0.39	0.08	<0.0017	0.078	1.7	3	1

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Notes: 1 - Average NP/AP and TIC/AP are represented by average NP/average AP and average TIC/average AP.

Lithology type codes and descriptions are provided in Table 4-2.

Mod. NP = modified neutralization potential; AP = acid potential; S = sulfur; TIC = total inorganic carbon; kg $CaCO_3$/t = kilogram of calcium carbonate per tonne; wt. % = weight percent.

5.3.4 Trace Element Enrichment

Trace element enrichment as a preliminary assessment of metal leaching potential was assessed based on the criterion defined in Section 4.4.4.

Results for selected parameters are provided in Table 5-12.

From the samples of the shaft and portal areas, only one sample from the LITL was enriched in silver.

Overall, the trace elements results show no appreciable enrichment for the samples from the shaft and portal areas.

Table 5-12: Trace Element Results from Aqua Regia Digestion and ICP-MS Finish for Selected Parameters from Mine Development Area Samples

Lithology or Waste Type	Analyte	Ag	As	Be	Bi	Cd	Co	Cu	Hg	Mo	Ni	Pb	Rb	Sb	Se	Sn	Te	Th	U	V	W	Y	Zn
	Unit	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
	Detection	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.001**	**0.01**	**0.01**	**0.1**	**0.01**	**0.01**	**0.01**	**0.01**	**0.1**	**0.1**	**0.01**	**0.1**
10X ACA Basalt		*1.1*	*20*	*10*	*0.07*	*2.2*	*480*	*870*	*0.9*	*15*	*1300*	*60*	*300*	*2*	*0.5*	*15*	*-*	*40*	*10*	*2500*	*7*	*210*	*1050*
10X ACA Shale		*0.7*	*130*	*30*	*-*	*3*	*190*	*450*	*4*	*26*	*680*	*200*	*1400*	*15*	*6*	*60*	*-*	*120*	*37*	*1300*	*18*	*260*	*950*
INT (n=13)	Min	<0.01	0.23	0.06	<0.01	<0.01	0.6	1.1	<0.01	0.18	4.2	0.77	1.2	<0.01	<0.1	<0.01	<0.01	5.5	0.19	13	<0.1	0.44	2.6
	P05	0.01	0.28	0.06	0.01	0.01	2.3	1.1	<0.01	0.19	8.7	0.94	2.9	<0.01	<0.1	0.016	<0.01	5.9	0.25	14	0.1	0.93	6.7
	P50	0.03	0.78	0.24	0.07	0.02	10	8	<0.01	0.4	24	3.8	18	<0.01	<0.1	0.06	<0.01	15	0.8	33	0.1	2.8	27
	Average	0.041	0.88	0.23	0.098	0.052	10	16	0.011	0.87	25	3.7	21	<0.01	0.12	0.059	0.021	12	0.82	32	0.1	3.5	40
	P75	0.06	1.2	0.34	0.11	0.06	12	19	<0.01	0.6	27	5.1	30	<0.01	<0.1	0.07	0.02	15	1.1	39	0.1	3.4	46
	P95	0.1	2	0.41	0.32	0.16	19	57	0.014	2.7	51	7.4	54	<0.01	0.24	0.1	0.052	18	1.7	56	0.1	8.2	110
	Max	0.13	2.1	0.43	0.35	0.3	22	71	0.02	2.7	68	8.6	61	<0.01	0.30	0.14	0.07	18	1.8	59	0.1	11	190
CRET (n=4)	Sample ID: 143104	0.07	11	1.2	0.34	0.07	15	15	0.06	0.25	29	14	15	<0.01	1.1	0.38	0.02	10	1.6	7.1	<0.1	19	47
	Sample ID: 143105	0.07	7.3	1	0.18	0.06	10	13	0.03	0.38	24	10	9.5	<0.01	0.8	0.3	<0.01	7.1	1.1	30	<0.1	17	60
	Sample ID: 143126	0.06	1.3	0.28	0.06	0.05	5	6.4	0.01	0.1	7.9	4.1	5.6	<0.01	0.4	0.16	<0.01	3	0.48	5.2	<0.1	3.7	22
	Sample ID: 143127	0.07	11	1	0.30	0.07	10	16	0.06	0.24	20	14	13	<0.01	0.9	0.41	0.02	8.9	1.5	13	<0.1	16	51
OVB (n=2)	Sample ID: 143101	0.13	0.36	0.03	0.06	<0.01	0.13	1.7	<0.01	0.1	0.92	1.4	0.2	<0.01	<0.1	0.06	0.01	0.65	1.1	2.5	<0.4	0.63	1.1
	Sample ID: 143123	0.51	0.28	0.03	0.10	<0.01	0.37	1.6	<0.01	0.08	0.66	0.54	0.84	<0.01	<0.1	0.06	0.01	0.82	0.2	1.4	0.8	0.85	1.4
DEVO (n=4)	Sample ID: 143106	0.07	0.82	0.08	0.06	0.01	14	6.2	<0.01	0.02	19	0.83	2.7	0.01	0.2	0.13	<0.01	2.9	0.42	1.1	<0.1	2.3	47
	Sample ID: 143107	0.06	0.21	0.17	0.05	<0.01	0.3	5	<0.01	0.03	1.8	1.5	3.1	0.01	0.2	0.18	<0.01	3.9	0.54	1.9	<0.1	1.8	2.2
	Sample ID: 143128	0.03	0.17	0.14	0.04	<0.01	0.19	5.3	<0.01	0.06	1.3	1.1	2.7	<0.01	0.1	0.2	<0.01	4.5	0.43	2.3	<0.1	1.2	0.9
	Sample ID: 143129	0.01	0.33	0.11	0.02	<0.01	0.6	12	<0.01	0.11	5.5	1.4	1.5	0.01	<0.1	0.09	<0.01	2.4	0.22	1.8	<0.1	1	0.9
ASST (n=4)	Sample ID: 143108	0.02	0.18	0.04	0.05	<0.01	0.08	0.84	<0.01	0.11	0.27	0.48	0.15	<0.01	<0.1	0.10	0.01	1.5	0.32	0.3	<0.1	1	0.6
	Sample ID: 143109	0.06	0.24	0.02	0.04	<0.01	0.04	0.71	<0.01	0.1	0.29	0.31	0.09	<0.01	<0.1	0.02	0.02	0.76	0.25	0.2	<0.1	1.2	0.5
	Sample ID: 143130	<0.01	0.15	0.02	0.01	<0.01	0.04	4.1	<0.01	0.06	0.17	0.42	0.12	<0.01	<0.1	0.17	0.01	0.68	0.15	0.2	<0.1	0.4	0.6
	Sample ID: 143131	<0.01	0.20	0.03	0.02	<0.01	0.08	1.9	<0.01	0.1	0.19	0.40	0.12	<0.01	<0.1	0.37	0.01	1.3	0.26	0.5	<0.1	0.6	0.7
LITL (n=4)	Sample ID: 143102	0.13	0.5	0.52	0.09	0.03	1.7	6.6	0.07	0.18	3.1	5.5	3.8	0.02	<0.1	0.24	<0.01	3.6	1.3	5.9	0.5	2.8	9.2
	Sample ID: 143103	0.07	1.9	0.60	0.10	0.09	8.4	8.7	0.08	0.37	16	6.9	9	0.04	<0.1	0.3	0.01	5.1	1	18	0.3	7.7	42
	Sample ID: 143124	**1.2**	0.77	0.28	0.04	0.04	5.3	4.5	0.03	0.16	6	3.1	4	0.02	<0.1	0.12	<0.01	2.4	0.44	6.2	1.3	2.8	14
	Sample ID: 143125	0.07	1.1	0.38	0.05	0.05	4.8	8.3	0.04	0.18	6.6	4.5	5.6	0.03	<0.1	0.16	<0.01	2.7	0.43	6.9	<0.1	2.7	24
SPGN (n=12)	Min	<0.01	0.24	0.02	0.02	<0.01	0.73	0.75	<0.01	0.09	3.4	0.68	1.7	<0.01	<0.1	0.02	<0.01	6.2	0.26	5.8	<0.01	0.58	1.4
	P05	0.01	0.24	0.02	0.02	0.01	0.76	0.92	<0.01	0.14	3.6	0.84	1.7	0.01	<0.1	0.02	<0.01	6.3	0.27	9.8	<0.1	0.64	1.5
	P50	0.01	0.76	0.21	0.05	0.01	7.5	3.2	0.015	0.23	15	1.3	15	0.01	<0.1	0.05	0.02	9.5	0.56	23	<0.1	1.1	16
	Average	0.011	1.2	0.19	0.056	0.014	6.6	4.7	0.022	0.29	15	1.8	23	0.011	<0.1	0.051	0.018	9.2	0.62	21	0.1	1.5	19
	P75	0.01	0.82	0.26	0.053	0.02	8.7	7.6	0.033	0.32	21	2.4	38	0.01	<0.1	0.063	0.02	11	0.76	28	<0.1	2.1	28
	P95	0.02	4.1	0.40	0.13	0.025	12	11	0.045	0.57	23	3.6	59	0.015	<0.1	0.085	0.029	12	1.2	34	0.15	3	44
	Max	0.02	7.5	0.46	0.19	0.03	12	13	0.05	0.61	23	4.4	66	0.02	<0.1	0.090	0.040	13	1.2	34	0.2	3.7	54

Source: https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/03_Results_Processing/[1CN034.002_NexGen_GeochemCharacterization_jcc_mc_jac_rev014.xlsx]

Note: Values in **bold** exceed 10X the average crustal abundance of comparable rock types; results reported to 2 significant figures.
Lithology type codes and descriptions are provided in Table 4-2.

ICP-MS = inductively coupled plasma-mass spectrometry; mg/kg = milligram per kilogram; ACA = average crustal abundance.

5.4 Special Waste

In total, 29 samples were collected from the special waste within the mine development area. The majority of these samples (28) are from the SPGN unit, with one sample from the INT unit. Of the 28 SPGN samples, six were from faulted material in proximity to a mineralized shear zone (logged as SPGN/FLT). A subset of samples was selected for mineralogy with results presented in Table 5-13. A statistical summary of ABA and elemental results for the special waste samples by rock type is presented in Table 5-14 and Table 5-15. The complete data set is provided in Appendix B.

5.4.1 Mineralogy

Mineralogy by XRD was completed on both samples selected for humidity cell testing as part of Phase 2 of the geochemical characterization program.

The XRD results identified the dominant mineral phase in both samples as quartz with 42 wt. % and 36 wt. %, followed by biotite (29 wt. % and 30 wt. %), muscovite (15 wt. % and 16 wt. %), and chlorite (9.8 wt. % and 14 wt. %). Anorthite was also identified both samples (4.4 wt. % and 4.2 wt. %) (Table 5-13). No sulfide or carbonate minerals were identified by XRD.

Table 5-13: X-Ray Diffraction Results from Special Waste Samples

Sample ID	Location	Lithology Type	Quartz	Anorthite	Muscovite	Biotite	Chlorite
39130	Mine	SPGN-Special waste	42	4.4	15	29	9.8
39172	Mine	SPGN-Special waste	36	4.2	16	30	14

Source:https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/Mineralogy/[XRD_Results_Compilation_1CN034.002_JAC.xlsx]Sheet
Note: Lithology type codes and descriptions are provided in Table 4-2.

5.4.2 Sulfur Speciation

The results for total sulfur ranged from <0.01% to 1.7%, with a median of 0.03% for all samples. The samples from the SPGN/FLT had the highest sulfur concentrations (up to 1.7%) with a median of 0.37% in comparison to the samples of SPGN unit with a median of 0.025% and single sample of the INT unit (<0.01%). Sulfate sulfur concentrations ranged from <0.0017%S to a maximum of 0.025%S, with a median of 0.018%S for all special waste samples. Sulfur occurs primarily as sulfide in the waste rock samples from shaft and portal samples (Figure 5-24).

Paste pH values from the special waste samples were circum-neutral to slightly alkaline, ranging from 6.5 to 8.8 with an average of pH 7.9. Sulfate sulfur values showed slightly higher concentrations as pH decreased indicating slight weathering in some samples, with oxidation of some sulfides producing sulfate minerals and slightly depressing the pH (Figure 5-25). Overall, sulfate was detected in most samples indicating the samples were slightly weathered.

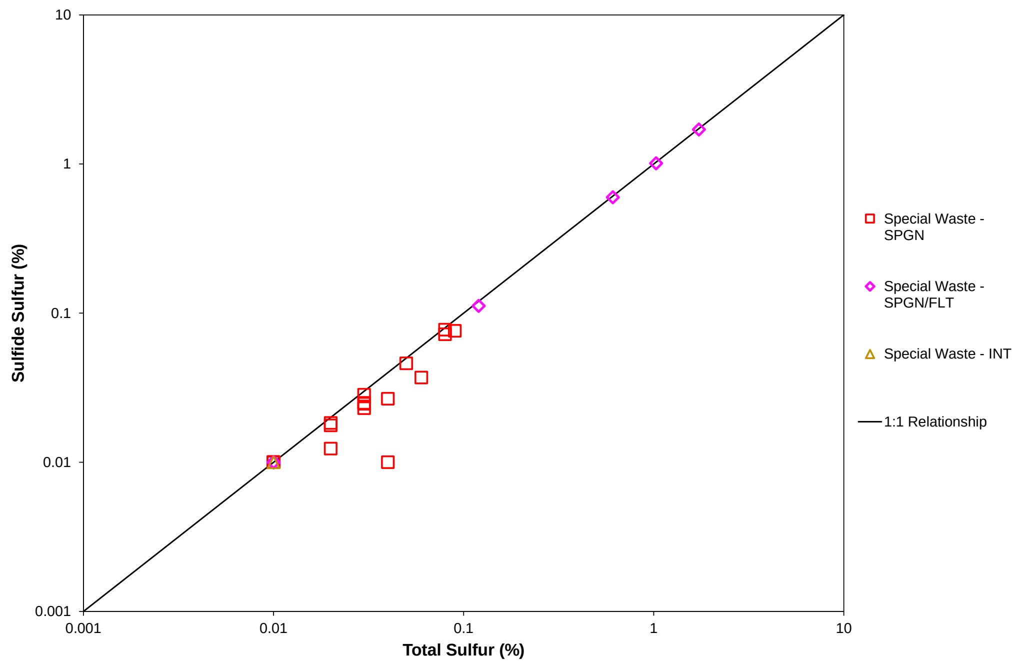

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Figure 5-24: Total Sulfur vs. Sulfur as Sulfide for Special Waste Sample

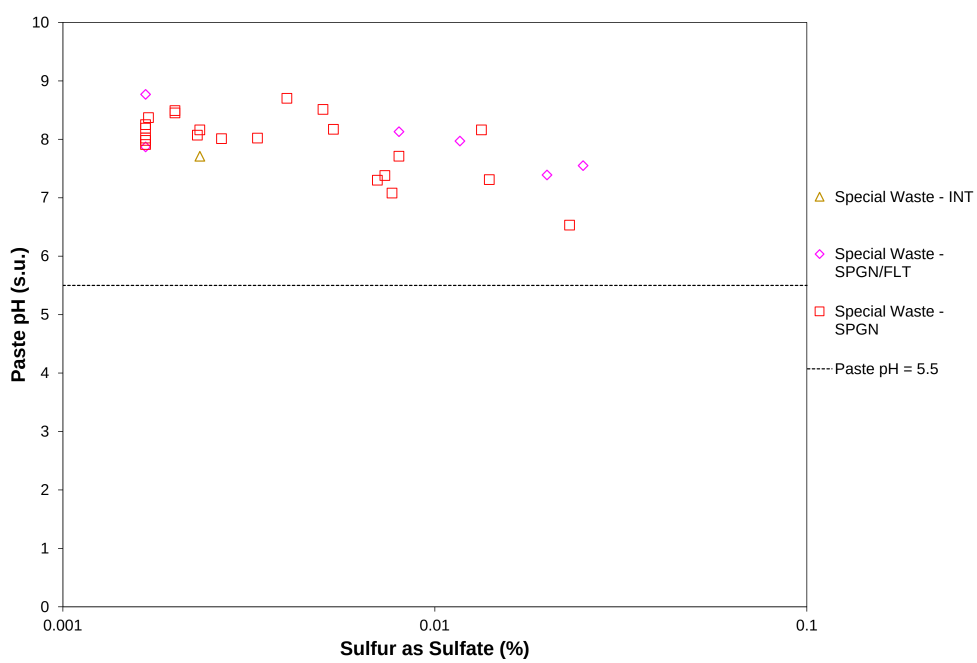

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Figure 5-25: Sulfate Sulfur vs. Paste pH for Special Waste Samples

5.4.3 Neutralization Potential

Neutralization potential as measured by both the Modified NP and TIC methods were low in most samples (<10 kg $CaCO_3$/t).

The results for Modified NP from the samples of special waste ranged from 2.5 kg $CaCO_3$/t to 40 kg $CaCO_3$/t, with a median of 3.9 kg $CaCO_3$/t.

TIC ranged from <0.83 kg $CaCO_3$/t to 23 kg $CaCO_3$/t, with a median of <0.83 kg $CaCO_3$/t from all samples. The majority of samples (24 of 29) had TIC values at or below the detection limit of 0.83 kg $CaCO_3$/t.

The results for Modified NP were typically four to five times higher than TIC, indicating the Modified NP method is dominated by NP from silicate dissolution (Figure 5-26).

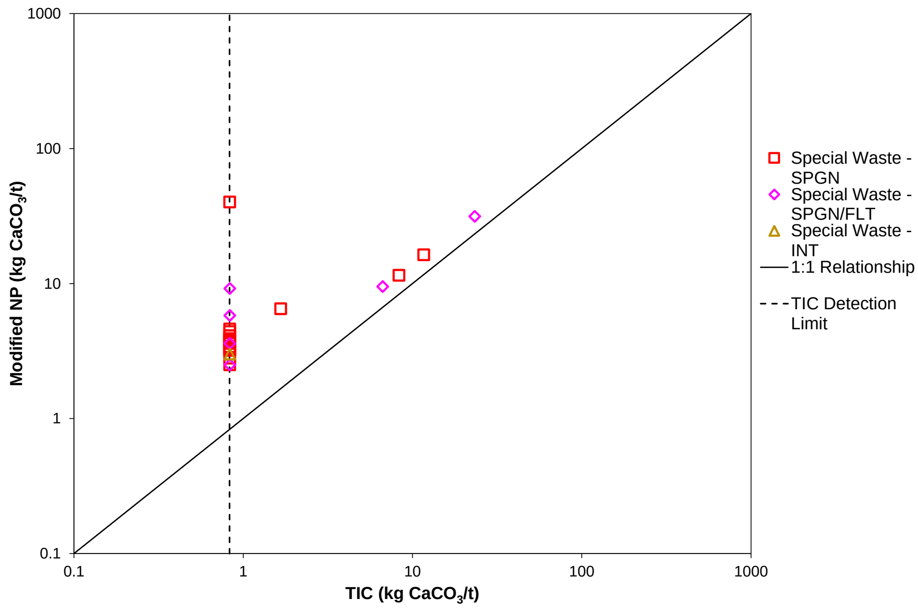

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Figure 5-26: TIC vs. Modified NP for Special Waste Samples

5.4.4 Acid Rock Drainage Potential

The ARD classification criteria described in Section 4.4.3 for NP/AP is shown in Figure 5-6 and TIC/AP is shown in Figure 5-7.

Based on the ARD classification using NP/AP and TIC/AP, three samples of the SPGN/FLT (10%) were classified as PAG with all other samples classified as NPAG (Figure 5-27 and Figure 5-28).

Like the samples from the UGTMF and mine development area, the majority of NPAG samples based on the TIC/AP criteria were classified due to having sulfur as sulfide content of <0.1% rather than having TIC/AP of greater than 3.

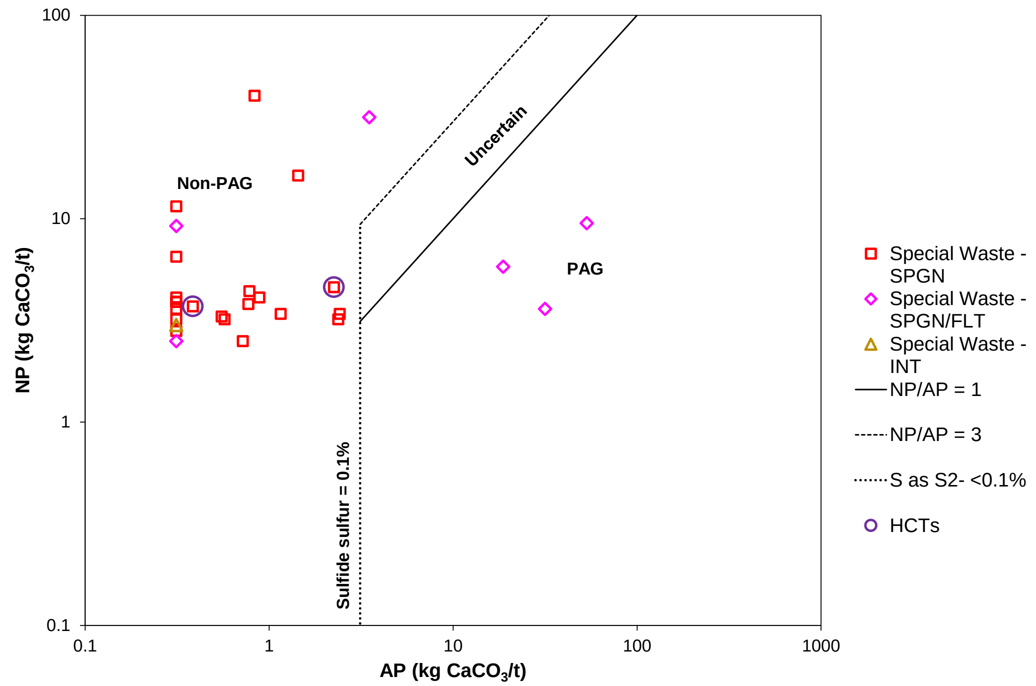

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Figure 5-27: AP vs. Modified NP for Special Waste Samples

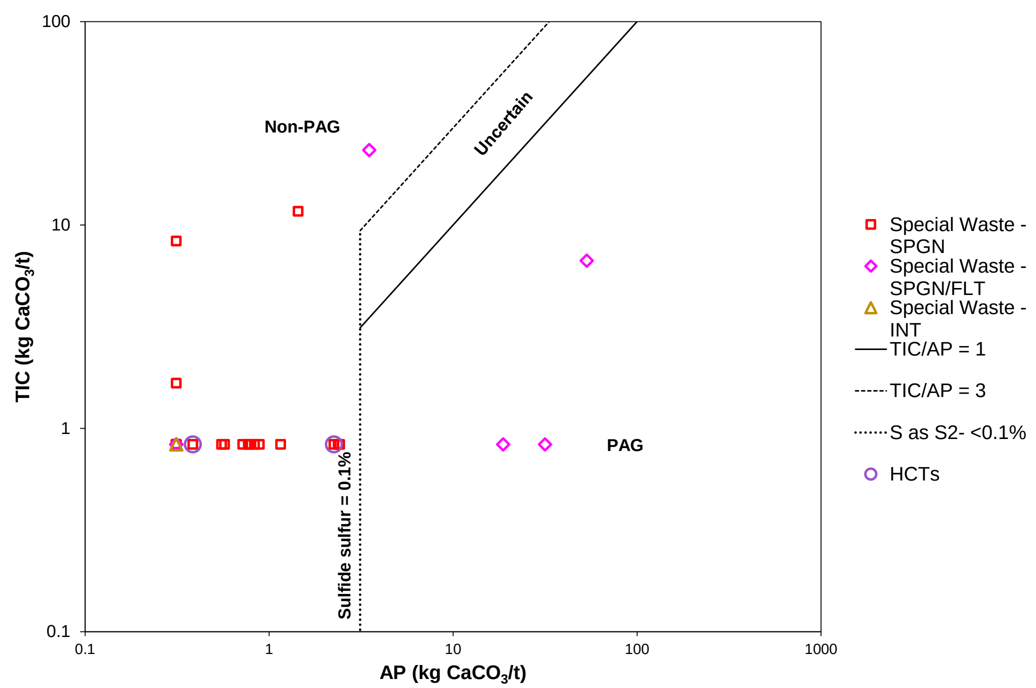

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Figure 5-28: AP vs. TIC for Special Waste Samples

Table 5-14: Summary of Acid Base Accounting Results for Special Waste Samples

Lithology or Waste Type	Analyte	pH, Paste	Mod. NP	AP	Total Carbon	Total Sulfur	S as Sulfate	S as Sulfide	TIC	NP/AP	TIC/AP
	Unit	**pH Units**	**kg $CaCO_3$/t**	**kg $CaCO_3$/t**	**wt. %**	**wt. %**	**wt. %**	**wt. %**	**kg $CaCO_3$/t**	**--**	**-**
	Detection	**--**	**0.5**	**0.5**	**0.01**	**0.01**	**0.0017**	**Calc.**	**Calc.**	**Calc.**	**Calc.**
INT (n=1)	Sample ID: 39081	7.7	3	0.5	6	0.01	0.0023	0.01	<0.83	6	2.7
SPGN (n=22)	Min	6.5	2.5	0.5	0.05	<0.01	<0.0017	0.01	<0.83	1.3	0.34
	P05	7.1	2.8	0.5	0.05	<0.01	<0.0017	0.01	<0.83	1.4	0.35
	P50	8.0	3.9	0.65	0.24	0.025	0.003	0.018	<0.83	6	1.8
	Average	7.9	6.3	0.94	0.27	0.032	0.005	0.026	1.7	6.8[1]	1.8[1]
	P75	8.2	4.3	1.1	0.33	0.04	0.0073	0.028	0.83	7.8	2.7
	P95	8.5	16	2.4	0.73	0.08	0.014	0.076	8.0	23	8
	Max	8.7	40	2.4	0.80	0.09	0.023	0.077	12	50	27
SPGN/FLT (n=6)	Min	7.4	2.5	0.5	0.03	0.01	<0.0017	0.01	<0.83	0.11	0.026
	P05	7.4	2.8	0.5	0.17	0.01	0.0017	0.01	<0.83	0.13	0.031
	P50	7.9	7.5	11	1.7	0.37	0.0098	0.36	<0.83	2.7	1.4
	Average	7.9	10	18	1.8	0.59	0.011	0.57	5.6	0.57[1]	0.31[1]
	P75	8.1	9.4	28	3.2	0.93	0.018	0.91	5.2	8	2.7
	P95	8.6	26	48	3.5	1.6	0.024	1.5	19	16	6
	Max	8.8	32	53	3.5	1.7	0.025	1.7	23	18	7

Source: \\srk.ad\dfs\na\van\Projects\01_SITES\Rook 1\1CN034.002_Geochem Characterization\03_Task300_GeochemicalTesting\03_Results_Processing\1CN034.002_NexGen_GeochemCharacterization_jcc_mc_jac_rev010.xlsx

Notes: 1 - Average NP/AP and TIC/AP are represented by average NP/average AP and average TIC/average AP.

Lithology type codes and descriptions are provided in Table 4-2.

Mod. NP = modified neutralization potential; AP = acid potential; S = sulfur; TIC = total inorganic carbon; kg $CaCO_3$/t = kilogram of calcium carbonate per tonne; wt. % = weight percent.

5.4.5 Trace Element Enrichment

Trace element enrichment as a preliminary assessment of metal leaching potential was assessed based on the criterion defined in Section 4.4.4.

Results for selected parameters are provided in Table 5-15.

Of the 22 SPGN samples representing special waste, all samples were enriched in uranium, 8 samples (36%) were enriched in molybdenum, 3 samples (14%) were enriched in selenium, and 1 sample (4.5%) was enriched in each of silver, copper, and lead. The single sample of the INT unit was enriched in uranium, molybdenum, and selenium. For the 6 samples of the SPGN/FLT unit, all were enriched in uranium, 3 samples (50%) were enriched in copper, 2 samples (33%) were enriched in molybdenum, and 1 sample (17%) was enriched in each of cobalt, selenium, and silver.

Overall, samples from the SPGN/FLT had higher enrichment of trace elements in comparison to the samples of SPGN and INT units.

Trace element enrichment for parameters typically associated with uranium mineralization at the Project (e.g., uranium, molybdenum, selenium) were higher in the samples of special waste in comparison to waste rock samples from the mine development area.

In general, the samples with the highest copper content also had elevated total sulfur (>0.5%) indicating copper likely occurs as copper sulfide (chalcopyrite) (Figure 5-29).

Molybdenum shows no relationship with sulfur, with the highest concentrations of molybdenum in samples with low sulfur (<0.1%) (Figure 5-30). A comparison of uranium concentrations to molybdenum shows some samples having both elevated molybdenum and uranium, though not exclusively (Figure 5-31). The results indicate that molybdenum may occur in association with uranium mineralization in non-sulfide forms, though its mineralogical form is unknown.

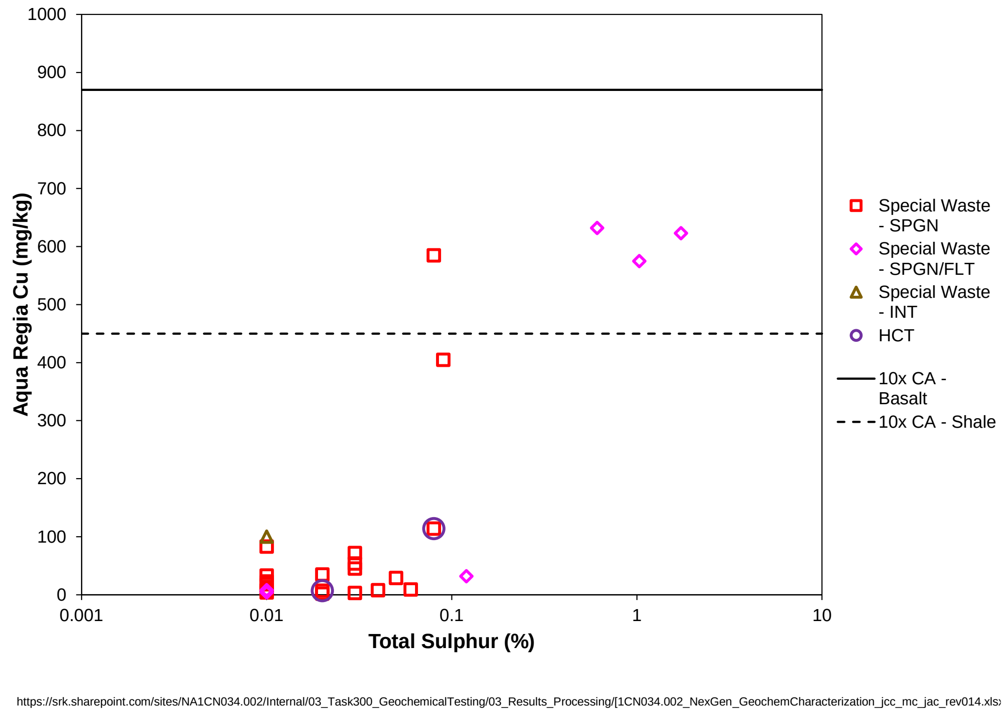

Figure 5-29: Total Sulfur vs. Copper for Special Waste Samples

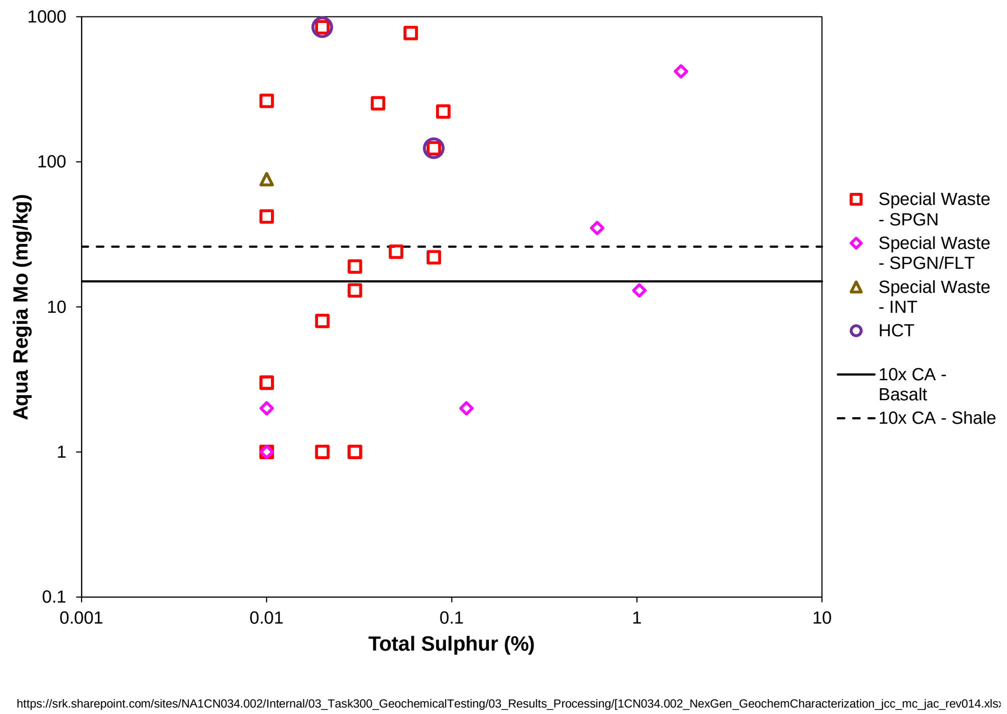

Figure 5-30: Total Sulfur vs. Molybdenum for Special Waste Samples

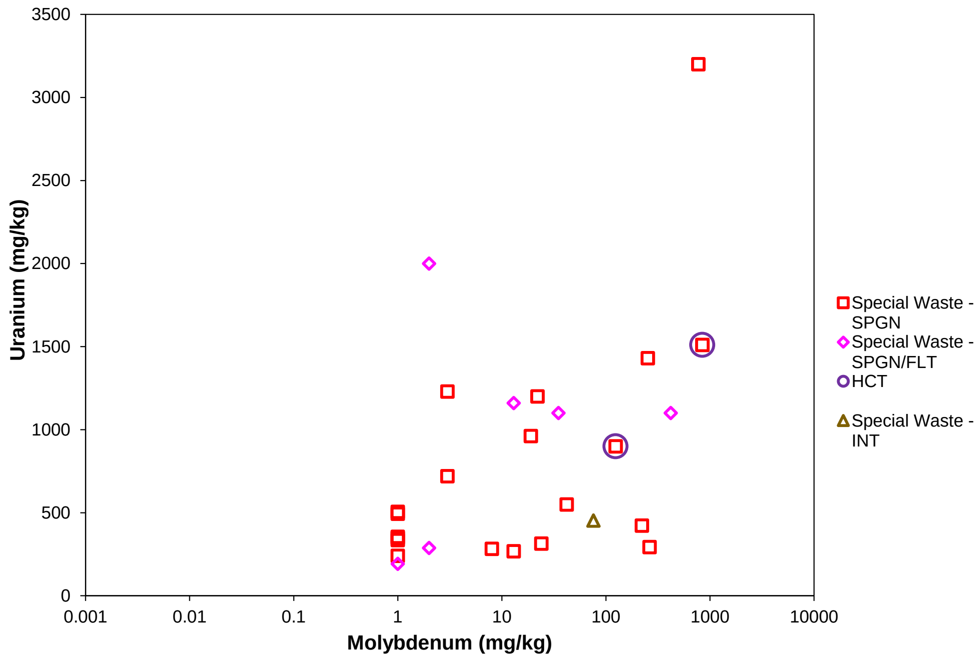

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Figure 5-31: Molybdenum vs. Uranium for Special Waste Samples

Table 5-15: Trace Element Results from Aqua Regia Digestion and ICP-OES Finish for Selected Parameters from Special Waste Samples

Lithology or Waste Type	Analyte	Ag	As	Bi	Co	Cu	Hg	Mo	Ni	Pb	Sb	Se	Te	U	V	Zn
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	Detection	***0.2***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***
10X ACA Basalt		*1.1*	*20*	*0.07*	*480*	*870*	*0.9*	*15*	*1300*	*60*	*2*	*0.5*	-	*10*	*2500*	*1050*
10X ACA Shale		*0.7*	*130*	-	*190*	*450*	*4*	*26*	*680*	*200*	*15*	*6*	-	*37*	*1300*	*950*
INT (n=1)	Sample ID: 39081	0.2	2	**2**	7	100	<1	**76**	12	24	<1	**2**	<1	**450**	19	<1
SPGN (n=22)	Min	<0.2	<1	<1	2	2	<1	<1	6	9	<1	<1	<1	**240**	6	<1
	P05	0.2	1	1	2	3	<1	1	12	12	<1	<1	<1	**270**	14	1
	P50	0.2	4	2	4.5	26	<1	16	23	40	<1	<1	<1	**500**	44	3
	Average	0.3	12	6	7.7	77	<1	**130**	28	44	1.3	3.5	<1	**780**	43	4.8
	P75	0.2	13	8.3	8	59	<1	**150**	34	47	<1	1.5	<1	**1000**	62	5.3
	P95	0.29	34	20	18	410	<1	**780**	53	84	2.2	**12**	<1	**1600**	89	17
	Max	**1.9**	100	27	44	**590**	<1	**850**	97	240	5	**27**	<1	**3200**	97	23
SPGN/FLT (n=6)	Min	<0.2	2	<1	2	4	<1	<1	8	7	<1	<1	<1	**190**	15	3
	P05	0.2	2.8	1	2	5	<1	1.3	10	8.3	1	<1	<1	**220**	20	7.3
	P50	0.2	9	2.5	47	300	<1	7.5	97	46	1	<1	<1	**1100**	65	85
	Average	0.32	11	7	100	310	<1	**79**	130	62	1	2.5	<1	**970**	72	120
	P75	0.2	15	6.3	140	**610**	<1	**30**	130	71	<1	<1	<1	**1100**	88	160
	P95	**0.73**	22	23	**310**	**630**	<1	**320**	350	160	<1	**7.8**	<1	**1800**	140	310
	Max	**0.9**	24	28	**360**	**630**	<1	**420**	410	190	<1	**10**	<1	**2000**	160	350

Source: https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/03_Results_Processing/[1CN034.002_NexGen_GeochemCharacterization_jcc_mc_jac_rev014.xlsx]

Note: Values in **bold** exceed 10X the average crustal abundance of comparable rock types; results reported to 2 significant figures.
Lithology type codes and descriptions are provided in Table 4-2.

ICP-OES = inductively coupled plasma-optical emission spectrometry; mg/kg = milligram per kilogram; ACA = average crustal abundance.

5.4.6 Radionuclides

Radionuclide analysis from selected samples representing special waste is presented in Table 5-16, with results for uranium also provided for reference. Both samples exceeded the UDRL for diffuse NORM sources (Health Canada 2011) for radium-226, lead-210, and thorium-230. Both samples had summed ratios of the radionuclide to corresponding UDRL greater than 1. The results indicate the special waste material is likely to fall within a restricted NORM classification and require a site review to determine NORM management program requirements.

All samples with exceedances were classified as having enrichment in uranium.

Table 5-16: Solid-Phase Radionuclide and Uranium Results from Selected Samples from the Mine Development Area

Sample ID	Lithology Type	U-238 Decay Chain					Th-232 Decay Chain			Sum of Ratios
		U-238	Lead-210	Polonium-210	Radium-226	Thorium-230	Thorium-232	Thorium-228	Radium-228	
		Bq/g	Bq/g	Bq/g	Bq/g	Bq/g	Bq/g	Bq/g	Bq/g	Unitless
39130	SPGN	**19**	**21**	24	**33**	**24**	0.073	0.07	0.2	**115**
39172	SPGN	**11**	**11**	14	**22**	**15**	0.13	0.11	0.1	**77**
Unconditional derived release limits diffuse NORM sources (Health Canada 2011)		*10*	*0.3*	*-*	*0.3*	*10*	*10*	*0.3*	*0.3*	*1*

Source:https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/HCT/[Rook1_Radionulcides_1CN034.002_JAC_RTC_REV01.xlsx]

Notes: 1 – U calculated from aqua regia digest and ICP-OES analysis.
2 – Th-232 results are calculated from measured thorium.
3 – Values in **bold** exceed the UDRL for diffuse NORM sources.

Lithology type codes and descriptions are provided in Table 4-2.

Bq/g = becquerels per gram; NORM = naturally occurring radioactive material; ICP-OES = inductively coupled plasma-optical emission spectrometry; UDRL = unconditional derived release limits.

5.5 Summary of Static Results

The static test results show that PAG materials are expected to be excavated from each of the UGTMF, mine development area, and shaft and portal areas. The results show there is a higher proportion of PAG materials at the UGTMF in comparison to the mine development and shaft and portal areas.

Modified NP is generally higher than TIC, and carbonate is below the detection limit in the majority of samples, indicating that Modified NP is dominated by silicate mineral dissolution. Therefore, the effectiveness of silicate NP is important to understand for the Project.

The ARD classification criterion based on TIC/AP shows the majority of samples classified as NPAG are due to sulfide content below the low-sulfide cut-off of 0.1% rather than having TIC/AP of greater than 3. The low-sulfide cut-off criterion is therefore important to evaluate through kinetic testing with HCTs.

For the samples representing waste rock, the samples collected from the mine development area have enrichments in uranium, molybdenum, selenium, silver, cobalt, and copper. Samples from the UGTMF show no appreciable element enrichment.

The samples representing special waste have a higher proportion of samples with elemental enrichment in comparison to the waste rock samples, with enrichment of uranium, molybdenum, selenium, silver, copper, cobalt, and lead.

A summary of the results from static testing are provided in Table 5-17.

Table 5-17: Summary of Static Test Results

Location	Material Type	Lithology Type	Median Sulfur (%)	Samples Classified as PAG		Elemental Enrichment
				NP/AP	TIC/AP	
UGTMF	Waste Rock	INT (n=49)	0.18	43%	73%	As (n=1), Cd (n=1), Se (n=2)
		SPGN (n=57)	0.19	44%	54%	Cu (n=1)
Mine Development Area	Waste Rock	INT (n=25)	0.17	36%	64%	Se (n=1), U (n=2)
		SPGN (n=79)	0.02	20%	20%	U (n=15), Mo (n=8), Ag (n=1), Co (n=1), Cu (n=1), Se (n=1)
		OVB (n=2)	0.025	0%	50%	Ag (n=2)
		MST (n=1)	0.12	100%	100%	-
		SST (n=2)	0.03	0%	50%	-
Shafts and Portal	Waste Rock	INT (n=13)	0.07	23%	46%	-
		SPGN (n=12)	<0.01	0%	0%	-
		OVB (n=2)	<0.01	0%	0%	-
		LITL (n=4)	0.02	25%	25%	Ag (n=2)
		CRET (n=4)	0.34	75%	75%	-
		DEVO (n=4)	0.01	0%	0%	-
		ASST (n=4)	<0.01	0%	0%	-
Mine Development Area	Special Waste	INT (n=1)	0.01	0%	0%	U (n=1), Mo (n=1), Se (n=1)
		SPGN (n=22)	0.032	0%	0%	U (n=22), Mo (n=8), Se (n=3), Ag (n=1), Cu (n=1), Pb (n=1)
		SPGN/FLT (n=6)	0.37	50%	50%	U (n=6), Cu (n=3), Mo (n=2), Co (n=1), Se (n=1), Ag (n=1)

Note: Lithology type codes and descriptions are provided in Table 4-2.

PAG = potentially acid generating; UGTMF = underground tailings management facility; NP = neutralization potential; AP acid potential; TIC = total inorganic carbon.

6 Results - Kinetic Geochemical Characterization

6.1 Humidity Cell Test Sample Characteristics and Representativeness

A summary of the static characteristics of the samples tested in HCTs is provided in Table 6-1. Prior to testing, all samples had circum-neutral to alkaline paste pH. All samples were classified as PAG (based on TIC/AP) except for three samples that were classified as NPAG based on sulfide content of less than 0.1%S.

The representativeness of the samples selected for kinetic testing relative to the static ML/ARD data set for each lithology type and location is presented in a series of box and whisker plots (Figure 6-1 to Figure 6-6). These plots show the solid concentrations of the HCT samples superimposed onto box and whisker plots for each of the main lithology units from the static data set presented in Section 5. HCT samples from the mine development area were compared to static samples from the mine development area and shaft and portal areas, whereas the HCT samples from the UGTMF were compared to static samples from the UGTMF. The HCT samples of special waste were compared to the static data set from special waste samples.

The sulfur content of the HCT samples representing the SPGN unit from the mine development area and SPGN and INT units from the UGTMF represented mid- (near median) to upper-range (near 95th percentile) sulfur contents compared to the static dataset for these areas (Figure 6-1). The single HCT from the INT unit in the mine development area was near the median sulfur content. The two HCT samples of special waste represented mid-range (near 40th percentile) and upper-range (near 80th percentile) sulfur content compared to the static dataset for special waste.

By virtue of targeting mid-range and upper-range sulfur content, trace elements that are typically associated with sulfide (e.g., cobalt, copper, zinc) also show coverage for mid-range (near 50th percentile) and upper-range (near 95th percentile) concentrations for the samples selected for HCTs compared to the static datasets (Figure 6-6 showing copper as an example).

The results for Modified NP for the HCT samples generally represented mid-range content in all lithology groupings (between 25th and 75th percentile compared to the static dataset). HCTs 39010 and 39015 representing the INT unit from the UGTMF and sample 39137 representing the SPGN unit from the mine development area had lower range (5th to 25th percentile) values for Modified NP (Figure 6-2). The TIC content of the HCT samples were below the detection limit of 0.83 kg $CaCO_3$/t in 11 of the 13 samples which is equivalent to the 50th percentile in the static dataset for each of the lithology groupings (Figure 6-3).

Uranium concentration in the HCTs representing the SPGN unit from the mine development area and special waste were represented by mid-range and upper-range uranium content compared to the static datasets. The single sample of the INT unit from the mine development area had near 50th percentile uranium concentration. The samples from the UGTMF have lower uranium content in comparison to the waste rock samples from the mine development area, with HCT samples representing mid-range (near 50th percentile) and lower-range (<25th percentile) uranium concentrations (Figure 6-4).

The molybdenum concentrations of the HCT samples included samples representing the mid-range and upper-range molybdenum contents compared to the equivalent static datasets, for all lithology groupings, with the exception of the INT unit from the mine development area, which is represented by one sample with mid-range content (Figure 6-5).

Overall, the samples selected for HCTs show good coverage of mid-range and upper-range geochemical characteristics for sulfur, NP, and trace element content (including uranium), and are considered representative of the static sample set. The upper-range samples were intentionally selected to represent upper case characteristics to provide a degree of conservatism in the leachate dataset. This is discussed further in Section 7.6.

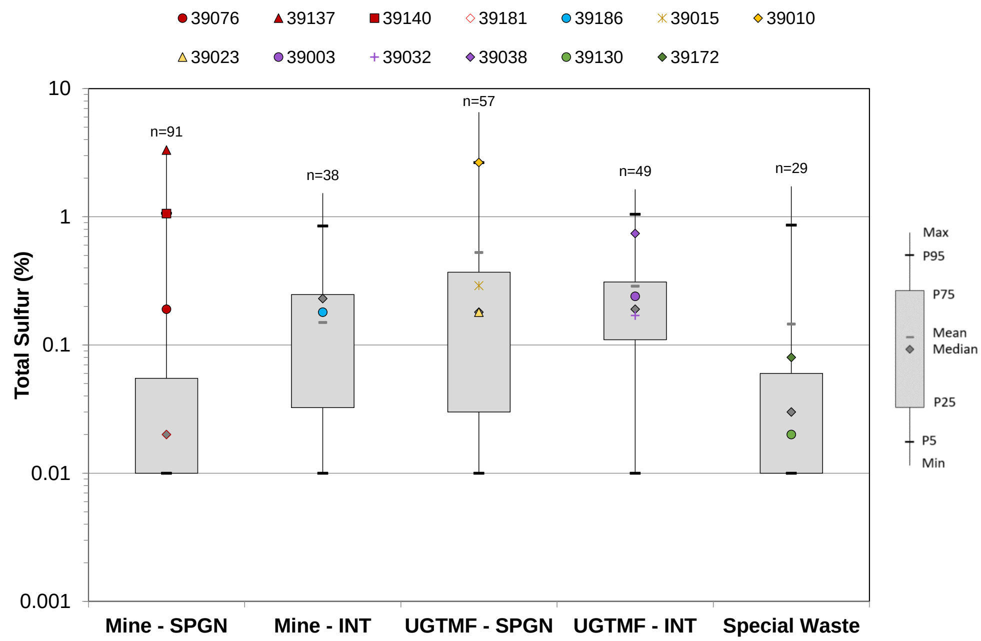

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Figure 6-1: Total Sulfur of the HCT Samples Compared to the Samples from the Static Data Set

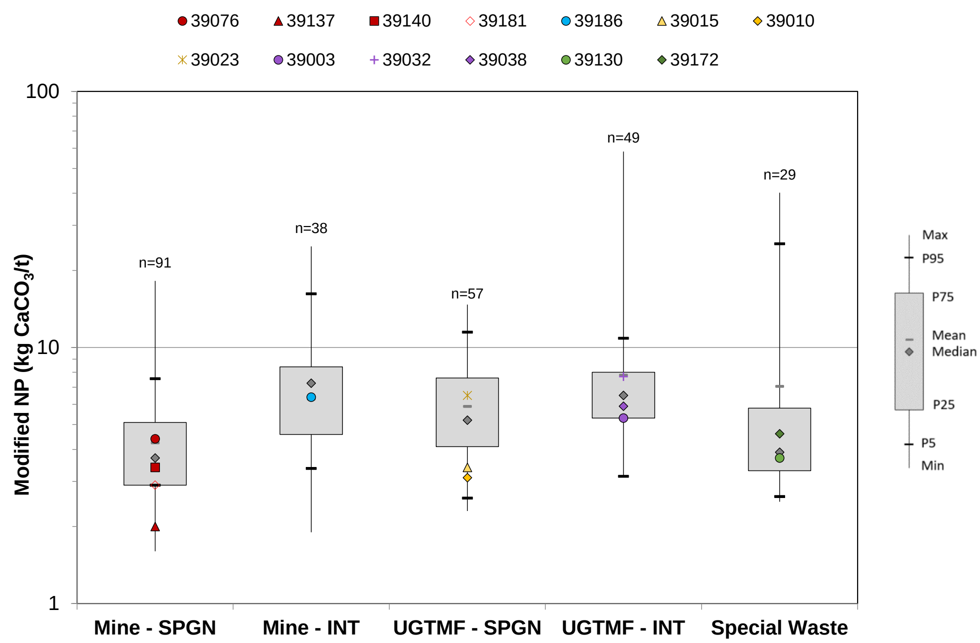

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Figure 6-2: Modified NP of the HCT Samples Compared to the Samples from the Static Data Set

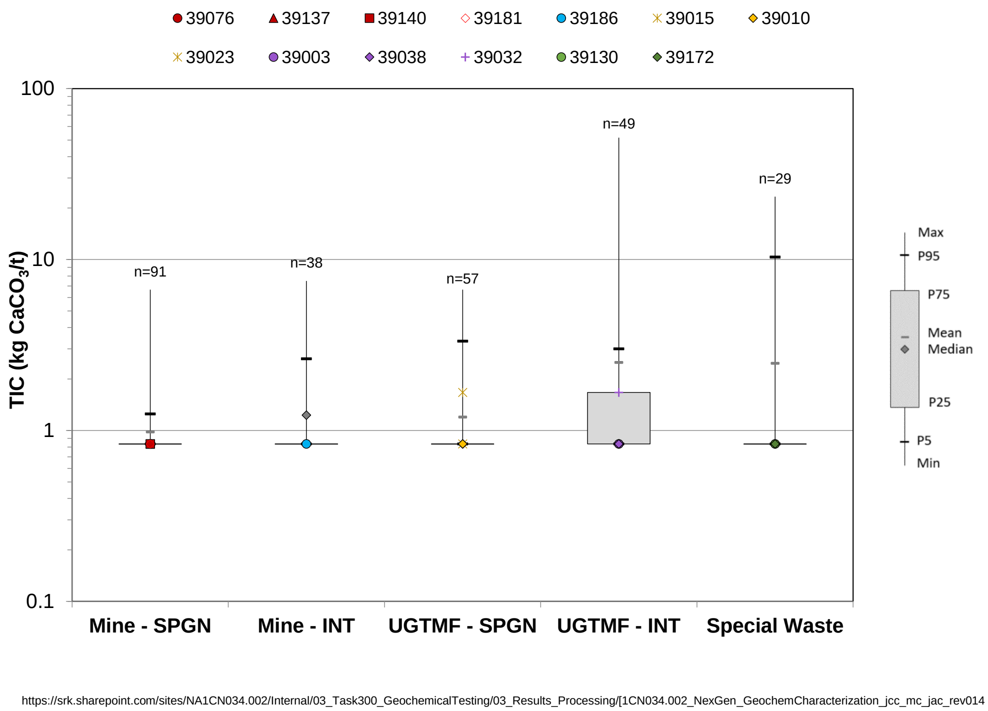

Figure 6-3: TIC of the HCT Samples Compared to the Samples from the Static Data Set

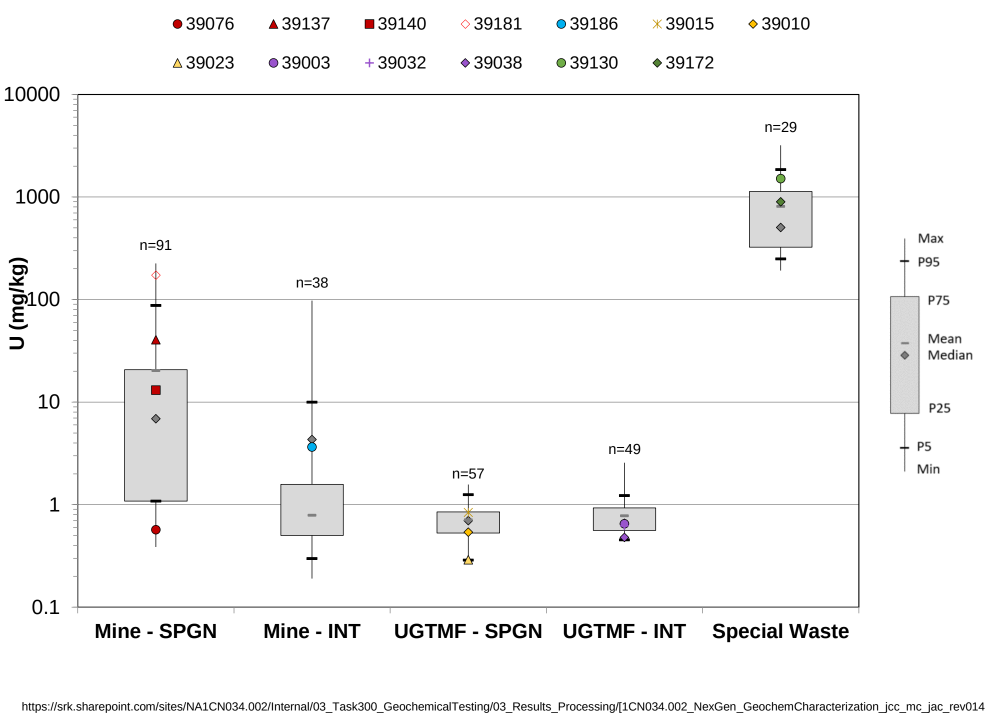

Figure 6-4: Uranium Content of the HCT Samples Compared to the Samples from the Static Data Set

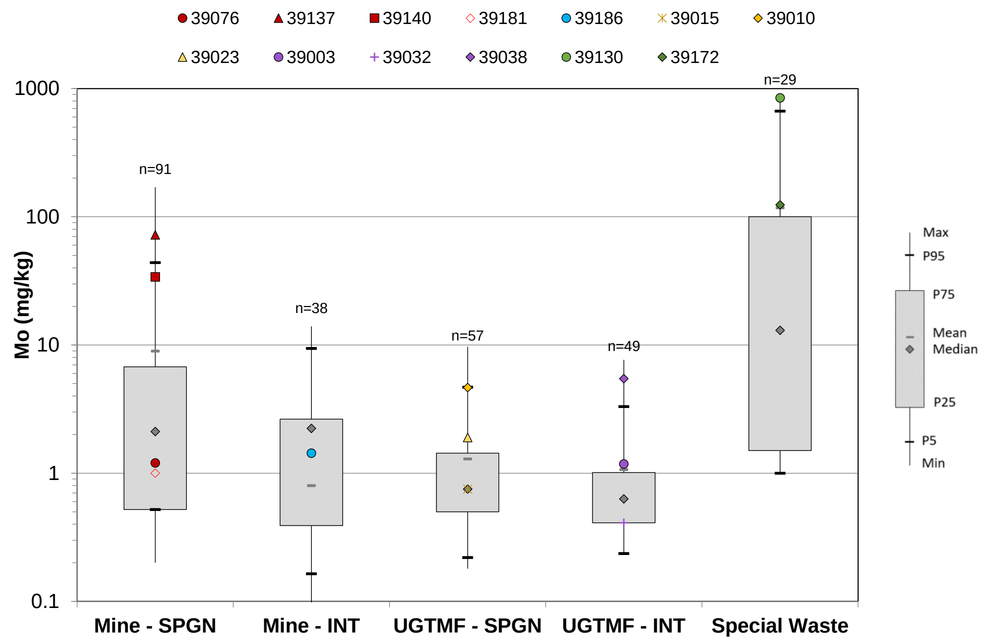

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Figure 6-5: Molybdenum Content of the HCT Samples Compared to the Samples from the Static Data Set

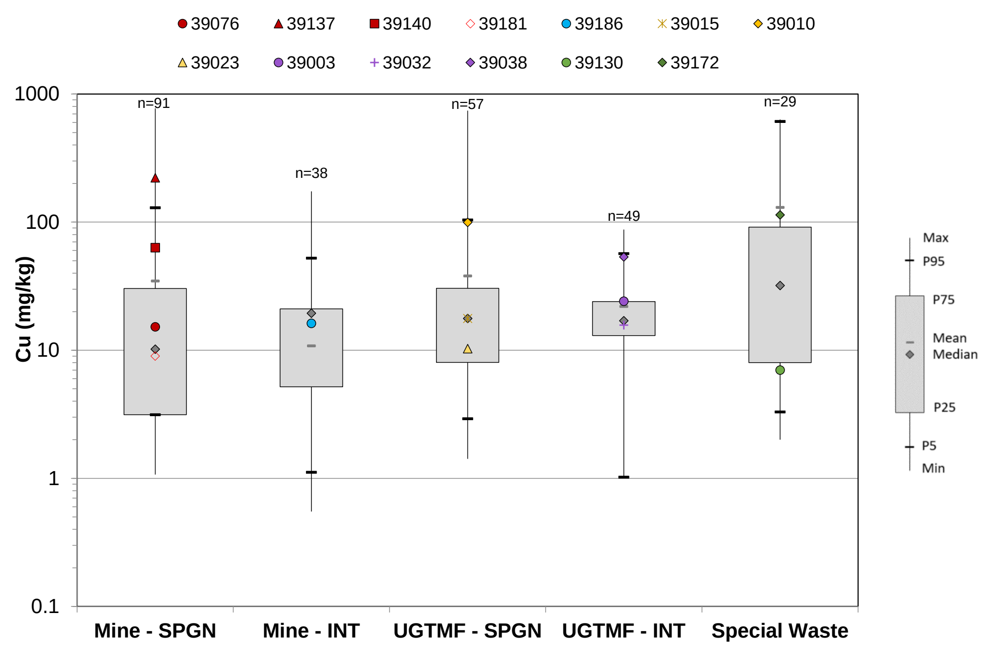

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Figure 6-6: Copper Content of the HCT Samples Compared to the Samples from the Static Data Set

Table 6-1: Summary of Static Characteristics of Humidity Cell Test Samples

HCT ID	Material Type	Lithology Type	Location	Sample Interval			Paste pH	Total Sulfur	Sulfur as Sulfate	Sulfur as Sulfide	AP	Modified NP	TIC	NP/AP	TIC/AP	ARD Class. (NP/AP)	ARD Class. (TIC/AP)	Ag[1]	As[1]	Cd[1]	Co[1]	Cu[1]	Hg[1]	Mo[1]	Ni[1]	Pb[1]	Sb[1]	Se[1]	U[1]	Zn[1]
				Drill Hole ID	From (m)	To (m)	-	%	%	%	kg $CaCO_3$/t	kg $CaCO_3$/t	kg $CaCO_3$/t	-	-	-	-	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
39003	Waste Rock	INT	UGTMF	GAR-19-018	454	455	9.2	0.24	<0.0017	0.24	7.5	5.3	<0.83	0.71	0.11	PAG	PAG	0.05	0.84	0.03	12	24	<0.01	1.2	30	4.1	<0.01	<0.01	0.65	57
39010	Waste Rock	SPGN	UGTMF	GAR-19-020	481.3	482.3	8.2	2.7	0.0023	2.6	83	3.1	<0.83	0.037	0.01	PAG	PAG	0.1	1.8	0.05	17	100	<0.01	4.7	43	11	0.01	0.6	0.54	21
39015	Waste Rock	SPGN	UGTMF	GAR-19-020	406	407	8.9	0.29	0.0023	0.29	9	3.4	<0.83	0.38	0.093	PAG	PAG	0.02	1.5	0.01	11	18	<0.01	0.75	20	2.6	<0.01	<0.01	0.84	44
39023	Waste Rock	SPGN	UGTMF	GAR-19-022	410.4	411.4	9	0.18	<0.0017	0.18	5.6	6.5	1.7	1.2	0.3	UC	PAG	0.04	1	0.03	11	10	<0.01	1.9	35	3.9	<0.01	<0.01	0.29	54
39032	Waste Rock	INT	UGTMF	GAR-19-019	498	499	9.3	0.17	<0.0017	0.17	5.3	7.7	1.7	1.4	0.31	UC	PAG	0.04	0.62	0.07	11	16	<0.01	0.41	28	6.3	<0.01	<0.01	0.62	59
39038	Waste Rock	INT	UGTMF	GAR-19-019	578.5	579.5	8.3	0.74	<0.0017	0.74	23	5.9	<0.83	0.26	0.036	PAG	PAG	0.14	25	0.08	24	54	<0.01	5.5	46	9.5	0.05	0.1	0.48	44
39076	Waste Rock	SPGN	Mine Area	GAR-18-006	550	551.5	8.6	0.19	<0.0017	0.19	5.9	4.4	<0.83	0.74	0.14	PAG	PAG	0.03	1.3	0.03	15	15	<0.01	1.2	24	4.1	<0.01	<0.01	0.57	19
39137	Waste Rock	SPGN	Mine Area	AR-16-080C4	502	504	6.8	3.3	0.032	3.3	100	2	<0.83	0.019	0.0081	PAG	PAG	0.43	22	0.36	320	220	0.04	72	79	21	0.06	4.5	41	11
39140	Waste Rock	SPGN	Mine Area	AR-16-085C1	407.5	410	7.8	1.1	0.011	1	33	3.4	<0.83	0.1	0.025	PAG	PAG	0.48	5.9	0.24	72	63	0.02	34	82	16	0.01	6.7	13	5
39186	Waste Rock	INT	Mine Area	AR-18-208C1	560	562	8.6	0.18	<0.0017	0.18	5.6	6.4	<0.83	1.1	0.15	UC[3]	PAG	0.02	1.4	0.01	7.9	16	<0.01	1.4	28	5.7	<0.01	<0.01	3.7	13
39181	Waste Rock	SPGN	Mine Area	AR-18-187C1	388	390	8.3	0.02	<0.0017	0.02	0.63	2.9	<0.83	4.6	1.3	NPAG	NPAG	<0.2	3	<1[2]	2	9	<1	<1	20	9	<1	<1	170	8
39130	Special Waste	SPGN	Mine Area	AR-16-059C5	554.5	557	7.1	0.02	0.0077	0.012	0.39	3.7	<0.83	9.6	2.2	NPAG	NPAG	0.2	6	<1[2]	3	7	<1	850	21	45	2	<1	1500	1
39172	Special Waste	SPGN	Mine Area	AR-17-126C1	749.5	752	7.7	0.08	0.008	0.072	2.2	4.6	<0.83	2	0.37	UC	PAG	<0.2	18	<1[2]	11	110	<1	120	51	42	1	<1	900	23

Source: https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/03_Results_Processing/[1CN034.002_NexGen_GeochemCharacterization_jcc_mc_jac_rev014.xlsx]

Notes: 1 – Trace element results from aqua regia digestion and ICP-MS finish; with the exception of samples 39181, 39130, and 39172 with elevated uranium content which were analyzed by ICP-OES.
2 – Cd results from samples 39181, 39130 and 39172 were from 4-acid digestion and ICP-MS finish.
3 – UC = uncertain.

Lithology type codes and descriptions are provided in Table 4-2.

HCT = humidity cell test; AP acid potential; NP = neutralization potential; TIC = total inorganic carbon; ARD = acid rock drainage; kg $CaCO_3$/t = kilogram of calcium carbonate per tonne; mg/kg = milligram per kilogram; UGTMF = underground tailings management facility; PAG = potentially acid generating; NPAG = non-potentially acid generating; ICP-OES = inductively coupled plasma-optical emission spectrometry; ICP-MS = inductively coupled plasma-mass spectrometry.

6.2 Leachate Chemistry and Trends

Plots for selected parameters are shown in Figure 6-7 to Figure 6-18 and figures showing concentration trends for all parameters analyzed are provided in Appendix C. A summary table of release rates representing stable periods of weathering (as defined in Section 4.4.6) is provided in Table 6-3.

6.2.1 Underground Tailings Management Facility

The HCT program includes six samples representing waste rock from the UGTMF, including three samples from the SPGN unit and three samples from the INT unit. Geochemical trends in these cells are described in Section 6.2.1.

pH

pH of leachates from the UGTMF HCTs generally ranged from pH 3.9 to 7.4. HCTs 39003, 39023, and 39032 representing waste rock from the INT and SPGN units with sulfide content of 0.17%S to 0.24%S had circum-neutral pH for the duration of testing with stable pH between 6.5 and 7.5 (Figure 6-7).

HCT 39010, a PAG sample from the SPGN unit (with sulfide content of 2.7%S), had circum-neutral pH (around pH 6.5) at the beginning of testing with a quickly decreasing pH starting at week 2 of testing, with pH stabilizing around 4.

HCT 39038, a PAG sample (with sulfide content 0.7%S) from the INT unit, initially had circum-neutral pH (around 6.5), and then pH declined from approximately week 40. Since week 128, pH has been stable at around 4.5 (Figure 6-7).

HCT 39015, a PAG sample (with sulfide content of 0.29%S), representing waste rock from the SPGN, had circum-neutral pH at the start of testing (approximately 7.5) and showed decreasing pH since approximately week 70. Since week 128, the pH has varied from circum-neutral to slightly acidic (pH 5.3 to 6) (Figure 6-7).

Major Ions

The HCT leachates were dominated by the anions of alkalinity or sulfate, and major cations including calcium, magnesium, and potassium. HCT 39010, which had acidic pH, was also dominated by iron. Overall, leachates generally had low conductivity (<100 µS/cm), with an initial spike present due to flushing of oxidation products (as detailed below) and some tests showing increasing conductivity concurrent with declining pH.

Sulfate showed the following (Figure 6-10):

- All HCTs showed an initial spike in sulfate release at the start of testing, attributed to an initial flush of sulfide oxidation products (up to 50 mg/L in HCT 39010).

- Non-acidic HCTs showed low stable sulfate concentrations (at or below the detection limit of 2 mg/L), indicating negligible rates of sulfide oxidation.
- HCTs with declining pH showed concurrent increasing sulfate. Sulfate was highest in the lowest pH HCT (stable concentrations near 40 mg/L).

Alkalinity showed the following (Figure 6-9):

- Alkalinity was present in leachates with pH greater than around 6.5.
- In the tests with detectable alkalinity, concentrations were generally low for the duration of testing (<5 mg $CaCO_3$/L).
- HCT 39032 had the highest alkalinity with an initial flush (up to 20 mg/L) over the first 5 weeks, which then stabilized to around 5 mg/L.
- For the other HCTs with circum-neutral pH (39023 and 39003) initial spikes (around 15 mg/L) were followed by stable concentrations of around 2 mg $CaCO_3$/L to 3 mg $CaCO_3$/L.
- Although alkalinity release was low in HCTs with circum-neutral pH, onset of acidic conditions has not occurred, indicating the alkalinity released is sufficient to consume the acid produced from the low rates of sulfide oxidation indicated by the sulfate concentrations.

Major cations (e.g., calcium, magnesium, potassium, sodium, iron, aluminum) showed the following (Figure 6-8, Figure 6-11, Figure 6-12):

- Calcium was the dominant major cation in all HCTs with near neutral pH, followed by potassium and magnesium (Figure 6-12). Calcium is likely released from calcite or calcium-bearing feldspar phases (anorthite or oligoclase). Potassium is likely released from dissolution of the silicate phases biotite, muscovite, or K-feldspar. As no dolomite was identified by XRD or QEMSCAN, magnesium is likely released by the dissolution of the silicate phases biotite and chlorite.
- All HCTs showed highest calcium concentrations in the first few weeks, which is interpreted to be from dissolution of calcite. Most cells had stable calcium concentrations by week 40 of testing.
- HCTs 39003 and 39032, which both maintained circum-neutral pH and were characterized by low sulfur (0.24% and 0.17%), showed a slight increase in calcium concentrations at week 92, which coincided with a slight increase in alkalinity and pH indicating dissolution of a calcium-bearing phase such as calcite, anorthite, or oligoclase which is providing neutralization (Figure 6-19 and Figure 6-20). The low carbonate content of the samples (as measured by TIC) and delayed release of calcium suggest the signature may be attributed to dissolution of calcium-bearing silicate phases.
- Following an initial flush of calcium, which is attributed to dissolution of calcite, HCTs 39003 and 39032 showed higher potassium concentrations relative to calcium for the first 64 and 24 weeks of testing, respectively. The potassium concentrations indicate dissolution of silicates either from K-feldspar or biotite. Both HCTs showed stable release of calcium, potassium, and magnesium with stable pH near 6.5 to 7 indicating silicate dissolution is providing effective neutralization to maintain circum-neutral pH conditions.

- HCT 39023 maintained circum-neutral pH for the duration of testing and is characterized by low-sulfide (0.18%). The test showed an initial flush of calcium, which coincided with an initial elevated pH (8.7) attributed to alkalinity released from carbonate dissolution. From week 30, this cell showed low (<1 mg/L), stable concentrations of calcium, potassium, and magnesium with circum-neutral pH conditions persisting (pH 6.6 to 7.3) indicating the dissolution of silicates is providing neutralization to maintain circum-neutral pH conditions (Figure 6-21).
- Stable concentrations for magnesium were generally low (<0.1 mg/L) in HCTs with circum-neutral pH for the duration of testing. The highest magnesium concentrations were in HCTs with acidic pH (39010 and 39038), and with mildly acidic pH (39015), with HCTs 39038 and 39015 both showing an increasing trend in magnesium concurrent with pH decline (Figure 6-12). The trends suggest higher rates of dissolution of the magnesium bearing silicate phases biotite and chlorite at mildly acidic to acidic pH conditions.
- HCT 39010 showed an increasing trend for both aluminum and iron concentrations (up to 2.9 mg/L and 1.5 mg/L, respectively) as pH decreased, likely reflecting dissolution of aluminosilicate minerals and oxide species and release of these constituents that have greater mobility at acidic pH.
- Stable sodium concentrations were generally low (<0.5 mg/L) in all HCTs, though most HCTs showed an initial flush (up to 13 mg/L in HCT 39038), which is attributed to dissolution of soluble oxidation products or release from freshly broken mineral grains as a result of sample preparation.

Overall, the results for major ion chemistry show that the HCTs with with 0.17% to 0.24% sulfur content oxidized at a slow rate and maintained circum-neutral pH conditions with evidence of dissolution of silicate minerals providing sufficient alkalinity to neutralize acid generation from sulfide oxidation. Sulfide oxidation rates were higher in samples with higher sulfide content (0.29% to 2.7%) and rates of alkalinity generation were insufficient to provide neutralization in these samples.

The results to date show that dissolution of silicate may provide effective NP to maintain circum-neutral pH for materials with up to 0.24% sulfur. Continuation of the HCTs with low sulfur content (HCTs 39003 and 39032) will further support refining the low-sulfide cut-off criterion.

Trace Elements

Figures for selected trace elements are provided in Figure 6-13 to Figure 6-18. These parameters were selected as they were identified as having enriched solid-phase content or are parameters of interest for the Project. A review of the trace element trends showed the following:

- Some trace elements (e.g., arsenic, barium, boron, cadmium, molybdenum, manganese, selenium, vanadium) showed a spike in concentrations during the first few weeks of testing representing a flush of oxidation products and then declined to lower concentrations.
- Concentrations for mercury, silver, bismuth, and antimony were generally below the limit of detection following the first few weeks of testing.
- Concentrations for some cation species including cadmium, copper, cobalt, manganese, lead, and zinc increased as pH declined in HCTs 39010 and 39038 (Figure 6-13 and Figure 6-14). HCT

39015, with mildly acidic conditions developing near week 120, showed increasing concentrations of cobalt and manganese as pH began to decrease.

- Arsenic and molybdenum concentrations were highest in HCT 39038, which showed a spike in concentrations (up to 0.13 and 0.24 mg/L, respectively) early in the testing, likely representing a flush in oxidation products. Arsenic and molybdenum concentrations have been steadily decreasing in this cell and stabilizing at low concentrations (approximately 0.0002 mg/L and 0.00005 mg/L, respectively). Stable concentrations of these parameters were generally low in all other cells (<0.0015 mg/L and <0.001 mg/L, respectively) (Figure 6-15 and Figure 6-16).
- Selenium concentrations were generally stable for the duration of testing in all HCTs. Selenium concentrations were highest in the HCTs with highest sulfide content (HCT 39010 and 39038 with 2.7% and 0.74%, respectively). Both cells showed stable concentrations near 0.0008 mg/L (Figure 6-17).
- Stable concentration of uranium were generally low in all HCTs with near-neutral pH (<0.001 mg/L), with highest concentrations in HCTs with acidic pH (39010 and 39038) (with up to 0.0067 mg/L) (Figure 6-18).

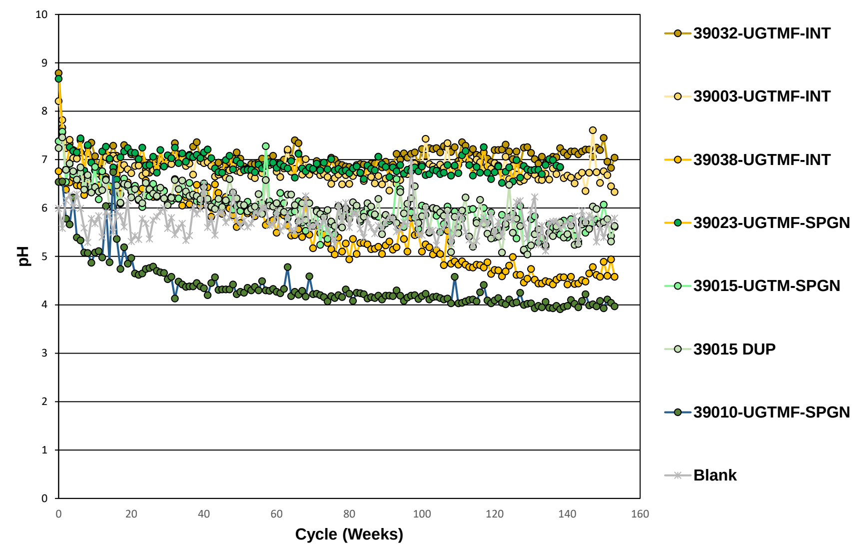

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Figure 6-7: pH vs. Cycle (Weeks) from UGTMF HCTs

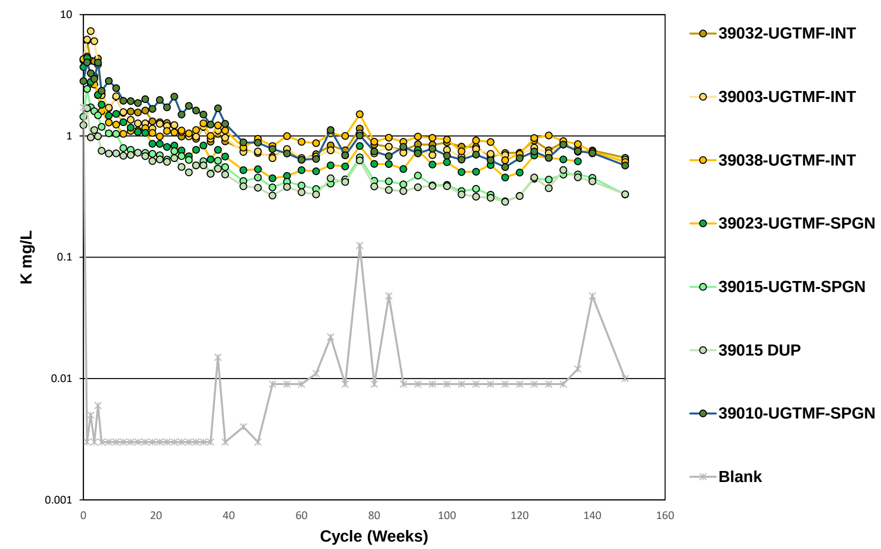

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Figure 6-8: Potassium (mg/L) vs. Cycle (Weeks) from UGTMF HCTs

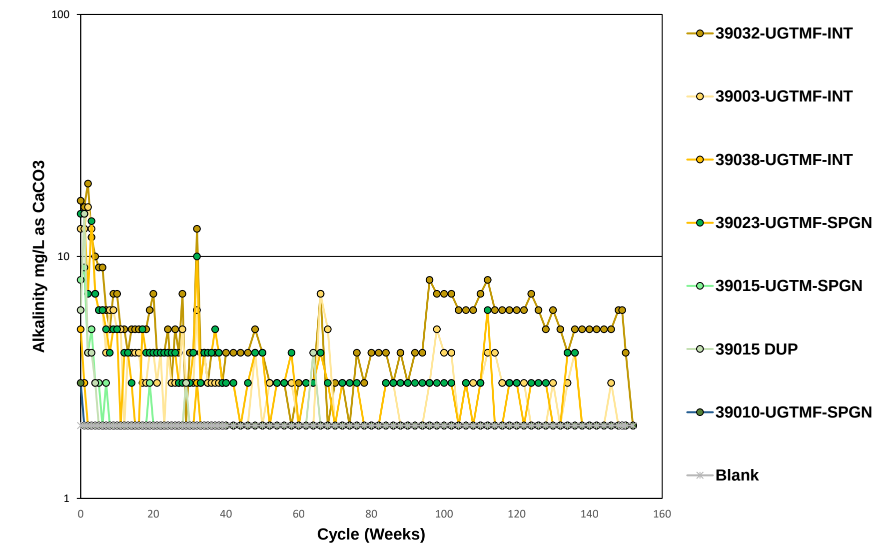

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Figure 6-9: Alkalinity (mg/L as $CaCO_3$) vs. Cycle (Weeks) from UGTMF HCTs

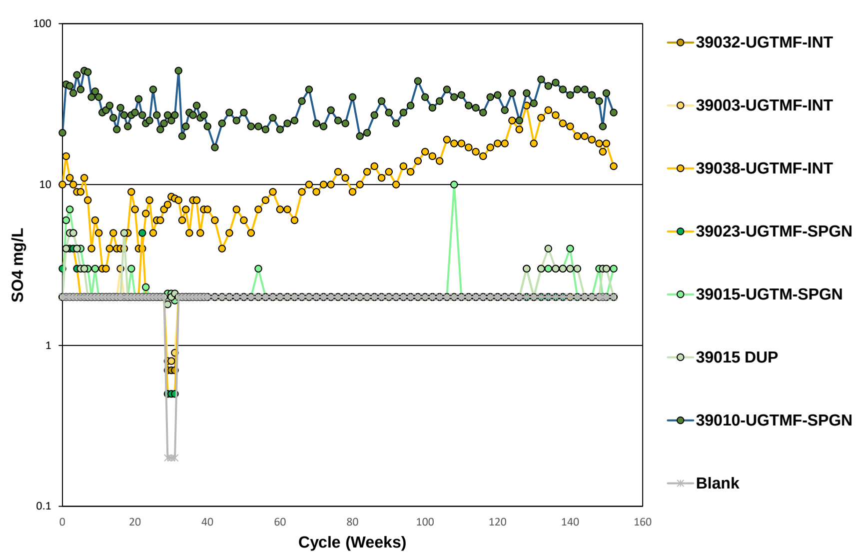

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Figure 6-10: Sulfate vs. Cycle (Weeks) from UGTMF HCTs

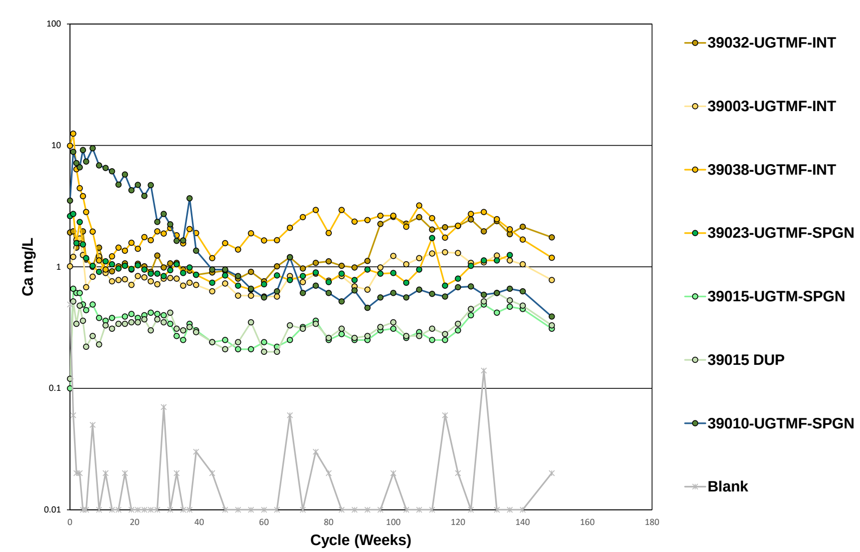

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Figure 6-11: Calcium (mg/L) vs. Cycle (Weeks) from UGTMF HCTs

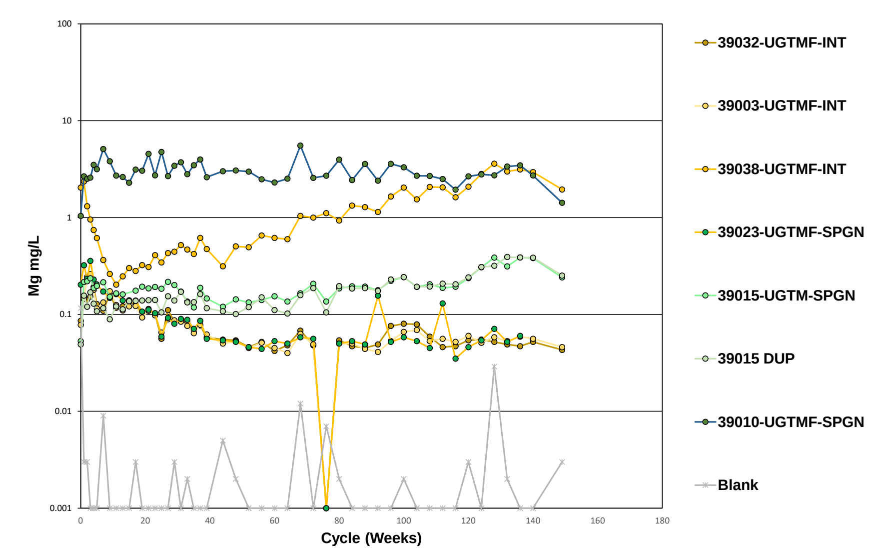

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Figure 6-12: Magnesium (mg/L) vs. Cycle (Weeks) from UGTMF HCTs

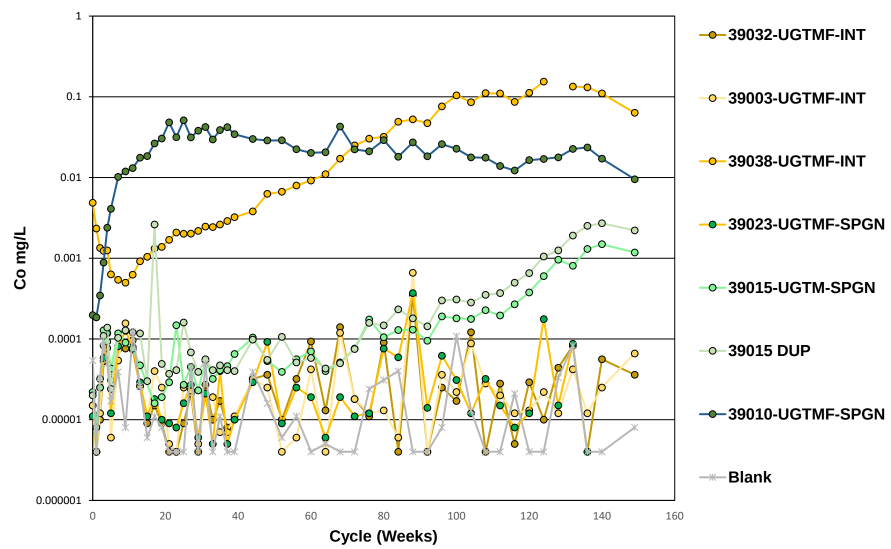

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Figure 6-13: Co (mg/L) vs. Cycle (Weeks) for UGTMF HCTs

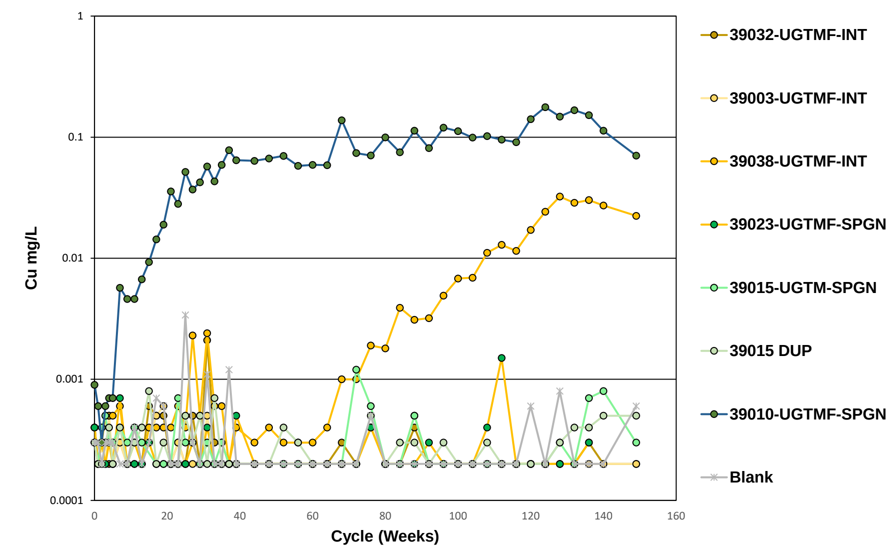

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Figure 6-14: Cu (mg/L) vs. Cycle (Weeks) for UGTMF HCTs

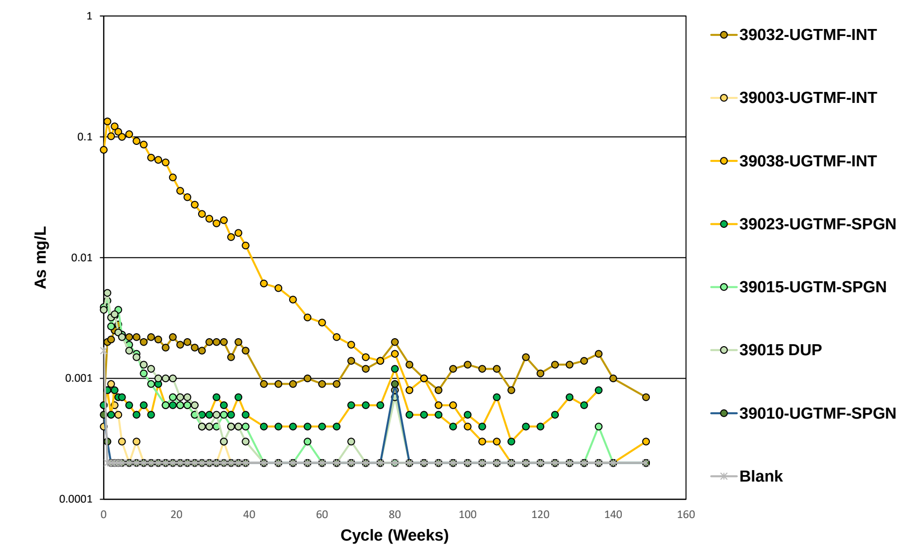

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Figure 6-15: As (mg/L) vs. Cycle (Weeks) for UGTMF HCTs

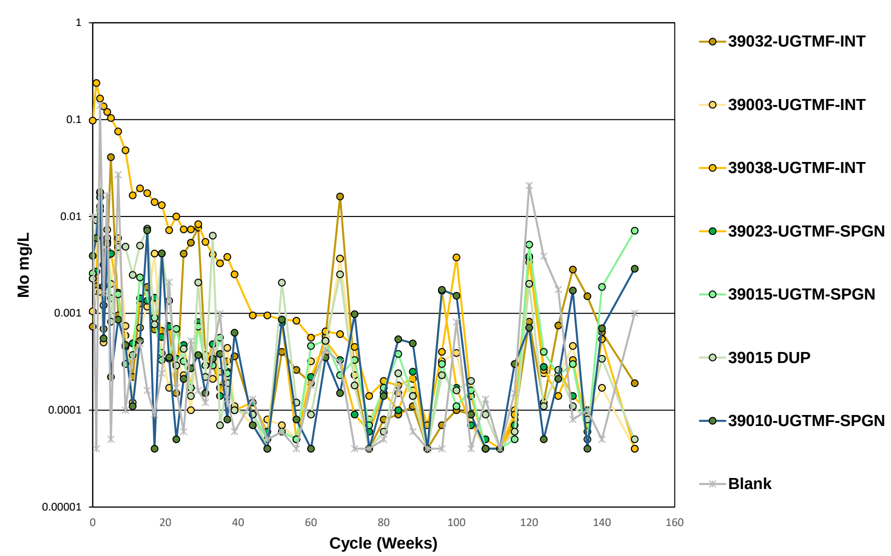

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Figure 6-16: Mo (mg/L) vs. Cycle (Weeks) for UGTMF HCTs

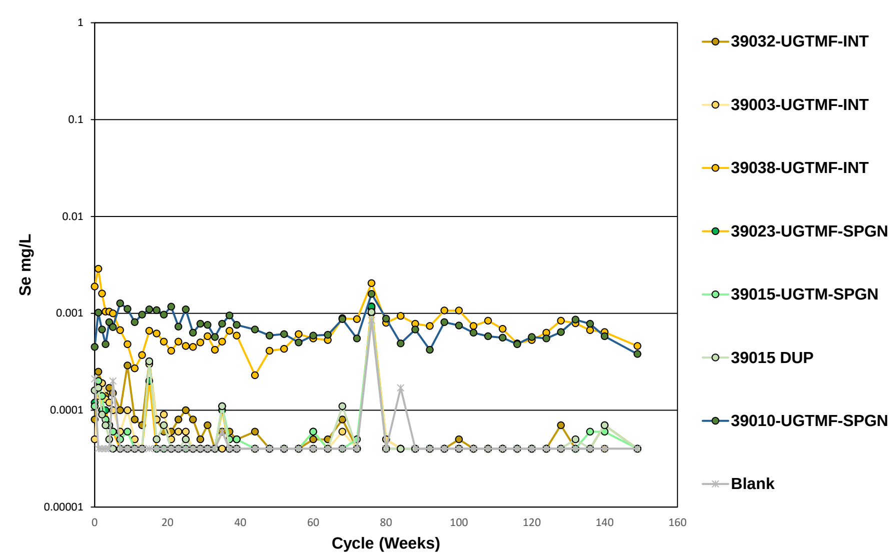

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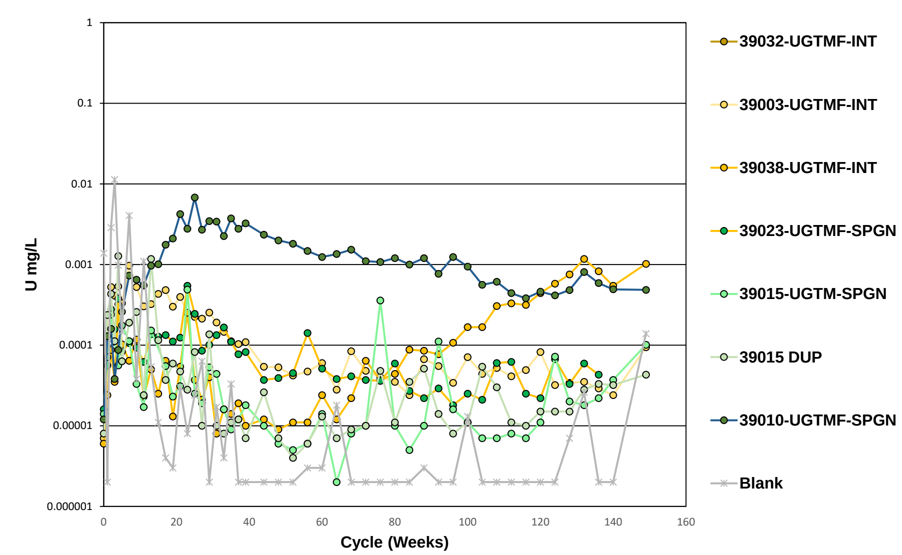
Figure 6-17: Se (mg/L) vs. Cycle (Weeks) for UGTMF HCTs



https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/HCT/[Rook1_HCT_WR_conc charts_1CN034.002_rtc_rev02.xlsm

Figure 6-18: U (mg/L) vs. Cycle (Weeks) for UGTMF HCTs

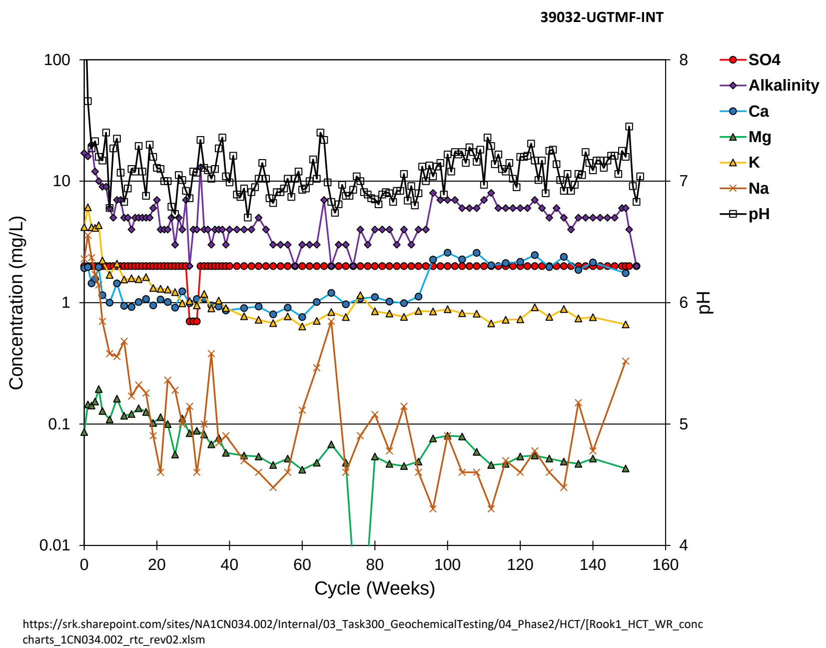


Figure 6-19: Major Ion Trends from HCT 39032

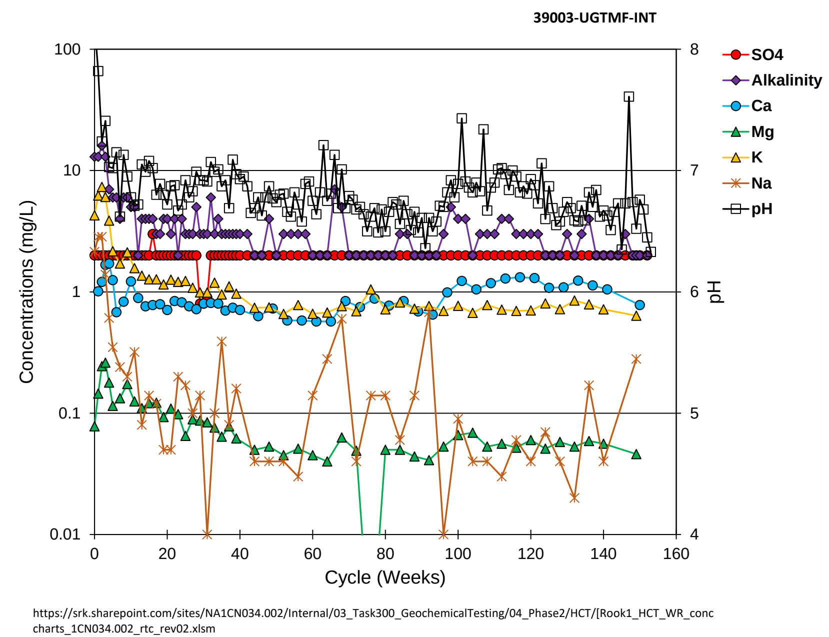


Figure 6-20: Major Ion Trends from HCT 39003

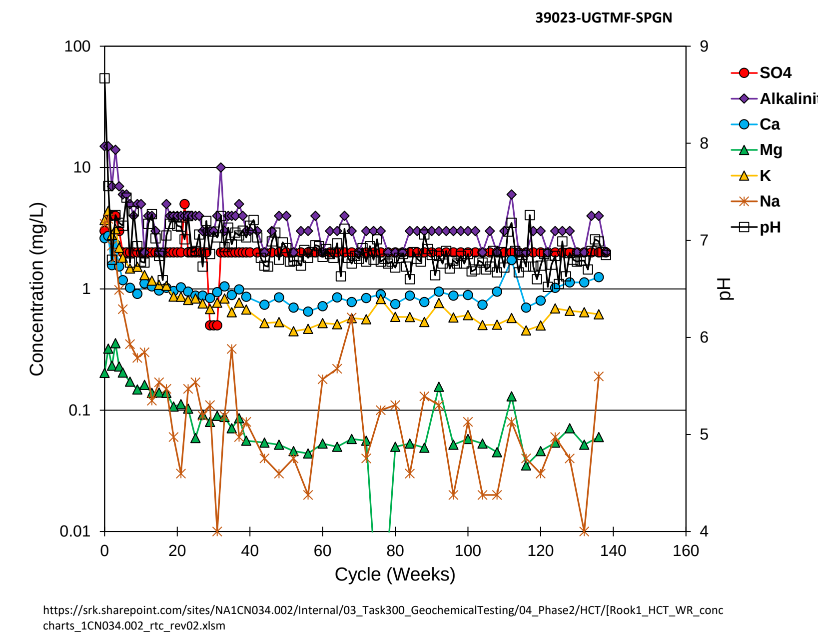


Figure 6-21: Major Ion Trends from HCT 39023

6.2.2 Mine Development Area

In total, seven HCTs were initiated from samples collected from the mine development area. This includes four from waste rock of the SPGN unit, one from waste rock of the INT unit and two representing special waste. Geochemical trends in these cells are described in Section 6.2.2.

pH

pH of leachates from the mine development area generally ranged from 7.1 to 3.9. HCTs 39181 and 39186 representing waste rock with low sulfide content of 0.02% and 0.18%, respectively had circum-neutral pH for the duration of testing with stable pH between 6.1 and 7 (Figure 6-24).

The HCTs representing special waste (39130 and 39172) with low sulfide content (0.012% and 0.072%, respectively) showed mildly acidic to circum-neutral pH for the duration of testing with stable pH of 5.6 to 6.6 in both cells, which is comparable to the pH of the blank cell representing de-ionized water (Figure 6-24).

HCTs 39137 and 39140, both representing waste rock of the SPGN unit with sulfide content of 3.3% and 1%, respectively showed rapid development of acidic conditions. HCT 39137 has been consistently acidic since the beginning of testing dropping from pH near 5 at week 0 to a stable pH near 4 at week 14 of testing, and finally stabilizing to pH of around 3.6. HCT 39140 had an initial pH near 7 with pH decreasing at week 8 of testing and stabilizing at pH near 4 at week 95 of testing.

HCT 39076, representing waste rock from the SPGN unit with lower sulfide content (0.19%S) in comparison to HCTs 39137 and 39140, showed a delay to development of mildly acidic conditions. This cell had initial pH near 7, with circum-neutral pH conditions persisting to approximately week 30. The pH in this cell slowly decreased and stabilized at pH around 5 at week 138 of testing (Figure 6-24).

Major Ions

Sulfate showed the following (Figure 6-26):

- All HCTs showed an initial spike in sulfate release at the start of testing, attributed to an initial flush of sulfide oxidation products (up to 200 mg/L in HCT 39137, representing waste rock of the SPGN unit).
- Non-acidic HCTs showed low, stable sulfate concentrations (<2 mg/L), indicating negligible rates of sulfide oxidation.
- HCTs with declining pH showed concurrent increasing sulfate. Sulfate was highest in the HCT 39137 with lowest pH (stable concentrations near 60 mg/L).

Alkalinity showed the following (Figure 6-25):

- The HCTs representing waste rock that had circum-neutral pH at the start of testing all showed an initial flush of alkalinity in the first few cycles (up to 10 mg $CaCO_3$/L) in HCT 39181.

- In the tests with detectable alkalinity, concentrations were generally low for the duration of testing (<5 mg $CaCO_3$/L).
- HCT 39137, which had acidic pH at the start of testing, had alkalinity below the limit of detection for the duration of testing.

Major cations (e.g., calcium, magnesium, potassium, sodium) showed the following (Figure 6-27 to Figure 6-29):

- Calcium was the dominant major cation in most HCTs with circum-neutral pH followed by potassium and magnesium (Figure 6-27). HCT 39181, representing waste rock with low sulfide content of 0.018%, had potassium as the dominant major cation followed by calcium and magnesium (Figure 6-28).
- HCTs 39076, 39181, and 39186 showed an initial flush in calcium with coinciding spike in alkalinity and pH. This trend is attributed to dissolution of carbonate providing alkalinity and increasing pH conditions.
- HCTs 39181 and 39186, representing waste rock with low-sulfide content (0.02% and 0.18%, respectively), showed low (<1 mg/L), stable concentrations of calcium, potassium, and magnesium from week 19 and 16, respectively, while maintaining pH conditions from 6.4 to 7 in HCT 39181 and 6.1 to 6.8 in HCT 39186. The stable release of these major ions is attributed to dissolution of silicate phases, either feldspars, biotite, or chlorite (Figure 6-22 and Figure 6-23), providing neutralization to maintain circum-neutral pH.
- Leachates with acidic pH in HCTs 39137 and 39140 had higher magnesium in comparison to calcium and potassium, indicating increasing rates of dissolution of biotite or chlorite, which are the only magnesium-bearing mineral phases identified by XRD or QEMSCAN (Figure 6-29).
- HCT 39137 and 39140 showed an increasing trend for both aluminum and iron concentrations (up to 4.3 mg/L and 22 mg/L, respectively) as pH decreased, likely reflecting dissolution of aluminosilicate minerals and oxide species and release of these constituents, which are more mobile at acidic pH.
- Sodium concentrations were generally stable and low (<0.5 mg/L) in most HCTs, though most HCTs showed an initial flush, which is attributed to dissolution of soluble oxidation products or release from freshly broken mineral grains as a result of sample preparation. The special waste HCTs had higher initial flush (up to 36 mg/L in 39172) in comparison to the HCTs of waste rock.

Overall, the results for pH and major ion chemistry showed that the HCTs with 0.02% to 0.18% sulfur content oxidized at a slow rate and maintained circum-neutral pH conditions, with evidence of dissolution of silicate minerals providing sufficient alkalinity to neutralize acid generation from sulfide oxidation. Sulfide oxidation rates were higher in HCTs with higher sulfide content (0.19%S to 3.3%S) and rates of alkalinity generation were insufficient to provide neutralization in these HCTs.

Trace Elements

Figures for selected trace elements are provided in Figure 6-30 to Figure 6-35. These parameters were selected as they were identified as having enriched solid-phase content or were identified as parameters of interest for the Project. A review of the trace element trends showed the following:

- Some trace elements (e.g., arsenic, boron, barium, cadmium, manganese, molybdenum, nickel, antimony, selenium, uranium, vanadium, zinc) showed a spike in concentrations during the first few weeks of testing likely representing a flush of oxidation products and then declined to lower concentrations. The highest concentrations in the early flush for arsenic and antimony were from HCTs representing special waste (up to 0.038 mg/L and 0.014 mg/L, respectively).
- The HCTs representing special waste (39130 and 39172) showed initial flushes with highly elevated concentrations for molybdenum (up to 91 mg/L) and uranium (up to 2.9 mg/L), potentially released from freshly broken mineral grains as a result of sample crushing or from soluble weathering products (Figure 6-33 and Figure 6-35).
- Concentrations for mercury, silver, and bismuth were generally below the limit of detection following the first few weeks of testing.
- Concentrations for some cation species including cadmium, copper, cobalt, manganese, lead, and zinc increased as pH declined in HCTs 39137, 39140, and 39076 (Figure 6-30 and Figure 6-31). The HCT 39015 with mildly acidic conditions developing near week 120 showed increasing concentrations of cobalt and manganese.
- Uranium leachate concentrations for HCTs 39137, 39140, and 39076 increased as pH decreased with the onset of acidic conditions. Stable uranium concentrations were highest in HCT 39172, representing special waste with circum-neutral pH (Figure 6-35).
- Arsenic and molybdenum concentrations were highest in HCTs representing special waste (39130 and 39172). For the waste rock HCTs, the highest stable arsenic and molybdenum concentrations of approximately 0.001 mg/L and 0.01 mg/L, respectively were observed in HCT 39137 with acidic pH (Figure 6-32 and Figure 6-33). For the cells that developed acidic conditions, molybdenum concentrations decreased as pH decreased.
- Selenium concentrations were generally stable for the duration of testing. Selenium concentrations were highest in the HCTs with highest sulfide content (HCT 39137 and 39140 with 3.3% and 1%, respectively), with HCT 39137 having a stable concentration near 0.005 mg/L and HCT 39140 with a stable concentration near 0.01 mg/L. HCT 39172, representing special waste, also had an elevated stable selenium concentration of approximately 0.0035 mg/L (Figure 6-34) compared to all other tests having less than 0.001 mg/L stable selenium.

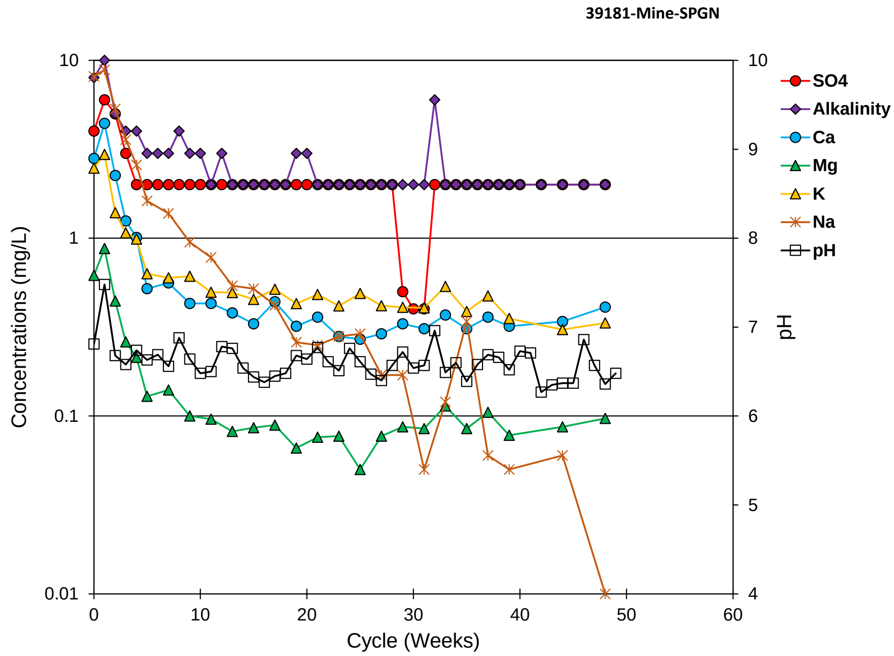


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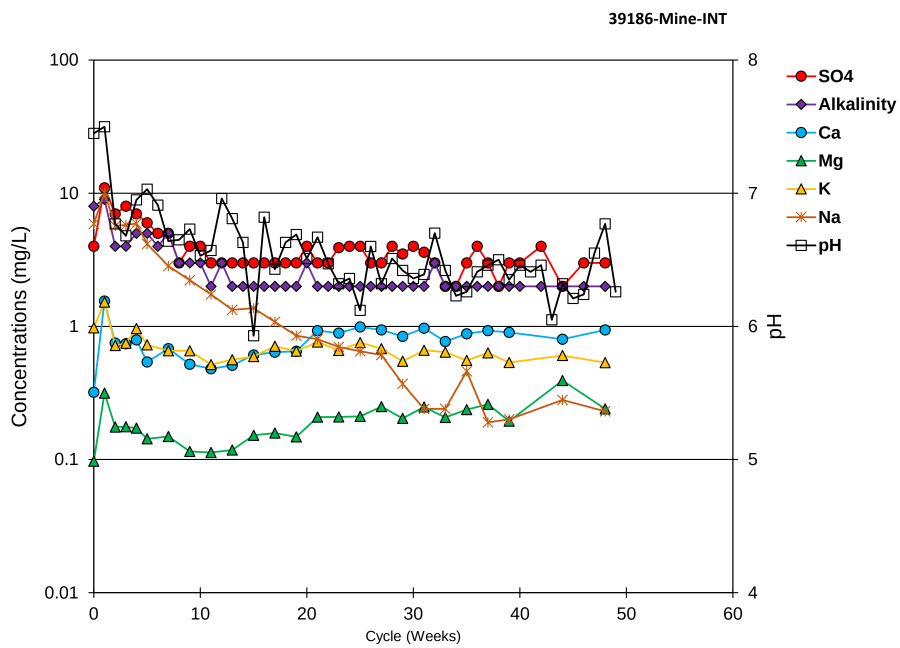
Figure 6-22: Major Ion Trends from HCT 39181



https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/HCT/[Rook1_HCT_WR_conc charts_1CN034.002_rtc_rev02.xlsm

Figure 6-23: Major Ion Trends from HCT 39186

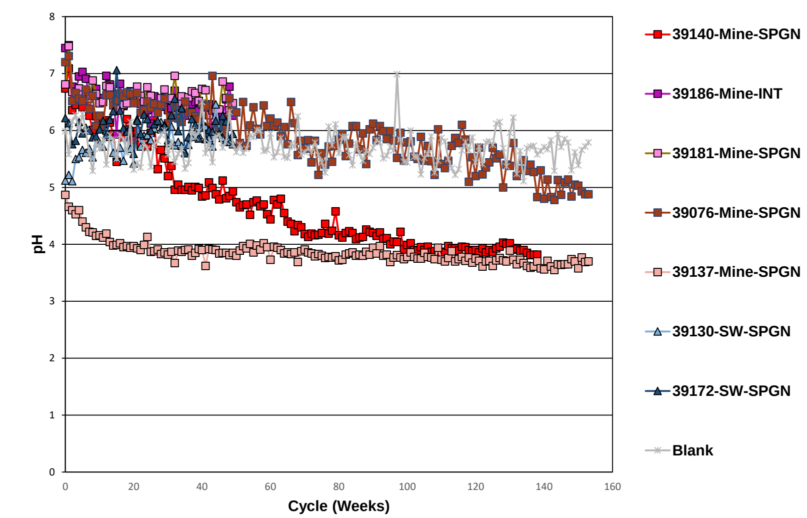


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Figure 6-24: pH vs. Cycle (Weeks) for Mine Development Area HCTs

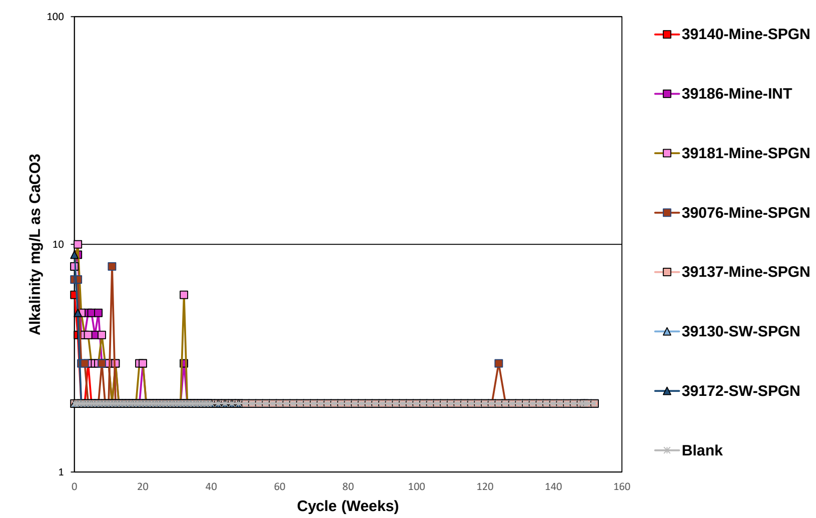

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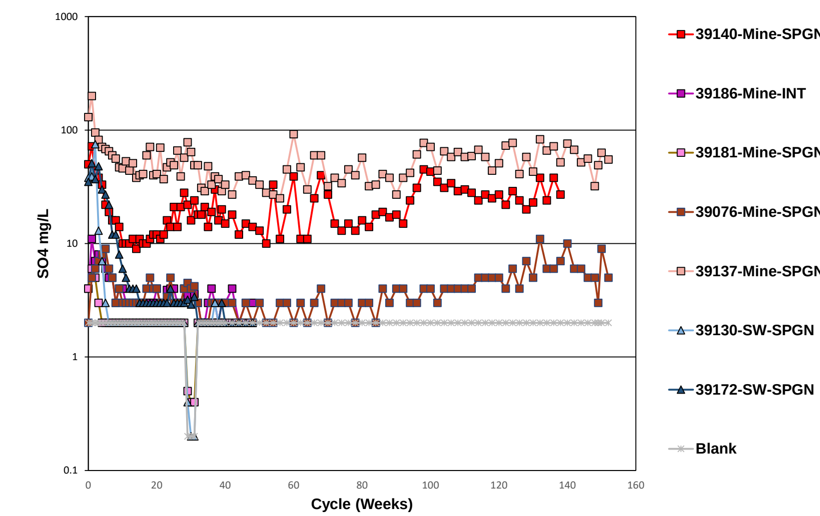
Figure 6-25: Alkalinity (mg/L as $CaCO_3$) vs. Cycle (Weeks) for Mine Development Area HCTs



https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/HCT/[Rook1_HCT_WR_conc charts_1CN034.002_rtc_rev02.xlsm

Figure 6-26: Sulfate (mg/L) vs. Cycle (Weeks) for Mine Development Area HCTs

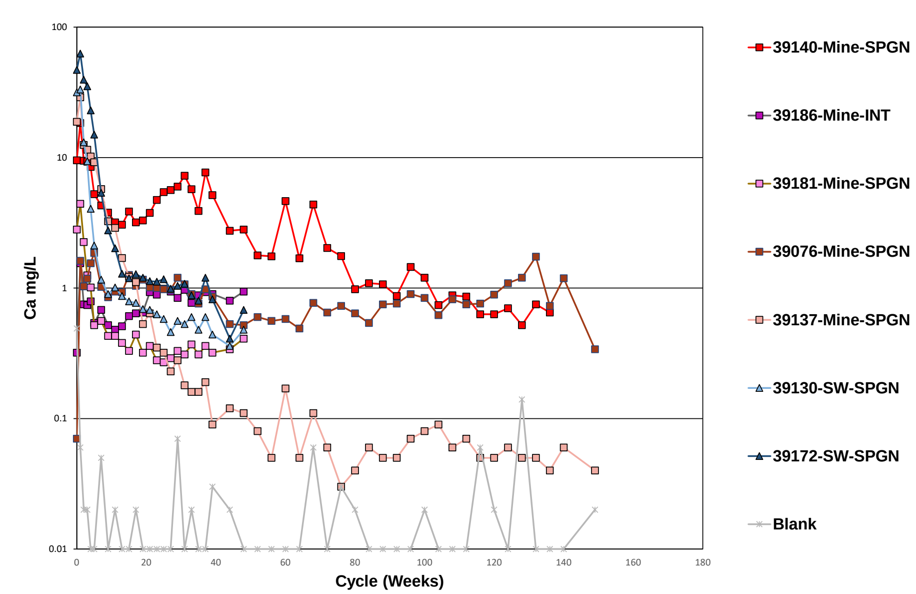


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Figure 6-27: Calcium vs. Cycle (Weeks) for Mine Development Area HCTs

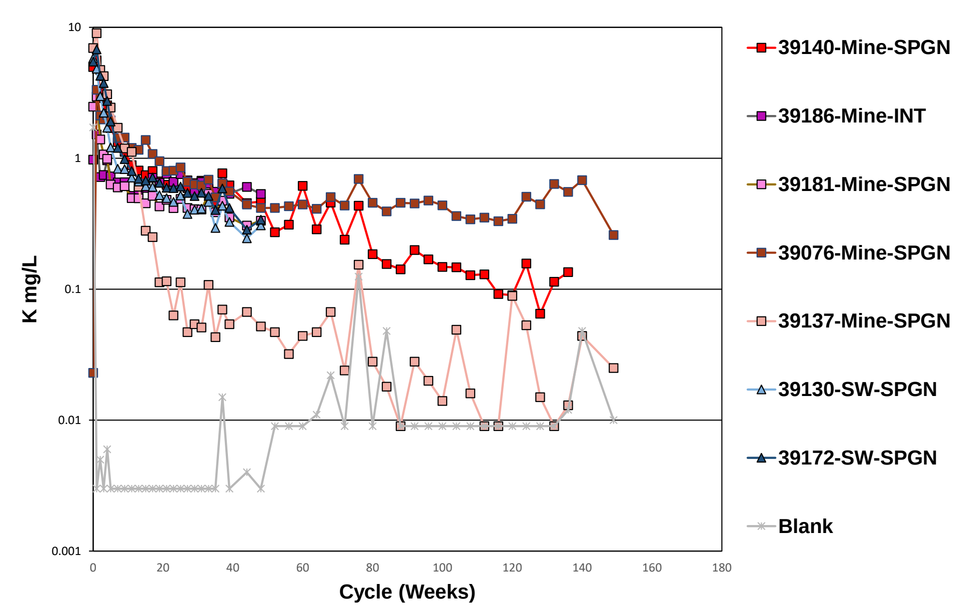

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Figure 6-28: Potassium vs. Cycle (Weeks) for Mine Development Area HCTs

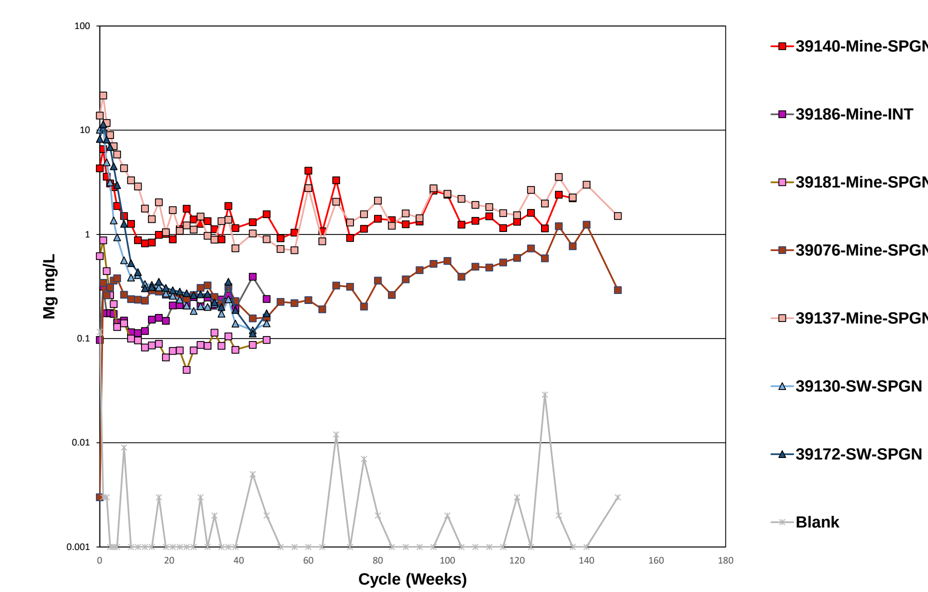

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Figure 6-29: Magnesium vs. Cycle (Weeks) for Mine Development Area HCTs

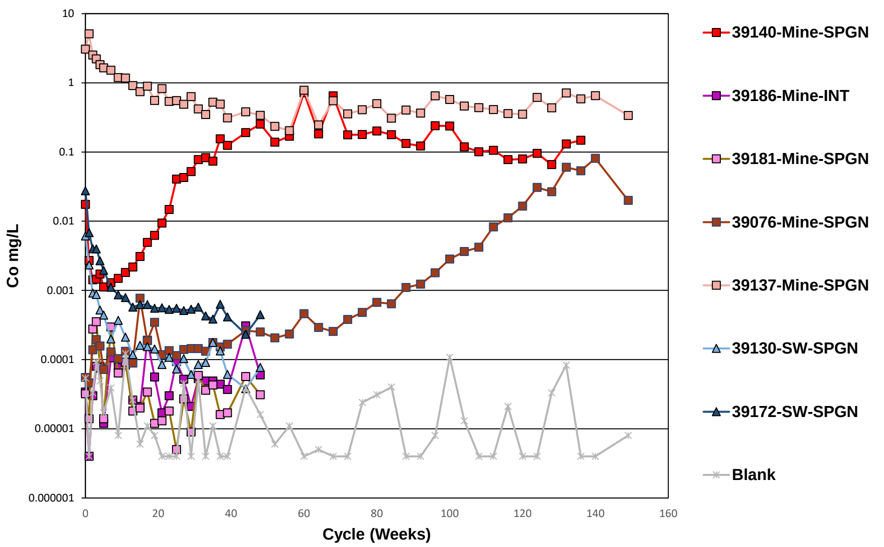

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Figure 6-30: Co (mg/L) vs. Cycle (Weeks) for Mine Development Area HCTs

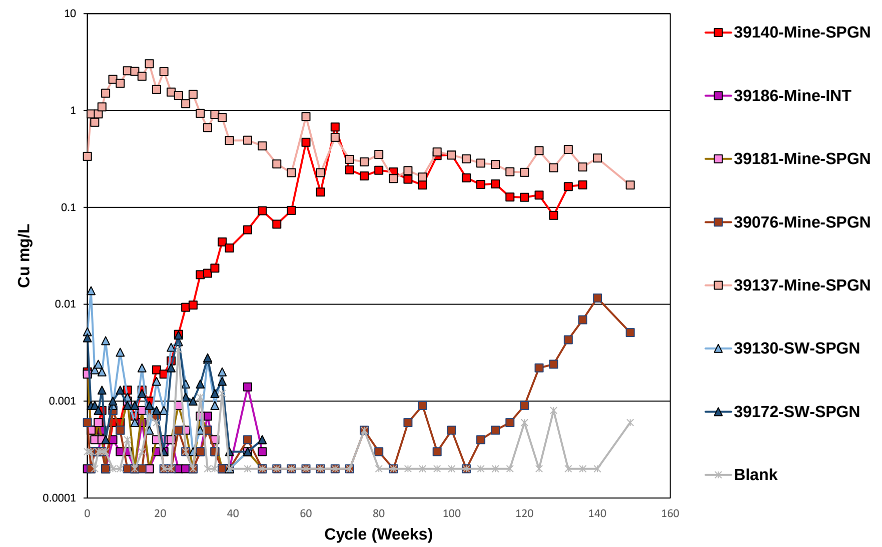

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Figure 6-31: Cu (mg/L) vs. Cycle (Weeks) for Mine Development Area HCTs

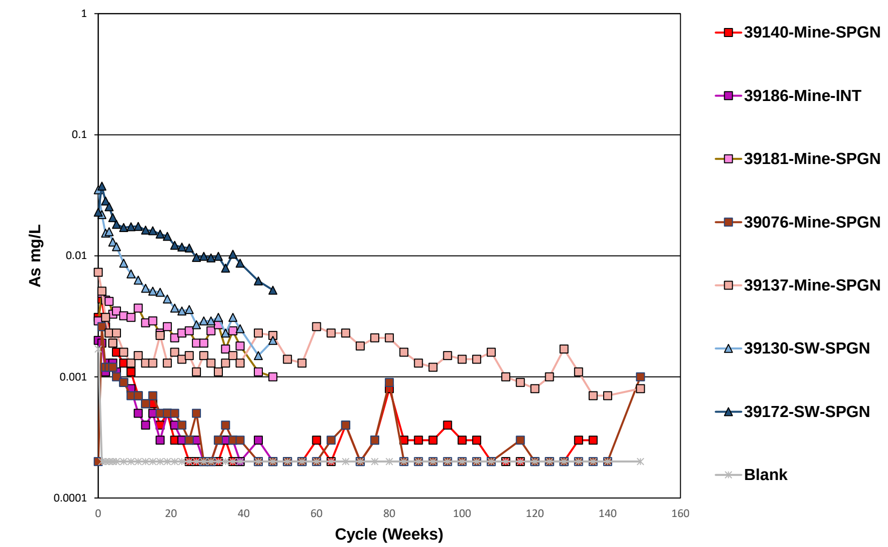

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Figure 6-32: As (mg/L) vs. Cycle (Weeks) for Mine Development Area HCTs

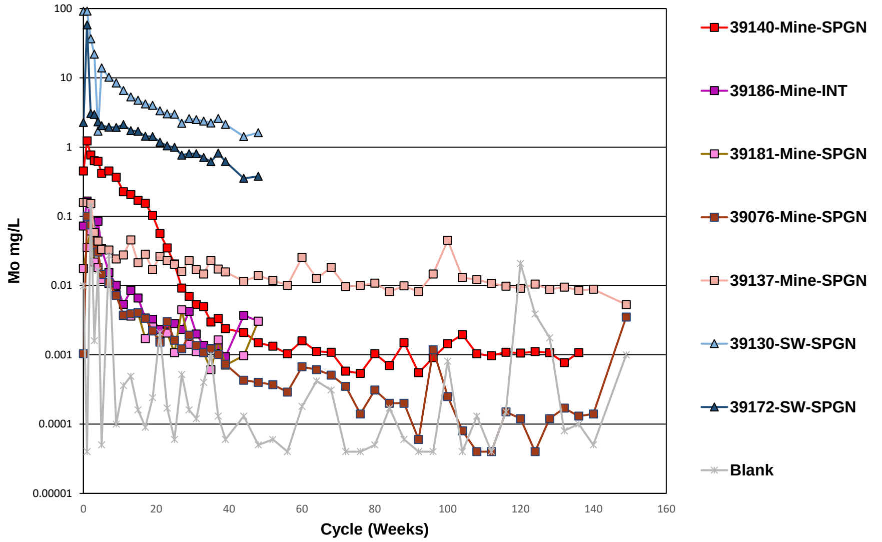

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Figure 6-33: Mo (mg/L) vs. Cycle (Weeks) for Mine Development Area HCTs

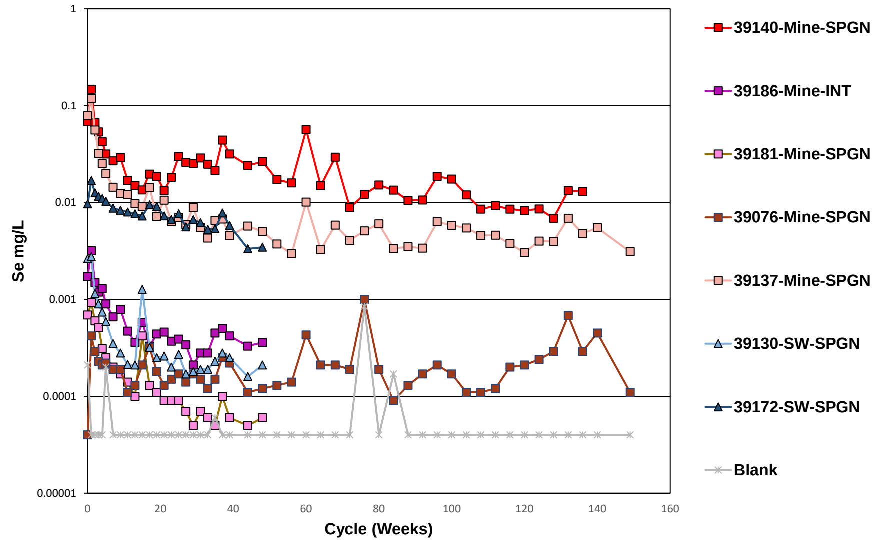

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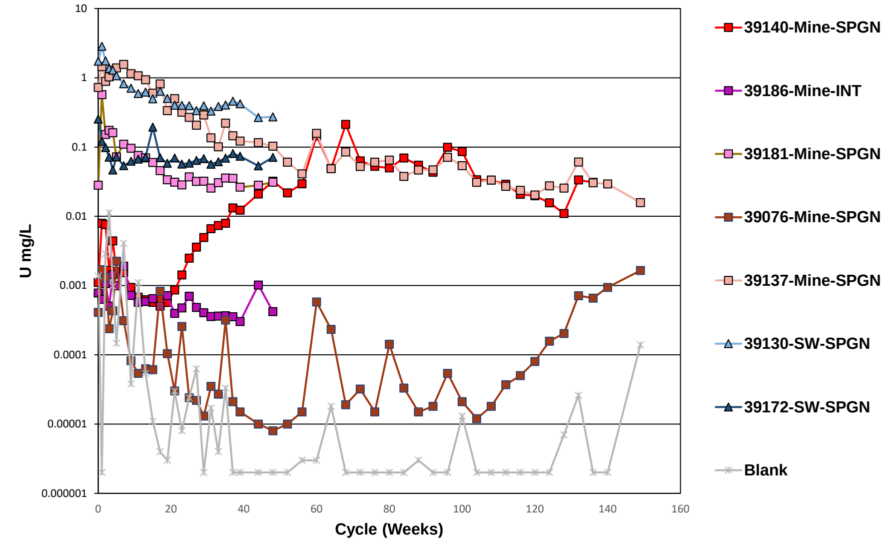
Figure 6-34: Se (mg/L) vs. Cycle (Weeks) for Mine Development Area HCTs



https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/HCT/[Rook1_HCT_WR_conc charts_1CN034.002_rtc_rev02.xlsm

Figure 6-35: U (mg/L) vs. Cycle (Weeks) for Mine Development Area HCTs

6.2.3 Radionuclides

Results for radionuclides from HCTs representing waste rock showed the following:

- Uranium-238 activity was highest in HCT 39137 with up to 17 Bq/L early in the testing period, with concentrations stabilizing at 0.024 Bq/L. HCT 39140 showed increasing urainum-238 activity up to 0.95 Bq/L in the composite sample representing week 96-100 as pH decreased. Uranium-238 is likely released from dissolution of uraninite early in testing, with increased dissolution with the development of acidic conditions.
- Radium-226 was routinely analyzed in all waste rock HCTs from the mine development area and at lower frequency from the HCTs representing waste rock at the UGTMF. Measured radium-226 activity in all HCTs from the UGTMF was generally low (below or slightly above the level of detection).
- Radium-226 from waste rock HCTs representing the mine development area showed similar trends to uranium-238, with highest activities in HCT 39137 (up to 0.8 Bq/L from early in the testing cycles). None of the leachates analyzed exceeded the unconditional derived release limits for diffuse NORM sources for radium-226 (Figure 6-36).
- Thorium-230 was below the level of detection limit for all samples representing waste rock from the mine development area, with the exception of HCT 39137, which had activity up to 0.2 Bq/L.
- Lead-210 and polonium-210 were below detection limits in most samples, with one leachate sample having detectable activities from HCT 39181 (representing waste rock with elevated solid-phase uranium content).
- Radium-228 was above the detection limit in one leachate sample from each of HCT 39137 and 39140 (representing waste rock from the mine development area), with all other leachates collected from these samples having radium-228 activity below detection limit.
- Activities of thorium-228 and thorium-232 were below the detection limits of the radionuclide methods used in all leachates representing waste rock.

The HCTs on special waste had the highest radionuclide activities of all samples tested, including up to 22 Bq/L uranium-238, 1.1 Bq/L uranium-235, 66 Bq/L radium-226, 0.43 Bq/L polonium-210, 0.4 Bq/L lead-210, 0.24 Bq/L thorium-228, and 2.1 Bq/L thorium-230.

The highest activities for radionuclides were observed in the composite representing the first few cycles (weeks 0-4), with activities generally decreasing or at detection limits as the humidity cell testing progressed. The results show there is likely an initial spike in radionuclide activity due to release from uranium-bearing mineral phases such as uraninite and associated release of daughter radionuclides contained in such minerals. Activities for radium-228 and thorium-232 were below the limits of detection in both samples representing special waste, consistent with thorium being relatively immobile, and radium-228 being a decay product of thorium-232, which is likely not a significant component of uraninite.

The special waste sample leachates exceeded the UDRL for radium-226 in the first composite (0-4 weeks) for both samples (Figure 6-36).

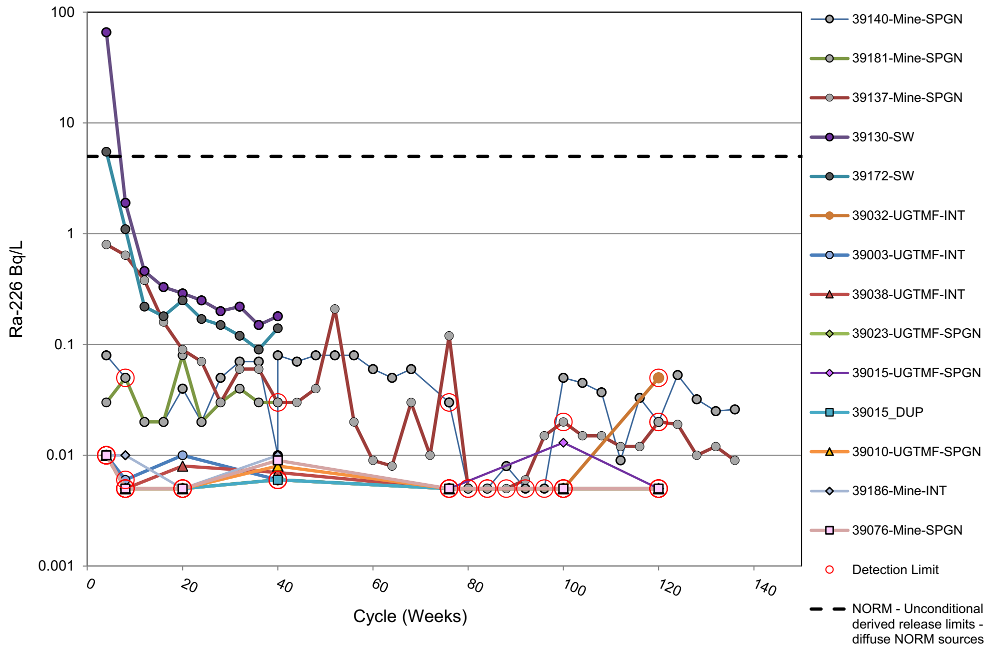


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Figure 6-36: Radium-226 Results from HCTs

6.3 Factors Controlling Release Rate

Stable element release rates (in mg/kg/week), as defined in Section 4.4.6, were calculated for all HCTs. The stable HCT rates were compared with pH, sulfate release rate, and solid-phase content to further inform controls on release rates. Figures for selected parameters of interest or figures showing relationships are provided in Figure 6-37 to Figure 6-54 with figures for all parameters provided in Appendix D. The relationships were classified as either positive or negative, and either weak (general positive or negative relationship with some scatter and outliers) or strong (definitive linear relationship with little scatter). Stable release rates are provided in Table 6-3. Findings are summarized in Table 6-2 and outlined as follows:

- Relationships with pH, which indicate whether release is controlled by pH conditions:
  - The following parameters showed a negative relationship between stable release rates and pH: sulfate, copper, cobalt, nickel, zinc, lead, iron, and aluminum.
  - Stable release rates for manganese and selenium showed a weak negative relationship with pH.
  - Stable release rates for cadmium showed a weak negative relationship for waste rock samples only.

  - Uranium release rates showed a negative relationship with pH for waste rock samples with low uranium content. At circum-neutral pH, special waste and HCT 39181 representing waste rock with elevated uranium content had higher release rates than waste rock samples, suggesting that pH is unlikely to be the only control on uranium release rates.
  - Molybdenum and arsenic showed no clear relationship between stable release rates and pH.
- Relationship with sulfate release rate, which indicates whether release is likely associated with sulfide oxidation:
  - Release rates for cobalt, copper, nickel, zinc, lead, iron, and aluminum showed a positive relationship with sulfate release rate.
  - Selenium, manganese, and chromium release rates showed a weak positive relationship with sulfate release rate.
  - Waste rock samples showed a positive relationship between cadmium and sulfate release rates, whereas special waste sampled had elevated cadmium release rates and low sulfate release rates.
  - Release rates for uranium, arsenic, and molybdenum showed no clear relationship with sulfate release rates.
- Relationship with solid-phase content, which indicates whether release is associated with enrichment:
  - Uranium and sulfur showed a positive relationship between release rate and solid-phase content for all samples.
  - Copper and lead showed a positive relationship between stable release rate and solid-phase content for waste rock samples only. Samples of special waste showed no relationship.
  - Cobalt, molybdenum, selenium, and cadmium showed a weak positive relationship between stable release rate and solid-phase content, with the HCTs with highest solid-phase content having highest release rate.
  - No clear relationship was observed between stable release rate and solid-phase content for arsenic, nickel, zinc, iron, aluminum, manganese, and chromium.

The dominant controls on release rates are summarized as follows:

- Decreasing pH associated with the onset of acidic conditions was the dominant control on release rates of sulfate, cadmium (for waste rock samples), cobalt, copper, nickel, zinc, lead, iron, and aluminum. Release rates for these constituents were relatively low at circum-neutral pH.
- Samples of special waste with circum-neutral pH had high cadmium release rates associated with highest cadmium solid-phase content.
- Cadmium, cobalt, copper, nickel, sulfur, zinc, lead, and iron had increasing release rates with higher sulfate release rates, indicating they are likely released through sulfide oxidation.
- For aluminum, a positive relationship with sulfate reflects the pH-sulfate relationship, rather than release of aluminum from sulfide oxidation.

- Selenium was weakly controlled by pH, solid-phase content, and sulfate release rate, with the relationship with sulfate indicating it is released by sulfide oxidation.
- Uranium solid-phase content was the strongest control on uranium release rates; however, elevated release rates were also observed at acidic pH, indicating that elevated uranium leaching could occur from materials with low uranium enrichment at acidic pH weathering conditions. Uranium release was generally lower in the samples of the UGTMF in comparison to the samples from the mine development area.
- Molybdenum release rates were highest in samples of special waste with highest solid-phase molybdenum content. Molybdenum showed no clear relationship to pH or sulfate.
- Arsenic release rates showed no clear relationship to pH, sulfate, or solid-phase arsenic content. Arsenic release was highest in the samples of special waste.
- Results for chromium, antimony, mercury, and silver were mostly at detection limit and therefore definitive relationships between release rates, pH, sulfate, and solid-phase content could not be established.

Table 6-2: Summary of Factors Controlling Element Leaching Rates from Humidity Cell Tests

Correlation with Element Release	Leachate pH	Sulfate Release Rate	Solid-Phase Content
Negative	SO_4, Co, Cu, Ni, Zn, Pb, Fe, Al, Cd[1]	-	-
Weak Negative	Mn, Se, U[2]	-	-
Positive	-	Co, Cu, Ni, Zn, Pb, Fe, Al, Cd[1]	U, SO_4
Weak Positive	-	Se, Mn	Co, Mo, Se, Cd, Cu[1], Pb[1]
No definitive relationship or values mostly at DL	Mo, As, Ag, Sb, Hg	U, As, Mo, Ag, Sb, Cr, Hg	As, Ni, Ag, Zn, Fe, Al, Mn, Cr, Hg

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Notes: 1 – Observed only in samples classified as waste rock.
2 – Not observed in samples of special waste or waste rock sample 39181 with elevated U content (182 mg/kg).

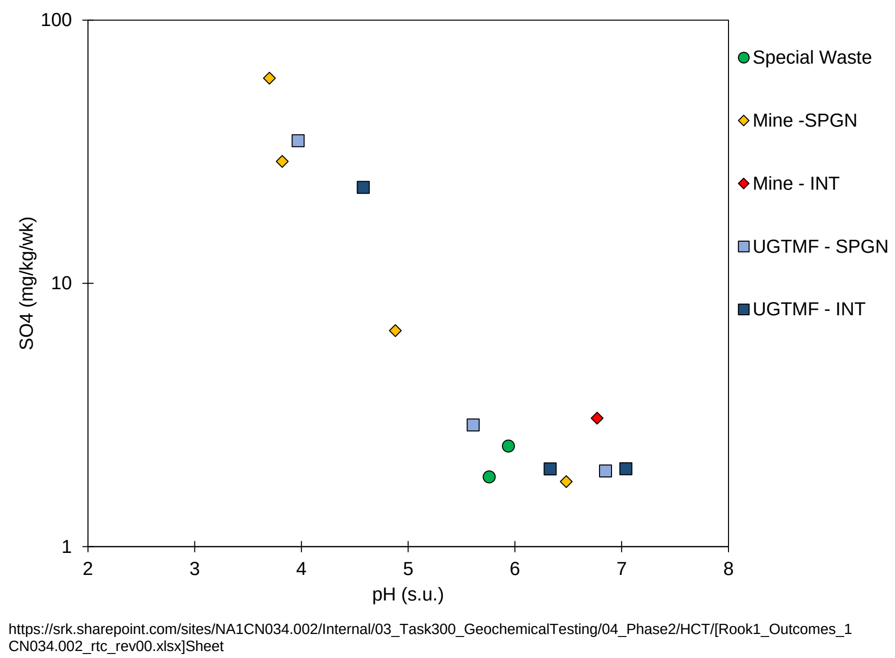

Figure 6-37: SO_4 Stable Release Rate (mg/kg/week) vs. pH

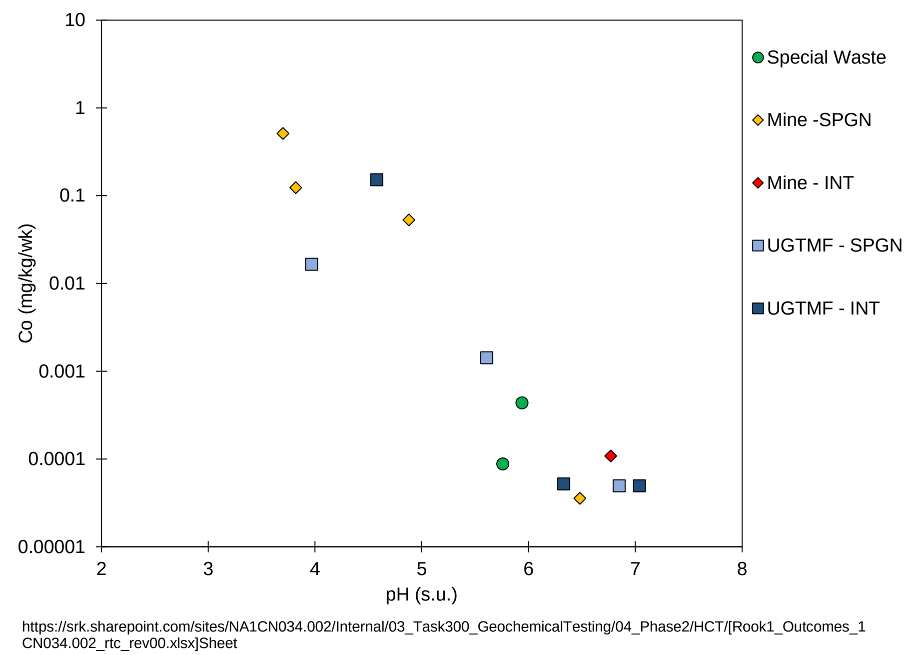

Figure 6-38: Co Stable Release Rate (mg/kg/week) vs. pH

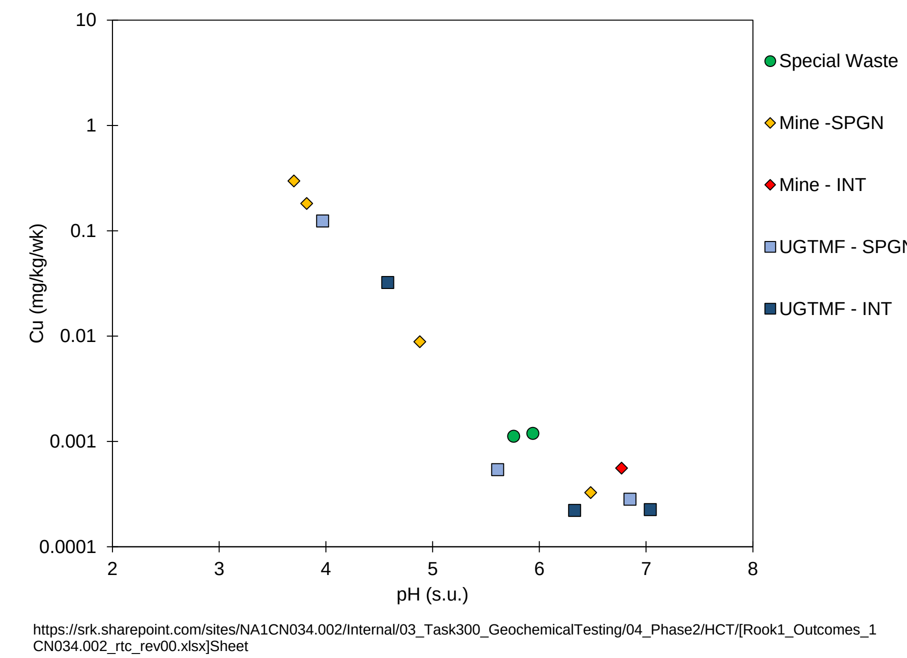

Figure 6-39: Cu Stable Release Rate (mg/kg/week) vs. pH

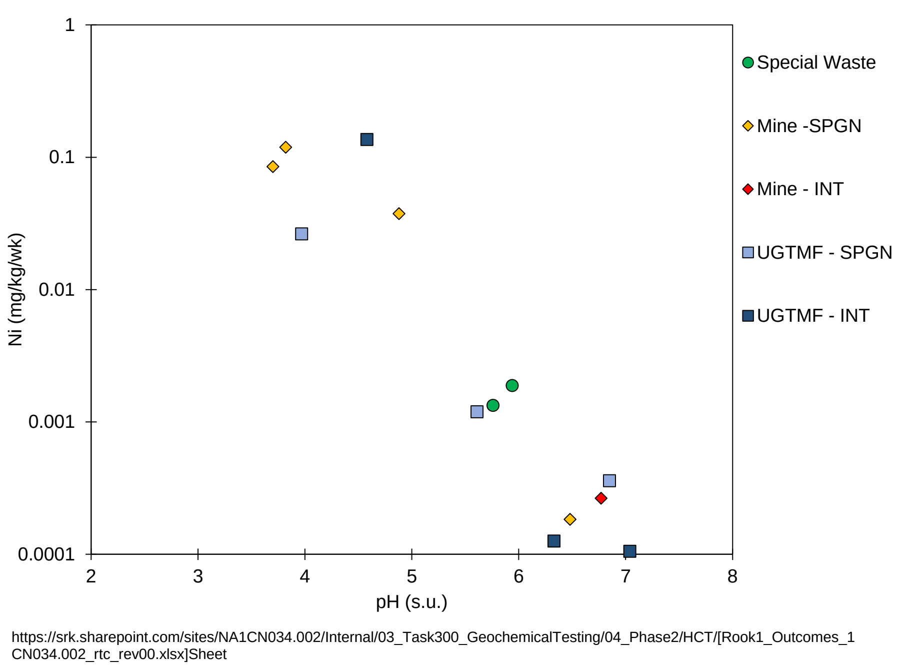

Figure 6-40: Ni Stable Release Rate (mg/kg/week) vs. pH

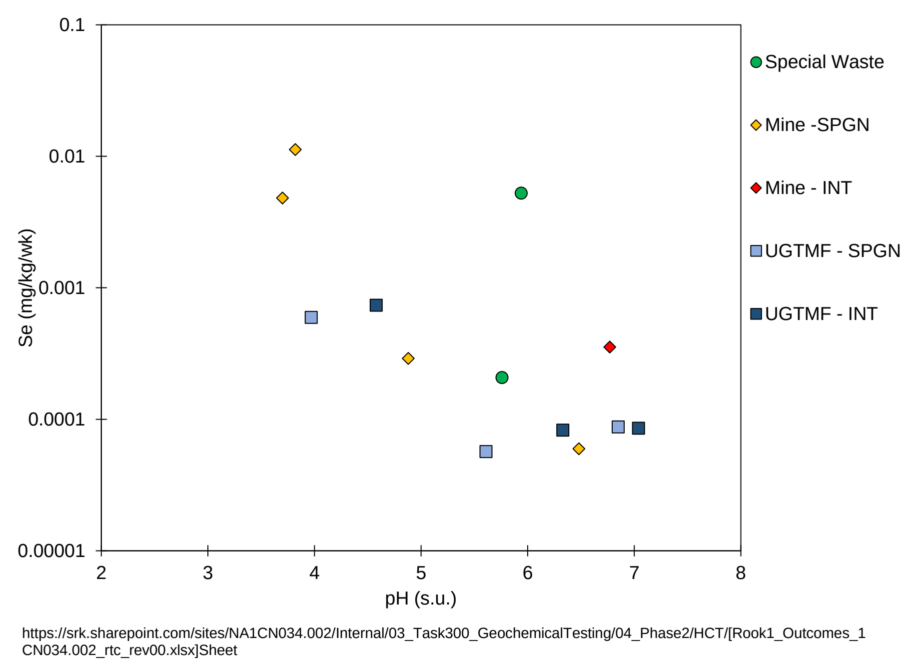

Figure 6-41: Se Stable Release Rate (mg/kg/week) vs. pH

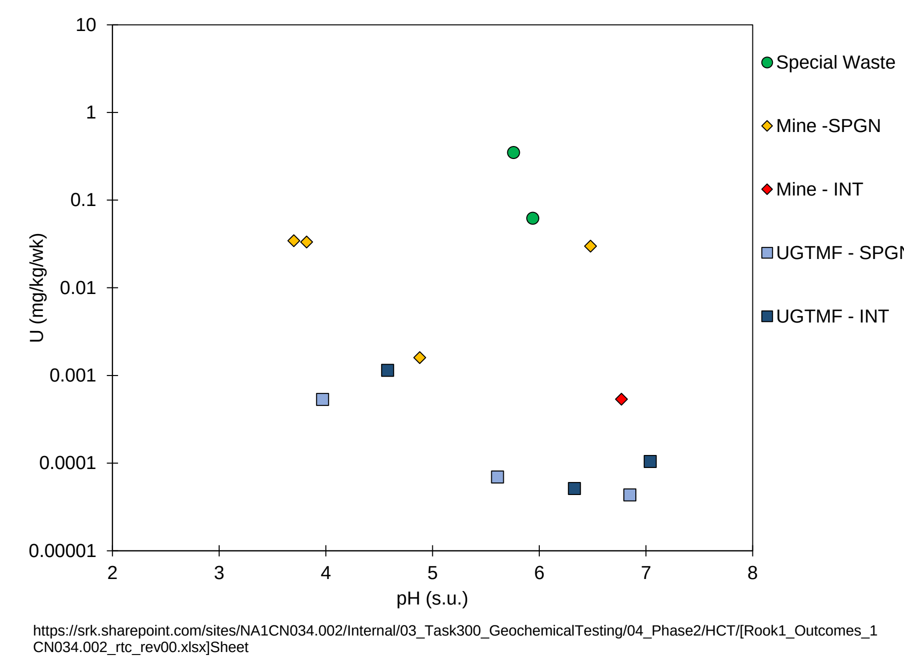

Figure 6-42: U Stable Release Rate (mg/kg/week) vs. pH

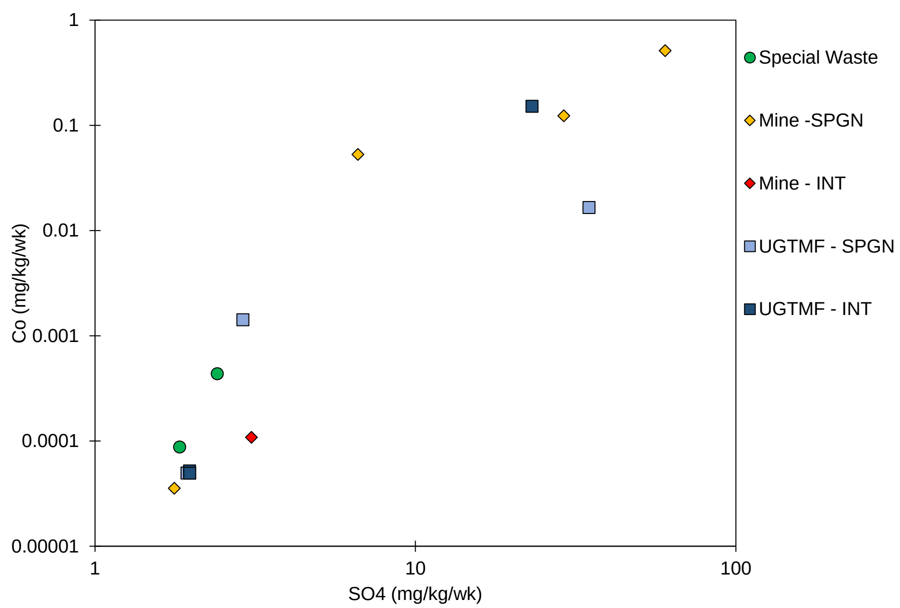

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Figure 6-43: SO_4 Stable Release Rate (mg/kg/week) vs. Co Stable Release Rate (mg/kg/week)

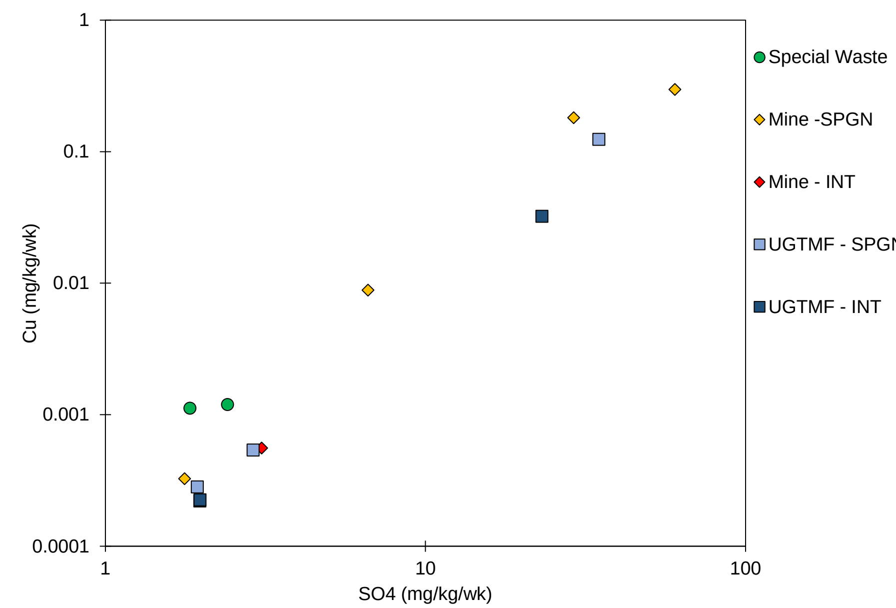

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Figure 6-44: SO_4 Stable Release Rate (mg/kg/week) vs. Cu Stable Release Rate (mg/kg/week)

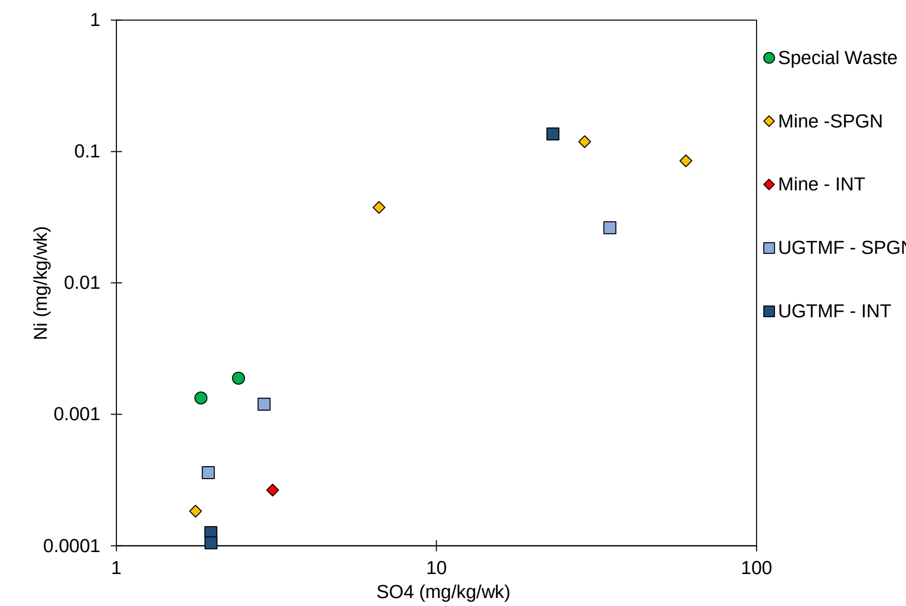

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Figure 6-45: SO_4 Stable Release Rate (mg/kg/week) vs. Ni Stable Release Rate (mg/kg/week)

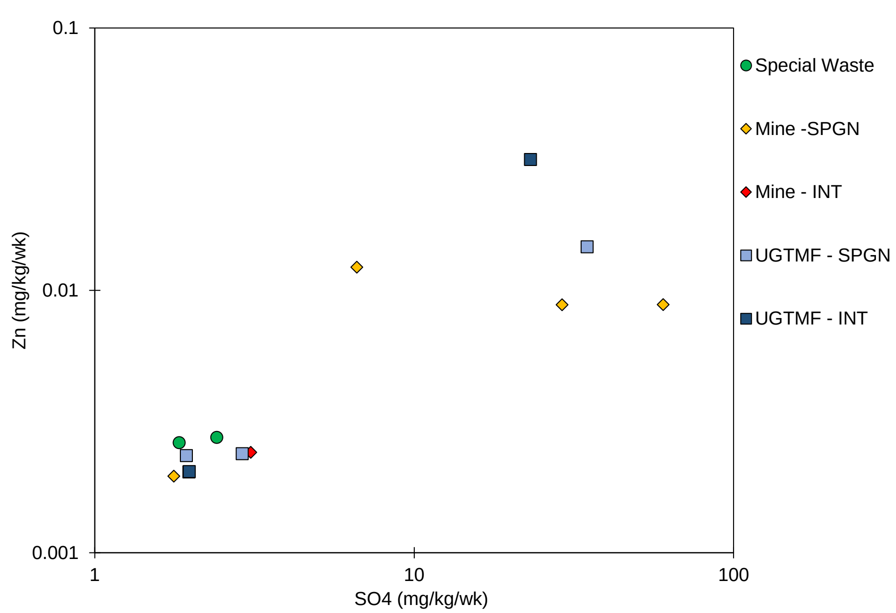

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Figure 6-46: SO_4 Stable Release Rate (mg/kg/week) vs. Zn Stable Release Rate (mg/kg/week)

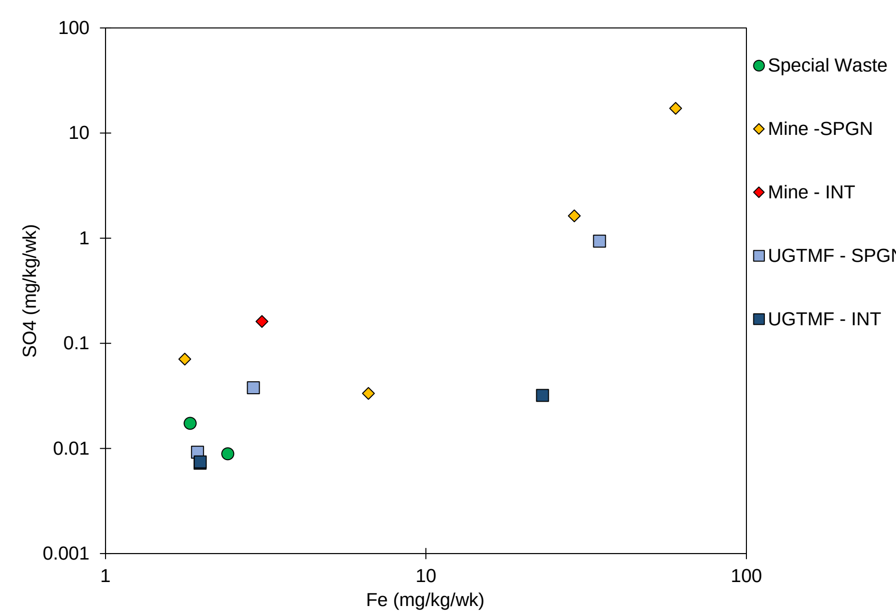

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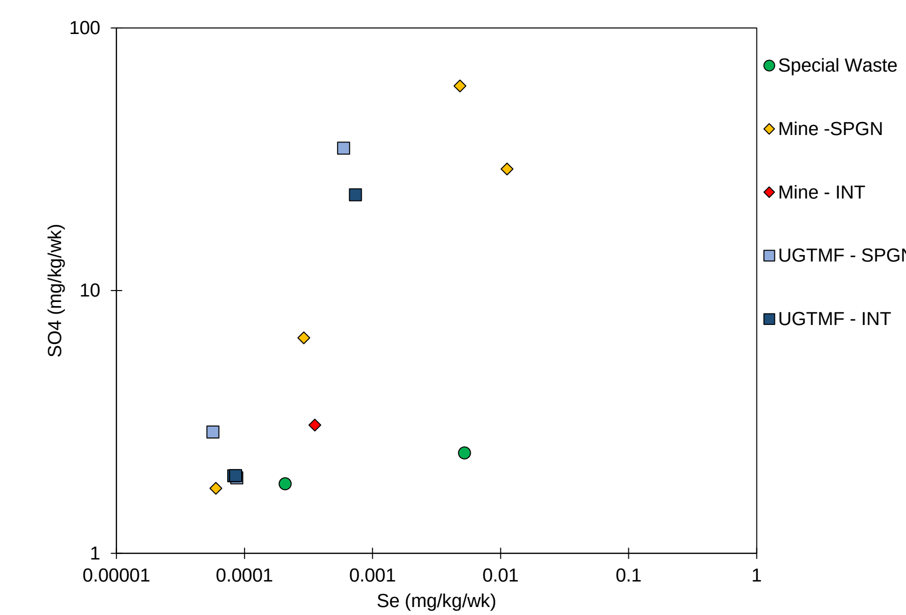
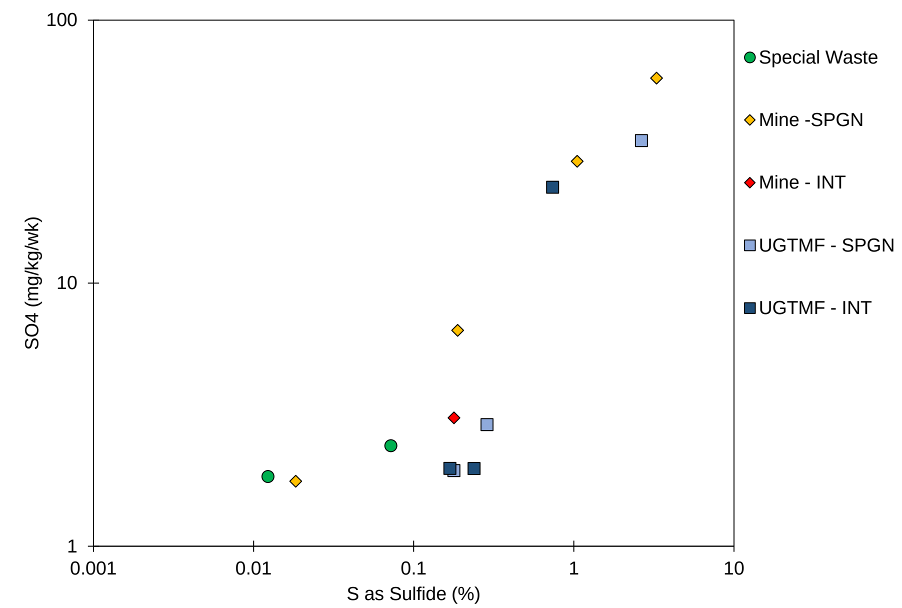
Figure 6-47: SO_4 Stable Release Rate (mg/kg/week) vs. Fe Stable Release Rate (mg/kg/week)



https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/HCT/[Rook1_Outcomes_1 CN034.002_rtc_rev00.xlsx]Sheet

Figure 6-48: SO_4 Stable Release Rate (mg/kg/week) vs. Se Stable Release Rate (mg/kg/week)



https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/HCT/[Rook1_Outcomes_1CN034.002_rtc_rev00.xlsx]Sheet

Figure 6-49: SO_4 Stable Release Rate (mg/kg/week) vs. Co Solid Phase (mg/kg)

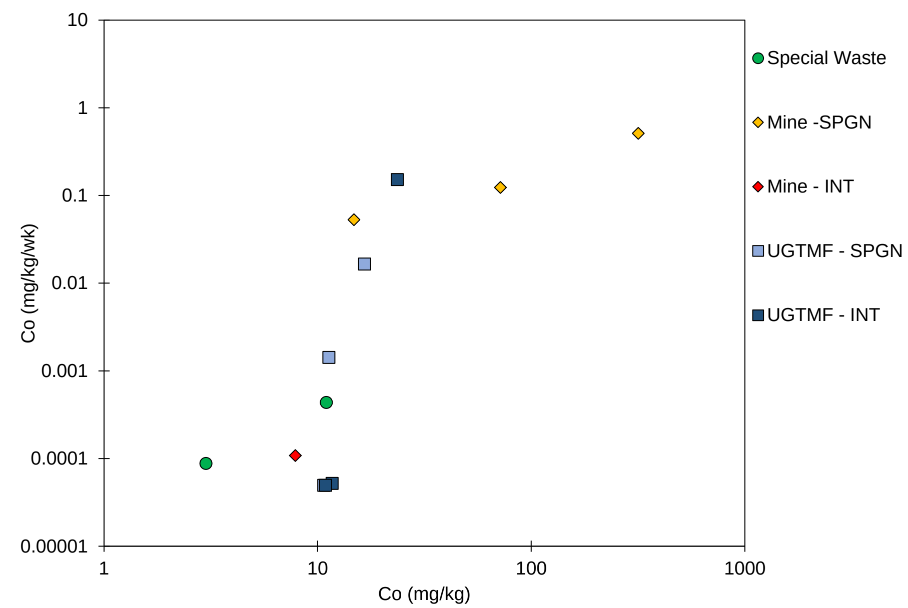


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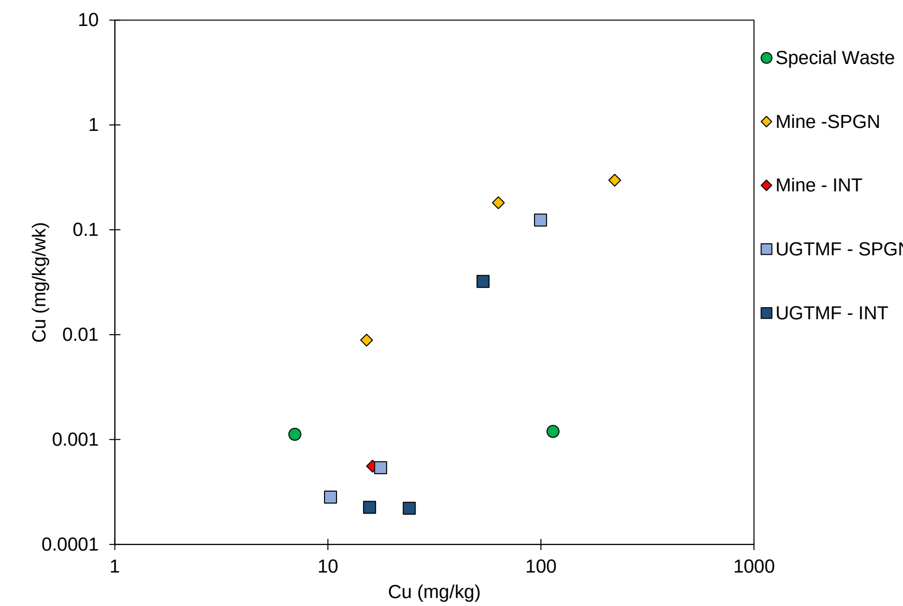
Figure 6-50: Co Stable Release Rate (mg/kg/week) vs. Cu Solid Phase (mg/kg)



https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/HCT/[Rook1_Outcomes_1CN034.002_rtc_rev00.xlsx]Sheet

Figure 6-51: Cu Stable Release Rate (mg/kg/week) vs. As Solid Phase (mg/kg)

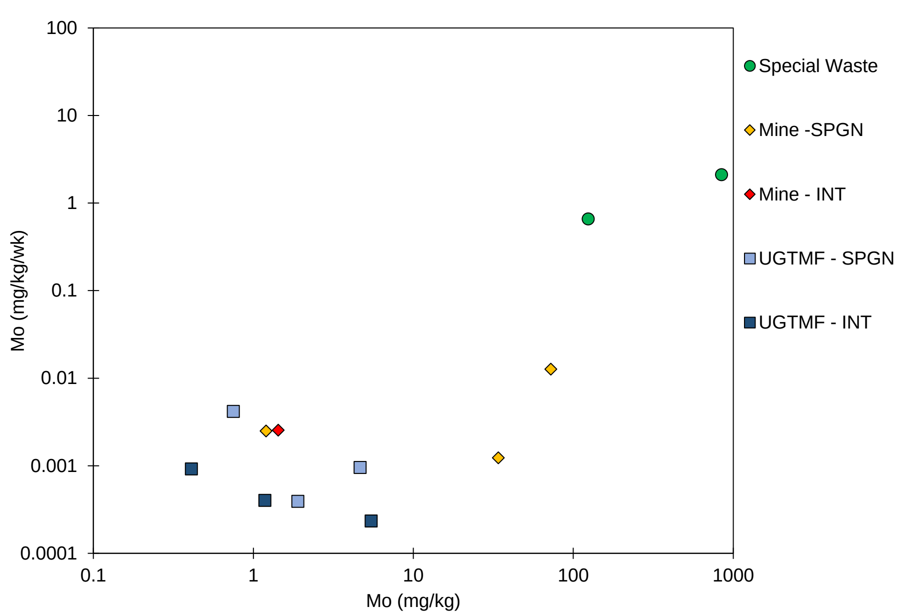


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Figure 6-52: Zn Stable Release Rate (mg/kg/week) vs. Mo Solid Phase (mg/kg)

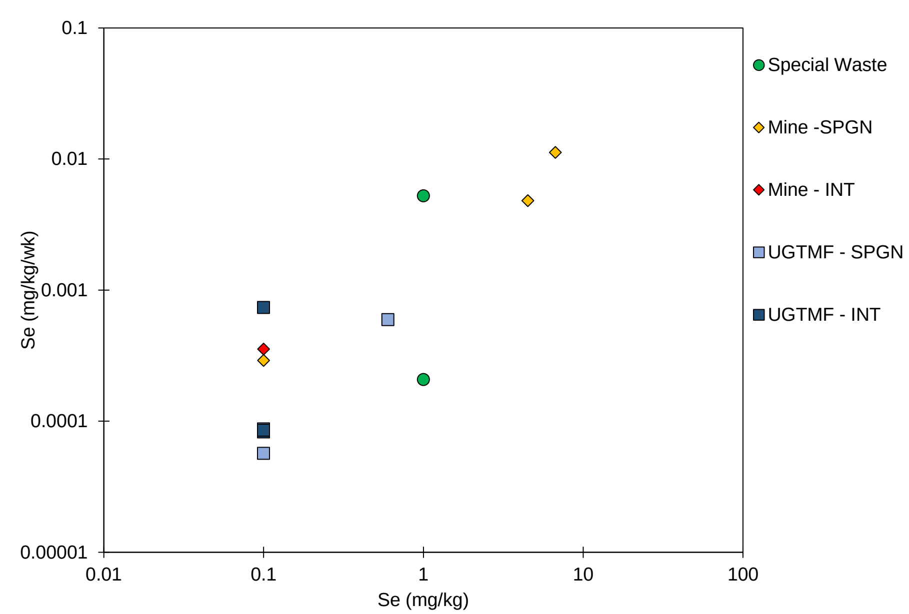

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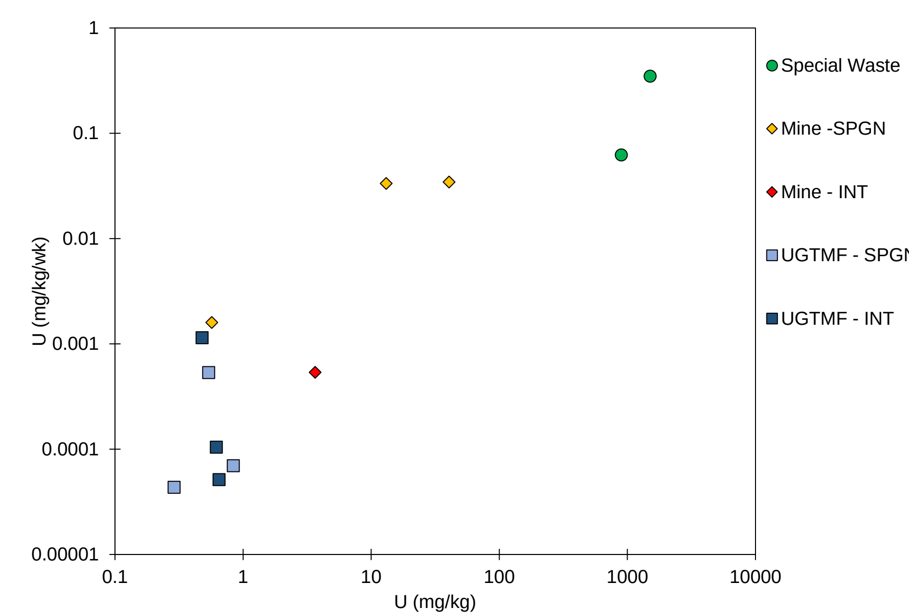
Figure 6-53: Se Stable Release Rate (mg/kg/week) vs. Se Solid Phase (mg/kg)



https://srk.sharepoint.com/sites/NA1CN034.002/Internal/03_Task300_GeochemicalTesting/04_Phase2/HCT/[Rook1_Outcomes_1CN034.002_rtc_rev00.xlsx]Sheet

Figure 6-54: U Stable Release Rate (mg/kg/week) vs. U Solid Phase (mg/kg)

Table 6-3: Stable Release Rates from Humidity Cell Tests

Sample ID	Material Type	Location	Lithology Type	Test Status	Start of Stable Period	pH	SO_4	Acidity	Alkalinity	Cl	Ag	Al	As	Ba	Be	B	Bi	Ca	Cd	Co	Cr	Cu	Fe	K	Li
					Week		mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week
39076	Waste Rock	Mine Area	SPGN	Ongoing	136	4.9	6.6	4.3	2.1	1.3	0.000064	0.1	0.0008	0.0037	0.000076	0.0085	0.000013	0.79	0.000042	0.053	0.00013	0.0089	0.033	0.54	0.0015
39130	Special Waste	Mine Area	SPGN	Terminated at Week 49	24	5.8	1.8	2.1	<2	0.89	0.00005	0.019	0.0026	0.0011	0.0000092	0.051	0.0000097	0.53	0.00079	0.000088	0.00019	0.0011	0.017	0.38	0.0013
39172	Special Waste	Mine Area	SPGN	Terminated at Week 49	20	5.9	2.4	2.1	<2	0.86	0.000048	0.025	0.0084	0.00034	0.000007	0.037	0.000009	0.83	0.00022	0.00043	0.00011	0.0012	0.0089	0.44	0.00086
39137	Waste Rock	Mine Area	SPGN	Ongoing	96	3.7	60	52	<2	1	0.000052	2.4	0.0011	0.00024	0.00016	0.012	0.00001	0.06	0.00012	0.51	0.0054	0.3	17	0.029	0.0051
39140	Waste Rock	Mine Area	SPGN	Terminated at Week 138	100	3.8	29	22	<2	1.1	0.000055	1.9	0.00025	0.0022	0.00043	0.009	0.000011	0.8	0.00047	0.12	0.00071	0.18	1.6	0.13	0.0043
39003	Waste Rock	UGTMF	INT	Ongoing	44	6.3	2	2	2.7	1	0.000051	0.022	0.00023	0.00066	0.0000073	0.0027	0.0000088	0.93	0.0000033	0.000052	0.000089	0.00022	0.0072	0.75	0.00029
39032	Waste Rock	UGTMF	INT	Ongoing	44	7	2	2	4.7	1	0.000051	0.04	0.0012	0.00058	0.0000075	0.0023	0.0000089	1.6	0.0000039	0.000049	0.000085	0.00023	0.0074	0.8	0.00021
39038	Waste Rock	UGTMF	INT	Ongoing	132	4.6	23	8.1	2.2	1.2	0.000062	0.35	0.0003	0.0054	0.00022	0.0061	0.000012	2.1	0.00013	0.15	0.0001	0.032	0.032	0.91	0.0057
39010	Waste Rock	UGTMF	SPGN	Ongoing	108	4	35	21	2	1	0.000052	2.1	0.00021	0.0027	0.00061	0.011	0.00001	0.6	0.00007	0.017	0.00024	0.12	0.94	0.7	0.0093
39015	Waste Rock	UGTMF	SPGN	Ongoing	132	5.6	2.9	3.3	2.1	1.2	0.00006	0.0032	0.00028	0.00053	0.0000083	0.029	0.000012	0.46	0.000005	0.0014	0.00011	0.00054	0.038	0.49	0.00031
39023	Waste Rock	UGTMF	SPGN	Terminated at Week 138	44	6.9	1.9	2	2.8	1	0.00005	0.027	0.00052	0.0007	0.00001	0.0022	0.0000086	0.9	0.0000032	0.000049	0.000087	0.00028	0.0092	0.57	0.00022
39181	Waste Rock	Mine Area	SPGN	Terminated at Week 49	26	6.5	1.8	2	2.1	0.85	0.000049	0.033	0.0016	0.00029	0.0000069	0.011	0.000007	0.34	0.0000034	0.000036	0.00012	0.00033	0.071	0.32	0.00031
39186	Waste Rock	Mine Area	INT	Terminated at Week 49	18	6.3	3.1	2.2	2.1	0.88	0.000051	0.096	0.00026	0.00043	0.0000092	0.016	0.000017	0.89	0.0000031	0.00011	0.00028	0.00056	0.16	0.51	0.0008

Table 6-3 Continued

Sample ID	Material Type	Location	Lithology Type	Test Status	Start of Stable Period	pH	Mg	Mn	Mo	Na	Ni	Pb	Sb	Se	Sr	Sn	Ti	Tl	U	V	W	Y	Zn
					Week		mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week
39076	Waste Rock	Mine Area	SPGN	Ongoing	136	4.9	0.78	0.039	0.0025	0.049	0.038	0.00014	0.0011	0.00029	0.014	0.000076	0.000064	0.0000064	0.0016	0.000022	0.00041	0.00025	0.012
39130	Special Waste	Mine Area	SPGN	Terminated at Week 49	24	5.8	0.18	0.0047	2.1	0.15	0.0013	0.000068	0.0018	0.00021	0.011	0.0001	0.0013	0.000005	0.35	0.0044	0.000087	0.000046	0.0026
39172	Special Waste	Mine Area	SPGN	Terminated at Week 49	20	5.9	0.21	0.002	0.66	0.14	0.0019	0.000076	0.0016	0.0052	0.016	0.00012	0.0007	0.000062	0.062	0.00077	0.000056	0.000027	0.0027
39137	Waste Rock	Mine Area	SPGN	Ongoing	96	3.7	2.3	0.0026	0.013	0.039	0.085	0.0013	0.00094	0.0048	0.0021	0.000067	0.000088	0.0000052	0.034	0.0089	0.000036	0.0011	0.0088
39140	Waste Rock	Mine Area	SPGN	Terminated at Week 138	100	3.8	1.7	0.0079	0.0012	0.035	0.12	0.00039	0.00096	0.011	0.0052	0.000064	0.000082	0.000019	0.033	0.000081	0.000032	0.0068	0.0088
39003	Waste Rock	UGTMF	INT	Ongoing	44	6.3	0.051	0.00066	0.0004	0.13	0.00013	0.000065	0.00091	0.000083	0.0025	0.000062	0.00024	0.0000051	0.000051	0.0002	0.000038	0.000014	0.002
39032	Waste Rock	UGTMF	INT	Ongoing	44	7	0.053	0.00078	0.00092	0.12	0.00011	0.000061	0.00092	0.000085	0.0033	0.000061	0.00025	0.0000051	0.0001	0.00022	0.000043	0.000013	0.002
39038	Waste Rock	UGTMF	INT	Ongoing	132	4.6	3.2	0.077	0.00023	0.18	0.14	0.00066	0.0011	0.00074	0.031	0.000074	0.000062	0.000011	0.0011	0.000019	0.00028	0.00059	0.032
39010	Waste Rock	UGTMF	SPGN	Ongoing	108	4	2.6	0.04	0.00096	0.056	0.026	0.00066	0.00093	0.00059	0.004	0.000082	0.000077	0.0000066	0.00053	0.000014	0.000045	0.0014	0.015
39015	Waste Rock	UGTMF	SPGN	Ongoing	132	5.6	0.37	0.011	0.0042	0.21	0.0012	0.00011	0.0011	0.000057	0.0083	0.000072	0.00006	0.000006	0.000069	0.000021	0.000051	0.000024	0.0024
39023	Waste Rock	UGTMF	SPGN	Terminated at Week 138	44	6.9	0.058	0.0023	0.00039	0.092	0.00036	0.00009	0.0009	0.000087	0.0046	0.00007	0.000076	0.000005	0.000043	0.00013	0.00004	0.000012	0.0023
39181	Waste Rock	Mine Area	SPGN	Terminated at Week 49	26	6.5	0.089	0.00029	0.0017	0.095	0.00018	0.000059	0.00089	0.00006	0.0068	0.00022	0.00044	0.0000049	0.03	0.00053	0.00012	0.000036	0.002
39186	Waste Rock	Mine Area	INT	Terminated at Week 49	18	6.3	0.27	0.00059	0.0026	0.31	0.00027	0.00013	0.00091	0.00035	0.016	0.00014	0.00059	0.0000051	0.00054	0.00027	0.000084	0.000026	0.0024

Note: Lithology type codes and descriptions are provided in Table 4-2.
UGTMF = underground tailings management facility; mg/kg/week = milligram per kilogram per week.

6.4 Timing to Onset of Acidic Conditions

6.4.1 Laboratory Conditions

Release rates of sulfate and calcium measured from the HCTs were used in conjunction with depletion calculations to determine if and when cells are expected to form acidic conditions (delay to onset of ARD). The depletion calculation methods used to determine potential for development of ARD and timing to onset of acidic conditions under laboratory conditions are provided in Section 4.4.7. For these calculations, measured sulfate is assumed to be produced from sulfide oxidation, which would generate acidity, and calcium is assumed to be released primarily from the dissolution of calcite, which is expected to provide effective acid neutralization. The length of time to deplete sulfide under laboratory conditions is calculated from the sulfate release rate and solid-phase sulfide content as described in Section 4.4.7. The length of time to deplete calcite is calculated from the calcium release rates and measured neutralization potential (estimates from measured TIC). The calculated time to consume calcite from the measured TIC under laboratory conditions may be overestimated as most HCT samples have TIC below the detection limit. The calculated delay to ARD based on TIC depletion under laboratory conditions may therefore be overestimated.

In consideration of the potential for silicate dissolution providing effective NP, the depletion calculations considered release of calcium, magnesium, and potassium. This depletion calculation is based on the Modified NP content and assumes that silicate NP measured by that test method is available for neutralization, and that calcium would be released from calcite dissolution and silicate dissolution, along with the release of potassium and magnesium from silicate dissolution, which would contribute to effective neutralization. If silicate NP is not effective, then depletion times under laboratory conditions based on Modified NP are likely to be overestimated.

A comparison of calculated to actual (observed in testwork) times to development of acidic conditions in acidic HCTs provides some insight into the effectiveness of NP (Table 6-4) and is discussed further in this subsection.

Results From Acidic Tests

Of the 13 HCTs that were initiated, acidic conditions have developed in three cells with stable pH between 3.5 and 4 (HCTs 39010, 39137, and 39140), and in two cells (HCTs 39038 and 39076) with pH 4.5 to 5. HCT 39015 also has slightly acidic and decreasing pH, which may soon become acidic (pH 5.7 at week 153). All acidic samples were classified as PAG based on static test results (Modified NP/AP and TIC/AP of less than 1), and the sulfide content of the samples ranged from 0.19%S to 3.3%S). HCT 39137 and HCT 39010 had rapid onset to acidic conditions (immediate to a few weeks) with no stable period with circum-neutral pH.

A comparison between the observed laboratory time to development of acidic pH and the calculated time to carbonate depletion (Table 6-4) indicates that in the three acidic tests that showed a delay to onset of acidic conditions, the carbonate depletion times overestimated the delay to acidic conditions (by a factor of 1.5 to 5). This overestimation is likely due (as indicated above) to less carbonate present in the samples than the detection limit value. The calculated Modified NP depletion times were longer than the carbonate depletion times and significantly overestimated the delay to ARD (by a factor of around 9). This is likely due to silicate NP being ineffective at neutralization in the tests at the sulfide contents present and the resulting rates of sulfate and acidity release.

Results From Non-Acidic Tests

Of the remaining samples that are classified as PAG or uncertain based on static test results, the depletion calculations indicated the following:

- 28 to 34 years before NP is consumed in the HCTs based on the Modified NP method; and
- 6.9 to 19 years before NP is consumed in the HCTs based on carbonate NP (measured by TIC).

The difference in timeframes to consumption of NP is based on the NP sources measured in the analytical methods. The Modified NP method measures neutralization potential from carbonate as well as a component of silicate dissolution, whereas the TIC method measures only carbonate content.

Discussion

The acidic tests indicated that both carbonate and Modified NP depletion times were overestimated in three samples with 0.19%S to 1.1%S. At these and higher sulfide contents, it is likely that laboratory delay to ARD estimates based on the other kinetic samples would also be overestimated for the following reasons:

- Carbonate depletion times are likely to be overestimated where carbonate content is below detection (i.e., in most samples) as the carbonate content used in the calculation (i.e., the detection limit value) is an overestimate.
- Modified NP depletion times are likely to be overestimated because silicate NP is insufficiently effective and is overwhelmed by rates of acid generation at these sulfide contents.

In samples with lower sulfide contents (<0.19%S), and hence lower rates of sulfide oxidation and acid generation, NP from silicate dissolution is more likely to be effective at maintaining neutral pH conditions. However, the sulfide content below which silicate NP may be effective is unquantified for this Project, and the applicability of depletion times requires further evaluation.

Table 6-4: Summary of Laboratory Depletion Calculations for Sulfide and Neutralization Potential Consumption

HCT ID	Lithology Type	Location	Total Sulfur	NP/AP	TIC/AP	pH at End of Testing or Last Sampling Event	pH Trend	Observed Time to Development of Acidic pH (Stable pH<5) in Test	Calculated Time to Carbonate Depletion (Based on Depletion of TIC)	Calculated Time to NP Depletion (Based on Depletion of Measured NP from Modified NP)	Calculated Time to Sulfide Depletion (Years)
			%	-	-	-	-	Years	Years	Years	Years
39003	INT	UGTMF	0.24	0.71	0.11	6.3	Neutral, Stable	-	6.9	29	69
39032	INT	UGTMF	0.17	1.5	0.31	7.0	Neutral, Stable	-	7.8	28	49
39038	INT	UGTMF	0.74	0.26	0.04	4.6	Acidic, Decreasing	2.1	3.1	18	18
39010	SPGN	UGTMF	2.7	0.04	0.01	4.0	Acidic, Stable	0	N/A	N/A	44
39015	SPGN	UGTMF	0.29	0.38	0.09	5.6	Mildly acidic, Decreasing	-	14	20	57
39023	SPGN	UGTMF	0.18	1.2	0.30	6.9	Neutral, Stable	-	14	39	53
39076	SPGN	Mine	0.19	0.75	0.14	4.9	Acidic, Decreasing	2.9	11	26	16
39137	SPGN	Mine	3.3	0.02	0.01	3.7	Acidic, Stable	0	N/A	N/A	31
39140	SPGN	Mine	1.1	0.10	0.03	3.8	Acidic, Stable	0.75	3.8	7	21
39181	SPGN	Mine	0.02	5.1	1.3	6.5	Neutral, Stable	-	19	34	6.0
39186	INT	Mine	0.18	1.1	0.15	6.8	Neutral, Stable	-	7.2	31	33
39130	SPGN	Mine - Special Waste	0.02	9.6	2.7	5.8	Mildly acidic, Stable	-	12	28	3.8
39172	SPGN	Mine - Special Waste	0.08	2.0	0.38	5.9	Mildly acidic, Stable	-	7.7	25	17

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Notes: ARD classification is colour coded; pink = PAG, yellow = uncertain, and green = NPAG; Depletion calculations are based on HCT release rates during periods of stable circum-neutral pH weathering. Time in years is from the start of testing. N/A = calculation not applicable (effective NP was depleted at the start of testing).

Lithology type codes and descriptions are provided in Table 4-2.

HCT = humidity cell test; NP = neutralization potential; AP = acid potential; TIC = total inorganic carbon; UGTMF = underground tailings management facility; ARD = acid rock drainage; PAG = potentially acid generating; NPAG = non-potentially acid generating.

6.4.2 Implications for Field Conditions

The calculated times to depletion of NP and onset of acidic conditions discussed in Section 6.4.1 are based on laboratory conditions (routine wet and dry cycles and stable temperature of 20°C). The laboratory rates are accelerated in comparison to field conditions at the Project, where weathering rates for both sulfide oxidation and responding carbonate dissolution are expected to be lower.

Based on SRK's experience, delay to ARD at field sites in northern Canada and Alaska is typically approximately five times longer than that indicated by laboratory kinetic testing. This is a generalization but is considered applicable guidance for northern Saskatchewan given the lack of site-specific data on field oxidation rates. As discussed above, there is uncertainty in the applicability of laboratory depletion calculations to indicate delay to ARD; however, two kinetic tests generated acidic conditions within a few weeks, and three further tests within one to three years. Therefore, despite the expectation of slower oxidation rates under field conditions, these observations indicate that delay to ARD for some PAG materials with higher sulfide content is expected to be short (i.e., immediate or within a few years) if it is stored under oxygenated conditions.

6.5 Humidity Cell Test Termination Assessment

The HCT program was designed to operate for a minimum of 40 weeks, with results reviewed periodically to assess if the cells had met their objectives and could be terminated or if continuing the testing was warranted.

The evaluation of test completion included the assessment of the following:

- determine if stable pH conditions had been established, or whether the development of acidic conditions is expected to occur within a reasonable timeframe;
- stability of sulfate and major ion leaching rates; and
- stability of trace element leaching rates.

An assessment was completed at week 49 of testing (June 2020) where it was determined that HCTs 39181, 39186, 39130, and 39172 could be terminated. For the cells that were terminated, the assessment showed the following:

- The key parameters used to predict ARD potential and the delay to onset of ARD had sufficiently stabilized and indicated that the circum-neutral pH conditions observed at the end of testing would persist.
- Trace elements had stabilized in the waste rock samples (HCT 39181 and HCT 39186).
- Most trace elements had stabilized in leachates from the two samples of special waste (HCT 39130 and HCT 39173) with some parameters showing slight decreasing trends when the cells were terminated (i.e., arsenic, molybdenum, selenium).

An assessment for HCT termination was completed at week 139 of testing (March 2022) for the nine remaining cells in operation and it was determined that HCTs 39023 and 39140 could be terminated, and the other tests would continue. Details of this determination are as follows:

- HCT 39140 had stable acidic pH and stable release rates for both major and trace elements. No further pH change was expected therefore it was determined that this cell had reached stability and was terminated.
- HCT 39137 and HCT 39010 both showed sustained acidic pH (near pH 3.5 and 4, respectively), and these cells were continued to monitor whether further pH drop would occur as further neutralization potential was consumed.
- HCTs 39003, 39023, and 39032 with relatively low sulfide content (0.17%S to 0.25%S) had stable circum-neutral pH; however, as these samples are PAG, they are expected to eventually generate acidic leachates. The depletion calculations indicated a long lag time for onset of acidic conditions based on Modified NP depletion (28 to 39 years), with a shorter lag time based on carbonate (i.e., TIC) depletion (6.9 to 14 years). These tests are important for understanding the effectiveness of neutralization from silicate mineral dissolution; however, this may require a long period of continued testing. As the depletion calculations for HCT 39023 showed the longest predicted time to deplete NP, this cell was terminated. HCTs 39003 and 39032 were continued to provide further data that could be used to evaluate the potential for effective NP from silicate mineral dissolution for low sulfide materials.
- All other HCTs (39076, 39015, 39038) had not stabilized and were recommended to continue.

7 Summary and Conclusions

The results of the geochemical characterization were used to evaluate the ML/ARD potential of waste rock that would be excavated and exposed as wall rock as part of the development of the underground workings at the Project. The ML/ARD potential was reviewed by lithological unit at each of the UGTMF and mine development area (including the shaft and portal areas). In addition to waste rock, the ML/ARD potential of special waste was assessed.

7.1 Underground Tailings Management Facility

The results from the samples representing the UGTMF development showed the following:

- Sulfide content was variable (average of 0.42% from all samples).
- Overall, neutralization potential as measured by both Modified NP (average of 6.7 kg $CaCO_3$/t for all samples) and TIC (below the detection limit of 0.83 kg $CaCO_3$/t for the majority of samples) was low, with silicate NP dominating the Modified NP analysis.
- As the waste rock from the UGTMF has low NP, ARD potential is primarily a function of sulfide content.
- PAG materials are expected to be encountered, with 63% of samples classified as PAG or uncertain using the ARD classification criteria based on NP/AP, and 64% of samples classified as PAG or uncertain using the ARD classification criteria based on TIC/AP.
- Of the samples classified as NPAG, 81% have NP/AP greater than 3, compared to 30% that have TIC/AP greater than 3. The remaining NPAG samples are classified based on sulfide content below 0.1%. At low sulfide content (below approximately 0.1%), meteoric weathering of silicates is expected to contribute sufficient alkalinity to maintain neutral pH conditions, though the site-specific sulfur content below which silicate NP may be effective has not been determined.
- Based on a comparison to average crustal abundances, metal enrichment is generally low. Overall, metal enrichment in waste rock from the UGTMF is lower than waste rock at the mine development area.
- Two humidity cell tests with 0.74% and 2.7% sulfur content developed acidic conditions (pH <5), with delay to onset of ARD ranging from 9 to 106 weeks. A third test (0.29%S) has been mildly acidic (pH 5 to 6) since week 45.
- Waste rock with low sulfide content (0.17%S to 0.24%S) showed stable concentrations of calcium, potassium, and magnesium with the release attributed to dissolution of silicates. These HCTs show sustained circum-neutral pH, indicating alkalinity released from the dissolution of silicate phases is providing neutralization to maintain circum-neutral pH conditions.
- pH was a strong control on release of aluminum, cadmium, cobalt, copper, iron, manganese, nickel, lead, uranium, and zinc, with element mobility increasing substantially with pH decline. Conversely, mobility of arsenic and molybdenum decreased with pH decline.

7.2 Mine Development Area, Shafts, and Portal

The results from the waste rock samples collected from the mine development area (including the shafts and portal) showed the following:

- Sulfide content was variable, but generally low (average of 0.18% for all samples).
- Overall, neutralization potential as measured by both Modified NP (average of 4.7 kg $CaCO_3$/t for all samples) and TIC (below the detection limit of 0.83 kg $CaCO_3$/t for most samples) was low, with silicate NP dominating the Modified NP analysis.
- PAG materials are expected to be encountered at the mine development area and the shaft and portal areas, though at a lower proportion in comparison to the UGTMF. The results show 28% of all samples from the mine development, shaft, and portal areas were classified as PAG or uncertain using the ARD classification criteria based on NP/AP, and 29% of samples were classified as PAG or uncertain using the ARD classification criteria based on TIC/AP.
- Of the samples classified as NPAG, 85% have NP/AP greater than 3, compared to 29% that have TIC/AP greater than 3. The remaining NPAG samples are classified based on sulfide content below 0.1%. At low sulfide content (below approximately 0.1%), meteoric weathering of silicates is expected to contribute sufficient alkalinity to maintain neutral pH conditions, though the site-specific sulfur content below which silicate NP may be effective has not been determined.
- Overall, the waste rock samples from the mine development area showed higher solid-phase trace element content compared to samples of UGTMF development rock. Parameters that were routinely enriched included uranium, molybdenum, selenium, and silver.
- Three humidity cell tests with 0.19% to 3.3% sulfur content developed acidic conditions (pH <5), with delay to onset of ARD ranging from 32 to 138 weeks. This indicates that acidic conditions in the SPGN unit can develop with sulfide content as low as 0.19%S.
- Stable release of calcium, potassium, and magnesium in HCTs representing waste rock samples with low sulfide content (0.02%S and 0.18%S) is attributed to dissolution of silicates providing neutralization to maintain circum-neutral pH conditions.
- pH was a strong control on release of aluminum, cobalt, copper, iron, manganese, nickel, lead, uranium, and zinc, with element mobility increasing with pH decline. Conversely, mobility of arsenic, molybdenum, and selenium decreased with pH decline.
- HCTs that maintained circum-neutral pH also showed substantial leaching of molybdenum and uranium.
- Radium-226 activities in leachates were highest from HCTs with solid-phase uranium enrichment and elevated uranium release rates.

7.3 Special Waste

The results from the samples of special waste showed the following:

- With an average of 0.15%S, sulfide content is comparable to the samples of waste rock from the mine development area; however, the proportion of samples classified as PAG or uncertain are lower (10% of samples based on both Modified NP/AP and TIC/AP).
- Samples of special waste had enrichment of constituents typically associated with uranium mineralization at the Project (e.g., uranium, molybdenum, selenium, silver) as well as copper and cobalt.
- Solid-phase radium-226, lead-210, and thorium-230 activity exceeded UDRLs for diffuse NORM sources from Health Canada guidelines (Health Canada 2011).
- HCTs with sulfide contents of 0.02%S and 0.08%S had a stable pH of 5.8 and 5.9, with major ion trends thought to indicate silicate buffering.
- HCT leachates from special waste showed amongst the highest concentrations of uranium, molybdenum, selenium, arsenic, and radium-226, compared to HCTs from the other areas, with peak concentrations from early flushes.

7.4 Delay to Acid Rock Drainage

Kinetic testing indicated that samples with 0.19%S to 3.3%S generated ARD. Delay to ARD for some of the PAG materials is expected to be short (i.e., within a few years) for PAG materials that is stored under oxygenated conditions.

7.5 Silicate Neutralization Potential

The potential for neutralization from dissolution of silicates was considered using HCTs.

Overall, the results for major ion chemistry showed that four samples with 0.17% to 0.24% sulfur oxidized at a slow rate and maintained circum-neutral pH conditions with evidence of dissolution of silicate minerals providing sufficient alkalinity to neutralize acid generation from sulfide oxidation. However, one sample with 0.19% sulfur generated acidic leachates.

Further evaluation is required to determine the sulfur content whereby NP from silicate dissolution is capable of maintaining circum-neutral pH.

7.6 Conservative Assumptions

The assessment of the ML/ARD potential of waste rock and special waste presented in this report used conservative assumptions. Key areas of conservatism in the geochemical evaluation include the following:

- The assessment of sulfide liberation by QEMSCAN mineralogy indicated potential for mineralogical locking of a component of sulfide which may prevent oxidation; however, for the calculation of AP, it was assumed that all measured sulfide was available to oxidize and produce acidity. This is an appropriate assumption at this stage as a complete assessment of potential blast fractionation or sulfide locking would need to be conducted on blasted rock.

- For the HCT selection, some samples were selected representing upper case (near 95th percentile) geochemical characteristics for sulfur and metal enrichment. Where solid-phase content is a control on release rates, the leachates produced from these HCTs would represent upper case scenarios; however, most element release rates were controlled by pH rather than solid-phase content. Exceptions were molybdenum and uranium, where leachate concentrations may be considered conservative from tests with 95th percentile solid-phase content.

Closure

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All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

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Appendix A QA/QC Summary of Static Testing

QC Test	SRK QC Criteria	Results
	paste pH	
Crush Duplicate (n=19)	For any samples, +/- 0.5 difference pH unit	All passed.
Pulp Duplicate (n=22)	For any samples, +/- 0.5 difference pH unit	All passed.
	TIC	
Lab Blank (n=0) for Total C and TIC	<2X detection limit (DL)	Lab did not run blanks
Carbon balance (Total C > TIC) (n=194)	For samples > 10X the detection limit (DL), Total Carbon should be greater than Total Inorganic Carbon, if not the % difference should be within +/-20%	All passed.
Crush Duplicate (n=19)	For samples > 10X the detection limit (DL), % RPD within +/-30%	All passed.
Pulp Duplicate (n=9)	For samples > 10X the detection limit (DL), % RPD within +/-20%	All passed.
Standard Reference Material (n=18)	Within specified tolerance ranges.	All passed.
	Total S & Total Sulphate	
Lab Blank (n=0)	<5X detection limit (DL)	Lab did not run blanks
Sulphur balance (total S > sulphate S) (n=194)	For samples > 10X the detection limit (DL), Total Sulphur should be greater than Total Sulphate, if not the % difference should be within +/-20%	All passed.
Crush Duplicate (n=19)	For samples > 10X the detection limit (DL), % RPD within +/-30%	All passed.
Pulp Duplicate (n=10) for Total S, (n=24) for SO4	For samples > 10X the detection limit (DL), % RPD within +/-20%	All passed.
Standard Reference Material (n=15) for Total S, (n=15) for SO4	Within specified tolerance ranges.	All passed.
	Total S-Leco and S-ICP	
Comparison between Total S-Leco and S-ICP (n=194)	For samples >10X detection limit (DL), % RPD within +/-20%	Variable for WO nos. G-2019-408, G-2019-407 and 201904174.
	Modified NP	
NP consistent with paste pH (n=194)	Negative NP has paste pH <= 5	All passed.
Crush Duplicate (n=24)	% RPD better than +/-15% for NP>20 kg/t, % RPD better than +/-20% for NP>10 kg/t, Difference within +/-5kg/t for NP<10 kg/t. Fizz test rating is the same.	All passed.
Pulp Duplicate(n=22)	% RPD better than +/-15% for NP>20 kg/t, % RPD better than +/-20% for NP>10 kg/t, Difference within +/-5kg/t for NP<10 kg/t. Fizz test rating is the same.	All passed.
Fizz test rating with NP (n=194)	Max NP does not exceed fizz test rating	All passed.
Comparison between Modified NP and TIC (n=194)	Check for trends/co-relation	NP and TIC are generally low.
Standard Reference Material (n=8)	Within specified tolerance ranges.	All passed.
	Whole Solids (Total Digestion)	
Lab Blank (n=0)	<2X Detection Limit	Lab did not run blanks
Crush Duplicate (n=12)	For samples >10X detection limit (DL), % RPD within +/- 30%, ok 10% of metal scan failing.	All passed
Pulp Duplicate (n=19)	For samples >10X detection limit (DL), % RPD within +/- 20%, ok 10% of metal scan failing.	All passed
Standard Reference Material (n=15)	Within specified tolerance ranges.	All passed.
	Aqua Regia (Partial Digestion)	
Lab Blank (n=0)	<2X Detection Limit	Lab did not run blanks
Crush Duplicate (n=12)	For samples >10X detection limit (DL), % RPD within +/- 30%, ok 10% of metal scan failing.	All passed.
Pulp Duplicate (n=19)	For samples >10X detection limit (DL), % RPD within +/- 20%, ok 10% of metal scan failing.	All passed.
Standard Reference Material (n=15)	Within specified tolerance ranges.	All passed.

Appendix B Static Test Results

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		ABA												
									Analyte	Sulfate (SO_4), acid soluble	pH, paste	Modified NP	Acid Producing	Net Acid Generation	Sulfur as Sulfide	Total Carbon	Total Sulfur	Inorganic Carbon (TIC)	TIC	NP/AP	TIC/AP
									Unit	wt. %	pH units	kg CaCO3/t	kg $CaCO_3$/t	kg $CaCO_3$/t	wt. %	wt. %	wt. %	wt. %	kg $CaCO_3$/t	-	-
									Method							LECO	LECO	LECO			
									Detection Limit	0.005	--	0.5	0.5	--		0.01	0.01	0.01			
39060	SRK	GAR-18-009	467	468.5	Waste Rock	Mine Area	INT	INT		< 0.0050	9.01	4.20	2.20	- 2.00	0.07	0.17	0.070	0.010	0.83	2.0	0.4
39062	SRK	GAR-18-009	524.5	526	Waste Rock	Mine Area	INT	INT		< 0.0050	8.63	5.80	7.80	2.00	0.25	0.11	0.25	0.010	0.83	0.7	0.1
39063	SRK	GAR-18-013	510	512	Waste Rock	Mine Area	INT	INT		< 0.0050	8.27	4.00	9.70	5.70	0.31	0.11	0.31	< 0.010	0.83	0.4	0.1
39064	SRK	GAR-18-013	430	431	Waste Rock	Mine Area	INT	INT		< 0.0050	8.27	1.90	< 0.50	- 1.90	0.01	< 0.010	< 0.010	< 0.010	0.83	6.1	2.7
39066	SRK	GAR-18-006	400.5	402	Waste Rock	Mine Area	INT	INT		< 0.0050	8.84	5.50	9.40	3.90	0.30	0.16	0.30	0.010	0.83	0.6	0.1
39067	SRK	GAR-18-006	350.5	352	Waste Rock	Mine Area	INT	INT		< 0.0050	9.01	6.60	5.30	- 1.30	0.17	0.16	0.17	0.010	0.83	1.3	0.2
39068	SRK	GAR-18-006	298.5	300	Waste Rock	Mine Area	INT	INT		< 0.0050	9.26	6.80	1.90	- 4.90	0.06	0.040	0.060	0.010	0.83	3.7	0.5
39069	SRK	GAR-18-006	200.1	201.5	Waste Rock	Mine Area	INT	INT		< 0.0050	9.14	9.00	6.90	- 2.10	0.22	0.19	0.22	0.020	1.67	1.3	0.2
39070	SRK	GAR-18-006	121	122.5	Waste Rock	Mine Area	INT	INT		< 0.0050	8.39	9.20	< 0.50	- 9.20	0.010	0.85	< 0.010	0.020	1.67	29.4	5.3
39077	SRK	GAR-18-006	500	501.5	Waste Rock	Mine Area	INT	INT		< 0.0050	9.59	6.10	8.40	2.30	0.27	0.13	0.27	0.010	0.83	0.7	0.1
39078	SRK	GAR-18-006	450	451.5	Waste Rock	Mine Area	INT	INT		< 0.0050	9.46	7.10	3.80	- 3.30	0.12	0.040	0.12	0.030	2.50	1.9	0.7
39084	SRK	AR-17-179C1	442	443.5	Waste Rock	Mine Area	INT	INT		< 0.0050	8.94	8.50	0.60	- 7.90	0.020	< 0.010	0.020	0.010	0.83	14.8	1.5
39091	SRK	AR-15-052	625	626.5	Waste Rock	Mine Area	INT	INT		< 0.0050	8.51	3.90	0.90	- 3.00	0.030	0.48	0.030	< 0.010	0.83	4.4	0.9
39079	SRK	AR-16-110C1	440	441.5	Waste Rock	Mine Area	INT	INT		0.032	7.29	4.40	10.3	5.90	0.33	< 0.010	0.34	< 0.010	0.83	0.4	0.1
39080	SRK	AR-16-110C1	471	472.5	Waste Rock	Mine Area	INT	INT		0.016	8.18	6.50	19.2	12.7	0.61	< 0.010	0.62	< 0.010	0.83	0.3	0.0
39081	SRK	AR-16-105C1	567	569	Special Waste	Mine Area	INT	INT		0.0070	7.71	3.00	< 0.50	- 3.00	0.010	< 0.010	0.010	< 0.010	0.83	9.6	2.7
39082	SRK	AR-17-115C1	506.05	507.5	Waste Rock	Mine Area	INT	INT		< 0.0050	9.17	5.10	1.30	- 3.80	0.040	0.18	0.040	< 0.010	0.83	4.3	0.7
39083	SRK	AR-17-147C3	476	478	Waste Rock	Mine Area	INT	INT		0.010	7.49	5.10	4.60	- 0.50	0.15	< 0.010	0.15	< 0.010	0.83	1.1	0.2
39085	SRK	AR-17-155C3	499	500	Waste Rock	Mine Area	INT	INT		0.0060	8.18	4.10	4.90	0.80	0.16	0.040	0.21	< 0.010	0.83	0.6	0.1
39092	SRK	AR-16-110C2	498	500	Waste Rock	Mine Area	INT	INT		0.0070	9.05	24.8	3.40	- 21.4	0.11	0.15	0.11	0.090	7.50	7.4	2.2
39093	SRK	AR-17-136C1	425	426.5	Waste Rock	Mine Area	INT	INT		0.0060	8.63	10.2	3.70	- 6.50	0.12	< 0.010	0.12	0.010	0.83	2.8	0.2
39174	SRK	AR-17-147C1	480.1	482	Waste Rock	Mine Area	INT	INT		0.013	7.98	6.90	7.10	< 0.50	0.23	0.010	0.23	< 0.010	0.83	1.0	0.1
39176	SRK	AR-17-183C1	476.5	478.2	Waste Rock	Mine Area	INT	INT		< 0.0050	7.62	4.10	< 0.50	- 4.10	0.010	0.010	0.010	< 0.010	0.83	13.1	2.7
39186	SRK	AR-18-208C1	560	562	Waste Rock	Mine Area	INT	INT		< 0.0050	8.57	6.40	5.60	- 0.80	0.18	0.11	0.18	< 0.010	0.83	1.1	0.1
39189	SRK	AR-18-209C1	551	553	Waste Rock	Mine Area	INT	INT		0.034	7.09	3.60	47.5	43.9	1.50	0.49	1.53	< 0.010	0.83	0.1	0.0
39193	SRK	AR-18-200C4	569.5	571	Waste Rock	Mine Area	INT	INT		0.0050	8.91	15.6	13.4	- 2.20	0.43	< 0.010	0.43	< 0.010	0.83	1.2	0.1
39072	SRK	GAR-18-006	50	51.5	Waste Rock	Mine Area	MST	MST		0.033	7.04	< 0.50	3.40	3.40	0.11	2.13	0.12	0.010	0.83	0.1	0.2
39190	SRK	GAR-18-015	13	14	Waste Rock	Mine Area	OVB	OVB		0.011	5.51	1.20	0.80	< 0.50	0.030	1.29	0.030	< 0.010	0.83	1.5	1.0
39191	SRK	GAR-18-013	11.3	15.8	Waste Rock	Mine Area	OVB	OVB		0.014	5.13	1.40	< 0.50	- 1.40	0.020	0.70	0.020	< 0.010	0.83	2.9	1.7
39163	SRK	AR-16-110C2	469.5	471	Waste Rock	Mine Area	PEG	SPGN		< 0.0050	9.99	18.2	1.60	- 16.6	0.050	0.10	0.050	0.050	4.17	12.1	2.8
39192	SRK	AR-18-200C4	541	542.5	Waste Rock	Mine Area	PEG	SPGN		0.0050	9.45	8.10	13.1	5.00	0.42	0.020	0.42	0.010	0.83	0.6	0.1
39056	SRK	GAR-18-012	660	661.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.69	2.80	0.60	- 2.20	0.02	0.40	0.020	< 0.010	0.83	4.9	1.5
39057	SRK	GAR-18-012	532	533.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.26	5.60	< 0.50	5.60	0.01	0.30	< 0.010	< 0.010	0.83	17.9	2.7
39058	SRK	GAR-18-012	431	432.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.31	1.80	< 0.50	- 1.80	0.01	0.090	0.010	< 0.010	0.83	5.8	2.7
39059	SRK	GAR-18-012	495	496.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.36	3.30	1.90	- 1.40	0.06	0.20	0.060	< 0.010	0.83	1.8	0.5
39061	SRK	GAR-18-011	651	652.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.64	2.70	0.60	- 2.10	0.02	0.11	0.020	< 0.010	0.83	4.7	1.5
39065	SRK	GAR-18-013	378	379	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.27	2.10	< 0.50	- 2.10	0.01	0.16	0.010	< 0.010	0.83	6.7	2.7
39074	SRK	GAR-18-006	650	651.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	7.94	2.80	< 0.50	- 2.80	0.010	0.33	< 0.010	< 0.010	0.83	9.0	2.7
39075	SRK	GAR-18-006	603.5	605	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.96	5.30	0.60	- 4.70	0.020	0.17	0.020	0.010	0.83	9.3	1.5
39076	SRK	GAR-18-006	550	551.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.59	4.40	5.90	1.50	0.19	0.060	0.19	< 0.010	0.83	0.7	0.1
39086	SRK	AR-17-120C2	685	686.5	Waste Rock	Mine Area	SPGN	SPGN		0.014	7.66	2.00	28.6	26.6	0.92	0.95	0.92	< 0.010	0.83	0.1	0.0
39087	SRK	AR-15-052	418.5	420	Waste Rock	Mine Area	SPGN	SPGN		0.0070	9.30	3.50	2.70	- 0.80	0.090	0.82	0.090	< 0.010	0.83	1.3	0.3
39088	SRK	AR-15-052	456	457.5	Waste Rock	Mine Area	SPGN	SPGN		0.018	8.39	3.30	10.1	6.80	0.32	0.91	0.33	< 0.010	0.83	0.3	0.1
39089	SRK	AR-15-052	499.5	501	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.29	1.60	< 0.50	- 1.60	0.010	0.14	< 0.010	< 0.010	0.83	5.1	2.7
39090	SRK	AR-15-052	561.5	563	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.33	3.00	2.20	- 0.80	0.070	0.29	0.070	< 0.010	0.83	1.4	0.4
39094	SRK	AR-14-015	690	691	Waste Rock	Mine Area	SPGN	SPGN		0.013	7.86	1.30	1.10	< 0.50	0.040	0.16	0.040	< 0.010	0.83	1.2	0.7
39095	SRK	AR-14-028	372	374	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.16	4.00	< 0.50	- 4.00	0.010	0.28	< 0.010	< 0.010	0.83	12.8	2.7
39096	SRK	AR-14-026	479	481	Special Waste	Mine Area	SPGN	SPGN		0.016	7.91	3.80	0.80	- 3.00	0.020	0.13	0.030	< 0.010	0.83	4.9	1.1
39097	SRK	AR-14-026	438	440	Special Waste	Mine Area	SPGN	SPGN		< 0.0050	8.17	3.60	< 0.50	- 3.60	0.010	0.12	0.010	< 0.010	0.83	11.5	2.7
39098	SRK	AR-14-024	572	573.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.50	3.00	< 0.50	- 3.00	0.010	0.26	0.010	0.020	1.67	9.6	5.3
39099	SRK	AR-14-024	446	448	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.64	1.60	0.90	- 0.70	0.030	0.32	0.030	< 0.010	0.83	1.8	0.9
39101	SRK	AR-15-033	476	478	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.67	4.80	< 0.50	- 4.80	0.010	0.23	< 0.010	< 0.010	0.83	15.4	2.7
39102	SRK	AR-15-033	504.5	506	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.47	4.40	0.60	- 3.80	0.020	0.41	0.020	< 0.010	0.83	7.7	1.5
39103	SRK	AR-15-033	551	553	Special Waste	Mine Area	SPGN	SPGN		0.015	8.51	4.40	0.80	- 3.60	0.030	0.20	0.030	0.010	0.83	5.6	1.1
39104	SRK	AR-15-039W1	418.5	421	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.32	4.80	< 0.50	- 4.80	0.010	0.27	< 0.010	< 0.010	0.83	15.4	2.7
39105	SRK	AR-15-043A	368	370.5	Special Waste	Mine Area	SPGN	SPGN		0.0060	8.49	11.5	< 0.50	- 11.5	0.010	0.21	0.010	0.10	8.33	36.8	26.7
39106	SRK	AR-15-052	528	530	Special Waste	Mine Area	SPGN	SPGN		0.0050	8.37	3.9	< 0.50	- 3.9	0.010	0.25	< 0.010	< 0.010	0.83	12.5	2.7
39107	SRK	AR-15-052	568.5	570.5	Special Waste	Mine Area	SPGN	SPGN		0.069	6.53	3.40	1.20	- 2.20	0.040	0.47	0.060	< 0.010	0.83	2.9	0.7
39108	SRK	AR-15-052	590	592	Waste Rock	Mine Area	SPGN	SPGN		0.067	6.64	6.30	57.1	50.8	1.80	0.93	1.85	< 0.010	0.83	0.1	0.0
39109	SRK	AR-15-034b	406	408.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.82	6.80	1.30	- 5.50	0.040	0.25	0.040	< 0.010	0.83	5.7	0.7
39110	SRK	AR-15-034b	667	669.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.21	4.20	1.60	- 2.60	0.050	0.33	0.050	< 0.010	0.83	2.8	0.6
39111	SRK	AR-15-036	340	342	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.28	4.10	< 0.50	- 4.10	0.010	0.26	0.010	< 0.010	0.83	13.1	2.7
39112	SRK	AR-15-057c3	367.5	369	Special Waste	Mine Area	SPGN	SPGN		0.021	7.30	2.50	0.70	- 1.80	0.020	0.050	0.030	< 0.010	0.83	3.5	1.2
39113	SRK	AR-15-054c2	530	531.5	Special Waste	Mine Area	SPGN	SPGN		0.007	8.07	2.80	1.20	- 1.60	0.040	0.250	0.040	< 0.010	0.83	9.0	2.7
39114	SRK	AR-15-054c2	665	667	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.14	2.50	1.30	- 1.20	0.040	0.27	0.040	< 0.010	0.83	2.1	0.7
39115	SRK	AR-15-054C4	694.5	697	Special Waste	Mine Area	SPGN	SPGN		0.042	7.31	3.20	2.40	- 0.80	0.080	0.37	0.090	< 0.010	0.83	1.3	0.4
39116	SRK	AR-15-055	552	554	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.24	4.00	0.60	- 3.40	0.020	0.29	0.020	< 0.010	0.83	7.0	1.5
39117	SRK	AR-15-055	602.5	605	Waste Rock	Mine Area	SPGN	SPGN		0.0060	8.02	1.00	< 0.50	- 1.00	0.010	0.34	< 0.010	< 0.010	0.83	3.2	2.7
39118	SRK	AR-15-058C1	393	395.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.39	9.00	< 0.50	- 9.00	0.010	0.15	< 0.010	0.040	3.33	28.8	10.7
39119	SRK	AR-15-059C1	424.5	426.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.67	3.40	< 0.50	- 3.40	0.010	0.19	0.010	< 0.010	0.83	10.9	2.7
39120	SRK	AR-15-059C2	468	470.5	Special Waste	Mine Area	SPGN	SPGN		< 0.0050	8.02	3.20	< 0.50	- 3.20	0.010	0.29	0.010	< 0.010	0.83	10.2	2.7
39122	SRK	AR-15-059C4	498.5	500.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.30	3.80	0.90	- 2.90	0.030	0.12	0.030	< 0.010	0.83	4.3	0.9
39123	SRK	AR-15-059C4	556	558.5	Waste Rock	Mine Area	SPGN	SPGN		0.010	7.72	0.90	1.10	< 0.50	0.040	0.15	0.040	< 0.010	0.83	0.8	0.7
39125	SRK	AR-15-060C2	404.5	407	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.49	2.60	< 0.50	- 2.60	0.010	0.24	< 0.010	< 0.010	0.83	8.3	2.7
39126	SRK	AR-15-060C2	481	483.5	Special Waste	Mine Area	SPGN	SPGN		0.0060	8.45	6.50	< 0.50	- 6.50	0.010	0.050	< 0.010	0.020	1.67	20.8	5.3
39127	SRK	AR-15-061C1	548	550.5	Waste Rock	Mine Area	SPGN	SPGN		0.016	7.36	5.30	< 0.50	- 5.30	0.010	0.57	0.010	< 0.010	0.83	17.0	2.7
39128	SRK	AR-15-061C2	504	506.5	Special Waste	Mine Area	SPGN	SPGN		0.0070	8.16	3.30	0.60	- 2.70	0.020	0.23	0.020	< 0.010	0.83	6.0	1.5

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping	Analyte	Ag	Al_2O_3	Ba	Be	CaO	Cd	Ce	Co	Cr	Cu	Dy	Er
										Total - 4 Acid Digestion and ICP-OES finish											
									Units	ppm	wt. %	ppm	ppm	wt. %	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion
									Detection Limit	0.2	0.01	1	0.2	0.01	1	1	1	1	1	0.2	0.2
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$
39060	SRK	GAR-18-009	467	468.5	Waste Rock	Mine Area	INT	INT		-	12.8	870	-	1.32	-	102	-	65.0	-	-	-
39062	SRK	GAR-18-009	524.5	526	Waste Rock	Mine Area	INT	INT		-	14.1	591	-	0.99	-	77.0	-	97.0	-	-	-
39063	SRK	GAR-18-013	510	512	Waste Rock	Mine Area	INT	INT		-	15.1	485	-	0.14	-	80.0	-	99.0	-	-	-
39064	SRK	GAR-18-013	430	431	Waste Rock	Mine Area	INT	INT		-	7.04	270	-	0.040	-	26.0	-	43.0	-	-	-
39066	SRK	GAR-18-006	400.5	402	Waste Rock	Mine Area	INT	INT		-	16.5	870	-	1.37	-	108	-	114	-	-	-
39067	SRK	GAR-18-006	350.5	352	Waste Rock	Mine Area	INT	INT		-	11.9	708	-	0.78	-	86.0	-	69.0	-	-	-
39068	SRK	GAR-18-006	298.5	300	Waste Rock	Mine Area	INT	INT		-	13.4	753	-	1.73	-	92.0	-	79.0	-	-	-
39069	SRK	GAR-18-006	200.1	201.5	Waste Rock	Mine Area	INT	INT		-	14.6	870	-	1.40	-	88.0	-	83.0	-	-	-
39070	SRK	GAR-18-006	121	122.5	Waste Rock	Mine Area	INT	INT		-	15.2	937	-	0.12	-	88.0	-	58.0	-	-	-
39077	SRK	GAR-18-006	500	501.5	Waste Rock	Mine Area	INT	INT		-	14.4	745	-	1.29	-	96.0	-	94.0	-	-	-
39078	SRK	GAR-18-006	450	451.5	Waste Rock	Mine Area	INT	INT		-	12.4	664	-	1.31	-	60.0	-	72.0	-	-	-
39084	SRK	AR-17-179C1	442	443.5	Waste Rock	Mine Area	INT	INT		-	13.9	82.0	-	0.24	-	74.0	-	71.0	-	-	-
39091	SRK	AR-15-052	625	626.5	Waste Rock	Mine Area	INT	INT		-	22.3	637	-	0.090	-	107	-	125	-	-	-
39079	SRK	AR-16-110C1	440	441.5	Waste Rock	Mine Area	INT	INT		< 0.20	16.6	36.0	2.70	0.19	< 1.00	316	27.0	23.0	161	3.80	1.60
39080	SRK	AR-16-110C1	471	472.5	Waste Rock	Mine Area	INT	INT		-	15.4	165	-	0.20	-	77.0	-	37.0	-	-	-
39081	SRK	AR-16-105C1	567	569	Special Waste	Mine Area	INT	INT		< 0.20	18.0	31.0	3.00	0.13	< 1.00	1.00	9.00	13.0	115	1.80	1.40
39082	SRK	AR-17-115C1	506.05	507.5	Waste Rock	Mine Area	INT	INT		-	10.7	826	-	0.22	-	57.0	-	60.0	-	-	-
39083	SRK	AR-17-147C3	476	478	Waste Rock	Mine Area	INT	INT		-	20.0	45.0	-	0.24	-	2.00	-	239	-	-	-
39085	SRK	AR-17-155C3	499	500	Waste Rock	Mine Area	INT	INT		-	15.8	345	-	0.11	-	93.0	-	105	-	-	-
39092	SRK	AR-16-110C2	498	500	Waste Rock	Mine Area	INT	INT		-	15.5	446	-	2.40	-	50.0	-	108	-	-	-
39093	SRK	AR-17-136C1	425	426.5	Waste Rock	Mine Area	INT	INT		-	18.0	22.0	-	0.38	-	19.0	-	89.0	-	-	-
39174	SRK	AR-17-147C1	480.1	482	Waste Rock	Mine Area	INT	INT		-	17.3	40.0	-	0.19	-	10.0	-	95.0	-	-	-
39176	SRK	AR-17-183C1	476.5	478.2	Waste Rock	Mine Area	INT	INT		-	26.4	17.0	-	0.13	-	3.00	-	72.0	-	-	-
39186	SRK	AR-18-208C1	560	562	Waste Rock	Mine Area	INT	INT		-	16.6	370	-	0.22	-	111	-	153	-	-	-
39189	SRK	AR-18-209C1	551	553	Waste Rock	Mine Area	INT	INT		-	19.1	770	-	0.080	-	73.0	-	120	-	-	-
39193	SRK	AR-18-200C4	569.5	571	Waste Rock	Mine Area	INT	INT		-	17.7	266	-	1.12	-	103	-	43.0	-	-	-
39072	SRK	GAR-18-006	50	51.5	Waste Rock	Mine Area	MST	MST		-	13.0	320	-	0.43	-	61.0	-	58.0	-	-	-
39190	SRK	GAR-18-015	13	14	Waste Rock	Mine Area	OVB	OVB		-	4.86	181	-	0.16	-	41.0	-	16.0	-	-	-
39191	SRK	GAR-18-013	11.3	15.8	Waste Rock	Mine Area	OVB	OVB		-	8.34	225	-	0.16	-	76.0	-	37.0	-	-	-
39163	SRK	AR-16-110C2	469.5	471	Waste Rock	Mine Area	PEG	SPGN		-	18.0	602	-	3.18	-	71.0	-	85.0	-	-	-
39192	SRK	AR-18-200C4	541	542.5	Waste Rock	Mine Area	PEG	SPGN		-	18.2	2520	-	0.83	-	137	-	17.0	-	-	-
39056	SRK	GAR-18-012	660	661.5	Waste Rock	Mine Area	SPGN	SPGN		-	10.9	680	-	0.11	-	80.0	-	67.0	-	-	-
39057	SRK	GAR-18-012	532	533.5	Waste Rock	Mine Area	SPGN	SPGN		-	26.7	253	-	0.23	-	< 1.00	-	289	-	-	-
39058	SRK	GAR-18-012	431	432.5	Waste Rock	Mine Area	SPGN	SPGN		-	11.6	620	-	0.060	-	74.0	-	60.0	-	-	-
39059	SRK	GAR-18-012	495	496.5	Waste Rock	Mine Area	SPGN	SPGN		-	9.58	449	-	0.090	-	31.0	-	65.0	-	-	-
39061	SRK	GAR-18-011	651	652.5	Waste Rock	Mine Area	SPGN	SPGN		-	9.78	651	-	0.070	-	83.0	-	55.0	-	-	-
39065	SRK	GAR-18-013	378	379	Waste Rock	Mine Area	SPGN	SPGN		-	12.4	752	-	0.040	-	79.0	-	71.0	-	-	-
39074	SRK	GAR-18-006	650	651.5	Waste Rock	Mine Area	SPGN	SPGN		-	13.9	542	-	0.060	-	30.0	-	79.0	-	-	-
39075	SRK	GAR-18-006	603.5	605	Waste Rock	Mine Area	SPGN	SPGN		-	20.1	1020	-	0.34	-	134	-	116	-	-	-
39076	SRK	GAR-18-006	550	551.5	Waste Rock	Mine Area	SPGN	SPGN		-	13.0	762	-	0.22	-	71.0	-	83.0	-	-	-
39086	SRK	AR-17-120C2	685	686.5	Waste Rock	Mine Area	SPGN	SPGN		-	16.1	787	-	0.040	-	84.0	-	87.0	-	-	-
39087	SRK	AR-15-052	418.5	420	Waste Rock	Mine Area	SPGN	SPGN		-	17.0	947	-	0.18	-	98.0	-	105	-	-	-
39088	SRK	AR-15-052	456	457.5	Waste Rock	Mine Area	SPGN	SPGN		-	15.9	705	-	0.090	-	102	-	52.0	-	-	-
39089	SRK	AR-15-052	499.5	501	Waste Rock	Mine Area	SPGN	SPGN		-	16.0	795	-	0.040	-	71.0	-	77.0	-	-	-
39090	SRK	AR-15-052	561.5	563	Waste Rock	Mine Area	SPGN	SPGN		-	16.5	803	-	0.030	-	123	-	99.0	-	-	-
39094	SRK	AR-14-015	690	691	Waste Rock	Mine Area	SPGN	SPGN		-	12.4	759	-	0.040	-	25.0	-	67.0	-	-	-
39095	SRK	AR-14-028	372	374	Waste Rock	Mine Area	SPGN	SPGN		-	15.8	945	-	0.22	-	20.0	-	82.0	-	-	-
39096	SRK	AR-14-026	479	481	Special Waste	Mine Area	SPGN	SPGN		< 0.20	24.1	1370	2.80	0.090	< 1.00	132	11.0	137	50.0	7.80	3.80
39097	SRK	AR-14-026	438	440	Special Waste	Mine Area	SPGN	SPGN		< 0.20	24.0	1190	3.60	0.10	< 1.00	390	11.0	105	160	10.8	5.50
39098	SRK	AR-14-024	572	573.5	Waste Rock	Mine Area	SPGN	SPGN		-	17.6	871	-	0.17	-	89.0	-	94.0	-	-	-
39099	SRK	AR-14-024	446	448	Waste Rock	Mine Area	SPGN	SPGN		-	15.7	842	-	0.050	-	87.0	-	92.0	-	-	-
39101	SRK	AR-15-033	476	478	Waste Rock	Mine Area	SPGN	SPGN		-	13.9	791	-	0.040	-	72.0	-	88.0	-	-	-
39102	SRK	AR-15-033	504.5	506	Waste Rock	Mine Area	SPGN	SPGN		-	15.9	715	-	0.080	-	77.0	-	57.0	-	-	-
39103	SRK	AR-15-033	551	553	Special Waste	Mine Area	SPGN	SPGN		< 0.20	11.8	801	1.00	0.12	< 1.00	97.0	5.00	70.0	75.0	5.00	2.40
39104	SRK	AR-15-039W1	418.5	421	Waste Rock	Mine Area	SPGN	SPGN		-	16.0	827	-	0.040	-	144	-	86.0	-	-	-
39105	SRK	AR-15-043A	368	370.5	Special Waste	Mine Area	SPGN	SPGN		< 0.20	15.1	870	2.20	0.60	< 1.00	14.0	12.0	237	5.00	7.20	3.40
39106	SRK	AR-15-052	528	530	Special Waste	Mine Area	SPGN	SPGN		-	10.6	616	-	0.030	-	60	-	63.0	-	-	-
39107	SRK	AR-15-052	568.5	570.5	Special Waste	Mine Area	SPGN	SPGN		2.20	26.4	679	3.10	0.13	< 1.00	342	19.0	154	9.00	7.70	3.60
39108	SRK	AR-15-052	590	592	Waste Rock	Mine Area	SPGN	SPGN		-	14.5	744	-	0.080	-	101	-	63.0	-	-	-
39109	SRK	AR-15-034b	406	408.5	Waste Rock	Mine Area	SPGN	SPGN		-	12.3	842	-	0.070	-	56.0	-	69.0	-	-	-
39110	SRK	AR-15-034b	667	669.5	Waste Rock	Mine Area	SPGN	SPGN		-	17.9	885	-	0.060	-	82.0	-	109	-	-	-
39111	SRK	AR-15-036	340	342	Waste Rock	Mine Area	SPGN	SPGN		-	16.4	929	-	0.040	-	110	-	76.0	-	-	-
39112	SRK	AR-15-057c3	367.5	369	Special Waste	Mine Area	SPGN	SPGN		< 0.20	13.8	723	1.90	0.060	< 1.00	172	10.0	78.0	6.00	9.40	4.00
39113	SRK	AR-15-054c2	530	531.5	Special Waste	Mine Area	SPGN	SPGN		-	13.8	757	-	0.040	-	62	-	78.0	-	-	-
39114	SRK	AR-15-054c2	665	667	Waste Rock	Mine Area	SPGN	SPGN		-	11.6	529	-	0.020	-	60.0	-	63.0	-	-	-
39115	SRK	AR-15-054C4	694.5	697	Special Waste	Mine Area	SPGN	SPGN		< 0.20	16.4	926	2.00	0.080	< 1.00	184	11.0	68.0	423	3.70	2.20
39116	SRK	AR-15-055	552	554	Waste Rock	Mine Area	SPGN	SPGN		-	18.3	1150	-	0.040	-	90.0	-	99.0	-	-	-
39117	SRK	AR-15-055	602.5	605	Waste Rock	Mine Area	SPGN	SPGN		-	17.7	885	-	0.040	-	50.0	-	108	-	-	-
39118	SRK	AR-15-058C1	393	395.5	Waste Rock	Mine Area	SPGN	SPGN		-	13.7	532	-	0.32	-	183	-	113	-	-	-
39119	SRK	AR-15-059C1	424.5	426.5	Waste Rock	Mine Area	SPGN	SPGN		-	10.4	538	-	0.020	-	66.0	-	56.0	-	-	-
39120	SRK	AR-15-059C2	468	470.5	Special Waste	Mine Area	SPGN	SPGN		< 0.20	25.6	1740	3.00	0.080	< 1.00	227	7.00	147	22.0	6.00	3.60
39122	SRK	AR-15-059C4	498.5	500.5	Waste Rock	Mine Area	SPGN	SPGN		-	12.2	672	-	0.030	-	57.0	-	61.0	-	-	-
39123	SRK	AR-15-059C4	556	558.5	Waste Rock	Mine Area	SPGN	SPGN		-	11.6	701	-	0.040	-	16.0	-	62.0	-	-	-
39125	SRK	AR-15-060C2	404.5	407	Waste Rock	Mine Area	SPGN	SPGN		< 0.20	15.6	841	1.30	0.040	< 1.00	45.0	3.00	91.0	2.00	3.60	2.20
39126	SRK	AR-15-060C2	481	483.5	Special Waste	Mine Area	SPGN	SPGN		< 0.20	11.7	704	1.20	0.22	< 1.00	99.0	6.00	54.0	11.0	4.30	2.40
39127	SRK	AR-15-061C1	548	550.5	Waste Rock	Mine Area	SPGN	SPGN		-	26.9	968	-	0.060	-	13.0	-	126	-	-	-
39128	SRK	AR-15-061C2	504	506.5	Special Waste	Mine Area	SPGN	SPGN		< 0.20	20.7	1190	2.40	0.060	< 1.00	8.00	7.00	112	3.00	8.50	4.60

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4 Acid Digestion and ICP-OES finish											
									Analyte	Eu	Fe_2O_3	Ga	Gd	Hf	Ho	2	K_2O	La	Li	MgO	MgO
									Units	ppm	wt. %	ppm	ppm	ppm	ppm	wt. %	wt. %	ppm	ppm	wt. %	wt. %
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion
									Detection Limit	0.2	0.01	1	1	1	1	0.002	0.01	1	1	0.002	0.01
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$
39060	SRK	GAR-18-009	467	468.5	Waste Rock	Mine Area	INT	INT		-	4.91	-	-	-	-	3.68	-	56.0	11.0	1.68	-
39062	SRK	GAR-18-009	524.5	526	Waste Rock	Mine Area	INT	INT		-	5.60	-	-	-	-	3.01	-	42.0	35.0	2.96	-
39063	SRK	GAR-18-013	510	512	Waste Rock	Mine Area	INT	INT		-	5.10	-	-	-	-	2.81	-	43.0	66.0	5.41	-
39064	SRK	GAR-18-013	430	431	Waste Rock	Mine Area	INT	INT		-	2.65	-	-	-	-	1.46	-	15.0	18.0	1.48	-
39066	SRK	GAR-18-006	400.5	402	Waste Rock	Mine Area	INT	INT		-	8.41	-	-	-	-	3.97	-	58.0	17.0	3.20	-
39067	SRK	GAR-18-006	350.5	352	Waste Rock	Mine Area	INT	INT		-	5.32	-	-	-	-	3.02	-	48.0	13.0	1.95	-
39068	SRK	GAR-18-006	298.5	300	Waste Rock	Mine Area	INT	INT		-	5.88	-	-	-	-	2.99	-	51.0	14.0	2.30	-
39069	SRK	GAR-18-006	200.1	201.5	Waste Rock	Mine Area	INT	INT		-	6.15	-	-	-	-	3.61	-	49.0	20.0	2.53	-
39070	SRK	GAR-18-006	121	122.5	Waste Rock	Mine Area	INT	INT		-	6.60	-	-	-	-	3.76	-	51.0	37.0	1.86	-
39077	SRK	GAR-18-006	500	501.5	Waste Rock	Mine Area	INT	INT		-	6.32	-	-	-	-	3.30	-	49.0	17.0	2.23	-
39078	SRK	GAR-18-006	450	451.5	Waste Rock	Mine Area	INT	INT		-	4.29	-	-	-	-	2.98	-	31.0	14.0	1.63	-
39084	SRK	AR-17-179C1	442	443.5	Waste Rock	Mine Area	INT	INT		-	4.38	-	-	-	-	2.33	-	38.0	86.0	6.82	-
39091	SRK	AR-15-052	625	626.5	Waste Rock	Mine Area	INT	INT		-	8.17	-	-	-	-	3.45	-	57.0	106	5.60	-
39079	SRK	AR-16-110C1	440	441.5	Waste Rock	Mine Area	INT	INT		0.60	1.08	26.0	4.00	14.0	< 1.00	-	2.58	151	83.0	-	4.34
39080	SRK	AR-16-110C1	471	472.5	Waste Rock	Mine Area	INT	INT		-	2.78	-	-	-	-	2.49	-	42.0	113	6.50	-
39081	SRK	AR-16-105C1	567	569	Special Waste	Mine Area	INT	INT		0.20	0.40	25.0	< 1.00	3.00	< 1.00	-	3.69	1.00	110	-	2.84
39082	SRK	AR-17-115C1	506.05	507.5	Waste Rock	Mine Area	INT	INT		-	4.72	-	-	-	-	3.19	-	33.0	12.0	1.54	-
39083	SRK	AR-17-147C3	476	478	Waste Rock	Mine Area	INT	INT		-	2.99	-	-	-	-	1.49	-	2.00	130	8.46	-
39085	SRK	AR-17-155C3	499	500	Waste Rock	Mine Area	INT	INT		-	1.95	-	-	-	-	2.76	-	49.0	93.0	5.33	-
39092	SRK	AR-16-110C2	498	500	Waste Rock	Mine Area	INT	INT		-	4.42	-	-	-	-	2.18	-	24.0	153	11.2	-
39093	SRK	AR-17-136C1	425	426.5	Waste Rock	Mine Area	INT	INT		-	3.79	-	-	-	-	2.44	-	9.00	167	10.5	-
39174	SRK	AR-17-147C1	480.1	482	Waste Rock	Mine Area	INT	INT		-	1.71	-	-	-	-	2.90	-	6.00	100	5.85	-
39176	SRK	AR-17-183C1	476.5	478.2	Waste Rock	Mine Area	INT	INT		-	0.67	-	-	-	-	3.30	-	2.00	160	7.85	-
39186	SRK	AR-18-208C1	560	562	Waste Rock	Mine Area	INT	INT		-	3.68	-	-	-	-	2.93	-	57.0	92.0	5.36	-
39189	SRK	AR-18-209C1	551	553	Waste Rock	Mine Area	INT	INT		-	3.20	-	-	-	-	4.25	-	39.0	59.0	3.81	-
39193	SRK	AR-18-200C4	569.5	571	Waste Rock	Mine Area	INT	INT		-	8.63	-	-	-	-	2.43	-	48.0	152	10.2	-
39072	SRK	GAR-18-006	50	51.5	Waste Rock	Mine Area	MST	MST		-	3.64	-	-	-	-	1.86	-	32.0	74.0	0.90	-
39190	SRK	GAR-18-015	13	14	Waste Rock	Mine Area	OVB	OVB		-	0.52	-	-	-	-	0.69	-	20.0	19.0	0.19	-
39191	SRK	GAR-18-013	11.3	15.8	Waste Rock	Mine Area	OVB	OVB		-	1.01	-	-	-	-	1.17	-	34.0	48.0	0.30	-
39163	SRK	AR-16-110C2	469.5	471	Waste Rock	Mine Area	PEG	SPGN		-	5.60	-	-	-	-	2.70	-	37.0	22.0	3.31	-
39192	SRK	AR-18-200C4	541	542.5	Waste Rock	Mine Area	PEG	SPGN		-	1.80	-	-	-	-	9.37	-	81.0	36.0	1.61	-
39056	SRK	GAR-18-012	660	661.5	Waste Rock	Mine Area	SPGN	SPGN		-	5.22	-	-	-	-	3.25	-	43.0	20.0	1.91	-
39057	SRK	GAR-18-012	532	533.5	Waste Rock	Mine Area	SPGN	SPGN		-	2.60	-	-	-	-	3.66	-	8.00	218	9.44	-
39058	SRK	GAR-18-012	431	432.5	Waste Rock	Mine Area	SPGN	SPGN		-	3.30	-	-	-	-	2.41	-	41.0	43.0	2.33	-
39059	SRK	GAR-18-012	495	496.5	Waste Rock	Mine Area	SPGN	SPGN		-	3.67	-	-	-	-	1.63	-	18.0	26.0	2.19	-
39061	SRK	GAR-18-011	651	652.5	Waste Rock	Mine Area	SPGN	SPGN		-	3.84	-	-	-	-	2.54	-	43.0	18.0	1.55	-
39065	SRK	GAR-18-013	378	379	Waste Rock	Mine Area	SPGN	SPGN		-	3.53	-	-	-	-	2.53	-	42.0	33.0	2.11	-
39074	SRK	GAR-18-006	650	651.5	Waste Rock	Mine Area	SPGN	SPGN		-	0.41	-	-	-	-	2.73	-	18.0	26.0	1.94	-
39075	SRK	GAR-18-006	603.5	605	Waste Rock	Mine Area	SPGN	SPGN		-	10.2	-	-	-	-	4.64	-	76.0	14.0	2.62	-
39076	SRK	GAR-18-006	550	551.5	Waste Rock	Mine Area	SPGN	SPGN		-	6.32	-	-	-	-	3.06	-	37.0	26.0	2.51	-
39086	SRK	AR-17-120C2	685	686.5	Waste Rock	Mine Area	SPGN	SPGN		-	1.65	-	-	-	-	3.38	-	49.0	41.0	2.28	-
39087	SRK	AR-15-052	418.5	420	Waste Rock	Mine Area	SPGN	SPGN		-	9.15	-	-	-	-	4.65	-	50.0	23.0	2.30	-
39088	SRK	AR-15-052	456	457.5	Waste Rock	Mine Area	SPGN	SPGN		-	1.18	-	-	-	-	2.82	-	56.0	57.0	3.21	-
39089	SRK	AR-15-052	499.5	501	Waste Rock	Mine Area	SPGN	SPGN		-	0.59	-	-	-	-	2.63	-	42.0	38.0	2.66	-
39090	SRK	AR-15-052	561.5	563	Waste Rock	Mine Area	SPGN	SPGN		-	1.42	-	-	-	-	3.32	-	65.0	52.0	2.59	-
39094	SRK	AR-14-015	690	691	Waste Rock	Mine Area	SPGN	SPGN		-	1.04	-	-	-	-	2.79	-	13.0	26.0	2.09	-
39095	SRK	AR-14-028	372	374	Waste Rock	Mine Area	SPGN	SPGN		-	0.94	-	-	-	-	3.63	-	13.0	47.0	2.39	-
39096	SRK	AR-14-026	479	481	Special Waste	Mine Area	SPGN	SPGN		1.40	1.84	34.0	5.00	10.0	1.00	-	5.05	80.0	175	-	3.54
39097	SRK	AR-14-026	438	440	Special Waste	Mine Area	SPGN	SPGN		2.20	3.32	32.0	6.00	9.00	1.00	-	4.29	232	111	-	5.26
39098	SRK	AR-14-024	572	573.5	Waste Rock	Mine Area	SPGN	SPGN		-	1.09	-	-	-	-	3.65	-	49.0	33.0	2.78	-
39099	SRK	AR-14-024	446	448	Waste Rock	Mine Area	SPGN	SPGN		-	4.42	-	-	-	-	3.35	-	46.0	37.0	2.92	-
39101	SRK	AR-15-033	476	478	Waste Rock	Mine Area	SPGN	SPGN		-	1.97	-	-	-	-	2.90	-	40.0	40.0	2.94	-
39102	SRK	AR-15-033	504.5	506	Waste Rock	Mine Area	SPGN	SPGN		-	1.79	-	-	-	-	3.63	-	40.0	48.0	3.41	-
39103	SRK	AR-15-033	551	553	Special Waste	Mine Area	SPGN	SPGN		0.90	1.14	16.0	3.00	6.00	< 1.00	-	2.62	54.0	48.0	-	1.87
39104	SRK	AR-15-039W1	418.5	421	Waste Rock	Mine Area	SPGN	SPGN		-	0.80	-	-	-	-	3.30	-	76.0	53.0	2.26	-
39105	SRK	AR-15-043A	368	370.5	Special Waste	Mine Area	SPGN	SPGN		0.80	1.61	18.0	3.00	6.00	1.00	-	3.74	10.0	62.0	-	0.99
39106	SRK	AR-15-052	528	530	Special Waste	Mine Area	SPGN	SPGN		-	0.47	-	-	-	-	2.10	-	34.0	41.0	1.55	-
39107	SRK	AR-15-052	568.5	570.5	Special Waste	Mine Area	SPGN	SPGN		2.60	1.00	30.0	9.00	7.00	1.00	-	3.73	190	270	-	5.63
39108	SRK	AR-15-052	590	592	Waste Rock	Mine Area	SPGN	SPGN		-	3.77	-	-	-	-	3.45	-	51.0	29.0	1.97	-
39109	SRK	AR-15-034b	406	408.5	Waste Rock	Mine Area	SPGN	SPGN		-	3.07	-	-	-	-	3.26	-	30.0	35.0	2.39	-
39110	SRK	AR-15-034b	667	669.5	Waste Rock	Mine Area	SPGN	SPGN		-	2.42	-	-	-	-	3.84	-	46.0	53.0	3.37	-
39111	SRK	AR-15-036	340	342	Waste Rock	Mine Area	SPGN	SPGN		-	1.76	-	-	-	-	3.50	-	58.0	61.0	2.91	-
39112	SRK	AR-15-057c3	367.5	369	Special Waste	Mine Area	SPGN	SPGN		2.10	1.06	21.0	7.00	6.00	1.00	-	2.39	95.0	85.0	-	2.69
39113	SRK	AR-15-054c2	530	531.5	Special Waste	Mine Area	SPGN	SPGN		-	1.34	-	-	-	-	3.33	-	33.0	34.0	1.59	-
39114	SRK	AR-15-054c2	665	667	Waste Rock	Mine Area	SPGN	SPGN		-	0.87	-	-	-	-	2.38	-	33.0	32.0	1.61	-
39115	SRK	AR-15-054C4	694.5	697	Special Waste	Mine Area	SPGN	SPGN		1.20	0.94	22.0	3.00	5.00	< 1.00	-	3.56	111	101	-	2.66
39116	SRK	AR-15-055	552	554	Waste Rock	Mine Area	SPGN	SPGN		-	0.81	-	-	-	-	3.81	-	50.0	56.0	2.51	-
39117	SRK	AR-15-055	602.5	605	Waste Rock	Mine Area	SPGN	SPGN		-	1.52	-	-	-	-	3.49	-	29.0	58.0	2.74	-
39118	SRK	AR-15-058C1	393	395.5	Waste Rock	Mine Area	SPGN	SPGN		-	0.82	-	-	-	-	1.97	-	106	74.0	3.16	-
39119	SRK	AR-15-059C1	424.5	426.5	Waste Rock	Mine Area	SPGN	SPGN		-	1.55	-	-	-	-	2.00	-	34.0	30.0	1.82	-
39120	SRK	AR-15-059C2	468	470.5	Special Waste	Mine Area	SPGN	SPGN		1.50	1.29	34.0	4.00	10.0	1.00	-	4.62	143	163	-	4.68
39122	SRK	AR-15-059C4	498.5	500.5	Waste Rock	Mine Area	SPGN	SPGN		-	0.50	-	-	-	-	2.25	-	34.0	49.0	1.92	-
39123	SRK	AR-15-059C4	556	558.5	Waste Rock	Mine Area	SPGN	SPGN		-	1.03	-	-	-	-	2.49	-	10.0	48.0	1.70	-
39125	SRK	AR-15-060C2	404.5	407	Waste Rock	Mine Area	SPGN	SPGN		0.60	0.85	19.0	2.00	6.00	< 1.00	-	3.42	26.0	55.0	-	2.23
39126	SRK	AR-15-060C2	481	483.5	Special Waste	Mine Area	SPGN	SPGN		1.00	1.18	15.0	3.00	7.00	< 1.00	-	2.38	55.0	49.0	-	1.99
39127	SRK	AR-15-061C1	548	550.5	Waste Rock	Mine Area	SPGN	SPGN		-	1.04	-	-	-	-	4.83	-	10.0	159	4.88	-
39128	SRK	AR-15-061C2	504	506.5	Special Waste	Mine Area	SPGN	SPGN		0.50	0.97	28.0	3.00	9.00	1.00	-	4.96	6.00	61.0	-	1.97

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4 Acid Digestion and ICP-OES finish											
									Analyte	MnO	MnO	Mo	Na_2O	Nb	Nd	Ni	P_2O_5	P_2O_5	Pb	Pr	S
									Units	wt. %	wt. %	ppm	wt. %	ppm	ppm	ppm	wt. %	wt. %	ppm	ppm	ppm
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion
									Detection Limit	0.001	0.01	1	0.01	1	1	1	0.002	0.01	1	1	10
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4
39060	SRK	GAR-18-009	467	468.5	Waste Rock	Mine Area	INT	INT		0.064	-	-	1.69	-	-	-	0.071	-	-	-	541
39062	SRK	GAR-18-009	524.5	526	Waste Rock	Mine Area	INT	INT		0.057	-	-	1.38	-	-	-	0.063	-	-	-	2620
39063	SRK	GAR-18-013	510	512	Waste Rock	Mine Area	INT	INT		0.018	-	-	0.090	-	-	-	0.065	-	-	-	3280
39064	SRK	GAR-18-013	430	431	Waste Rock	Mine Area	INT	INT		0.012	-	-	0.040	-	-	-	0.023	-	-	-	25.0
39066	SRK	GAR-18-006	400.5	402	Waste Rock	Mine Area	INT	INT		0.098	-	-	1.75	-	-	-	0.10	-	-	-	2990
39067	SRK	GAR-18-006	350.5	352	Waste Rock	Mine Area	INT	INT		0.052	-	-	1.40	-	-	-	0.056	-	-	-	1680
39068	SRK	GAR-18-006	298.5	300	Waste Rock	Mine Area	INT	INT		0.084	-	-	1.82	-	-	-	0.11	-	-	-	861
39069	SRK	GAR-18-006	200.1	201.5	Waste Rock	Mine Area	INT	INT		0.058	-	-	1.63	-	-	-	0.094	-	-	-	2390
39070	SRK	GAR-18-006	121	122.5	Waste Rock	Mine Area	INT	INT		0.025	-	-	0.080	-	-	-	0.044	-	-	-	43.0
39077	SRK	GAR-18-006	500	501.5	Waste Rock	Mine Area	INT	INT		0.080	-	-	1.86	-	-	-	0.068	-	-	-	2640
39078	SRK	GAR-18-006	450	451.5	Waste Rock	Mine Area	INT	INT		0.056	-	-	1.66	-	-	-	0.056	-	-	-	817
39084	SRK	AR-17-179C1	442	443.5	Waste Rock	Mine Area	INT	INT		0.028	-	-	0.12	-	-	-	0.085	-	-	-	201
39091	SRK	AR-15-052	625	626.5	Waste Rock	Mine Area	INT	INT		0.057	-	-	0.11	-	-	-	0.034	-	-	-	368
39079	SRK	AR-16-110C1	440	441.5	Waste Rock	Mine Area	INT	INT		-	< 0.010	12.0	0.040	15.0	121	80.0	-	0.16	19.0	38.0	3930
39080	SRK	AR-16-110C1	471	472.5	Waste Rock	Mine Area	INT	INT		0.012	-	-	0.060	-	-	-	0.11	-	-	-	5690
39081	SRK	AR-16-105C1	567	569	Special Waste	Mine Area	INT	INT		-	< 0.010	80.0	0.090	9.00	1.00	42.0	-	< 0.010	54.0	< 1.00	124
39082	SRK	AR-17-115C1	506.05	507.5	Waste Rock	Mine Area	INT	INT		0.061	-	-	0.32	-	-	-	0.025	-	-	-	570
39083	SRK	AR-17-147C3	476	478	Waste Rock	Mine Area	INT	INT		0.023	-	-	0.050	-	-	-	0.093	-	-	-	1740
39085	SRK	AR-17-155C3	499	500	Waste Rock	Mine Area	INT	INT		0.012	-	-	0.050	-	-	-	0.054	-	-	-	2290
39092	SRK	AR-16-110C2	498	500	Waste Rock	Mine Area	INT	INT		0.057	-	-	0.56	-	-	-	0.19	-	-	-	1140
39093	SRK	AR-17-136C1	425	426.5	Waste Rock	Mine Area	INT	INT		0.024	-	-	0.030	-	-	-	0.16	-	-	-	1210
39174	SRK	AR-17-147C1	480.1	482	Waste Rock	Mine Area	INT	INT		0.019	-	-	0.030	-	-	-	0.079	-	-	-	2480
39176	SRK	AR-17-183C1	476.5	478.2	Waste Rock	Mine Area	INT	INT		0.0040	-	-	0.060	-	-	-	0.0020	-	-	-	130
39186	SRK	AR-18-208C1	560	562	Waste Rock	Mine Area	INT	INT		0.015	-	-	0.29	-	-	-	0.078	-	-	-	1910
39189	SRK	AR-18-209C1	551	553	Waste Rock	Mine Area	INT	INT		0.0060	-	-	0.15	-	-	-	0.044	-	-	-	13100
39193	SRK	AR-18-200C4	569.5	571	Waste Rock	Mine Area	INT	INT		0.060	-	-	1.21	-	-	-	0.47	-	-	-	4070
39072	SRK	GAR-18-006	50	51.5	Waste Rock	Mine Area	MST	MST		0.053	-	-	0.10	-	-	-	0.053	-	-	-	1360
39190	SRK	GAR-18-015	13	14	Waste Rock	Mine Area	OVB	OVB		0.0080	-	-	0.10	-	-	-	0.016	-	-	-	329
39191	SRK	GAR-18-013	11.3	15.8	Waste Rock	Mine Area	OVB	OVB		0.011	-	-	0.26	-	-	-	0.027	-	-	-	219
39163	SRK	AR-16-110C2	469.5	471	Waste Rock	Mine Area	PEG	SPGN		0.078	-	-	4.54	-	-	-	0.17	-	-	-	624
39192	SRK	AR-18-200C4	541	542.5	Waste Rock	Mine Area	PEG	SPGN		0.015	-	-	1.39	-	-	-	0.18	-	-	-	4320
39056	SRK	GAR-18-012	660	661.5	Waste Rock	Mine Area	SPGN	SPGN		0.039	-	-	0.24	-	-	-	0.036	-	-	-	188
39057	SRK	GAR-18-012	532	533.5	Waste Rock	Mine Area	SPGN	SPGN		0.011	-	-	0.080	-	-	-	0.052	-	-	-	70.0
39058	SRK	GAR-18-012	431	432.5	Waste Rock	Mine Area	SPGN	SPGN		0.0090	-	-	0.070	-	-	-	0.031	-	-	-	371
39059	SRK	GAR-18-012	495	496.5	Waste Rock	Mine Area	SPGN	SPGN		0.035	-	-	0.060	-	-	-	0.029	-	-	-	506
39061	SRK	GAR-18-011	651	652.5	Waste Rock	Mine Area	SPGN	SPGN		0.023	-	-	0.12	-	-	-	0.025	-	-	-	246
39065	SRK	GAR-18-013	378	379	Waste Rock	Mine Area	SPGN	SPGN		0.0080	-	-	0.16	-	-	-	0.034	-	-	-	191
39074	SRK	GAR-18-006	650	651.5	Waste Rock	Mine Area	SPGN	SPGN		0.0010	-	-	0.14	-	-	-	0.015	-	-	-	49.0
39075	SRK	GAR-18-006	603.5	605	Waste Rock	Mine Area	SPGN	SPGN		0.15	-	-	0.42	-	-	-	0.046	-	-	-	262
39076	SRK	GAR-18-006	550	551.5	Waste Rock	Mine Area	SPGN	SPGN		0.12	-	-	0.16	-	-	-	0.098	-	-	-	1970
39086	SRK	AR-17-120C2	685	686.5	Waste Rock	Mine Area	SPGN	SPGN		0.0040	-	-	0.16	-	-	-	0.029	-	-	-	8040
39087	SRK	AR-15-052	418.5	420	Waste Rock	Mine Area	SPGN	SPGN		0.082	-	-	0.11	-	-	-	0.068	-	-	-	985
39088	SRK	AR-15-052	456	457.5	Waste Rock	Mine Area	SPGN	SPGN		0.0030	-	-	0.10	-	-	-	0.038	-	-	-	3250
39089	SRK	AR-15-052	499.5	501	Waste Rock	Mine Area	SPGN	SPGN		0.0010	-	-	0.18	-	-	-	0.028	-	-	-	53.0
39090	SRK	AR-15-052	561.5	563	Waste Rock	Mine Area	SPGN	SPGN		0.0090	-	-	0.12	-	-	-	0.042	-	-	-	653
39094	SRK	AR-14-015	690	691	Waste Rock	Mine Area	SPGN	SPGN		0.0020	-	-	0.14	-	-	-	0.0090	-	-	-	380
39095	SRK	AR-14-028	372	374	Waste Rock	Mine Area	SPGN	SPGN		0.0010	-	-	0.16	-	-	-	0.16	-	-	-	47.0
39096	SRK	AR-14-026	479	481	Special Waste	Mine Area	SPGN	SPGN		-	< 0.010	25.0	0.21	23.0	54.0	41.0	-	0.050	82.0	15.0	419
39097	SRK	AR-14-026	438	440	Special Waste	Mine Area	SPGN	SPGN		-	< 0.010	2.00	0.21	21.0	122	70.0	-	0.13	52.0	41.0	205
39098	SRK	AR-14-024	572	573.5	Waste Rock	Mine Area	SPGN	SPGN		0.0030	-	-	0.16	-	-	-	0.033	-	-	-	190
39099	SRK	AR-14-024	446	448	Waste Rock	Mine Area	SPGN	SPGN		0.023	-	-	0.14	-	-	-	0.041	-	-	-	338
39101	SRK	AR-15-033	476	478	Waste Rock	Mine Area	SPGN	SPGN		0.013	-	-	0.11	-	-	-	0.026	-	-	-	38.0
39102	SRK	AR-15-033	504.5	506	Waste Rock	Mine Area	SPGN	SPGN		0.010	-	-	0.11	-	-	-	0.041	-	-	-	249
39103	SRK	AR-15-033	551	553	Special Waste	Mine Area	SPGN	SPGN		-	< 0.010	2.00	0.13	13.0	36.0	31.0	-	0.030	34.0	11.0	357
39104	SRK	AR-15-039W1	418.5	421	Waste Rock	Mine Area	SPGN	SPGN		0.0020	-	-	0.14	-	-	-	0.055	-	-	-	72.0
39105	SRK	AR-15-043A	368	370.5	Special Waste	Mine Area	SPGN	SPGN		-	0.010	5.00	0.17	17.0	7.00	60.0	-	0.020	57.0	2.00	132
39106	SRK	AR-15-052	528	530	Special Waste	Mine Area	SPGN	SPGN		0.0010	-	-	0.09	-	-	-	0.018	-	-	-	75.0
39107	SRK	AR-15-052	568.5	570.5	Special Waste	Mine Area	SPGN	SPGN		-	< 0.010	781	0.13	27.0	138	106	-	0.12	266	37.0	662
39108	SRK	AR-15-052	590	592	Waste Rock	Mine Area	SPGN	SPGN		0.016	-	-	0.12	-	-	-	0.070	-	-	-	15600
39109	SRK	AR-15-034b	406	408.5	Waste Rock	Mine Area	SPGN	SPGN		0.018	-	-	0.10	-	-	-	0.023	-	-	-	359
39110	SRK	AR-15-034b	667	669.5	Waste Rock	Mine Area	SPGN	SPGN		0.0060	-	-	0.16	-	-	-	0.031	-	-	-	719
39111	SRK	AR-15-036	340	342	Waste Rock	Mine Area	SPGN	SPGN		0.0060	-	-	0.14	-	-	-	0.035	-	-	-	70.0
39112	SRK	AR-15-057c3	367.5	369	Special Waste	Mine Area	SPGN	SPGN		-	< 0.010	1.00	0.080	12.0	69.0	102	-	0.070	31.0	20.0	448
39113	SRK	AR-15-054c2	530	531.5	Special Waste	Mine Area	SPGN	SPGN		0.0070	-	-	0.11	-	-	-	0.022	-	-	-	486.0
39114	SRK	AR-15-054c2	665	667	Waste Rock	Mine Area	SPGN	SPGN		0.0040	-	-	0.12	-	-	-	0.020	-	-	-	388
39115	SRK	AR-15-054C4	694.5	697	Special Waste	Mine Area	SPGN	SPGN		-	< 0.010	243	0.14	17.0	60.0	36.0	-	0.060	61.0	19.0	1010
39116	SRK	AR-15-055	552	554	Waste Rock	Mine Area	SPGN	SPGN		0.0020	-	-	0.16	-	-	-	0.027	-	-	-	179
39117	SRK	AR-15-055	602.5	605	Waste Rock	Mine Area	SPGN	SPGN		0.0050	-	-	0.19	-	-	-	0.018	-	-	-	70.0
39118	SRK	AR-15-058C1	393	395.5	Waste Rock	Mine Area	SPGN	SPGN		0.015	-	-	0.080	-	-	-	0.095	-	-	-	63.0
39119	SRK	AR-15-059C1	424.5	426.5	Waste Rock	Mine Area	SPGN	SPGN		0.011	-	-	0.070	-	-	-	0.021	-	-	-	166
39120	SRK	AR-15-059C2	468	470.5	Special Waste	Mine Area	SPGN	SPGN		-	< 0.010	5.00	0.23	37.0	78.0	62.0	-	0.080	71.0	24.0	193
39122	SRK	AR-15-059C4	498.5	500.5	Waste Rock	Mine Area	SPGN	SPGN		0.0010	-	-	0.10	-	-	-	0.019	-	-	-	349
39123	SRK	AR-15-059C4	556	558.5	Waste Rock	Mine Area	SPGN	SPGN		0.0050	-	-	0.090	-	-	-	0.0040	-	-	-	399
39125	SRK	AR-15-060C2	404.5	407	Waste Rock	Mine Area	SPGN	SPGN		-	< 0.010	8.00	0.15	19.0	18.0	19.0	-	0.010	14.0	6.00	72.0
39126	SRK	AR-15-060C2	481	483.5	Special Waste	Mine Area	SPGN	SPGN		-	< 0.010	< 1.00	0.10	11.0	38.0	23.0	-	0.040	25.0	11.0	125
39127	SRK	AR-15-061C1	548	550.5	Waste Rock	Mine Area	SPGN	SPGN		0.0030	-	-	0.19	-	-	-	0.0060	-	-	-	325
39128	SRK	AR-15-061C2	504	506.5	Special Waste	Mine Area	SPGN	SPGN		-	< 0.010	10.0	0.25	22.0	3.00	35.0	-	< 0.010	32.0	1.00	300

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4 Acid Digestion and ICP-OES finish											
									Analyte	Sc	Sm	Sn	Sr	Ta	Tb	Th	TiO_2	TiO_2	U	V	W
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	wt. %	wt. %	ppm	ppm	ppm
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion
									Detection Limit	1	1	1	1	1	1	1	0.002	0.01	2	0.1	1
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4
39060	SRK	GAR-18-009	467	468.5	Waste Rock	Mine Area	INT	INT		-	-	-	162	-	-	-	0.47	-	-	68.6	-
39062	SRK	GAR-18-009	524.5	526	Waste Rock	Mine Area	INT	INT		-	-	-	98.0	-	-	-	0.54	-	-	84.3	-
39063	SRK	GAR-18-013	510	512	Waste Rock	Mine Area	INT	INT		-	-	-	25.0	-	-	-	0.73	-	-	98.1	-
39064	SRK	GAR-18-013	430	431	Waste Rock	Mine Area	INT	INT		-	-	-	15.0	-	-	-	0.41	-	-	50.5	-
39066	SRK	GAR-18-006	400.5	402	Waste Rock	Mine Area	INT	INT		-	-	-	141	-	-	-	0.77	-	-	125	-
39067	SRK	GAR-18-006	350.5	352	Waste Rock	Mine Area	INT	INT		-	-	-	92.0	-	-	-	0.52	-	-	76.0	-
39068	SRK	GAR-18-006	298.5	300	Waste Rock	Mine Area	INT	INT		-	-	-	164	-	-	-	0.63	-	-	90.6	-
39069	SRK	GAR-18-006	200.1	201.5	Waste Rock	Mine Area	INT	INT		-	-	-	140	-	-	-	0.60	-	-	99.5	-
39070	SRK	GAR-18-006	121	122.5	Waste Rock	Mine Area	INT	INT		-	-	-	95.0	-	-	-	0.73	-	-	104	-
39077	SRK	GAR-18-006	500	501.5	Waste Rock	Mine Area	INT	INT		-	-	-	144	-	-	-	0.53	-	-	89.0	-
39078	SRK	GAR-18-006	450	451.5	Waste Rock	Mine Area	INT	INT		-	-	-	144	-	-	-	0.46	-	-	66.0	-
39084	SRK	AR-17-179C1	442	443.5	Waste Rock	Mine Area	INT	INT		-	-	-	31.0	-	-	-	0.46	-	-	67.1	-
39091	SRK	AR-15-052	625	626.5	Waste Rock	Mine Area	INT	INT		-	-	-	36.0	-	-	-	1.09	-	-	130	-
39079	SRK	AR-16-110C1	440	441.5	Waste Rock	Mine Area	INT	INT		6.00	9.00	3.00	155	1.00	< 1.00	271	-	0.74	60.0	90.0	2.00
39080	SRK	AR-16-110C1	471	472.5	Waste Rock	Mine Area	INT	INT		-	-	-	35.0	-	-	-	0.35	-	-	31.1	-
39081	SRK	AR-16-105C1	567	569	Special Waste	Mine Area	INT	INT		6.00	< 1.00	4.00	35.0	< 1.00	< 1.00	2.00	-	0.66	568	309	1.00
39082	SRK	AR-17-115C1	506.05	507.5	Waste Rock	Mine Area	INT	INT		-	-	-	49.0	-	-	-	0.60	-	-	70.4	-
39083	SRK	AR-17-147C3	476	478	Waste Rock	Mine Area	INT	INT		-	-	-	24.0	-	-	-	2.40	-	-	618	-
39085	SRK	AR-17-155C3	499	500	Waste Rock	Mine Area	INT	INT		-	-	-	32.0	-	-	-	0.71	-	-	173	-
39092	SRK	AR-16-110C2	498	500	Waste Rock	Mine Area	INT	INT		-	-	-	135	-	-	-	0.58	-	-	88.0	-
39093	SRK	AR-17-136C1	425	426.5	Waste Rock	Mine Area	INT	INT		-	-	-	22.0	-	-	-	0.62	-	-	92.2	-
39174	SRK	AR-17-147C1	480.1	482	Waste Rock	Mine Area	INT	INT		-	-	-	21.0	-	-	-	0.74	-	-	146	-
39176	SRK	AR-17-183C1	476.5	478.2	Waste Rock	Mine Area	INT	INT		-	-	-	27.0	-	-	-	0.92	-	-	441	-
39186	SRK	AR-18-208C1	560	562	Waste Rock	Mine Area	INT	INT		-	-	-	50.0	-	-	-	0.61	-	-	108	-
39189	SRK	AR-18-209C1	551	553	Waste Rock	Mine Area	INT	INT		-	-	-	57.0	-	-	-	0.80	-	-	190	-
39193	SRK	AR-18-200C4	569.5	571	Waste Rock	Mine Area	INT	INT		-	-	-	85.0	-	-	-	2.16	-	-	209	-
39072	SRK	GAR-18-006	50	51.5	Waste Rock	Mine Area	MST	MST		-	-	-	84.0	-	-	-	0.82	-	-	85.7	-
39190	SRK	GAR-18-015	13	14	Waste Rock	Mine Area	OVB	OVB		-	-	-	47.0	-	-	-	0.41	-	-	20.9	-
39191	SRK	GAR-18-013	11.3	15.8	Waste Rock	Mine Area	OVB	OVB		-	-	-	64.0	-	-	-	0.63	-	-	50.1	-
39163	SRK	AR-16-110C2	469.5	471	Waste Rock	Mine Area	PEG	SPGN		-	-	-	285	-	-	-	0.66	-	-	85.5	-
39192	SRK	AR-18-200C4	541	542.5	Waste Rock	Mine Area	PEG	SPGN		-	-	-	187	-	-	-	0.58	-	-	25.7	-
39056	SRK	GAR-18-012	660	661.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	36.0	-	-	-	0.60	-	-	73.6	-
39057	SRK	GAR-18-012	532	533.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	43.0	-	-	-	2.92	-	-	454	-
39058	SRK	GAR-18-012	431	432.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	35.0	-	-	-	0.57	-	-	72.6	-
39059	SRK	GAR-18-012	495	496.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	38.0	-	-	-	0.63	-	-	98.8	-
39061	SRK	GAR-18-011	651	652.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	24.0	-	-	-	0.49	-	-	59.5	-
39065	SRK	GAR-18-013	378	379	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	39.0	-	-	-	0.58	-	-	84.3	-
39074	SRK	GAR-18-006	650	651.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	33.0	-	-	-	0.79	-	-	137	-
39075	SRK	GAR-18-006	603.5	605	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	59.0	-	-	-	0.97	-	-	158	-
39076	SRK	GAR-18-006	550	551.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	24.0	-	-	-	0.69	-	-	101	-
39086	SRK	AR-17-120C2	685	686.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	73.0	-	-	-	0.72	-	-	254	-
39087	SRK	AR-15-052	418.5	420	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	33.0	-	-	-	0.92	-	-	119	-
39088	SRK	AR-15-052	456	457.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	78.0	-	-	-	0.51	-	-	127	-
39089	SRK	AR-15-052	499.5	501	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	70.0	-	-	-	0.72	-	-	173	-
39090	SRK	AR-15-052	561.5	563	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	81.0	-	-	-	0.76	-	-	117	-
39094	SRK	AR-14-015	690	691	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	28.0	-	-	-	0.60	-	-	161	-
39095	SRK	AR-14-028	372	374	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	42.0	-	-	-	0.76	-	-	253	-
39096	SRK	AR-14-026	479	481	Special Waste	Mine Area	SPGN	SPGN		21.0	6.00	3.00	170	3.00	< 1.00	20.0	-	1.11	1030	330	4.00
39097	SRK	AR-14-026	438	440	Special Waste	Mine Area	SPGN	SPGN		27.0	12.0	4.00	313	2.00	< 1.00	27.0	-	0.96	546	374	4.00
39098	SRK	AR-14-024	572	573.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	65.0	-	-	-	0.77	-	-	257	-
39099	SRK	AR-14-024	446	448	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	71.0	-	-	-	0.75	-	-	100	-
39101	SRK	AR-15-033	476	478	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	64.0	-	-	-	0.77	-	-	115	-
39102	SRK	AR-15-033	504.5	506	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	49.0	-	-	-	0.49	-	-	73.3	-
39103	SRK	AR-15-033	551	553	Special Waste	Mine Area	SPGN	SPGN		11.0	4.00	2.00	91.0	< 1.00	< 1.00	22.0	-	0.62	376	108	1.00
39104	SRK	AR-15-039W1	418.5	421	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	156	-	-	-	0.78	-	-	140	-
39105	SRK	AR-15-043A	368	370.5	Special Waste	Mine Area	SPGN	SPGN		15.0	1.00	4.00	81.0	3.00	< 1.00	19.0	-	0.73	1260	274	3.00
39106	SRK	AR-15-052	528	530	Special Waste	Mine Area	SPGN	SPGN		-	-	-	47	-	-	-	0.56	-	-	76	-
39107	SRK	AR-15-052	568.5	570.5	Special Waste	Mine Area	SPGN	SPGN		20.0	14.0	5.00	262	3.00	< 1.00	54.0	-	1.01	3220	472	6.00
39108	SRK	AR-15-052	590	592	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	71.0	-	-	-	0.57	-	-	128	-
39109	SRK	AR-15-034b	406	408.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	24.0	-	-	-	0.63	-	-	84.1	-
39110	SRK	AR-15-034b	667	669.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	67.0	-	-	-	0.82	-	-	166	-
39111	SRK	AR-15-036	340	342	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	97.0	-	-	-	0.74	-	-	104	-
39112	SRK	AR-15-057c3	367.5	369	Special Waste	Mine Area	SPGN	SPGN		11.0	9.00	1.00	174	< 1.00	< 1.00	16.0	-	0.61	390	158	< 1.00
39113	SRK	AR-15-054c2	530	531.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	52.0	-	-	-	0.72	-	-	99	-
39114	SRK	AR-15-054c2	665	667	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	58.0	-	-	-	0.50	-	-	86.3	-
39115	SRK	AR-15-054C4	694.5	697	Special Waste	Mine Area	SPGN	SPGN		14.0	6.00	4.00	161	3.00	< 1.00	28.0	-	0.59	457	281	2.00
39116	SRK	AR-15-055	552	554	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	80.0	-	-	-	0.91	-	-	159	-
39117	SRK	AR-15-055	602.5	605	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	49.0	-	-	-	0.88	-	-	193	-
39118	SRK	AR-15-058C1	393	395.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	197	-	-	-	0.72	-	-	72.6	-
39119	SRK	AR-15-059C1	424.5	426.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	51.0	-	-	-	0.52	-	-	62.6	-
39120	SRK	AR-15-059C2	468	470.5	Special Waste	Mine Area	SPGN	SPGN		23.0	8.00	3.00	258	2.00	< 1.00	32.0	-	1.21	727	394	1.00
39122	SRK	AR-15-059C4	498.5	500.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	52.0	-	-	-	0.56	-	-	110	-
39123	SRK	AR-15-059C4	556	558.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	27.0	-	-	-	0.59	-	-	96.3	-
39125	SRK	AR-15-060C2	404.5	407	Waste Rock	Mine Area	SPGN	SPGN		15.0	2.00	5.00	40.0	< 1.00	< 1.00	17.0	-	0.87	171	171	3.00
39126	SRK	AR-15-060C2	481	483.5	Special Waste	Mine Area	SPGN	SPGN		10.0	5.00	1.00	103	1.00	< 1.00	17.0	-	0.53	243	83.0	< 1.00
39127	SRK	AR-15-061C1	548	550.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	42.0	-	-	-	1.19	-	-	394	-
39128	SRK	AR-15-061C2	504	506.5	Special Waste	Mine Area	SPGN	SPGN		16.0	1.00	4.00	53.0	3.00	< 1.00	12.0	-	1.03	292	310	4.00

										Total - 4 Acid Digestion and ICP-OES finish				Partial -- Aqua Regia Digestion and ICP-MS finish											
Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping	Analyte	Y	Yb	Zn	Zr	Ag	As	Be	Bi	Cd	Co	Cs	Cu	Dy	Er	Eu	Ga
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion
									Detection Limit	1	0.1	1	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl
39060	SRK	GAR-18-009	467	468.5	Waste Rock	Mine Area	INT	INT		-	-	-	300	0.030	0.18	0.050	< 0.010	0.020	4.81	0.050	8.90	0.50	0.26	0.12	1.01
39062	SRK	GAR-18-009	524.5	526	Waste Rock	Mine Area	INT	INT		-	-	-	222	0.040	3.75	0.28	0.37	0.050	11.3	0.22	20.6	0.60	0.29	0.18	2.62
39063	SRK	GAR-18-013	510	512	Waste Rock	Mine Area	INT	INT		-	-	-	185	0.030	1.51	0.91	0.14	0.040	13.6	0.31	14.8	0.73	0.26	0.45	4.70
39064	SRK	GAR-18-013	430	431	Waste Rock	Mine Area	INT	INT		-	-	-	201	< 0.010	1.58	0.18	0.10	0.010	4.94	0.090	1.10	0.34	0.17	0.10	2.18
39066	SRK	GAR-18-006	400.5	402	Waste Rock	Mine Area	INT	INT		-	-	-	191	0.050	0.52	0.080	0.010	0.10	11.3	0.29	34.1	0.49	0.27	0.16	2.50
39067	SRK	GAR-18-006	350.5	352	Waste Rock	Mine Area	INT	INT		-	-	-	213	0.020	0.41	0.12	0.020	0.010	6.95	0.60	12.2	2.54	1.27	0.75	2.88
39068	SRK	GAR-18-006	298.5	300	Waste Rock	Mine Area	INT	INT		-	-	-	229	0.010	0.48	0.060	< 0.010	0.020	7.86	0.30	5.17	1.12	0.48	0.34	2.28
39069	SRK	GAR-18-006	200.1	201.5	Waste Rock	Mine Area	INT	INT		-	-	-	208	0.040	0.50	0.080	0.050	0.040	10.4	0.27	27.0	1.06	0.42	0.36	2.88
39070	SRK	GAR-18-006	121	122.5	Waste Rock	Mine Area	INT	INT		-	-	-	304	< 0.010	0.21	0.22	0.030	< 0.010	0.63	0.050	0.55	0.16	0.090	0.12	0.47
39077	SRK	GAR-18-006	500	501.5	Waste Rock	Mine Area	INT	INT		-	-	-	155	0.040	0.46	0.070	0.040	0.030	9.93	0.30	21.0	1.00	0.48	0.25	2.57
39078	SRK	GAR-18-006	450	451.5	Waste Rock	Mine Area	INT	INT		-	-	-	138	0.030	0.55	0.060	0.010	0.070	6.35	0.11	10.6	0.56	0.33	0.17	1.64
39084	SRK	AR-17-179C1	442	443.5	Waste Rock	Mine Area	INT	INT		-	-	-	118	< 0.010	0.97	1.14	0.080	0.010	7.04	0.46	5.52	0.70	0.36	0.54	6.31
39091	SRK	AR-15-052	625	626.5	Waste Rock	Mine Area	INT	INT		-	-	-	339	0.020	1.01	0.39	0.090	0.020	13.4	0.29	1.12	1.84	0.80	0.82	5.50
39079	SRK	AR-16-110C1	440	441.5	Waste Rock	Mine Area	INT	INT		18.0	1.30	21.0	602	-	-	-	-	-	-	-	-	-	-	-	-
39080	SRK	AR-16-110C1	471	472.5	Waste Rock	Mine Area	INT	INT		-	-	-	167	0.060	0.75	0.94	0.73	0.040	10.4	0.22	31.5	0.46	0.24	0.25	4.50
39081	SRK	AR-16-105C1	567	569	Special Waste	Mine Area	INT	INT		10.0	0.90	1.00	190	-	-	-	-	-	-	-	-	-	-	-	-
39082	SRK	AR-17-115C1	506.05	507.5	Waste Rock	Mine Area	INT	INT		-	-	-	351	0.050	0.47	0.080	0.10	0.020	5.35	1.22	7.74	1.42	0.47	0.54	2.23
39083	SRK	AR-17-147C3	476	478	Waste Rock	Mine Area	INT	INT		-	-	-	88.0	0.020	0.84	0.92	0.36	0.010	12.7	0.10	11.6	0.99	0.65	0.080	4.66
39085	SRK	AR-17-155C3	499	500	Waste Rock	Mine Area	INT	INT		-	-	-	258	0.050	0.75	0.77	0.86	0.030	12.9	0.17	174	0.90	0.49	0.12	3.42
39092	SRK	AR-16-110C2	498	500	Waste Rock	Mine Area	INT	INT		-	-	-	133	0.030	0.95	1.61	0.090	0.020	9.97	0.32	26.1	1.12	0.54	0.30	7.26
39093	SRK	AR-17-136C1	425	426.5	Waste Rock	Mine Area	INT	INT		-	-	-	98.0	0.030	0.66	1.81	0.26	0.020	14.2	0.15	2.65	0.83	0.48	0.080	6.85
39174	SRK	AR-17-147C1	480.1	482	Waste Rock	Mine Area	INT	INT		-	-	-	145	0.030	0.82	0.92	0.63	< 0.010	29.4	0.10	15.3	1.17	0.65	0.060	2.79
39176	SRK	AR-17-183C1	476.5	478.2	Waste Rock	Mine Area	INT	INT		-	-	-	319	0.040	0.44	0.59	0.56	0.040	2.10	0.20	5.77	0.60	0.29	0.050	2.09
39186	SRK	AR-18-208C1	560	562	Waste Rock	Mine Area	INT	INT		-	-	-	218	0.020	1.41	0.90	0.16	0.010	7.86	0.22	16.2	0.76	0.39	0.18	3.81
39189	SRK	AR-18-209C1	551	553	Waste Rock	Mine Area	INT	INT		-	-	-	194	0.080	1.37	0.58	0.73	0.020	21.1	0.090	47.6	0.45	0.20	0.11	2.42
39193	SRK	AR-18-200C4	569.5	571	Waste Rock	Mine Area	INT	INT		-	-	-	99.0	0.050	1.44	1.44	0.61	0.020	20.1	0.53	10.8	2.23	1.27	0.38	9.29
39072	SRK	GAR-18-006	50	51.5	Waste Rock	Mine Area	MST	MST		-	-	-	157	0.090	2.46	0.66	0.19	0.070	8.84	0.88	10.3	1.90	0.91	0.62	1.74
39190	SRK	GAR-18-015	13	14	Waste Rock	Mine Area	OVB	OVB		-	-	-	148	1.19	0.59	0.45	0.10	0.040	1.54	0.23	4.96	0.60	0.28	0.18	0.56
39191	SRK	GAR-18-013	11.3	15.8	Waste Rock	Mine Area	OVB	OVB		-	-	-	303	4.36	1.24	0.90	0.15	0.11	7.30	0.62	21.4	2.01	0.91	0.75	1.00
39163	SRK	AR-16-110C2	469.5	471	Waste Rock	Mine Area	PEG	SPGN		-	-	-	125	0.030	0.57	0.090	0.10	0.030	10.8	2.01	16.4	1.33	0.68	0.38	5.93
39192	SRK	AR-18-200C4	541	542.5	Waste Rock	Mine Area	PEG	SPGN		-	-	-	128	0.23	1.07	0.33	0.38	0.22	3.21	0.17	32.3	0.80	0.31	0.74	2.74
39056	SRK	GAR-18-012	660	661.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	341	0.010	1.76	0.050	0.020	0.010	7.39	0.26	8.72	0.24	0.13	0.20	2.15
39057	SRK	GAR-18-012	532	533.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	1210	0.010	0.20	1.98	0.060	0.010	3.68	0.42	1.02	0.49	0.30	0.080	2.68
39058	SRK	GAR-18-012	431	432.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	284	< 0.010	0.52	0.12	0.040	< 0.010	5.58	0.18	2.35	0.24	0.15	0.14	2.41
39059	SRK	GAR-18-012	495	496.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	323	0.090	1.30	0.14	0.26	0.030	6.81	0.080	2.55	0.20	0.11	0.040	1.42
39061	SRK	GAR-18-011	651	652.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	281	< 0.010	1.11	0.16	0.060	< 0.010	5.27	0.25	2.74	0.43	0.18	0.32	1.93
39065	SRK	GAR-18-013	378	379	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	238	< 0.010	2.04	0.27	0.40	< 0.010	7.22	0.11	2.17	0.26	0.14	0.10	3.06
39074	SRK	GAR-18-006	650	651.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	371	< 0.010	0.30	0.12	0.030	< 0.010	0.36	0.13	1.23	0.15	0.090	0.050	0.31
39075	SRK	GAR-18-006	603.5	605	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	147	< 0.010	0.43	0.020	0.070	< 0.010	9.32	0.79	7.59	1.49	0.67	0.85	2.64
39076	SRK	GAR-18-006	550	551.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	210	0.030	1.29	0.14	0.38	0.030	14.8	0.29	15.2	0.59	0.28	0.22	2.46
39086	SRK	AR-17-120C2	685	686.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	216	0.090	13.6	0.17	1.33	0.030	23.4	0.080	95.6	0.30	0.15	0.070	0.82
39087	SRK	AR-15-052	418.5	420	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	194	< 0.010	0.66	0.030	0.10	0.010	11.2	0.51	15.2	0.46	0.17	0.31	2.62
39088	SRK	AR-15-052	456	457.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	201	0.020	1.61	0.49	0.91	0.030	4.70	0.14	20.2	0.35	0.20	0.10	1.06
39089	SRK	AR-15-052	499.5	501	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	427	0.020	0.20	0.12	0.060	< 0.010	1.23	0.060	1.09	0.15	0.090	0.040	0.47
39090	SRK	AR-15-052	561.5	563	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	233	0.040	0.49	0.13	0.32	0.020	2.92	0.10	14.2	0.57	0.30	0.17	1.13
39094	SRK	AR-14-015	690	691	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	293	0.020	16.5	0.30	1.80	0.13	3.07	0.070	10.6	1.18	0.55	0.17	1.66
39095	SRK	AR-14-028	372	374	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	307	0.010	1.57	0.22	0.81	0.030	2.85	0.060	13.0	1.26	0.50	0.22	1.73
39096	SRK	AR-14-026	479	481	Special Waste	Mine Area	SPGN	SPGN		38.0	3.60	17.0	469	-	-	-	-	-	-	-	-	-	-	-	-
39097	SRK	AR-14-026	438	440	Special Waste	Mine Area	SPGN	SPGN		48.0	5.60	14.0	414	-	-	-	-	-	-	-	-	-	-	-	-
39098	SRK	AR-14-024	572	573.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	470	0.040	1.28	0.14	2.08	0.020	1.21	0.10	19.6	0.24	0.15	0.030	0.84
39099	SRK	AR-14-024	446	448	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	213	0.020	1.16	0.14	0.77	0.020	7.51	0.080	10.6	0.24	0.14	0.090	2.37
39101	SRK	AR-15-033	476	478	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	291	0.020	2.10	0.29	0.38	0.010	5.13	0.090	4.31	0.37	0.18	0.070	2.11
39102	SRK	AR-15-033	504.5	506	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	157	0.030	1.14	0.36	0.36	0.010	5.12	0.19	8.88	0.47	0.24	0.080	2.05
39103	SRK	AR-15-033	551	553	Special Waste	Mine Area	SPGN	SPGN		25.0	2.30	14.0	247	-	-	-	-	-	-	-	-	-	-	-	-
39104	SRK	AR-15-039W1	418.5	421	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	268	0.020	1.55	0.23	0.060	< 0.010	2.62	0.10	3.82	0.27	0.14	0.10	0.83
39105	SRK	AR-15-043A	368	370.5	Special Waste	Mine Area	SPGN	SPGN		31.0	3.30	19.0	294	-	-	-	-	-	-	-	-	-	-	-	-
39106	SRK	AR-15-052	528	530	Special Waste	Mine Area	SPGN	SPGN		-	-	-	330	0.020	3.09	0.15	0.950	0.030	1.30	0.07	4	0.4	0.21	0.07	0.54
39107	SRK	AR-15-052	568.5	570.5	Special Waste	Mine Area	SPGN	SPGN		30.0	2.60	10.0	350	-	-	-	-	-	-	-	-	-	-	-	-
39108	SRK	AR-15-052	590	592	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	239	0.22	3.56	0.19	2.69	0.040	23.9	0.10	28.5	0.69	0.29	0.16	1.49
39109	SRK	AR-15-034b	406	408.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	333	0.090	2.95	0.24	1.66	0.020	7.14	0.39	2.47	0.99	0.49	0.35	2.08
39110	SRK	AR-15-034b	667	669.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	279	0.030	3.39	0.40	1.32	0.040	4.96	0.17	119	0.68	0.35	0.13	2.27
39111	SRK	AR-15-036	340	342	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	222	0.050	1.84	0.38	0.24	0.18	11.0	0.10	8.45	0.46	0.26	0.13	2.27
39112	SRK	AR-15-057c3	367.5	369	Special Waste	Mine Area	SPGN	SPGN		42.0	3.80	24.0	298	-	-	-	-	-	-	-	-	-	-	-	-
39113	SRK	AR-15-054c2	530	531.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	316	0.110	2.29	0.19	2.11	0.07	8.6	0.10	9.68	0.31	0.16	0.07	1.14
39114	SRK	AR-15-054c2	665	667	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	286	0.040	1.51	0.12	0.30	0.020	2.67	0.060	4.17	0.13	0.080	0.050	0.70
39115	SRK	AR-15-054C4	694.5	697	Special Waste	Mine Area	SPGN	SPGN		20.0	2.20	11.0	225	-	-	-	-	-	-	-	-	-	-	-	-
39116	SRK	AR-15-055	552	554	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	279	0.040	2.18	0.21	0.43	0.050	3.02	0.10	12.7	0.27	0.15	0.080	0.83
39117	SRK	AR-15-055	602.5	605	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	283	0.070	1.21	0.21	0.92	0.10	3.46	0.10	1.68	0.26	0.13	0.080	1.43
39118	SRK	AR-15-058C1	393	395.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	337	0.030	4.46	0.41	0.40	0.020	4.19	0.11	5.84	0.46	0.23	0.10	0.96
39119	SRK	AR-15-059C1	424.5	426.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	285	0.010	0.53	0.15	0.17	0.010	3.56	0.060	2.46	0.26	0.14	0.070	1.07
39120	SRK	AR-15-059C2	468	470.5	Special Waste	Mine Area	SPGN	SPGN		33.0	3.60	32.0	477	-	-	-	-	-	-	-	-	-	-	-	-
39122	SRK	AR-15-059C4	498.5	500.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	320	0.070	2.08	0.13	0.82	0.020	2.64	0.070	24.9	0.28	0.14	0.060	0.63
39123	SRK	AR-15-059C4	556	558.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	272	0.020	4.05	0.20	0.30	0.14	7.29	0.090	212	0.11	0.060	0.020	1.10
39125	SRK	AR-15-060C2	404.5	407	Waste Rock	Mine Area	SPGN	SPGN		19.0	2.20	6.00	251	-	-	-	-	-	-	-	-	-	-	-	-
39126	SRK	AR-15-060C2	481	483.5	Special Waste	Mine Area	SPGN	SPGN		22.0	2.40	13.0	325	-	-	-	-	-	-	-	-	-	-	-	-
39127	SRK	AR-15-061C1	548	550.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	467	0.76	0.63	0.24	2.17	0.37	3.73	0.19	5.50	0.11	0.060	0.020	1.12
39128	SRK	AR-15-061C2	504	506.5	Special Waste	Mine Area	SPGN	SPGN		47.0	4.70	6.00	392	-	-	-	-	-	-	-	-	-	-	-	-

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Partial -- Aqua Regia Digestion and ICP-MS finish																	
									Analyte	Gd	Ge	Hf	Hg	Ho	Mo	Nb	Nd	Ni	Pb204	Pb206	Pb207	Pb208	PbSUM	Pr	Rb	Sb	Sc
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion
									Detection Limit	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.001	0.001	0.001	0.001	0.001	0.01	0.01	0.01	0.1
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl
39060	SRK	GAR-18-009	467	468.5	Waste Rock	Mine Area	INT	INT		0.98	0.020	0.030	< 0.010	0.090	0.30	0.010	9.40	15.5	0.037	1.22	0.62	2.14	4.02	2.47	9.32	< 0.010	0.80
39062	SRK	GAR-18-009	524.5	526	Waste Rock	Mine Area	INT	INT		0.94	0.020	0.060	< 0.010	0.11	0.95	0.020	7.38	26.7	0.077	1.53	1.15	3.42	6.18	1.88	34.2	< 0.010	4.00
39063	SRK	GAR-18-013	510	512	Waste Rock	Mine Area	INT	INT		1.86	0.020	0.10	< 0.010	0.10	1.80	0.020	15.4	31.5	0.070	2.19	1.11	3.26	6.63	4.09	12.8	< 0.010	3.40
39064	SRK	GAR-18-013	430	431	Waste Rock	Mine Area	INT	INT		0.54	< 0.010	0.090	< 0.010	0.060	0.10	0.020	4.36	14.6	0.013	0.28	0.19	0.66	1.15	1.18	3.81	< 0.010	1.40
39066	SRK	GAR-18-006	400.5	402	Waste Rock	Mine Area	INT	INT		0.76	0.030	0.060	< 0.010	0.10	0.60	0.010	6.17	37.1	0.076	1.28	1.10	2.94	5.39	1.59	38.2	< 0.010	1.90
39067	SRK	GAR-18-006	350.5	352	Waste Rock	Mine Area	INT	INT		2.86	0.030	0.040	< 0.010	0.49	0.21	0.040	17.8	19.9	0.027	0.55	0.41	1.46	2.46	4.85	44.3	< 0.010	3.00
39068	SRK	GAR-18-006	298.5	300	Waste Rock	Mine Area	INT	INT		1.56	0.050	0.020	< 0.010	0.19	0.40	0.030	10.1	13.5	0.035	0.61	0.52	1.50	2.67	2.58	49.8	< 0.010	4.40
39069	SRK	GAR-18-006	200.1	201.5	Waste Rock	Mine Area	INT	INT		1.44	0.050	0.030	0.010	0.17	0.45	0.030	8.34	23.2	0.054	0.91	0.81	2.13	3.90	2.21	49.5	< 0.010	4.30
39070	SRK	GAR-18-006	121	122.5	Waste Rock	Mine Area	INT	INT		0.43	0.020	0.31	0.010	0.030	0.090	0.020	3.70	2.72	0.012	0.31	0.18	0.65	2.14	1.11	1.11	0.010	0.60
39077	SRK	GAR-18-006	500	501.5	Waste Rock	Mine Area	INT	INT		1.38	0.040	0.050	0.010	0.18	0.80	0.040	8.91	36.3	0.074	1.37	1.19	3.31	5.95	2.34	45.3	< 0.010	3.60
39078	SRK	GAR-18-006	450	451.5	Waste Rock	Mine Area	INT	INT		0.82	0.030	0.040	< 0.010	0.12	0.24	0.020	6.47	21.9	0.16	2.66	2.46	6.25	11.5	1.72	23.2	< 0.010	2.50
39084	SRK	AR-17-179C1	442	443.5	Waste Rock	Mine Area	INT	INT		1.84	0.020	0.090	0.010	0.12	2.63	0.030	16.4	23.1	0.0070	0.66	0.15	0.50	1.31	4.54	11.3	< 0.010	5.10
39091	SRK	AR-15-052	625	626.5	Waste Rock	Mine Area	INT	INT		3.62	0.030	0.11	< 0.010	0.31	6.68	0.020	25.4	26.9	0.013	0.48	0.22	0.83	1.54	7.00	8.19	< 0.010	5.10
39079	SRK	AR-16-110C1	440	441.5	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39080	SRK	AR-16-110C1	471	472.5	Waste Rock	Mine Area	INT	INT		1.16	< 0.010	0.080	< 0.010	0.080	12.0	< 0.010	11.4	20.2	0.020	2.27	0.49	1.00	3.78	3.13	5.98	< 0.010	1.90
39081	SRK	AR-16-105C1	567	569	Special Waste	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39082	SRK	AR-17-115C1	506.05	507.5	Waste Rock	Mine Area	INT	INT		2.19	0.040	0.030	< 0.010	0.22	1.20	0.11	14.1	12.3	0.024	0.61	0.37	1.08	2.08	3.82	41.8	< 0.010	3.20
39083	SRK	AR-17-147C3	476	478	Waste Rock	Mine Area	INT	INT		0.51	< 0.010	0.14	< 0.010	0.23	2.19	< 0.010	1.54	40.2	0.010	1.36	0.28	0.47	2.12	0.33	3.28	< 0.010	8.70
39085	SRK	AR-17-155C3	499	500	Waste Rock	Mine Area	INT	INT		1.20	< 0.010	0.20	< 0.010	0.18	8.74	< 0.010	10.2	36.0	0.033	7.71	0.94	2.41	11.1	2.96	3.66	< 0.010	2.40
39092	SRK	AR-16-110C2	498	500	Waste Rock	Mine Area	INT	INT		1.89	0.030	0.16	< 0.010	0.21	5.21	0.020	14.0	54.0	0.013	1.74	0.30	0.67	2.72	3.50	13.0	< 0.010	5.70
39093	SRK	AR-17-136C1	425	426.5	Waste Rock	Mine Area	INT	INT		1.08	0.010	0.14	< 0.010	0.17	3.44	< 0.010	6.73	51.5	0.018	2.89	0.48	0.79	4.18	1.51	4.45	< 0.010	5.20
39174	SRK	AR-17-147C1	480.1	482	Waste Rock	Mine Area	INT	INT		0.60	< 0.010	0.17	< 0.010	0.25	1.76	< 0.010	1.35	30.8	0.018	3.09	0.47	0.84	4.42	0.31	3.37	< 0.010	2.40
39176	SRK	AR-17-183C1	476.5	478.2	Waste Rock	Mine Area	INT	INT		0.28	< 0.010	0.23	0.010	0.12	14.0	< 0.010	0.58	17.1	0.0040	3.04	0.23	0.25	3.53	0.16	2.32	< 0.010	1.70
39186	SRK	AR-18-208C1	560	562	Waste Rock	Mine Area	INT	INT		1.05	< 0.010	0.090	< 0.010	0.15	1.43	< 0.010	7.60	27.5	0.029	3.32	0.66	1.70	5.71	1.98	12.1	< 0.010	3.80
39189	SRK	AR-18-209C1	551	553	Waste Rock	Mine Area	INT	INT		0.61	0.010	0.18	< 0.010	0.080	3.51	0.010	4.46	42.5	0.047	1.84	0.76	2.01	4.66	1.17	3.24	< 0.010	1.50
39193	SRK	AR-18-200C4	569.5	571	Waste Rock	Mine Area	INT	INT		3.32	0.050	0.050	0.020	0.47	2.64	0.050	25.0	25.2	0.022	0.89	0.39	0.93	2.23	5.61	16.7	< 0.010	8.60
39072	SRK	GAR-18-006	50	51.5	Waste Rock	Mine Area	MST	MST		2.50	< 0.010	0.45	0.040	0.36	0.38	0.050	14.4	15.5	0.14	2.30	1.99	4.89	9.33	3.63	10.8	0.040	3.00
39190	SRK	GAR-18-015	13	14	Waste Rock	Mine Area	OVB	OVB		0.88	< 0.010	0.34	0.030	0.11	0.21	0.040	5.82	3.04	0.094	1.74	1.46	3.52	6.82	1.59	1.80	0.030	0.70
39191	SRK	GAR-18-013	11.3	15.8	Waste Rock	Mine Area	OVB	OVB		3.05	< 0.010	1.63	0.29	0.36	0.39	0.46	19.1	11.9	0.25	5.01	3.88	9.84	19.0	4.86	6.11	0.030	2.10
39163	SRK	AR-16-110C2	469.5	471	Waste Rock	Mine Area	PEG	SPGN		1.65	0.060	0.050	< 0.010	0.26	0.86	0.090	9.14	26.2	0.050	1.03	0.78	2.06	3.92	2.21	44.5	< 0.010	6.50
39192	SRK	AR-18-200C4	541	542.5	Waste Rock	Mine Area	PEG	SPGN		2.52	< 0.010	0.080	0.020	0.11	3.35	0.030	26.6	2.96	0.20	3.52	3.10	7.29	14.1	6.79	7.15	< 0.010	0.40
39056	SRK	GAR-18-012	660	661.5	Waste Rock	Mine Area	SPGN	SPGN		0.63	0.030	0.020	< 0.010	0.040	1.24	0.020	6.45	28.6	0.024	0.44	0.36	1.12	1.94	1.76	30.4	< 0.010	3.30
39057	SRK	GAR-18-012	532	533.5	Waste Rock	Mine Area	SPGN	SPGN		0.45	< 0.010	0.21	< 0.010	0.10	3.49	0.010	3.47	25.0	0.0070	0.49	0.14	0.66	1.29	0.88	6.77	< 0.010	5.90
39058	SRK	GAR-18-012	431	432.5	Waste Rock	Mine Area	SPGN	SPGN		0.57	0.010	0.080	< 0.010	0.050	0.78	0.020	6.14	18.3	0.019	0.48	0.30	1.03	1.83	1.60	9.37	< 0.010	2.30
39059	SRK	GAR-18-012	495	496.5	Waste Rock	Mine Area	SPGN	SPGN		0.14	0.010	0.10	< 0.010	0.040	8.20	0.020	0.72	11.3	0.015	1.58	0.31	0.62	2.53	0.19	1.60	< 0.010	2.60
39061	SRK	GAR-18-011	651	652.5	Waste Rock	Mine Area	SPGN	SPGN		1.16	0.010	0.030	< 0.010	0.060	0.58	0.060	11.3	14.6	0.016	0.33	0.23	0.85	1.43	3.12	16.3	< 0.010	2.50
39065	SRK	GAR-18-013	378	379	Waste Rock	Mine Area	SPGN	SPGN		0.58	0.010	0.080	< 0.010	0.050	0.36	0.020	5.83	17.3	0.0080	0.30	0.13	0.59	1.02	1.58	4.18	< 0.010	1.60
39074	SRK	GAR-18-006	650	651.5	Waste Rock	Mine Area	SPGN	SPGN		0.19	< 0.010	0.10	< 0.010	0.030	0.28	< 0.010	1.68	2.34	0.0050	0.19	0.082	0.28	0.56	0.49	1.57	< 0.010	0.30
39075	SRK	GAR-18-006	603.5	605	Waste Rock	Mine Area	SPGN	SPGN		3.01	0.020	0.030	< 0.010	0.24	0.97	0.050	29.6	19.1	0.013	0.34	0.21	0.97	1.53	8.43	41.9	< 0.010	2.20
39076	SRK	GAR-18-006	550	551.5	Waste Rock	Mine Area	SPGN	SPGN		0.86	0.020	0.040	< 0.010	0.11	1.20	0.020	5.71	23.9	0.053	1.06	0.81	2.17	4.10	1.52	21.4	< 0.010	2.60
39086	SRK	AR-17-120C2	685	686.5	Waste Rock	Mine Area	SPGN	SPGN		0.36	< 0.010	0.10	0.010	0.060	9.77	0.020	2.63	28.1	0.039	1.79	0.65	1.79	4.28	0.68	2.17	0.050	0.60
39087	SRK	AR-15-052	418.5	420	Waste Rock	Mine Area	SPGN	SPGN		0.90	0.040	0.030	< 0.010	0.080	1.00	0.050	7.14	24.0	0.019	0.40	0.29	0.94	1.65	1.92	57.7	< 0.010	4.80
39088	SRK	AR-15-052	456	457.5	Waste Rock	Mine Area	SPGN	SPGN		0.65	< 0.010	0.15	< 0.010	0.070	5.71	0.020	7.27	12.7	0.020	1.29	0.38	1.09	2.78	2.09	2.51	0.020	0.80
39089	SRK	AR-15-052	499.5	501	Waste Rock	Mine Area	SPGN	SPGN		0.24	< 0.010	0.17	< 0.010	0.030	0.26	< 0.010	2.48	4.15	0.0040	0.26	0.075	0.34	0.68	0.74	1.50	< 0.010	0.30
39090	SRK	AR-15-052	561.5	563	Waste Rock	Mine Area	SPGN	SPGN		0.85	< 0.010	0.11	< 0.010	0.12	7.89	0.020	7.09	8.66	0.010	2.39	0.31	0.72	3.43	2.04	2.46	< 0.010	0.90
39094	SRK	AR-14-015	690	691	Waste Rock	Mine Area	SPGN	SPGN		0.93	< 0.010	0.47	< 0.010	0.21	5.58	0.030	4.52	20.8	0.13	14.7	2.87	6.65	24.3	1.20	1.68	0.18	1.20
39095	SRK	AR-14-028	372	374	Waste Rock	Mine Area	SPGN	SPGN		1.05	< 0.010	0.47	< 0.010	0.22	4.05	0.020	1.29	15.0	0.0080	3.32	0.26	0.47	4.06	0.32	1.90	0.030	1.10
39096	SRK	AR-14-026	479	481	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39097	SRK	AR-14-026	438	440	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39098	SRK	AR-14-024	572	573.5	Waste Rock	Mine Area	SPGN	SPGN		0.19	< 0.010	0.26	< 0.010	0.050	4.73	0.020	1.10	5.84	0.020	2.93	0.49	1.07	4.51	0.32	1.71	0.020	0.50
39099	SRK	AR-14-024	446	448	Waste Rock	Mine Area	SPGN	SPGN		0.35	0.020	0.11	0.010	0.040	3.07	0.070	2.73	20.4	0.047	4.05	0.95	2.08	7.13	0.81	3.11	< 0.010	2.20
39101	SRK	AR-15-033	476	478	Waste Rock	Mine Area	SPGN	SPGN		0.34	< 0.010	0.25	< 0.010	0.070	0.51	0.050	1.91	17.1	0.0060	1.23	0.13	0.35	1.72	0.57	1.54	< 0.010	1.60
39102	SRK	AR-15-033	504.5	506	Waste Rock	Mine Area	SPGN	SPGN		0.47	< 0.010	0.14	< 0.010	0.090	2.61	0.020	2.92	17.9	0.0080	1.24	0.18	0.63	2.06	0.82	3.92	< 0.010	1.20
39103	SRK	AR-15-033	551	553	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39104	SRK	AR-15-039W1	418.5	421	Waste Rock	Mine Area	SPGN	SPGN		0.40	< 0.010	0.21	< 0.010	0.050	0.15	0.010	3.69	13.7	0.0090	0.61	0.17	0.55	1.34	1.02	2.33	0.010	0.70
39105	SRK	AR-15-043A	368	370.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39106	SRK	AR-15-052	528	530	Special Waste	Mine Area	SPGN	SPGN		0.35	< 0.010	0.23	< 0.010	0.080	1.83	< 0.010	2.75	6.5	0.0160	2.44	0.37	0.83	3.65	0.82	1.40	0.030	0.60
39107	SRK	AR-15-052	568.5	570.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39108	SRK	AR-15-052	590	592	Waste Rock	Mine Area	SPGN	SPGN		0.78	0.010	0.10	0.010	0.12	10.4	0.020	5.95	63.9	0.057	3.84	1.06	2.63	7.58	1.60	2.88	0.020	0.70
39109	SRK	AR-15-034b	406	408.5	Waste Rock	Mine Area	SPGN	SPGN		1.47	0.020	0.11	< 0.010	0.19	4.64	0.040	9.98	15.7	0.027	4.35	0.67	1.35	6.40	2.73	18.6	0.010	2.20
39110	SRK	AR-15-034b	667	669.5	Waste Rock	Mine Area	SPGN	SPGN		0.65	0.010	0.18	< 0.010	0.14	10.4	0.060	3.76	19.7	0.030	3.81	0.64	1.51	5.99	1.03	4.10	0.020	2.50
39111	SRK	AR-15-036	340	342	Waste Rock	Mine Area	SPGN	SPGN		0.64	0.010	0.22	< 0.010	0.090	0.40	0.070	5.60	48.2	0.036	2.20	0.62	1.71	4.56	1.61	2.16	0.030	2.10
39112	SRK	AR-15-057c3	367.5	369	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39113	SRK	AR-15-054c2	530	531.5	Special Waste	Mine Area	SPGN	SPGN		0.32	< 0.010	0.12	0.020	0.060	27.20	0.030	2.52	8.5	0.026	3.91	0.61	1.36	5.90	0.74	2.66	0.020	1.00
39114	SRK	AR-15-054c2	665	667	Waste Rock	Mine Area	SPGN	SPGN		0.26	< 0.010	0.060	< 0.010	0.030	5.19	0.010	2.79	5.59	0.0090	1.07	0.19	0.55	1.82	0.83	1.94	0.010	0.70
39115	SRK	AR-15-054C4	694.5	697	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39116	SRK	AR-15-055	552	554	Waste Rock	Mine Area	SPGN	SPGN		0.33	< 0.010	0.17	< 0.010	0.050	10.4	0.020	2.77	5.40	0.026	3.46	0.54	1.15	5.18	0.84	2.31	0.020	0.80
39117	SRK	AR-15-055	602.5	605	Waste Rock	Mine Area	SPGN	SPGN		0.32	0.010	0.17	< 0.010	0.050	39.0	0.040	2.45	8.85	0.015	2.69	0.29	0.78	3.78	0.74	2.65	0.020	1.50
39118	SRK	AR-15-058C1	393	395.5	Waste Rock	Mine Area	SPGN	SPGN		0.44	< 0.010	0.28	< 0.010	0.090	0.64	< 0.010	2.37	27.3	0.016	2.59	0.41	0.74	3.75	0.64	1.30	0.020	0.80
39119	SRK	AR-15-059C1	424.5	426.5	Waste Rock	Mine Area	SPGN	SPGN		0.34	< 0.010	0.11	< 0.010	0.060	0.60	0.040	2.96	10.7	0.0050	0.64	0.12	0.37	1.13	0.84	2.20	< 0.010	0.90
39120	SRK	AR-15-059C2	468	470.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39122	SRK	AR-15-059C4	498.5	500.5	Waste Rock	Mine Area	SPGN	SPGN		0.31	< 0.010	0.26	< 0.010	0.050	1.74	0.010	2.40	5.69	0.018	3.46	0.46	0.86	4.80	0.72	2.19	0.020	0.60
39123	SRK	AR-15-059C4	556	558.5	Waste Rock	Mine Area	SPGN	SPGN		0.12	< 0.010	0.10	< 0.010	0.020	63.1	0.010	0.96	7.33	0.023	49.9	4.01	1.07	55.0	0.28	1.94	0.020	0.90
39125	SRK	AR-15-060C2	404.5	407	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39126	SRK	AR-15-060C2	481	483.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39127	SRK	AR-15-061C1	548	550.5	Waste Rock	Mine Area	SPGN	SPGN		0.10	< 0.010	0.18	0.060	0.020	170	< 0.010	0.59	6.97	0.012	4.06	0.41	0.68	5.16	0.18	3.05	0.020	0.60
39128	SRK	AR-15-061C2	504	506.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Partial -- Aqua Regia Digestion and ICP-MS finish														Total - 4-Acid Digestion and ICP-MS finish		
									Analyte	Se	Sm	Sn	Ta	Tb	Te	Th	U	V	W	Y	Yb	Zn	Zr	Ag	Be	Bi
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion
									Detection Limit	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01	0.1	0.01	0.02	0.1	0.1
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HF/HNO_3/$HClO_4$	HF/HNO_3/$HClO_4$	HF/HNO_3/$HClO_4$
39060	SRK	GAR-18-009	467	468.5	Waste Rock	Mine Area	INT	INT		< 0.10	1.47	0.030	< 0.010	0.090	< 0.010	10.4	0.60	10.6	< 0.10	2.10	0.21	23.7	0.95	0.16	0.60	0.10
39062	SRK	GAR-18-009	524.5	526	Waste Rock	Mine Area	INT	INT		< 0.10	1.30	0.070	< 0.010	0.10	0.020	12.4	0.74	31.8	< 0.10	2.44	0.24	35.3	1.60	0.17	0.80	0.60
39063	SRK	GAR-18-013	510	512	Waste Rock	Mine Area	INT	INT		0.20	2.67	0.060	< 0.010	0.16	0.020	17.8	0.65	37.4	< 0.10	2.03	0.16	16.3	3.32	0.19	1.20	0.30
39064	SRK	GAR-18-013	430	431	Waste Rock	Mine Area	INT	INT		< 0.10	0.69	0.020	< 0.010	0.060	< 0.010	5.01	0.47	19.5	< 0.10	1.35	0.14	10.5	2.22	0.11	0.30	0.20
39066	SRK	GAR-18-006	400.5	402	Waste Rock	Mine Area	INT	INT		< 0.10	1.10	0.060	< 0.010	0.080	0.010	5.57	0.38	41.7	< 0.10	2.23	0.24	55.7	1.61	0.18	0.50	0.10
39067	SRK	GAR-18-006	350.5	352	Waste Rock	Mine Area	INT	INT		0.10	3.40	0.080	0.010	0.41	< 0.010	17.7	0.88	26.1	< 0.10	10.6	0.94	35.8	0.90	0.14	0.50	0.10
39068	SRK	GAR-18-006	298.5	300	Waste Rock	Mine Area	INT	INT		< 0.10	2.00	0.040	< 0.010	0.20	< 0.010	6.20	0.42	38.6	< 0.10	4.29	0.40	36.1	0.66	0.15	0.60	0.10
39069	SRK	GAR-18-006	200.1	201.5	Waste Rock	Mine Area	INT	INT		< 0.10	1.75	0.060	< 0.010	0.20	0.020	7.15	0.42	39.8	0.40	3.66	0.30	41.3	1.02	0.17	0.50	0.20
39070	SRK	GAR-18-006	121	122.5	Waste Rock	Mine Area	INT	INT		< 0.10	0.58	0.050	< 0.010	0.030	0.010	6.77	0.48	22.3	0.20	0.55	0.080	2.10	11.8	0.16	0.70	0.10
39077	SRK	GAR-18-006	500	501.5	Waste Rock	Mine Area	INT	INT		< 0.10	1.73	0.10	< 0.010	0.17	0.010	11.3	0.68	33.8	0.50	3.71	0.40	37.6	1.62	0.19	0.60	0.20
39078	SRK	GAR-18-006	450	451.5	Waste Rock	Mine Area	INT	INT		< 0.10	1.04	0.050	< 0.010	0.090	< 0.010	6.64	0.38	25.4	0.30	2.44	0.27	42.1	1.28	0.13	0.60	0.10
39084	SRK	AR-17-179C1	442	443.5	Waste Rock	Mine Area	INT	INT		< 0.10	2.58	0.37	< 0.010	0.15	< 0.010	8.30	3.13	39.2	0.10	2.48	0.29	20.4	2.68	0.090	2.10	0.20
39091	SRK	AR-15-052	625	626.5	Waste Rock	Mine Area	INT	INT		0.20	4.74	0.030	< 0.010	0.38	0.020	9.78	0.79	44.6	< 0.10	5.94	0.62	48.4	2.27	0.30	1.20	0.20
39079	SRK	AR-16-110C1	440	441.5	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39080	SRK	AR-16-110C1	471	472.5	Waste Rock	Mine Area	INT	INT		< 0.10	1.58	0.12	< 0.010	0.080	< 0.010	6.11	0.80	17.5	0.20	1.90	0.16	9.10	2.69	0.14	1.80	0.90
39081	SRK	AR-16-105C1	567	569	Special Waste	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39082	SRK	AR-17-115C1	506.05	507.5	Waste Rock	Mine Area	INT	INT		0.20	2.75	0.11	< 0.010	0.27	< 0.010	8.65	0.56	22.1	0.20	3.87	0.28	31.4	0.67	0.23	0.20	0.20
39083	SRK	AR-17-147C3	476	478	Waste Rock	Mine Area	INT	INT		< 0.10	0.37	0.050	< 0.010	0.14	0.020	0.50	3.51	89.1	0.20	4.85	0.56	12.6	3.19	0.090	3.20	0.50
39085	SRK	AR-17-155C3	499	500	Waste Rock	Mine Area	INT	INT		< 0.10	1.35	0.070	< 0.010	0.15	0.020	37.8	17.4	29.2	0.10	4.10	0.40	5.00	7.45	0.20	2.50	1.20
39092	SRK	AR-16-110C2	498	500	Waste Rock	Mine Area	INT	INT		0.10	2.48	0.31	< 0.010	0.21	0.010	4.42	0.97	48.4	< 0.10	4.72	0.40	20.6	4.30	0.12	2.80	0.20
39093	SRK	AR-17-136C1	425	426.5	Waste Rock	Mine Area	INT	INT		< 0.10	1.25	0.11	< 0.010	0.14	0.010	1.06	1.60	45.0	< 0.10	4.02	0.39	11.3	2.91	0.11	3.60	0.40
39174	SRK	AR-17-147C1	480.1	482	Waste Rock	Mine Area	INT	INT		0.20	0.41	0.070	< 0.010	0.16	0.020	3.30	8.12	17.5	< 0.10	5.97	0.57	7.20	4.54	0.14	2.40	0.90
39176	SRK	AR-17-183C1	476.5	478.2	Waste Rock	Mine Area	INT	INT		< 0.10	0.15	0.080	< 0.010	0.090	0.020	1.52	97.7	28.0	0.20	2.51	0.22	1.10	7.64	0.18	2.80	0.70
39186	SRK	AR-18-208C1	560	562	Waste Rock	Mine Area	INT	INT		< 0.10	1.31	0.040	< 0.010	0.13	0.020	9.52	3.65	34.0	< 0.10	3.21	0.32	13.1	2.96	0.15	1.70	0.30
39189	SRK	AR-18-209C1	551	553	Waste Rock	Mine Area	INT	INT		0.60	0.70	0.020	< 0.010	0.080	0.15	9.37	4.16	19.0	< 0.10	1.75	0.14	5.80	4.99	0.27	1.40	0.90
39193	SRK	AR-18-200C4	569.5	571	Waste Rock	Mine Area	INT	INT		< 0.10	4.48	0.22	< 0.010	0.38	< 0.010	3.66	0.50	104	0.70	9.88	1.15	31.7	1.70	0.21	2.40	0.80
39072	SRK	GAR-18-006	50	51.5	Waste Rock	Mine Area	MST	MST		< 0.10	2.96	0.38	< 0.010	0.34	0.020	5.40	0.81	10.8	0.20	7.85	0.68	36.4	18.3	0.25	1.80	0.40
39190	SRK	GAR-18-015	13	14	Waste Rock	Mine Area	OVB	OVB		< 0.10	1.04	0.13	< 0.010	0.10	< 0.010	4.75	1.25	4.20	1.20	2.41	0.22	10.9	11.0	1.50	0.70	0.20
39191	SRK	GAR-18-013	11.3	15.8	Waste Rock	Mine Area	OVB	OVB		0.50	3.80	0.57	< 0.010	0.38	0.010	29.8	9.21	8.30	19.0	7.64	0.72	26.0	64.0	10.6	2.80	0.30
39163	SRK	AR-16-110C2	469.5	471	Waste Rock	Mine Area	PEG	SPGN		< 0.10	1.94	0.32	< 0.010	0.23	< 0.010	4.10	2.25	62.3	< 0.10	6.02	0.54	60.5	1.68	0.15	1.80	0.20
39192	SRK	AR-18-200C4	541	542.5	Waste Rock	Mine Area	PEG	SPGN		0.50	3.77	0.10	< 0.010	0.17	< 0.010	7.28	1.12	14.2	1.30	2.68	0.14	19.4	2.66	0.36	1.10	1.20
39056	SRK	GAR-18-012	660	661.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	1.05	0.070	< 0.010	0.050	0.020	5.50	0.34	24.0	< 0.10	0.82	0.12	24.3	1.62	0.12	0.10	0.10
39057	SRK	GAR-18-012	532	533.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.54	0.020	< 0.010	0.070	< 0.010	5.60	4.31	46.4	< 0.10	2.11	0.31	6.70	6.00	1.86	4.30	0.20
39058	SRK	GAR-18-012	431	432.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.87	0.020	< 0.010	0.040	0.010	5.38	0.71	15.3	< 0.10	0.85	0.13	10.2	2.58	0.15	0.20	0.20
39059	SRK	GAR-18-012	495	496.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.13	0.010	< 0.010	0.030	< 0.010	0.82	1.55	16.4	< 0.10	0.95	0.090	17.8	3.08	0.32	0.50	0.40
39061	SRK	GAR-18-011	651	652.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	1.86	0.040	< 0.010	0.090	0.030	9.63	0.49	15.7	< 0.10	1.15	0.11	16.8	0.97	0.21	0.20	0.20
39065	SRK	GAR-18-013	378	379	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.78	0.030	< 0.010	0.050	0.020	5.47	0.86	20.0	< 0.10	0.98	0.11	15.9	2.38	0.15	0.40	0.40
39074	SRK	GAR-18-006	650	651.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.22	0.020	< 0.010	0.020	0.020	5.30	1.47	2.60	0.10	0.70	0.080	1.00	3.61	0.18	1.60	0.10
39075	SRK	GAR-18-006	603.5	605	Waste Rock	Mine Area	SPGN	SPGN		0.10	3.91	0.050	< 0.010	0.27	0.020	18.0	1.12	21.6	0.10	5.03	0.40	26.9	1.26	0.19	< 0.10	0.20
39076	SRK	GAR-18-006	550	551.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	1.02	0.050	< 0.010	0.11	0.030	12.0	0.57	25.3	0.10	2.28	0.23	19.2	1.30	0.14	0.30	0.50
39086	SRK	AR-17-120C2	685	686.5	Waste Rock	Mine Area	SPGN	SPGN		0.40	0.41	0.020	< 0.010	0.050	0.090	13.8	1.26	14.6	0.20	1.32	0.13	2.00	3.43	0.25	1.00	1.50
39087	SRK	AR-15-052	418.5	420	Waste Rock	Mine Area	SPGN	SPGN		0.20	1.32	0.090	< 0.010	0.090	0.050	4.69	0.38	24.8	0.10	1.33	0.14	25.6	1.04	0.21	0.10	0.20
39088	SRK	AR-15-052	456	457.5	Waste Rock	Mine Area	SPGN	SPGN		0.10	0.77	0.020	< 0.010	0.060	0.10	23.3	1.01	7.60	< 0.10	1.46	0.16	1.40	3.97	0.20	1.00	1.20
39089	SRK	AR-15-052	499.5	501	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.28	< 0.010	< 0.010	0.020	0.010	4.78	0.40	5.10	< 0.10	0.70	0.070	1.40	5.26	0.20	1.20	0.20
39090	SRK	AR-15-052	561.5	563	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.99	0.020	< 0.010	0.10	0.030	9.49	25.0	7.60	< 0.10	2.41	0.25	8.40	4.42	0.21	0.60	0.50
39094	SRK	AR-14-015	690	691	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.81	0.020	< 0.010	0.19	0.65	6.11	225	22.7	0.20	4.52	0.44	23.2	21.0	0.16	0.80	2.20
39095	SRK	AR-14-028	372	374	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.62	0.020	< 0.010	0.22	0.030	2.27	46.3	32.8	< 0.10	4.60	0.41	2.00	18.5	0.19	0.70	1.10
39096	SRK	AR-14-026	479	481	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39097	SRK	AR-14-026	438	440	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39098	SRK	AR-14-024	572	573.5	Waste Rock	Mine Area	SPGN	SPGN		1.70	0.15	0.020	< 0.010	0.040	0.10	2.41	4.78	15.8	< 0.10	1.21	0.12	0.80	9.01	0.25	1.10	2.10
39099	SRK	AR-14-024	446	448	Waste Rock	Mine Area	SPGN	SPGN		1.30	0.44	0.020	< 0.010	0.040	< 0.010	7.42	2.72	16.2	0.30	0.88	0.10	27.9	3.66	0.20	0.50	1.40
39101	SRK	AR-15-033	476	478	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.30	0.030	< 0.010	0.060	0.010	4.57	15.5	16.6	0.20	1.30	0.17	13.2	7.50	0.19	0.60	0.70
39102	SRK	AR-15-033	504.5	506	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.48	0.020	< 0.010	0.080	0.030	16.4	4.03	7.40	< 0.10	1.96	0.22	10.4	3.53	0.20	1.20	0.50
39103	SRK	AR-15-033	551	553	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39104	SRK	AR-15-039W1	418.5	421	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.49	0.020	< 0.010	0.040	< 0.010	8.91	6.89	8.20	0.10	1.20	0.17	14.1	6.22	0.22	1.00	0.20
39105	SRK	AR-15-043A	368	370.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39106	SRK	AR-15-052	528	530	Special Waste	Mine Area	SPGN	SPGN		< 0.10	0.37	0.010	< 0.010	0.060	< 0.010	5.23	39.60	5.20	< 0.10	1.84	0.18	1.9	9.41	0.15	0.60	1.40
39107	SRK	AR-15-052	568.5	570.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39108	SRK	AR-15-052	590	592	Waste Rock	Mine Area	SPGN	SPGN		0.70	0.93	0.020	< 0.010	0.10	0.090	13.1	2.07	13.2	0.10	2.61	0.19	13.4	2.81	0.37	0.90	3.20
39109	SRK	AR-15-034b	406	408.5	Waste Rock	Mine Area	SPGN	SPGN		0.80	1.93	0.040	< 0.010	0.17	0.010	6.33	12.1	16.8	< 0.10	3.78	0.40	16.7	3.76	0.31	0.80	1.80
39110	SRK	AR-15-034b	667	669.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.69	0.040	< 0.010	0.12	0.10	9.54	45.8	24.1	< 0.10	2.56	0.32	11.7	6.96	0.22	1.20	1.60
39111	SRK	AR-15-036	340	342	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.77	0.030	< 0.010	0.070	0.020	13.8	16.6	13.4	< 0.10	2.20	0.23	117	7.16	0.26	0.80	0.50
39112	SRK	AR-15-057c3	367.5	369	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39113	SRK	AR-15-054c2	530	531.5	Special Waste	Mine Area	SPGN	SPGN		0.90	0.32	0.020	< 0.010	0.04	0.010	4.18	6.1	7.2	< 0.10	1.39	0.12	9.2	4.00	0.30	0.80	2.60
39114	SRK	AR-15-054c2	665	667	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.33	0.010	< 0.010	0.020	< 0.010	7.04	0.91	4.40	< 0.10	0.58	0.060	5.40	2.26	0.18	0.60	0.40
39115	SRK	AR-15-054C4	694.5	697	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39116	SRK	AR-15-055	552	554	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.38	0.020	< 0.010	0.040	< 0.010	5.40	12.0	10.4	< 0.10	1.32	0.14	2.00	6.00	0.21	0.80	0.60
39117	SRK	AR-15-055	602.5	605	Waste Rock	Mine Area	SPGN	SPGN		0.10	0.37	0.020	< 0.010	0.040	0.020	4.33	6.70	19.6	< 0.10	1.18	0.12	8.60	5.77	0.28	0.90	1.40
39118	SRK	AR-15-058C1	393	395.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.43	0.030	< 0.010	0.080	0.030	1.57	15.6	6.20	< 0.10	2.10	0.22	3.50	8.15	0.28	1.80	0.50
39119	SRK	AR-15-059C1	424.5	426.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	0.42	0.020	< 0.010	0.040	< 0.010	4.41	0.99	6.00	< 0.10	1.16	0.12	14.1	3.20	0.16	0.50	0.30
39120	SRK	AR-15-059C2	468	470.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39122	SRK	AR-15-059C4	498.5	500.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.34	0.020	< 0.010	0.040	< 0.010	7.14	53.8	7.40	< 0.10	1.14	0.18	2.20	9.80	0.22	0.80	1.00
39123	SRK	AR-15-059C4	556	558.5	Waste Rock	Mine Area	SPGN	SPGN		0.50	0.13	0.010	< 0.010	0.020	< 0.010	4.13	2.64	12.0	0.30	0.53	0.060	5.00	3.26	0.19	0.80	0.50
39125	SRK	AR-15-060C2	404.5	407	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39126	SRK	AR-15-060C2	481	483.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39127	SRK	AR-15-061C1	548	550.5	Waste Rock	Mine Area	SPGN	SPGN		0.90	0.090	0.020	< 0.010	0.020	0.040	7.32	6.89	22.5	0.10	0.58	0.060	1.70	5.48	1.29	1.60	2.60
39128	SRK	AR-15-061C2	504	506.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

										Total - 4-Acid Digestion and ICP-MS finish												
Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping	Analyte	Cd	Co	Cs	Cu	Dy	Er	Eu	Ga	Gd	Hf	Ho	Mo	Nb
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion
									Detection Limit	0.1	0.02	0.1	0.1	0.02	0.02	0.02	0.1	0.1	0.1	0.02	0.01	0.1
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$
39060	SRK	GAR-18-009	467	468.5	Waste Rock	Mine Area	INT	INT		0.30	12.4	0.20	12.6	6.30	3.87	1.58	17.2	6.40	10.0	1.17	0.49	10.7
39062	SRK	GAR-18-009	524.5	526	Waste Rock	Mine Area	INT	INT		0.30	17.4	0.50	32.9	4.51	2.63	1.28	18.1	4.60	7.00	0.81	1.42	12.3
39063	SRK	GAR-18-013	510	512	Waste Rock	Mine Area	INT	INT		0.20	16.6	1.30	21.6	3.84	2.00	1.29	19.1	4.70	6.00	0.64	2.40	15.9
39064	SRK	GAR-18-013	430	431	Waste Rock	Mine Area	INT	INT		0.20	6.82	0.30	2.20	2.48	1.53	0.48	8.60	2.00	6.30	0.48	0.15	9.90
39066	SRK	GAR-18-006	400.5	402	Waste Rock	Mine Area	INT	INT		0.50	21.0	0.70	47.3	7.60	4.71	1.70	24.1	7.00	6.30	1.36	1.24	10.9
39067	SRK	GAR-18-006	350.5	352	Waste Rock	Mine Area	INT	INT		0.20	11.6	1.40	19.6	4.50	2.63	1.55	16.0	4.80	6.80	0.82	0.37	10.4
39068	SRK	GAR-18-006	298.5	300	Waste Rock	Mine Area	INT	INT		0.20	15.3	0.60	9.80	4.43	2.52	1.57	16.8	5.40	7.30	0.75	0.67	13.1
39069	SRK	GAR-18-006	200.1	201.5	Waste Rock	Mine Area	INT	INT		0.20	16.1	0.60	37.2	3.82	2.10	1.57	17.9	5.10	6.70	0.87	0.56	11.9
39070	SRK	GAR-18-006	121	122.5	Waste Rock	Mine Area	INT	INT		0.20	5.42	0.30	2.50	3.55	2.35	1.30	21.6	4.20	9.90	0.68	0.25	14.5
39077	SRK	GAR-18-006	500	501.5	Waste Rock	Mine Area	INT	INT		0.20	15.9	0.60	25.0	5.02	2.88	1.50	19.0	5.30	4.60	0.98	1.21	10.6
39078	SRK	GAR-18-006	450	451.5	Waste Rock	Mine Area	INT	INT		0.30	10.8	0.30	12.0	3.74	2.31	1.35	16.1	3.40	4.20	0.74	0.50	8.80
39084	SRK	AR-17-179C1	442	443.5	Waste Rock	Mine Area	INT	INT		0.20	9.61	2.10	7.10	2.92	1.62	1.32	19.6	3.90	3.70	0.53	3.95	7.00
39091	SRK	AR-15-052	625	626.5	Waste Rock	Mine Area	INT	INT		0.20	21.6	1.20	2.80	8.69	5.46	1.89	26.1	7.30	11.2	1.74	10.3	26.8
39079	SRK	AR-16-110C1	440	441.5	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-	-	-	-
39080	SRK	AR-16-110C1	471	472.5	Waste Rock	Mine Area	INT	INT		0.20	12.0	1.10	39.2	1.36	0.71	0.85	20.8	2.30	4.60	0.24	15.5	7.60
39081	SRK	AR-16-105C1	567	569	Special Waste	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-	-	-	-
39082	SRK	AR-17-115C1	506.05	507.5	Waste Rock	Mine Area	INT	INT		0.20	10.9	2.40	11.9	3.50	1.71	1.32	13.4	3.80	10.9	0.60	1.64	20.0
39083	SRK	AR-17-147C3	476	478	Waste Rock	Mine Area	INT	INT		0.10	18.0	0.60	12.5	12.5	7.09	0.63	34.6	3.90	3.10	2.51	3.65	7.00
39085	SRK	AR-17-155C3	499	500	Waste Rock	Mine Area	INT	INT		0.20	17.1	0.80	217	5.91	3.52	0.57	25.5	4.00	7.90	1.16	13.6	12.7
39092	SRK	AR-16-110C2	498	500	Waste Rock	Mine Area	INT	INT		0.20	15.5	0.90	27.0	3.03	1.65	0.94	22.3	3.40	4.20	0.56	8.19	7.70
39093	SRK	AR-17-136C1	425	426.5	Waste Rock	Mine Area	INT	INT		0.10	17.7	1.10	4.10	2.57	1.51	0.32	27.2	2.10	3.20	0.50	5.21	7.80
39174	SRK	AR-17-147C1	480.1	482	Waste Rock	Mine Area	INT	INT		0.20	37.9	1.00	22.9	5.47	3.24	0.35	27.6	2.20	4.40	1.08	2.57	9.30
39176	SRK	AR-17-183C1	476.5	478.2	Waste Rock	Mine Area	INT	INT		0.20	3.39	1.50	7.90	1.88	1.05	0.16	41.1	0.90	9.60	0.36	30.1	13.3
39186	SRK	AR-18-208C1	560	562	Waste Rock	Mine Area	INT	INT		0.20	11.2	0.80	22.2	5.16	3.10	1.17	21.9	5.40	6.60	1.00	2.41	12.2
39189	SRK	AR-18-209C1	551	553	Waste Rock	Mine Area	INT	INT		0.20	27.5	0.60	67.5	4.60	2.78	0.79	29.4	3.60	5.60	0.87	14.5	17.0
39193	SRK	AR-18-200C4	569.5	571	Waste Rock	Mine Area	INT	INT		0.20	29.7	1.40	23.3	4.26	2.46	1.68	26.7	5.80	2.70	0.77	4.28	14.5
39072	SRK	GAR-18-006	50	51.5	Waste Rock	Mine Area	MST	MST		0.30	14.6	6.20	18.3	4.05	2.33	1.22	18.4	4.30	5.30	0.73	0.98	17.0
39190	SRK	GAR-18-015	13	14	Waste Rock	Mine Area	OVB	OVB		0.20	2.84	1.00	7.30	2.00	1.21	0.62	6.60	2.30	4.70	0.36	0.49	9.70
39191	SRK	GAR-18-013	11.3	15.8	Waste Rock	Mine Area	OVB	OVB		0.30	11.2	3.70	27.5	4.15	2.36	1.38	12.5	4.70	9.00	0.76	0.89	23.5
39163	SRK	AR-16-110C2	469.5	471	Waste Rock	Mine Area	PEG	SPGN		0.20	17.5	3.00	27.5	3.57	1.93	1.66	25.0	4.40	3.90	0.66	1.13	9.90
39192	SRK	AR-18-200C4	541	542.5	Waste Rock	Mine Area	PEG	SPGN		0.60	4.38	1.20	43.6	1.13	0.45	2.97	23.8	3.30	3.60	0.15	8.85	9.10
39056	SRK	GAR-18-012	660	661.5	Waste Rock	Mine Area	SPGN	SPGN		0.30	13.4	0.60	12.4	3.45	2.22	1.30	13.9	4.10	11.3	0.65	1.38	10.0
39057	SRK	GAR-18-012	532	533.5	Waste Rock	Mine Area	SPGN	SPGN		0.60	7.53	2.60	6.20	11.0	7.18	0.80	29.6	4.90	38.3	2.34	7.34	238
39058	SRK	GAR-18-012	431	432.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	10.2	0.50	4.50	3.42	2.06	1.24	15.6	4.10	9.30	0.64	0.98	13.9
39059	SRK	GAR-18-012	495	496.5	Waste Rock	Mine Area	SPGN	SPGN		0.30	10.9	0.40	10.8	2.85	1.83	0.56	12.7	2.10	10.2	0.56	11.5	24.1
39061	SRK	GAR-18-011	651	652.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	8.71	0.60	4.00	3.17	1.92	1.09	13.1	4.10	9.00	0.57	2.44	10.1
39065	SRK	GAR-18-013	378	379	Waste Rock	Mine Area	SPGN	SPGN		0.20	10.0	0.40	7.00	3.10	1.91	0.99	17.2	3.80	7.90	0.56	0.50	14.1
39074	SRK	GAR-18-006	650	651.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	1.07	0.50	2.80	2.61	1.75	0.43	20.4	1.80	11.9	0.53	0.42	17.3
39075	SRK	GAR-18-006	603.5	605	Waste Rock	Mine Area	SPGN	SPGN		0.20	26.3	1.90	11.6	5.93	3.30	2.46	26.6	6.60	5.10	1.13	1.13	19.8
39076	SRK	GAR-18-006	550	551.5	Waste Rock	Mine Area	SPGN	SPGN		0.30	24.4	0.70	24.1	4.09	2.34	1.00	16.7	3.80	6.50	0.73	1.68	10.2
39086	SRK	AR-17-120C2	685	686.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	25.4	0.40	102	2.64	1.68	0.92	22.6	2.60	7.00	0.54	11.4	16.1
39087	SRK	AR-15-052	418.5	420	Waste Rock	Mine Area	SPGN	SPGN		0.20	26.4	1.30	22.4	5.61	3.85	1.60	22.1	5.40	6.30	1.14	2.96	22.2
39088	SRK	AR-15-052	456	457.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	7.72	0.40	26.6	2.46	1.61	0.72	22.5	2.50	7.00	0.48	6.50	17.7
39089	SRK	AR-15-052	499.5	501	Waste Rock	Mine Area	SPGN	SPGN		0.30	2.98	0.20	2.00	2.77	1.87	0.65	21.5	2.40	13.2	0.58	0.45	15.6
39090	SRK	AR-15-052	561.5	563	Waste Rock	Mine Area	SPGN	SPGN		0.20	5.44	0.40	18.9	5.11	3.06	1.45	23.1	4.90	7.70	0.98	11.9	16.7
39094	SRK	AR-14-015	690	691	Waste Rock	Mine Area	SPGN	SPGN		0.30	4.24	0.40	12.1	4.60	2.50	0.68	16.4	2.80	9.10	0.90	8.31	13.5
39095	SRK	AR-14-028	372	374	Waste Rock	Mine Area	SPGN	SPGN		0.20	4.55	0.20	13.3	6.42	3.49	0.88	22.0	3.60	10.1	1.20	6.08	15.6
39096	SRK	AR-14-026	479	481	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39097	SRK	AR-14-026	438	440	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39098	SRK	AR-14-024	572	573.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	3.57	0.40	21.4	4.40	2.83	1.09	24.4	3.70	15.2	0.91	8.32	19.7
39099	SRK	AR-14-024	446	448	Waste Rock	Mine Area	SPGN	SPGN		0.20	13.9	0.40	16.0	3.12	1.94	1.14	21.0	3.30	6.80	0.60	5.00	16.6
39101	SRK	AR-15-033	476	478	Waste Rock	Mine Area	SPGN	SPGN		0.20	8.79	0.40	7.20	3.70	2.20	0.89	19.5	3.00	8.70	0.71	1.02	19.5
39102	SRK	AR-15-033	504.5	506	Waste Rock	Mine Area	SPGN	SPGN		0.20	7.90	1.00	11.9	3.69	2.32	0.72	22.3	3.00	5.90	0.73	3.79	17.5
39103	SRK	AR-15-033	551	553	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39104	SRK	AR-15-039W1	418.5	421	Waste Rock	Mine Area	SPGN	SPGN		0.20	5.23	0.30	6.40	3.59	2.31	1.54	25.0	4.70	8.60	0.70	0.27	17.4
39105	SRK	AR-15-043A	368	370.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39106	SRK	AR-15-052	528	530	Special Waste	Mine Area	SPGN	SPGN		0.30	2.80	0.20	5.40	3.09	1.94	0.66	13.9	2.50	10.50	0.63	3.07	12.8
39107	SRK	AR-15-052	568.5	570.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39108	SRK	AR-15-052	590	592	Waste Rock	Mine Area	SPGN	SPGN		0.20	29.3	0.50	34.0	3.38	1.83	0.98	20.1	3.40	8.00	0.64	16.1	12.9
39109	SRK	AR-15-034b	406	408.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	10.7	1.20	3.40	4.86	2.98	1.05	16.2	3.80	10.4	0.96	8.41	17.6
39110	SRK	AR-15-034b	667	669.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	7.94	0.50	153	4.85	2.99	1.01	24.5	3.80	8.90	0.96	15.4	17.8
39111	SRK	AR-15-036	340	342	Waste Rock	Mine Area	SPGN	SPGN		0.40	15.5	0.30	9.30	3.82	2.36	1.14	23.3	3.70	7.40	0.80	0.73	17.2
39112	SRK	AR-15-057c3	367.5	369	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39113	SRK	AR-15-054c2	530	531.5	Special Waste	Mine Area	SPGN	SPGN		0.20	12.4	0.40	13.00	4.28	2.65	0.76	22.4	2.90	10.20	0.86	42.10	17.0
39114	SRK	AR-15-054c2	665	667	Waste Rock	Mine Area	SPGN	SPGN		0.20	3.87	0.30	6.20	2.77	1.82	0.63	16.9	2.20	9.20	0.57	7.00	12.2
39115	SRK	AR-15-054C4	694.5	697	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39116	SRK	AR-15-055	552	554	Waste Rock	Mine Area	SPGN	SPGN		0.20	4.96	0.30	16.4	3.30	2.04	0.92	23.9	2.90	8.00	0.59	16.7	19.0
39117	SRK	AR-15-055	602.5	605	Waste Rock	Mine Area	SPGN	SPGN		0.20	5.75	0.40	3.20	3.24	2.03	0.75	23.8	2.50	9.10	0.66	57.0	19.6
39118	SRK	AR-15-058C1	393	395.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	7.66	0.30	12.5	5.12	3.12	2.13	21.0	6.30	10.7	0.98	1.09	22.1
39119	SRK	AR-15-059C1	424.5	426.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	6.22	0.20	3.90	3.60	2.24	0.72	14.5	2.70	9.10	0.70	0.85	12.5
39120	SRK	AR-15-059C2	468	470.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39122	SRK	AR-15-059C4	498.5	500.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	3.85	0.20	30.0	1.87	1.16	0.55	16.0	1.70	10.1	0.36	2.69	13.0
39123	SRK	AR-15-059C4	556	558.5	Waste Rock	Mine Area	SPGN	SPGN		0.30	10.5	0.30	270	1.88	1.24	0.32	16.1	1.10	8.80	0.37	92.2	16.6
39125	SRK	AR-15-060C2	404.5	407	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39126	SRK	AR-15-060C2	481	483.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39127	SRK	AR-15-061C1	548	550.5	Waste Rock	Mine Area	SPGN	SPGN		0.40	5.70	0.80	5.80	2.23	1.58	0.35	35.6	1.20	16.1	0.48	254	34.1
39128	SRK	AR-15-061C2	504	506.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4-Acid Digestion and ICP-MS finish											
									Analyte	Nd	Ni	Pb204	Pb206	Pb207	Pb208	PbSUM	Pr	Rb	Sc	Sm	Sn
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion
									Detection Limit	0.1	0.1	0.001	0.001	0.001	0.001	0.001	0.1	0.1	0.1	0.1	0.02
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$
39060	SRK	GAR-18-009	467	468.5	Waste Rock	Mine Area	INT	INT		50.4	23.2	0.42	7.30	6.08	15.7	29.5	13.9	126	14.6	8.40	0.40
39062	SRK	GAR-18-009	524.5	526	Waste Rock	Mine Area	INT	INT		37.1	40.9	0.29	4.97	4.02	10.7	20.0	10.2	96.6	16.3	6.30	0.54
39063	SRK	GAR-18-013	510	512	Waste Rock	Mine Area	INT	INT		38.8	46.3	0.083	2.28	1.31	3.93	7.60	10.5	78.4	16.6	6.70	0.57
39064	SRK	GAR-18-013	430	431	Waste Rock	Mine Area	INT	INT		11.5	24.9	0.037	0.75	0.52	1.56	2.86	3.30	53.7	9.10	2.20	0.19
39066	SRK	GAR-18-006	400.5	402	Waste Rock	Mine Area	INT	INT		56.7	50.4	0.44	7.13	6.06	16.2	29.8	15.1	167	25.0	9.10	0.43
39067	SRK	GAR-18-006	350.5	352	Waste Rock	Mine Area	INT	INT		40.4	31.6	0.15	2.44	2.08	5.56	10.2	11.3	116	13.0	6.80	0.58
39068	SRK	GAR-18-006	298.5	300	Waste Rock	Mine Area	INT	INT		44.5	21.0	0.30	4.70	4.20	10.7	19.9	12.1	109	16.7	7.60	0.20
39069	SRK	GAR-18-006	200.1	201.5	Waste Rock	Mine Area	INT	INT		42.8	39.7	0.28	4.26	3.75	9.78	18.1	11.5	116	17.8	7.20	0.34
39070	SRK	GAR-18-006	121	122.5	Waste Rock	Mine Area	INT	INT		38.4	28.3	0.070	1.48	1.03	3.31	5.89	11.0	64.9	19.6	5.90	0.59
39077	SRK	GAR-18-006	500	501.5	Waste Rock	Mine Area	INT	INT		41.6	54.5	0.36	5.62	5.18	13.1	24.3	11.8	128	17.3	7.40	0.56
39078	SRK	GAR-18-006	450	451.5	Waste Rock	Mine Area	INT	INT		25.0	30.7	0.46	6.96	6.47	15.6	29.4	7.20	113	12.3	4.30	0.39
39084	SRK	AR-17-179C1	442	443.5	Waste Rock	Mine Area	INT	INT		32.7	40.3	0.012	0.93	0.23	1.02	2.20	9.30	51.0	11.2	5.40	1.42
39091	SRK	AR-15-052	625	626.5	Waste Rock	Mine Area	INT	INT		45.1	72.0	0.11	1.99	1.57	4.08	7.74	12.8	100	26.4	8.80	0.59
39079	SRK	AR-16-110C1	440	441.5	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-	-	-
39080	SRK	AR-16-110C1	471	472.5	Waste Rock	Mine Area	INT	INT		30.2	36.6	0.041	2.62	0.76	1.82	5.24	9.00	53.7	4.20	4.00	0.95
39081	SRK	AR-16-105C1	567	569	Special Waste	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-	-	-
39082	SRK	AR-17-115C1	506.05	507.5	Waste Rock	Mine Area	INT	INT		24.1	26.6	0.079	1.59	1.21	3.17	6.06	7.00	108	13.4	4.90	0.64
39083	SRK	AR-17-147C3	476	478	Waste Rock	Mine Area	INT	INT		4.60	150	0.011	1.89	0.28	0.51	2.69	1.00	32.7	55.3	1.50	1.30
39085	SRK	AR-17-155C3	499	500	Waste Rock	Mine Area	INT	INT		34.4	90.6	0.056	12.0	1.24	4.74	18.1	11.0	53.4	18.8	4.40	0.94
39092	SRK	AR-16-110C2	498	500	Waste Rock	Mine Area	INT	INT		26.1	112	0.057	2.77	0.91	2.16	5.89	6.80	45.3	13.2	4.70	1.53
39093	SRK	AR-17-136C1	425	426.5	Waste Rock	Mine Area	INT	INT		12.2	104	0.025	3.54	0.56	1.01	5.14	3.10	45.5	15.2	2.30	0.69
39174	SRK	AR-17-147C1	480.1	482	Waste Rock	Mine Area	INT	INT		5.90	94.4	0.019	3.43	0.50	1.09	5.04	1.60	52.9	17.4	1.30	0.74
39176	SRK	AR-17-183C1	476.5	478.2	Waste Rock	Mine Area	INT	INT		2.30	104	0.0080	8.56	0.51	0.49	9.57	0.70	95.5	10.8	0.50	1.37
39186	SRK	AR-18-208C1	560	562	Waste Rock	Mine Area	INT	INT		45.1	57.3	0.079	4.70	1.32	4.60	10.7	13.6	77.1	17.9	7.70	0.54
39189	SRK	AR-18-209C1	551	553	Waste Rock	Mine Area	INT	INT		28.3	89.8	0.11	3.32	1.47	4.38	9.28	8.60	86.5	21.6	4.40	0.73
39193	SRK	AR-18-200C4	569.5	571	Waste Rock	Mine Area	INT	INT		52.1	47.3	0.063	1.59	0.97	2.31	4.93	14.0	62.9	20.7	9.00	1.55
39072	SRK	GAR-18-006	50	51.5	Waste Rock	Mine Area	MST	MST		31.0	33.5	0.24	4.07	3.32	8.21	15.8	8.20	91.1	12.0	5.60	2.28
39190	SRK	GAR-18-015	13	14	Waste Rock	Mine Area	OVB	OVB		16.7	6.80	0.15	2.68	2.21	5.43	10.5	4.90	22.6	3.50	3.10	0.74
39191	SRK	GAR-18-013	11.3	15.8	Waste Rock	Mine Area	OVB	OVB		31.8	25.0	0.36	6.92	5.18	13.2	25.7	9.00	65.3	8.20	6.30	2.44
39163	SRK	AR-16-110C2	469.5	471	Waste Rock	Mine Area	PEG	SPGN		34.3	47.8	0.22	3.44	3.15	7.67	14.5	9.20	64.3	14.2	6.10	0.93
39192	SRK	AR-18-200C4	541	542.5	Waste Rock	Mine Area	PEG	SPGN		50.8	5.80	0.57	8.54	7.95	18.7	35.8	15.8	249	0.70	6.40	0.61
39056	SRK	GAR-18-012	660	661.5	Waste Rock	Mine Area	SPGN	SPGN		36.7	41.9	0.20	3.28	2.76	7.56	13.8	10.2	120	15.7	6.00	0.66
39057	SRK	GAR-18-012	532	533.5	Waste Rock	Mine Area	SPGN	SPGN		11.0	102	0.026	1.71	0.46	1.53	3.73	2.70	66.0	66.8	2.80	0.76
39058	SRK	GAR-18-012	431	432.5	Waste Rock	Mine Area	SPGN	SPGN		33.4	34.1	0.092	1.80	1.29	4.07	7.26	9.50	67.9	14.0	5.90	0.52
39059	SRK	GAR-18-012	495	496.5	Waste Rock	Mine Area	SPGN	SPGN		14.0	28.6	0.054	3.36	0.89	2.01	6.31	4.00	35.7	15.0	2.10	0.26
39061	SRK	GAR-18-011	651	652.5	Waste Rock	Mine Area	SPGN	SPGN		40.5	23.0	0.10	1.94	1.48	4.78	8.30	11.1	76.2	11.3	6.10	0.50
39065	SRK	GAR-18-013	378	379	Waste Rock	Mine Area	SPGN	SPGN		37.8	29.6	0.068	1.51	0.97	3.73	6.28	10.2	69.5	15.6	5.80	0.48
39074	SRK	GAR-18-006	650	651.5	Waste Rock	Mine Area	SPGN	SPGN		12.5	24.1	0.047	1.37	0.72	2.41	4.53	3.70	56.9	12.6	1.70	0.57
39075	SRK	GAR-18-006	603.5	605	Waste Rock	Mine Area	SPGN	SPGN		58.1	46.0	0.13	2.12	1.68	5.02	8.95	16.7	180	26.4	9.20	0.91
39076	SRK	GAR-18-006	550	551.5	Waste Rock	Mine Area	SPGN	SPGN		34.6	40.2	0.14	2.64	2.06	5.93	10.7	7.80	102	16.4	5.00	0.56
39086	SRK	AR-17-120C2	685	686.5	Waste Rock	Mine Area	SPGN	SPGN		29.0	65.9	0.092	3.76	1.39	3.75	8.99	9.00	98.5	18.7	4.10	0.96
39087	SRK	AR-15-052	418.5	420	Waste Rock	Mine Area	SPGN	SPGN		40.6	51.2	0.13	2.36	1.85	5.64	9.98	11.7	199	25.2	7.60	0.99
39088	SRK	AR-15-052	456	457.5	Waste Rock	Mine Area	SPGN	SPGN		34.5	55.4	0.095	2.98	1.45	3.94	8.47	10.7	76.6	13.2	3.70	0.68
39089	SRK	AR-15-052	499.5	501	Waste Rock	Mine Area	SPGN	SPGN		23.5	36.4	0.082	1.93	1.23	3.24	6.48	7.60	57.3	13.4	3.20	0.62
39090	SRK	AR-15-052	561.5	563	Waste Rock	Mine Area	SPGN	SPGN		45.8	50.3	0.084	5.72	1.38	3.50	10.7	14.2	85.1	17.9	6.70	0.82
39094	SRK	AR-14-015	690	691	Waste Rock	Mine Area	SPGN	SPGN		11.4	41.8	0.20	18.2	3.75	8.30	30.5	3.30	64.6	12.0	2.30	0.67
39095	SRK	AR-14-028	372	374	Waste Rock	Mine Area	SPGN	SPGN		8.00	44.0	0.13	7.86	2.06	4.44	14.5	2.50	81.4	13.0	2.20	0.90
39096	SRK	AR-14-026	479	481	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39097	SRK	AR-14-026	438	440	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39098	SRK	AR-14-024	572	573.5	Waste Rock	Mine Area	SPGN	SPGN		32.5	29.1	0.071	4.78	1.26	3.08	9.19	10.0	74.4	16.0	5.00	0.74
39099	SRK	AR-14-024	446	448	Waste Rock	Mine Area	SPGN	SPGN		33.2	51.7	0.18	7.24	2.87	6.85	17.1	9.80	81.1	18.4	5.20	0.61
39101	SRK	AR-15-033	476	478	Waste Rock	Mine Area	SPGN	SPGN		26.2	46.4	0.041	3.10	0.70	1.89	5.73	8.10	63.7	16.6	3.80	0.71
39102	SRK	AR-15-033	504.5	506	Waste Rock	Mine Area	SPGN	SPGN		27.0	45.0	0.067	3.08	1.11	3.13	7.39	8.60	84.4	12.6	3.80	0.75
39103	SRK	AR-15-033	551	553	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39104	SRK	AR-15-039W1	418.5	421	Waste Rock	Mine Area	SPGN	SPGN		52.6	49.1	0.15	3.65	2.23	6.06	12.1	15.8	76.4	15.5	8.00	0.84
39105	SRK	AR-15-043A	368	370.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39106	SRK	AR-15-052	528	530	Special Waste	Mine Area	SPGN	SPGN		20.5	27.5	0.11	7.77	1.74	4.21	13.8	6.5	49.6	11.0	2.90	0.56
39107	SRK	AR-15-052	568.5	570.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39108	SRK	AR-15-052	590	592	Waste Rock	Mine Area	SPGN	SPGN		41.2	109	0.11	5.55	1.81	4.87	12.3	12.1	104	10.7	5.50	0.92
39109	SRK	AR-15-034b	406	408.5	Waste Rock	Mine Area	SPGN	SPGN		24.5	34.2	0.081	5.37	1.43	3.56	10.4	6.90	80.4	14.2	4.60	0.47
39110	SRK	AR-15-034b	667	669.5	Waste Rock	Mine Area	SPGN	SPGN		29.1	51.2	0.16	9.32	2.53	6.13	18.1	9.00	85.0	19.9	4.50	0.71
39111	SRK	AR-15-036	340	342	Waste Rock	Mine Area	SPGN	SPGN		40.0	86.1	0.19	6.18	2.84	7.58	16.8	12.3	78.2	15.9	5.80	0.73
39112	SRK	AR-15-057c3	367.5	369	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39113	SRK	AR-15-054c2	530	531.5	Special Waste	Mine Area	SPGN	SPGN		24.5	25.2	0.11	8.54	1.76	4.33	14.7	7.5	78.2	15.8	3.00	0.78
39114	SRK	AR-15-054c2	665	667	Waste Rock	Mine Area	SPGN	SPGN		20.8	29.3	0.099	4.25	1.44	3.67	9.46	6.60	73.8	12.0	2.80	0.48
39115	SRK	AR-15-054C4	694.5	697	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39116	SRK	AR-15-055	552	554	Waste Rock	Mine Area	SPGN	SPGN		31.7	37.0	0.23	12.6	3.52	8.58	24.9	9.90	95.1	18.4	4.30	0.83
39117	SRK	AR-15-055	602.5	605	Waste Rock	Mine Area	SPGN	SPGN		17.5	43.0	0.12	8.04	1.68	4.16	14.0	5.50	87.2	20.4	2.60	0.77
39118	SRK	AR-15-058C1	393	395.5	Waste Rock	Mine Area	SPGN	SPGN		67.8	89.3	0.076	5.68	1.22	2.90	9.87	20.1	36.8	17.4	10.4	0.76
39119	SRK	AR-15-059C1	424.5	426.5	Waste Rock	Mine Area	SPGN	SPGN		24.8	35.5	0.062	2.12	0.96	2.59	5.73	7.60	51.8	11.1	3.50	0.49
39120	SRK	AR-15-059C2	468	470.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39122	SRK	AR-15-059C4	498.5	500.5	Waste Rock	Mine Area	SPGN	SPGN		17.4	31.6	0.11	7.58	1.87	4.17	13.7	5.80	54.8	11.8	2.20	0.56
39123	SRK	AR-15-059C4	556	558.5	Waste Rock	Mine Area	SPGN	SPGN		7.00	28.9	0.098	54.2	4.71	3.67	62.7	2.20	63.8	11.7	1.00	0.42
39125	SRK	AR-15-060C2	404.5	407	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39126	SRK	AR-15-060C2	481	483.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39127	SRK	AR-15-061C1	548	550.5	Waste Rock	Mine Area	SPGN	SPGN		5.40	60.5	0.12	8.60	1.91	4.58	15.2	1.70	116	22.1	0.80	1.06
39128	SRK	AR-15-061C2	504	506.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4-Acid Digestion and ICP-MS finish								Partial - Aqua Regia Digestion and ICP-OES Finish					
									Analyte	Ta	Tb	Th	U	W	Y	Yb	Zn	Ag	As	Bi	Co	Cu	Ge
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion
									Detection Limit	0.02	0.02	0.02	0.02	0.1	0.1	0.02	1	0.2	1	1	1	1	1
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HNO$_3$/HCl	HNO$_3$/HCl	HNO$_3$/HCl	HNO$_3$/HCl	HNO$_3$/HCl	HNO$_3$/HCl
39060	SRK	GAR-18-009	467	468.5	Waste Rock	Mine Area	INT	INT		0.66	0.93	27.5	2.78	0.40	32.7	3.69	67.0	-	-	-	-	-	-
39062	SRK	GAR-18-009	524.5	526	Waste Rock	Mine Area	INT	INT		0.69	0.64	21.2	2.94	0.70	22.4	2.52	64.0	-	-	-	-	-	-
39063	SRK	GAR-18-013	510	512	Waste Rock	Mine Area	INT	INT		0.89	0.62	26.1	2.89	0.60	17.2	1.80	30.0	-	-	-	-	-	-
39064	SRK	GAR-18-013	430	431	Waste Rock	Mine Area	INT	INT		0.59	0.36	9.34	1.84	1.10	12.8	1.46	17.0	-	-	-	-	-	-
39066	SRK	GAR-18-006	400.5	402	Waste Rock	Mine Area	INT	INT		0.55	1.03	29.0	2.84	0.40	39.1	4.57	174	-	-	-	-	-	-
39067	SRK	GAR-18-006	350.5	352	Waste Rock	Mine Area	INT	INT		0.56	0.67	21.8	2.39	2.40	21.4	2.44	72.0	-	-	-	-	-	-
39068	SRK	GAR-18-006	298.5	300	Waste Rock	Mine Area	INT	INT		0.76	0.76	18.8	2.17	0.30	19.9	2.50	74.0	-	-	-	-	-	-
39069	SRK	GAR-18-006	200.1	201.5	Waste Rock	Mine Area	INT	INT		0.66	0.64	16.5	1.71	0.60	17.5	1.78	89.0	-	-	-	-	-	-
39070	SRK	GAR-18-006	121	122.5	Waste Rock	Mine Area	INT	INT		0.90	0.52	33.6	2.47	0.90	19.1	2.44	20.0	-	-	-	-	-	-
39077	SRK	GAR-18-006	500	501.5	Waste Rock	Mine Area	INT	INT		0.66	0.78	22.3	2.33	0.80	26.2	2.78	83.0	-	-	-	-	-	-
39078	SRK	GAR-18-006	450	451.5	Waste Rock	Mine Area	INT	INT		0.48	0.53	10.8	1.30	0.50	21.0	2.12	90.0	-	-	-	-	-	-
39084	SRK	AR-17-179C1	442	443.5	Waste Rock	Mine Area	INT	INT		0.34	0.47	14.3	5.09	0.50	14.9	1.41	34.0	-	-	-	-	-	-
39091	SRK	AR-15-052	625	626.5	Waste Rock	Mine Area	INT	INT		1.56	1.28	18.5	2.28	1.80	46.4	5.58	90.0	-	-	-	-	-	-
39079	SRK	AR-16-110C1	440	441.5	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	< 0.20	5.00	< 1.00	23.0	145	1.00
39080	SRK	AR-16-110C1	471	472.5	Waste Rock	Mine Area	INT	INT		0.38	0.23	11.2	2.34	0.60	7.00	0.54	14.0	-	-	-	-	-	-
39081	SRK	AR-16-105C1	567	569	Special Waste	Mine Area	INT	INT		-	-	-	-	-	-	-	-	0.20	2.00	2.00	7.00	100	< 1.00
39082	SRK	AR-17-115C1	506.05	507.5	Waste Rock	Mine Area	INT	INT		1.16	0.59	12.5	1.56	2.50	15.7	1.60	63.0	-	-	-	-	-	-
39083	SRK	AR-17-147C3	476	478	Waste Rock	Mine Area	INT	INT		0.35	1.57	1.07	8.99	1.70	79.1	5.50	34.0	-	-	-	-	-	-
39085	SRK	AR-17-155C3	499	500	Waste Rock	Mine Area	INT	INT		0.87	0.80	84.5	26.3	2.10	34.5	3.37	19.0	-	-	-	-	-	-
39092	SRK	AR-16-110C2	498	500	Waste Rock	Mine Area	INT	INT		0.58	0.49	8.78	2.71	1.00	16.1	1.39	45.0	-	-	-	-	-	-
39093	SRK	AR-17-136C1	425	426.5	Waste Rock	Mine Area	INT	INT		0.46	0.36	3.24	3.26	0.60	14.3	1.32	23.0	-	-	-	-	-	-
39174	SRK	AR-17-147C1	480.1	482	Waste Rock	Mine Area	INT	INT		0.57	0.72	10.8	14.5	1.00	32.7	2.70	16.0	-	-	-	-	-	-
39176	SRK	AR-17-183C1	476.5	478.2	Waste Rock	Mine Area	INT	INT		1.01	0.26	4.91	150	1.10	10.9	0.90	7.00	-	-	-	-	-	-
39186	SRK	AR-18-208C1	560	562	Waste Rock	Mine Area	INT	INT		0.86	0.78	31.7	8.10	0.60	27.7	2.91	26.0	-	-	-	-	-	-
39189	SRK	AR-18-209C1	551	553	Waste Rock	Mine Area	INT	INT		1.07	0.64	32.0	10.5	1.00	25.6	2.31	20.0	-	-	-	-	-	-
39193	SRK	AR-18-200C4	569.5	571	Waste Rock	Mine Area	INT	INT		0.69	0.68	5.09	1.19	1.40	20.1	2.17	66.0	-	-	-	-	-	-
39072	SRK	GAR-18-006	50	51.5	Waste Rock	Mine Area	MST	MST		0.96	0.63	11.4	2.90	2.00	20.2	2.28	68.0	-	-	-	-	-	-
39190	SRK	GAR-18-015	13	14	Waste Rock	Mine Area	OVB	OVB		0.64	0.32	8.52	2.69	7.90	10.8	1.28	20.0	-	-	-	-	-	-
39191	SRK	GAR-18-013	11.3	15.8	Waste Rock	Mine Area	OVB	OVB		1.32	0.68	46.6	11.4	62.2	21.0	2.32	44.0	-	-	-	-	-	-
39163	SRK	AR-16-110C2	469.5	471	Waste Rock	Mine Area	PEG	SPGN		0.57	0.56	6.44	2.38	0.40	17.4	1.81	100	-	-	-	-	-	-
39192	SRK	AR-18-200C4	541	542.5	Waste Rock	Mine Area	PEG	SPGN		0.45	0.21	9.14	1.56	1.50	4.40	0.16	34.0	-	-	-	-	-	-
39056	SRK	GAR-18-012	660	661.5	Waste Rock	Mine Area	SPGN	SPGN		0.42	0.53	20.1	2.06	0.60	17.1	2.22	59.0	-	-	-	-	-	-
39057	SRK	GAR-18-012	532	533.5	Waste Rock	Mine Area	SPGN	SPGN		12.0	1.45	14.2	13.7	5.80	61.4	8.02	33.0	-	-	-	-	-	-
39058	SRK	GAR-18-012	431	432.5	Waste Rock	Mine Area	SPGN	SPGN		0.73	0.55	19.0	2.41	1.70	16.4	2.08	25.0	-	-	-	-	-	-
39059	SRK	GAR-18-012	495	496.5	Waste Rock	Mine Area	SPGN	SPGN		1.97	0.37	3.63	5.22	3.70	16.0	1.84	45.0	-	-	-	-	-	-
39061	SRK	GAR-18-011	651	652.5	Waste Rock	Mine Area	SPGN	SPGN		0.63	0.51	26.0	2.42	1.70	15.4	1.90	36.0	-	-	-	-	-	-
39065	SRK	GAR-18-013	378	379	Waste Rock	Mine Area	SPGN	SPGN		0.78	0.49	23.1	3.10	2.00	14.9	1.77	27.0	-	-	-	-	-	-
39074	SRK	GAR-18-006	650	651.5	Waste Rock	Mine Area	SPGN	SPGN		0.88	0.35	24.6	6.88	1.60	15.4	1.79	9.00	-	-	-	-	-	-
39075	SRK	GAR-18-006	603.5	605	Waste Rock	Mine Area	SPGN	SPGN		1.11	0.93	33.0	2.56	1.90	27.3	3.02	87.0	-	-	-	-	-	-
39076	SRK	GAR-18-006	550	551.5	Waste Rock	Mine Area	SPGN	SPGN		0.48	0.56	19.9	2.20	1.50	19.7	2.36	50.0	-	-	-	-	-	-
39086	SRK	AR-17-120C2	685	686.5	Waste Rock	Mine Area	SPGN	SPGN		1.03	0.37	26.8	3.64	3.70	15.9	1.70	15.0	-	-	-	-	-	-
39087	SRK	AR-15-052	418.5	420	Waste Rock	Mine Area	SPGN	SPGN		1.37	0.84	21.0	2.35	1.80	30.6	4.94	78.0	-	-	-	-	-	-
39088	SRK	AR-15-052	456	457.5	Waste Rock	Mine Area	SPGN	SPGN		1.12	0.35	31.8	3.42	1.60	13.8	1.67	16.0	-	-	-	-	-	-
39089	SRK	AR-15-052	499.5	501	Waste Rock	Mine Area	SPGN	SPGN		0.99	0.38	15.8	3.24	2.10	17.4	1.93	13.0	-	-	-	-	-	-
39090	SRK	AR-15-052	561.5	563	Waste Rock	Mine Area	SPGN	SPGN		0.85	0.79	24.6	31.6	1.60	28.2	2.83	26.0	-	-	-	-	-	-
39094	SRK	AR-14-015	690	691	Waste Rock	Mine Area	SPGN	SPGN		0.77	0.69	12.4	372	3.20	24.5	2.35	35.0	-	-	-	-	-	-
39095	SRK	AR-14-028	372	374	Waste Rock	Mine Area	SPGN	SPGN		0.85	0.95	8.00	70.8	2.70	33.6	3.09	11.0	-	-	-	-	-	-
39096	SRK	AR-14-026	479	481	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	< 0.20	4.00	27.0	8.00	45.0	< 1.00
39097	SRK	AR-14-026	438	440	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	< 0.20	3.00	< 1.00	5.00	83.0	< 1.00
39098	SRK	AR-14-024	572	573.5	Waste Rock	Mine Area	SPGN	SPGN		1.24	0.62	14.2	13.4	3.50	26.6	2.68	13.0	-	-	-	-	-	-
39099	SRK	AR-14-024	446	448	Waste Rock	Mine Area	SPGN	SPGN		0.90	0.45	18.5	5.88	1.50	16.3	1.97	65.0	-	-	-	-	-	-
39101	SRK	AR-15-033	476	478	Waste Rock	Mine Area	SPGN	SPGN		0.90	0.49	16.7	30.1	3.20	19.5	2.07	26.0	-	-	-	-	-	-
39102	SRK	AR-15-033	504.5	506	Waste Rock	Mine Area	SPGN	SPGN		1.06	0.53	33.7	7.29	1.30	20.9	2.32	24.0	-	-	-	-	-	-
39103	SRK	AR-15-033	551	553	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	< 0.20	2.00	8.00	2.00	72.0	< 1.00
39104	SRK	AR-15-039W1	418.5	421	Waste Rock	Mine Area	SPGN	SPGN		1.00	0.55	31.1	15.3	2.40	20.5	2.15	33.0	-	-	-	-	-	-
39105	SRK	AR-15-043A	368	370.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	0.20	30.0	2.00	7.00	4.00	< 1.00
39106	SRK	AR-15-052	528	530	Special Waste	Mine Area	SPGN	SPGN		0.73	0.42	18.7	60.8	1.70	18.2	1.91	13.0	-	-	-	-	-	-
39107	SRK	AR-15-052	568.5	570.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	1.90	12.0	20.0	17.0	9.00	< 1.00
39108	SRK	AR-15-052	590	592	Waste Rock	Mine Area	SPGN	SPGN		1.11	0.49	31.5	4.67	5.10	18.0	1.38	34.0	-	-	-	-	-	-
39109	SRK	AR-15-034b	406	408.5	Waste Rock	Mine Area	SPGN	SPGN		1.03	0.68	15.8	28.5	2.00	26.6	2.97	35.0	-	-	-	-	-	-
39110	SRK	AR-15-034b	667	669.5	Waste Rock	Mine Area	SPGN	SPGN		0.96	0.70	24.3	61.1	1.80	25.2	2.80	29.0	-	-	-	-	-	-
39111	SRK	AR-15-036	340	342	Waste Rock	Mine Area	SPGN	SPGN		0.99	0.55	36.6	33.7	1.90	20.8	2.28	164	-	-	-	-	-	-
39112	SRK	AR-15-057c3	367.5	369	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	< 0.20	15.0	< 1.00	4.00	3.00	< 1.00
39113	SRK	AR-15-054c2	530	531.5	Special Waste	Mine Area	SPGN	SPGN		0.84	0.58	18.0	11.9	1.90	26.0	2.41	21	-	-	-	-	-	-
39114	SRK	AR-15-054c2	665	667	Waste Rock	Mine Area	SPGN	SPGN		0.87	0.36	19.1	2.77	1.40	16.2	1.99	22.0	-	-	-	-	-	-
39115	SRK	AR-15-054C4	694.5	697	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	0.20	4.00	3.00	7.00	405	< 1.00
39116	SRK	AR-15-055	552	554	Waste Rock	Mine Area	SPGN	SPGN		1.06	0.43	25.9	25.1	2.00	19.5	2.00	17.0	-	-	-	-	-	-
39117	SRK	AR-15-055	602.5	605	Waste Rock	Mine Area	SPGN	SPGN		1.06	0.45	16.0	16.1	2.10	18.4	2.10	21.0	-	-	-	-	-	-
39118	SRK	AR-15-058C1	393	395.5	Waste Rock	Mine Area	SPGN	SPGN		1.27	0.78	13.6	24.5	1.80	27.8	2.80	16.0	-	-	-	-	-	-
39119	SRK	AR-15-059C1	424.5	426.5	Waste Rock	Mine Area	SPGN	SPGN		0.70	0.49	14.0	2.95	1.30	20.1	2.18	34.0	-	-	-	-	-	-
39120	SRK	AR-15-059C2	468	470.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	0.20	2.00	5.00	4.00	18.0	< 1.00
39122	SRK	AR-15-059C4	498.5	500.5	Waste Rock	Mine Area	SPGN	SPGN		0.78	0.26	19.1	70.1	1.70	10.2	1.22	12.0	-	-	-	-	-	-
39123	SRK	AR-15-059C4	556	558.5	Waste Rock	Mine Area	SPGN	SPGN		1.10	0.24	12.5	6.10	2.00	11.4	1.42	15.0	-	-	-	-	-	-
39125	SRK	AR-15-060C2	404.5	407	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	< 0.20	< 1.00	< 1.00	< 1.00	2.00	< 1.00
39126	SRK	AR-15-060C2	481	483.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	< 0.20	3.00	< 1.00	2.00	8.00	< 1.00
39127	SRK	AR-15-061C1	548	550.5	Waste Rock	Mine Area	SPGN	SPGN		2.24	0.30	20.9	15.0	2.90	14.9	1.90	17.0	-	-	-	-	-	-
39128	SRK	AR-15-061C2	504	506.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	< 0.20	4.00	2.00	5.00	2.00	< 1.00

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Partial - Aqua Regia Digestion and ICP-OES Finish									
									Analyte	Hg	Mo	Ni	Pb	Sb	Se	Te	U	V	Zn
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion
									Detection Limit	1	1	1	1	1	1	1	1	1	1
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl
39060	SRK	GAR-18-009	467	468.5	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39062	SRK	GAR-18-009	524.5	526	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39063	SRK	GAR-18-013	510	512	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39064	SRK	GAR-18-013	430	431	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39066	SRK	GAR-18-006	400.5	402	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39067	SRK	GAR-18-006	350.5	352	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39068	SRK	GAR-18-006	298.5	300	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39069	SRK	GAR-18-006	200.1	201.5	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39070	SRK	GAR-18-006	121	122.5	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39077	SRK	GAR-18-006	500	501.5	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39078	SRK	GAR-18-006	450	451.5	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39084	SRK	AR-17-179C1	442	443.5	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39091	SRK	AR-15-052	625	626.5	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39079	SRK	AR-16-110C1	440	441.5	Waste Rock	Mine Area	INT	INT		< 1.00	11.0	32.0	12.0	< 1.00	< 1.00	< 1.00	48.0	11.0	18.0
39080	SRK	AR-16-110C1	471	472.5	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39081	SRK	AR-16-105C1	567	569	Special Waste	Mine Area	INT	INT		< 1.00	76.0	12.0	24.0	< 1.00	2.00	< 1.00	453	19.0	< 1.00
39082	SRK	AR-17-115C1	506.05	507.5	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39083	SRK	AR-17-147C3	476	478	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39085	SRK	AR-17-155C3	499	500	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39092	SRK	AR-16-110C2	498	500	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39093	SRK	AR-17-136C1	425	426.5	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39174	SRK	AR-17-147C1	480.1	482	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39176	SRK	AR-17-183C1	476.5	478.2	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39186	SRK	AR-18-208C1	560	562	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39189	SRK	AR-18-209C1	551	553	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39193	SRK	AR-18-200C4	569.5	571	Waste Rock	Mine Area	INT	INT		-	-	-	-	-	-	-	-	-	-
39072	SRK	GAR-18-006	50	51.5	Waste Rock	Mine Area	MST	MST		-	-	-	-	-	-	-	-	-	-
39190	SRK	GAR-18-015	13	14	Waste Rock	Mine Area	OVB	OVB		-	-	-	-	-	-	-	-	-	-
39191	SRK	GAR-18-013	11.3	15.8	Waste Rock	Mine Area	OVB	OVB		-	-	-	-	-	-	-	-	-	-
39163	SRK	AR-16-110C2	469.5	471	Waste Rock	Mine Area	PEG	SPGN		-	-	-	-	-	-	-	-	-	-
39192	SRK	AR-18-200C4	541	542.5	Waste Rock	Mine Area	PEG	SPGN		-	-	-	-	-	-	-	-	-	-
39056	SRK	GAR-18-012	660	661.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39057	SRK	GAR-18-012	532	533.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39058	SRK	GAR-18-012	431	432.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39059	SRK	GAR-18-012	495	496.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39061	SRK	GAR-18-011	651	652.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39065	SRK	GAR-18-013	378	379	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39074	SRK	GAR-18-006	650	651.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39075	SRK	GAR-18-006	603.5	605	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39076	SRK	GAR-18-006	550	551.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39086	SRK	AR-17-120C2	685	686.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39087	SRK	AR-15-052	418.5	420	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39088	SRK	AR-15-052	456	457.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39089	SRK	AR-15-052	499.5	501	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39090	SRK	AR-15-052	561.5	563	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39094	SRK	AR-14-015	690	691	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39095	SRK	AR-14-028	372	374	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39096	SRK	AR-14-026	479	481	Special Waste	Mine Area	SPGN	SPGN		< 1.00	19.0	23.0	63.0	1.00	< 1.00	< 1.00	961	84.0	7.00
39097	SRK	AR-14-026	438	440	Special Waste	Mine Area	SPGN	SPGN		< 1.00	1.00	33.0	21.0	< 1.00	< 1.00	< 1.00	505	61.0	3.00
39098	SRK	AR-14-024	572	573.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39099	SRK	AR-14-024	446	448	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39101	SRK	AR-15-033	476	478	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39102	SRK	AR-15-033	504.5	506	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39103	SRK	AR-15-033	551	553	Special Waste	Mine Area	SPGN	SPGN		< 1.00	1.00	12.0	18.0	< 1.00	< 1.00	< 1.00	348	17.0	2.00
39104	SRK	AR-15-039W1	418.5	421	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39105	SRK	AR-15-043A	368	370.5	Special Waste	Mine Area	SPGN	SPGN		< 1.00	3.00	43.0	40.0	< 1.00	< 1.00	< 1.00	1230	43.0	4.00
39106	SRK	AR-15-052	528	530	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39107	SRK	AR-15-052	568.5	570.5	Special Waste	Mine Area	SPGN	SPGN		< 1.00	773	35.0	242	5.00	27.0	< 1.00	3200	67.0	2.00
39108	SRK	AR-15-052	590	592	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39109	SRK	AR-15-034b	406	408.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39110	SRK	AR-15-034b	667	669.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39111	SRK	AR-15-036	340	342	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39112	SRK	AR-15-057c3	367.5	369	Special Waste	Mine Area	SPGN	SPGN		< 1.00	< 1.00	38.0	14.0	< 1.00	< 1.00	< 1.00	355	14.0	3.00
39113	SRK	AR-15-054c2	530	531.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39114	SRK	AR-15-054c2	665	667	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39115	SRK	AR-15-054C4	694.5	697	Special Waste	Mine Area	SPGN	SPGN		< 1.00	222	12.0	39.0	< 1.00	4.00	< 1.00	422	45.0	1.00
39116	SRK	AR-15-055	552	554	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39117	SRK	AR-15-055	602.5	605	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39118	SRK	AR-15-058C1	393	395.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39119	SRK	AR-15-059C1	424.5	426.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39120	SRK	AR-15-059C2	468	470.5	Special Waste	Mine Area	SPGN	SPGN		< 1.00	3.00	23.0	52.0	1.00	< 1.00	< 1.00	720	48.0	17.0
39122	SRK	AR-15-059C4	498.5	500.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39123	SRK	AR-15-059C4	556	558.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39125	SRK	AR-15-060C2	404.5	407	Waste Rock	Mine Area	SPGN	SPGN		< 1.00	7.00	4.00	3.00	< 1.00	< 1.00	< 1.00	162	10.0	1.00
39126	SRK	AR-15-060C2	481	483.5	Special Waste	Mine Area	SPGN	SPGN		< 1.00	< 1.00	6.00	9.00	< 1.00	< 1.00	< 1.00	241	6.00	1.00
39127	SRK	AR-15-061C1	548	550.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39128	SRK	AR-15-061C2	504	506.5	Special Waste	Mine Area	SPGN	SPGN		< 1.00	8.00	17.0	12.0	< 1.00	1.00	< 1.00	283	20.0	< 1.00

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		ABA											
									Analyte	Sulfate (SO_4), acid soluble	pH, paste	Modified NP	Acid Producing	Net Acid Generation	Sulfur as Sulfide	Total Carbon	Total Sulfur	Inorganic Carbon (TIC)	TIC	NP/AP	TIC/AP
									Unit	wt. %	pH units	kg CaCO3/t	kg $CaCO_3$/t	kg $CaCO_3$/t	wt. %	wt. %	wt. %	wt. %	kg $CaCO_3$/t	-	-
									Method							LECO	LECO	LECO			
									Detection Limit	0.005	--	0.5	0.5	--		0.01	0.01	0.01			
39129	SRK	AR-16-059C5	545.5	548	Waste Rock	Mine Area	SPGN	SPGN		0.0070	8.22	3.00	< 0.50	- 3.00	0.010	0.31	0.010	< 0.010	0.83	9.6	2.7
39130	SRK	AR-16-059C5	554.5	557	Special Waste	Mine Area	SPGN	SPGN		0.023	7.08	3.70	< 0.50	- 3.70	0.010	0.14	0.020	< 0.010	0.83	9.6	2.2
39131	SRK	AR-16-064C1	439	441	Special Waste	Mine Area	SPGN	SPGN		0.040	8.16	40.2	0.80	- 39.4	0.030	0.74	0.040	< 0.010	0.83	48.3	1.0
39132	SRK	AR-16-074C3	447	449	Waste Rock	Mine Area	SPGN	SPGN		0.020	7.75	3.70	3.90	< 0.50	0.12	0.52	0.13	< 0.010	0.83	1.0	0.2
39133	SRK	AR-16-076C2	475.5	478	Waste Rock	Mine Area	SPGN	SPGN		0.0080	8.55	3.40	7.70	4.30	0.25	0.18	0.25	< 0.010	0.83	0.4	0.1
39134	SRK	AR-16-076C3	415	416.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.63	2.70	< 0.50	- 2.70	0.010	0.27	< 0.010	< 0.010	0.83	8.6	2.7
39135	SRK	AR-16-078C4	366.5	368.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.29	7.00	< 0.50	- 7.00	0.010	0.070	< 0.010	< 0.010	0.83	22.4	2.7
39136	SRK	AR-16-080C1	453.5	456.5	Special Waste	Mine Area	SPGN	SPGN		0.010	8.02	3.90	< 0.50	- 3.90	0.010	0.19	0.010	< 0.010	0.83	12.5	2.7
39138	SRK	AR-16-081C1	480.5	482	Waste Rock	Mine Area	SPGN	SPGN		0.0080	8.73	3.10	3.70	0.60	0.12	0.45	0.12	< 0.010	0.83	0.8	0.2
39139	SRK	AR-16-084C1	691	692.5	Waste Rock	Mine Area	SPGN	SPGN		0.040	6.33	2.60	33.0	30.4	1.10	0.54	1.07	< 0.010	0.83	0.1	0.0
39141	SRK	AR-16-091C3	572.5	575	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.25	3.80	< 0.50	- 3.80	0.010	0.25	0.010	< 0.010	0.83	12.2	2.7
39142	SRK	AR-16-091C3	620	622.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	7.99	1.50	1.30	< 0.50	0.040	0.33	0.040	< 0.010	0.83	1.3	0.7
39144	SRK	AR-16-092C3	528.5	531	Waste Rock	Mine Area	SPGN	SPGN		0.0060	8.74	13.9	2.80	- 11.1	0.090	0.31	0.090	0.080	6.67	5.1	2.4
39145	SRK	AR-16-093C2	612.5	615	Special Waste	Mine Area	SPGN	SPGN		< 0.0050	8.25	4.10	0.90	- 3.20	0.030	0.41	0.030	< 0.010	0.83	4.6	0.9
39146	SRK	AR-16-093C2	653.5	655.5	Waste Rock	Mine Area	SPGN	SPGN		0.024	8.14	4.60	14.4	9.80	0.46	1.15	0.47	< 0.010	0.83	0.3	0.1
39147	SRK	AR-16-098C1	603	605.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.60	4.60	0.90	- 3.70	0.030	0.19	0.030	< 0.010	0.83	5.2	0.9
39149	SRK	AR-16-096C1	396.5	398.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.09	2.40	< 0.50	- 2.40	0.010	0.070	0.010	< 0.010	0.83	7.7	2.7
39150	SRK	AR-16-102C1	644	646	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.16	3.90	0.60	- 3.30	0.020	0.19	0.020	< 0.010	0.83	6.8	1.5
39151	SRK	AR-16-102C1	665.5	668	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.00	2.60	0.60	- 2.00	0.020	0.14	0.020	< 0.010	0.83	4.5	1.5
39152	SRK	AR-16-102C1	701	703.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	7.82	4.10	1.30	- 2.80	0.040	0.20	0.040	< 0.010	0.83	3.4	0.7
39153	SRK	AR-16-102C2	607	609.5	Special Waste	Mine Area	SPGN	SPGN		0.022	7.38	4.10	< 0.50	- 4.10	0.010	0.25	0.010	< 0.010	0.83	13.1	2.7
39154	SRK	AR-16-104C1	756	758	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	7.92	4.00	1.30	- 2.70	0.040	0.25	0.040	< 0.010	0.83	3.3	0.7
39155	SRK	AR-16-106C1	631	633	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.28	3.40	2.80	- 0.60	0.090	0.44	0.090	< 0.010	0.83	1.2	0.3
39156	SRK	AR-16-106C1	687.5	689.5	Waste Rock	Mine Area	SPGN	SPGN		0.0080	7.97	2.90	4.60	1.70	0.15	0.36	0.15	< 0.010	0.83	0.6	0.2
39157	SRK	AR-16-106C1	729	730.6	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	7.92	2.90	< 0.50	- 2.90	0.010	0.090	< 0.010	< 0.010	0.83	9.3	2.7
39158	SRK	AR-16-106C2	577.5	579.5	Waste Rock	Mine Area	SPGN	SPGN		0.010	7.94	2.90	4.90	2.00	0.16	0.36	0.16	< 0.010	0.83	0.6	0.2
39159	SRK	AR-16-108C3	374	377	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.33	3.20	< 0.50	- 3.20	0.010	0.10	0.010	< 0.010	0.83	10.2	2.7
39160	SRK	AR-16-109C2	652	654	Special Waste	Mine Area	SPGN	SPGN		0.0080	8.01	3.40	2.40	- 1.00	0.080	0.25	0.080	< 0.010	0.83	1.4	0.3
39161	SRK	AR-16-109C3	695.5	697.2	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.07	3.10	0.60	- 2.50	0.020	0.26	0.020	< 0.010	0.83	5.4	1.5
39162	SRK	AR-16-110C1	683	685	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.22	3.70	< 0.50	- 3.70	0.010	0.090	0.010	< 0.010	0.83	11.8	2.7
39164	SRK	AR-16-111C1	766	768	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.88	4.10	0.90	- 3.20	0.030	0.43	0.030	< 0.010	0.83	4.6	0.9
39167	SRK	AR-17-115C2	697	698.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.12	3.20	0.60	- 2.60	0.020	0.25	0.020	< 0.010	0.83	5.6	1.5
39169	SRK	AR-17-120C1	716	717.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.28	3.10	< 0.50	- 3.10	0.010	0.25	< 0.010	< 0.010	0.83	9.9	2.7
39170	SRK	AR-17-127C2	506.5	508.5	Special Waste	Mine Area	SPGN	SPGN		0.012	8.70	16.3	1.40	- 14.9	0.050	0.34	0.050	0.14	11.67	11.3	8.1
39172	SRK	AR-17-126C1	749.5	752	Special Waste	Mine Area	SPGN	SPGN		0.024	7.71	4.60	2.30	- 2.30	0.070	0.80	0.080	< 0.010	0.83	2.0	0.4
39173	SRK	AR-17-136C2	750	752	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.08	3.60	< 0.50	- 3.60	0.010	0.64	< 0.010	< 0.010	0.83	11.5	2.7
39175	SRK	AR-17-164C1	520.5	522.5	Waste Rock	Mine Area	SPGN	SPGN		0.050	7.30	6.30	102	96.0	3.30	0.99	3.29	< 0.010	0.83	0.1	0.0
39177	SRK	GAR-17-003	488.5	491	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	7.89	2.90	< 0.50	- 2.90	0.010	0.43	< 0.010	< 0.010	0.83	9.3	2.7
39178	SRK	GAR-17-003	680.5	682	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	9.42	6.00	2.80	- 3.20	0.090	0.46	0.090	< 0.010	0.83	2.2	0.3
39179	SRK	AR-18-186C1	580.5	582.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.93	4.10	< 0.50	- 4.10	0.010	0.20	0.010	< 0.010	0.83	13.1	2.7
39180	SRK	AR-18-186C1	741.5	744	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.63	5.10	1.30	- 3.80	0.040	0.24	0.040	< 0.010	0.83	4.3	0.7
39181	SRK	AR-18-187C1	388	390	Waste Rock	Mine Area	SPGN	SPGN		0.0050	8.27	2.90	0.60	- 2.30	0.020	0.020	0.020	< 0.010	0.83	5.1	1.5
39182	SRK	AR-18-187C1	520	522.5	Special Waste	Mine Area	SPGN	SPGN		< 0.0050	8.19	3.90	< 0.50	- 3.90	0.010	0.13	0.010	< 0.010	0.83	12.5	2.7
39183	SRK	AR-18-187C3	548.5	550.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.85	5.00	0.60	- 4.40	0.020	0.24	0.020	< 0.010	0.83	8.7	1.5
39184	SRK	AR-18-187C4	472.5	474.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	7.59	3.50	< 0.50	- 3.50	0.010	0.17	0.010	< 0.010	0.83	11.2	2.7
39185	SRK	AR-18-207C1	577	579.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	8.88	4.60	< 0.50	- 4.60	0.010	0.20	0.010	< 0.010	0.83	14.7	2.7
39187	SRK	AR-18-208C1	596	598	Waste Rock	Mine Area	SPGN	SPGN		< 0.0050	7.94	4.10	0.90	- 3.20	0.030	0.070	0.030	< 0.010	0.83	4.6	0.9
39188	SRK	AR-18-209C1	501	503	Special Waste	Mine Area	SPGN	SPGN		0.0050	7.98	3.20	0.60	- 2.60	0.020	0.050	0.020	< 0.010	0.83	5.6	1.5
39194	SRK	AR-18-200C4	608.5	610.5	Waste Rock	Mine Area	SPGN	SPGN		0.012	8.27	5.60	62.4	56.8	2.00	0.38	1.77	< 0.010	0.83	0.1	0.0
39137	SRK	AR-16-080C4	502	504	Waste Rock	Mine Area	SPGN	SPGN		0.095	6.81	2.00	104	102	3.30	4.01	3.32	< 0.010	0.83	0.0	0.0
39143	SRK	AR-16-091C4	680	682.5	Waste Rock	Mine Area	SPGN/DIOR	SPGN		< 0.0050	8.33	5.10	0.60	- 4.50	0.020	0.73	0.020	< 0.010	0.83	8.9	1.5
39100	SRK	AR-14-024	372	374.5	Special Waste	Mine Area	SPGN/FLT	SPGN		0.0050	7.87	2.50	< 0.50	- 2.50	0.010	0.030	0.010	< 0.010	0.83	8.0	2.7
39124	SRK	AR-15-060C1	435	436.5	Special Waste	Mine Area	SPGN/FLT	SPGN		< 0.0050	8.77	9.20	< 0.50	- 9.20	0.010	0.96	0.010	< 0.010	0.83	29.4	2.7
39140	SRK	AR-16-085C1	407.5	410	Waste Rock	Mine Area	SPGN/FLT	SPGN		0.034	7.84	3.40	32.8	29.4	1.00	2.44	1.06	< 0.010	0.83	0.1	0.0
39148	SRK	AR-16-098C2	706	708.5	Special Waste	Mine Area	SPGN/FLT	SPGN		0.035	7.97	5.80	18.7	12.9	0.60	2.38	0.61	0.010	0.83	0.3	0.0
39165	SRK	AR-16-111C2	696	698	Special Waste	Mine Area	SPGN/FLT	SPGN		0.060	7.39	3.60	31.6	28.0	1.00	3.44	1.03	< 0.010	0.83	0.1	0.0
39168	SRK	AR-17-119C2	387	389	Special Waste	Mine Area	SPGN/FLT	SPGN		0.024	8.13	31.5	3.50	- 28.0	0.11	0.58	0.12	0.28	23.33	9.0	6.7
39166	SRK	AR-17-114C1	736	737.5	Waste Rock	Mine Area	FLT/SPGN	SPGN		< 0.0050	8.57	5.80	< 0.50	- 5.80	0.010	0.47	0.010	< 0.010	0.83	18.6	2.7
39171	SRK	AR-17-127C1	475	479	Special Waste	Mine Area	SPGN/FLT	SPGN		0.075	7.55	9.50	53.3	43.8	1.70	3.53	1.73	0.080	6.67	0.2	0.1
39071	SRK	GAR-18-006	81	82	Waste Rock	Mine Area	SST	SST		0.0070	6.01	3.00	< 0.50	- 3.00	0.010	< 0.010	0.01	< 0.010	0.83	9.6	2.7
39073	SRK	GAR-18-006	69	70.5	Waste Rock	Mine Area	SST	SST		0.028	6.85	2.4	1.3	-1.1	0.040	0.01	0.05	< 0.010	0.83	1.9	0.7
39048	SRK	GAR-19-020	560	561	Waste Rock	UGTMF	INT	INT		< 0.0050	8.86	5.80	2.50	- 3.30	0.08	0.040	0.080	0.010	0.83	2.4	0.3
39055	SRK	GAR-19-022	509	510	Waste Rock	UGTMF	INT	INT		< 0.0050	8.62	6.20	6.30	< 0.50	0.20	0.18	0.20	0.020	1.67	1.0	0.3
39001	SRK	GAR-19-018	529	530	Waste Rock	UGTMF	INT	INT		< 0.0050	8.56	5.30	21.9	16.6	0.70	0.20	0.70	0.010	0.83	0.2	0.0
39002	SRK	GAR-19-018	515	516	Waste Rock	UGTMF	INT	INT		< 0.0050	8.48	5.90	1.90	- 4.00	0.06	0.070	0.060	0.030	2.50	3.2	1.4
39003	SRK	GAR-19-018	454	455	Waste Rock	UGTMF	INT	INT		< 0.0050	9.21	5.30	7.50	2.20	0.24	0.15	0.24	< 0.010	0.83	0.7	0.1
39004	SRK	GAR-19-018	474	475	Waste Rock	UGTMF	INT	INT		< 0.0050	8.93	6.00	4.40	- 1.60	0.14	0.060	0.14	0.020	1.67	1.4	0.4
39005	SRK	GAR-19-018	488	489	Waste Rock	UGTMF	INT	INT		< 0.0050	8.89	8.00	13.4	5.40	0.43	0.22	0.43	0.030	2.50	0.6	0.2
39006	SRK	GAR-19-018	497	498	Waste Rock	UGTMF	INT	INT		< 0.0050	8.99	8.50	3.80	- 4.70	0.12	0.15	0.12	0.030	2.50	2.3	0.7
39007	SRK	GAR-19-018	424	425	Waste Rock	UGTMF	INT	INT		< 0.0050	8.81	6.70	9.70	3.00	0.31	0.17	0.31	0.020	1.67	0.7	0.2
39008	SRK	GAR-19-018	440	441	Waste Rock	UGTMF	INT	INT		< 0.0050	9.04	7.70	2.20	- 5.50	0.07	0.11	0.070	0.020	1.67	3.6	0.8
39025	SRK	GAR-19-019	387.8	388.8	Waste Rock	UGTMF	INT	INT		< 0.0050	9.07	6.20	4.40	- 1.80	0.14	0.080	0.14	0.020	1.67	1.4	0.4
39026	SRK	GAR-19-019	406	407	Waste Rock	UGTMF	INT	INT		< 0.0050	9.08	8.50	11.3	2.80	0.26	0.22	0.36	0.030	2.50	0.8	0.2
39027	SRK	GAR-19-019	419	420	Waste Rock	UGTMF	INT	INT		< 0.0050	8.69	14.7	4.10	- 10.6	0.13	0.21	0.13	0.10	8.33	3.7	2.1
39028	SRK	GAR-19-019	431.25	432.25	Waste Rock	UGTMF	INT	INT		< 0.0050	9.15	7.50	2.50	- 5.00	0.08	0.20	0.080	0.020	1.67	3.1	0.7
39029	SRK	GAR-19-019	448.5	449.5	Waste Rock	UGTMF	INT	INT		< 0.0050	8.57	58.2	15.6	- 42.6	0.50	0.80	0.50	0.62	51.67	3.7	3.3

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4 Acid Digestion and ICP-OES finish											
									Analyte	Ag	Al_2O_3	Ba	Be	CaO	Cd	Ce	Co	Cr	Cu	Dy	Er
									Units	ppm	wt. %	ppm	ppm	wt. %	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion
									Detection Limit	0.2	0.01	1	0.2	0.01	1	1	1	1	1	0.2	0.2
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$
39129	SRK	AR-16-059C5	545.5	548	Waste Rock	Mine Area	SPGN	SPGN		-	18.6	879	-	0.040	-	35.0	-	116	-	-	-
39130	SRK	AR-16-059C5	554.5	557	Special Waste	Mine Area	SPGN	SPGN		< 0.20	23.2	1230	2.00	0.080	< 1.00	75.0	3.00	156	8.00	7.80	3.90
39131	SRK	AR-16-064C1	439	441	Special Waste	Mine Area	SPGN	SPGN		< 0.20	27.4	1710	3.80	1.48	< 1.00	33.0	49.0	180	10.0	10.6	6.10
39132	SRK	AR-16-074C3	447	449	Waste Rock	Mine Area	SPGN	SPGN		-	15.6	709	-	0.060	-	392	-	91.0	-	-	-
39133	SRK	AR-16-076C2	475.5	478	Waste Rock	Mine Area	SPGN	SPGN		-	10.8	740	-	0.020	-	58.0	-	64.0	-	-	-
39134	SRK	AR-16-076C3	415	416.5	Waste Rock	Mine Area	SPGN	SPGN		-	16.2	830	-	0.060	-	117	-	66.0	-	-	-
39135	SRK	AR-16-078C4	366.5	368.5	Waste Rock	Mine Area	SPGN	SPGN		-	10.0	541	-	0.050	-	65.0	-	59.0	-	-	-
39136	SRK	AR-16-080C1	453.5	456.5	Special Waste	Mine Area	SPGN	SPGN		< 0.20	16.5	1360	2.20	0.070	< 1.00	82.0	7.00	99.0	28.0	13.4	5.50
39138	SRK	AR-16-081C1	480.5	482	Waste Rock	Mine Area	SPGN	SPGN		-	16.5	1020	-	0.040	-	57.0	-	103	-	-	-
39139	SRK	AR-16-084C1	691	692.5	Waste Rock	Mine Area	SPGN	SPGN		-	12.6	666	-	0.060	-	100	-	64.0	-	-	-
39141	SRK	AR-16-091C3	572.5	575	Waste Rock	Mine Area	SPGN	SPGN		-	15.2	813	-	0.040	-	25.0	-	79.0	-	-	-
39142	SRK	AR-16-091C3	620	622.5	Waste Rock	Mine Area	SPGN	SPGN		-	13.9	736	-	0.040	-	107	-	86.0	-	-	-
39144	SRK	AR-16-092C3	528.5	531	Waste Rock	Mine Area	SPGN	SPGN		-	14.4	736	-	0.88	-	38.0	-	83.0	-	-	-
39145	SRK	AR-16-093C2	612.5	615	Special Waste	Mine Area	SPGN	SPGN		< 0.20	19.7	1120	1.20	0.050	< 1.00	96.0	5.00	99.0	56.0	6.20	3.60
39146	SRK	AR-16-093C2	653.5	655.5	Waste Rock	Mine Area	SPGN	SPGN		-	15.0	695	-	0.090	-	142	-	93.0	-	-	-
39147	SRK	AR-16-098C1	603	605.5	Waste Rock	Mine Area	SPGN	SPGN		-	12.6	784	-	0.070	-	66.0	-	66.0	-	-	-
39149	SRK	AR-16-096C1	396.5	398.5	Waste Rock	Mine Area	SPGN	SPGN		-	14.1	542	-	0.040	-	129	-	81.0	-	-	-
39150	SRK	AR-16-102C1	644	646	Waste Rock	Mine Area	SPGN	SPGN		-	11.8	653	-	0.050	-	87.0	-	61.0	-	-	-
39151	SRK	AR-16-102C1	665.5	668	Waste Rock	Mine Area	SPGN	SPGN		-	14.6	768	-	0.030	-	115	-	74.0	-	-	-
39152	SRK	AR-16-102C1	701	703.5	Waste Rock	Mine Area	SPGN	SPGN		-	13.2	742	-	0.050	-	91.0	-	73.0	-	-	-
39153	SRK	AR-16-102C2	607	609.5	Special Waste	Mine Area	SPGN	SPGN		< 0.20	16.7	435	2.20	0.10	< 1.00	200	11.0	51.0	36.0	3.20	2.00
39154	SRK	AR-16-104C1	756	758	Waste Rock	Mine Area	SPGN	SPGN		-	16.0	849	-	0.050	-	29.0	-	94.0	-	-	-
39155	SRK	AR-16-106C1	631	633	Waste Rock	Mine Area	SPGN	SPGN		-	17.0	774	-	0.040	-	93.0	-	101	-	-	-
39156	SRK	AR-16-106C1	687.5	689.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.20	14.9	831	1.20	0.070	< 1.00	38.0	21.0	86.0	138	4.10	2.40
39157	SRK	AR-16-106C1	729	730.6	Waste Rock	Mine Area	SPGN	SPGN		-	10.9	603	-	0.030	-	37.0	-	51.0	-	-	-
39158	SRK	AR-16-106C2	577.5	579.5	Waste Rock	Mine Area	SPGN	SPGN		-	11.5	598	-	0.030	-	113	-	68.0	-	-	-
39159	SRK	AR-16-108C3	374	377	Waste Rock	Mine Area	SPGN	SPGN		-	21.3	963	-	0.050	-	210	-	155	-	-	-
39160	SRK	AR-16-109C2	652	654	Special Waste	Mine Area	SPGN	SPGN		< 0.20	20.2	1060	1.60	0.060	< 1.00	20.0	9.00	207	592	5.30	2.60
39161	SRK	AR-16-109C3	695.5	697.2	Waste Rock	Mine Area	SPGN	SPGN		-	15.8	840	-	0.040	-	36.0	-	90.0	-	-	-
39162	SRK	AR-16-110C1	683	685	Waste Rock	Mine Area	SPGN	SPGN		-	14.8	771	-	0.040	-	170	-	84.0	-	-	-
39164	SRK	AR-16-111C1	766	768	Waste Rock	Mine Area	SPGN	SPGN		-	14.9	334	-	0.14	-	110	-	88.0	-	-	-
39167	SRK	AR-17-115C2	697	698.5	Waste Rock	Mine Area	SPGN	SPGN		-	11.2	217	-	0.050	-	102	-	65.0	-	-	-
39169	SRK	AR-17-120C1	716	717.5	Waste Rock	Mine Area	SPGN	SPGN		-	14.2	698	-	0.040	-	84.0	-	80.0	-	-	-
39170	SRK	AR-17-127C2	506.5	508.5	Special Waste	Mine Area	SPGN	SPGN		< 0.20	15.0	813	1.40	0.81	< 1.00	152	6.00	71.0	45.0	4.00	2.10
39172	SRK	AR-17-126C1	749.5	752	Special Waste	Mine Area	SPGN	SPGN		< 0.20	26.1	1020	2.10	0.10	< 1.00	84.0	16.0	229	121	8.80	4.50
39173	SRK	AR-17-136C2	750	752	Waste Rock	Mine Area	SPGN	SPGN		-	19.2	287	-	0.060	-	172	-	98.0	-	-	-
39175	SRK	AR-17-164C1	520.5	522.5	Waste Rock	Mine Area	SPGN	SPGN		-	18.2	594	-	0.20	-	81.0	-	142	-	-	-
39177	SRK	GAR-17-003	488.5	491	Waste Rock	Mine Area	SPGN	SPGN		-	34.7	1570	-	0.070	-	4.00	-	175	-	-	-
39178	SRK	GAR-17-003	680.5	682	Waste Rock	Mine Area	SPGN	SPGN		-	17.2	849	-	0.17	-	101	-	108	-	-	-
39179	SRK	AR-18-186C1	580.5	582.5	Waste Rock	Mine Area	SPGN	SPGN		-	12.9	736	-	0.060	-	85.0	-	68.0	-	-	-
39180	SRK	AR-18-186C1	741.5	744	Waste Rock	Mine Area	SPGN	SPGN		-	15.3	512	-	0.11	-	95.0	-	53.0	-	-	-
39181	SRK	AR-18-187C1	388	390	Waste Rock	Mine Area	SPGN	SPGN		< 0.20	16.5	880	2.00	0.060	< 1.00	426	8.00	110	17.0	4.70	2.40
39182	SRK	AR-18-187C1	520	522.5	Special Waste	Mine Area	SPGN	SPGN		< 0.20	16.0	900	1.80	0.060	< 1.00	66.0	6.00	88.0	12.0	4.20	2.30
39183	SRK	AR-18-187C3	548.5	550.5	Waste Rock	Mine Area	SPGN	SPGN		-	13.1	801	-	0.080	-	56.0	-	82.0	-	-	-
39184	SRK	AR-18-187C4	472.5	474.5	Waste Rock	Mine Area	SPGN	SPGN		-	27.1	1270	-	0.11	-	93.0	-	126	-	-	-
39185	SRK	AR-18-207C1	577	579.5	Waste Rock	Mine Area	SPGN	SPGN		-	12.7	551	-	0.16	-	80.0	-	74.0	-	-	-
39187	SRK	AR-18-208C1	596	598	Waste Rock	Mine Area	SPGN	SPGN		-	16.0	568	-	0.10	-	61.0	-	102	-	-	-
39188	SRK	AR-18-209C1	501	503	Special Waste	Mine Area	SPGN	SPGN		< 0.20	12.8	288	2.60	0.090	< 1.00	69.0	10.0	70.0	95.0	6.60	2.90
39194	SRK	AR-18-200C4	608.5	610.5	Waste Rock	Mine Area	SPGN	SPGN		-	17.1	789	-	0.13	-	95.0	-	113	-	-	-
39137	SRK	AR-16-080C4	502	504	Waste Rock	Mine Area	SPGN	SPGN		-	14.0	572	-	0.030	-	130	-	93.0	-	-	-
39143	SRK	AR-16-091C4	680	682.5	Waste Rock	Mine Area	SPGN/DIOR	SPGN		-	13.1	618	-	0.060	-	100	-	71.0	-	-	-
39100	SRK	AR-14-024	372	374.5	Special Waste	Mine Area	SPGN/FLT	SPGN		< 0.20	17.7	1020	2.10	0.060	< 1.00	68.0	9.00	94.0	11.0	7.10	3.60
39124	SRK	AR-15-060C1	435	436.5	Special Waste	Mine Area	SPGN/FLT	SPGN		< 0.20	29.7	1420	3.80	0.16	< 1.00	50.0	17.0	130	20.0	7.40	4.60
39140	SRK	AR-16-085C1	407.5	410	Waste Rock	Mine Area	SPGN/FLT	SPGN		-	16.2	778	-	0.11	-	169	-	94.0	-	-	-
39148	SRK	AR-16-098C2	706	708.5	Special Waste	Mine Area	SPGN/FLT	SPGN		< 0.20	23.7	1070	2.60	0.17	< 1.00	420	165	210	646	6.80	3.50
39165	SRK	AR-16-111C2	696	698	Special Waste	Mine Area	SPGN/FLT	SPGN		< 0.20	24.8	944	3.60	0.12	1.00	668	365	199	575	7.80	3.80
39168	SRK	AR-17-119C2	387	389	Special Waste	Mine Area	SPGN/FLT	SPGN		< 0.20	28.2	1230	3.20	1.30	< 1.00	89.0	16.0	170	32.0	15.8	6.60
39166	SRK	AR-17-114C1	736	737.5	Waste Rock	Mine Area	FLT/SPGN	SPGN		< 0.20	31.0	1330	2.80	0.070	< 1.00	39.0	15.0	135	138	5.90	3.70
39171	SRK	AR-17-127C1	475	479	Special Waste	Mine Area	SPGN/FLT	SPGN		1.70	16.2	759	2.20	0.47	< 1.00	462	97.0	246	750	6.80	3.00
39071	SRK	GAR-18-006	81	82	Waste Rock	Mine Area	SST	SST		-	0.7	4	-	< 0.01	-	13	-	6	-	-	-
39073	SRK	GAR-18-006	69	70.5	Waste Rock	Mine Area	SST	SST		-	5.5	120	-	0.05	-	53	-	40	-	-	-
39048	SRK	GAR-19-020	560	561	Waste Rock	UGTMF	INT	INT		-	13.6	779	-	1.38	-	112	-	80	-	-	-
39055	SRK	GAR-19-022	509	510	Waste Rock	UGTMF	INT	INT		-	15.0	725	-	0.96	-	94	-	100	-	-	-
39001	SRK	GAR-19-018	529	530	Waste Rock	UGTMF	INT	INT		-	20.6	1160	-	1.56	-	127	-	141	-	-	-
39002	SRK	GAR-19-018	515	516	Waste Rock	UGTMF	INT	INT		-	14.2	706	-	0.53	-	83.0	-	92.0	-	-	-
39003	SRK	GAR-19-018	454	455	Waste Rock	UGTMF	INT	INT		-	14.6	794	-	1.92	-	85.0	-	100	-	-	-
39004	SRK	GAR-19-018	474	475	Waste Rock	UGTMF	INT	INT		-	13.5	758	-	1.78	-	114	-	86.0	-	-	-
39005	SRK	GAR-19-018	488	489	Waste Rock	UGTMF	INT	INT		-	17.5	967	-	0.72	-	90.0	-	109	-	-	-
39006	SRK	GAR-19-018	497	498	Waste Rock	UGTMF	INT	INT		-	12.8	666	-	1.28	-	85.0	-	76.0	-	-	-
39007	SRK	GAR-19-018	424	425	Waste Rock	UGTMF	INT	INT		-	13.2	721	-	1.26	-	76.0	-	75.0	-	-	-
39008	SRK	GAR-19-018	440	441	Waste Rock	UGTMF	INT	INT		-	11.6	460	-	1.94	-	97.0	-	57.0	-	-	-
39025	SRK	GAR-19-019	387.8	388.8	Waste Rock	UGTMF	INT	INT		-	13.5	734	-	1.85	-	99.0	-	82.0	-	-	-
39026	SRK	GAR-19-019	406	407	Waste Rock	UGTMF	INT	INT		-	15.2	891	-	1.84	-	92.0	-	91.0	-	-	-
39027	SRK	GAR-19-019	419	420	Waste Rock	UGTMF	INT	INT		-	13.3	727	-	1.42	-	85.0	-	82.0	-	-	-
39028	SRK	GAR-19-019	431.25	432.25	Waste Rock	UGTMF	INT	INT		-	14.4	914	-	1.64	-	97.0	-	94.0	-	-	-
39029	SRK	GAR-19-019	448.5	449.5	Waste Rock	UGTMF	INT	INT		-	12.8	744	-	2.82	-	54.0	-	74.0	-	-	-

										Total - 4 Acid Digestion and ICP-OES finish											
Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping	Analyte	Eu	Fe_2O_3	Ga	Gd	Hf	Ho	2	K_2O	La	Li	MgO	MgO
									Units	ppm	wt. %	ppm	ppm	ppm	ppm	wt. %	wt. %	ppm	ppm	wt. %	wt. %
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion
									Detection Limit	0.2	0.01	1	1	1	1	0.002	0.01	1	1	0.002	0.01
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$
39129	SRK	AR-16-059C5	545.5	548	Waste Rock	Mine Area	SPGN	SPGN		-	0.85	-	-	-	-	4.04	-	20.0	92.0	2.28	-
39130	SRK	AR-16-059C5	554.5	557	Special Waste	Mine Area	SPGN	SPGN		1.20	2.02	28.0	5.00	9.00	1.00	-	5.07	43.0	126	-	3.00
39131	SRK	AR-16-064C1	439	441	Special Waste	Mine Area	SPGN	SPGN		0.80	2.14	36.0	3.00	14.0	2.00	-	6.47	24.0	139	-	5.09
39132	SRK	AR-16-074C3	447	449	Waste Rock	Mine Area	SPGN	SPGN		-	0.88	-	-	-	-	3.13	-	232	47.0	2.29	-
39133	SRK	AR-16-076C2	475.5	478	Waste Rock	Mine Area	SPGN	SPGN		-	2.44	-	-	-	-	2.26	-	33.0	32.0	1.75	-
39134	SRK	AR-16-076C3	415	416.5	Waste Rock	Mine Area	SPGN	SPGN		-	2.76	-	-	-	-	2.94	-	62.0	68.0	3.55	-
39135	SRK	AR-16-078C4	366.5	368.5	Waste Rock	Mine Area	SPGN	SPGN		-	0.59	-	-	-	-	1.73	-	34.0	45.0	1.95	-
39136	SRK	AR-16-080C1	453.5	456.5	Special Waste	Mine Area	SPGN	SPGN		1.80	1.96	23.0	8.00	6.00	2.00	-	3.38	49.0	122	-	2.66
39138	SRK	AR-16-081C1	480.5	482	Waste Rock	Mine Area	SPGN	SPGN		-	0.90	-	-	-	-	3.36	-	36.0	59.0	2.46	-
39139	SRK	AR-16-084C1	691	692.5	Waste Rock	Mine Area	SPGN	SPGN		-	1.56	-	-	-	-	2.73	-	56.0	98.0	0.74	-
39141	SRK	AR-16-091C3	572.5	575	Waste Rock	Mine Area	SPGN	SPGN		-	0.84	-	-	-	-	3.30	-	15.0	43.0	2.03	-
39142	SRK	AR-16-091C3	620	622.5	Waste Rock	Mine Area	SPGN	SPGN		-	0.98	-	-	-	-	3.03	-	57.0	38.0	1.85	-
39144	SRK	AR-16-092C3	528.5	531	Waste Rock	Mine Area	SPGN	SPGN		-	2.98	-	-	-	-	3.15	-	21.0	43.0	2.46	-
39145	SRK	AR-16-093C2	612.5	615	Special Waste	Mine Area	SPGN	SPGN		0.90	1.67	26.0	3.00	8.00	1.00	-	4.64	52.0	42.0	-	2.54
39146	SRK	AR-16-093C2	653.5	655.5	Waste Rock	Mine Area	SPGN	SPGN		-	1.21	-	-	-	-	3.18	-	73.0	44.0	2.08	-
39147	SRK	AR-16-098C1	603	605.5	Waste Rock	Mine Area	SPGN	SPGN		-	2.72	-	-	-	-	2.88	-	33.0	30.0	2.35	-
39149	SRK	AR-16-096C1	396.5	398.5	Waste Rock	Mine Area	SPGN	SPGN		-	0.60	-	-	-	-	2.56	-	68.0	54.0	2.14	-
39150	SRK	AR-16-102C1	644	646	Waste Rock	Mine Area	SPGN	SPGN		-	1.15	-	-	-	-	2.36	-	45.0	40.0	2.26	-
39151	SRK	AR-16-102C1	665.5	668	Waste Rock	Mine Area	SPGN	SPGN		-	1.87	-	-	-	-	3.11	-	62.0	43.0	2.93	-
39152	SRK	AR-16-102C1	701	703.5	Waste Rock	Mine Area	SPGN	SPGN		-	2.19	-	-	-	-	2.69	-	48.0	38.0	2.42	-
39153	SRK	AR-16-102C2	607	609.5	Special Waste	Mine Area	SPGN	SPGN		1.00	1.09	22.0	3.00	6.00	< 1.00	-	2.01	105	147	-	4.88
39154	SRK	AR-16-104C1	756	758	Waste Rock	Mine Area	SPGN	SPGN		-	1.82	-	-	-	-	3.50	-	17.0	51.0	2.53	-
39155	SRK	AR-16-106C1	631	633	Waste Rock	Mine Area	SPGN	SPGN		-	1.91	-	-	-	-	3.62	-	47.0	56.0	2.75	-
39156	SRK	AR-16-106C1	687.5	689.5	Special Waste	Mine Area	SPGN	SPGN		0.50	0.99	19.0	2.00	5.00	< 1.00	-	3.81	20.0	35.0	-	1.34
39157	SRK	AR-16-106C1	729	730.6	Waste Rock	Mine Area	SPGN	SPGN		-	0.74	-	-	-	-	2.68	-	20.0	23.0	1.20	-
39158	SRK	AR-16-106C2	577.5	579.5	Waste Rock	Mine Area	SPGN	SPGN		-	1.45	-	-	-	-	2.49	-	59.0	38.0	1.86	-
39159	SRK	AR-16-108C3	374	377	Waste Rock	Mine Area	SPGN	SPGN		-	1.05	-	-	-	-	4.40	-	113	82.0	3.14	-
39160	SRK	AR-16-109C2	652	654	Special Waste	Mine Area	SPGN	SPGN		0.60	1.13	24.0	2.00	9.00	< 1.00	-	4.36	13.0	121	-	2.87
39161	SRK	AR-16-109C3	695.5	697.2	Waste Rock	Mine Area	SPGN	SPGN		-	0.98	-	-	-	-	3.39	-	20.0	50.0	2.01	-
39162	SRK	AR-16-110C1	683	685	Waste Rock	Mine Area	SPGN	SPGN		-	1.00	-	-	-	-	3.28	-	89.0	56.0	2.31	-
39164	SRK	AR-16-111C1	766	768	Waste Rock	Mine Area	SPGN	SPGN		-	3.96	-	-	-	-	2.22	-	55.0	75.0	4.19	-
39167	SRK	AR-17-115C2	697	698.5	Waste Rock	Mine Area	SPGN	SPGN		-	0.56	-	-	-	-	1.45	-	53.0	67.0	2.90	-
39169	SRK	AR-17-120C1	716	717.5	Waste Rock	Mine Area	SPGN	SPGN		-	3.92	-	-	-	-	2.85	-	43.0	41.0	2.53	-
39170	SRK	AR-17-127C2	506.5	508.5	Special Waste	Mine Area	SPGN	SPGN		1.00	1.23	19.0	3.00	4.00	< 1.00	-	3.01	81.0	64.0	-	2.98
39172	SRK	AR-17-126C1	749.5	752	Special Waste	Mine Area	SPGN	SPGN		1.40	2.02	33.0	5.00	6.00	1.00	-	4.99	48.0	110	-	4.94
39173	SRK	AR-17-136C2	750	752	Waste Rock	Mine Area	SPGN	SPGN		-	1.27	-	-	-	-	3.16	-	93.0	76.0	4.46	-
39175	SRK	AR-17-164C1	520.5	522.5	Waste Rock	Mine Area	SPGN	SPGN		-	8.46	-	-	-	-	2.98	-	42.0	104	4.30	-
39177	SRK	GAR-17-003	488.5	491	Waste Rock	Mine Area	SPGN	SPGN		-	0.96	-	-	-	-	6.54	-	5.00	46.0	4.11	-
39178	SRK	GAR-17-003	680.5	682	Waste Rock	Mine Area	SPGN	SPGN		-	8.32	-	-	-	-	4.74	-	50.0	17.0	2.64	-
39179	SRK	AR-18-186C1	580.5	582.5	Waste Rock	Mine Area	SPGN	SPGN		-	0.93	-	-	-	-	2.80	-	47.0	49.0	2.00	-
39180	SRK	AR-18-186C1	741.5	744	Waste Rock	Mine Area	SPGN	SPGN		-	3.01	-	-	-	-	2.80	-	47.0	82.0	4.10	-
39181	SRK	AR-18-187C1	388	390	Waste Rock	Mine Area	SPGN	SPGN		2.70	0.96	22.0	7.00	11.0	< 1.00	-	3.07	232	81.0	-	3.21
39182	SRK	AR-18-187C1	520	522.5	Special Waste	Mine Area	SPGN	SPGN		0.90	2.26	21.0	2.00	6.00	< 1.00	-	3.61	36.0	54.0	-	2.44
39183	SRK	AR-18-187C3	548.5	550.5	Waste Rock	Mine Area	SPGN	SPGN		-	4.48	-	-	-	-	2.58	-	30.0	45.0	2.71	-
39184	SRK	AR-18-187C4	472.5	474.5	Waste Rock	Mine Area	SPGN	SPGN		-	3.72	-	-	-	-	6.10	-	50.0	98.0	3.56	-
39185	SRK	AR-18-207C1	577	579.5	Waste Rock	Mine Area	SPGN	SPGN		-	4.65	-	-	-	-	2.78	-	43.0	57.0	2.83	-
39187	SRK	AR-18-208C1	596	598	Waste Rock	Mine Area	SPGN	SPGN		-	1.44	-	-	-	-	3.04	-	34.0	94.0	4.25	-
39188	SRK	AR-18-209C1	501	503	Special Waste	Mine Area	SPGN	SPGN		1.10	0.97	18.0	4.00	8.00	1.00	-	2.33	37.0	113	-	2.34
39194	SRK	AR-18-200C4	608.5	610.5	Waste Rock	Mine Area	SPGN	SPGN		-	8.48	-	-	-	-	3.37	-	50.0	53.0	4.16	-
39137	SRK	AR-16-080C4	502	504	Waste Rock	Mine Area	SPGN	SPGN		-	4.96	-	-	-	-	3.21	-	75.0	58.0	2.17	-
39143	SRK	AR-16-091C4	680	682.5	Waste Rock	Mine Area	SPGN/DIOR	SPGN		-	2.67	-	-	-	-	2.53	-	50.0	49.0	2.60	-
39100	SRK	AR-14-024	372	374.5	Special Waste	Mine Area	SPGN/FLT	SPGN		0.90	1.34	24.0	3.00	9.00	1.00	-	3.93	38.0	72.0	-	2.33
39124	SRK	AR-15-060C1	435	436.5	Special Waste	Mine Area	SPGN/FLT	SPGN		1.10	8.90	41.0	< 1.00	8.00	1.00	-	5.95	28.0	197	-	5.46
39140	SRK	AR-16-085C1	407.5	410	Waste Rock	Mine Area	SPGN/FLT	SPGN		-	1.74	-	-	-	-	3.30	-	88.0	54.0	2.84	-
39148	SRK	AR-16-098C2	706	708.5	Special Waste	Mine Area	SPGN/FLT	SPGN		2.30	1.96	30.0	7.00	6.00	1.00	-	5.14	230	68.0	-	3.39
39165	SRK	AR-16-111C2	696	698	Special Waste	Mine Area	SPGN/FLT	SPGN		3.80	2.32	35.0	11.0	6.00	1.00	-	4.79	401	115	-	3.92
39168	SRK	AR-17-119C2	387	389	Special Waste	Mine Area	SPGN/FLT	SPGN		2.00	5.09	37.0	7.00	9.00	2.00	-	5.60	48.0	159	-	6.65
39166	SRK	AR-17-114C1	736	737.5	Waste Rock	Mine Area	FLT/SPGN	SPGN		0.60	3.41	41.0	2.00	10.0	1.00	-	5.99	27.0	85.0	-	9.49
39171	SRK	AR-17-127C1	475	479	Special Waste	Mine Area	SPGN/FLT	SPGN		2.10	3.35	21.0	6.00	4.00	1.00	-	3.58	261	93.0	-	2.25
39071	SRK	GAR-18-006	81	82	Waste Rock	Mine Area	SST	SST		-	0.05	-	-	-	-	0.01	-	7.0	3.0	0.03	-
39073	SRK	GAR-18-006	69	70.5	Waste Rock	Mine Area	SST	SST		-	0.55	-	-	-	-	0.99	-	28.0	21.0	0.44	-
39048	SRK	GAR-19-020	560	561	Waste Rock	UGTMF	INT	INT		-	5.37	-	-	-	-	3.15	-	63.0	14.0	2.11	-
39055	SRK	GAR-19-022	509	510	Waste Rock	UGTMF	INT	INT		-	6.74	-	-	-	-	3.52	-	52.0	29.0	3.13	-
39001	SRK	GAR-19-018	529	530	Waste Rock	UGTMF	INT	INT		-	8.66	-	-	-	-	5.10	-	70.0	29.0	2.96	-
39002	SRK	GAR-19-018	515	516	Waste Rock	UGTMF	INT	INT		-	6.28	-	-	-	-	3.75	-	47.0	42.0	3.10	-
39003	SRK	GAR-19-018	454	455	Waste Rock	UGTMF	INT	INT		-	6.80	-	-	-	-	3.35	-	48.0	21.0	2.45	-
39004	SRK	GAR-19-018	474	475	Waste Rock	UGTMF	INT	INT		-	6.06	-	-	-	-	2.84	-	62.0	17.0	2.11	-
39005	SRK	GAR-19-018	488	489	Waste Rock	UGTMF	INT	INT		-	8.03	-	-	-	-	4.33	-	49.0	31.0	3.22	-
39006	SRK	GAR-19-018	497	498	Waste Rock	UGTMF	INT	INT		-	5.24	-	-	-	-	2.90	-	45.0	14.0	1.90	-
39007	SRK	GAR-19-018	424	425	Waste Rock	UGTMF	INT	INT		-	5.53	-	-	-	-	2.91	-	44.0	21.0	2.17	-
39008	SRK	GAR-19-018	440	441	Waste Rock	UGTMF	INT	INT		-	4.29	-	-	-	-	1.96	-	54.0	11.0	1.52	-
39025	SRK	GAR-19-019	387.8	388.8	Waste Rock	UGTMF	INT	INT		-	5.77	-	-	-	-	2.76	-	53.0	11.0	2.08	-
39026	SRK	GAR-19-019	406	407	Waste Rock	UGTMF	INT	INT		-	7.11	-	-	-	-	3.36	-	51.0	19.0	2.52	-
39027	SRK	GAR-19-019	419	420	Waste Rock	UGTMF	INT	INT		-	6.38	-	-	-	-	2.98	-	47.0	38.0	2.58	-
39028	SRK	GAR-19-019	431.25	432.25	Waste Rock	UGTMF	INT	INT		-	6.30	-	-	-	-	3.55	-	55.0	19.0	2.32	-
39029	SRK	GAR-19-019	448.5	449.5	Waste Rock	UGTMF	INT	INT		-	5.56	-	-	-	-	4.28	-	28.0	51.0	2.61	-

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4 Acid Digestion and ICP-OES finish											
									Analyte	MnO	MnO	Mo	Na_2O	Nb	Nd	Ni	P_2O_5	P_2O_5	Pb	Pr	S
									Units	wt. %	wt. %	ppm	wt. %	ppm	ppm	ppm	wt. %	wt. %	ppm	ppm	ppm
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion
									Detection Limit	0.001	0.01	1	0.01	1	1	1	0.002	0.01	1	1	10
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$
39129	SRK	AR-16-059C5	545.5	548	Waste Rock	Mine Area	SPGN	SPGN		0.0020	-	-	0.18	-	-	-	0.011	-	-	-	74.0
39130	SRK	AR-16-059C5	554.5	557	Special Waste	Mine Area	SPGN	SPGN		-	< 0.010	851	0.22	22.0	34.0	50.0	-	0.020	70.0	8.00	233
39131	SRK	AR-16-064C1	439	441	Special Waste	Mine Area	SPGN	SPGN		-	0.010	266	0.25	33.0	11.0	127	-	0.020	93.0	3.00	421
39132	SRK	AR-16-074C3	447	449	Waste Rock	Mine Area	SPGN	SPGN		0.0020	-	-	0.15	-	-	-	0.12	-	-	-	1380
39133	SRK	AR-16-076C2	475.5	478	Waste Rock	Mine Area	SPGN	SPGN		0.021	-	-	0.080	-	-	-	0.021	-	-	-	2490
39134	SRK	AR-16-076C3	415	416.5	Waste Rock	Mine Area	SPGN	SPGN		0.023	-	-	0.10	-	-	-	0.058	-	-	-	43.0
39135	SRK	AR-16-078C4	366.5	368.5	Waste Rock	Mine Area	SPGN	SPGN		0.0020	-	-	0.070	-	-	-	0.024	-	-	-	43.0
39136	SRK	AR-16-080C1	453.5	456.5	Special Waste	Mine Area	SPGN	SPGN		-	0.040	54.0	0.12	31.0	33.0	55.0	-	0.030	100	9.00	149
39138	SRK	AR-16-081C1	480.5	482	Waste Rock	Mine Area	SPGN	SPGN		0.0040	-	-	0.13	-	-	-	0.022	-	-	-	1310
39139	SRK	AR-16-084C1	691	692.5	Waste Rock	Mine Area	SPGN	SPGN		0.0020	-	-	0.11	-	-	-	0.039	-	-	-	8560
39141	SRK	AR-16-091C3	572.5	575	Waste Rock	Mine Area	SPGN	SPGN		0.0020	-	-	0.16	-	-	-	0.011	-	-	-	84.0
39142	SRK	AR-16-091C3	620	622.5	Waste Rock	Mine Area	SPGN	SPGN		0.0030	-	-	0.14	-	-	-	0.036	-	-	-	371
39144	SRK	AR-16-092C3	528.5	531	Waste Rock	Mine Area	SPGN	SPGN		0.024	-	-	0.11	-	-	-	0.37	-	-	-	1080
39145	SRK	AR-16-093C2	612.5	615	Special Waste	Mine Area	SPGN	SPGN		-	< 0.010	15.0	0.20	21.0	37.0	36.0	-	0.030	29.0	11.0	312
39146	SRK	AR-16-093C2	653.5	655.5	Waste Rock	Mine Area	SPGN	SPGN		0.0020	-	-	0.16	-	-	-	0.050	-	-	-	4180
39147	SRK	AR-16-098C1	603	605.5	Waste Rock	Mine Area	SPGN	SPGN		0.013	-	-	0.17	-	-	-	0.031	-	-	-	287
39149	SRK	AR-16-096C1	396.5	398.5	Waste Rock	Mine Area	SPGN	SPGN		0.0020	-	-	0.16	-	-	-	0.052	-	-	-	184
39150	SRK	AR-16-102C1	644	646	Waste Rock	Mine Area	SPGN	SPGN		0.0080	-	-	0.080	-	-	-	0.035	-	-	-	275
39151	SRK	AR-16-102C1	665.5	668	Waste Rock	Mine Area	SPGN	SPGN		0.016	-	-	0.14	-	-	-	0.038	-	-	-	173
39152	SRK	AR-16-102C1	701	703.5	Waste Rock	Mine Area	SPGN	SPGN		0.020	-	-	0.12	-	-	-	0.035	-	-	-	553
39153	SRK	AR-16-102C2	607	609.5	Special Waste	Mine Area	SPGN	SPGN		-	< 0.010	301	0.090	13.0	75.0	69.0	-	0.060	70.0	23.0	243
39154	SRK	AR-16-104C1	756	758	Waste Rock	Mine Area	SPGN	SPGN		0.0080	-	-	0.19	-	-	-	0.0090	-	-	-	450
39155	SRK	AR-16-106C1	631	633	Waste Rock	Mine Area	SPGN	SPGN		0.0080	-	-	0.18	-	-	-	0.038	-	-	-	859
39156	SRK	AR-16-106C1	687.5	689.5	Waste Rock	Mine Area	SPGN	SPGN		-	< 0.010	23.0	0.17	17.0	16.0	31.0	-	0.020	23.0	5.00	1920
39157	SRK	AR-16-106C1	729	730.6	Waste Rock	Mine Area	SPGN	SPGN		0.0030	-	-	0.11	-	-	-	0.011	-	-	-	23.0
39158	SRK	AR-16-106C2	577.5	579.5	Waste Rock	Mine Area	SPGN	SPGN		0.0050	-	-	0.11	-	-	-	0.036	-	-	-	1700
39159	SRK	AR-16-108C3	374	377	Waste Rock	Mine Area	SPGN	SPGN		0.0020	-	-	0.20	-	-	-	0.081	-	-	-	174
39160	SRK	AR-16-109C2	652	654	Special Waste	Mine Area	SPGN	SPGN		-	< 0.010	23.0	0.18	22.0	8.00	40.0	-	< 0.010	63.0	2.00	769
39161	SRK	AR-16-109C3	695.5	697.2	Waste Rock	Mine Area	SPGN	SPGN		0.0040	-	-	0.19	-	-	-	0.010	-	-	-	267
39162	SRK	AR-16-110C1	683	685	Waste Rock	Mine Area	SPGN	SPGN		0.0030	-	-	0.14	-	-	-	0.053	-	-	-	234
39164	SRK	AR-16-111C1	766	768	Waste Rock	Mine Area	SPGN	SPGN		0.040	-	-	0.35	-	-	-	0.044	-	-	-	578
39167	SRK	AR-17-115C2	697	698.5	Waste Rock	Mine Area	SPGN	SPGN		0.0010	-	-	0.040	-	-	-	0.038	-	-	-	328
39169	SRK	AR-17-120C1	716	717.5	Waste Rock	Mine Area	SPGN	SPGN		0.016	-	-	0.14	-	-	-	0.024	-	-	-	130
39170	SRK	AR-17-127C2	506.5	508.5	Special Waste	Mine Area	SPGN	SPGN		-	0.010	26.0	0.11	14.0	59.0	41.0	-	0.060	31.0	17.0	591
39172	SRK	AR-17-126C1	749.5	752	Special Waste	Mine Area	SPGN	SPGN		-	< 0.010	137	0.25	26.0	35.0	104	-	0.030	65.0	9.00	749
39173	SRK	AR-17-136C2	750	752	Waste Rock	Mine Area	SPGN	SPGN		0.0040	-	-	0.060	-	-	-	0.056	-	-	-	53.0
39175	SRK	AR-17-164C1	520.5	522.5	Waste Rock	Mine Area	SPGN	SPGN		0.075	-	-	0.15	-	-	-	0.10	-	-	-	32000
39177	SRK	GAR-17-003	488.5	491	Waste Rock	Mine Area	SPGN	SPGN		0.0030	-	-	0.46	-	-	-	0.020	-	-	-	36.0
39178	SRK	GAR-17-003	680.5	682	Waste Rock	Mine Area	SPGN	SPGN		0.13	-	-	0.22	-	-	-	0.064	-	-	-	1030
39179	SRK	AR-18-186C1	580.5	582.5	Waste Rock	Mine Area	SPGN	SPGN		0.0020	-	-	0.13	-	-	-	0.052	-	-	-	97.0
39180	SRK	AR-18-186C1	741.5	744	Waste Rock	Mine Area	SPGN	SPGN		0.017	-	-	0.070	-	-	-	0.054	-	-	-	488
39181	SRK	AR-18-187C1	388	390	Waste Rock	Mine Area	SPGN	SPGN		-	< 0.010	1.00	0.12	21.0	163	68.0	-	0.16	47.0	48.0	235
39182	SRK	AR-18-187C1	520	522.5	Special Waste	Mine Area	SPGN	SPGN		-	< 0.010	1.00	0.21	18.0	27.0	32.0	-	0.020	25.0	8.00	111
39183	SRK	AR-18-187C3	548.5	550.5	Waste Rock	Mine Area	SPGN	SPGN		0.037	-	-	0.12	-	-	-	0.020	-	-	-	205
39184	SRK	AR-18-187C4	472.5	474.5	Waste Rock	Mine Area	SPGN	SPGN		0.013	-	-	0.21	-	-	-	0.037	-	-	-	119
39185	SRK	AR-18-207C1	577	579.5	Waste Rock	Mine Area	SPGN	SPGN		0.039	-	-	0.16	-	-	-	0.033	-	-	-	175
39187	SRK	AR-18-208C1	596	598	Waste Rock	Mine Area	SPGN	SPGN		0.0090	-	-	0.080	-	-	-	0.042	-	-	-	532
39188	SRK	AR-18-209C1	501	503	Special Waste	Mine Area	SPGN	SPGN		-	< 0.010	1.00	0.060	12.0	28.0	71.0	-	0.030	39.0	8.00	233
39194	SRK	AR-18-200C4	608.5	610.5	Waste Rock	Mine Area	SPGN	SPGN		0.16	-	-	0.12	-	-	-	0.051	-	-	-	15800
39137	SRK	AR-16-080C4	502	504	Waste Rock	Mine Area	SPGN	SPGN		0.0030	-	-	0.11	-	-	-	0.045	-	-	-	33600
39143	SRK	AR-16-091C4	680	682.5	Waste Rock	Mine Area	SPGN/DIOR	SPGN		0.013	-	-	0.10	-	-	-	0.038	-	-	-	235
39100	SRK	AR-14-024	372	374.5	Special Waste	Mine Area	SPGN/FLT	SPGN		-	< 0.010	3.00	0.15	18.0	26.0	56.0	-	0.030	39.0	8.00	103
39124	SRK	AR-15-060C1	435	436.5	Special Waste	Mine Area	SPGN/FLT	SPGN		-	0.10	3.00	0.22	29.0	20.0	76.0	-	0.020	40.0	7.00	325
39140	SRK	AR-16-085C1	407.5	410	Waste Rock	Mine Area	SPGN/FLT	SPGN		0.0040	-	-	0.12	-	-	-	0.10	-	-	-	9220
39148	SRK	AR-16-098C2	706	708.5	Special Waste	Mine Area	SPGN/FLT	SPGN		-	< 0.010	37.0	0.31	25.0	164	172	-	0.14	66.0	44.0	5590
39165	SRK	AR-16-111C2	696	698	Special Waste	Mine Area	SPGN/FLT	SPGN		-	< 0.010	18.0	0.35	29.0	221	444	-	0.24	68.0	70.0	8750
39168	SRK	AR-17-119C2	387	389	Special Waste	Mine Area	SPGN/FLT	SPGN		-	0.040	4.00	0.17	26.0	39.0	141	-	0.060	100	10.0	1080
39166	SRK	AR-17-114C1	736	737.5	Waste Rock	Mine Area	FLT/SPGN	SPGN		-	< 0.010	6.00	0.25	26.0	14.0	104	-	0.020	23.0	6.00	185
39171	SRK	AR-17-127C1	475	479	Special Waste	Mine Area	SPGN/FLT	SPGN		-	< 0.010	430	0.15	17.0	158	127	-	0.14	221	46.0	15500
39071	SRK	GAR-18-006	81	82	Waste Rock	Mine Area	SST	SST		< 0.001	-	-	< 0.010	-	-	-	0.008	-	-	-	115
39073	SRK	GAR-18-006	69	70.5	Waste Rock	Mine Area	SST	SST		0.003	-	-	0.03	-	-	-	0.032	-	-	-	585
39048	SRK	GAR-19-020	560	561	Waste Rock	UGTMF	INT	INT		0.063	-	-	1.61	-	-	-	0.071	-	-	-	979
39055	SRK	GAR-19-022	509	510	Waste Rock	UGTMF	INT	INT		0.066	-	-	1.18	-	-	-	0.058	-	-	-	2260
39001	SRK	GAR-19-018	529	530	Waste Rock	UGTMF	INT	INT		0.081	-	-	2.08	-	-	-	0.090	-	-	-	7830
39002	SRK	GAR-19-018	515	516	Waste Rock	UGTMF	INT	INT		0.063	-	-	0.74	-	-	-	0.061	-	-	-	779
39003	SRK	GAR-19-018	454	455	Waste Rock	UGTMF	INT	INT		0.079	-	-	1.89	-	-	-	0.073	-	-	-	1570
39004	SRK	GAR-19-018	474	475	Waste Rock	UGTMF	INT	INT		0.082	-	-	1.73	-	-	-	0.064	-	-	-	1020
39005	SRK	GAR-19-018	488	489	Waste Rock	UGTMF	INT	INT		0.076	-	-	0.88	-	-	-	0.079	-	-	-	4380
39006	SRK	GAR-19-018	497	498	Waste Rock	UGTMF	INT	INT		0.066	-	-	1.65	-	-	-	0.051	-	-	-	1300
39007	SRK	GAR-19-018	424	425	Waste Rock	UGTMF	INT	INT		0.050	-	-	1.60	-	-	-	0.057	-	-	-	3730
39008	SRK	GAR-19-018	440	441	Waste Rock	UGTMF	INT	INT		0.058	-	-	1.88	-	-	-	0.052	-	-	-	494
39025	SRK	GAR-19-019	387.8	388.8	Waste Rock	UGTMF	INT	INT		0.074	-	-	1.77	-	-	-	0.080	-	-	-	997
39026	SRK	GAR-19-019	406	407	Waste Rock	UGTMF	INT	INT		0.096	-	-	1.88	-	-	-	0.067	-	-	-	2500
39027	SRK	GAR-19-019	419	420	Waste Rock	UGTMF	INT	INT		0.073	-	-	1.37	-	-	-	0.083	-	-	-	985
39028	SRK	GAR-19-019	431.25	432.25	Waste Rock	UGTMF	INT	INT		0.086	-	-	1.73	-	-	-	0.067	-	-	-	687
39029	SRK	GAR-19-019	448.5	449.5	Waste Rock	UGTMF	INT	INT		0.099	-	-	0.24	-	-	-	0.050	-	-	-	4400

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping	Total - 4 Acid Digestion and ICP-OES finish												
									Analyte	Sc	Sm	Sn	Sr	Ta	Tb	Th	TiO_2	TiO_2	U	V	W
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	wt. %	wt. %	ppm	ppm	ppm
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion
									Detection Limit	1	1	1	1	1	1	1	0.002	0.01	2	0.1	1
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4	HF/HNO$_3$/HClO4
39129	SRK	AR-16-059C5	545.5	548	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	57.0	-	-	-	0.88	-	-	174	-
39130	SRK	AR-16-059C5	554.5	557	Special Waste	Mine Area	SPGN	SPGN		20.0	4.00	6.00	91.0	4.00	< 1.00	17.0	-	1.04	1580	305	5.00
39131	SRK	AR-16-064C1	439	441	Special Waste	Mine Area	SPGN	SPGN		26.0	2.00	5.00	91.0	4.00	< 1.00	5.00	-	1.47	1540	465	5.00
39132	SRK	AR-16-074C3	447	449	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	241	-	-	-	0.75	-	-	185	-
39133	SRK	AR-16-076C2	475.5	478	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	64.0	-	-	-	0.59	-	-	72.3	-
39134	SRK	AR-16-076C3	415	416.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	69.0	-	-	-	0.63	-	-	91.4	-
39135	SRK	AR-16-078C4	366.5	368.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	70.0	-	-	-	0.49	-	-	66.6	-
39136	SRK	AR-16-080C1	453.5	456.5	Special Waste	Mine Area	SPGN	SPGN		18.0	5.00	2.00	97.0	2.00	< 1.00	12.0	-	0.85	574	203	1.00
39138	SRK	AR-16-081C1	480.5	482	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	68.0	-	-	-	0.96	-	-	136	-
39139	SRK	AR-16-084C1	691	692.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	125	-	-	-	0.50	-	-	140	-
39141	SRK	AR-16-091C3	572.5	575	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	36.0	-	-	-	0.69	-	-	152	-
39142	SRK	AR-16-091C3	620	622.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	83.0	-	-	-	0.77	-	-	151	-
39144	SRK	AR-16-092C3	528.5	531	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	32.0	-	-	-	0.73	-	-	142	-
39145	SRK	AR-16-093C2	612.5	615	Special Waste	Mine Area	SPGN	SPGN		17.0	4.00	6.00	87.0	< 1.00	< 1.00	17.0	-	0.97	272	240	4.00
39146	SRK	AR-16-093C2	653.5	655.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	132	-	-	-	0.81	-	-	183	-
39147	SRK	AR-16-098C1	603	605.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	35.0	-	-	-	0.60	-	-	80.7	-
39149	SRK	AR-16-096C1	396.5	398.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	139	-	-	-	0.52	-	-	204	-
39150	SRK	AR-16-102C1	644	646	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	54.0	-	-	-	0.54	-	-	97.5	-
39151	SRK	AR-16-102C1	665.5	668	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	79.0	-	-	-	0.72	-	-	123	-
39152	SRK	AR-16-102C1	701	703.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	62.0	-	-	-	0.73	-	-	124	-
39153	SRK	AR-16-102C2	607	609.5	Special Waste	Mine Area	SPGN	SPGN		11.0	6.00	3.00	183	1.00	< 1.00	43.0	-	0.44	319	288	1.00
39154	SRK	AR-16-104C1	756	758	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	41.0	-	-	-	0.81	-	-	140	-
39155	SRK	AR-16-106C1	631	633	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	87.0	-	-	-	0.78	-	-	143	-
39156	SRK	AR-16-106C1	687.5	689.5	Waste Rock	Mine Area	SPGN	SPGN		13.0	2.00	4.00	57.0	< 1.00	< 1.00	17.0	-	0.72	274	185	< 1.00
39157	SRK	AR-16-106C1	729	730.6	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	34.0	-	-	-	0.61	-	-	94.5	-
39158	SRK	AR-16-106C2	577.5	579.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	93.0	-	-	-	0.54	-	-	93.9	-
39159	SRK	AR-16-108C3	374	377	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	271	-	-	-	0.93	-	-	230	-
39160	SRK	AR-16-109C2	652	654	Special Waste	Mine Area	SPGN	SPGN		18.0	1.00	2.00	55.0	2.00	< 1.00	18.0	-	0.99	1210	223	3.00
39161	SRK	AR-16-109C3	695.5	697.2	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	39.0	-	-	-	0.79	-	-	116	-
39162	SRK	AR-16-110C1	683	685	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	123	-	-	-	0.71	-	-	126	-
39164	SRK	AR-16-111C1	766	768	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	37.0	-	-	-	0.59	-	-	99.8	-
39167	SRK	AR-17-115C2	697	698.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	76.0	-	-	-	0.52	-	-	76.2	-
39169	SRK	AR-17-120C1	716	717.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	47.0	-	-	-	0.67	-	-	95.4	-
39170	SRK	AR-17-127C2	506.5	508.5	Special Waste	Mine Area	SPGN	SPGN		13.0	6.00	1.00	117	1.00	< 1.00	32.0	-	0.53	344	128	< 1.00
39172	SRK	AR-17-126C1	749.5	752	Special Waste	Mine Area	SPGN	SPGN		25.0	5.00	2.00	102	5.00	< 1.00	34.0	-	1.20	926	499	2.00
39173	SRK	AR-17-136C2	750	752	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	134	-	-	-	0.77	-	-	184	-
39175	SRK	AR-17-164C1	520.5	522.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	66.0	-	-	-	0.71	-	-	220	-
39177	SRK	GAR-17-003	488.5	491	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	52.0	-	-	-	1.54	-	-	357	-
39178	SRK	GAR-17-003	680.5	682	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	27.0	-	-	-	0.85	-	-	123	-
39179	SRK	AR-18-186C1	580.5	582.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	71.0	-	-	-	0.64	-	-	151	-
39180	SRK	AR-18-186C1	741.5	744	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	50.0	-	-	-	0.53	-	-	62.7	-
39181	SRK	AR-18-187C1	388	390	Waste Rock	Mine Area	SPGN	SPGN		15.0	16.0	3.00	449	< 1.00	< 1.00	34.0	-	0.92	215	221	5.00
39182	SRK	AR-18-187C1	520	522.5	Special Waste	Mine Area	SPGN	SPGN		15.0	3.00	6.00	56.0	1.00	< 1.00	18.0	-	0.80	506	140	2.00
39183	SRK	AR-18-187C3	548.5	550.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	32.0	-	-	-	0.66	-	-	102	-
39184	SRK	AR-18-187C4	472.5	474.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	113	-	-	-	1.22	-	-	312	-
39185	SRK	AR-18-207C1	577	579.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	41.0	-	-	-	0.65	-	-	88.1	-
39187	SRK	AR-18-208C1	596	598	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	46.0	-	-	-	0.84	-	-	130	-
39188	SRK	AR-18-209C1	501	503	Special Waste	Mine Area	SPGN	SPGN		12.0	4.00	3.00	69.0	< 1.00	< 1.00	18.0	-	0.57	375	264	1.00
39194	SRK	AR-18-200C4	608.5	610.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	45.0	-	-	-	0.68	-	-	143	-
39137	SRK	AR-16-080C4	502	504	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	148	-	-	-	0.60	-	-	442	-
39143	SRK	AR-16-091C4	680	682.5	Waste Rock	Mine Area	SPGN/DIOR	SPGN		-	-	-	81.0	-	-	-	0.54	-	-	116	-
39100	SRK	AR-14-024	372	374.5	Special Waste	Mine Area	SPGN/FLT	SPGN		16.0	3.00	3.00	93.0	3.00	< 1.00	16.0	-	0.84	379	327	6.00
39124	SRK	AR-15-060C1	435	436.5	Special Waste	Mine Area	SPGN/FLT	SPGN		31.0	3.00	4.00	93.0	4.00	< 1.00	54.0	-	1.37	247	311	1.00
39140	SRK	AR-16-085C1	407.5	410	Waste Rock	Mine Area	SPGN/FLT	SPGN		-	-	-	163	-	-	-	0.68	-	-	369	-
39148	SRK	AR-16-098C2	706	708.5	Special Waste	Mine Area	SPGN/FLT	SPGN		26.0	16.0	3.00	320	5.00	< 1.00	67.0	-	1.06	1130	495	10.0
39165	SRK	AR-16-111C2	696	698	Special Waste	Mine Area	SPGN/FLT	SPGN		28.0	23.0	5.00	578	5.00	< 1.00	73.0	-	1.09	1180	693	7.00
39168	SRK	AR-17-119C2	387	389	Special Waste	Mine Area	SPGN/FLT	SPGN		30.0	6.00	5.00	88.0	5.00	< 1.00	25.0	-	1.14	2040	426	4.00
39166	SRK	AR-17-114C1	736	737.5	Waste Rock	Mine Area	FLT/SPGN	SPGN		20.0	2.00	7.00	66.0	4.00	< 1.00	29.0	-	1.14	145	508	5.00
39171	SRK	AR-17-127C1	475	479	Special Waste	Mine Area	SPGN/FLT	SPGN		18.0	14.0	3.00	425	4.00	< 1.00	27.0	-	0.80	1220	398	2.00
39071	SRK	GAR-18-006	81	82	Waste Rock	Mine Area	SST	SST		-	-	-	19	-	-	-	0.09	-	-	3	-
39073	SRK	GAR-18-006	69	70.5	Waste Rock	Mine Area	SST	SST		-	-	-	69	-	-	-	0.31	-	-	43	-
39048	SRK	GAR-19-020	560	561	Waste Rock	UGTMF	INT	INT		-	-	-	144	-	-	-	0.68	-	-	77	-
39055	SRK	GAR-19-022	509	510	Waste Rock	UGTMF	INT	INT		-	-	-	86.0	-	-	-	0.70	-	-	101	-
39001	SRK	GAR-19-018	529	530	Waste Rock	UGTMF	INT	INT		-	-	-	157	-	-	-	0.92	-	-	145	-
39002	SRK	GAR-19-018	515	516	Waste Rock	UGTMF	INT	INT		-	-	-	80.0	-	-	-	0.51	-	-	86.2	-
39003	SRK	GAR-19-018	454	455	Waste Rock	UGTMF	INT	INT		-	-	-	177	-	-	-	0.66	-	-	105	-
39004	SRK	GAR-19-018	474	475	Waste Rock	UGTMF	INT	INT		-	-	-	171	-	-	-	0.53	-	-	83.5	-
39005	SRK	GAR-19-018	488	489	Waste Rock	UGTMF	INT	INT		-	-	-	75.0	-	-	-	0.78	-	-	124	-
39006	SRK	GAR-19-018	497	498	Waste Rock	UGTMF	INT	INT		-	-	-	131	-	-	-	0.53	-	-	78.2	-
39007	SRK	GAR-19-018	424	425	Waste Rock	UGTMF	INT	INT		-	-	-	120	-	-	-	0.56	-	-	85.2	-
39008	SRK	GAR-19-018	440	441	Waste Rock	UGTMF	INT	INT		-	-	-	157	-	-	-	0.39	-	-	64.5	-
39025	SRK	GAR-19-019	387.8	388.8	Waste Rock	UGTMF	INT	INT		-	-	-	168	-	-	-	0.60	-	-	88.4	-
39026	SRK	GAR-19-019	406	407	Waste Rock	UGTMF	INT	INT		-	-	-	178	-	-	-	0.66	-	-	109	-
39027	SRK	GAR-19-019	419	420	Waste Rock	UGTMF	INT	INT		-	-	-	125	-	-	-	0.62	-	-	94.3	-
39028	SRK	GAR-19-019	431.25	432.25	Waste Rock	UGTMF	INT	INT		-	-	-	180	-	-	-	0.61	-	-	89.7	-
39029	SRK	GAR-19-019	448.5	449.5	Waste Rock	UGTMF	INT	INT		-	-	-	57.0	-	-	-	0.54	-	-	80.7	-

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4 Acid Digestion and ICP-OES finish				Partial -- Aqua Regia Digestion and ICP-MS finish											
									Analyte	Y	Yb	Zn	Zr	Ag	As	Be	Bi	Cd	Co	Cs	Cu	Dy	Er	Eu	Ga
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion
									Detection Limit	1	0.1	1	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	HF/HNO_3/HClO4	HF/HNO_3/HClO4	HF/HNO_3/HClO4	HF/HNO_3/HClO4	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl
39129	SRK	AR-16-059C5	545.5	548	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	266	0.070	2.46	0.36	0.46	0.11	1.79	0.11	4.53	0.38	0.19	0.070	1.17
39130	SRK	AR-16-059C5	554.5	557	Special Waste	Mine Area	SPGN	SPGN		34.0	3.60	8.00	457	-	-	-	-	-	-	-	-	-	-	-	-
39131	SRK	AR-16-064C1	439	441	Special Waste	Mine Area	SPGN	SPGN		62.0	6.10	10.0	657	-	-	-	-	-	-	-	-	-	-	-	-
39132	SRK	AR-16-074C3	447	449	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	273	0.040	4.89	0.28	1.25	0.020	17.2	0.040	184	0.24	0.14	0.090	0.88
39133	SRK	AR-16-076C2	475.5	478	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	293	0.060	5.64	0.16	0.59	0.030	13.2	0.050	15.3	0.23	0.14	0.050	1.42
39134	SRK	AR-16-076C3	415	416.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	232	0.010	0.73	0.42	0.070	< 0.010	19.7	0.13	1.90	0.60	0.27	0.19	2.41
39135	SRK	AR-16-078C4	366.5	368.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	397	< 0.010	1.13	0.26	0.14	< 0.010	2.75	0.060	2.51	0.25	0.11	0.080	0.64
39136	SRK	AR-16-080C1	453.5	456.5	Special Waste	Mine Area	SPGN	SPGN		60.0	5.10	18.0	286	-	-	-	-	-	-	-	-	-	-	-	-
39138	SRK	AR-16-081C1	480.5	482	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	272	0.18	4.39	0.21	0.89	0.040	16.9	0.10	53.1	0.41	0.23	0.070	0.89
39139	SRK	AR-16-084C1	691	692.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	169	0.40	21.6	0.28	4.37	0.10	87.0	0.16	773	0.22	0.10	0.10	0.99
39141	SRK	AR-16-091C3	572.5	575	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	317	0.020	2.86	0.20	0.75	0.020	3.17	0.10	15.4	0.56	0.28	0.070	0.96
39142	SRK	AR-16-091C3	620	622.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	288	0.030	3.13	0.13	0.51	0.020	2.58	0.080	35.3	0.31	0.19	0.080	0.84
39144	SRK	AR-16-092C3	528.5	531	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	277	0.10	9.85	0.26	1.81	0.040	14.5	0.090	12.3	1.34	0.49	0.26	2.20
39145	SRK	AR-16-093C2	612.5	615	Special Waste	Mine Area	SPGN	SPGN		34.0	3.70	21.0	368	-	-	-	-	-	-	-	-	-	-	-	-
39146	SRK	AR-16-093C2	653.5	655.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	235	0.10	4.51	0.15	1.21	0.040	11.4	0.14	47.5	0.43	0.22	0.11	0.86
39147	SRK	AR-16-098C1	603	605.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	250	0.010	1.87	0.30	0.090	< 0.010	4.58	0.16	10.2	0.50	0.21	0.19	1.86
39149	SRK	AR-16-096C1	396.5	398.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	204	0.040	0.89	0.24	0.32	0.010	2.01	0.070	69.5	0.98	0.49	0.20	0.76
39150	SRK	AR-16-102C1	644	646	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	244	0.010	1.92	0.18	0.16	0.020	4.30	0.14	44.2	0.43	0.23	0.090	1.18
39151	SRK	AR-16-102C1	665.5	668	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	339	0.040	9.66	0.24	1.69	0.020	7.74	0.080	134	0.38	0.20	0.070	1.88
39152	SRK	AR-16-102C1	701	703.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	380	0.030	2.15	0.18	0.44	0.050	16.5	0.12	61.4	0.54	0.26	0.12	1.67
39153	SRK	AR-16-102C2	607	609.5	Special Waste	Mine Area	SPGN	SPGN		17.0	2.00	12.0	193	-	-	-	-	-	-	-	-	-	-	-	-
39154	SRK	AR-16-104C1	756	758	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	282	0.050	2.56	0.32	4.04	0.040	6.00	0.17	80.3	0.35	0.17	0.060	1.79
39155	SRK	AR-16-106C1	631	633	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	228	0.030	5.48	0.27	0.78	0.010	12.0	0.15	8.56	0.68	0.31	0.21	1.54
39156	SRK	AR-16-106C1	687.5	689.5	Waste Rock	Mine Area	SPGN	SPGN		23.0	2.50	11.0	226	-	-	-	-	-	-	-	-	-	-	-	-
39157	SRK	AR-16-106C1	729	730.6	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	250	< 0.010	0.54	0.11	0.10	< 0.010	2.15	0.10	7.52	0.17	0.080	0.060	0.68
39158	SRK	AR-16-106C2	577.5	579.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	286	0.060	2.49	0.27	1.91	0.030	14.0	0.080	35.3	0.40	0.19	0.15	1.29
39159	SRK	AR-16-108C3	374	377	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	328	0.090	3.07	0.20	0.30	0.020	1.66	0.10	5.34	0.77	0.50	0.24	0.75
39160	SRK	AR-16-109C2	652	654	Special Waste	Mine Area	SPGN	SPGN		22.0	3.00	7.00	416	-	-	-	-	-	-	-	-	-	-	-	-
39161	SRK	AR-16-109C3	695.5	697.2	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	441	0.010	0.91	0.14	0.72	0.010	1.90	0.090	0.95	0.49	0.24	0.11	0.82
39162	SRK	AR-16-110C1	683	685	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	283	0.040	2.95	0.47	3.06	0.050	1.36	0.10	47.7	0.60	0.31	0.14	1.96
39164	SRK	AR-16-111C1	766	768	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	253	< 0.010	0.66	0.44	0.080	< 0.010	6.19	0.46	17.2	0.34	0.16	0.19	2.17
39167	SRK	AR-17-115C2	697	698.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	354	0.040	1.20	0.24	0.33	0.020	3.22	0.19	8.78	0.23	0.12	0.090	0.76
39169	SRK	AR-17-120C1	716	717.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	284	0.010	1.80	0.18	0.57	0.020	8.49	0.13	2.08	0.60	0.29	0.14	2.58
39170	SRK	AR-17-127C2	506.5	508.5	Special Waste	Mine Area	SPGN	SPGN		20.0	2.30	18.0	169	-	-	-	-	-	-	-	-	-	-	-	-
39172	SRK	AR-17-126C1	749.5	752	Special Waste	Mine Area	SPGN	SPGN		42.0	4.40	38.0	284	-	-	-	-	-	-	-	-	-	-	-	-
39173	SRK	AR-17-136C2	750	752	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	261	< 0.010	0.22	0.23	0.18	< 0.010	3.05	0.35	3.06	0.31	0.17	0.11	1.12
39175	SRK	AR-17-164C1	520.5	522.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	151	0.49	17.9	0.89	4.01	0.15	93.6	0.39	56.3	0.66	0.35	0.14	3.33
39177	SRK	GAR-17-003	488.5	491	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	891	< 0.010	0.11	0.24	0.070	0.010	0.82	0.060	0.50	0.31	0.17	0.020	0.43
39178	SRK	GAR-17-003	680.5	682	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	181	0.010	0.78	0.44	0.090	< 0.010	14.3	0.83	3.22	1.05	0.45	0.52	3.54
39179	SRK	AR-18-186C1	580.5	582.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	268	0.040	3.24	0.21	5.06	0.020	2.56	0.080	29.2	0.84	0.39	0.12	1.17
39180	SRK	AR-18-186C1	741.5	744	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	199	0.010	0.78	0.41	0.20	< 0.010	6.46	0.44	36.4	0.51	0.25	0.20	2.16
39181	SRK	AR-18-187C1	388	390	Waste Rock	Mine Area	SPGN	SPGN		22.0	2.20	42.0	659	-	-	-	-	-	-	-	-	-	-	-	-
39182	SRK	AR-18-187C1	520	522.5	Special Waste	Mine Area	SPGN	SPGN		21.0	2.20	15.0	271	-	-	-	-	-	-	-	-	-	-	-	-
39183	SRK	AR-18-187C3	548.5	550.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	304	0.040	1.13	0.21	0.50	0.030	10.5	0.29	31.5	0.70	0.34	0.28	2.56
39184	SRK	AR-18-187C4	472.5	474.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	522	0.050	1.73	0.76	1.31	0.050	8.37	0.44	34.2	4.59	2.06	0.39	1.83
39185	SRK	AR-18-207C1	577	579.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	249	0.010	2.03	0.27	0.080	0.020	6.33	0.26	6.49	0.42	0.21	0.23	2.22
39187	SRK	AR-18-208C1	596	598	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	231	0.030	2.23	0.97	0.54	0.080	4.08	0.17	25.1	0.65	0.31	0.070	3.08
39188	SRK	AR-18-209C1	501	503	Special Waste	Mine Area	SPGN	SPGN		28.0	2.90	18.0	325	-	-	-	-	-	-	-	-	-	-	-	-
39194	SRK	AR-18-200C4	608.5	610.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	167	0.12	5.51	0.39	0.96	0.070	41.1	0.40	12.6	0.81	0.41	0.21	3.27
39137	SRK	AR-16-080C4	502	504	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	165	0.43	22.4	0.30	5.04	0.36	317	0.080	222	0.24	0.12	0.050	1.53
39143	SRK	AR-16-091C4	680	682.5	Waste Rock	Mine Area	SPGN/DIOR	SPGN		-	-	-	159	0.030	1.28	0.29	0.22	0.020	4.60	0.10	27.3	0.52	0.25	0.11	2.18
39100	SRK	AR-14-024	372	374.5	Special Waste	Mine Area	SPGN/FLT	SPGN		35.0	3.60	143	402	-	-	-	-	-	-	-	-	-	-	-	-
39124	SRK	AR-15-060C1	435	436.5	Special Waste	Mine Area	SPGN/FLT	SPGN		38.0	4.80	22.0	364	-	-	-	-	-	-	-	-	-	-	-	-
39140	SRK	AR-16-085C1	407.5	410	Waste Rock	Mine Area	SPGN/FLT	SPGN		-	-	-	223	0.48	5.87	0.38	6.48	0.24	71.8	0.10	63.1	0.84	0.36	0.27	1.26
39148	SRK	AR-16-098C2	706	708.5	Special Waste	Mine Area	SPGN/FLT	SPGN		29.0	3.40	135	308	-	-	-	-	-	-	-	-	-	-	-	-
39165	SRK	AR-16-111C2	696	698	Special Waste	Mine Area	SPGN/FLT	SPGN		28.0	3.30	353	349	-	-	-	-	-	-	-	-	-	-	-	-
39168	SRK	AR-17-119C2	387	389	Special Waste	Mine Area	SPGN/FLT	SPGN		62.0	6.80	240	454	-	-	-	-	-	-	-	-	-	-	-	-
39166	SRK	AR-17-114C1	736	737.5	Waste Rock	Mine Area	FLT/SPGN	SPGN		32.0	3.70	30.0	397	-	-	-	-	-	-	-	-	-	-	-	-
39171	SRK	AR-17-127C1	475	479	Special Waste	Mine Area	SPGN/FLT	SPGN		21.0	2.40	32.0	221	-	-	-	-	-	-	-	-	-	-	-	-
39071	SRK	GAR-18-006	81	82	Waste Rock	Mine Area	SST	SST		-	-	-	169	0.020	0.310	0.030	0.020	0.010	0.100	< 0.010	0.86	0.13	0.08	0.03	0.16
39073	SRK	GAR-18-006	69	70.5	Waste Rock	Mine Area	SST	SST		-	-	-	145	< 0.010	0.73	0.14	0.04	0.02	3.65	0.08	4.68	0.28	0.13	0.08	0.67
39048	SRK	GAR-19-020	560	561	Waste Rock	UGTMF	INT	INT		-	-	-	268	0.020	0.58	0.080	0.010	0.010	7.30	0.89	9.74	1.41	0.48	0.54	2.83
39055	SRK	GAR-19-022	509	510	Waste Rock	UGTMF	INT	INT		-	-	-	201	0.040	1.02	0.14	0.030	0.040	10.5	0.36	23.3	0.69	0.27	0.29	3.88
39001	SRK	GAR-19-018	529	530	Waste Rock	UGTMF	INT	INT		-	-	-	260	0.10	1.08	0.13	0.14	0.040	13.2	0.54	36.1	3.04	1.32	0.83	3.94
39002	SRK	GAR-19-018	515	516	Waste Rock	UGTMF	INT	INT		-	-	-	190	0.060	6.57	0.41	0.10	0.050	9.63	0.23	22.7	0.92	0.43	0.41	3.54
39003	SRK	GAR-19-018	454	455	Waste Rock	UGTMF	INT	INT		-	-	-	172	0.050	0.84	0.040	0.040	0.030	11.7	0.72	24.1	1.70	0.68	0.46	3.44
39004	SRK	GAR-19-018	474	475	Waste Rock	UGTMF	INT	INT		-	-	-	202	0.030	0.56	0.050	0.020	0.040	8.32	0.17	14.5	0.90	0.46	0.18	1.80
39005	SRK	GAR-19-018	488	489	Waste Rock	UGTMF	INT	INT		-	-	-	182	0.070	0.73	0.19	0.11	0.020	15.7	0.58	44.0	1.60	0.78	0.36	4.53
39006	SRK	GAR-19-018	497	498	Waste Rock	UGTMF	INT	INT		-	-	-	178	0.040	0.86	0.060	0.060	0.050	8.26	0.44	15.0	1.23	0.53	0.38	2.75
39007	SRK	GAR-19-018	424	425	Waste Rock	UGTMF	INT	INT		-	-	-	193	0.050	0.92	0.15	0.040	0.040	10.0	0.56	22.5	1.33	0.50	0.44	3.08
39008	SRK	GAR-19-018	440	441	Waste Rock	UGTMF	INT	INT		-	-	-	234	0.020	0.31	0.030	0.010	0.030	5.30	0.18	9.83	0.78	0.35	0.19	1.75
39025	SRK	GAR-19-019	387.8	388.8	Waste Rock	UGTMF	INT	INT		-	-	-	206	0.030	0.70	0.060	< 0.010	0.030	8.14	0.16	12.8	0.77	0.42	0.14	1.85
39026	SRK	GAR-19-019	406	407	Waste Rock	UGTMF	INT	INT		-	-	-	172	0.060	0.47	0.090	0.030	0.10	13.3	0.40	31.4	1.22	0.69	0.22	3.12
39027	SRK	GAR-19-019	419	420	Waste Rock	UGTMF	INT	INT		-	-	-	199	0.050	1.59	0.22	0.040	0.60	10.6	0.41	19.0	2.12	1.07	0.55	4.48
39028	SRK	GAR-19-019	431.25	432.25	Waste Rock	UGTMF	INT	INT		-	-	-	214	0.020	0.56	0.030	0.010	0.060	8.83	0.38	6.40	1.25	0.61	0.30	3.10
39029	SRK	GAR-19-019	448.5	449.5	Waste Rock	UGTMF	INT	INT		-	-	-	158	0.13	4.94	0.31	0.020	2.19	10.6	0.36	23.7	1.57	0.75	0.44	4.40

Partial -- Aqua Regia Digestion and ICP-MS finish

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping	Analyte	Gd	Ge	Hf	Hg	Ho	Mo	Nb	Nd	Ni	Pb204	Pb206	Pb207	Pb208	PbSUM	Pr	Rb	Sb	Sc
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion
									Detection Limit	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.001	0.001	0.001	0.001	0.001	0.01	0.01	0.01	0.1
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl
39129	SRK	AR-16-059C5	545.5	548	Waste Rock	Mine Area	SPGN	SPGN		0.31	< 0.010	0.41	< 0.010	0.070	46.0	0.020	1.32	11.6	0.0080	7.54	0.38	0.47	8.40	0.37	2.59	0.060	1.10
39130	SRK	AR-16-059C5	554.5	557	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39131	SRK	AR-16-064C1	439	441	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39132	SRK	AR-16-074C3	447	449	Waste Rock	Mine Area	SPGN	SPGN		0.42	< 0.010	0.24	0.020	0.050	2.33	< 0.010	3.70	28.3	0.039	5.70	0.95	2.09	8.78	1.04	1.48	0.020	0.60
39133	SRK	AR-16-076C2	475.5	478	Waste Rock	Mine Area	SPGN	SPGN		0.30	0.020	0.13	< 0.010	0.050	2.12	0.090	1.45	16.4	0.023	3.13	0.52	1.05	4.72	0.42	2.28	< 0.010	1.20
39134	SRK	AR-16-076C3	415	416.5	Waste Rock	Mine Area	SPGN	SPGN		0.93	0.020	0.14	0.020	0.11	0.20	0.070	7.17	24.8	0.0090	0.35	0.13	0.51	1.01	2.03	3.41	< 0.010	2.00
39135	SRK	AR-16-078C4	366.5	368.5	Waste Rock	Mine Area	SPGN	SPGN		0.35	< 0.010	0.31	< 0.010	0.050	0.13	0.010	2.64	14.0	0.022	1.40	0.39	1.01	2.82	0.72	1.10	0.040	0.50
39136	SRK	AR-16-080C1	453.5	456.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39138	SRK	AR-16-081C1	480.5	482	Waste Rock	Mine Area	SPGN	SPGN		0.32	< 0.010	0.15	< 0.010	0.090	4.68	0.030	1.79	13.0	0.083	26.5	3.00	3.88	33.5	0.53	2.00	0.030	0.70
39139	SRK	AR-16-084C1	691	692.5	Waste Rock	Mine Area	SPGN	SPGN		0.30	< 0.010	0.090	0.010	0.040	23.9	< 0.010	2.40	70.4	0.29	105	11.2	12.8	129	0.68	3.59	0.12	1.00
39141	SRK	AR-16-091C3	572.5	575	Waste Rock	Mine Area	SPGN	SPGN		0.37	< 0.010	0.34	< 0.010	0.11	2.11	0.010	1.82	8.80	0.015	3.20	0.45	0.83	4.49	0.51	2.31	0.020	0.90
39142	SRK	AR-16-091C3	620	622.5	Waste Rock	Mine Area	SPGN	SPGN		0.37	< 0.010	0.20	< 0.010	0.070	2.83	0.010	3.26	8.86	0.020	2.96	0.45	1.02	4.45	0.92	2.06	0.010	0.80
39144	SRK	AR-16-092C3	528.5	531	Waste Rock	Mine Area	SPGN	SPGN		1.34	0.020	0.34	< 0.010	0.22	10.4	0.040	2.60	21.9	0.036	7.88	1.05	1.70	10.7	0.64	3.00	0.040	2.20
39145	SRK	AR-16-093C2	612.5	615	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39146	SRK	AR-16-093C2	653.5	655.5	Waste Rock	Mine Area	SPGN	SPGN		0.56	< 0.010	0.15	< 0.010	0.090	6.70	< 0.010	4.35	17.0	0.084	8.55	1.78	4.00	14.4	1.14	1.97	0.010	0.90
39147	SRK	AR-16-098C1	603	605.5	Waste Rock	Mine Area	SPGN	SPGN		0.86	0.010	0.090	< 0.010	0.080	1.20	0.050	7.12	12.4	0.015	1.10	0.28	0.81	2.19	1.93	7.19	< 0.010	2.10
39149	SRK	AR-16-096C1	396.5	398.5	Waste Rock	Mine Area	SPGN	SPGN		1.00	< 0.010	0.29	0.010	0.20	0.22	< 0.010	6.63	11.9	0.013	1.90	0.31	0.89	3.12	1.78	1.19	0.080	0.60
39150	SRK	AR-16-102C1	644	646	Waste Rock	Mine Area	SPGN	SPGN		0.40	< 0.010	0.20	< 0.010	0.090	2.37	0.040	2.47	11.7	0.019	1.80	0.39	0.93	3.14	0.71	2.73	0.010	1.50
39151	SRK	AR-16-102C1	665.5	668	Waste Rock	Mine Area	SPGN	SPGN		0.40	< 0.010	0.24	< 0.010	0.080	4.07	0.080	2.91	16.8	0.015	2.47	0.32	0.81	3.62	0.86	1.55	0.080	1.30
39152	SRK	AR-16-102C1	701	703.5	Waste Rock	Mine Area	SPGN	SPGN		0.57	< 0.010	0.20	< 0.010	0.10	8.06	0.060	3.89	36.2	0.025	2.67	0.52	1.33	4.54	1.06	1.87	0.010	1.50
39153	SRK	AR-16-102C2	607	609.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39154	SRK	AR-16-104C1	756	758	Waste Rock	Mine Area	SPGN	SPGN		0.33	< 0.010	0.18	< 0.010	0.060	18.0	0.030	2.23	14.4	0.10	8.97	1.92	4.85	15.8	0.59	2.56	0.020	1.90
39155	SRK	AR-16-106C1	631	633	Waste Rock	Mine Area	SPGN	SPGN		0.80	0.010	0.15	< 0.010	0.12	1.97	0.040	4.81	31.3	0.023	2.00	0.47	1.31	3.80	1.28	3.18	0.010	1.80
39156	SRK	AR-16-106C1	687.5	689.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39157	SRK	AR-16-106C1	729	730.6	Waste Rock	Mine Area	SPGN	SPGN		0.26	< 0.010	0.14	< 0.010	0.030	0.42	0.010	2.45	6.09	0.0080	1.36	0.17	0.45	1.99	0.69	1.94	< 0.010	0.50
39158	SRK	AR-16-106C2	577.5	579.5	Waste Rock	Mine Area	SPGN	SPGN		0.65	< 0.010	0.14	< 0.010	0.070	5.63	0.030	6.26	17.5	0.032	3.34	0.66	1.69	5.72	1.54	1.68	0.030	1.20
39159	SRK	AR-16-108C3	374	377	Waste Rock	Mine Area	SPGN	SPGN		0.94	< 0.010	0.45	0.010	0.15	0.36	< 0.010	7.09	14.0	0.018	4.45	0.55	1.06	6.08	1.91	1.55	0.070	0.90
39160	SRK	AR-16-109C2	652	654	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39161	SRK	AR-16-109C3	695.5	697.2	Waste Rock	Mine Area	SPGN	SPGN		0.55	< 0.010	0.13	0.010	0.090	1.80	< 0.010	3.94	5.51	0.014	1.46	0.29	0.91	2.67	1.12	2.60	< 0.010	0.80
39162	SRK	AR-16-110C1	683	685	Waste Rock	Mine Area	SPGN	SPGN		0.65	< 0.010	0.35	< 0.010	0.11	17.4	0.080	5.04	12.4	0.029	9.68	0.70	1.51	11.9	1.36	2.13	0.070	1.50
39164	SRK	AR-16-111C1	766	768	Waste Rock	Mine Area	SPGN	SPGN		0.89	< 0.010	0.050	< 0.010	0.060	1.12	0.020	8.57	19.2	0.012	0.48	0.21	0.89	1.58	2.24	15.2	< 0.010	3.00
39167	SRK	AR-17-115C2	697	698.5	Waste Rock	Mine Area	SPGN	SPGN		0.37	< 0.010	0.12	< 0.010	0.050	7.48	< 0.010	3.22	8.85	0.026	1.47	0.45	1.42	3.36	0.86	2.22	0.010	1.20
39169	SRK	AR-17-120C1	716	717.5	Waste Rock	Mine Area	SPGN	SPGN		0.70	0.010	0.10	< 0.010	0.11	6.83	0.010	4.64	14.2	0.018	0.84	0.32	0.95	2.12	1.23	3.57	0.020	1.70
39170	SRK	AR-17-127C2	506.5	508.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39172	SRK	AR-17-126C1	749.5	752	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39173	SRK	AR-17-136C2	750	752	Waste Rock	Mine Area	SPGN	SPGN		0.50	< 0.010	0.12	< 0.010	0.060	0.55	< 0.010	4.52	22.7	0.0050	0.80	0.11	0.58	1.49	1.30	3.24	< 0.010	1.40
39175	SRK	AR-17-164C1	520.5	522.5	Waste Rock	Mine Area	SPGN	SPGN		0.72	0.040	0.19	0.030	0.13	48.0	0.050	4.17	134	0.22	23.3	4.54	8.76	36.8	1.12	8.97	0.020	5.20
39177	SRK	GAR-17-003	488.5	491	Waste Rock	Mine Area	SPGN	SPGN		0.16	< 0.010	0.48	< 0.010	0.060	0.98	< 0.010	0.38	4.57	0.0040	0.67	0.11	0.44	1.22	0.10	2.02	< 0.010	0.30
39178	SRK	GAR-17-003	680.5	682	Waste Rock	Mine Area	SPGN	SPGN		1.74	0.050	0.040	< 0.010	0.17	1.26	0.10	14.2	33.2	0.021	0.48	0.34	1.23	2.07	3.88	62.0	< 0.010	3.30
39179	SRK	AR-18-186C1	580.5	582.5	Waste Rock	Mine Area	SPGN	SPGN		0.61	< 0.010	0.43	< 0.010	0.16	2.20	0.020	2.04	15.2	0.036	6.73	0.98	1.74	9.49	0.56	2.40	0.040	1.00
39180	SRK	AR-18-186C1	741.5	744	Waste Rock	Mine Area	SPGN	SPGN		0.95	0.010	0.10	< 0.010	0.090	1.63	0.020	8.00	13.8	0.017	1.26	0.32	1.36	2.96	2.10	8.20	< 0.010	2.40
39181	SRK	AR-18-187C1	388	390	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39182	SRK	AR-18-187C1	520	522.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39183	SRK	AR-18-187C3	548.5	550.5	Waste Rock	Mine Area	SPGN	SPGN		1.02	0.020	0.11	< 0.010	0.15	8.08	0.070	7.31	19.7	0.030	3.35	0.62	1.55	5.55	1.89	20.6	0.020	4.70
39184	SRK	AR-18-187C4	472.5	474.5	Waste Rock	Mine Area	SPGN	SPGN		2.30	0.010	0.98	< 0.010	0.86	0.50	< 0.010	6.92	19.7	0.25	12.6	4.53	10.8	28.1	1.80	5.72	0.12	2.70
39185	SRK	AR-18-207C1	577	579.5	Waste Rock	Mine Area	SPGN	SPGN		0.93	0.020	0.080	< 0.010	0.070	5.40	0.030	9.80	23.6	0.017	0.56	0.30	1.09	1.97	2.68	14.2	< 0.010	2.60
39187	SRK	AR-18-208C1	596	598	Waste Rock	Mine Area	SPGN	SPGN		0.58	< 0.010	0.17	< 0.010	0.12	31.5	< 0.010	3.99	19.6	0.013	4.99	0.34	0.89	6.23	1.08	2.67	0.020	1.80
39188	SRK	AR-18-209C1	501	503	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39194	SRK	AR-18-200C4	608.5	610.5	Waste Rock	Mine Area	SPGN	SPGN		0.98	0.040	0.080	0.020	0.16	6.30	0.090	6.31	66.6	0.060	1.91	0.96	2.40	5.33	1.75	16.3	< 0.010	4.40
39137	SRK	AR-16-080C4	502	504	Waste Rock	Mine Area	SPGN	SPGN		0.26	0.020	0.29	0.040	0.050	72.3	< 0.010	1.73	79.4	0.075	16.1	2.10	3.03	21.3	0.48	2.73	0.060	0.60
39143	SRK	AR-16-091C4	680	682.5	Waste Rock	Mine Area	SPGN/DIOR	SPGN		0.60	0.010	0.090	< 0.010	0.090	1.25	0.020	4.50	19.6	0.0080	1.19	0.17	0.63	2.00	1.21	2.59	< 0.010	1.30
39100	SRK	AR-14-024	372	374.5	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39124	SRK	AR-15-060C1	435	436.5	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39140	SRK	AR-16-085C1	407.5	410	Waste Rock	Mine Area	SPGN/FLT	SPGN		0.97	< 0.010	0.22	0.020	0.15	34.0	0.010	5.84	82.1	0.084	10.2	1.92	3.81	16.0	1.10	1.69	0.010	0.90
39148	SRK	AR-16-098C2	706	708.5	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39165	SRK	AR-16-111C2	696	698	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39168	SRK	AR-17-119C2	387	389	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39166	SRK	AR-17-114C1	736	737.5	Waste Rock	Mine Area	FLT/SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39171	SRK	AR-17-127C1	475	479	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39071	SRK	GAR-18-006	81	82	Waste Rock	Mine Area	SST	SST		0.17	< 0.010	0.170	< 0.010	0.02	0.12	< 0.010	1.3	0.6	0.0	0.2	0.1	0.3	0.6	0.4	0.1	< 0.010	0.10
39073	SRK	GAR-18-006	69	70.5	Waste Rock	Mine Area	SST	SST		0.41	< 0.010	0.260	< 0.010	0.04	0.11	< 0.010	2.4	28.2	0.0	0.6	0.4	1.2	2.2	0.6	2.9	0.1	1.30
39048	SRK	GAR-19-020	560	561	Waste Rock	UGTMF	INT	INT		2.70	0.030	0.040	< 0.010	0.20	0.34	0.060	18.7	12.5	0.033	0.72	0.52	1.85	3.13	5.16	52.3	< 0.010	3.90
39055	SRK	GAR-19-022	509	510	Waste Rock	UGTMF	INT	INT		1.19	0.050	0.040	< 0.010	0.11	0.93	0.030	8.96	27.8	0.064	1.06	0.95	2.63	4.70	2.40	53.1	< 0.010	5.90
39001	SRK	GAR-19-018	529	530	Waste Rock	UGTMF	INT	INT		3.86	0.040	0.070	< 0.010	0.54	0.98	0.050	23.0	38.4	0.097	1.86	1.42	4.25	7.64	6.26	53.7	0.020	4.00
39002	SRK	GAR-19-018	515	516	Waste Rock	UGTMF	INT	INT		1.54	0.020	0.090	< 0.010	0.16	1.86	< 0.010	11.9	26.2	0.070	1.31	1.05	2.88	5.30	3.14	21.3	0.030	3.60
39003	SRK	GAR-19-018	454	455	Waste Rock	UGTMF	INT	INT		2.00	0.070	0.070	< 0.010	0.28	1.18	0.080	12.0	30.1	0.048	0.90	0.70	2.49	4.14	3.18	68.8	< 0.010	6.70
39004	SRK	GAR-19-018	474	475	Waste Rock	UGTMF	INT	INT		1.21	0.040	0.050	< 0.010	0.17	0.34	0.020	8.97	27.9	0.071	1.31	1.06	3.51	5.95	2.35	29.1	< 0.010	3.00
39005	SRK	GAR-19-018	488	489	Waste Rock	UGTMF	INT	INT		1.56	0.040	0.060	< 0.010	0.30	1.31	0.020	9.37	42.4	0.062	1.08	0.92	2.62	4.68	2.46	51.1	< 0.010	5.70
39006	SRK	GAR-19-018	497	498	Waste Rock	UGTMF	INT	INT		1.72	0.050	0.040	< 0.010	0.21	0.54	0.030	10.9	22.9	0.093	1.62	1.36	3.79	6.86	2.88	48.8	< 0.010	5.20
39007	SRK	GAR-19-018	424	425	Waste Rock	UGTMF	INT	INT		1.92	0.050	0.040	< 0.010	0.21	0.50	0.090	11.3	30.9	0.090	1.58	1.33	3.63	6.64	3.03	43.9	< 0.010	4.80
39008	SRK	GAR-19-018	440	441	Waste Rock	UGTMF	INT	INT		1.35	0.040	0.040	< 0.010	0.14	0.29	0.020	10.6	9.92	0.059	1.08	0.87	3.04	5.05	2.79	31.9	< 0.010	4.10
39025	SRK	GAR-19-019	387.8	388.8	Waste Rock	UGTMF	INT	INT		1.14	0.040	0.050	< 0.010	0.15	0.43	0.020	8.61	24.0	0.038	0.81	0.59	2.14	3.57	2.22	25.3	< 0.010	1.60
39026	SRK	GAR-19-019	406	407	Waste Rock	UGTMF	INT	INT		1.14	0.060	0.050	< 0.010	0.26	0.86	0.050	7.06	32.6	0.13	2.20	1.94	5.22	9.48	1.88	53.7	< 0.010	5.70
39027	SRK	GAR-19-019	419	420	Waste Rock	UGTMF	INT	INT		2.46	0.040	0.040	< 0.010	0.41	1.84	0.040	14.1	23.2	0.37	6.72	5.39	14.0	26.5	3.74	21.6	< 0.010	4.70
39028	SRK	GAR-19-019	431.25	432.25	Waste Rock	UGTMF	INT	INT		1.65	0.050	0.040	< 0.010	0.23	0.26	0.050	10.6	22.0	0.096	1.65	1.41	3.99	7.15	2.87	51.4	< 0.010	4.90
39029	SRK	GAR-19-019	448.5	449.5	Waste Rock	UGTMF	INT	INT		1.99	0.030	0.060	< 0.010	0.28	3.04	0.020	12.0	20.7	0.16	3.00	2.36	6.17	11.7	3.19	17.1	0.030	3.30

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Partial -- Aqua Regia Digestion and ICP-MS finish														Total - 4-Acid Digestion and ICP-MS finish		
									Analyte	Se	Sm	Sn	Ta	Tb	Te	Th	U	V	W	Y	Yb	Zn	Zr	Ag	Be	Bi
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion
									Detection Limit	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01	0.1	0.01	0.02	0.1	0.1
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HF/HNO_3/$HClO_4$	HF/HNO_3/$HClO_4$	HF/HNO_3/$HClO_4$
39129	SRK	AR-16-059C5	545.5	548	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.28	0.020	< 0.010	0.060	< 0.010	6.32	81.1	18.4	0.10	1.47	0.19	1.40	15.4	0.27	1.10	0.70
39130	SRK	AR-16-059C5	554.5	557	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39131	SRK	AR-16-064C1	439	441	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39132	SRK	AR-16-074C3	447	449	Waste Rock	Mine Area	SPGN	SPGN		0.60	0.57	< 0.010	< 0.010	0.040	0.050	10.3	11.6	10.1	< 0.10	1.03	0.10	1.90	7.95	0.21	1.30	1.60
39133	SRK	AR-16-076C2	475.5	478	Waste Rock	Mine Area	SPGN	SPGN		0.50	0.22	0.020	< 0.010	0.030	0.020	3.84	2.89	11.2	< 0.10	1.01	0.14	19.7	4.53	0.23	0.60	0.80
39134	SRK	AR-16-076C3	415	416.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	1.17	0.030	< 0.010	0.10	0.020	13.0	1.37	14.5	< 0.10	2.25	0.22	53.5	3.96	0.20	1.10	0.20
39135	SRK	AR-16-078C4	366.5	368.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.48	0.020	< 0.010	0.040	< 0.010	5.36	20.7	6.00	< 0.10	1.29	0.10	25.5	10.3	0.16	0.80	0.30
39136	SRK	AR-16-080C1	453.5	456.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39138	SRK	AR-16-081C1	480.5	482	Waste Rock	Mine Area	SPGN	SPGN		3.70	0.29	0.020	< 0.010	0.060	0.020	2.19	7.79	8.10	< 0.10	1.91	0.19	6.30	4.73	0.48	0.90	1.10
39139	SRK	AR-16-084C1	691	692.5	Waste Rock	Mine Area	SPGN	SPGN		3.40	0.40	0.030	< 0.010	0.040	0.12	7.65	90.5	12.9	< 0.10	0.67	0.10	10.9	3.87	0.55	1.60	5.20
39141	SRK	AR-16-091C3	572.5	575	Waste Rock	Mine Area	SPGN	SPGN		0.50	0.32	0.020	< 0.010	0.090	0.14	5.75	69.5	11.1	< 0.10	2.37	0.23	2.60	13.6	0.18	1.10	0.90
39142	SRK	AR-16-091C3	620	622.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.44	0.010	< 0.010	0.050	0.040	5.08	21.2	9.60	< 0.10	1.50	0.16	5.60	8.17	0.21	0.70	0.70
39144	SRK	AR-16-092C3	528.5	531	Waste Rock	Mine Area	SPGN	SPGN		1.00	0.90	0.030	< 0.010	0.26	0.060	6.27	98.6	20.1	0.10	4.84	0.39	15.8	15.4	0.30	0.70	2.20
39145	SRK	AR-16-093C2	612.5	615	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39146	SRK	AR-16-093C2	653.5	655.5	Waste Rock	Mine Area	SPGN	SPGN		1.10	0.67	0.010	< 0.010	0.070	0.11	35.8	8.77	10.9	< 0.10	1.64	0.17	2.90	5.40	0.30	0.80	1.80
39147	SRK	AR-16-098C1	603	605.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	1.17	0.040	< 0.010	0.10	0.020	8.99	16.8	14.6	< 0.10	1.53	0.16	12.5	3.34	0.17	0.80	0.20
39149	SRK	AR-16-096C1	396.5	398.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	1.17	0.020	< 0.010	0.16	0.020	10.0	45.1	11.9	0.30	4.38	0.37	5.90	11.8	0.26	1.60	0.50
39150	SRK	AR-16-102C1	644	646	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.40	0.020	< 0.010	0.070	< 0.010	4.87	34.9	11.2	0.20	1.84	0.21	12.0	8.16	0.14	0.60	0.30
39151	SRK	AR-16-102C1	665.5	668	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.37	0.020	< 0.010	0.060	0.010	5.85	32.3	15.9	0.10	1.56	0.16	9.90	8.87	0.23	0.60	2.20
39152	SRK	AR-16-102C1	701	703.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.60	0.040	< 0.010	0.090	0.020	11.2	67.5	13.1	< 0.10	2.02	0.22	84.3	8.83	0.22	0.70	0.60
39153	SRK	AR-16-102C2	607	609.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39154	SRK	AR-16-104C1	756	758	Waste Rock	Mine Area	SPGN	SPGN		2.90	0.31	0.020	< 0.010	0.060	0.020	8.37	18.2	15.8	< 0.10	1.35	0.14	11.7	6.88	0.25	1.00	4.90
39155	SRK	AR-16-106C1	631	633	Waste Rock	Mine Area	SPGN	SPGN		0.40	0.89	0.020	< 0.010	0.11	0.28	14.1	29.6	11.9	< 0.10	2.56	0.27	14.0	5.28	0.21	0.80	1.00
39156	SRK	AR-16-106C1	687.5	689.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39157	SRK	AR-16-106C1	729	730.6	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.34	0.010	< 0.010	0.030	0.010	5.01	10.7	5.60	< 0.10	0.74	0.070	3.30	4.81	0.15	0.50	0.20
39158	SRK	AR-16-106C2	577.5	579.5	Waste Rock	Mine Area	SPGN	SPGN		0.40	1.03	0.020	< 0.010	0.070	0.090	24.1	15.6	9.40	< 0.10	1.40	0.15	11.8	5.63	0.22	0.90	2.90
39159	SRK	AR-16-108C3	374	377	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	1.19	0.020	< 0.010	0.13	0.020	6.55	110	11.8	< 0.10	3.20	0.39	3.10	17.3	0.46	1.70	0.50
39160	SRK	AR-16-109C2	652	654	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39161	SRK	AR-16-109C3	695.5	697.2	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.59	0.020	< 0.010	0.11	< 0.010	13.9	17.0	7.10	< 0.10	2.09	0.19	3.60	5.35	0.24	0.60	1.00
39162	SRK	AR-16-110C1	683	685	Waste Rock	Mine Area	SPGN	SPGN		0.40	0.84	0.030	< 0.010	0.10	0.030	5.47	139	21.6	< 0.10	2.20	0.28	1.60	13.5	0.21	1.20	3.50
39164	SRK	AR-16-111C1	766	768	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	1.28	0.050	< 0.010	0.070	0.040	10.8	1.44	18.4	< 0.10	1.22	0.12	10.0	1.42	0.16	1.20	0.20
39167	SRK	AR-17-115C2	697	698.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.53	0.010	< 0.010	0.040	0.010	4.15	8.90	6.40	< 0.10	0.94	0.10	2.10	3.02	0.17	0.90	0.50
39169	SRK	AR-17-120C1	716	717.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.76	0.020	< 0.010	0.10	< 0.010	6.51	9.19	21.6	< 0.10	2.58	0.24	23.1	2.98	0.17	0.70	1.30
39170	SRK	AR-17-127C2	506.5	508.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39172	SRK	AR-17-126C1	749.5	752	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39173	SRK	AR-17-136C2	750	752	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.62	0.020	< 0.010	0.060	0.040	7.62	18.0	11.2	< 0.10	1.36	0.16	18.6	3.81	0.19	1.50	0.40
39175	SRK	AR-17-164C1	520.5	522.5	Waste Rock	Mine Area	SPGN	SPGN		3.20	0.73	0.040	< 0.010	0.12	0.17	11.3	8.92	51.7	0.50	3.29	0.33	29.6	6.17	0.82	1.90	4.80
39177	SRK	GAR-17-003	488.5	491	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.090	0.010	< 0.010	0.040	0.060	1.23	2.54	5.40	< 0.10	1.59	0.13	0.60	13.9	0.44	3.90	0.20
39178	SRK	GAR-17-003	680.5	682	Waste Rock	Mine Area	SPGN	SPGN		0.30	2.37	0.12	< 0.010	0.19	0.040	14.7	1.05	29.9	0.10	3.48	0.35	40.2	1.68	0.20	0.80	0.20
39179	SRK	AR-18-186C1	580.5	582.5	Waste Rock	Mine Area	SPGN	SPGN		2.10	0.47	0.020	< 0.010	0.13	0.080	3.46	67.5	17.8	< 0.10	3.96	0.33	5.10	16.2	0.19	0.70	5.90
39180	SRK	AR-18-186C1	741.5	744	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	1.33	0.030	< 0.010	0.10	0.030	17.4	11.0	10.7	< 0.10	1.86	0.20	10.7	3.14	0.16	1.10	0.30
39181	SRK	AR-18-187C1	388	390	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39182	SRK	AR-18-187C1	520	522.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39183	SRK	AR-18-187C3	548.5	550.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	1.26	0.040	< 0.010	0.12	0.020	8.79	35.8	25.2	< 0.10	2.72	0.30	26.9	4.02	0.20	0.60	0.70
39184	SRK	AR-18-187C4	472.5	474.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	1.55	0.090	< 0.010	0.67	0.14	10.8	41.7	49.2	0.20	16.5	1.58	199	29.9	0.46	3.80	1.70
39185	SRK	AR-18-207C1	577	579.5	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	1.35	0.050	< 0.010	0.080	0.020	7.62	1.15	21.4	< 0.10	1.37	0.17	12.1	2.69	0.15	0.50	0.20
39187	SRK	AR-18-208C1	596	598	Waste Rock	Mine Area	SPGN	SPGN		< 0.10	0.57	0.020	< 0.010	0.10	0.020	13.1	20.7	25.2	< 0.10	2.89	0.23	4.20	4.74	0.22	2.30	0.80
39188	SRK	AR-18-209C1	501	503	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39194	SRK	AR-18-200C4	608.5	610.5	Waste Rock	Mine Area	SPGN	SPGN		0.60	1.06	0.040	< 0.010	0.13	0.090	11.4	0.59	29.7	0.40	3.36	0.33	35.2	1.85	0.32	0.80	1.20
39137	SRK	AR-16-080C4	502	504	Waste Rock	Mine Area	SPGN	SPGN		4.50	0.27	0.020	< 0.010	0.040	0.15	3.92	40.6	52.8	0.20	1.05	0.10	11.1	10.6	0.66	1.20	6.20
39143	SRK	AR-16-091C4	680	682.5	Waste Rock	Mine Area	SPGN/DIOR	SPGN		< 0.10	0.66	0.020	< 0.010	0.080	0.050	9.56	3.35	18.1	< 0.10	2.37	0.24	8.80	2.63	0.17	0.70	0.40
39100	SRK	AR-14-024	372	374.5	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39124	SRK	AR-15-060C1	435	436.5	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39140	SRK	AR-16-085C1	407.5	410	Waste Rock	Mine Area	SPGN/FLT	SPGN		6.70	1.47	0.020	< 0.010	0.14	0.21	8.71	13.1	30.1	0.10	3.37	0.25	5.00	6.94	0.83	1.30	8.90
39148	SRK	AR-16-098C2	706	708.5	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39165	SRK	AR-16-111C2	696	698	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39168	SRK	AR-17-119C2	387	389	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39166	SRK	AR-17-114C1	736	737.5	Waste Rock	Mine Area	FLT/SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39171	SRK	AR-17-127C1	475	479	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39071	SRK	GAR-18-006	81	82	Waste Rock	Mine Area	SST	SST		< 0.10	0.21	0.03	< 0.010	0.02	< 0.010	1.0	0.3	0.3	< 0.10	0.71	0.06	0.40	6.94	0.08	0.10	< 0.10
39073	SRK	GAR-18-006	69	70.5	Waste Rock	Mine Area	SST	SST		0.20	0.46	0.19	< 0.010	0.05	< 0.010	3.8	0.4	2.0	< 0.10	1.14	0.09	133.00	9.52	0.11	0.70	0.10
39048	SRK	GAR-19-020	560	561	Waste Rock	UGTMF	INT	INT		< 0.10	3.52	0.10	< 0.010	0.29	< 0.010	15.5	1.1	31.1	< 0.10	3.93	0.28	39.9	1.12	0.22	0.50	0.10
39055	SRK	GAR-19-022	509	510	Waste Rock	UGTMF	INT	INT		< 0.10	1.62	0.090	< 0.010	0.13	0.020	10.9	0.46	45.1	< 0.10	2.22	0.19	54.5	1.40	0.20	0.50	0.20
39001	SRK	GAR-19-018	529	530	Waste Rock	UGTMF	INT	INT		0.50	4.46	0.11	0.010	0.53	0.030	18.7	2.57	42.5	< 0.10	11.4	0.89	61.3	1.94	0.30	0.80	0.20
39002	SRK	GAR-19-018	515	516	Waste Rock	UGTMF	INT	INT		< 0.10	1.99	0.060	< 0.010	0.16	0.010	11.9	1.40	33.5	< 0.10	3.46	0.32	26.4	2.46	0.16	1.00	0.20
39003	SRK	GAR-19-018	454	455	Waste Rock	UGTMF	INT	INT		< 0.10	2.24	0.11	0.020	0.27	0.020	11.1	0.65	53.2	< 0.10	5.85	0.47	56.9	1.82	0.16	0.50	0.10
39004	SRK	GAR-19-018	474	475	Waste Rock	UGTMF	INT	INT		< 0.10	1.57	0.060	< 0.010	0.15	< 0.010	15.7	0.93	27.1	< 0.10	3.79	0.39	35.8	1.34	0.17	0.50	0.10
39005	SRK	GAR-19-018	488	489	Waste Rock	UGTMF	INT	INT		< 0.10	1.75	0.12	< 0.010	0.25	0.030	15.5	1.16	43.0	< 0.10	7.01	0.61	37.1	1.83	0.24	0.40	0.20
39006	SRK	GAR-19-018	497	498	Waste Rock	UGTMF	INT	INT		< 0.10	2.21	0.090	< 0.010	0.21	0.010	9.36	1.11	39.0	< 0.10	4.49	0.41	41.0	1.16	0.16	0.60	0.20
39007	SRK	GAR-19-018	424	425	Waste Rock	UGTMF	INT	INT		0.20	2.28	0.090	< 0.010	0.25	0.020	9.39	0.63	38.9	< 0.10	4.31	0.35	48.4	1.07	0.18	0.60	0.20
39008	SRK	GAR-19-018	440	441	Waste Rock	UGTMF	INT	INT		< 0.10	1.83	0.050	< 0.010	0.14	< 0.010	13.7	0.61	30.1	< 0.10	2.81	0.28	30.4	1.06	0.12	0.60	0.10
39025	SRK	GAR-19-019	387.8	388.8	Waste Rock	UGTMF	INT	INT		< 0.10	1.54	0.050	< 0.010	0.13	0.010	10.9	0.74	32.6	< 0.10	3.38	0.36	33.9	1.38	0.16	0.70	0.10
39026	SRK	GAR-19-019	406	407	Waste Rock	UGTMF	INT	INT		< 0.10	1.28	0.080	< 0.010	0.18	0.020	8.37	0.69	49.1	< 0.10	5.83	0.56	58.4	1.33	0.21	0.70	0.20
39027	SRK	GAR-19-019	419	420	Waste Rock	UGTMF	INT	INT		< 0.10	2.82	0.070	0.010	0.36	0.010	11.0	0.68	55.0	< 0.10	8.98	0.83	229	1.26	0.20	0.70	0.20
39028	SRK	GAR-19-019	431.25	432.25	Waste Rock	UGTMF	INT	INT		< 0.10	2.00	0.080	< 0.010	0.22	< 0.010	9.20	0.52	43.4	< 0.10	5.10	0.49	49.6	1.06	0.15	0.40	0.10
39029	SRK	GAR-19-019	448.5	449.5	Waste Rock	UGTMF	INT	INT		< 0.10	2.32	0.060	< 0.010	0.28	0.010	9.20	0.65	42.5	< 0.10	6.55	0.56	484	1.71	0.28	0.90	0.10

										Total - 4-Acid Digestion and ICP-MS finish												
Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping	Analyte	Cd	Co	Cs	Cu	Dy	Er	Eu	Ga	Gd	Hf	Ho	Mo	Nb
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion
									Detection Limit	0.1	0.02	0.1	0.1	0.02	0.02	0.02	0.1	0.1	0.1	0.02	0.01	0.1
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$
39129	SRK	AR-16-059C5	545.5	548	Waste Rock	Mine Area	SPGN	SPGN		0.30	3.60	0.40	7.80	2.29	1.37	0.58	26.1	1.80	9.00	0.44	69.7	19.8
39130	SRK	AR-16-059C5	554.5	557	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39131	SRK	AR-16-064C1	439	441	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39132	SRK	AR-16-074C3	447	449	Waste Rock	Mine Area	SPGN	SPGN		0.20	21.9	0.20	203	2.55	1.66	2.42	27.8	7.00	8.70	0.46	2.95	16.2
39133	SRK	AR-16-076C2	475.5	478	Waste Rock	Mine Area	SPGN	SPGN		0.20	17.6	0.20	17.4	2.67	1.62	0.84	13.9	2.40	9.10	0.54	3.29	14.5
39134	SRK	AR-16-076C3	415	416.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	29.7	0.50	3.40	4.00	2.34	1.20	21.0	3.90	7.30	0.73	0.54	17.0
39135	SRK	AR-16-078C4	366.5	368.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	4.93	0.20	5.20	2.54	1.55	0.91	16.1	2.80	13.0	0.50	0.36	12.5
39136	SRK	AR-16-080C1	453.5	456.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39138	SRK	AR-16-081C1	480.5	482	Waste Rock	Mine Area	SPGN	SPGN		0.30	17.6	0.30	59.3	4.59	2.92	0.89	22.4	2.90	9.10	0.93	6.13	28.5
39139	SRK	AR-16-084C1	691	692.5	Waste Rock	Mine Area	SPGN	SPGN		0.30	117	0.50	1090	1.89	1.16	1.38	18.0	2.90	5.50	0.35	36.4	11.6
39141	SRK	AR-16-091C3	572.5	575	Waste Rock	Mine Area	SPGN	SPGN		0.20	3.97	0.40	19.0	4.35	2.55	0.61	21.7	2.40	10.6	0.85	2.69	16.2
39142	SRK	AR-16-091C3	620	622.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	4.92	0.30	40.3	3.89	2.44	1.09	19.9	3.60	9.40	0.76	4.08	16.9
39144	SRK	AR-16-092C3	528.5	531	Waste Rock	Mine Area	SPGN	SPGN		0.20	19.5	0.40	14.9	4.37	2.31	0.88	19.0	3.50	9.00	0.80	15.0	17.4
39145	SRK	AR-16-093C2	612.5	615	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39146	SRK	AR-16-093C2	653.5	655.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	15.3	0.40	53.7	2.92	1.83	1.40	21.4	4.10	6.90	0.58	10.8	19.8
39147	SRK	AR-16-098C1	603	605.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	7.76	0.40	12.5	3.33	1.98	0.93	17.0	3.20	7.90	0.63	1.74	14.1
39149	SRK	AR-16-096C1	396.5	398.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	4.68	0.20	88.7	4.84	2.51	1.61	22.7	5.10	6.70	0.89	0.40	11.1
39150	SRK	AR-16-102C1	644	646	Waste Rock	Mine Area	SPGN	SPGN		0.20	6.88	0.40	50.4	3.68	2.16	1.22	15.1	3.80	7.90	0.69	3.78	11.2
39151	SRK	AR-16-102C1	665.5	668	Waste Rock	Mine Area	SPGN	SPGN		0.20	11.7	0.30	141	4.32	2.55	1.17	20.5	4.00	11.1	0.87	6.72	16.7
39152	SRK	AR-16-102C1	701	703.5	Waste Rock	Mine Area	SPGN	SPGN		0.30	23.3	0.50	68.9	4.67	2.57	1.35	17.7	4.40	12.6	0.86	13.7	16.3
39153	SRK	AR-16-102C2	607	609.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39154	SRK	AR-16-104C1	756	758	Waste Rock	Mine Area	SPGN	SPGN		0.20	8.72	0.50	82.5	3.47	2.01	0.67	21.3	2.20	9.20	0.64	26.4	19.5
39155	SRK	AR-16-106C1	631	633	Waste Rock	Mine Area	SPGN	SPGN		0.20	16.8	0.50	13.2	4.89	2.72	1.19	22.7	4.10	7.60	0.90	3.76	18.9
39156	SRK	AR-16-106C1	687.5	689.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39157	SRK	AR-16-106C1	729	730.6	Waste Rock	Mine Area	SPGN	SPGN		0.20	3.36	0.30	12.3	2.19	1.36	0.56	15.7	1.80	8.20	0.44	0.74	13.1
39158	SRK	AR-16-106C2	577.5	579.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	17.6	0.20	44.6	3.07	1.89	1.16	16.7	3.80	9.60	0.60	9.49	13.3
39159	SRK	AR-16-108C3	374	377	Waste Rock	Mine Area	SPGN	SPGN		0.20	7.48	0.40	10.7	5.02	3.27	2.10	32.3	5.90	10.6	1.00	0.95	22.8
39160	SRK	AR-16-109C2	652	654	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39161	SRK	AR-16-109C3	695.5	697.2	Waste Rock	Mine Area	SPGN	SPGN		0.20	4.04	0.30	2.20	4.58	2.89	0.75	21.2	2.80	14.1	0.95	2.95	20.7
39162	SRK	AR-16-110C1	683	685	Waste Rock	Mine Area	SPGN	SPGN		0.20	2.70	0.40	52.9	3.62	2.20	1.33	22.1	4.40	9.80	0.67	24.7	13.9
39164	SRK	AR-16-111C1	766	768	Waste Rock	Mine Area	SPGN	SPGN		0.20	13.3	1.10	23.3	4.39	2.91	1.42	18.2	5.00	8.10	0.87	2.02	13.3
39167	SRK	AR-17-115C2	697	698.5	Waste Rock	Mine Area	SPGN	SPGN		0.30	4.98	0.40	10.9	3.10	1.93	1.50	13.5	3.90	11.0	0.60	11.4	10.5
39169	SRK	AR-17-120C1	716	717.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	12.6	0.50	3.60	4.93	2.94	1.21	18.7	4.40	9.40	0.95	9.98	14.8
39170	SRK	AR-17-127C2	506.5	508.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39172	SRK	AR-17-126C1	749.5	752	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39173	SRK	AR-17-136C2	750	752	Waste Rock	Mine Area	SPGN	SPGN		0.20	8.31	1.00	4.70	3.41	2.12	1.53	24.7	4.90	9.20	0.64	1.71	18.0
39175	SRK	AR-17-164C1	520.5	522.5	Waste Rock	Mine Area	SPGN	SPGN		0.30	115	1.00	64.5	4.56	2.73	0.90	23.3	3.90	4.80	0.86	91.8	19.0
39177	SRK	GAR-17-003	488.5	491	Waste Rock	Mine Area	SPGN	SPGN		0.40	2.96	0.40	3.40	8.96	5.35	0.74	48.6	4.00	27.9	1.73	1.69	42.8
39178	SRK	GAR-17-003	680.5	682	Waste Rock	Mine Area	SPGN	SPGN		0.20	25.4	1.80	5.80	5.72	3.40	1.50	23.3	5.80	5.60	1.08	3.66	19.8
39179	SRK	AR-18-186C1	580.5	582.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	4.00	0.20	33.6	4.78	2.67	1.11	18.0	3.80	8.50	0.90	3.18	15.6
39180	SRK	AR-18-186C1	741.5	744	Waste Rock	Mine Area	SPGN	SPGN		0.20	11.5	1.40	51.9	4.68	2.75	1.31	18.0	4.70	7.20	0.87	3.85	14.2
39181	SRK	AR-18-187C1	388	390	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39182	SRK	AR-18-187C1	520	522.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39183	SRK	AR-18-187C3	548.5	550.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	16.4	0.60	32.7	5.11	3.25	1.28	16.2	4.20	9.90	1.00	11.9	15.4
39184	SRK	AR-18-187C4	472.5	474.5	Waste Rock	Mine Area	SPGN	SPGN		0.40	15.6	1.30	89.9	18.7	9.82	2.18	40.3	9.70	16.7	3.37	0.84	29.9
39185	SRK	AR-18-207C1	577	579.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	12.7	0.60	9.50	4.18	2.47	1.31	15.2	4.40	8.00	0.84	8.19	12.3
39187	SRK	AR-18-208C1	596	598	Waste Rock	Mine Area	SPGN	SPGN		0.20	5.63	0.60	28.6	4.60	2.85	0.53	24.1	3.00	7.60	0.91	43.1	19.2
39188	SRK	AR-18-209C1	501	503	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39194	SRK	AR-18-200C4	608.5	610.5	Waste Rock	Mine Area	SPGN	SPGN		0.20	62.1	1.00	15.4	5.09	3.30	1.16	22.1	4.40	5.40	1.02	9.88	19.0
39137	SRK	AR-16-080C4	502	504	Waste Rock	Mine Area	SPGN	SPGN		0.60	449	0.50	272	1.49	0.90	0.88	23.1	2.80	5.20	0.26	101	15.1
39143	SRK	AR-16-091C4	680	682.5	Waste Rock	Mine Area	SPGN/DIOR	SPGN		0.20	7.81	0.30	37.0	3.57	2.14	0.94	18.9	3.40	5.40	0.66	2.24	13.6
39100	SRK	AR-14-024	372	374.5	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39124	SRK	AR-15-060C1	435	436.5	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39140	SRK	AR-16-085C1	407.5	410	Waste Rock	Mine Area	SPGN/FLT	SPGN		0.60	91.6	0.40	77.9	4.62	2.50	1.90	26.2	5.50	7.40	0.84	53.9	16.4
39148	SRK	AR-16-098C2	706	708.5	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39165	SRK	AR-16-111C2	696	698	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39168	SRK	AR-17-119C2	387	389	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39166	SRK	AR-17-114C1	736	737.5	Waste Rock	Mine Area	FLT/SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39171	SRK	AR-17-127C1	475	479	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-	-
39071	SRK	GAR-18-006	81	82	Waste Rock	Mine Area	SST	SST		0.10	0.24	< 0.10	1.5	1.0	0.6	0.2	1.2	0.9	4.0	0.2	0.2	2.0
39073	SRK	GAR-18-006	69	70.5	Waste Rock	Mine Area	SST	SST		0.10	5.02	1.70	6.2	2.9	1.5	0.9	8.7	3.9	3.2	0.5	0.5	9.1
39048	SRK	GAR-19-020	560	561	Waste Rock	UGTMF	INT	INT		0.20	13.8	2.00	15.9	4.27	2.06	1.62	17.8	5.50	8.80	0.65	0.59	17.3
39055	SRK	GAR-19-022	509	510	Waste Rock	UGTMF	INT	INT		0.30	17.5	0.70	31.0	4.02	2.29	1.55	18.9	5.00	6.60	0.71	1.09	15.5
39001	SRK	GAR-19-018	529	530	Waste Rock	UGTMF	INT	INT		0.30	23.7	1.30	62.2	6.18	3.46	2.01	28.7	7.30	8.40	1.10	1.48	20.4
39002	SRK	GAR-19-018	515	516	Waste Rock	UGTMF	INT	INT		0.20	14.6	0.80	23.2	5.28	3.16	1.60	18.0	5.30	6.10	1.00	2.66	10.3
39003	SRK	GAR-19-018	454	455	Waste Rock	UGTMF	INT	INT		0.20	18.2	1.20	34.8	4.30	2.22	1.54	19.6	5.00	5.30	0.73	1.30	13.7
39004	SRK	GAR-19-018	474	475	Waste Rock	UGTMF	INT	INT		0.30	15.1	0.30	21.3	6.15	3.58	1.54	17.4	6.30	6.30	1.11	0.64	10.6
39005	SRK	GAR-19-018	488	489	Waste Rock	UGTMF	INT	INT		0.20	23.4	1.40	63.3	6.12	3.57	1.54	23.4	5.80	6.00	1.13	1.42	17.4
39006	SRK	GAR-19-018	497	498	Waste Rock	UGTMF	INT	INT		0.30	13.0	0.80	21.7	3.91	2.14	1.34	17.0	4.40	5.90	0.94	0.64	12.4
39007	SRK	GAR-19-018	424	425	Waste Rock	UGTMF	INT	INT		0.20	15.4	1.00	35.7	3.77	1.91	1.44	17.0	4.50	6.40	0.65	0.75	14.0
39008	SRK	GAR-19-018	440	441	Waste Rock	UGTMF	INT	INT		0.30	8.41	0.20	12.5	4.45	2.45	1.38	15.2	5.20	7.10	0.74	3.05	7.50
39025	SRK	GAR-19-019	387.8	388.8	Waste Rock	UGTMF	INT	INT		0.30	15.3	0.40	18.1	5.59	3.30	1.52	18.0	5.60	6.40	1.04	0.69	10.2
39026	SRK	GAR-19-019	406	407	Waste Rock	UGTMF	INT	INT		0.40	20.1	0.70	40.8	5.90	3.44	1.62	19.8	5.50	5.40	1.21	1.36	13.5
39027	SRK	GAR-19-019	419	420	Waste Rock	UGTMF	INT	INT		1.00	14.4	0.90	25.2	5.31	3.09	1.54	17.1	5.20	6.70	0.96	2.38	13.5
39028	SRK	GAR-19-019	431.25	432.25	Waste Rock	UGTMF	INT	INT		0.30	14.8	0.60	10.9	4.95	2.94	1.62	18.3	5.60	7.00	0.88	0.50	12.0
39029	SRK	GAR-19-019	448.5	449.5	Waste Rock	UGTMF	INT	INT		3.20	13.3	1.00	24.7	3.26	1.91	1.20	16.1	3.60	5.20	0.60	3.98	12.4

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4-Acid Digestion and ICP-MS finish											
									Analyte	Nd	Ni	Pb204	Pb206	Pb207	Pb208	PbSUM	Pr	Rb	Sc	Sm	Sn
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion
									Detection Limit	0.1	0.1	0.001	0.001	0.001	0.001	0.001	0.1	0.1	0.1	0.1	0.02
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$	HF/HNO$_3$/HClO$_4$
39129	SRK	AR-16-059C5	545.5	548	Waste Rock	Mine Area	SPGN	SPGN		14.2	41.3	0.15	17.9	2.56	5.31	25.9	4.20	108	22.6	2.20	0.82
39130	SRK	AR-16-059C5	554.5	557	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39131	SRK	AR-16-064C1	439	441	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39132	SRK	AR-16-074C3	447	449	Waste Rock	Mine Area	SPGN	SPGN		117	61.1	0.15	10.9	2.64	6.59	20.3	38.6	72.1	17.3	13.9	0.63
39133	SRK	AR-16-076C2	475.5	478	Waste Rock	Mine Area	SPGN	SPGN		21.8	33.1	0.084	5.53	1.37	3.24	10.2	6.60	52.7	12.7	3.30	0.53
39134	SRK	AR-16-076C3	415	416.5	Waste Rock	Mine Area	SPGN	SPGN		44.4	59.2	0.092	1.89	1.32	3.66	6.96	13.5	73.7	15.3	6.60	0.56
39135	SRK	AR-16-078C4	366.5	368.5	Waste Rock	Mine Area	SPGN	SPGN		24.9	42.6	0.12	4.50	1.98	5.05	11.6	7.70	40.6	11.2	4.10	0.54
39136	SRK	AR-16-080C1	453.5	456.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39138	SRK	AR-16-081C1	480.5	482	Waste Rock	Mine Area	SPGN	SPGN		18.9	49.0	0.20	30.0	4.41	7.48	42.1	6.00	74.8	20.7	3.10	0.83
39139	SRK	AR-16-084C1	691	692.5	Waste Rock	Mine Area	SPGN	SPGN		37.5	115	0.43	130	13.2	17.3	161	11.1	77.4	12.5	5.60	0.42
39141	SRK	AR-16-091C3	572.5	575	Waste Rock	Mine Area	SPGN	SPGN		9.80	31.4	0.10	8.14	1.90	4.01	14.2	3.00	79.6	15.5	1.80	0.77
39142	SRK	AR-16-091C3	620	622.5	Waste Rock	Mine Area	SPGN	SPGN		39.1	34.4	0.11	5.88	1.69	4.16	11.8	12.0	73.2	14.7	5.60	0.71
39144	SRK	AR-16-092C3	528.5	531	Waste Rock	Mine Area	SPGN	SPGN		16.7	44.6	0.11	9.33	2.09	4.43	16.0	5.00	65.8	17.9	3.40	0.72
39145	SRK	AR-16-093C2	612.5	615	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39146	SRK	AR-16-093C2	653.5	655.5	Waste Rock	Mine Area	SPGN	SPGN		52.8	52.9	0.21	13.0	3.52	8.61	25.3	16.2	79.7	19.5	7.50	0.59
39147	SRK	AR-16-098C1	603	605.5	Waste Rock	Mine Area	SPGN	SPGN		26.4	27.6	0.092	3.03	1.42	3.60	8.13	7.80	69.8	13.7	4.20	0.56
39149	SRK	AR-16-096C1	396.5	398.5	Waste Rock	Mine Area	SPGN	SPGN		48.6	42.3	0.12	6.65	2.02	5.04	13.8	14.6	62.7	12.2	7.70	0.55
39150	SRK	AR-16-102C1	644	646	Waste Rock	Mine Area	SPGN	SPGN		32.5	32.2	0.10	4.68	1.63	4.06	10.5	9.60	62.1	11.8	5.60	0.63
39151	SRK	AR-16-102C1	665.5	668	Waste Rock	Mine Area	SPGN	SPGN		41.1	45.5	0.094	5.92	1.46	3.56	11.0	12.6	68.0	15.2	5.90	0.66
39152	SRK	AR-16-102C1	701	703.5	Waste Rock	Mine Area	SPGN	SPGN		35.7	71.2	0.088	5.79	1.58	3.91	11.4	10.5	70.0	15.0	6.20	0.76
39153	SRK	AR-16-102C2	607	609.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39154	SRK	AR-16-104C1	756	758	Waste Rock	Mine Area	SPGN	SPGN		10.9	39.3	0.24	16.2	3.73	9.23	29.4	3.40	71.7	18.8	1.90	0.65
39155	SRK	AR-16-106C1	631	633	Waste Rock	Mine Area	SPGN	SPGN		35.7	73.1	0.13	4.70	1.99	5.12	11.9	10.7	91.4	22.1	5.70	0.87
39156	SRK	AR-16-106C1	687.5	689.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39157	SRK	AR-16-106C1	729	730.6	Waste Rock	Mine Area	SPGN	SPGN		14.6	21.6	0.077	4.13	1.22	3.11	8.54	4.40	61.2	11.7	2.10	0.62
39158	SRK	AR-16-106C2	577.5	579.5	Waste Rock	Mine Area	SPGN	SPGN		43.6	39.8	0.12	7.28	1.94	5.18	14.5	13.2	62.5	13.7	6.60	0.53
39159	SRK	AR-16-108C3	374	377	Waste Rock	Mine Area	SPGN	SPGN		72.9	75.5	0.25	14.9	4.12	9.68	28.9	22.0	108	25.5	10.5	0.99
39160	SRK	AR-16-109C2	652	654	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39161	SRK	AR-16-109C3	695.5	697.2	Waste Rock	Mine Area	SPGN	SPGN		14.0	35.5	0.14	4.76	2.12	5.26	12.3	4.20	97.2	17.5	2.40	0.94
39162	SRK	AR-16-110C1	683	685	Waste Rock	Mine Area	SPGN	SPGN		61.0	33.8	0.11	19.1	2.02	5.01	26.3	18.6	93.2	17.5	7.90	1.07
39164	SRK	AR-16-111C1	766	768	Waste Rock	Mine Area	SPGN	SPGN		45.9	51.7	0.072	1.90	1.13	4.19	7.29	13.2	67.4	19.5	7.70	0.58
39167	SRK	AR-17-115C2	697	698.5	Waste Rock	Mine Area	SPGN	SPGN		40.6	48.2	0.060	3.56	0.95	3.02	7.59	11.6	46.2	12.3	6.80	0.41
39169	SRK	AR-17-120C1	716	717.5	Waste Rock	Mine Area	SPGN	SPGN		35.8	34.9	0.17	3.92	2.49	6.22	12.8	10.4	76.8	16.0	6.20	0.59
39170	SRK	AR-17-127C2	506.5	508.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39172	SRK	AR-17-126C1	749.5	752	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39173	SRK	AR-17-136C2	750	752	Waste Rock	Mine Area	SPGN	SPGN		61.3	117	0.055	4.30	0.85	3.19	8.40	19.3	120	20.9	8.30	0.99
39175	SRK	AR-17-164C1	520.5	522.5	Waste Rock	Mine Area	SPGN	SPGN		29.5	222	0.28	25.8	4.94	10.6	41.6	9.20	92.2	24.8	4.80	0.73
39177	SRK	GAR-17-003	488.5	491	Waste Rock	Mine Area	SPGN	SPGN		3.80	33.5	0.097	3.21	1.52	5.54	10.4	1.00	90.1	26.9	1.60	1.28
39178	SRK	GAR-17-003	680.5	682	Waste Rock	Mine Area	SPGN	SPGN		41.0	60.1	0.11	2.01	1.54	4.70	8.36	12.2	198	23.8	7.90	1.17
39179	SRK	AR-18-186C1	580.5	582.5	Waste Rock	Mine Area	SPGN	SPGN		29.8	38.0	0.10	10.7	2.05	4.10	16.9	9.10	58.3	13.5	5.10	0.68
39180	SRK	AR-18-186C1	741.5	744	Waste Rock	Mine Area	SPGN	SPGN		36.7	33.5	0.071	3.01	1.11	3.93	8.12	11.1	89.3	14.1	6.60	0.66
39181	SRK	AR-18-187C1	388	390	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39182	SRK	AR-18-187C1	520	522.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39183	SRK	AR-18-187C3	548.5	550.5	Waste Rock	Mine Area	SPGN	SPGN		23.0	41.7	0.11	6.08	1.81	4.64	12.6	6.80	73.2	19.7	4.60	0.41
39184	SRK	AR-18-187C4	472.5	474.5	Waste Rock	Mine Area	SPGN	SPGN		39.2	72.8	0.93	42.8	15.6	36.4	95.7	11.5	144	29.7	8.40	1.40
39185	SRK	AR-18-207C1	577	579.5	Waste Rock	Mine Area	SPGN	SPGN		32.1	43.0	0.15	2.80	2.22	6.12	11.3	9.60	94.5	16.9	6.00	0.52
39187	SRK	AR-18-208C1	596	598	Waste Rock	Mine Area	SPGN	SPGN		22.1	54.6	0.051	14.4	1.01	2.76	18.2	7.20	57.7	17.5	2.90	0.39
39188	SRK	AR-18-209C1	501	503	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39194	SRK	AR-18-200C4	608.5	610.5	Waste Rock	Mine Area	SPGN	SPGN		35.7	107	0.12	3.10	1.77	4.63	9.61	11.0	93.0	24.2	6.00	0.58
39137	SRK	AR-16-080C4	502	504	Waste Rock	Mine Area	SPGN	SPGN		41.4	141	0.16	23.9	3.34	6.12	33.5	13.3	95.5	13.3	5.00	1.66
39143	SRK	AR-16-091C4	680	682.5	Waste Rock	Mine Area	SPGN/DIOR	SPGN		36.8	51.5	0.078	3.40	1.20	3.30	7.98	11.2	73.8	14.6	5.10	0.62
39100	SRK	AR-14-024	372	374.5	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39124	SRK	AR-15-060C1	435	436.5	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39140	SRK	AR-16-085C1	407.5	410	Waste Rock	Mine Area	SPGN/FLT	SPGN		64.3	158	0.22	15.0	3.77	8.54	27.5	19.2	84.6	18.4	10.1	0.94
39148	SRK	AR-16-098C2	706	708.5	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39165	SRK	AR-16-111C2	696	698	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39168	SRK	AR-17-119C2	387	389	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39166	SRK	AR-17-114C1	736	737.5	Waste Rock	Mine Area	FLT/SPGN	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39171	SRK	AR-17-127C1	475	479	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-	-	-
39071	SRK	GAR-18-006	81	82	Waste Rock	Mine Area	SST	SST		6.3	1.4	0.0	1.1	0.50	1.28	3.0	1.8	0	0.8	1.00	0.35
39073	SRK	GAR-18-006	69	70.5	Waste Rock	Mine Area	SST	SST		25.7	33.9	0.1	1.5	1.14	2.89	5.6	7.3	35	6.6	4.70	0.86
39048	SRK	GAR-19-020	560	561	Waste Rock	UGTMF	INT	INT		52.0	21.8	0.20	3.55	2.80	8.04	14.6	14.5	123	15.1	8.30	0.53
39055	SRK	GAR-19-022	509	510	Waste Rock	UGTMF	INT	INT		42.5	44.5	0.24	3.72	3.20	8.18	15.3	11.8	116	18.9	7.30	0.46
39001	SRK	GAR-19-018	529	530	Waste Rock	UGTMF	INT	INT		59.3	72.7	0.37	6.03	5.15	13.6	25.2	16.2	190	20.0	10.1	0.73
39002	SRK	GAR-19-018	515	516	Waste Rock	UGTMF	INT	INT		38.6	38.2	0.25	3.94	3.45	8.60	16.2	10.7	137	16.7	6.80	0.37
39003	SRK	GAR-19-018	454	455	Waste Rock	UGTMF	INT	INT		39.2	46.1	0.33	5.06	4.53	11.7	21.6	10.8	137	19.2	6.60	0.41
39004	SRK	GAR-19-018	474	475	Waste Rock	UGTMF	INT	INT		49.2	39.4	0.39	6.35	5.66	14.9	27.3	13.8	97.8	17.4	8.30	0.30
39005	SRK	GAR-19-018	488	489	Waste Rock	UGTMF	INT	INT		41.7	62.9	0.18	3.04	2.52	6.80	12.5	11.4	182	20.3	7.40	0.63
39006	SRK	GAR-19-018	497	498	Waste Rock	UGTMF	INT	INT		39.7	33.0	0.29	4.58	4.00	10.7	19.6	10.9	116	16.1	6.40	0.49
39007	SRK	GAR-19-018	424	425	Waste Rock	UGTMF	INT	INT		34.7	48.9	0.26	4.25	3.64	9.21	17.4	9.80	99.2	16.0	5.90	0.44
39008	SRK	GAR-19-018	440	441	Waste Rock	UGTMF	INT	INT		43.8	13.0	0.34	5.36	4.68	12.4	22.8	12.0	67.6	13.2	7.20	0.23
39025	SRK	GAR-19-019	387.8	388.8	Waste Rock	UGTMF	INT	INT		46.0	33.6	0.33	5.42	4.60	11.8	22.2	12.7	103	15.6	7.70	0.35
39026	SRK	GAR-19-019	406	407	Waste Rock	UGTMF	INT	INT		42.7	47.8	0.45	6.86	6.18	15.8	29.2	11.8	130	20.7	7.30	0.54
39027	SRK	GAR-19-019	419	420	Waste Rock	UGTMF	INT	INT		39.8	32.8	0.56	9.73	7.76	20.3	38.4	10.9	106	17.8	7.00	0.39
39028	SRK	GAR-19-019	431.25	432.25	Waste Rock	UGTMF	INT	INT		44.9	33.4	0.44	6.96	6.19	15.8	29.4	12.5	124	18.0	7.60	0.40
39029	SRK	GAR-19-019	448.5	449.5	Waste Rock	UGTMF	INT	INT		26.8	27.2	0.24	4.45	3.40	8.74	16.8	7.40	165	14.7	4.80	0.42

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4-Acid Digestion and ICP-MS finish								Partial - Aqua Regia Digestion and ICP-OES Finish					
									Analyte	Ta	Tb	Th	U	W	Y	Yb	Zn	Ag	As	Bi	Co	Cu	Ge
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion
									Detection Limit	0.02	0.02	0.02	0.02	0.1	0.1	0.02	1	0.2	1	1	1	1	1
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl
39129	SRK	AR-16-059C5	545.5	548	Waste Rock	Mine Area	SPGN	SPGN		1.03	0.36	21.2	123	1.70	11.8	1.50	13.0	-	-	-	-	-	-
39130	SRK	AR-16-059C5	554.5	557	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	0.20	6.00	2.00	3.00	7.00	< 1.00
39131	SRK	AR-16-064C1	439	441	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	< 0.20	104	14.0	44.0	8.00	< 1.00
39132	SRK	AR-16-074C3	447	449	Waste Rock	Mine Area	SPGN	SPGN		0.87	0.41	36.6	18.8	2.00	13.1	1.40	13.0	-	-	-	-	-	-
39133	SRK	AR-16-076C2	475.5	478	Waste Rock	Mine Area	SPGN	SPGN		0.82	0.37	11.8	6.04	1.90	14.7	1.61	39.0	-	-	-	-	-	-
39134	SRK	AR-16-076C3	415	416.5	Waste Rock	Mine Area	SPGN	SPGN		0.91	0.54	26.3	3.98	1.10	20.1	2.37	85.0	-	-	-	-	-	-
39135	SRK	AR-16-078C4	366.5	368.5	Waste Rock	Mine Area	SPGN	SPGN		0.76	0.38	20.4	34.6	1.80	14.0	1.53	49.0	-	-	-	-	-	-
39136	SRK	AR-16-080C1	453.5	456.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	< 0.20	8.00	3.00	4.00	23.0	< 1.00
39138	SRK	AR-16-081C1	480.5	482	Waste Rock	Mine Area	SPGN	SPGN		1.60	0.61	12.1	14.0	2.60	26.2	2.69	27.0	-	-	-	-	-	-
39139	SRK	AR-16-084C1	691	692.5	Waste Rock	Mine Area	SPGN	SPGN		0.61	0.27	20.6	90.9	0.90	10.1	1.15	27.0	-	-	-	-	-	-
39141	SRK	AR-16-091C3	572.5	575	Waste Rock	Mine Area	SPGN	SPGN		0.88	0.60	15.9	94.4	2.00	24.2	2.47	13.0	-	-	-	-	-	-
39142	SRK	AR-16-091C3	620	622.5	Waste Rock	Mine Area	SPGN	SPGN		0.89	0.54	18.7	35.8	2.40	22.5	2.23	23.0	-	-	-	-	-	-
39144	SRK	AR-16-092C3	528.5	531	Waste Rock	Mine Area	SPGN	SPGN		0.95	0.68	12.6	108	2.30	22.7	2.14	35.0	-	-	-	-	-	-
39145	SRK	AR-16-093C2	612.5	615	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	< 0.20	4.00	< 1.00	3.00	54.0	< 1.00
39146	SRK	AR-16-093C2	653.5	655.5	Waste Rock	Mine Area	SPGN	SPGN		1.15	0.43	59.9	16.4	2.10	15.8	1.81	17.0	-	-	-	-	-	-
39147	SRK	AR-16-098C1	603	605.5	Waste Rock	Mine Area	SPGN	SPGN		0.74	0.50	18.7	25.2	1.60	17.2	1.96	31.0	-	-	-	-	-	-
39149	SRK	AR-16-096C1	396.5	398.5	Waste Rock	Mine Area	SPGN	SPGN		0.58	0.72	36.2	91.3	1.60	25.7	1.94	22.0	-	-	-	-	-	-
39150	SRK	AR-16-102C1	644	646	Waste Rock	Mine Area	SPGN	SPGN		0.64	0.55	14.2	53.0	1.30	19.3	2.09	27.0	-	-	-	-	-	-
39151	SRK	AR-16-102C1	665.5	668	Waste Rock	Mine Area	SPGN	SPGN		0.91	0.63	19.5	52.7	2.30	23.3	2.40	26.0	-	-	-	-	-	-
39152	SRK	AR-16-102C1	701	703.5	Waste Rock	Mine Area	SPGN	SPGN		0.85	0.72	26.1	97.4	3.00	23.6	2.38	122	-	-	-	-	-	-
39153	SRK	AR-16-102C2	607	609.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	< 0.20	4.00	15.0	9.00	33.0	< 1.00
39154	SRK	AR-16-104C1	756	758	Waste Rock	Mine Area	SPGN	SPGN		1.09	0.47	18.0	26.3	2.70	17.4	1.98	28.0	-	-	-	-	-	-
39155	SRK	AR-16-106C1	631	633	Waste Rock	Mine Area	SPGN	SPGN		1.06	0.68	30.6	42.0	2.90	26.4	2.56	35.0	-	-	-	-	-	-
39156	SRK	AR-16-106C1	687.5	689.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	< 0.20	3.00	< 1.00	16.0	107	< 1.00
39157	SRK	AR-16-106C1	729	730.6	Waste Rock	Mine Area	SPGN	SPGN		0.78	0.32	16.4	15.0	1.90	12.4	1.38	13.0	-	-	-	-	-	-
39158	SRK	AR-16-106C2	577.5	579.5	Waste Rock	Mine Area	SPGN	SPGN		0.84	0.45	42.8	22.0	1.70	16.5	1.74	30.0	-	-	-	-	-	-
39159	SRK	AR-16-108C3	374	377	Waste Rock	Mine Area	SPGN	SPGN		1.21	0.73	38.6	157	2.90	28.1	2.92	34.0	-	-	-	-	-	-
39160	SRK	AR-16-109C2	652	654	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	0.20	10.0	1.00	8.00	585	< 1.00
39161	SRK	AR-16-109C3	695.5	697.2	Waste Rock	Mine Area	SPGN	SPGN		1.26	0.64	24.8	25.3	2.60	26.8	2.94	14.0	-	-	-	-	-	-
39162	SRK	AR-16-110C1	683	685	Waste Rock	Mine Area	SPGN	SPGN		0.77	0.52	29.6	225	2.70	18.2	2.15	19.0	-	-	-	-	-	-
39164	SRK	AR-16-111C1	766	768	Waste Rock	Mine Area	SPGN	SPGN		0.68	0.68	23.4	3.88	1.00	23.6	3.12	35.0	-	-	-	-	-	-
39167	SRK	AR-17-115C2	697	698.5	Waste Rock	Mine Area	SPGN	SPGN		0.64	0.48	20.7	12.2	1.10	16.3	1.99	10.0	-	-	-	-	-	-
39169	SRK	AR-17-120C1	716	717.5	Waste Rock	Mine Area	SPGN	SPGN		0.82	0.72	18.4	18.0	1.40	25.6	2.79	44.0	-	-	-	-	-	-
39170	SRK	AR-17-127C2	506.5	508.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	< 0.20	14.0	9.00	3.00	29.0	< 1.00
39172	SRK	AR-17-126C1	749.5	752	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	< 0.20	18.0	2.00	11.0	114	< 1.00
39173	SRK	AR-17-136C2	750	752	Waste Rock	Mine Area	SPGN	SPGN		0.96	0.54	38.3	28.2	1.50	17.2	2.27	48.0	-	-	-	-	-	-
39175	SRK	AR-17-164C1	520.5	522.5	Waste Rock	Mine Area	SPGN	SPGN		1.80	0.64	25.9	13.2	2.40	26.9	2.67	75.0	-	-	-	-	-	-
39177	SRK	GAR-17-003	488.5	491	Waste Rock	Mine Area	SPGN	SPGN		4.20	1.19	42.4	12.8	4.60	49.8	4.80	13.0	-	-	-	-	-	-
39178	SRK	GAR-17-003	680.5	682	Waste Rock	Mine Area	SPGN	SPGN		1.12	0.88	22.1	2.47	2.90	30.2	3.20	83.0	-	-	-	-	-	-
39179	SRK	AR-18-186C1	580.5	582.5	Waste Rock	Mine Area	SPGN	SPGN		1.07	0.69	12.9	102	2.50	26.8	2.33	15.0	-	-	-	-	-	-
39180	SRK	AR-18-186C1	741.5	744	Waste Rock	Mine Area	SPGN	SPGN		0.89	0.71	40.0	16.4	1.20	24.6	2.69	26.0	-	-	-	-	-	-
39181	SRK	AR-18-187C1	388	390	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	< 0.20	3.00	< 1.00	2.00	9.00	< 1.00
39182	SRK	AR-18-187C1	520	522.5	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	< 0.20	< 1.00	< 1.00	3.00	9.00	< 1.00
39183	SRK	AR-18-187C3	548.5	550.5	Waste Rock	Mine Area	SPGN	SPGN		0.96	0.75	18.2	45.7	1.60	28.2	3.38	52.0	-	-	-	-	-	-
39184	SRK	AR-18-187C4	472.5	474.5	Waste Rock	Mine Area	SPGN	SPGN		1.98	2.59	38.6	110	7.20	82.9	8.39	354	-	-	-	-	-	-
39185	SRK	AR-18-207C1	577	579.5	Waste Rock	Mine Area	SPGN	SPGN		0.77	0.63	18.4	2.63	1.00	21.3	2.43	35.0	-	-	-	-	-	-
39187	SRK	AR-18-208C1	596	598	Waste Rock	Mine Area	SPGN	SPGN		1.26	0.60	33.8	26.3	0.80	27.5	2.85	15.0	-	-	-	-	-	-
39188	SRK	AR-18-209C1	501	503	Special Waste	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	0.20	1.00	< 1.00	4.00	35.0	< 1.00
39194	SRK	AR-18-200C4	608.5	610.5	Waste Rock	Mine Area	SPGN	SPGN		1.15	0.70	18.8	1.78	1.80	28.6	3.03	85.0	-	-	-	-	-	-
39137	SRK	AR-16-080C4	502	504	Waste Rock	Mine Area	SPGN	SPGN		1.06	0.25	19.9	61.2	5.90	8.10	0.79	35.0	-	-	-	-	-	-
39143	SRK	AR-16-091C4	680	682.5	Waste Rock	Mine Area	SPGN/DIOR	SPGN		0.76	0.50	24.1	7.56	1.20	20.0	2.08	30.0	-	-	-	-	-	-
39100	SRK	AR-14-024	372	374.5	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	< 0.20	2.00	4.00	2.00	4.00	< 1.00
39124	SRK	AR-15-060C1	435	436.5	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	< 0.20	5.00	< 1.00	2.00	8.00	< 1.00
39140	SRK	AR-16-085C1	407.5	410	Waste Rock	Mine Area	SPGN/FLT	SPGN		1.17	0.69	30.8	23.0	5.20	23.0	2.00	22.0	-	-	-	-	-	-
39148	SRK	AR-16-098C2	706	708.5	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	0.20	8.00	1.00	161	632	< 1.00
39165	SRK	AR-16-111C2	696	698	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	0.20	10.0	1.00	359	575	< 1.00
39168	SRK	AR-17-119C2	387	389	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	< 0.20	17.0	7.00	12.0	32.0	< 1.00
39166	SRK	AR-17-114C1	736	737.5	Waste Rock	Mine Area	FLT/SPGN	SPGN		-	-	-	-	-	-	-	-	< 0.20	< 1.00	< 1.00	8.00	134	< 1.00
39171	SRK	AR-17-127C1	475	479	Special Waste	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	0.90	24.0	28.0	81.0	623	< 1.00
39071	SRK	GAR-18-006	81	82	Waste Rock	Mine Area	SST	SST		0.14	0.15	3.9	1.56	0.50	5.6	0.70	3.0	-	-	-	-	-	-
39073	SRK	GAR-18-006	69	70.5	Waste Rock	Mine Area	SST	SST		0.47	0.53	8.5	1.57	0.90	13.1	1.35	142.0	-	-	-	-	-	-
39048	SRK	GAR-19-020	560	561	Waste Rock	UGTMF	INT	INT		1.30	0.68	29.4	3.22	1.20	17.1	1.76	79.0	-	-	-	-	-	-
39055	SRK	GAR-19-022	509	510	Waste Rock	UGTMF	INT	INT		0.97	0.67	15.1	1.72	0.60	18.1	2.03	91.0	-	-	-	-	-	-
39001	SRK	GAR-19-018	529	530	Waste Rock	UGTMF	INT	INT		1.21	0.99	35.6	3.68	1.00	30.0	3.02	133	-	-	-	-	-	-
39002	SRK	GAR-19-018	515	516	Waste Rock	UGTMF	INT	INT		0.56	0.80	17.2	2.00	0.40	28.4	3.05	49.0	-	-	-	-	-	-
39003	SRK	GAR-19-018	454	455	Waste Rock	UGTMF	INT	INT		0.78	0.71	19.6	1.80	0.80	19.6	1.89	99.0	-	-	-	-	-	-
39004	SRK	GAR-19-018	474	475	Waste Rock	UGTMF	INT	INT		0.60	0.90	30.8	2.74	0.60	31.3	3.38	78.0	-	-	-	-	-	-
39005	SRK	GAR-19-018	488	489	Waste Rock	UGTMF	INT	INT		0.93	0.90	25.6	2.58	1.00	33.6	3.34	71.0	-	-	-	-	-	-
39006	SRK	GAR-19-018	497	498	Waste Rock	UGTMF	INT	INT		0.77	0.58	20.1	2.04	1.10	19.1	1.92	77.0	-	-	-	-	-	-
39007	SRK	GAR-19-018	424	425	Waste Rock	UGTMF	INT	INT		0.84	0.62	13.1	1.73	0.90	17.3	1.72	74.0	-	-	-	-	-	-
39008	SRK	GAR-19-018	440	441	Waste Rock	UGTMF	INT	INT		0.41	0.70	22.2	2.29	0.40	21.7	2.33	52.0	-	-	-	-	-	-
39025	SRK	GAR-19-019	387.8	388.8	Waste Rock	UGTMF	INT	INT		0.58	0.85	19.2	2.72	0.40	28.8	3.00	79.0	-	-	-	-	-	-
39026	SRK	GAR-19-019	406	407	Waste Rock	UGTMF	INT	INT		0.73	0.85	22.3	2.28	0.60	30.5	3.01	132	-	-	-	-	-	-
39027	SRK	GAR-19-019	419	420	Waste Rock	UGTMF	INT	INT		0.75	0.77	16.6	2.10	0.70	25.1	2.89	287	-	-	-	-	-	-
39028	SRK	GAR-19-019	431.25	432.25	Waste Rock	UGTMF	INT	INT		0.67	0.80	22.2	2.14	0.50	23.7	2.57	87.0	-	-	-	-	-	-
39029	SRK	GAR-19-019	448.5	449.5	Waste Rock	UGTMF	INT	INT		0.71	0.51	9.64	1.72	1.00	16.7	1.89	611	-	-	-	-	-	-

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Partial - Aqua Regia Digestion and ICP-OES Finish									
									Analyte	Hg	Mo	Ni	Pb	Sb	Se	Te	U	V	Zn
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion
									Detection Limit	1	1	1	1	1	1	1	1	1	1
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl
39129	SRK	AR-16-059C5	545.5	548	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39130	SRK	AR-16-059C5	554.5	557	Special Waste	Mine Area	SPGN	SPGN		< 1.00	846	21.0	45.0	2.00	< 1.00	< 1.00	1510	48.0	1.00
39131	SRK	AR-16-064C1	439	441	Special Waste	Mine Area	SPGN	SPGN		< 1.00	253	97.0	66.0	1.00	10.0	< 1.00	1430	97.0	5.00
39132	SRK	AR-16-074C3	447	449	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39133	SRK	AR-16-076C2	475.5	478	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39134	SRK	AR-16-076C3	415	416.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39135	SRK	AR-16-078C4	366.5	368.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39136	SRK	AR-16-080C1	453.5	456.5	Special Waste	Mine Area	SPGN	SPGN		< 1.00	42.0	26.0	76.0	< 1.00	< 1.00	< 1.00	550	38.0	4.00
39138	SRK	AR-16-081C1	480.5	482	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39139	SRK	AR-16-084C1	691	692.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39141	SRK	AR-16-091C3	572.5	575	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39142	SRK	AR-16-091C3	620	622.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39144	SRK	AR-16-092C3	528.5	531	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39145	SRK	AR-16-093C2	612.5	615	Special Waste	Mine Area	SPGN	SPGN		< 1.00	13.0	12.0	17.0	< 1.00	< 1.00	< 1.00	268	15.0	6.00
39146	SRK	AR-16-093C2	653.5	655.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39147	SRK	AR-16-098C1	603	605.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39149	SRK	AR-16-096C1	396.5	398.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39150	SRK	AR-16-102C1	644	646	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39151	SRK	AR-16-102C1	665.5	668	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39152	SRK	AR-16-102C1	701	703.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39153	SRK	AR-16-102C2	607	609.5	Special Waste	Mine Area	SPGN	SPGN		< 1.00	263	27.0	45.0	< 1.00	11.0	< 1.00	293	63.0	1.00
39154	SRK	AR-16-104C1	756	758	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39155	SRK	AR-16-106C1	631	633	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39156	SRK	AR-16-106C1	687.5	689.5	Waste Rock	Mine Area	SPGN	SPGN		< 1.00	20.0	15.0	11.0	< 1.00	2.00	< 1.00	270	10.0	1.00
39157	SRK	AR-16-106C1	729	730.6	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39158	SRK	AR-16-106C2	577.5	579.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39159	SRK	AR-16-108C3	374	377	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39160	SRK	AR-16-109C2	652	654	Special Waste	Mine Area	SPGN	SPGN		< 1.00	22.0	18.0	42.0	1.00	< 1.00	< 1.00	1200	28.0	1.00
39161	SRK	AR-16-109C3	695.5	697.2	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39162	SRK	AR-16-110C1	683	685	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39164	SRK	AR-16-111C1	766	768	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39167	SRK	AR-17-115C2	697	698.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39169	SRK	AR-17-120C1	716	717.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39170	SRK	AR-17-127C2	506.5	508.5	Special Waste	Mine Area	SPGN	SPGN		< 1.00	24.0	17.0	19.0	< 1.00	3.00	< 1.00	314	19.0	2.00
39172	SRK	AR-17-126C1	749.5	752	Special Waste	Mine Area	SPGN	SPGN		< 1.00	124	51.0	42.0	1.00	< 1.00	< 1.00	899	89.0	23.0
39173	SRK	AR-17-136C2	750	752	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39175	SRK	AR-17-164C1	520.5	522.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39177	SRK	GAR-17-003	488.5	491	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39178	SRK	GAR-17-003	680.5	682	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39179	SRK	AR-18-186C1	580.5	582.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39180	SRK	AR-18-186C1	741.5	744	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39181	SRK	AR-18-187C1	388	390	Waste Rock	Mine Area	SPGN	SPGN		< 1.00	< 1.00	20.0	9.00	< 1.00	< 1.00	< 1.00	173	15.0	8.00
39182	SRK	AR-18-187C1	520	522.5	Special Waste	Mine Area	SPGN	SPGN		< 1.00	< 1.00	14.0	12.0	< 1.00	< 1.00	< 1.00	494	16.0	7.00
39183	SRK	AR-18-187C3	548.5	550.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39184	SRK	AR-18-187C4	472.5	474.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39185	SRK	AR-18-207C1	577	579.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39187	SRK	AR-18-208C1	596	598	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39188	SRK	AR-18-209C1	501	503	Special Waste	Mine Area	SPGN	SPGN		< 1.00	< 1.00	28.0	13.0	< 1.00	< 1.00	< 1.00	335	49.0	4.00
39194	SRK	AR-18-200C4	608.5	610.5	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39137	SRK	AR-16-080C4	502	504	Waste Rock	Mine Area	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39143	SRK	AR-16-091C4	680	682.5	Waste Rock	Mine Area	SPGN/DIOR	SPGN		-	-	-	-	-	-	-	-	-	-
39100	SRK	AR-14-024	372	374.5	Special Waste	Mine Area	SPGN/FLT	SPGN		< 1.00	2.00	17.0	12.0	< 1.00	1.00	< 1.00	288	35.0	44.0
39124	SRK	AR-15-060C1	435	436.5	Special Waste	Mine Area	SPGN/FLT	SPGN		< 1.00	< 1.00	8.00	7.00	< 1.00	< 1.00	< 1.00	192	15.0	3.00
39140	SRK	AR-16-085C1	407.5	410	Waste Rock	Mine Area	SPGN/FLT	SPGN		-	-	-	-	-	-	-	-	-	-
39148	SRK	AR-16-098C2	706	708.5	Special Waste	Mine Area	SPGN/FLT	SPGN		< 1.00	35.0	144	53.0	< 1.00	< 1.00	< 1.00	1100	45.0	125
39165	SRK	AR-16-111C2	696	698	Special Waste	Mine Area	SPGN/FLT	SPGN		< 1.00	13.0	413	39.0	1.00	< 1.00	< 1.00	1160	85.0	353
39168	SRK	AR-17-119C2	387	389	Special Waste	Mine Area	SPGN/FLT	SPGN		< 1.00	2.00	100	77.0	< 1.00	< 1.00	< 1.00	2000	163	168
39166	SRK	AR-17-114C1	736	737.5	Waste Rock	Mine Area	FLT/SPGN	SPGN		< 1.00	2.00	48.0	7.00	< 1.00	< 1.00	< 1.00	115	44.0	19.0
39171	SRK	AR-17-127C1	475	479	Special Waste	Mine Area	SPGN/FLT	SPGN		< 1.00	420	94.0	185	< 1.00	10.0	< 1.00	1100	89.0	20.0
39071	SRK	GAR-18-006	81	82	Waste Rock	Mine Area	SST	SST		-	-	-	-	-	-	-	-	-	-
39073	SRK	GAR-18-006	69	70.5	Waste Rock	Mine Area	SST	SST		-	-	-	-	-	-	-	-	-	-
39048	SRK	GAR-19-020	560	561	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39055	SRK	GAR-19-022	509	510	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39001	SRK	GAR-19-018	529	530	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39002	SRK	GAR-19-018	515	516	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39003	SRK	GAR-19-018	454	455	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39004	SRK	GAR-19-018	474	475	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39005	SRK	GAR-19-018	488	489	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39006	SRK	GAR-19-018	497	498	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39007	SRK	GAR-19-018	424	425	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39008	SRK	GAR-19-018	440	441	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39025	SRK	GAR-19-019	387.8	388.8	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39026	SRK	GAR-19-019	406	407	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39027	SRK	GAR-19-019	419	420	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39028	SRK	GAR-19-019	431.25	432.25	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39029	SRK	GAR-19-019	448.5	449.5	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		ABA													
									Analyte	Sulfate (SO_4), acid soluble	pH, paste	Modified NP	Acid Producing	Net Acid Generation	Sulfur as Sulfide	Total Carbon	Total Sulfur	Inorganic Carbon (TIC)	TIC	NP/AP	TIC/AP
									Unit	wt. %	pH units	kg CaCO3/t	kg $CaCO_3$/t	kg $CaCO_3$/t	wt. %	wt. %	wt. %	wt. %	kg $CaCO_3$/t	-	-
									Method							LECO	LECO	LECO			
									Detection Limit	0.005	--	0.5	0.5	--		0.01	0.01	0.01			
39030	SRK	GAR-19-019	464	465	Waste Rock	UGTMF	INT	INT		< 0.0050	9.24	5.10	7.50	2.40	0.24	0.16	0.24	< 0.010	0.83	0.7	0.1
39031	SRK	GAR-19-019	482	483	Waste Rock	UGTMF	INT	INT		< 0.0050	9.17	6.90	7.50	0.60	0.24	0.16	0.24	0.010	0.83	0.9	0.1
39032	SRK	GAR-19-019	498	499	Waste Rock	UGTMF	INT	INT		< 0.0050	9.27	7.70	5.30	- 2.40	0.17	0.14	0.17	0.020	1.67	1.5	0.3
39033	SRK	GAR-19-019	544	545	Waste Rock	UGTMF	INT	INT		< 0.0050	8.59	5.20	3.10	- 2.10	0.10	0.27	0.10	0.010	0.83	1.7	0.3
39034	SRK	GAR-19-019	529	530	Waste Rock	UGTMF	INT	INT		< 0.0050	9.09	7.70	5.90	- 1.80	0.19	0.19	0.19	0.020	1.67	1.3	0.3
39035	SRK	GAR-19-019	512.45	513.45	Waste Rock	UGTMF	INT	INT		< 0.0050	8.84	8.60	5.30	- 3.30	0.17	0.11	0.17	0.030	2.50	1.6	0.5
39036	SRK	GAR-19-019	364	365	Waste Rock	UGTMF	INT	INT		< 0.0050	9.28	10.2	5.00	- 5.20	0.16	0.13	0.16	0.040	3.33	2.1	0.7
39037	SRK	GAR-19-019	559	560	Waste Rock	UGTMF	INT	INT		< 0.0050	9.24	6.50	8.10	1.60	0.26	0.17	0.26	< 0.010	0.83	0.8	0.1
39038	SRK	GAR-19-019	578.5	579.5	Waste Rock	UGTMF	INT	INT		< 0.0050	8.34	5.90	23.1	17.2	0.74	0.38	0.74	< 0.010	0.83	0.3	0.0
39039	SRK	GAR-19-019	598.2	599.2	Waste Rock	UGTMF	INT	INT		< 0.0050	8.60	4.70	51.3	46.6	1.60	0.88	1.64	< 0.010	0.83	0.1	0.0
39040	SRK	GAR-19-019	613	614	Waste Rock	UGTMF	INT	INT		< 0.0050	9.05	6.00	11.6	5.60	0.37	0.10	0.37	0.010	0.83	0.5	0.1
39041	SRK	GAR-19-019	628.7	629.7	Waste Rock	UGTMF	INT	INT		< 0.0050	9.15	5.00	6.90	1.90	0.22	0.22	0.22	0.010	0.83	0.7	0.1
39042	SRK	GAR-19-018	546	547	Waste Rock	UGTMF	INT	INT		< 0.0050	9.09	5.10	7.50	2.40	0.24	0.040	0.24	< 0.010	0.83	0.7	0.1
39043	SRK	GAR-19-018	631	632	Waste Rock	UGTMF	INT	INT		< 0.0050	9.05	5.00	7.50	2.50	0.24	0.18	0.24	0.010	0.83	0.7	0.1
39044	SRK	GAR-19-018	601	602	Waste Rock	UGTMF	INT	INT		< 0.0050	8.99	4.70	9.10	4.40	0.29	0.16	0.37	< 0.010	0.83	0.4	0.1
39045	SRK	GAR-19-018	573	574	Waste Rock	UGTMF	INT	INT		< 0.0050	8.69	3.50	9.10	5.60	0.29	0.13	1.37	< 0.010	0.83	0.1	0.0
39009	SRK	GAR-19-020	496	497	Waste Rock	UGTMF	SPGN	SPGN		0.030	7.56	3.80	204	201	6.50	0.59	6.55	< 0.010	0.83	0.0	0.0
39010	SRK	GAR-19-020	481.3	482.3	Waste Rock	UGTMF	SPGN	SPGN		0.0070	8.15	3.10	82.7	79.6	2.70	0.37	2.65	< 0.010	0.83	0.0	0.0
39011	SRK	GAR-19-020	465	466	Waste Rock	UGTMF	SPGN	SPGN		< 0.0050	8.44	3.80	44.4	40.6	1.40	0.33	1.42	0.010	0.83	0.1	0.0
39012	SRK	GAR-19-020	451	452	Waste Rock	UGTMF	SPGN	SPGN		< 0.0050	8.92	4.50	11.9	7.40	0.38	0.14	0.38	< 0.010	0.83	0.4	0.1
39013	SRK	GAR-19-020	436.9	437.9	Waste Rock	UGTMF	SPGN	SPGN		0.0070	8.27	3.30	110	107	3.50	0.41	2.60	< 0.010	0.83	0.0	0.0
39014	SRK	GAR-19-020	422	423	Waste Rock	UGTMF	SPGN	SPGN		< 0.0050	8.36	5.00	13.8	8.80	0.44	0.24	0.44	< 0.010	0.83	0.4	0.1
39015	SRK	GAR-19-020	406	407	Waste Rock	UGTMF	SPGN	SPGN		0.0070	8.94	3.40	9.00	5.60	0.29	0.17	0.29	< 0.010	0.83	0.4	0.1
39016	SRK	GAR-19-020	391	392	Waste Rock	UGTMF	SPGN	SPGN		< 0.0050	8.27	4.50	11.6	7.10	0.37	0.24	0.37	< 0.010	0.83	0.4	0.1
39017	SRK	GAR-19-022	498	499	Waste Rock	UGTMF	SPGN	SPGN		< 0.0050	9.07	5.00	8.80	3.80	0.28	0.18	0.28	0.010	0.83	0.6	0.1
39018	SRK	GAR-19-022	480.7	481.7	Waste Rock	UGTMF	SPGN	SPGN		< 0.0050	9.24	4.90	11.9	7.00	0.38	0.12	0.38	0.010	0.83	0.4	0.1
39019	SRK	GAR-19-022	467.7	468.7	Waste Rock	UGTMF	SPGN	SPGN		< 0.0050	8.89	8.20	9.10	0.90	0.29	0.13	0.29	0.030	2.50	0.9	0.3
39020	SRK	GAR-19-022	455	456	Waste Rock	UGTMF	SPGN	SPGN		< 0.0050	8.68	3.10	1.90	- 1.20	0.06	0.030	0.060	< 0.010	0.83	1.7	0.5
39021	SRK	GAR-19-022	433.8	434.8	Waste Rock	UGTMF	SPGN	SPGN		< 0.0050	8.98	6.40	1.30	- 5.10	0.04	0.060	0.040	0.010	0.83	5.3	0.7
39022	SRK	GAR-19-022	423	424	Waste Rock	UGTMF	SPGN	SPGN		< 0.0050	8.50	4.30	7.20	2.90	0.23	0.13	0.23	0.010	0.83	0.6	0.1
39023	SRK	GAR-19-022	410.4	411.4	Waste Rock	UGTMF	SPGN	SPGN		< 0.0050	8.97	6.50	5.60	- 0.90	0.18	0.27	0.18	0.020	1.67	1.2	0.3
39024	SRK	GAR-19-022	393.5	394.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.0050	8.79	3.50	19.4	16.9	0.62	0.69	0.62	< 0.010	0.83	0.2	0.0
39046	SRK	GAR-19-020	616	617	Waste Rock	UGTMF	SPGN	SPGN		< 0.0050	8.76	3.50	8.40	4.90	0.27	0.14	0.04	< 0.010	0.83	2.9	0.7
39047	SRK	GAR-19-020	589	590	Waste Rock	UGTMF	SPGN	SPGN		< 0.0050	8.46	7.10	0.60	- 6.50	0.02	0.14	0.020	0.020	1.67	12.4	2.9
39049	SRK	GAR-19-020	527	528	Waste Rock	UGTMF	SPGN	SPGN		0.0080	7.88	5.30	82.4	77.1	2.60	0.24	2.64	< 0.010	0.83	0.1	0.0
39050	SRK	GAR-19-020	643.3	644.3	Waste Rock	UGTMF	SPGN	SPGN		< 0.0050	8.81	3.50	< 0.50	- 3.50	0.01	0.010	0.010	< 0.010	0.83	13.4	3.2
39051	SRK	GAR-19-022	630.1	631.1	Waste Rock	UGTMF	SPGN	SPGN		< 0.0050	8.33	2.30	0.60	- 1.70	0.02	0.22	0.020	< 0.010	0.83	4.0	1.5
39052	SRK	GAR-19-022	600	601	Waste Rock	UGTMF	SPGN	SPGN		< 0.0050	8.37	3.00	0.60	- 2.40	0.02	0.19	0.020	< 0.010	0.83	5.2	1.5
39053	SRK	GAR-19-022	570.1	571.1	Waste Rock	UGTMF	SPGN	SPGN		< 0.0050	8.39	2.50	2.20	< 0.50	0.07	0.49	0.070	< 0.010	0.83	1.2	0.4
39054	SRK	GAR-19-022	538.7	539.7	Waste Rock	UGTMF	SPGN/DIOR	SPGN		< 0.0050	8.87	2.30	10.9	8.60	0.35	0.12	0.35	< 0.010	0.83	0.2	0.1
143101	NexGen	GAR-18-013	6	6.5	Waste Rock	Shaft Pilot Hole	OVB	OVB		< 0.0050	5.86	2.20	< 0.5000	- 2.20	0.01	0	< 0.0100	< 0.010	0.83	8.5	3.2
143102	NexGen	GAR-18-013	18.8	19.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.01	4.99	< 0.5000	< 0.5000	< 0.5000	0.01	2.11	0.01	< 0.010	0.83	2.4	4.0
143103	NexGen	GAR-18-013	54.8	55.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.01	7.35	3.7	0.8	-2.9	0.03	1.58	0.03	0.01	0.83	4.4	1.0
143104	NexGen	GAR-18-013	59.3	59.8	Waste Rock	Shaft Pilot Hole	CRET	CRET		0.0590	7.43	5	13.8	8.8	0.44	1.69	0.46	0.02	1.67	0.4	0.1
143105	NexGen	GAR-18-013	60.8	61.3	Waste Rock	Shaft Pilot Hole	CRET	CRET		0.075	6.62	5.2	6.1	0.9	0.20	2.99	0.22	0.01	0.83	0.9	0.1
143106	NexGen	GAR-18-013	66.8	67.3	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		0.012	7.33	1.8	< 0.5000	-1.8	0.01	0.06	0.01	< 0.010	0.83	9.6	4.4
143107	NexGen	GAR-18-013	80.3	80.8	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		< 0.0050	7.35	1.8	< 0.5000	-1.8	0.01	0.05	0.01	< 0.010	0.83	6.9	3.2
143108	NexGen	GAR-18-013	92.9	93.4	Waste Rock	Shaft Pilot Hole	ASST	ASST		< 0.0050	6.42	2.1	< 0.5000	-2.1	0.01	< 0.0100	< 0.0100	< 0.010	0.83	8.1	3.2
143109	NexGen	GAR-18-013	105	105.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		< 0.0050	5.91	1.5	< 0.5000	-1.5	0.01	0.01	< 0.0100	< 0.010	0.83	5.8	3.2
143110	NexGen	GAR-18-013	114.5	115	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.0050	8.62	5.3	< 0.5000	-5.3	0.01	0.29	< 0.0100	< 0.010	0.83	20.4	3.2
143111	NexGen	GAR-18-013	164.5	165	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.0050	8.63	3	< 0.5000	-3	0.01	< 0.0100	< 0.0100	< 0.010	0.83	11.5	3.2
143112	NexGen	GAR-18-013	214.5	215	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.0050	8.73	2.5	< 0.5000	-2.5	0.01	0.23	< 0.0100	< 0.010	0.83	9.6	3.2
143113	NexGen	GAR-18-013	265	265.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.0050	8.71	3.6	< 0.5000	-3.6	0.01	0.39	< 0.0100	< 0.010	0.83	13.8	3.2
143114	NexGen	GAR-18-013	313.5	314	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.0050	8.66	4.5	< 0.5000	-4.5	0.01	0.15	< 0.0100	< 0.010	0.83	17.3	3.2
143115	NexGen	GAR-18-013	366	366.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.0050	8.6	6	< 0.5000	-6	0.01	0.38	< 0.0100	< 0.010	0.83	23.0	3.2
143116	NexGen	GAR-18-013	414	414.5	Waste Rock	Shaft Pilot Hole	INT	INT		< 0.0050	8.72	6.2	< 0.5000	-6.2	0.01	0.15	< 0.0100	< 0.010	0.83	23.8	3.2
143117	NexGen	GAR-18-013	466	466.5	Waste Rock	Shaft Pilot Hole	INT	INT		< 0.0050	8.87	5.6	< 0.5000	-5.6	0.01	0.1	0.01	< 0.010	0.83	21.5	3.2
143118	NexGen	GAR-18-013	516	516.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.008	8.65	5.7	38.7	33	1.24	0.21	1.24	< 0.010	0.83	0.1	0.0
143119	NexGen	GAR-18-013	566	566.5	Waste Rock	Shaft Pilot Hole	VNQZ/INT	INT		< 0.0050	8.56	3.4	< 0.5000	-3.4	0.01	< 0.0100	< 0.0100	< 0.010	0.83	13.1	3.2
143120	NexGen	GAR-18-013	616.15	616.65	Waste Rock	Shaft Pilot Hole	INT	INT		< 0.0050	8.23	3.2	< 0.5000	-3.2	0.01	0.01	< 0.0100	< 0.010	0.83	12.3	3.2
143121	NexGen	GAR-18-013	648	648.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.0050	8.31	5.4	< 0.5000	-5.4	0.01	0.09	< 0.0100	< 0.010	0.83	20.7	3.2

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4 Acid Digestion and ICP-OES finish											
									Analyte	Ag	Al_2O_3	Ba	Be	CaO	Cd	Ce	Co	Cr	Cu	Dy	Er
									Units	ppm	wt. %	ppm	ppm	wt. %	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion
									Detection Limit	0.2	0.01	1	0.2	0.01	1	1	1	1	1	0.2	0.2
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$
39030	SRK	GAR-19-019	464	465	Waste Rock	UGTMF	INT	INT		-	16.5	969	-	1.60	-	106	-	108	-	-	-
39031	SRK	GAR-19-019	482	483	Waste Rock	UGTMF	INT	INT		-	13.9	818	-	1.45	-	86.0	-	91.0	-	-	-
39032	SRK	GAR-19-019	498	499	Waste Rock	UGTMF	INT	INT		-	16.2	942	-	1.67	-	93.0	-	108	-	-	-
39033	SRK	GAR-19-019	544	545	Waste Rock	UGTMF	INT	INT		-	14.1	628	-	0.25	-	80.0	-	101	-	-	-
39034	SRK	GAR-19-019	529	530	Waste Rock	UGTMF	INT	INT		-	12.2	534	-	1.51	-	78.0	-	111	-	-	-
39035	SRK	GAR-19-019	512.45	513.45	Waste Rock	UGTMF	INT	INT		-	13.7	781	-	1.17	-	82.0	-	93.0	-	-	-
39036	SRK	GAR-19-019	364	365	Waste Rock	UGTMF	INT	INT		-	14.8	841	-	1.93	-	95.0	-	87.0	-	-	-
39037	SRK	GAR-19-019	559	560	Waste Rock	UGTMF	INT	INT		-	15.0	895	-	1.56	-	106	-	99.0	-	-	-
39038	SRK	GAR-19-019	578.5	579.5	Waste Rock	UGTMF	INT	INT		-	16.3	884	-	0.29	-	103	-	84.0	-	-	-
39039	SRK	GAR-19-019	598.2	599.2	Waste Rock	UGTMF	INT	INT		-	14.4	765	-	0.82	-	103	-	83.0	-	-	-
39040	SRK	GAR-19-019	613	614	Waste Rock	UGTMF	INT	INT		-	14.9	840	-	1.43	-	89.0	-	91.0	-	-	-
39041	SRK	GAR-19-019	628.7	629.7	Waste Rock	UGTMF	INT	INT		-	14.5	763	-	1.17	-	89.0	-	102	-	-	-
39042	SRK	GAR-19-018	546	547	Waste Rock	UGTMF	INT	INT		-	13.9	703	-	0.92	-	119	-	81.0	-	-	-
39043	SRK	GAR-19-018	631	632	Waste Rock	UGTMF	INT	INT		-	14.0	844	-	1.15	-	90.0	-	93.0	-	-	-
39044	SRK	GAR-19-018	601	602	Waste Rock	UGTMF	INT	INT		-	14.3	722	-	1.08	-	98.0	-	84.0	-	-	-
39045	SRK	GAR-19-018	573	574	Waste Rock	UGTMF	INT	INT		-	16.2	851	-	0.91	-	78.0	-	96.0	-	-	-
39009	SRK	GAR-19-020	496	497	Waste Rock	UGTMF	SPGN	SPGN		-	13.4	371	-	0.15	-	73.0	-	79.0	-	-	-
39010	SRK	GAR-19-020	481.3	482.3	Waste Rock	UGTMF	SPGN	SPGN		-	13.9	630	-	0.15	-	76.0	-	75.0	-	-	-
39011	SRK	GAR-19-020	465	466	Waste Rock	UGTMF	SPGN	SPGN		-	12.8	743	-	0.30	-	89.0	-	80.0	-	-	-
39012	SRK	GAR-19-020	451	452	Waste Rock	UGTMF	SPGN	SPGN		-	14.4	807	-	0.73	-	95.0	-	95.0	-	-	-
39013	SRK	GAR-19-020	436.9	437.9	Waste Rock	UGTMF	SPGN	SPGN		-	13.5	347	-	0.23	-	54.0	-	69.0	-	-	-
39014	SRK	GAR-19-020	422	423	Waste Rock	UGTMF	SPGN	SPGN		-	15.4	688	-	0.17	-	93.0	-	99.0	-	-	-
39015	SRK	GAR-19-020	406	407	Waste Rock	UGTMF	SPGN	SPGN		-	14.5	801	-	0.66	-	142	-	77.0	-	-	-
39016	SRK	GAR-19-020	391	392	Waste Rock	UGTMF	SPGN	SPGN		-	17.1	855	-	0.14	-	62.0	-	99.0	-	-	-
39017	SRK	GAR-19-022	498	499	Waste Rock	UGTMF	SPGN	SPGN		-	14.7	721	-	1.15	-	86.0	-	107	-	-	-
39018	SRK	GAR-19-022	480.7	481.7	Waste Rock	UGTMF	SPGN	SPGN		-	14.5	859	-	1.36	-	83.0	-	98.0	-	-	-
39019	SRK	GAR-19-022	467.7	468.7	Waste Rock	UGTMF	SPGN	SPGN		-	14.0	797	-	1.28	-	98.0	-	86.0	-	-	-
39020	SRK	GAR-19-022	455	456	Waste Rock	UGTMF	SPGN	SPGN		-	12.6	492	-	0.26	-	128	-	65.0	-	-	-
39021	SRK	GAR-19-022	433.8	434.8	Waste Rock	UGTMF	SPGN	SPGN		-	13.1	656	-	1.06	-	98.0	-	78.0	-	-	-
39022	SRK	GAR-19-022	423	424	Waste Rock	UGTMF	SPGN	SPGN		-	15.7	810	-	0.64	-	122	-	101	-	-	-
39023	SRK	GAR-19-022	410.4	411.4	Waste Rock	UGTMF	SPGN	SPGN		-	14.9	719	-	1.39	-	62.0	-	110	-	-	-
39024	SRK	GAR-19-022	393.5	394.5	Waste Rock	UGTMF	SPGN	SPGN		-	17.2	1010	-	0.61	-	70.0	-	125	-	-	-
39046	SRK	GAR-19-020	616	617	Waste Rock	UGTMF	SPGN	SPGN		-	22.5	1140	-	0.24	-	116	-	112	-	-	-
39047	SRK	GAR-19-020	589	590	Waste Rock	UGTMF	SPGN	SPGN		-	21.0	1210	-	0.47	-	103	-	110	-	-	-
39049	SRK	GAR-19-020	527	528	Waste Rock	UGTMF	SPGN	SPGN		-	13.7	194	-	0.19	-	78.0	-	71.0	-	-	-
39050	SRK	GAR-19-020	643.3	644.3	Waste Rock	UGTMF	SPGN	SPGN		-	16.0	950	-	0.28	-	95.0	-	87.0	-	-	-
39051	SRK	GAR-19-022	630.1	631.1	Waste Rock	UGTMF	SPGN	SPGN		-	20.0	905	-	0.070	-	137	-	119	-	-	-
39052	SRK	GAR-19-022	600	601	Waste Rock	UGTMF	SPGN	SPGN		-	17.4	917	-	0.15	-	100	-	89.0	-	-	-
39053	SRK	GAR-19-022	570.1	571.1	Waste Rock	UGTMF	SPGN	SPGN		-	14.4	774	-	0.060	-	102	-	82.0	-	-	-
39054	SRK	GAR-19-022	538.7	539.7	Waste Rock	UGTMF	SPGN/DIOR	SPGN		-	14.6	787	-	0.97	-	95.0	-	95.0	-	-	-
143101	NexGen	GAR-18-013	6	6.5	Waste Rock	Shaft Pilot Hole	OVB	OVB		-	0.4	14	-	< 0.010	-	26.0	-	17.0	-	-	-
143102	NexGen	GAR-18-013	18.8	19.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	7.43	317	-	0.07	-	35	-	27	-	-	-
143103	NexGen	GAR-18-013	54.8	55.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	10.9	486	-	0.34	-	67	-	50	-	-	-
143104	NexGen	GAR-18-013	59.3	59.8	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	19	342	-	0.77	-	89	-	87	-	-	-
143105	NexGen	GAR-18-013	60.8	61.3	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	13.2	450	-	0.45	-	67	-	66	-	-	-
143106	NexGen	GAR-18-013	66.8	67.3	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	6.82	97	-	0.06	-	53	-	45	-	-	-
143107	NexGen	GAR-18-013	80.3	80.8	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	6.52	120	-	0.06	-	52	-	47	-	-	-
143108	NexGen	GAR-18-013	92.9	93.4	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	0.93	5	-	< 0.010	-	17	-	3	-	-	-
143109	NexGen	GAR-18-013	105	105.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	0.77	9	-	< 0.010	-	17	-	7	-	-	-
143110	NexGen	GAR-18-013	114.5	115	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	17.1	539	-	0.11	-	68	-	75	-	-	-
143111	NexGen	GAR-18-013	164.5	165	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	17.5	829	-	0.07	-	88	-	214	-	-	-
143112	NexGen	GAR-18-013	214.5	215	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	15.5	795	-	0.04	-	107	-	98	-	-	-
143113	NexGen	GAR-18-013	265	265.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	14.8	695	-	0.06	-	107	-	96	-	-	-
143114	NexGen	GAR-18-013	313.5	314	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	14.5	592	-	0.05	-	78	-	53	-	-	-
143115	NexGen	GAR-18-013	366	366.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	13.3	730	-	0.22	-	110	-	87	-	-	-
143116	NexGen	GAR-18-013	414	414.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	19	865	-	0.08	-	111	-	109	-	-	-
143117	NexGen	GAR-18-013	466	466.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	21	1000	-	0.06	-	93	-	142	-	-	-
143118	NexGen	GAR-18-013	516	516.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	11.7	495	-	0.2	-	98	-	109	-	-	-
143119	NexGen	GAR-18-013	566	566.5	Waste Rock	Shaft Pilot Hole	VNQZ/INT	INT		-	12.4	1060	-	0.06	-	60	-	78	-	-	-
143120	NexGen	GAR-18-013	616.15	616.65	Waste Rock	Shaft Pilot Hole	INT	INT		-	10.6	255	-	0.06	-	83	-	86	-	-	-
143121	NexGen	GAR-18-013	648	648.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	9.86	610	-	0.05	-	69	-	68	-	-	-

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4 Acid Digestion and ICP-OES finish											
									Analyte	Eu	Fe_2O_3	Ga	Gd	Hf	Ho	2	K_2O	La	Li	MgO	MgO
									Units	ppm	wt. %	ppm	ppm	ppm	ppm	wt. %	wt. %	ppm	ppm	wt. %	wt. %
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion
									Detection Limit	0.2	0.01	1	1	1	1	0.002	0.01	1	1	0.002	0.01
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$
39030	SRK	GAR-19-019	464	465	Waste Rock	UGTMF	INT	INT		-	6.96	-	-	-	-	4.22	-	59.0	20.0	2.53	-
39031	SRK	GAR-19-019	482	483	Waste Rock	UGTMF	INT	INT		-	6.35	-	-	-	-	3.23	-	47.0	21.0	2.22	-
39032	SRK	GAR-19-019	498	499	Waste Rock	UGTMF	INT	INT		-	7.22	-	-	-	-	3.92	-	52.0	18.0	2.58	-
39033	SRK	GAR-19-019	544	545	Waste Rock	UGTMF	INT	INT		-	6.08	-	-	-	-	3.86	-	39.0	40.0	2.98	-
39034	SRK	GAR-19-019	529	530	Waste Rock	UGTMF	INT	INT		-	5.72	-	-	-	-	2.61	-	43.0	19.0	2.07	-
39035	SRK	GAR-19-019	512.45	513.45	Waste Rock	UGTMF	INT	INT		-	6.01	-	-	-	-	3.19	-	44.0	33.0	2.41	-
39036	SRK	GAR-19-019	364	365	Waste Rock	UGTMF	INT	INT		-	6.17	-	-	-	-	3.28	-	53.0	19.0	2.36	-
39037	SRK	GAR-19-019	559	560	Waste Rock	UGTMF	INT	INT		-	6.28	-	-	-	-	3.45	-	59.0	21.0	2.31	-
39038	SRK	GAR-19-019	578.5	579.5	Waste Rock	UGTMF	INT	INT		-	7.45	-	-	-	-	3.96	-	55.0	48.0	4.00	-
39039	SRK	GAR-19-019	598.2	599.2	Waste Rock	UGTMF	INT	INT		-	8.19	-	-	-	-	3.43	-	56.0	24.0	2.29	-
39040	SRK	GAR-19-019	613	614	Waste Rock	UGTMF	INT	INT		-	6.53	-	-	-	-	3.48	-	48.0	20.0	2.43	-
39041	SRK	GAR-19-019	628.7	629.7	Waste Rock	UGTMF	INT	INT		-	7.06	-	-	-	-	3.43	-	48.0	16.0	2.33	-
39042	SRK	GAR-19-018	546	547	Waste Rock	UGTMF	INT	INT		-	5.72	-	-	-	-	3.01	-	64.0	15.0	2.56	-
39043	SRK	GAR-19-018	631	632	Waste Rock	UGTMF	INT	INT		-	6.28	-	-	-	-	3.44	-	49.0	14.0	2.13	-
39044	SRK	GAR-19-018	601	602	Waste Rock	UGTMF	INT	INT		-	6.10	-	-	-	-	3.10	-	54.0	17.0	2.64	-
39045	SRK	GAR-19-018	573	574	Waste Rock	UGTMF	INT	INT		-	8.33	-	-	-	-	3.51	-	44.0	33.0	2.42	-
39009	SRK	GAR-19-020	496	497	Waste Rock	UGTMF	SPGN	SPGN		-	15.2	-	-	-	-	2.42	-	40.0	50.0	4.00	-
39010	SRK	GAR-19-020	481.3	482.3	Waste Rock	UGTMF	SPGN	SPGN		-	8.53	-	-	-	-	3.33	-	39.0	60.0	3.25	-
39011	SRK	GAR-19-020	465	466	Waste Rock	UGTMF	SPGN	SPGN		-	6.47	-	-	-	-	3.96	-	48.0	42.0	2.80	-
39012	SRK	GAR-19-020	451	452	Waste Rock	UGTMF	SPGN	SPGN		-	6.62	-	-	-	-	3.65	-	53.0	26.0	3.02	-
39013	SRK	GAR-19-020	436.9	437.9	Waste Rock	UGTMF	SPGN	SPGN		-	8.13	-	-	-	-	2.04	-	29.0	90.0	5.20	-
39014	SRK	GAR-19-020	422	423	Waste Rock	UGTMF	SPGN	SPGN		-	6.43	-	-	-	-	2.65	-	48.0	72.0	5.54	-
39015	SRK	GAR-19-020	406	407	Waste Rock	UGTMF	SPGN	SPGN		-	6.01	-	-	-	-	4.00	-	77.0	24.0	2.86	-
39016	SRK	GAR-19-020	391	392	Waste Rock	UGTMF	SPGN	SPGN		-	6.54	-	-	-	-	3.18	-	33.0	66.0	5.45	-
39017	SRK	GAR-19-022	498	499	Waste Rock	UGTMF	SPGN	SPGN		-	6.67	-	-	-	-	3.40	-	48.0	15.0	2.58	-
39018	SRK	GAR-19-022	480.7	481.7	Waste Rock	UGTMF	SPGN	SPGN		-	6.68	-	-	-	-	3.48	-	46.0	15.0	2.44	-
39019	SRK	GAR-19-022	467.7	468.7	Waste Rock	UGTMF	SPGN	SPGN		-	5.80	-	-	-	-	3.40	-	54.0	19.0	2.27	-
39020	SRK	GAR-19-022	455	456	Waste Rock	UGTMF	SPGN	SPGN		-	4.96	-	-	-	-	2.89	-	70.0	32.0	2.73	-
39021	SRK	GAR-19-022	433.8	434.8	Waste Rock	UGTMF	SPGN	SPGN		-	5.18	-	-	-	-	2.88	-	53.0	13.0	2.40	-
39022	SRK	GAR-19-022	423	424	Waste Rock	UGTMF	SPGN	SPGN		-	7.13	-	-	-	-	3.86	-	64.0	25.0	2.62	-
39023	SRK	GAR-19-022	410.4	411.4	Waste Rock	UGTMF	SPGN	SPGN		-	7.31	-	-	-	-	3.27	-	35.0	13.0	2.61	-
39024	SRK	GAR-19-022	393.5	394.5	Waste Rock	UGTMF	SPGN	SPGN		-	7.76	-	-	-	-	4.61	-	38.0	18.0	2.61	-
39046	SRK	GAR-19-020	616	617	Waste Rock	UGTMF	SPGN	SPGN		-	8.74	-	-	-	-	5.12	-	62.0	18.0	2.73	-
39047	SRK	GAR-19-020	589	590	Waste Rock	UGTMF	SPGN	SPGN		-	9.12	-	-	-	-	4.58	-	55.0	17.0	2.46	-
39049	SRK	GAR-19-020	527	528	Waste Rock	UGTMF	SPGN	SPGN		-	8.24	-	-	-	-	2.48	-	42.0	66.0	4.44	-
39050	SRK	GAR-19-020	643.3	644.3	Waste Rock	UGTMF	SPGN	SPGN		-	9.07	-	-	-	-	4.03	-	52.0	14.0	2.15	-
39051	SRK	GAR-19-022	630.1	631.1	Waste Rock	UGTMF	SPGN	SPGN		-	8.94	-	-	-	-	4.18	-	80.0	21.0	2.73	-
39052	SRK	GAR-19-022	600	601	Waste Rock	UGTMF	SPGN	SPGN		-	7.20	-	-	-	-	3.80	-	55.0	21.0	2.49	-
39053	SRK	GAR-19-022	570.1	571.1	Waste Rock	UGTMF	SPGN	SPGN		-	5.95	-	-	-	-	3.14	-	54.0	23.0	2.28	-
39054	SRK	GAR-19-022	538.7	539.7	Waste Rock	UGTMF	SPGN/DIOR	SPGN		-	6.31	-	-	-	-	2.99	-	52.0	19.0	2.97	-
143101	NexGen	GAR-18-013	6	6.5	Waste Rock	Shaft Pilot Hole	OVB	OVB		-	0.22	-	-	-	-	0.05	-	11.0	3.0	0.02	-
143102	NexGen	GAR-18-013	18.8	19.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	0.77	-	-	-	-	1.3	-	19	24	0.25	-
143103	NexGen	GAR-18-013	54.8	55.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	3.3	-	-	-	-	1.96	-	32	45	0.724	-
143104	NexGen	GAR-18-013	59.3	59.8	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	5.37	-	-	-	-	2.63	-	45	87	1.58	-
143105	NexGen	GAR-18-013	60.8	61.3	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	6.2	-	-	-	-	2.04	-	33	63	0.972	-
143106	NexGen	GAR-18-013	66.8	67.3	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	0.74	-	-	-	-	1.27	-	26	33	0.65	-
143107	NexGen	GAR-18-013	80.3	80.8	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	0.67	-	-	-	-	1.31	-	27	27	0.634	-
143108	NexGen	GAR-18-013	92.9	93.4	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	0.04	-	-	-	-	0.013	-	8	3	0.043	-
143109	NexGen	GAR-18-013	105	105.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	0.03	-	-	-	-	0.016	-	8	3	0.01	-
143110	NexGen	GAR-18-013	114.5	115	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	4.42	-	-	-	-	4.03	-	37	31	2.06	-
143111	NexGen	GAR-18-013	164.5	165	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	5.37	-	-	-	-	4.02	-	44	31	1.65	-
143112	NexGen	GAR-18-013	214.5	215	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	1.85	-	-	-	-	3.56	-	53	33	1.54	-
143113	NexGen	GAR-18-013	265	265.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	4.35	-	-	-	-	3	-	55	54	2.44	-
143114	NexGen	GAR-18-013	313.5	314	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	3.56	-	-	-	-	2.94	-	40	53	2.95	-
143115	NexGen	GAR-18-013	366	366.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	5.43	-	-	-	-	2.68	-	54	32	2.13	-
143116	NexGen	GAR-18-013	414	414.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	6.54	-	-	-	-	3.55	-	58	51	3.46	-
143117	NexGen	GAR-18-013	466	466.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	6.85	-	-	-	-	4.04	-	47	57	4.01	-
143118	NexGen	GAR-18-013	516	516.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	5.95	-	-	-	-	2.41	-	47	41	3.41	-
143119	NexGen	GAR-18-013	566	566.5	Waste Rock	Shaft Pilot Hole	VNQZ/INT	INT		-	2.51	-	-	-	-	2.89	-	30	17	1.41	-
143120	NexGen	GAR-18-013	616.15	616.65	Waste Rock	Shaft Pilot Hole	INT	INT		-	2.32	-	-	-	-	2.41	-	42	19	1.76	-
143121	NexGen	GAR-18-013	648	648.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	2.65	-	-	-	-	2.01	-	35	28	2.25	-

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping	Analyte	MnO	MnO	Mo	Na_2O	Nb	Nd	Ni	P_2O_5	P_2O_5	Pb	Pr	S
										Total - 4 Acid Digestion and ICP-OES finish											
									Units	wt. %	wt. %	ppm	wt. %	ppm	ppm	ppm	wt. %	wt. %	ppm	ppm	ppm
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion
									Detection Limit	0.001	0.01	1	0.01	1	1	1	0.002	0.01	1	1	10
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$
39030	SRK	GAR-19-019	464	465	Waste Rock	UGTMF	INT	INT		0.068	-	-	1.63	-	-	-	0.076	-	-	-	1620
39031	SRK	GAR-19-019	482	483	Waste Rock	UGTMF	INT	INT		0.075	-	-	1.55	-	-	-	0.057	-	-	-	1600
39032	SRK	GAR-19-019	498	499	Waste Rock	UGTMF	INT	INT		0.089	-	-	1.93	-	-	-	0.069	-	-	-	1520
39033	SRK	GAR-19-019	544	545	Waste Rock	UGTMF	INT	INT		0.034	-	-	0.17	-	-	-	0.059	-	-	-	1140
39034	SRK	GAR-19-019	529	530	Waste Rock	UGTMF	INT	INT		0.074	-	-	1.61	-	-	-	0.050	-	-	-	1440
39035	SRK	GAR-19-019	512.45	513.45	Waste Rock	UGTMF	INT	INT		0.054	-	-	1.44	-	-	-	0.062	-	-	-	1900
39036	SRK	GAR-19-019	364	365	Waste Rock	UGTMF	INT	INT		0.078	-	-	2.18	-	-	-	0.080	-	-	-	1310
39037	SRK	GAR-19-019	559	560	Waste Rock	UGTMF	INT	INT		0.074	-	-	1.75	-	-	-	0.066	-	-	-	1870
39038	SRK	GAR-19-019	578.5	579.5	Waste Rock	UGTMF	INT	INT		0.064	-	-	0.41	-	-	-	0.068	-	-	-	7160
39039	SRK	GAR-19-019	598.2	599.2	Waste Rock	UGTMF	INT	INT		0.056	-	-	1.32	-	-	-	0.055	-	-	-	15000
39040	SRK	GAR-19-019	613	614	Waste Rock	UGTMF	INT	INT		0.082	-	-	1.64	-	-	-	0.082	-	-	-	3740
39041	SRK	GAR-19-019	628.7	629.7	Waste Rock	UGTMF	INT	INT		0.14	-	-	1.46	-	-	-	0.079	-	-	-	2310
39042	SRK	GAR-19-018	546	547	Waste Rock	UGTMF	INT	INT		0.049	-	-	1.62	-	-	-	0.074	-	-	-	2300
39043	SRK	GAR-19-018	631	632	Waste Rock	UGTMF	INT	INT		0.056	-	-	1.40	-	-	-	0.069	-	-	-	2770
39044	SRK	GAR-19-018	601	602	Waste Rock	UGTMF	INT	INT		0.058	-	-	1.70	-	-	-	0.065	-	-	-	3670
39045	SRK	GAR-19-018	573	574	Waste Rock	UGTMF	INT	INT		0.052	-	-	1.73	-	-	-	0.066	-	-	-	13500
39009	SRK	GAR-19-020	496	497	Waste Rock	UGTMF	SPGN	SPGN		0.045	-	-	0.050	-	-	-	0.067	-	-	-	64000
39010	SRK	GAR-19-020	481.3	482.3	Waste Rock	UGTMF	SPGN	SPGN		0.024	-	-	0.090	-	-	-	0.065	-	-	-	23100
39011	SRK	GAR-19-020	465	466	Waste Rock	UGTMF	SPGN	SPGN		0.052	-	-	0.34	-	-	-	0.094	-	-	-	12600
39012	SRK	GAR-19-020	451	452	Waste Rock	UGTMF	SPGN	SPGN		0.092	-	-	1.04	-	-	-	0.059	-	-	-	4130
39013	SRK	GAR-19-020	436.9	437.9	Waste Rock	UGTMF	SPGN	SPGN		0.042	-	-	0.050	-	-	-	0.16	-	-	-	26900
39014	SRK	GAR-19-020	422	423	Waste Rock	UGTMF	SPGN	SPGN		0.036	-	-	0.080	-	-	-	0.095	-	-	-	4320
39015	SRK	GAR-19-020	406	407	Waste Rock	UGTMF	SPGN	SPGN		0.045	-	-	0.94	-	-	-	0.063	-	-	-	2760
39016	SRK	GAR-19-020	391	392	Waste Rock	UGTMF	SPGN	SPGN		0.024	-	-	0.10	-	-	-	0.070	-	-	-	3730
39017	SRK	GAR-19-022	498	499	Waste Rock	UGTMF	SPGN	SPGN		0.062	-	-	1.64	-	-	-	0.060	-	-	-	2990
39018	SRK	GAR-19-022	480.7	481.7	Waste Rock	UGTMF	SPGN	SPGN		0.073	-	-	1.81	-	-	-	0.063	-	-	-	3660
39019	SRK	GAR-19-022	467.7	468.7	Waste Rock	UGTMF	SPGN	SPGN		0.075	-	-	1.76	-	-	-	0.055	-	-	-	2930
39020	SRK	GAR-19-022	455	456	Waste Rock	UGTMF	SPGN	SPGN		0.041	-	-	0.54	-	-	-	0.058	-	-	-	745
39021	SRK	GAR-19-022	433.8	434.8	Waste Rock	UGTMF	SPGN	SPGN		0.054	-	-	1.85	-	-	-	0.064	-	-	-	581
39022	SRK	GAR-19-022	423	424	Waste Rock	UGTMF	SPGN	SPGN		0.074	-	-	1.20	-	-	-	0.058	-	-	-	2300
39023	SRK	GAR-19-022	410.4	411.4	Waste Rock	UGTMF	SPGN	SPGN		0.12	-	-	1.70	-	-	-	0.056	-	-	-	1760
39024	SRK	GAR-19-022	393.5	394.5	Waste Rock	UGTMF	SPGN	SPGN		0.082	-	-	1.08	-	-	-	0.050	-	-	-	5540
39046	SRK	GAR-19-020	616	617	Waste Rock	UGTMF	SPGN	SPGN		0.10	-	-	0.44	-	-	-	0.046	-	-	-	442
39047	SRK	GAR-19-020	589	590	Waste Rock	UGTMF	SPGN	SPGN		0.23	-	-	0.44	-	-	-	0.063	-	-	-	319
39049	SRK	GAR-19-020	527	528	Waste Rock	UGTMF	SPGN	SPGN		0.034	-	-	0.040	-	-	-	0.11	-	-	-	22500
39050	SRK	GAR-19-020	643.3	644.3	Waste Rock	UGTMF	SPGN	SPGN		0.083	-	-	0.44	-	-	-	0.035	-	-	-	92.0
39051	SRK	GAR-19-022	630.1	631.1	Waste Rock	UGTMF	SPGN	SPGN		0.026	-	-	0.29	-	-	-	0.034	-	-	-	249
39052	SRK	GAR-19-022	600	601	Waste Rock	UGTMF	SPGN	SPGN		0.049	-	-	0.21	-	-	-	0.042	-	-	-	250
39053	SRK	GAR-19-022	570.1	571.1	Waste Rock	UGTMF	SPGN	SPGN		0.034	-	-	0.20	-	-	-	0.025	-	-	-	812
39054	SRK	GAR-19-022	538.7	539.7	Waste Rock	UGTMF	SPGN/DIOR	SPGN		0.053	-	-	1.43	-	-	-	0.058	-	-	-	4000
143101	NexGen	GAR-18-013	6	6.5	Waste Rock	Shaft Pilot Hole	OVB	OVB		< 0.001	-	-	< 0.010	-	-	-	0.016	-	-	-	18
143102	NexGen	GAR-18-013	18.8	19.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.012	-	-	0.07	-	-	-	0.02	-	-	-	181
143103	NexGen	GAR-18-013	54.8	55.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.049	-	-	0.41	-	-	-	0.093	-	-	-	497
143104	NexGen	GAR-18-013	59.3	59.8	Waste Rock	Shaft Pilot Hole	CRET	CRET		0.026	-	-	0.11	-	-	-	0.069	-	-	-	4940
143105	NexGen	GAR-18-013	60.8	61.3	Waste Rock	Shaft Pilot Hole	CRET	CRET		0.104	-	-	0.09	-	-	-	0.102	-	-	-	2210
143106	NexGen	GAR-18-013	66.8	67.3	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		0.004	-	-	0.03	-	-	-	0.03	-	-	-	213
143107	NexGen	GAR-18-013	80.3	80.8	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		0.004	-	-	0.03	-	-	-	0.03	-	-	-	206
143108	NexGen	GAR-18-013	92.9	93.4	Waste Rock	Shaft Pilot Hole	ASST	ASST		< 0.001	-	-	< 0.010	-	-	-	0.01	-	-	-	37
143109	NexGen	GAR-18-013	105	105.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		< 0.001	-	-	< 0.010	-	-	-	0.009	-	-	-	31
143110	NexGen	GAR-18-013	114.5	115	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.015	-	-	0.12	-	-	-	0.047	-	-	-	31
143111	NexGen	GAR-18-013	164.5	165	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.003	-	-	0.21	-	-	-	0.055	-	-	-	31
143112	NexGen	GAR-18-013	214.5	215	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.001	-	-	0.15	-	-	-	0.041	-	-	-	33
143113	NexGen	GAR-18-013	265	265.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.008	-	-	0.07	-	-	-	0.044	-	-	-	27
143114	NexGen	GAR-18-013	313.5	314	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.009	-	-	0.13	-	-	-	0.032	-	-	-	20
143115	NexGen	GAR-18-013	366	366.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.024	-	-	0.14	-	-	-	0.186	-	-	-	63
143116	NexGen	GAR-18-013	414	414.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.023	-	-	0.2	-	-	-	0.071	-	-	-	81
143117	NexGen	GAR-18-013	466	466.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.031	-	-	0.23	-	-	-	0.059	-	-	-	98
143118	NexGen	GAR-18-013	516	516.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.018	-	-	0.33	-	-	-	0.061	-	-	-	10200
143119	NexGen	GAR-18-013	566	566.5	Waste Rock	Shaft Pilot Hole	VNQZ/INT	INT		0.014	-	-	0.16	-	-	-	0.035	-	-	-	63
143120	NexGen	GAR-18-013	616.15	616.65	Waste Rock	Shaft Pilot Hole	INT	INT		0.011	-	-	0.04	-	-	-	0.033	-	-	-	36
143121	NexGen	GAR-18-013	648	648.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.005	-	-	0.1	-	-	-	0.035	-	-	-	54

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4 Acid Digestion and ICP-OES finish											
									Analyte	Sc	Sm	Sn	Sr	Ta	Tb	Th	TiO_2	TiO_2	U	V	W
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	wt. %	wt. %	ppm	ppm	ppm
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion
									Detection Limit	1	1	1	1	1	1	1	0.002	0.01	2	0.1	1
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$
39030	SRK	GAR-19-019	464	465	Waste Rock	UGTMF	INT	INT		-	-	-	166	-	-	-	0.71	-	-	112	-
39031	SRK	GAR-19-019	482	483	Waste Rock	UGTMF	INT	INT		-	-	-	147	-	-	-	0.58	-	-	91.4	-
39032	SRK	GAR-19-019	498	499	Waste Rock	UGTMF	INT	INT		-	-	-	181	-	-	-	0.76	-	-	106	-
39033	SRK	GAR-19-019	544	545	Waste Rock	UGTMF	INT	INT		-	-	-	37.0	-	-	-	0.58	-	-	95.5	-
39034	SRK	GAR-19-019	529	530	Waste Rock	UGTMF	INT	INT		-	-	-	134	-	-	-	0.46	-	-	78.6	-
39035	SRK	GAR-19-019	512.45	513.45	Waste Rock	UGTMF	INT	INT		-	-	-	136	-	-	-	0.66	-	-	89.2	-
39036	SRK	GAR-19-019	364	365	Waste Rock	UGTMF	INT	INT		-	-	-	197	-	-	-	0.63	-	-	99.2	-
39037	SRK	GAR-19-019	559	560	Waste Rock	UGTMF	INT	INT		-	-	-	165	-	-	-	0.54	-	-	95.9	-
39038	SRK	GAR-19-019	578.5	579.5	Waste Rock	UGTMF	INT	INT		-	-	-	54.0	-	-	-	0.64	-	-	110	-
39039	SRK	GAR-19-019	598.2	599.2	Waste Rock	UGTMF	INT	INT		-	-	-	101	-	-	-	0.63	-	-	128	-
39040	SRK	GAR-19-019	613	614	Waste Rock	UGTMF	INT	INT		-	-	-	143	-	-	-	0.70	-	-	105	-
39041	SRK	GAR-19-019	628.7	629.7	Waste Rock	UGTMF	INT	INT		-	-	-	132	-	-	-	0.73	-	-	106	-
39042	SRK	GAR-19-018	546	547	Waste Rock	UGTMF	INT	INT		-	-	-	114	-	-	-	0.64	-	-	85.3	-
39043	SRK	GAR-19-018	631	632	Waste Rock	UGTMF	INT	INT		-	-	-	123	-	-	-	0.59	-	-	94.1	-
39044	SRK	GAR-19-018	601	602	Waste Rock	UGTMF	INT	INT		-	-	-	118	-	-	-	0.64	-	-	92.1	-
39045	SRK	GAR-19-018	573	574	Waste Rock	UGTMF	INT	INT		-	-	-	111	-	-	-	0.74	-	-	132	-
39009	SRK	GAR-19-020	496	497	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	14.0	-	-	-	0.60	-	-	124	-
39010	SRK	GAR-19-020	481.3	482.3	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	19.0	-	-	-	0.66	-	-	105	-
39011	SRK	GAR-19-020	465	466	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	44.0	-	-	-	0.57	-	-	90.2	-
39012	SRK	GAR-19-020	451	452	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	91.0	-	-	-	0.69	-	-	102	-
39013	SRK	GAR-19-020	436.9	437.9	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	18.0	-	-	-	0.61	-	-	105	-
39014	SRK	GAR-19-020	422	423	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	22.0	-	-	-	0.80	-	-	119	-
39015	SRK	GAR-19-020	406	407	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	80.0	-	-	-	0.60	-	-	89.4	-
39016	SRK	GAR-19-020	391	392	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	26.0	-	-	-	0.70	-	-	118	-
39017	SRK	GAR-19-022	498	499	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	119	-	-	-	0.62	-	-	98.5	-
39018	SRK	GAR-19-022	480.7	481.7	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	134	-	-	-	0.66	-	-	102	-
39019	SRK	GAR-19-022	467.7	468.7	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	133	-	-	-	0.45	-	-	81.2	-
39020	SRK	GAR-19-022	455	456	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	38.0	-	-	-	0.47	-	-	65.4	-
39021	SRK	GAR-19-022	433.8	434.8	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	122	-	-	-	0.48	-	-	70.9	-
39022	SRK	GAR-19-022	423	424	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	93.0	-	-	-	0.69	-	-	101	-
39023	SRK	GAR-19-022	410.4	411.4	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	114	-	-	-	0.55	-	-	101	-
39024	SRK	GAR-19-022	393.5	394.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	97.0	-	-	-	1.01	-	-	135	-
39046	SRK	GAR-19-020	616	617	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	75.0	-	-	-	0.95	-	-	154	-
39047	SRK	GAR-19-020	589	590	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	71.0	-	-	-	0.88	-	-	146	-
39049	SRK	GAR-19-020	527	528	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	31.0	-	-	-	0.55	-	-	93.0	-
39050	SRK	GAR-19-020	643.3	644.3	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	73.0	-	-	-	0.96	-	-	110	-
39051	SRK	GAR-19-022	630.1	631.1	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	48.0	-	-	-	1.20	-	-	160	-
39052	SRK	GAR-19-022	600	601	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	36.0	-	-	-	0.77	-	-	115	-
39053	SRK	GAR-19-022	570.1	571.1	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	32.0	-	-	-	0.72	-	-	106	-
39054	SRK	GAR-19-022	538.7	539.7	Waste Rock	UGTMF	SPGN/DIOR	SPGN		-	-	-	115	-	-	-	0.70	-	-	101	-
143101	NexGen	GAR-18-013	6	6.5	Waste Rock	Shaft Pilot Hole	OVB	OVB		-	-	-	47	-	-	-	0.03	-	-	4	-
143102	NexGen	GAR-18-013	18.8	19.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	-	-	38	-	-	-	0.704	-	-	40.8	-
143103	NexGen	GAR-18-013	54.8	55.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	-	-	88	-	-	-	0.683	-	-	84	-
143104	NexGen	GAR-18-013	59.3	59.8	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	-	-	163	-	-	-	0.911	-	-	139	-
143105	NexGen	GAR-18-013	60.8	61.3	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	-	-	89	-	-	-	0.644	-	-	112	-
143106	NexGen	GAR-18-013	66.8	67.3	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	-	-	90	-	-	-	0.32	-	-	48.8	-
143107	NexGen	GAR-18-013	80.3	80.8	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	-	-	62	-	-	-	0.316	-	-	53.7	-
143108	NexGen	GAR-18-013	92.9	93.4	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	-	-	25	-	-	-	0.166	-	-	4.7	-
143109	NexGen	GAR-18-013	105	105.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	-	-	21	-	-	-	0.066	-	-	2.2	-
143110	NexGen	GAR-18-013	114.5	115	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	103	-	-	-	0.865	-	-	129	-
143111	NexGen	GAR-18-013	164.5	165	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	98	-	-	-	0.862	-	-	126	-
143112	NexGen	GAR-18-013	214.5	215	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	75	-	-	-	0.748	-	-	95.1	-
143113	NexGen	GAR-18-013	265	265.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	66	-	-	-	0.795	-	-	103	-
143114	NexGen	GAR-18-013	313.5	314	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	34	-	-	-	0.433	-	-	61.1	-
143115	NexGen	GAR-18-013	366	366.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	53	-	-	-	0.611	-	-	102	-
143116	NexGen	GAR-18-013	414	414.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	60	-	-	-	0.696	-	-	117	-
143117	NexGen	GAR-18-013	466	466.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	53	-	-	-	0.954	-	-	158	-
143118	NexGen	GAR-18-013	516	516.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	29	-	-	-	0.559	-	-	88.6	-
143119	NexGen	GAR-18-013	566	566.5	Waste Rock	Shaft Pilot Hole	VNQZ/INT	INT		-	-	-	26	-	-	-	0.403	-	-	84.2	-
143120	NexGen	GAR-18-013	616.15	616.65	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	40	-	-	-	0.537	-	-	62.4	-
143121	NexGen	GAR-18-013	648	648.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	34	-	-	-	0.452	-	-	55.6	-

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4 Acid Digestion and ICP-OES finish				Partial -- Aqua Regia Digestion and ICP-MS finish											
									Analyte	Y	Yb	Zn	Zr	Ag	As	Be	Bi	Cd	Co	Cs	Cu	Dy	Er	Eu	Ga
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion
									Detection Limit	1	0.1	1	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	HF/HNO_3/HClO4	HF/HNO_3/HClO4	HF/HNO_3/HClO4	HF/HNO_3/HClO4	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl
39030	SRK	GAR-19-019	464	465	Waste Rock	UGTMF	INT	INT		-	-	-	230	0.040	0.45	0.070	0.030	0.060	11.3	0.87	24.8	2.28	0.90	0.56	3.78
39031	SRK	GAR-19-019	482	483	Waste Rock	UGTMF	INT	INT		-	-	-	202	0.050	0.32	0.040	0.020	0.050	10.6	0.37	22.5	1.20	0.60	0.25	2.78
39032	SRK	GAR-19-019	498	499	Waste Rock	UGTMF	INT	INT		-	-	-	222	0.040	0.62	0.040	0.010	0.070	10.9	0.44	15.7	1.01	0.49	0.24	3.11
39033	SRK	GAR-19-019	544	545	Waste Rock	UGTMF	INT	INT		-	-	-	184	0.060	2.15	0.49	0.020	0.44	8.38	0.31	18.0	0.98	0.47	0.44	4.95
39034	SRK	GAR-19-019	529	530	Waste Rock	UGTMF	INT	INT		-	-	-	159	0.040	0.41	0.050	0.020	0.060	8.52	0.27	13.9	1.05	0.41	0.27	2.53
39035	SRK	GAR-19-019	512.45	513.45	Waste Rock	UGTMF	INT	INT		-	-	-	234	0.030	1.17	0.10	0.040	0.080	9.75	0.81	15.7	2.52	1.12	0.60	3.90
39036	SRK	GAR-19-019	364	365	Waste Rock	UGTMF	INT	INT		-	-	-	197	0.050	1.62	0.040	0.060	0.050	11.0	0.61	24.0	0.96	0.45	0.26	3.18
39037	SRK	GAR-19-019	559	560	Waste Rock	UGTMF	INT	INT		-	-	-	178	0.050	0.72	0.030	0.020	0.060	11.3	0.41	14.9	1.40	0.52	0.33	3.02
39038	SRK	GAR-19-019	578.5	579.5	Waste Rock	UGTMF	INT	INT		-	-	-	156	0.14	25.1	0.40	0.32	0.080	23.6	0.28	53.5	0.62	0.34	0.26	4.80
39039	SRK	GAR-19-019	598.2	599.2	Waste Rock	UGTMF	INT	INT		-	-	-	185	0.16	0.77	0.13	0.16	0.080	18.4	0.35	59.1	1.28	0.44	0.46	4.16
39040	SRK	GAR-19-019	613	614	Waste Rock	UGTMF	INT	INT		-	-	-	200	0.050	0.30	0.080	0.040	0.030	10.7	0.82	17.5	1.98	0.83	0.54	3.72
39041	SRK	GAR-19-019	628.7	629.7	Waste Rock	UGTMF	INT	INT		-	-	-	216	0.030	0.23	0.040	0.040	0.020	12.5	0.78	21.2	1.19	0.43	0.45	3.25
39042	SRK	GAR-19-018	546	547	Waste Rock	UGTMF	INT	INT		-	-	-	247	0.030	1.54	0.16	0.040	0.040	10.6	0.63	16.8	0.98	0.50	0.29	3.57
39043	SRK	GAR-19-018	631	632	Waste Rock	UGTMF	INT	INT		-	-	-	244	0.030	0.28	0.070	0.030	0.010	9.20	1.38	32.6	1.50	0.55	0.46	3.24
39044	SRK	GAR-19-018	601	602	Waste Rock	UGTMF	INT	INT		-	-	-	218	0.040	2.43	0.23	0.070	0.030	9.19	0.66	17.0	1.16	0.53	0.31	3.72
39045	SRK	GAR-19-018	573	574	Waste Rock	UGTMF	INT	INT		-	-	-	173	0.13	0.41	0.15	0.090	0.050	16.1	1.24	87.4	2.33	1.00	0.74	4.55
39009	SRK	GAR-19-020	496	497	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	137	0.23	3.12	0.66	1.18	0.060	56.7	0.13	172	0.34	0.20	0.12	5.16
39010	SRK	GAR-19-020	481.3	482.3	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	157	0.10	1.83	0.74	0.77	0.050	16.6	0.20	99.6	0.45	0.22	0.16	4.29
39011	SRK	GAR-19-020	465	466	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	162	0.080	2.47	0.62	0.34	0.080	12.6	0.21	74.0	0.58	0.29	0.17	3.16
39012	SRK	GAR-19-020	451	452	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	193	0.020	8.82	0.25	0.16	0.020	13.0	0.39	31.6	0.59	0.25	0.26	3.86
39013	SRK	GAR-19-020	436.9	437.9	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	184	0.12	5.58	1.02	2.09	0.040	27.4	0.16	78.6	0.56	0.29	0.19	4.97
39014	SRK	GAR-19-020	422	423	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	185	0.040	1.96	0.97	0.40	0.040	14.5	0.10	41.7	1.18	0.50	0.48	5.60
39015	SRK	GAR-19-020	406	407	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	181	0.020	1.49	0.24	0.060	0.010	11.3	0.34	17.7	0.92	0.39	0.24	3.47
39016	SRK	GAR-19-020	391	392	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	168	0.020	2.42	0.74	0.70	0.020	13.7	0.060	35.2	1.07	0.44	0.44	5.05
39017	SRK	GAR-19-022	498	499	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	191	0.030	0.36	0.11	0.040	0.020	10.7	0.79	21.4	1.03	0.41	0.29	3.43
39018	SRK	GAR-19-022	480.7	481.7	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	216	0.050	0.25	0.050	0.040	0.020	12.1	0.35	27.3	1.59	0.58	0.50	3.65
39019	SRK	GAR-19-022	467.7	468.7	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	175	0.070	0.55	0.10	0.020	0.15	9.82	0.19	24.7	0.83	0.41	0.21	2.42
39020	SRK	GAR-19-022	455	456	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	258	0.020	0.90	0.39	0.060	0.020	6.31	0.18	30.4	1.14	0.50	0.63	3.89
39021	SRK	GAR-19-022	433.8	434.8	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	252	0.020	1.11	0.12	0.010	0.010	7.25	0.32	4.65	0.83	0.31	0.29	2.72
39022	SRK	GAR-19-022	423	424	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	209	0.040	1.12	0.14	0.020	0.060	10.3	0.32	17.7	0.51	0.24	0.28	2.96
39023	SRK	GAR-19-022	410.4	411.4	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	140	0.040	1.01	0.060	0.020	0.030	10.7	0.28	10.3	1.00	0.40	0.38	3.06
39024	SRK	GAR-19-022	393.5	394.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	197	0.050	0.46	0.090	0.070	0.050	13.5	0.47	34.6	1.41	0.51	0.41	3.68
39046	SRK	GAR-19-020	616	617	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	198	< 0.010	1.33	0.11	0.060	< 0.010	9.41	0.29	5.93	1.33	0.49	0.67	3.26
39047	SRK	GAR-19-020	589	590	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	211	< 0.010	3.83	0.050	0.060	0.020	11.0	0.26	6.05	1.50	0.64	0.91	3.11
39049	SRK	GAR-19-020	527	528	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	198	0.090	3.56	0.83	0.86	0.030	20.3	0.13	34.7	0.62	0.27	0.18	4.24
39050	SRK	GAR-19-020	643.3	644.3	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	256	0.010	0.38	0.010	0.060	0.020	7.41	0.35	1.42	0.39	0.18	0.25	1.76
39051	SRK	GAR-19-022	630.1	631.1	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	226	0.010	0.76	0.040	0.17	0.010	10.4	0.070	21.1	1.16	0.50	0.58	3.17
39052	SRK	GAR-19-022	600	601	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	201	< 0.010	1.30	0.080	0.040	0.010	8.71	0.16	2.98	0.87	0.36	0.72	2.91
39053	SRK	GAR-19-022	570.1	571.1	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	238	< 0.010	0.58	0.23	0.050	< 0.010	8.91	0.20	3.70	0.47	0.24	0.28	3.14
39054	SRK	GAR-19-022	538.7	539.7	Waste Rock	UGTMF	SPGN/DIOR	SPGN		-	-	-	209	0.020	0.75	0.19	0.040	0.010	11.6	0.69	27.3	0.78	0.33	0.24	3.43
143101	NexGen	GAR-18-013	6	6.5	Waste Rock	Shaft Pilot Hole	OVB	OVB		-	-	-	44	0.130	0.36	0.03	0.060	< 0.0100	0.1	< 0.0100	1.7	0.14	0.07	0.04	0.14
143102	NexGen	GAR-18-013	18.8	19.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	-	-	169	0.13	0.5	0.52	0.09	0.03	1.65	0.54	6.55	0.66	0.32	0.2	0.96
143103	NexGen	GAR-18-013	54.8	55.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	-	-	191	0.07	1.9	0.6	0.1	0.09	8.36	0.74	8.66	1.91	0.87	0.71	2.07
143104	NexGen	GAR-18-013	59.3	59.8	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	-	-	175	0.07	10.7	1.18	0.34	0.07	14.6	0.48	14.6	4.34	1.92	1.46	2.63
143105	NexGen	GAR-18-013	60.8	61.3	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	-	-	132	0.07	7.33	1	0.18	0.06	10.1	0.26	12.8	3.8	1.85	1.24	3.65
143106	NexGen	GAR-18-013	66.8	67.3	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	-	-	101	0.07	0.82	0.08	0.06	0.01	14.2	0.04	6.15	0.62	0.24	0.23	0.53
143107	NexGen	GAR-18-013	80.3	80.8	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	-	-	100	0.06	0.21	0.17	0.05	< 0.0100	0.3	0.05	5	0.43	0.18	0.18	0.54
143108	NexGen	GAR-18-013	92.9	93.4	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	-	-	239	0.02	0.18	0.04	0.05	< 0.0100	0.08	< 0.0100	0.84	0.16	0.09	0.03	0.21
143109	NexGen	GAR-18-013	105	105.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	-	-	104	0.06	0.24	0.02	0.04	< 0.0100	0.04	< 0.0100	0.71	0.19	0.11	0.03	0.15
143110	NexGen	GAR-18-013	114.5	115	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	214	< 0.0100	0.74	0.25	0.03	0.02	0.73	0.04	1.06	0.28	0.15	0.11	0.58
143111	NexGen	GAR-18-013	164.5	165	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	238	< 0.0100	0.24	0.21	0.05	0.01	0.79	0.06	1.26	0.31	0.15	0.14	0.61
143112	NexGen	GAR-18-013	214.5	215	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	251	< 0.0100	0.24	0.1	0.05	< 0.0100	1.03	0.09	0.75	0.16	0.09	0.09	0.6
143113	NexGen	GAR-18-013	265	265.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	302	< 0.0100	0.48	0.35	0.03	< 0.0100	7.99	0.29	1.12	0.29	0.16	0.21	2.81
143114	NexGen	GAR-18-013	313.5	314	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	140	< 0.0100	0.79	0.46	0.02	0.01	6.47	0.24	1.12	0.27	0.12	0.14	2.64
143115	NexGen	GAR-18-013	366	366.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	233	< 0.0100	0.9	0.24	0.19	0.03	8.59	0.12	5.65	0.7	0.26	0.27	3.72
143116	NexGen	GAR-18-013	414	414.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	167	0.01	0.81	0.27	0.3	0.02	12.3	0.15	2.49	0.95	0.41	0.31	4.08
143117	NexGen	GAR-18-013	466	466.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	178	< 0.0100	1.29	0.37	0.11	0.01	17	0.16	1.81	0.85	0.33	0.42	5.26
143118	NexGen	GAR-18-013	516	516.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	157	0.08	0.78	0.43	0.35	0.06	21.8	0.35	46.9	0.44	0.21	0.22	4.02
143119	NexGen	GAR-18-013	566	566.5	Waste Rock	Shaft Pilot Hole	VNQZ/INT	INT		-	-	-	72	< 0.0100	0.37	0.15	0.07	< 0.0100	4.48	0.14	1.15	0.69	0.31	0.22	1.85
143120	NexGen	GAR-18-013	616.15	616.65	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	303	< 0.0100	0.23	0.27	0.01	< 0.0100	3.36	0.19	1.62	0.42	0.16	0.22	1.74
143121	NexGen	GAR-18-013	648	648.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	266	0.01	1.24	0.3	0.04	< 0.0100	5.51	0.09	8.82	0.21	0.11	0.09	2.05

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Partial -- Aqua Regia Digestion and ICP-MS finish																	
									Analyte	Gd	Ge	Hf	Hg	Ho	Mo	Nb	Nd	Ni	Pb204	Pb206	Pb207	Pb208	PbSUM	Pr	Rb	Sb	Sc
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion
									Detection Limit	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.001	0.001	0.001	0.001	0.001	0.01	0.01	0.01	0.1
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl
39030	SRK	GAR-19-019	464	465	Waste Rock	UGTMF	INT	INT		2.72	0.050	0.060	< 0.010	0.38	0.56	0.060	18.3	29.6	0.042	0.88	0.62	2.25	3.79	4.85	69.8	< 0.010	5.00
39031	SRK	GAR-19-019	482	483	Waste Rock	UGTMF	INT	INT		1.46	0.050	0.070	< 0.010	0.23	0.51	0.040	8.71	32.5	0.070	1.20	1.03	3.08	5.38	2.21	50.0	< 0.010	4.80
39032	SRK	GAR-19-019	498	499	Waste Rock	UGTMF	INT	INT		1.33	0.060	0.10	< 0.010	0.19	0.41	0.040	9.61	37.7	0.079	1.38	1.17	3.65	6.28	2.48	69.7	< 0.010	5.20
39033	SRK	GAR-19-019	544	545	Waste Rock	UGTMF	INT	INT		1.98	< 0.010	0.070	< 0.010	0.17	0.64	< 0.010	17.6	24.6	1.19	20.6	17.5	42.7	82.1	4.79	8.28	0.040	3.90
39034	SRK	GAR-19-019	529	530	Waste Rock	UGTMF	INT	INT		1.52	0.060	0.050	< 0.010	0.17	0.68	0.040	9.61	19.4	0.13	2.32	1.98	5.44	9.88	2.55	49.9	< 0.010	5.80
39035	SRK	GAR-19-019	512.45	513.45	Waste Rock	UGTMF	INT	INT		3.08	0.040	0.080	< 0.010	0.46	1.18	0.060	18.5	23.9	0.14	2.60	2.06	5.82	10.6	5.01	39.0	0.010	4.70
39036	SRK	GAR-19-019	364	365	Waste Rock	UGTMF	INT	INT		1.29	0.060	0.040	< 0.010	0.18	0.67	0.050	8.45	42.0	0.13	2.00	1.85	4.88	8.87	2.20	60.2	< 0.010	5.80
39037	SRK	GAR-19-019	559	560	Waste Rock	UGTMF	INT	INT		1.84	0.050	0.050	< 0.010	0.23	0.44	0.050	11.4	36.2	0.071	1.24	1.06	3.38	5.75	2.97	57.4	< 0.010	5.10
39038	SRK	GAR-19-019	578.5	579.5	Waste Rock	UGTMF	INT	INT		0.99	0.030	0.060	< 0.010	0.12	5.46	0.010	8.20	45.5	0.13	2.29	1.96	5.07	9.45	2.21	36.1	0.050	5.70
39039	SRK	GAR-19-019	598.2	599.2	Waste Rock	UGTMF	INT	INT		2.22	0.050	0.050	< 0.010	0.19	7.67	0.050	15.5	53.1	0.17	2.77	2.49	6.65	12.1	4.19	47.9	< 0.010	5.40
39040	SRK	GAR-19-019	613	614	Waste Rock	UGTMF	INT	INT		2.46	0.050	0.050	< 0.010	0.35	0.63	0.080	15.8	27.7	0.054	1.05	0.83	2.48	4.42	4.26	60.7	< 0.010	6.40
39041	SRK	GAR-19-019	628.7	629.7	Waste Rock	UGTMF	INT	INT		2.18	0.040	0.040	< 0.010	0.17	0.87	0.080	15.8	25.7	0.041	0.87	0.65	2.27	3.83	4.31	56.4	< 0.010	4.70
39042	SRK	GAR-19-018	546	547	Waste Rock	UGTMF	INT	INT		1.53	0.050	0.050	< 0.010	0.19	0.56	0.10	11.8	28.5	0.062	1.09	0.90	2.71	4.76	3.17	46.5	< 0.010	4.40
39043	SRK	GAR-19-018	631	632	Waste Rock	UGTMF	INT	INT		2.32	0.050	0.040	< 0.010	0.23	0.77	0.060	16.0	23.2	0.040	0.79	0.59	2.21	3.62	4.39	55.7	< 0.010	4.40
39044	SRK	GAR-19-018	601	602	Waste Rock	UGTMF	INT	INT		1.53	0.050	0.040	< 0.010	0.21	0.71	0.070	11.0	23.8	0.063	1.16	0.93	2.91	5.06	2.96	49.3	< 0.010	5.50
39045	SRK	GAR-19-018	573	574	Waste Rock	UGTMF	INT	INT		3.24	0.050	0.040	< 0.010	0.40	3.49	0.070	19.5	47.3	0.093	1.68	1.40	4.27	7.44	5.25	46.8	< 0.010	4.90
39009	SRK	GAR-19-020	496	497	Waste Rock	UGTMF	SPGN	SPGN		0.54	0.060	0.18	< 0.010	0.070	9.70	0.030	4.49	129	0.26	4.25	3.75	9.26	17.5	1.22	5.47	< 0.010	2.50
39010	SRK	GAR-19-020	481.3	482.3	Waste Rock	UGTMF	SPGN	SPGN		0.63	0.040	0.070	< 0.010	0.080	4.65	0.040	3.95	43.3	0.16	2.72	2.29	5.84	11.0	1.03	15.6	0.010	3.10
39011	SRK	GAR-19-020	465	466	Waste Rock	UGTMF	SPGN	SPGN		0.76	0.030	0.040	< 0.010	0.11	1.57	0.020	4.64	27.2	0.11	1.98	1.70	4.53	8.33	1.18	22.9	0.030	3.50
39012	SRK	GAR-19-020	451	452	Waste Rock	UGTMF	SPGN	SPGN		1.02	0.060	0.040	< 0.010	0.10	1.62	0.040	8.24	29.8	0.045	0.87	0.66	2.15	3.73	2.19	55.1	0.020	5.60
39013	SRK	GAR-19-020	436.9	437.9	Waste Rock	UGTMF	SPGN	SPGN		0.93	0.030	0.12	< 0.010	0.10	5.19	0.010	5.88	53.0	0.19	3.43	2.86	7.32	13.8	1.54	6.15	0.020	2.40
39014	SRK	GAR-19-020	422	423	Waste Rock	UGTMF	SPGN	SPGN		2.27	0.020	0.11	< 0.010	0.19	1.85	0.010	17.4	35.4	0.053	1.27	0.82	2.57	4.71	4.51	4.56	0.010	3.00
39015	SRK	GAR-19-020	406	407	Waste Rock	UGTMF	SPGN	SPGN		1.26	0.040	0.030	< 0.010	0.16	0.75	0.040	11.0	20.4	0.029	0.58	0.43	1.59	2.63	3.01	48.9	< 0.010	4.60
39016	SRK	GAR-19-020	391	392	Waste Rock	UGTMF	SPGN	SPGN		2.01	0.020	0.11	< 0.010	0.18	2.12	< 0.010	14.8	28.4	0.046	0.98	0.68	2.11	3.82	3.84	4.99	0.020	3.60
39017	SRK	GAR-19-022	498	499	Waste Rock	UGTMF	SPGN	SPGN		1.38	0.060	0.030	< 0.010	0.16	1.03	0.040	8.27	27.7	0.062	1.02	0.92	2.59	4.59	2.16	53.4	0.020	6.00
39018	SRK	GAR-19-022	480.7	481.7	Waste Rock	UGTMF	SPGN	SPGN		2.24	0.070	0.040	< 0.010	0.25	0.94	0.10	13.1	34.6	0.058	1.01	0.86	2.58	4.51	3.52	58.2	< 0.010	6.00
39019	SRK	GAR-19-022	467.7	468.7	Waste Rock	UGTMF	SPGN	SPGN		1.11	0.040	0.040	< 0.010	0.16	1.01	0.020	7.92	27.6	0.21	3.24	3.07	7.80	14.3	2.13	30.0	< 0.010	2.80
39020	SRK	GAR-19-022	455	456	Waste Rock	UGTMF	SPGN	SPGN		2.97	0.020	0.090	< 0.010	0.18	1.63	< 0.010	26.2	18.5	0.033	0.60	0.49	1.54	2.66	7.11	10.2	< 0.010	3.80
39021	SRK	GAR-19-022	433.8	434.8	Waste Rock	UGTMF	SPGN	SPGN		1.42	0.050	0.030	< 0.010	0.13	0.22	0.030	10.2	14.8	0.023	0.46	0.35	1.20	2.04	2.72	48.4	< 0.010	4.50
39022	SRK	GAR-19-022	423	424	Waste Rock	UGTMF	SPGN	SPGN		1.04	0.030	0.070	< 0.010	0.090	0.64	0.010	9.96	23.0	0.078	1.32	1.16	3.24	5.81	2.63	45.6	< 0.010	3.70
39023	SRK	GAR-19-022	410.4	411.4	Waste Rock	UGTMF	SPGN	SPGN		1.39	0.050	0.030	< 0.010	0.17	1.90	0.020	8.12	35.2	0.054	0.87	0.78	2.15	3.85	2.15	54.5	< 0.010	4.00
39024	SRK	GAR-19-022	393.5	394.5	Waste Rock	UGTMF	SPGN	SPGN		1.76	0.040	0.030	< 0.010	0.22	0.75	0.060	11.2	35.6	0.070	1.17	1.02	2.85	5.11	3.00	54.7	< 0.010	4.20
39046	SRK	GAR-19-020	616	617	Waste Rock	UGTMF	SPGN	SPGN		2.73	0.020	0.040	< 0.010	0.20	0.58	0.070	24.0	24.5	0.016	0.37	0.23	1.09	1.71	6.51	19.8	0.010	3.20
39047	SRK	GAR-19-020	589	590	Waste Rock	UGTMF	SPGN	SPGN		2.84	0.020	0.040	< 0.010	0.24	0.71	0.060	27.1	23.6	0.016	0.39	0.25	1.11	1.76	7.52	20.3	< 0.010	2.00
39049	SRK	GAR-19-020	527	528	Waste Rock	UGTMF	SPGN	SPGN		0.93	0.030	0.13	< 0.010	0.11	3.62	< 0.010	5.36	49.4	0.14	2.62	2.11	5.45	10.3	1.36	5.23	0.010	2.90
39050	SRK	GAR-19-020	643.3	644.3	Waste Rock	UGTMF	SPGN	SPGN		0.91	0.020	0.040	< 0.010	0.060	0.50	0.020	8.03	26.0	0.040	0.65	0.55	1.70	2.93	2.16	38.1	< 0.010	2.90
39051	SRK	GAR-19-022	630.1	631.1	Waste Rock	UGTMF	SPGN	SPGN		2.30	0.030	0.040	< 0.010	0.18	1.24	0.080	17.8	20.4	0.020	0.49	0.31	1.26	2.08	4.83	4.13	< 0.010	3.20
39052	SRK	GAR-19-022	600	601	Waste Rock	UGTMF	SPGN	SPGN		2.22	0.010	0.050	< 0.010	0.13	1.20	0.020	20.4	13.2	0.012	0.30	0.19	0.79	1.29	5.75	10.1	< 0.010	3.10
39053	SRK	GAR-19-022	570.1	571.1	Waste Rock	UGTMF	SPGN	SPGN		1.10	0.020	0.040	< 0.010	0.080	0.72	0.040	9.90	19.0	0.019	0.37	0.28	1.02	1.68	2.61	14.5	< 0.010	3.60
39054	SRK	GAR-19-022	538.7	539.7	Waste Rock	UGTMF	SPGN/DIOR	SPGN		1.05	0.040	0.050	< 0.010	0.13	0.98	0.070	7.43	25.7	0.038	0.67	0.54	1.71	2.96	1.94	42.4	< 0.010	5.50
143101	NexGen	GAR-18-013	6	6.5	Waste Rock	Shaft Pilot Hole	OVB	OVB		0.25	< 0.0100	0.050	< 0.0100	0.02	0.10	< 0.0100	1.61	0.9	0.020	0.39	0.28	0.72	1.41	0.47	0.2	< 0.0100	< 0.1000
143102	NexGen	GAR-18-013	18.8	19.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.87	< 0.0100	0.34	0.07	0.12	0.18	0.08	5.75	3.06	0.079	1.41	1.17	2.84	5.5	1.6	3.79	0.02	1
143103	NexGen	GAR-18-013	54.8	55.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		2.5	0.01	0.57	0.08	0.33	0.37	0.06	15.4	16.1	0.101	1.74	1.48	3.61	6.92	4.01	9.04	0.04	2.6
143104	NexGen	GAR-18-013	59.3	59.8	Waste Rock	Shaft Pilot Hole	CRET	CRET		6.88	< 0.0100	0.17	0.06	0.71	0.25	0.02	34.5	29.1	0.211	3.38	2.92	7.44	13.9	8.52	14.7	< 0.0100	6.3
143105	NexGen	GAR-18-013	60.8	61.3	Waste Rock	Shaft Pilot Hole	CRET	CRET		5.6	< 0.0100	0.31	0.03	0.65	0.38	0.12	26.4	23.7	0.158	2.52	2.13	5.46	10.3	6.61	9.47	< 0.0100	7.1
143106	NexGen	GAR-18-013	66.8	67.3	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		1.04	< 0.0100	0.17	< 0.0100	0.09	0.02	< 0.0100	5.33	19.1	0.01	0.245	0.148	0.427	0.83	1.36	2.69	0.01	1.1
143107	NexGen	GAR-18-013	80.3	80.8	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		0.75	< 0.0100	0.16	< 0.0100	0.07	0.03	< 0.0100	4.14	1.77	0.02	0.42	0.285	0.774	1.5	1.08	3.07	0.01	2.9
143108	NexGen	GAR-18-013	92.9	93.4	Waste Rock	Shaft Pilot Hole	ASST	ASST		0.2	< 0.0100	0.22	< 0.0100	0.03	0.11	< 0.0100	1.51	0.27	0.004	0.177	0.072	0.222	0.475	0.43	0.15	< 0.0100	0.2
143109	NexGen	GAR-18-013	105	105.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		0.18	< 0.0100	0.11	< 0.0100	0.04	0.1	< 0.0100	1.4	0.29	0.003	0.11	0.047	0.146	0.306	0.4	0.09	< 0.0100	0.1
143110	NexGen	GAR-18-013	114.5	115	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.53	< 0.0100	0.44	0.05	0.05	0.2	0.04	4.65	3.71	0.01	0.276	0.143	0.609	1.04	1.4	1.78	0.02	0.6
143111	NexGen	GAR-18-013	164.5	165	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.73	< 0.0100	0.35	0.04	0.05	0.31	0.03	6.88	3.38	0.007	0.257	0.102	0.697	1.06	1.86	1.66	0.01	0.6
143112	NexGen	GAR-18-013	214.5	215	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.35	< 0.0100	0.17	0.04	0.03	0.09	0.01	4.08	6.71	0.006	0.169	0.102	0.402	0.68	1.32	2.97	< 0.0100	0.6
143113	NexGen	GAR-18-013	265	265.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.78	0.01	0.13	0.03	0.05	0.18	0.03	8.39	18.8	0.01	0.278	0.16	0.754	1.2	2.36	30.1	< 0.0100	3.8
143114	NexGen	GAR-18-013	313.5	314	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.71	0.02	0.12	0.02	0.04	0.21	0.02	7.5	10.1	0.021	0.463	0.326	1.28	2.09	2.03	22	< 0.0100	2.4
143115	NexGen	GAR-18-013	366	366.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		1.1	0.02	0.12	0.02	0.1	0.2	0.02	6.72	20.7	0.011	0.363	0.18	0.722	1.28	1.88	5.54	< 0.0100	1.8
143116	NexGen	GAR-18-013	414	414.5	Waste Rock	Shaft Pilot Hole	INT	INT		1.38	0.02	0.07	0.02	0.14	0.54	0.03	10.5	24.5	0.01	0.374	0.16	0.81	1.35	2.91	5.45	< 0.0100	2.6
143117	NexGen	GAR-18-013	466	466.5	Waste Rock	Shaft Pilot Hole	INT	INT		1.68	0.03	0.09	0.01	0.12	0.4	0.08	13.9	23.8	0.01	0.333	0.174	0.859	1.38	3.87	5.53	< 0.0100	3.3
143118	NexGen	GAR-18-013	516	516.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.76	0.03	0.04	0.01	0.08	2.72	0.06	6.21	68.3	0.071	1.86	1.14	2.99	6.06	1.69	21.5	< 0.0100	3.2
143119	NexGen	GAR-18-013	566	566.5	Waste Rock	Shaft Pilot Hole	VNQZ/INT	INT		1.11	< 0.0100	0.04	0.01	0.11	0.33	0.02	8.13	14.3	0.006	0.191	0.111	0.462	0.77	2.28	5.28	< 0.0100	0.8
143120	NexGen	GAR-18-013	616.15	616.65	Waste Rock	Shaft Pilot Hole	INT	INT		0.98	< 0.0100	0.1	< 0.0100	0.06	0.18	0.01	8.67	11.7	0.012	0.248	0.177	0.619	1.06	2.44	4.51	< 0.0100	1.2
143121	NexGen	GAR-18-013	648	648.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.41	0.01	0.09	< 0.0100	0.03	0.24	0.02	4.52	15	0.008	0.273	0.12	0.568	0.969	1.26	2.9	< 0.0100	1.6

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Partial -- Aqua Regia Digestion and ICP-MS finish														Total - 4-Acid Digestion and ICP-MS finish		
									Analyte	Se	Sm	Sn	Ta	Tb	Te	Th	U	V	W	Y	Yb	Zn	Zr	Ag	Be	Bi
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion
									Detection Limit	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01	0.1	0.01	0.02	0.1	0.1
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$
39030	SRK	GAR-19-019	464	465	Waste Rock	UGTMF	INT	INT		0.20	3.40	0.12	0.010	0.41	0.010	15.5	0.98	43.5	< 0.10	7.75	0.60	62.1	1.39	0.20	0.60	0.20
39031	SRK	GAR-19-019	482	483	Waste Rock	UGTMF	INT	INT		< 0.10	1.60	0.080	< 0.010	0.19	0.010	10.6	0.66	35.1	< 0.10	4.60	0.50	46.4	1.65	0.19	0.40	0.10
39032	SRK	GAR-19-019	498	499	Waste Rock	UGTMF	INT	INT		< 0.10	1.78	0.11	< 0.010	0.16	0.010	13.4	0.62	43.8	< 0.10	4.03	0.41	58.5	2.44	0.20	0.40	0.10
39033	SRK	GAR-19-019	544	545	Waste Rock	UGTMF	INT	INT		< 0.10	2.86	0.040	< 0.010	0.18	0.010	16.7	0.50	40.8	< 0.10	3.64	0.31	165	1.59	0.19	1.00	0.20
39034	SRK	GAR-19-019	529	530	Waste Rock	UGTMF	INT	INT		< 0.10	1.89	0.080	< 0.010	0.19	< 0.010	11.0	0.53	38.2	< 0.10	3.62	0.31	46.8	1.16	0.16	0.60	0.10
39035	SRK	GAR-19-019	512.45	513.45	Waste Rock	UGTMF	INT	INT		0.30	3.57	0.080	0.020	0.44	0.010	15.1	1.04	43.5	< 0.10	10.3	0.83	64.9	3.14	0.18	0.50	0.20
39036	SRK	GAR-19-019	364	365	Waste Rock	UGTMF	INT	INT		< 0.10	1.58	0.050	< 0.010	0.16	0.020	8.18	0.48	49.4	< 0.10	3.80	0.40	53.4	1.02	0.20	0.60	0.20
39037	SRK	GAR-19-019	559	560	Waste Rock	UGTMF	INT	INT		< 0.10	2.30	0.080	0.010	0.25	0.010	12.5	0.55	39.0	< 0.10	4.79	0.36	50.8	1.09	0.19	0.40	0.10
39038	SRK	GAR-19-019	578.5	579.5	Waste Rock	UGTMF	INT	INT		0.10	1.35	0.060	< 0.010	0.10	0.060	10.2	0.48	49.6	< 0.10	2.43	0.26	44.1	1.43	0.31	0.80	0.50
39039	SRK	GAR-19-019	598.2	599.2	Waste Rock	UGTMF	INT	INT		0.90	2.89	0.10	< 0.010	0.26	0.040	12.2	0.88	53.2	< 0.10	4.05	0.28	76.2	1.19	0.32	0.50	0.30
39040	SRK	GAR-19-019	613	614	Waste Rock	UGTMF	INT	INT		< 0.10	2.97	0.12	< 0.010	0.34	0.020	12.0	0.70	44.5	< 0.10	7.35	0.58	61.6	1.01	0.21	0.70	0.20
39041	SRK	GAR-19-019	628.7	629.7	Waste Rock	UGTMF	INT	INT		0.10	2.99	0.090	< 0.010	0.23	0.020	14.9	0.88	38.9	< 0.10	3.45	0.29	45.6	0.93	0.20	0.40	0.20
39042	SRK	GAR-19-018	546	547	Waste Rock	UGTMF	INT	INT		< 0.10	2.00	0.090	0.020	0.17	0.010	15.9	1.09	38.4	< 0.10	3.74	0.36	62.5	1.55	0.18	0.60	0.20
39043	SRK	GAR-19-018	631	632	Waste Rock	UGTMF	INT	INT		< 0.10	3.09	0.11	< 0.010	0.28	0.020	15.8	0.76	35.4	< 0.10	4.77	0.38	43.0	1.09	0.18	0.40	0.10
39044	SRK	GAR-19-018	601	602	Waste Rock	UGTMF	INT	INT		< 0.10	1.98	0.080	< 0.010	0.19	0.010	17.5	1.00	40.4	< 0.10	4.36	0.38	69.3	1.11	0.21	0.70	0.20
39045	SRK	GAR-19-018	573	574	Waste Rock	UGTMF	INT	INT		0.90	3.77	0.090	0.010	0.42	0.050	13.6	0.70	59.6	< 0.10	8.65	0.70	64.0	0.97	0.34	0.70	0.20
39009	SRK	GAR-19-020	496	497	Waste Rock	UGTMF	SPGN	SPGN		3.40	0.72	0.030	0.010	0.060	0.25	13.0	0.58	61.0	< 0.10	1.48	0.18	19.5	5.70	0.44	1.00	1.60
39010	SRK	GAR-19-020	481.3	482.3	Waste Rock	UGTMF	SPGN	SPGN		0.60	0.72	0.050	< 0.010	0.080	0.090	12.1	0.54	38.6	< 0.10	1.75	0.20	21.2	2.56	0.26	1.10	1.00
39011	SRK	GAR-19-020	465	466	Waste Rock	UGTMF	SPGN	SPGN		< 0.10	0.84	0.060	< 0.010	0.11	0.050	12.6	0.57	41.0	< 0.10	2.36	0.23	40.7	1.42	0.22	1.20	0.50
39012	SRK	GAR-19-020	451	452	Waste Rock	UGTMF	SPGN	SPGN		< 0.10	1.35	0.10	< 0.010	0.11	0.020	13.6	0.70	43.9	< 0.10	2.14	0.20	55.9	1.17	0.19	0.60	0.30
39013	SRK	GAR-19-020	436.9	437.9	Waste Rock	UGTMF	SPGN	SPGN		0.90	1.15	0.040	< 0.010	0.11	0.10	14.8	0.57	48.1	< 0.10	2.26	0.28	20.8	4.68	0.30	1.50	2.50
39014	SRK	GAR-19-020	422	423	Waste Rock	UGTMF	SPGN	SPGN		0.20	3.06	0.040	< 0.010	0.23	0.030	20.1	1.48	48.5	< 0.10	4.27	0.34	27.8	3.03	0.21	1.30	0.50
39015	SRK	GAR-19-020	406	407	Waste Rock	UGTMF	SPGN	SPGN		< 0.10	1.52	0.080	< 0.010	0.14	0.020	16.7	0.84	37.3	< 0.10	3.23	0.26	43.9	0.84	0.17	0.60	0.20
39016	SRK	GAR-19-020	391	392	Waste Rock	UGTMF	SPGN	SPGN		< 0.10	2.60	0.040	< 0.010	0.22	0.030	17.9	1.19	42.5	< 0.10	3.75	0.29	31.9	2.76	0.18	1.10	0.90
39017	SRK	GAR-19-022	498	499	Waste Rock	UGTMF	SPGN	SPGN		< 0.10	1.65	0.080	< 0.010	0.18	0.020	11.4	0.52	43.0	< 0.10	3.25	0.25	45.7	0.74	0.18	0.40	0.10
39018	SRK	GAR-19-022	480.7	481.7	Waste Rock	UGTMF	SPGN	SPGN		0.20	2.68	0.10	0.020	0.29	0.020	10.5	0.53	47.6	< 0.10	5.18	0.38	53.8	1.08	0.21	0.50	0.20
39019	SRK	GAR-19-022	467.7	468.7	Waste Rock	UGTMF	SPGN	SPGN		< 0.10	1.40	0.040	< 0.010	0.14	0.020	8.17	0.48	32.0	< 0.10	3.36	0.36	61.0	1.20	0.28	0.50	0.10
39020	SRK	GAR-19-022	455	456	Waste Rock	UGTMF	SPGN	SPGN		0.40	4.24	0.040	< 0.010	0.24	< 0.010	21.9	0.84	29.6	< 0.10	3.51	0.35	23.7	2.38	0.13	0.70	0.20
39021	SRK	GAR-19-022	433.8	434.8	Waste Rock	UGTMF	SPGN	SPGN		< 0.10	1.91	0.070	< 0.010	0.16	< 0.010	10.7	0.74	34.2	< 0.10	2.54	0.23	41.6	0.96	0.14	0.50	0.10
39022	SRK	GAR-19-022	423	424	Waste Rock	UGTMF	SPGN	SPGN		< 0.10	1.54	0.060	< 0.010	0.10	< 0.010	8.16	0.51	32.2	< 0.10	1.87	0.17	46.3	1.67	0.20	0.50	0.10
39023	SRK	GAR-19-022	410.4	411.4	Waste Rock	UGTMF	SPGN	SPGN		< 0.10	1.62	0.060	< 0.010	0.19	0.020	6.30	0.29	37.7	< 0.10	3.35	0.30	53.5	0.96	0.16	0.40	0.10
39024	SRK	GAR-19-022	393.5	394.5	Waste Rock	UGTMF	SPGN	SPGN		0.20	2.09	0.060	< 0.010	0.25	0.030	10.8	0.53	35.5	< 0.10	4.44	0.32	49.0	1.05	0.26	0.40	0.20
39046	SRK	GAR-19-020	616	617	Waste Rock	UGTMF	SPGN	SPGN		0.30	3.79	0.030	0.010	0.27	0.020	20.3	1.22	19.4	< 0.10	3.78	0.30	34.2	1.05	0.22	0.30	0.30
39047	SRK	GAR-19-020	589	590	Waste Rock	UGTMF	SPGN	SPGN		0.30	3.93	0.030	0.010	0.28	0.020	19.3	1.16	17.2	< 0.10	5.10	0.41	33.0	1.16	0.19	0.10	0.20
39049	SRK	GAR-19-020	527	528	Waste Rock	UGTMF	SPGN	SPGN		0.50	1.06	0.030	< 0.010	0.12	0.080	12.4	0.62	44.5	< 0.10	2.48	0.20	15.2	3.63	0.23	1.50	1.20
39050	SRK	GAR-19-020	643.3	644.3	Waste Rock	UGTMF	SPGN	SPGN		< 0.10	1.31	0.070	< 0.010	0.080	0.040	4.61	0.31	20.0	< 0.10	1.32	0.16	27.3	1.16	0.20	< 0.10	0.10
39051	SRK	GAR-19-022	630.1	631.1	Waste Rock	UGTMF	SPGN	SPGN		0.70	3.08	< 0.010	0.020	0.24	0.030	12.8	0.69	23.8	< 0.10	3.40	0.37	40.4	1.32	0.28	< 0.10	0.30
39052	SRK	GAR-19-022	600	601	Waste Rock	UGTMF	SPGN	SPGN		< 0.10	3.08	0.020	< 0.010	0.19	0.020	12.6	0.56	19.9	< 0.10	2.57	0.25	21.8	1.48	0.16	0.20	0.20
39053	SRK	GAR-19-022	570.1	571.1	Waste Rock	UGTMF	SPGN	SPGN		< 0.10	1.75	0.030	< 0.010	0.090	0.010	7.08	0.27	27.1	< 0.10	1.40	0.21	21.8	1.18	0.17	0.30	0.20
39054	SRK	GAR-19-022	538.7	539.7	Waste Rock	UGTMF	SPGN/DIOR	SPGN		< 0.10	1.32	0.070	< 0.010	0.13	0.010	16.8	0.85	43.5	< 0.10	2.68	0.24	43.0	1.16	0.17	0.50	0.20
143101	NexGen	GAR-18-013	6	6.5	Waste Rock	Shaft Pilot Hole	OVB	OVB		< 0.1000	0.27	0.060	< 0.010	0.02	< 0.0100	0.7	1.06	2.5	< 0.40	0.63	0.05	1.1	2.59	0.16	0.10	< 0.1000
143102	NexGen	GAR-18-013	18.8	19.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		< 0.1000	1.14	0.24	0.01	0.11	< 0.0100	3.55	1.3	5.9	0.5	2.82	0.26	9.2	12.3	0.33	0.8	0.1
143103	NexGen	GAR-18-013	54.8	55.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		< 0.1000	3.24	0.3	< 0.010	0.35	0.01	5.12	1.01	17.8	0.3	7.68	0.66	41.5	21.3	0.25	1.2	0.2
143104	NexGen	GAR-18-013	59.3	59.8	Waste Rock	Shaft Pilot Hole	CRET	CRET		1.1	6.81	0.38	< 0.010	0.79	0.02	10.2	1.57	7.1	< 0.1000	18.7	1.2	47.4	8.3	0.29	2.6	0.4
143105	NexGen	GAR-18-013	60.8	61.3	Waste Rock	Shaft Pilot Hole	CRET	CRET		0.8	5.4	0.3	< 0.010	0.66	< 0.0100	7.13	1.14	29.6	< 0.1000	16.9	1.3	60.1	13.2	0.24	1.8	0.2
143106	NexGen	GAR-18-013	66.8	67.3	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		0.2	1.11	0.13	< 0.010	0.12	< 0.0100	2.93	0.42	1.1	< 0.1000	2.34	0.14	46.6	7.17	0.23	0.7	0.1
143107	NexGen	GAR-18-013	80.3	80.8	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		0.2	0.84	0.18	< 0.010	0.08	< 0.0100	3.94	0.54	1.9	< 0.1000	1.76	0.11	2.2	7.4	0.15	0.9	< 0.1000
143108	NexGen	GAR-18-013	92.9	93.4	Waste Rock	Shaft Pilot Hole	ASST	ASST		< 0.1000	0.2	0.1	< 0.010	0.02	0.01	1.51	0.32	0.3	< 0.1000	1.02	0.07	0.6	11.2	0.08	0.2	0.1
143109	NexGen	GAR-18-013	105	105.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		< 0.1000	0.19	0.02	< 0.010	0.03	0.02	0.76	0.25	0.2	< 0.1000	1.16	0.08	0.5	5.23	0.1	0.1	0.1
143110	NexGen	GAR-18-013	114.5	115	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.1000	0.77	0.09	< 0.010	0.05	0.01	6.18	0.74	25.6	0.2	1.16	0.13	1.5	15.3	0.29	0.8	< 0.1000
143111	NexGen	GAR-18-013	164.5	165	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.1000	1.09	0.05	< 0.010	0.06	< 0.0100	10.8	1.2	13.2	< 0.1000	1.03	0.13	1.7	11.1	0.27	0.6	0.1
143112	NexGen	GAR-18-013	214.5	215	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.1000	0.47	0.02	< 0.010	0.03	< 0.0100	8.72	0.27	5.8	< 0.1000	0.58	0.08	1.4	4.53	0.23	0.3	0.1
143113	NexGen	GAR-18-013	265	265.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.1000	1.39	0.06	< 0.010	0.06	0.02	10.5	0.74	23	< 0.1000	1	0.12	18.2	4.14	0.22	0.5	< 0.1000
143114	NexGen	GAR-18-013	313.5	314	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.1000	1.28	0.04	< 0.010	0.05	< 0.0100	10.9	0.83	13	< 0.1000	0.81	0.09	19.4	3.32	0.15	0.7	< 0.1000
143115	NexGen	GAR-18-013	366	366.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.1000	1.46	0.04	< 0.010	0.14	0.04	7.25	0.44	34.1	< 0.1000	2.3	0.18	13.7	3.08	0.22	0.4	0.2
143116	NexGen	GAR-18-013	414	414.5	Waste Rock	Shaft Pilot Hole	INT	INT		< 0.1000	1.8	0.03	< 0.010	0.16	0.03	14.7	1.36	30.8	< 0.1000	3.39	0.32	27.2	2	0.19	0.4	0.4
143117	NexGen	GAR-18-013	466	466.5	Waste Rock	Shaft Pilot Hole	INT	INT		< 0.1000	2.51	0.14	< 0.010	0.17	< 0.0100	18.2	1.1	40.7	< 0.1000	2.76	0.25	24.1	2.42	0.27	0.6	0.2
143118	NexGen	GAR-18-013	516	516.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.3	1.09	0.08	< 0.010	0.09	0.07	14.8	0.8	39.1	< 0.1000	1.57	0.16	22.7	1.34	0.28	0.8	0.4
143119	NexGen	GAR-18-013	566	566.5	Waste Rock	Shaft Pilot Hole	VNQZ/INT	INT		< 0.1000	1.62	0.02	< 0.010	0.13	< 0.0100	10.4	0.3	12.9	< 0.1000	2.46	0.25	9.8	1.13	0.11	0.4	0.1
143120	NexGen	GAR-18-013	616.15	616.65	Waste Rock	Shaft Pilot Hole	INT	INT		< 0.1000	1.53	0.01	< 0.010	0.09	< 0.0100	8	0.19	16.7	< 0.1000	1.26	0.1	11.4	1.83	0.18	0.5	< 0.1000
143121	NexGen	GAR-18-013	648	648.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.1000	0.62	0.02	< 0.010	0.04	0.02	6.94	1.16	13	< 0.1000	0.8	0.08	8.9	2.44	0.16	0.4	< 0.1000

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4-Acid Digestion and ICP-MS finish												
									Analyte	Cd	Co	Cs	Cu	Dy	Er	Eu	Ga	Gd	Hf	Ho	Mo	Nb
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion
									Detection Limit	0.1	0.02	0.1	0.1	0.02	0.02	0.02	0.1	0.1	0.1	0.02	0.01	0.1
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$
39030	SRK	GAR-19-019	464	465	Waste Rock	UGTMF	INT	INT		0.30	18.2	1.50	35.0	5.09	2.71	1.74	23.1	6.10	6.80	0.90	0.73	15.8
39031	SRK	GAR-19-019	482	483	Waste Rock	UGTMF	INT	INT		0.30	16.4	0.60	36.3	5.15	3.05	1.40	18.3	5.00	6.50	0.94	0.93	12.9
39032	SRK	GAR-19-019	498	499	Waste Rock	UGTMF	INT	INT		0.40	20.9	0.70	23.7	5.45	3.34	1.70	21.3	5.50	7.00	1.05	0.68	12.8
39033	SRK	GAR-19-019	544	545	Waste Rock	UGTMF	INT	INT		0.80	12.3	1.40	32.9	3.70	2.41	1.09	19.4	4.20	6.00	0.71	1.37	11.2
39034	SRK	GAR-19-019	529	530	Waste Rock	UGTMF	INT	INT		0.30	13.5	0.50	21.2	4.33	2.42	1.21	15.4	4.60	5.20	0.76	0.81	10.6
39035	SRK	GAR-19-019	512.45	513.45	Waste Rock	UGTMF	INT	INT		0.30	15.5	1.50	27.2	4.89	2.84	1.38	17.9	5.00	7.30	0.89	1.93	14.2
39036	SRK	GAR-19-019	364	365	Waste Rock	UGTMF	INT	INT		0.30	16.9	1.00	30.8	4.46	2.20	1.64	19.4	5.30	6.50	0.76	1.27	12.0
39037	SRK	GAR-19-019	559	560	Waste Rock	UGTMF	INT	INT		0.30	17.2	0.70	20.9	4.90	2.62	1.61	20.6	5.70	5.80	0.84	0.83	12.0
39038	SRK	GAR-19-019	578.5	579.5	Waste Rock	UGTMF	INT	INT		0.30	30.5	0.70	72.3	4.64	2.86	1.44	22.8	5.20	5.20	0.89	9.73	12.9
39039	SRK	GAR-19-019	598.2	599.2	Waste Rock	UGTMF	INT	INT		0.30	24.5	0.70	76.5	3.68	1.76	1.47	19.4	5.30	6.10	0.57	11.6	13.1
39040	SRK	GAR-19-019	613	614	Waste Rock	UGTMF	INT	INT		0.20	16.6	1.50	26.9	4.53	2.44	1.52	20.5	4.80	5.30	0.80	0.88	15.4
39041	SRK	GAR-19-019	628.7	629.7	Waste Rock	UGTMF	INT	INT		0.20	22.1	1.50	30.2	3.76	2.13	1.34	19.2	4.80	6.80	0.66	1.52	16.1
39042	SRK	GAR-19-018	546	547	Waste Rock	UGTMF	INT	INT		0.30	15.1	1.20	23.8	4.46	2.48	1.49	18.4	5.90	7.80	0.76	0.85	14.0
39043	SRK	GAR-19-018	631	632	Waste Rock	UGTMF	INT	INT		0.20	14.6	2.80	41.2	3.48	1.87	1.36	18.7	4.60	7.90	0.59	1.41	14.9
39044	SRK	GAR-19-018	601	602	Waste Rock	UGTMF	INT	INT		0.20	14.1	1.30	23.6	4.10	2.40	1.54	20.7	5.10	7.20	0.74	1.72	14.9
39045	SRK	GAR-19-018	573	574	Waste Rock	UGTMF	INT	INT		0.20	21.6	2.40	110	3.67	2.00	1.49	21.5	4.50	5.70	0.65	5.92	14.7
39009	SRK	GAR-19-020	496	497	Waste Rock	UGTMF	SPGN	SPGN		0.20	75.2	0.70	255	3.16	1.59	1.10	17.0	4.20	4.80	0.51	9.84	13.6
39010	SRK	GAR-19-020	481.3	482.3	Waste Rock	UGTMF	SPGN	SPGN		0.20	21.6	0.60	167	3.30	1.90	1.19	18.8	3.60	4.70	0.58	6.30	14.7
39011	SRK	GAR-19-020	465	466	Waste Rock	UGTMF	SPGN	SPGN		0.30	16.5	0.60	108	3.98	2.23	1.42	16.9	4.80	5.30	0.73	2.61	10.9
39012	SRK	GAR-19-020	451	452	Waste Rock	UGTMF	SPGN	SPGN		0.20	17.9	0.70	45.2	4.57	2.52	1.44	19.2	5.60	6.20	0.82	2.45	14.5
39013	SRK	GAR-19-020	436.9	437.9	Waste Rock	UGTMF	SPGN	SPGN		0.20	35.6	0.70	104	3.58	1.99	0.98	17.8	3.90	6.00	0.64	7.16	15.2
39014	SRK	GAR-19-020	422	423	Waste Rock	UGTMF	SPGN	SPGN		0.20	17.8	0.60	42.4	5.32	3.07	1.55	20.9	6.00	5.90	0.97	3.08	17.8
39015	SRK	GAR-19-020	406	407	Waste Rock	UGTMF	SPGN	SPGN		0.20	17.1	0.80	28.0	5.32	2.47	1.57	20.7	6.10	5.80	0.88	1.34	14.2
39016	SRK	GAR-19-020	391	392	Waste Rock	UGTMF	SPGN	SPGN		0.20	17.5	0.50	45.2	5.75	3.22	1.14	21.9	4.80	5.50	1.05	3.00	13.8
39017	SRK	GAR-19-022	498	499	Waste Rock	UGTMF	SPGN	SPGN		0.20	16.0	1.60	24.9	4.26	2.18	1.39	19.4	5.00	6.10	0.68	2.69	13.3
39018	SRK	GAR-19-022	480.7	481.7	Waste Rock	UGTMF	SPGN	SPGN		0.20	17.7	0.60	36.0	3.66	1.74	1.43	19.2	4.60	7.10	0.63	1.00	13.8
39019	SRK	GAR-19-022	467.7	468.7	Waste Rock	UGTMF	SPGN	SPGN		0.40	16.5	0.40	28.0	5.00	3.02	1.44	19.1	5.20	5.50	0.95	1.11	8.20
39020	SRK	GAR-19-022	455	456	Waste Rock	UGTMF	SPGN	SPGN		0.20	9.32	0.70	50.7	4.67	2.67	1.63	17.0	6.10	8.10	0.82	2.47	9.70
39021	SRK	GAR-19-022	433.8	434.8	Waste Rock	UGTMF	SPGN	SPGN		0.20	12.2	0.60	7.10	3.65	1.96	1.39	17.0	4.80	7.90	0.66	0.43	10.9
39022	SRK	GAR-19-022	423	424	Waste Rock	UGTMF	SPGN	SPGN		0.40	17.0	0.60	24.0	5.87	3.33	1.55	21.2	6.70	6.60	1.02	1.17	15.0
39023	SRK	GAR-19-022	410.4	411.4	Waste Rock	UGTMF	SPGN	SPGN		0.20	18.4	0.50	12.8	3.76	2.06	1.32	19.9	3.90	4.50	0.66	1.95	12.7
39024	SRK	GAR-19-022	393.5	394.5	Waste Rock	UGTMF	SPGN	SPGN		0.20	20.7	1.00	53.3	3.99	1.94	1.32	25.5	4.30	6.70	0.66	0.81	19.3
39046	SRK	GAR-19-020	616	617	Waste Rock	UGTMF	SPGN	SPGN		0.20	24.3	0.80	7.70	6.26	3.36	2.05	31.2	7.00	7.20	1.13	0.95	21.3
39047	SRK	GAR-19-020	589	590	Waste Rock	UGTMF	SPGN	SPGN		0.30	32.7	0.70	9.40	6.60	3.62	2.09	32.2	6.80	7.50	1.18	0.97	18.8
39049	SRK	GAR-19-020	527	528	Waste Rock	UGTMF	SPGN	SPGN		0.20	25.7	0.70	50.2	4.67	2.77	1.04	18.5	4.50	6.60	0.88	9.04	11.2
39050	SRK	GAR-19-020	643.3	644.3	Waste Rock	UGTMF	SPGN	SPGN		0.30	21.7	0.90	4.90	6.87	4.27	1.76	19.4	6.40	9.00	1.31	0.88	18.1
39051	SRK	GAR-19-022	630.1	631.1	Waste Rock	UGTMF	SPGN	SPGN		0.20	23.6	0.50	30.7	5.91	2.92	2.54	28.9	8.20	8.00	0.94	1.80	27.1
39052	SRK	GAR-19-022	600	601	Waste Rock	UGTMF	SPGN	SPGN		0.20	17.9	0.50	5.70	5.03	3.01	1.73	22.4	5.30	6.60	0.92	1.33	15.4
39053	SRK	GAR-19-022	570.1	571.1	Waste Rock	UGTMF	SPGN	SPGN		0.20	15.4	0.50	8.10	3.56	2.05	1.40	20.2	4.80	7.80	0.64	0.83	16.5
39054	SRK	GAR-19-022	538.7	539.7	Waste Rock	UGTMF	SPGN/DIOR	SPGN		0.20	17.5	1.40	38.7	4.40	2.58	1.56	19.2	5.30	6.80	0.74	1.69	15.4
143101	NexGen	GAR-18-013	6	6.5	Waste Rock	Shaft Pilot Hole	OVB	OVB		< 0.1000	0.2	< 0.1000	2.2	0.84	0.42	0.28	1.0	1.50	1.00	0.14	0.19	0.7
143102	NexGen	GAR-18-013	18.8	19.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.2	3.25	2.2	10.5	2.1	1.33	0.55	8.6	2	4.8	0.42	0.43	12.8
143103	NexGen	GAR-18-013	54.8	55.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.2	11.8	2.9	13.4	3.38	1.83	1.13	13.3	4	5.4	0.61	0.96	12.9
143104	NexGen	GAR-18-013	59.3	59.8	Waste Rock	Shaft Pilot Hole	CRET	CRET		0.2	23.2	10	26.6	6.66	3.69	1.86	25.4	8.6	4	1.17	2.22	19.3
143105	NexGen	GAR-18-013	60.8	61.3	Waste Rock	Shaft Pilot Hole	CRET	CRET		0.2	13.5	4.9	18.6	5.16	2.94	1.56	17.3	7	3.2	0.92	1.61	12.8
143106	NexGen	GAR-18-013	66.8	67.3	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		< 0.1000	24	1.9	11.6	2.41	1.25	0.68	9.3	3.3	2.2	0.4	0.35	10.9
143107	NexGen	GAR-18-013	80.3	80.8	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		< 0.1000	1.29	2.1	9.6	2.76	1.36	0.95	9.5	4.1	2.2	0.45	0.43	7
143108	NexGen	GAR-18-013	92.9	93.4	Waste Rock	Shaft Pilot Hole	ASST	ASST		0.1	0.26	< 0.1000	2	1.42	0.82	0.2	1.8	1.2	5.4	0.26	0.2	2.6
143109	NexGen	GAR-18-013	105	105.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		< 0.1000	0.15	< 0.1000	1.5	2.08	1.14	0.18	1.6	1.3	2.4	0.37	0.16	1.1
143110	NexGen	GAR-18-013	114.5	115	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.2	4.22	0.4	3.5	3.72	2.18	0.81	21.7	3.5	6.5	0.71	0.5	18
143111	NexGen	GAR-18-013	164.5	165	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.2	9.13	0.3	3.7	3.02	1.89	1.18	23.8	4.2	7.4	0.55	0.66	18.2
143112	NexGen	GAR-18-013	214.5	215	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.2	3.95	0.3	2.5	2.29	1.37	0.97	19.2	3.2	7.5	0.42	0.34	16.6
143113	NexGen	GAR-18-013	265	265.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.2	13.6	0.5	3.2	4.54	2.39	1.52	17.5	5	8.6	0.77	0.54	14.5
143114	NexGen	GAR-18-013	313.5	314	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.2	9.72	0.6	2.6	3.09	1.88	0.75	16.4	3.5	4.6	0.59	0.34	10.3
143115	NexGen	GAR-18-013	366	366.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.2	11.8	0.4	8.8	3.36	1.94	1.17	16.9	4.4	7	0.62	0.5	14.3
143116	NexGen	GAR-18-013	414	414.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.2	19.5	0.5	4.8	4.38	2.96	1.56	21.6	5	5.3	0.8	0.83	12.8
143117	NexGen	GAR-18-013	466	466.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.2	24.7	0.5	4.5	3.39	2.05	1.22	27.4	4.1	5.6	0.64	0.6	18.4
143118	NexGen	GAR-18-013	516	516.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.3	26.6	0.8	69.8	2.76	1.72	1.09	15.2	4.3	4.9	0.48	2.84	12.7
143119	NexGen	GAR-18-013	566	566.5	Waste Rock	Shaft Pilot Hole	VNQZ/INT	INT		0.1	6.85	0.5	2	2.9	1.54	0.69	15.8	3.2	2.2	0.52	0.34	8.2
143120	NexGen	GAR-18-013	616.15	616.65	Waste Rock	Shaft Pilot Hole	INT	INT		0.2	6.02	0.7	2.7	2.52	1.44	0.82	9.8	3.3	9	0.45	0.32	11.9
143121	NexGen	GAR-18-013	648	648.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.2	7.87	0.2	13.7	2.29	1.31	0.68	12.2	2.4	7.7	0.41	0.65	9.9

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4-Acid Digestion and ICP-MS finish											
									Analyte	Nd	Ni	Pb204	Pb206	Pb207	Pb208	PbSUM	Pr	Rb	Sc	Sm	Sn
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion
									Detection Limit	0.1	0.1	0.001	0.001	0.001	0.001	0.001	0.1	0.1	0.1	0.1	0.02
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$
39030	SRK	GAR-19-019	464	465	Waste Rock	UGTMF	INT	INT		51.4	46.1	0.29	4.82	4.15	11.1	20.3	14.1	159	18.0	8.60	0.66
39031	SRK	GAR-19-019	482	483	Waste Rock	UGTMF	INT	INT		40.4	51.5	0.35	5.50	4.84	12.4	23.0	10.4	119	17.8	6.60	0.58
39032	SRK	GAR-19-019	498	499	Waste Rock	UGTMF	INT	INT		42.3	60.3	0.47	7.33	6.57	16.4	30.7	11.9	149	20.1	7.30	0.61
39033	SRK	GAR-19-019	544	545	Waste Rock	UGTMF	INT	INT		40.1	37.4	1.55	26.6	21.6	55.1	105	10.7	182	18.6	6.30	0.34
39034	SRK	GAR-19-019	529	530	Waste Rock	UGTMF	INT	INT		37.7	31.3	0.39	6.15	5.44	13.9	25.9	10.2	102	16.7	6.30	0.42
39035	SRK	GAR-19-019	512.45	513.45	Waste Rock	UGTMF	INT	INT		37.5	37.1	0.32	5.49	4.56	12.0	22.3	10.4	111	16.0	6.40	0.46
39036	SRK	GAR-19-019	364	365	Waste Rock	UGTMF	INT	INT		45.1	60.4	0.54	8.31	7.65	19.2	35.7	12.4	115	17.6	7.50	0.26
39037	SRK	GAR-19-019	559	560	Waste Rock	UGTMF	INT	INT		49.2	56.6	0.42	6.64	5.87	15.2	28.2	13.7	117	17.2	8.30	0.43
39038	SRK	GAR-19-019	578.5	579.5	Waste Rock	UGTMF	INT	INT		47.9	68.0	0.25	4.28	3.55	9.88	17.9	13.2	135	19.3	7.50	0.53
39039	SRK	GAR-19-019	598.2	599.2	Waste Rock	UGTMF	INT	INT		49.5	74.6	0.36	5.85	5.10	13.3	24.6	13.6	130	17.3	8.00	0.53
39040	SRK	GAR-19-019	613	614	Waste Rock	UGTMF	INT	INT		41.4	43.5	0.23	3.94	3.56	9.19	16.9	11.3	136	20.1	6.70	0.56
39041	SRK	GAR-19-019	628.7	629.7	Waste Rock	UGTMF	INT	INT		41.6	38.4	0.20	3.40	2.81	8.04	14.4	11.6	137	18.4	7.00	0.45
39042	SRK	GAR-19-018	546	547	Waste Rock	UGTMF	INT	INT		55.0	45.5	0.25	4.39	3.65	10.1	18.4	15.4	109	15.0	8.80	0.49
39043	SRK	GAR-19-018	631	632	Waste Rock	UGTMF	INT	INT		42.7	45.6	0.17	3.10	2.52	7.32	13.1	11.6	138	17.5	7.10	0.61
39044	SRK	GAR-19-018	601	602	Waste Rock	UGTMF	INT	INT		45.7	39.9	0.26	4.30	3.61	9.66	17.8	12.6	118	19.4	7.80	0.50
39045	SRK	GAR-19-018	573	574	Waste Rock	UGTMF	INT	INT		37.8	70.2	0.22	3.82	3.22	8.73	16.0	10.4	133	16.8	6.20	0.60
39009	SRK	GAR-19-020	496	497	Waste Rock	UGTMF	SPGN	SPGN		35.7	186	0.31	5.23	4.36	11.0	20.9	9.80	101	15.6	5.90	0.37
39010	SRK	GAR-19-020	481.3	482.3	Waste Rock	UGTMF	SPGN	SPGN		35.2	62.0	0.21	3.86	2.98	7.67	14.7	8.00	101	15.7	4.90	0.54
39011	SRK	GAR-19-020	465	466	Waste Rock	UGTMF	SPGN	SPGN		41.2	41.1	0.28	4.56	3.80	10.2	18.8	11.2	120	14.0	6.80	0.46
39012	SRK	GAR-19-020	451	452	Waste Rock	UGTMF	SPGN	SPGN		44.3	46.9	0.19	3.49	2.86	8.04	14.6	12.2	124	18.7	7.30	0.55
39013	SRK	GAR-19-020	436.9	437.9	Waste Rock	UGTMF	SPGN	SPGN		26.3	82.8	0.23	4.19	3.28	8.42	16.1	7.20	74.9	11.4	4.70	0.47
39014	SRK	GAR-19-020	422	423	Waste Rock	UGTMF	SPGN	SPGN		44.1	54.3	0.085	1.76	1.22	3.43	6.50	11.8	75.5	20.2	7.80	0.60
39015	SRK	GAR-19-020	406	407	Waste Rock	UGTMF	SPGN	SPGN		61.9	32.8	0.19	3.08	2.74	7.38	13.4	17.4	140	17.3	9.00	0.52
39016	SRK	GAR-19-020	391	392	Waste Rock	UGTMF	SPGN	SPGN		28.5	45.1	0.16	3.14	2.36	6.34	12.0	7.80	104	19.0	5.10	0.66
39017	SRK	GAR-19-022	498	499	Waste Rock	UGTMF	SPGN	SPGN		40.6	44.0	0.28	4.37	3.98	10.1	18.7	11.2	127	18.2	6.80	0.42
39018	SRK	GAR-19-022	480.7	481.7	Waste Rock	UGTMF	SPGN	SPGN		39.9	52.6	0.24	3.89	3.45	9.07	16.6	11.0	122	18.0	6.60	0.45
39019	SRK	GAR-19-022	467.7	468.7	Waste Rock	UGTMF	SPGN	SPGN		43.0	40.8	0.50	7.78	7.21	18.1	33.6	12.1	108	15.1	7.00	0.34
39020	SRK	GAR-19-022	455	456	Waste Rock	UGTMF	SPGN	SPGN		59.0	29.8	0.092	1.82	1.39	4.04	7.34	15.8	97.5	14.5	9.40	0.35
39021	SRK	GAR-19-022	433.8	434.8	Waste Rock	UGTMF	SPGN	SPGN		44.2	24.4	0.19	3.28	2.69	7.60	13.8	12.3	105	14.1	7.40	0.40
39022	SRK	GAR-19-022	423	424	Waste Rock	UGTMF	SPGN	SPGN		59.8	36.5	0.29	5.05	4.16	12.2	21.7	16.0	139	18.3	9.70	0.46
39023	SRK	GAR-19-022	410.4	411.4	Waste Rock	UGTMF	SPGN	SPGN		29.7	51.5	0.23	3.64	3.24	8.13	15.2	8.10	129	18.0	5.10	0.35
39024	SRK	GAR-19-022	393.5	394.5	Waste Rock	UGTMF	SPGN	SPGN		33.6	58.3	0.25	3.87	3.47	8.66	16.2	9.20	161	18.3	5.80	0.56
39046	SRK	GAR-19-020	616	617	Waste Rock	UGTMF	SPGN	SPGN		57.2	53.7	0.17	3.05	2.47	6.83	12.5	15.7	168	30.0	10.3	0.94
39047	SRK	GAR-19-020	589	590	Waste Rock	UGTMF	SPGN	SPGN		50.1	47.9	0.15	2.67	2.23	6.04	11.1	13.5	155	26.0	9.00	0.68
39049	SRK	GAR-19-020	527	528	Waste Rock	UGTMF	SPGN	SPGN		36.9	72.2	0.16	3.43	2.42	6.78	12.8	10.2	99.9	14.2	5.90	0.54
39050	SRK	GAR-19-020	643.3	644.3	Waste Rock	UGTMF	SPGN	SPGN		43.5	47.6	0.33	5.20	4.69	12.4	22.6	11.2	171	26.6	8.30	0.69
39051	SRK	GAR-19-022	630.1	631.1	Waste Rock	UGTMF	SPGN	SPGN		65.6	47.1	0.16	2.77	2.26	6.25	11.4	17.8	136	28.1	11.4	0.61
39052	SRK	GAR-19-022	600	601	Waste Rock	UGTMF	SPGN	SPGN		45.9	24.9	0.11	1.92	1.54	4.45	8.03	12.6	123	21.4	7.60	0.50
39053	SRK	GAR-19-022	570.1	571.1	Waste Rock	UGTMF	SPGN	SPGN		47.6	32.4	0.14	2.62	2.14	6.78	11.7	13.1	95.8	18.9	7.50	0.57
39054	SRK	GAR-19-022	538.7	539.7	Waste Rock	UGTMF	SPGN/DIOR	SPGN		44.8	41.3	0.18	2.96	2.49	6.71	12.3	12.2	104	19.1	7.50	0.37
143101	NexGen	GAR-18-013	6	6.5	Waste Rock	Shaft Pilot Hole	OVB	OVB		11.0	1.6	0.06	1.16	0.91	2.16	4.3	3.1	1	0.3	1.90	0.13
143102	NexGen	GAR-18-013	18.8	19.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		14.6	7.7	0.139	2.36	1.93	4.81	9.24	4.1	41.7	4.7	2.6	1.12
143103	NexGen	GAR-18-013	54.8	55.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		28.6	24.6	0.174	2.97	2.44	6.22	11.8	7.6	66.8	8.7	5.3	1.29
143104	NexGen	GAR-18-013	59.3	59.8	Waste Rock	Shaft Pilot Hole	CRET	CRET		51.7	44.3	0.364	6.46	5.32	12.6	24.7	13.3	152	17.6	9.6	3.08
143105	NexGen	GAR-18-013	60.8	61.3	Waste Rock	Shaft Pilot Hole	CRET	CRET		40.2	32.1	0.262	4.51	3.72	9.04	17.5	10.4	88.4	12.9	7.6	1.72
143106	NexGen	GAR-18-013	66.8	67.3	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		23.7	29.3	0.07	1.39	0.979	2.55	4.99	6.6	44.6	5.6	3.9	1.05
143107	NexGen	GAR-18-013	80.3	80.8	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		27.8	7.5	0.074	1.56	1.04	2.72	5.39	7.5	45.8	8.4	5	1.03
143108	NexGen	GAR-18-013	92.9	93.4	Waste Rock	Shaft Pilot Hole	ASST	ASST		7.9	1.1	0.021	0.81	0.342	1.04	2.21	2.2	0.6	1.1	1.2	0.32
143109	NexGen	GAR-18-013	105	105.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		8	0.9	0.014	0.498	0.231	0.66	1.4	2.2	0.4	0.8	1.1	0.11
143110	NexGen	GAR-18-013	114.5	115	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		25.9	23.1	0.088	1.55	1.27	3.75	6.65	7.7	66.2	20.3	4	0.57
143111	NexGen	GAR-18-013	164.5	165	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		36.9	32.4	0.114	2.08	1.62	4.74	8.55	10.2	70.8	22.5	6.1	0.61
143112	NexGen	GAR-18-013	214.5	215	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		42.3	41.7	0.072	1.35	1.07	3.72	6.21	12.2	67.2	15.3	5.3	0.46
143113	NexGen	GAR-18-013	265	265.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		41.1	36.9	0.082	1.6	1.23	3.56	6.48	11.6	100	16.8	7.2	0.49
143114	NexGen	GAR-18-013	313.5	314	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		28.9	17	0.127	2.12	1.82	5.28	9.35	8.4	89.3	13.6	4.6	0.35
143115	NexGen	GAR-18-013	366	366.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		41.2	29.7	0.066	1.42	0.983	3.57	6.04	11.7	84	13.7	6.7	0.44
143116	NexGen	GAR-18-013	414	414.5	Waste Rock	Shaft Pilot Hole	INT	INT		41.9	45	0.066	1.47	0.994	3.43	5.97	12	96.8	22.1	7	0.61
143117	NexGen	GAR-18-013	466	466.5	Waste Rock	Shaft Pilot Hole	INT	INT		35.8	41.6	0.073	1.53	1.14	3.57	6.32	10.1	99.6	25.7	5.9	0.81
143118	NexGen	GAR-18-013	516	516.5	Waste Rock	Shaft Pilot Hole	INT	INT		39	89.6	0.128	2.98	1.93	5.55	10.6	10.9	68.5	12.4	6.5	0.43
143119	NexGen	GAR-18-013	566	566.5	Waste Rock	Shaft Pilot Hole	VNQZ/INT	INT		23	22.6	0.052	0.89	0.74	2.16	3.84	6.5	89.1	14.5	4.1	0.4
143120	NexGen	GAR-18-013	616.15	616.65	Waste Rock	Shaft Pilot Hole	INT	INT		31.4	24.5	0.032	0.702	0.465	1.59	2.79	8.9	77.2	9.8	5.1	0.21
143121	NexGen	GAR-18-013	648	648.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		24.1	23.6	0.079	1.47	1.12	3.24	5.92	7	54.8	8.3	3.5	0.37

										Total - 4-Acid Digestion and ICP-MS finish								Partial - Aqua Regia Digestion and ICP-OES Finish					
Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping	Analyte	Ta	Tb	Th	U	W	Y	Yb	Zn	Ag	As	Bi	Co	Cu	Ge
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion
									Detection Limit	0.02	0.02	0.02	0.02	0.1	0.1	0.02	1	0.2	1	1	1	1	1
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl
39030	SRK	GAR-19-019	464	465	Waste Rock	UGTMF	INT	INT		0.91	0.83	27.1	2.81	1.00	23.7	2.22	108	-	-	-	-	-	-
39031	SRK	GAR-19-019	482	483	Waste Rock	UGTMF	INT	INT		0.72	0.77	24.0	2.34	0.80	26.0	2.88	90.0	-	-	-	-	-	-
39032	SRK	GAR-19-019	498	499	Waste Rock	UGTMF	INT	INT		0.68	0.80	19.9	3.41	1.20	27.8	3.70	124	-	-	-	-	-	-
39033	SRK	GAR-19-019	544	545	Waste Rock	UGTMF	INT	INT		0.58	0.53	34.6	2.08	1.30	19.1	2.53	215	-	-	-	-	-	-
39034	SRK	GAR-19-019	529	530	Waste Rock	UGTMF	INT	INT		0.64	0.70	20.1	1.89	0.60	21.0	2.27	101	-	-	-	-	-	-
39035	SRK	GAR-19-019	512.45	513.45	Waste Rock	UGTMF	INT	INT		0.77	0.74	22.1	3.06	1.00	24.4	2.67	92.0	-	-	-	-	-	-
39036	SRK	GAR-19-019	364	365	Waste Rock	UGTMF	INT	INT		0.63	0.71	24.1	2.15	0.30	19.3	2.07	94.0	-	-	-	-	-	-
39037	SRK	GAR-19-019	559	560	Waste Rock	UGTMF	INT	INT		0.71	0.80	23.9	2.40	0.50	21.4	2.28	88.0	-	-	-	-	-	-
39038	SRK	GAR-19-019	578.5	579.5	Waste Rock	UGTMF	INT	INT		0.53	0.67	29.4	2.32	0.50	24.4	2.69	83.0	-	-	-	-	-	-
39039	SRK	GAR-19-019	598.2	599.2	Waste Rock	UGTMF	INT	INT		0.70	0.64	28.5	2.81	0.40	14.8	1.44	114	-	-	-	-	-	-
39040	SRK	GAR-19-019	613	614	Waste Rock	UGTMF	INT	INT		0.81	0.67	19.5	2.15	0.50	20.6	2.23	111	-	-	-	-	-	-
39041	SRK	GAR-19-019	628.7	629.7	Waste Rock	UGTMF	INT	INT		0.88	0.64	27.2	2.60	1.20	17.7	2.03	96.0	-	-	-	-	-	-
39042	SRK	GAR-19-018	546	547	Waste Rock	UGTMF	INT	INT		0.83	0.70	38.5	3.59	0.80	20.1	2.22	101	-	-	-	-	-	-
39043	SRK	GAR-19-018	631	632	Waste Rock	UGTMF	INT	INT		0.89	0.57	24.2	2.37	2.30	15.7	1.72	87.0	-	-	-	-	-	-
39044	SRK	GAR-19-018	601	602	Waste Rock	UGTMF	INT	INT		0.78	0.70	29.6	2.77	0.60	18.8	2.03	112	-	-	-	-	-	-
39045	SRK	GAR-19-018	573	574	Waste Rock	UGTMF	INT	INT		0.71	0.59	18.6	1.84	1.20	16.2	1.90	102	-	-	-	-	-	-
39009	SRK	GAR-19-020	496	497	Waste Rock	UGTMF	SPGN	SPGN		0.88	0.52	18.3	2.05	1.80	13.8	1.43	31.0	-	-	-	-	-	-
39010	SRK	GAR-19-020	481.3	482.3	Waste Rock	UGTMF	SPGN	SPGN		0.72	0.50	17.7	1.90	0.60	16.1	1.78	42.0	-	-	-	-	-	-
39011	SRK	GAR-19-020	465	466	Waste Rock	UGTMF	SPGN	SPGN		0.61	0.64	18.1	1.99	1.00	18.9	1.98	86.0	-	-	-	-	-	-
39012	SRK	GAR-19-020	451	452	Waste Rock	UGTMF	SPGN	SPGN		0.76	0.74	22.9	2.65	0.70	21.5	2.50	111	-	-	-	-	-	-
39013	SRK	GAR-19-020	436.9	437.9	Waste Rock	UGTMF	SPGN	SPGN		1.06	0.57	16.3	2.01	0.80	17.7	2.04	38.0	-	-	-	-	-	-
39014	SRK	GAR-19-020	422	423	Waste Rock	UGTMF	SPGN	SPGN		1.03	0.84	22.0	3.80	0.70	27.1	2.83	47.0	-	-	-	-	-	-
39015	SRK	GAR-19-020	406	407	Waste Rock	UGTMF	SPGN	SPGN		0.72	0.82	28.6	1.94	0.80	22.7	1.86	84.0	-	-	-	-	-	-
39016	SRK	GAR-19-020	391	392	Waste Rock	UGTMF	SPGN	SPGN		0.77	0.88	22.9	4.47	0.70	30.4	3.04	62.0	-	-	-	-	-	-
39017	SRK	GAR-19-022	498	499	Waste Rock	UGTMF	SPGN	SPGN		0.74	0.66	20.8	1.78	0.60	18.4	1.84	89.0	-	-	-	-	-	-
39018	SRK	GAR-19-022	480.7	481.7	Waste Rock	UGTMF	SPGN	SPGN		0.76	0.61	18.7	1.91	0.50	15.8	1.80	95.0	-	-	-	-	-	-
39019	SRK	GAR-19-022	467.7	468.7	Waste Rock	UGTMF	SPGN	SPGN		0.45	0.75	19.2	1.80	0.30	26.1	2.83	110	-	-	-	-	-	-
39020	SRK	GAR-19-022	455	456	Waste Rock	UGTMF	SPGN	SPGN		0.60	0.75	35.7	2.98	0.60	21.8	2.61	41.0	-	-	-	-	-	-
39021	SRK	GAR-19-022	433.8	434.8	Waste Rock	UGTMF	SPGN	SPGN		0.65	0.61	25.1	2.97	0.50	16.5	1.78	75.0	-	-	-	-	-	-
39022	SRK	GAR-19-022	423	424	Waste Rock	UGTMF	SPGN	SPGN		0.82	0.89	33.7	3.30	0.50	28.7	3.06	109	-	-	-	-	-	-
39023	SRK	GAR-19-022	410.4	411.4	Waste Rock	UGTMF	SPGN	SPGN		0.72	0.59	8.19	1.15	0.40	18.1	2.13	110	-	-	-	-	-	-
39024	SRK	GAR-19-022	393.5	394.5	Waste Rock	UGTMF	SPGN	SPGN		1.11	0.64	15.8	1.83	0.80	16.7	1.72	106	-	-	-	-	-	-
39046	SRK	GAR-19-020	616	617	Waste Rock	UGTMF	SPGN	SPGN		1.09	1.02	33.1	3.46	2.10	27.6	3.06	97.0	-	-	-	-	-	-
39047	SRK	GAR-19-020	589	590	Waste Rock	UGTMF	SPGN	SPGN		0.97	1.04	23.6	2.62	1.60	30.2	3.32	98.0	-	-	-	-	-	-
39049	SRK	GAR-19-020	527	528	Waste Rock	UGTMF	SPGN	SPGN		0.68	0.69	23.1	3.08	0.60	24.1	2.63	33.0	-	-	-	-	-	-
39050	SRK	GAR-19-020	643.3	644.3	Waste Rock	UGTMF	SPGN	SPGN		0.98	1.06	20.2	2.08	0.90	34.4	4.23	110	-	-	-	-	-	-
39051	SRK	GAR-19-022	630.1	631.1	Waste Rock	UGTMF	SPGN	SPGN		1.63	1.04	22.5	2.40	3.30	23.9	2.66	119	-	-	-	-	-	-
39052	SRK	GAR-19-022	600	601	Waste Rock	UGTMF	SPGN	SPGN		0.97	0.80	21.1	1.92	1.50	23.6	2.87	60.0	-	-	-	-	-	-
39053	SRK	GAR-19-022	570.1	571.1	Waste Rock	UGTMF	SPGN	SPGN		0.88	0.59	27.9	1.97	1.50	16.6	1.98	51.0	-	-	-	-	-	-
39054	SRK	GAR-19-022	538.7	539.7	Waste Rock	UGTMF	SPGN/DIOR	SPGN		0.89	0.84	23.0	2.25	0.50	19.7	2.34	83.0	-	-	-	-	-	-
143101	NexGen	GAR-18-013	6	6.5	Waste Rock	Shaft Pilot Hole	OVB	OVB		0.06	0.16	2.6	1.60	0.80	3.7	0.37	2.0	-	-	-	-	-	-
143102	NexGen	GAR-18-013	18.8	19.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.7	0.3	6.94	2.64	1.6	11.6	1.53	20	-	-	-	-	-	-
143103	NexGen	GAR-18-013	54.8	55.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.7	0.54	10.9	2.72	1.3	16.6	1.8	60	-	-	-	-	-	-
143104	NexGen	GAR-18-013	59.3	59.8	Waste Rock	Shaft Pilot Hole	CRET	CRET		1.23	1.18	16.2	3.97	2.2	32.7	3.48	76	-	-	-	-	-	-
143105	NexGen	GAR-18-013	60.8	61.3	Waste Rock	Shaft Pilot Hole	CRET	CRET		0.82	0.95	11.4	2.86	1.7	26.3	2.78	79	-	-	-	-	-	-
143106	NexGen	GAR-18-013	66.8	67.3	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		0.58	0.44	8.62	2.32	1.5	10.9	1.2	67	-	-	-	-	-	-
143107	NexGen	GAR-18-013	80.3	80.8	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		0.4	0.51	8.93	2.29	1.4	12.2	1.28	10	-	-	-	-	-	-
143108	NexGen	GAR-18-013	92.9	93.4	Waste Rock	Shaft Pilot Hole	ASST	ASST		0.18	0.22	7.24	1.72	1.4	8.2	0.82	1	-	-	-	-	-	-
143109	NexGen	GAR-18-013	105	105.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		0.07	0.3	3.69	1.21	0.4	11.8	0.95	1	-	-	-	-	-	-
143110	NexGen	GAR-18-013	114.5	115	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.94	0.52	22.6	1.79	2.8	19.7	2.21	13	-	-	-	-	-	-
143111	NexGen	GAR-18-013	164.5	165	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.91	0.48	24.3	3.69	1.9	14.8	1.84	24	-	-	-	-	-	-
143112	NexGen	GAR-18-013	214.5	215	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.91	0.34	34.8	1.61	1.3	11.1	1.4	10	-	-	-	-	-	-
143113	NexGen	GAR-18-013	265	265.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.77	0.64	18.5	2.47	1	20.8	2.47	38	-	-	-	-	-	-
143114	NexGen	GAR-18-013	313.5	314	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.5	0.48	20.2	2.16	0.5	15.8	1.82	33	-	-	-	-	-	-
143115	NexGen	GAR-18-013	366	366.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.76	0.52	26.4	2.3	1.8	15.9	1.75	25	-	-	-	-	-	-
143116	NexGen	GAR-18-013	414	414.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.48	0.68	22.9	3.26	1.4	21.2	2.34	52	-	-	-	-	-	-
143117	NexGen	GAR-18-013	466	466.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.92	0.54	27.5	3.31	1.7	16.6	2.11	43	-	-	-	-	-	-
143118	NexGen	GAR-18-013	516	516.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.66	0.48	26.5	2.75	0.5	12.3	1.23	36	-	-	-	-	-	-
143119	NexGen	GAR-18-013	566	566.5	Waste Rock	Shaft Pilot Hole	VNQZ/INT	INT		0.37	0.44	13.2	0.93	2.4	13.6	1.41	18	-	-	-	-	-	-
143120	NexGen	GAR-18-013	616.15	616.65	Waste Rock	Shaft Pilot Hole	INT	INT		0.63	0.4	15	1.44	1	12.3	1.37	22	-	-	-	-	-	-
143121	NexGen	GAR-18-013	648	648.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.52	0.31	15.2	3.13	1.5	10.9	1.34	20	-	-	-	-	-	-

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Partial - Aqua Regia Digestion and ICP-OES Finish									
									Analyte	Hg	Mo	Ni	Pb	Sb	Se	Te	U	V	Zn
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion
									Detection Limit	1	1	1	1	1	1	1	1	1	1
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl
39030	SRK	GAR-19-019	464	465	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39031	SRK	GAR-19-019	482	483	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39032	SRK	GAR-19-019	498	499	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39033	SRK	GAR-19-019	544	545	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39034	SRK	GAR-19-019	529	530	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39035	SRK	GAR-19-019	512.45	513.45	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39036	SRK	GAR-19-019	364	365	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39037	SRK	GAR-19-019	559	560	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39038	SRK	GAR-19-019	578.5	579.5	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39039	SRK	GAR-19-019	598.2	599.2	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39040	SRK	GAR-19-019	613	614	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39041	SRK	GAR-19-019	628.7	629.7	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39042	SRK	GAR-19-018	546	547	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39043	SRK	GAR-19-018	631	632	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39044	SRK	GAR-19-018	601	602	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39045	SRK	GAR-19-018	573	574	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
39009	SRK	GAR-19-020	496	497	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39010	SRK	GAR-19-020	481.3	482.3	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39011	SRK	GAR-19-020	465	466	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39012	SRK	GAR-19-020	451	452	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39013	SRK	GAR-19-020	436.9	437.9	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39014	SRK	GAR-19-020	422	423	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39015	SRK	GAR-19-020	406	407	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39016	SRK	GAR-19-020	391	392	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39017	SRK	GAR-19-022	498	499	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39018	SRK	GAR-19-022	480.7	481.7	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39019	SRK	GAR-19-022	467.7	468.7	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39020	SRK	GAR-19-022	455	456	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39021	SRK	GAR-19-022	433.8	434.8	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39022	SRK	GAR-19-022	423	424	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39023	SRK	GAR-19-022	410.4	411.4	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39024	SRK	GAR-19-022	393.5	394.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39046	SRK	GAR-19-020	616	617	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39047	SRK	GAR-19-020	589	590	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39049	SRK	GAR-19-020	527	528	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39050	SRK	GAR-19-020	643.3	644.3	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39051	SRK	GAR-19-022	630.1	631.1	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39052	SRK	GAR-19-022	600	601	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39053	SRK	GAR-19-022	570.1	571.1	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
39054	SRK	GAR-19-022	538.7	539.7	Waste Rock	UGTMF	SPGN/DIOR	SPGN		-	-	-	-	-	-	-	-	-	-
143101	NexGen	GAR-18-013	6	6.5	Waste Rock	Shaft Pilot Hole	OVB	OVB		-	-	-	-	-	-	-	-	-	-
143102	NexGen	GAR-18-013	18.8	19.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	-	-	-	-	-	-	-	-	-
143103	NexGen	GAR-18-013	54.8	55.3	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	-	-	-	-	-	-	-	-	-
143104	NexGen	GAR-18-013	59.3	59.8	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	-	-	-	-	-	-	-	-	-
143105	NexGen	GAR-18-013	60.8	61.3	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	-	-	-	-	-	-	-	-	-
143106	NexGen	GAR-18-013	66.8	67.3	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	-	-	-	-	-	-	-	-	-
143107	NexGen	GAR-18-013	80.3	80.8	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	-	-	-	-	-	-	-	-	-
143108	NexGen	GAR-18-013	92.9	93.4	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	-	-	-	-	-	-	-	-	-
143109	NexGen	GAR-18-013	105	105.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	-	-	-	-	-	-	-	-	-
143110	NexGen	GAR-18-013	114.5	115	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
143111	NexGen	GAR-18-013	164.5	165	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
143112	NexGen	GAR-18-013	214.5	215	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
143113	NexGen	GAR-18-013	265	265.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
143114	NexGen	GAR-18-013	313.5	314	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
143115	NexGen	GAR-18-013	366	366.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
143116	NexGen	GAR-18-013	414	414.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	-	-	-	-	-	-	-
143117	NexGen	GAR-18-013	466	466.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	-	-	-	-	-	-	-
143118	NexGen	GAR-18-013	516	516.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	-	-	-	-	-	-	-
143119	NexGen	GAR-18-013	566	566.5	Waste Rock	Shaft Pilot Hole	VNQZ/INT	INT		-	-	-	-	-	-	-	-	-	-
143120	NexGen	GAR-18-013	616.15	616.65	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	-	-	-	-	-	-	-
143121	NexGen	GAR-18-013	648	648.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping	Analyte	ABA												
										Sulfate (SO_4), acid soluble	pH, paste	Modified NP	Acid Producing	Net Acid Generation	Sulfur as Sulfide	Total Carbon	Total Sulfur	Inorganic Carbon (TIC)	TIC	NP/AP	TIC/AP
									Unit	wt. %	pH units	kg CaCO3/t	kg $CaCO_3$/t	kg $CaCO_3$/t	wt. %	wt. %	wt. %	wt. %	kg $CaCO_3$/t	-	-
									Method							LECO	LECO	LECO			
									Detection Limit	0.005	--	0.5	0.5	--		0.01	0.01	0.01			
143123	NexGen	GAR-18-015	8.5	9	Waste Rock	Shaft Pilot Hole	OVB	OVB		< 0.0050	6.78	1.7	< 0.5000	-1.7	0.01	0.01	< 0.0100	< 0.010	0.83	6.5	3.2
143124	NexGen	GAR-18-015	11.5	12	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.008	6.39	2.5	< 0.5000	-2.5	0.01	0.3	0.01	< 0.010	0.83	10.9	3.6
143125	NexGen	GAR-18-015	32	32.5	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.017	6.4	2.7	5.1	2.4	0.16	1.36	0.17	< 0.010	0.83	0.5	0.2
143126	NexGen	GAR-18-015	45	45.5	Waste Rock	Shaft Pilot Hole	CRET	CRET		0.014	7.23	1.9	2	< 0.500	0.07	0.63	0.07	< 0.010	0.83	0.9	0.4
143127	NexGen	GAR-18-015	56.5	57	Waste Rock	Shaft Pilot Hole	CRET	CRET		0.24	6.81	3.4	19.4	16	0.62	2.11	0.7	< 0.010	0.83	0.2	0.0
143128	NexGen	GAR-18-015	66	66.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		< 0.0050	7.47	1.7	< 0.5000	-1.7	0.01	0.07	0.01	< 0.010	0.83	6.5	3.2
143129	NexGen	GAR-18-015	72	72.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		0.007	7.71	1.8	0.9	-0.9	0.03	0.06	0.03	< 0.010	0.83	2.1	1.0
143130	NexGen	GAR-18-015	80.5	81	Waste Rock	Shaft Pilot Hole	ASST	ASST		< 0.0050	6.9	1.2	< 0.500	-1.2	0.01	0.02	< 0.0100	< 0.010	0.83	4.6	3.2
143131	NexGen	GAR-18-015	91	91.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		< 0.0050	7.4	0.7	< 0.5000	-0.7	0.01	0.01	< 0.0100	< 0.010	0.83	2.7	3.2
143132	NexGen	GAR-18-015	101	101.5	Waste Rock	Shaft Pilot Hole	INT	INT		< 0.0050	8.49	9.3	< 0.5000	-9.3	0.01	0.47	< 0.0100	0.01	0.83	35.7	3.2
143133	NexGen	GAR-18-015	151	151.5	Waste Rock	Shaft Pilot Hole	INT	INT		< 0.0050	8.31	5.9	7.5	1.6	0.24	0.12	0.24	< 0.010	0.83	0.8	0.1
143134	NexGen	GAR-18-015	201	201.5	Waste Rock	Shaft Pilot Hole	INT	INT		< 0.0050	9.5	7.9	6.3	-1.6	0.20	0.12	0.2	0.02	1.67	1.3	0.3
143135	NexGen	GAR-18-015	251	251.5	Waste Rock	Shaft Pilot Hole	INT	INT		< 0.0050	9.51	8.8	1.3	-7.5	0.04	0.04	0.04	0.01	0.83	7.3	0.7
143136	NexGen	GAR-18-015	301	301.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.005	8.91	19.7	4.6	-13.3	0.15	0.06	0.15	0.02	1.67	4.2	0.4
143137	NexGen	GAR-18-015	351	351.5	Waste Rock	Shaft Pilot Hole	INT	INT		< 0.0050	9.51	9.3	5.3	-4	0.17	0.26	0.17	0.04	3.33	1.8	0.6
143138	NexGen	GAR-18-015	402	402.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.007	9.41	6.9	24.3	17.4	0.78	0.26	0.78	< 0.010	0.83	0.3	0.0
143139	NexGen	GAR-18-015	452.5	453	Waste Rock	Shaft Pilot Hole	INT	INT		< 0.0050	9.59	8.1	2.2	-5.9	0.07	0.09	0.07	0.02	1.67	3.8	0.8
143140	NexGen	GAR-18-015	502	502.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.0050	9.28	6.6	2.5	-4.1	0.08	0.13	0.08	0.02	1.67	2.7	0.7
143141	NexGen	GAR-18-015	551	551.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.0050	9.4	5.8	< 0.5000	-5.8	0.01	0.08	0.01	0.01	0.83	22.3	3.2
143142	NexGen	GAR-18-015	601	601.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.0050	9.46	8.2	0.6	-7.6	0.02	0.15	0.02	0.01	0.83	14.3	1.5
143143	NexGen	GAR-18-015	651	651.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.0050	9.16	6.7	0.6	-6.1	0.02	0.12	0.02	< 0.010	0.83	11.7	1.5
143144	NexGen	GAR-18-015	699.75	700.25	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.0050	8.83	6.8	1.3	-5.5	0.04	0.16	0.04	< 0.010	0.83	5.7	0.7
128830	NexGen	GAR-19-033	444	444.5	Waste Rock	UGTMF	INT	INT		< 0.005	9.15	10.1	4.7	-5.4	0.15	0.11	0.15	0.01	0.83	2.2	0.2
132124	NexGen	GAR-19-032	416	416.5	Waste Rock	UGTMF	INT	INT		< 0.005	9.08	9.1	3.4	-5.7	0.11	0.06	0.11	0.01	0.83	2.7	0.2
132144	NexGen	GAR-19-032	616	616.5	Waste Rock	UGTMF	INT	INT		< 0.005	8.94	7.4	16.9	9.5	0.54	0.16	0.54	< 0.010	0.83	0.4	0.0
128835	NexGen	GAR-19-033	494	494.5	Waste Rock	UGTMF	INT	INT		< 0.005	9.3	8	1.3	-6.7	0.04	0.03	0.04	0.01	0.83	6.7	0.7
128860	NexGen	GAR-19-033	744	744.5	Waste Rock	UGTMF	INT	INT		< 0.005	8.99	6.8	3.4	-3.4	0.11	0.03	0.11	< 0.010	0.83	2.0	0.2
128874	NexGen	GAR-19-035	129	129.5	Waste Rock	UGTMF	INT	INT		< 0.005	7.76	2.7	< 0.50	-2.7	0.01	0.18	< 0.01	< 0.01	0.83	10.4	3.2
128883	NexGen	GAR-19-035	179	179.5	Waste Rock	UGTMF	INT	INT		< 0.005	8.21	6.5	7.5	1	0.24	0.13	0.24	< 0.01	0.83	0.9	0.1
128888	NexGen	GAR-19-035	229	229.5	Waste Rock	UGTMF	INT	INT		< 0.005	9.26	8	2.2	-5.8	0.07	0.08	0.07	0.02	1.67	3.7	0.8
128893	NexGen	GAR-19-035	279	279.5	Waste Rock	UGTMF	INT	INT		< 0.005	9.14	6.4	13.4	7	0.43	0.18	0.43	0.01	0.83	0.5	0.1
132169	NexGen	GAR-19-034	147	147.5	Waste Rock	UGTMF	INT	INT		< 0.005	7.74	2.9	< 0.50	-2.9	0.01	0.19	< 0.01	< 0.0100	0.83	11.1	3.2
132174	NexGen	GAR-19-034	197	197.5	Waste Rock	UGTMF	INT	INT		< 0.005	8.43	7.1	< 0.50	-7.1	0.01	0.15	0.01	0.01	0.83	27.3	3.2
132179	NexGen	GAR-19-034	247	247.5	Waste Rock	UGTMF	INT	INT		< 0.005	8.65	5.6	39.1	33.5	1.25	0.27	1.25	< 0.01	0.83	0.1	0.0
132184	NexGen	GAR-19-034	297	297.5	Waste Rock	UGTMF	INT	INT		< 0.005	9.12	9.5	7.8	-1.7	0.25	0.1	0.25	0.03	2.50	1.2	0.3
132189	NexGen	GAR-19-034	347	347.5	Waste Rock	UGTMF	INT	INT		< 0.005	9.34	8.8	6.6	-2.2	0.21	0.1	0.21	0.01	0.83	1.4	0.1
132194	NexGen	GAR-19-034	397	397.5	Waste Rock	UGTMF	INT	INT		< 0.005	9.33	11.3	3.4	-7.9	0.11	0.08	0.11	0.03	2.50	3.3	0.7
132199	NexGen	GAR-19-034	447	447.5	Waste Rock	UGTMF	INT	INT		< 0.005	9.27	6.9	3.4	-3.5	0.11	0.04	0.11	0.02	1.67	2.0	0.5
132204	NexGen	GAR-19-034	497	497.5	Waste Rock	UGTMF	INT	INT		< 0.005	9.17	3.6	4.1	0.5	0.13	0.12	0.13	0.02	1.67	0.9	0.4
132245	NexGen	GAR-19-036	105	105.5	Waste Rock	UGTMF	INT	INT		< 0.005	7.98	2.8	< 0.50	-2.8	0.01	< 0.01	< 0.01	< 0.01	0.83	10.8	3.2
128800	NexGen	GAR-19-033	143.65	144.15	Waste Rock	UGTMF	SPGN	SPGN		0.007	7.3	4.2	< 0.500	-4.2	0.01	0.03	0.01	< 0.010	0.83	17.5	3.5
128805	NexGen	GAR-19-033	193.65	194.15	Waste Rock	UGTMF	SPGN	SPGN		0.012	8.17	6.4	30.5	24.1	0.98	0.39	0.98	< 0.010	0.83	0.2	0.0
128810	NexGen	GAR-19-033	243.65	244.15	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	8.8	8.1	3.8	-4.3	0.12	0.22	0.12	0.01	0.83	2.2	0.2
128815	NexGen	GAR-19-033	293.65	294.15	Waste Rock	UGTMF	SPGN	SPGN		0.007	8.16	12.3	32.1	19.8	1.03	0.4	1.03	0.08	6.67	0.4	0.2
128820	NexGen	GAR-19-033	344	344.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	9.25	8.2	5.3	-2.9	0.17	0.1	0.17	0.01	0.83	1.6	0.2
128825	NexGen	GAR-19-033	394	394.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	8.99	14.7	7.2	-7.5	0.23	0.26	0.23	0.04	3.33	2.1	0.5
132099	NexGen	GAR-19-032	166	166.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	8.12	7.6	1.9	-5.7	0.06	0.3	0.06	0.01	0.83	4.2	0.5
132104	NexGen	GAR-19-032	216	216.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	8.48	9.3	8.1	-1.2	0.26	0.21	0.26	0.02	1.67	1.2	0.2
132109	NexGen	GAR-19-032	266	266.5	Waste Rock	UGTMF	SPGN	SPGN		0.015	7.72	6.3	100.5	94.2	3.22	0.53	3.22	< 0.010	0.83	0.1	0.0
132114	NexGen	GAR-19-032	316	316.5	Waste Rock	UGTMF	SPGN	SPGN		0.007	8.82	7.9	34	26.1	1.09	0.2	1.09	< 0.010	0.83	0.2	0.0
132119	NexGen	GAR-19-032	366	366.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	9.18	10.2	10.9	0.7	0.35	0.38	0.35	0.01	0.83	0.9	0.1
132129	NexGen	GAR-19-032	466	466.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	9.28	12.2	7.8	-4.4	0.25	0.17	0.25	0.03	2.50	1.6	0.3
132134	NexGen	GAR-19-032	516	516.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	9.2	11.3	2.8	-8.5	0.09	0.1	0.09	0.01	0.83	4.1	0.3
132139	NexGen	GAR-19-032	566	566.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	8.98	8.9	8.1	-0.8	0.26	0.25	0.26	< 0.010	0.83	1.1	0.1
128840	NexGen	GAR-19-033	544	544.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	8.75	6.2	7.8	1.6	0.25	0.14	0.25	< 0.010	0.83	0.8	0.1
128845	NexGen	GAR-19-033	594	594.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	8.62	5.2	0.9	-4.3	0.03	0.14	0.03	< 0.010	0.83	5.9	0.9
128850	NexGen	GAR-19-033	644	644.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	8.94	6.2	0.6	-5.6	0.02	0.12	0.02	< 0.010	0.83	10.8	1.5
128855	NexGen	GAR-19-033	694	694.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	8.7	5.3	1.9	-3.4	0.06	0.19	0.06	< 0.010	0.83	2.9	0.5
132148	NexGen	GAR-19-032	666	666.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	8.83	4.2	0.6	-3.6	0.02	0.39	0.02	< 0.010	0.83	7.3	1.5
132153	NexGen	GAR-19-032	716	716.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	9.02	6.5	0.6	-5.9	0.02	0.07	0.02	0.01	0.83	11.3	1.5
128898	NexGen	GAR-19-035	329	329.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	9.25	5.6	0.6	-5	0.02	0.09	0.02	0.01	0.83	9.8	1.5
128903	NexGen	GAR-19-035	379	379.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	9.2	8.4	11.3	2.9	0.36	0.09	0.36	0.04	3.33	0.8	0.3
128908	NexGen	GAR-19-035	429	429.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	9.15	7.9	3.1	-4.8	0.10	0.09	0.1	0.04	3.33	2.6	1.1
128913	NexGen	GAR-19-035	479	479.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	8.81	5.2	0.6	-4.6	0.02	0.04	0.02	< 0.01	0.83	9.1	1.5
132209	NexGen	GAR-19-034	547	547.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	8.77	4.1	1.9	-2.2	0.06	0.21	0.06	< 0.01	0.83	2.2	0.5
132214	NexGen	GAR-19-034	597	597.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	8.67	4.2	< 0.50	-4.2	0.01	0.29	0.01	< 0.01	0.83	16.1	3.2
132219	NexGen	GAR-19-034	647	647.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	8.63	4.1	1.9	-2.2	0.06	0.14	0.06	0.01	0.83	2.2	0.5
132224	NexGen	GAR-19-034	697	697.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	9.11	5.5	0.9	-4.6	0.03	0.24	0.03	0.02	1.67	6.2	1.9
132229	NexGen	GAR-19-034	747	747.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	9.11	6.9	< 0.50	-6.9	0.01	0.22	0.01	0.02	1.67	26.5	6.4
128919	NexGen	GAR-19-035	539	539.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	9	5.2	6.3	1.1	0.20	0.18	0.2	< 0.01	0.83	0.8	0.1
128924	NexGen	GAR-19-035	589	589.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	8.87	7.9	20.3	12.4	0.65	0.35	0.65	0.01	0.83	0.4	0.0
128929	NexGen	GAR-19-035	639	639.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	8.18	2.6	< 0.50	-2.6	0.01	0.19	< 0.01	< 0.01	0.83	10.0	3.2
128934	NexGen	GAR-19-035	689	689.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.005	8.63	4.1	< 0.50	-4.1	0.01	0.18	< 0.01	< 0.01	0.83	15.7	3.2

										Total - 4 Acid Digestion and ICP-OES finish											
Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping	Analyte	Ag	Al_2O_3	Ba	Be	CaO	Cd	Ce	Co	Cr	Cu	Dy	Er
									Units	ppm	wt. %	ppm	ppm	wt. %	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion
									Detection Limit	0.2	0.01	1	0.2	0.01	1	1	1	1	1	0.2	0.2
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$
143123	NexGen	GAR-18-015	8.5	9	Waste Rock	Shaft Pilot Hole	OVB	OVB		-	1.04	42	-	0.07	-	23	-	13	-	-	-
143124	NexGen	GAR-18-015	11.5	12	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	5.31	156	-	0.37	-	39	-	22	-	-	-
143125	NexGen	GAR-18-015	32	32.5	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	6.76	289	-	0.11	-	39	-	31	-	-	-
143126	NexGen	GAR-18-015	45	45.5	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	7.02	385	-	0.14	-	49	-	31	-	-	-
143127	NexGen	GAR-18-015	56.5	57	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	16.8	372	-	0.63	-	75	-	76	-	-	-
143128	NexGen	GAR-18-015	66	66.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	7.49	126	-	0.06	-	55	-	48	-	-	-
143129	NexGen	GAR-18-015	72	72.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	4.53	91	-	0.04	-	49	-	39	-	-	-
143130	NexGen	GAR-18-015	80.5	81	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	0.41	3	-	< 0.010	-	10	-	1	-	-	-
143131	NexGen	GAR-18-015	91	91.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	0.76	6	-	< 0.010	-	12	-	2	-	-	-
143132	NexGen	GAR-18-015	101	101.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	15.4	596	-	0.14	-	78	-	84	-	-	-
143133	NexGen	GAR-18-015	151	151.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	10.6	96	-	0.08	-	65	-	77	-	-	-
143134	NexGen	GAR-18-015	201	201.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	14.9	828	-	0.92	-	114	-	96	-	-	-
143135	NexGen	GAR-18-015	251	251.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	12.5	600	-	1.23	-	115	-	84	-	-	-
143136	NexGen	GAR-18-015	301	301.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	7.75	189	-	0.97	-	60	-	65	-	-	-
143137	NexGen	GAR-18-015	351	351.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	11.2	364	-	1.43	-	117	-	107	-	-	-
143138	NexGen	GAR-18-015	402	402.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	11.1	746	-	0.99	-	117	-	86	-	-	-
143139	NexGen	GAR-18-015	452.5	453	Waste Rock	Shaft Pilot Hole	INT	INT		-	13.5	818	-	1.42	-	106	-	111	-	-	-
143140	NexGen	GAR-18-015	502	502.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	15.2	799	-	0.35	-	84	-	98	-	-	-
143141	NexGen	GAR-18-015	551	551.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	12.2	777	-	0.45	-	63	-	91	-	-	-
143142	NexGen	GAR-18-015	601	601.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	16.2	959	-	0.23	-	101	-	102	-	-	-
143143	NexGen	GAR-18-015	651	651.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	12.9	756	-	0.08	-	82	-	80	-	-	-
143144	NexGen	GAR-18-015	699.75	700.25	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	9.05	528	-	0.04	-	63	-	63	-	-	-
128830	NexGen	GAR-19-033	444	444.5	Waste Rock	UGTMF	INT	INT		-	15	746	-	1.6	-	100	-	119	-	-	-
132124	NexGen	GAR-19-032	416	416.5	Waste Rock	UGTMF	INT	INT		-	10.5	575	-	1.28	-	84	-	91	-	-	-
132144	NexGen	GAR-19-032	616	616.5	Waste Rock	UGTMF	INT	INT		-	15.8	921	-	0.73	-	90	-	103	-	-	-
128835	NexGen	GAR-19-033	494	494.5	Waste Rock	UGTMF	INT	INT		-	13.3	815	-	1.18	-	105	-	82	-	-	-
128860	NexGen	GAR-19-033	744	744.5	Waste Rock	UGTMF	INT	INT		-	12.1	487	-	0.88	-	84	-	85	-	-	-
128874	NexGen	GAR-19-035	129	129.5	Waste Rock	UGTMF	INT	INT		-	19.3	1080	-	0.09	-	207	-	123	-	-	-
128883	NexGen	GAR-19-035	179	179.5	Waste Rock	UGTMF	INT	INT		-	13	672	-	0.47	-	107	-	87	-	-	-
128888	NexGen	GAR-19-035	229	229.5	Waste Rock	UGTMF	INT	INT		-	13.5	869	-	1.48	-	124	-	85	-	-	-
128893	NexGen	GAR-19-035	279	279.5	Waste Rock	UGTMF	INT	INT		-	15.1	808	-	1.58	-	96	-	100	-	-	-
132169	NexGen	GAR-19-034	147	147.5	Waste Rock	UGTMF	INT	INT		-	17.7	873	-	0.13	-	202	-	114	-	-	-
132174	NexGen	GAR-19-034	197	197.5	Waste Rock	UGTMF	INT	INT		-	13.8	472	-	1	-	112	-	86	-	-	-
132179	NexGen	GAR-19-034	247	247.5	Waste Rock	UGTMF	INT	INT		-	15.8	1010	-	0.51	-	103	-	105	-	-	-
132184	NexGen	GAR-19-034	297	297.5	Waste Rock	UGTMF	INT	INT		-	13.9	804	-	1.55	-	105	-	77	-	-	-
132189	NexGen	GAR-19-034	347	347.5	Waste Rock	UGTMF	INT	INT		-	15.7	907	-	1.68	-	97	-	106	-	-	-
132194	NexGen	GAR-19-034	397	397.5	Waste Rock	UGTMF	INT	INT		-	14.4	845	-	1.84	-	94	-	92	-	-	-
132199	NexGen	GAR-19-034	447	447.5	Waste Rock	UGTMF	INT	INT		-	12.9	571	-	1.77	-	110	-	93	-	-	-
132204	NexGen	GAR-19-034	497	497.5	Waste Rock	UGTMF	INT	INT		-	15.1	849	-	1.62	-	109	-	101	-	-	-
132245	NexGen	GAR-19-036	105	105.5	Waste Rock	UGTMF	INT	INT		-	15.6	310	-	0.06	-	135	-	71	-	-	-
128800	NexGen	GAR-19-033	143.65	144.15	Waste Rock	UGTMF	SPGN	SPGN		-	14.2	475	-	0.09	-	168	-	96	-	-	-
128805	NexGen	GAR-19-033	193.65	194.15	Waste Rock	UGTMF	SPGN	SPGN		-	18.6	1050	-	0.42	-	80	-	117	-	-	-
128810	NexGen	GAR-19-033	243.65	244.15	Waste Rock	UGTMF	SPGN	SPGN		-	15.9	826	-	1.31	-	98	-	109	-	-	-
128815	NexGen	GAR-19-033	293.65	294.15	Waste Rock	UGTMF	SPGN	SPGN		-	17.9	688	-	0.45	-	73	-	128	-	-	-
128820	NexGen	GAR-19-033	344	344.5	Waste Rock	UGTMF	SPGN	SPGN		-	15.8	933	-	1.54	-	111	-	106	-	-	-
128825	NexGen	GAR-19-033	394	394.5	Waste Rock	UGTMF	SPGN	SPGN		-	16	1240	-	1.35	-	94	-	94	-	-	-
132099	NexGen	GAR-19-032	166	166.5	Waste Rock	UGTMF	SPGN	SPGN		-	11.9	551	-	0.49	-	93	-	92	-	-	-
132104	NexGen	GAR-19-032	216	216.5	Waste Rock	UGTMF	SPGN	SPGN		-	14.6	827	-	0.38	-	80	-	117	-	-	-
132109	NexGen	GAR-19-032	266	266.5	Waste Rock	UGTMF	SPGN	SPGN		-	14.7	792	-	0.22	-	103	-	90	-	-	-
132114	NexGen	GAR-19-032	316	316.5	Waste Rock	UGTMF	SPGN	SPGN		-	22.1	1310	-	0.66	-	97	-	162	-	-	-
132119	NexGen	GAR-19-032	366	366.5	Waste Rock	UGTMF	SPGN	SPGN		-	15.3	714	-	1.57	-	112	-	110	-	-	-
132129	NexGen	GAR-19-032	466	466.5	Waste Rock	UGTMF	SPGN	SPGN		-	17.3	936	-	1.87	-	87	-	113	-	-	-
132134	NexGen	GAR-19-032	516	516.5	Waste Rock	UGTMF	SPGN	SPGN		-	13.7	776	-	1.53	-	87	-	96	-	-	-
132139	NexGen	GAR-19-032	566	566.5	Waste Rock	UGTMF	SPGN	SPGN		-	14.8	729	-	1.39	-	103	-	102	-	-	-
128840	NexGen	GAR-19-033	544	544.5	Waste Rock	UGTMF	SPGN	SPGN		-	13.5	639	-	0.49	-	82	-	82	-	-	-
128845	NexGen	GAR-19-033	594	594.5	Waste Rock	UGTMF	SPGN	SPGN		-	17.8	789	-	0.21	-	74	-	123	-	-	-
128850	NexGen	GAR-19-033	644	644.5	Waste Rock	UGTMF	SPGN	SPGN		-	16.8	859	-	0.23	-	95	-	102	-	-	-
128855	NexGen	GAR-19-033	694	694.5	Waste Rock	UGTMF	SPGN	SPGN		-	19.2	797	-	0.15	-	93	-	114	-	-	-
132148	NexGen	GAR-19-032	666	666.5	Waste Rock	UGTMF	SPGN	SPGN		-	18.7	912	-	0.26	-	105	-	112	-	-	-
132153	NexGen	GAR-19-032	716	716.5	Waste Rock	UGTMF	SPGN	SPGN		-	10.1	711	-	0.35	-	77	-	71	-	-	-
128898	NexGen	GAR-19-035	329	329.5	Waste Rock	UGTMF	SPGN	SPGN		-	13	605	-	1.46	-	97	-	88	-	-	-
128903	NexGen	GAR-19-035	379	379.5	Waste Rock	UGTMF	SPGN	SPGN		-	16.4	1030	-	1.53	-	96	-	93	-	-	-
128908	NexGen	GAR-19-035	429	429.5	Waste Rock	UGTMF	SPGN	SPGN		-	13.7	682	-	1.26	-	108	-	98	-	-	-
128913	NexGen	GAR-19-035	479	479.5	Waste Rock	UGTMF	SPGN	SPGN		-	13.2	429	-	1.14	-	141	-	73	-	-	-
132209	NexGen	GAR-19-034	547	547.5	Waste Rock	UGTMF	SPGN	SPGN		-	18.4	857	-	0.22	-	109	-	98	-	-	-
132214	NexGen	GAR-19-034	597	597.5	Waste Rock	UGTMF	SPGN	SPGN		-	14.6	796	-	0.17	-	87	-	84	-	-	-
132219	NexGen	GAR-19-034	647	647.5	Waste Rock	UGTMF	SPGN	SPGN		-	9.17	490	-	0.16	-	68	-	69	-	-	-
132224	NexGen	GAR-19-034	697	697.5	Waste Rock	UGTMF	SPGN	SPGN		-	10.7	797	-	0.32	-	81	-	93	-	-	-
132229	NexGen	GAR-19-034	747	747.5	Waste Rock	UGTMF	SPGN	SPGN		-	10.4	785	-	0.33	-	85	-	67	-	-	-
128919	NexGen	GAR-19-035	539	539.5	Waste Rock	UGTMF	SPGN	SPGN		-	14.3	826	-	1.33	-	124	-	96	-	-	-
128924	NexGen	GAR-19-035	589	589.5	Waste Rock	UGTMF	SPGN	SPGN		-	16.3	825	-	0.86	-	100	-	109	-	-	-
128929	NexGen	GAR-19-035	639	639.5	Waste Rock	UGTMF	SPGN	SPGN		-	9.34	526	-	0.04	-	69	-	72	-	-	-
128934	NexGen	GAR-19-035	689	689.5	Waste Rock	UGTMF	SPGN	SPGN		-	21	977	-	0.16	-	90	-	126	-	-	-

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Eu	Fe_2O_3	Ga	Gd	Hf	Ho	2	K_2O	La	Li	MgO	MgO
										Total - 4 Acid Digestion and ICP-OES finish											
									Analyte	Eu	Fe_2O_3	Ga	Gd	Hf	Ho	2	K_2O	La	Li	MgO	MgO
									Units	ppm	wt. %	ppm	ppm	ppm	ppm	wt. %	wt. %	ppm	ppm	wt. %	wt. %
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion
									Detection Limit	0.2	0.01	1	1	1	1	0.002	0.01	1	1	0.002	0.01
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$
143123	NexGen	GAR-18-015	8.5	9	Waste Rock	Shaft Pilot Hole	OVB	OVB		-	0.22	-	-	-	-	0.218	-	10	8	0.052	-
143124	NexGen	GAR-18-015	11.5	12	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	0.68	-	-	-	-	0.642	-	17	21	0.244	-
143125	NexGen	GAR-18-015	32	32.5	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	1.11	-	-	-	-	1.27	-	20	28	0.377	-
143126	NexGen	GAR-18-015	45	45.5	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	1.04	-	-	-	-	1.46	-	23	28	0.369	-
143127	NexGen	GAR-18-015	56.5	57	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	5.46	-	-	-	-	2.37	-	37	95	1.33	-
143128	NexGen	GAR-18-015	66	66.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	0.58	-	-	-	-	1.17	-	29	26	0.495	-
143129	NexGen	GAR-18-015	72	72.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	0.44	-	-	-	-	0.886	-	25	23	0.475	-
143130	NexGen	GAR-18-015	80.5	81	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	0.02	-	-	-	-	0.01	-	5	2	0.013	-
143131	NexGen	GAR-18-015	91	91.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	0.03	-	-	-	-	0.014	-	6	3	0.025	-
143132	NexGen	GAR-18-015	101	101.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	3.44	-	-	-	-	2.76	-	31	49	2.84	-
143133	NexGen	GAR-18-015	151	151.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	4	-	-	-	-	1.75	-	30	63	4.02	-
143134	NexGen	GAR-18-015	201	201.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	6.67	-	-	-	-	3.66	-	58	16	2.16	-
143135	NexGen	GAR-18-015	251	251.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	5.58	-	-	-	-	2.31	-	58	18	2.53	-
143136	NexGen	GAR-18-015	301	301.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	4.05	-	-	-	-	1.97	-	26	20	2.21	-
143137	NexGen	GAR-18-015	351	351.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	5.18	-	-	-	-	2.04	-	56	14	1.91	-
143138	NexGen	GAR-18-015	402	402.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	5.34	-	-	-	-	3.03	-	60	9	1.46	-
143139	NexGen	GAR-18-015	452.5	453	Waste Rock	Shaft Pilot Hole	INT	INT		-	5.38	-	-	-	-	3.33	-	53	13	2.01	-
143140	NexGen	GAR-18-015	502	502.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	6.65	-	-	-	-	3.68	-	41	12	1.53	-
143141	NexGen	GAR-18-015	551	551.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	4.74	-	-	-	-	2.99	-	32	11	1.18	-
143142	NexGen	GAR-18-015	601	601.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	7.46	-	-	-	-	4.16	-	52	12	2.03	-
143143	NexGen	GAR-18-015	651	651.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	5	-	-	-	-	3.26	-	40	20	2.25	-
143144	NexGen	GAR-18-015	699.75	700.25	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	3.13	-	-	-	-	2.18	-	32	14	1.42	-
128830	NexGen	GAR-19-033	444	444.5	Waste Rock	UGTMF	INT	INT		-	6.16	-	-	-	-	3.46	-	53	14	2.37	-
132124	NexGen	GAR-19-032	416	416.5	Waste Rock	UGTMF	INT	INT		-	4.94	-	-	-	-	2.25	-	46	14	1.8	-
132144	NexGen	GAR-19-032	616	616.5	Waste Rock	UGTMF	INT	INT		-	7.27	-	-	-	-	4.21	-	49	20	2.52	-
128835	NexGen	GAR-19-033	494	494.5	Waste Rock	UGTMF	INT	INT		-	5.19	-	-	-	-	3.56	-	56	10	2.07	-
128860	NexGen	GAR-19-033	744	744.5	Waste Rock	UGTMF	INT	INT		-	4.75	-	-	-	-	2.32	-	44	35	2.14	-
128874	NexGen	GAR-19-035	129	129.5	Waste Rock	UGTMF	INT	INT		-	5.94	-	-	-	-	5.1	-	90	32	1.78	-
128883	NexGen	GAR-19-035	179	179.5	Waste Rock	UGTMF	INT	INT		-	5.15	-	-	-	-	3.27	-	55	47	3.43	-
128888	NexGen	GAR-19-035	229	229.5	Waste Rock	UGTMF	INT	INT		-	5.86	-	-	-	-	3.17	-	64	11	2.23	-
128893	NexGen	GAR-19-035	279	279.5	Waste Rock	UGTMF	INT	INT		-	6.59	-	-	-	-	3.4	-	49	15	2.18	-
132169	NexGen	GAR-19-034	147	147.5	Waste Rock	UGTMF	INT	INT		-	2.22	-	-	-	-	4.39	-	90	36	2.2	-
132174	NexGen	GAR-19-034	197	197.5	Waste Rock	UGTMF	INT	INT		-	5.08	-	-	-	-	2.62	-	57	45	3.64	-
132179	NexGen	GAR-19-034	247	247.5	Waste Rock	UGTMF	INT	INT		-	8.06	-	-	-	-	4.31	-	52	48	2.85	-
132184	NexGen	GAR-19-034	297	297.5	Waste Rock	UGTMF	INT	INT		-	5.54	-	-	-	-	2.83	-	53	13	2.05	-
132189	NexGen	GAR-19-034	347	347.5	Waste Rock	UGTMF	INT	INT		-	6.96	-	-	-	-	3.61	-	51	24	2.68	-
132194	NexGen	GAR-19-034	397	397.5	Waste Rock	UGTMF	INT	INT		-	6.12	-	-	-	-	3.45	-	48	19	2.33	-
132199	NexGen	GAR-19-034	447	447.5	Waste Rock	UGTMF	INT	INT		-	6.13	-	-	-	-	2.42	-	55	14	2.28	-
132204	NexGen	GAR-19-034	497	497.5	Waste Rock	UGTMF	INT	INT		-	6.46	-	-	-	-	3.7	-	56	11	2.26	-
132245	NexGen	GAR-19-036	105	105.5	Waste Rock	UGTMF	INT	INT		-	2.37	-	-	-	-	2.85	-	67	63	2.65	-
128800	NexGen	GAR-19-033	143.65	144.15	Waste Rock	UGTMF	SPGN	SPGN		-	1.8	-	-	-	-	2.38	-	88	60	3.75	-
128805	NexGen	GAR-19-033	193.65	194.15	Waste Rock	UGTMF	SPGN	SPGN		-	8.22	-	-	-	-	4.95	-	42	42	3.1	-
128810	NexGen	GAR-19-033	243.65	244.15	Waste Rock	UGTMF	SPGN	SPGN		-	6.34	-	-	-	-	3.9	-	54	32	2.95	-
128815	NexGen	GAR-19-033	293.65	294.15	Waste Rock	UGTMF	SPGN	SPGN		-	5.97	-	-	-	-	3.41	-	39	117	6.08	-
128820	NexGen	GAR-19-033	344	344.5	Waste Rock	UGTMF	SPGN	SPGN		-	6.88	-	-	-	-	3.8	-	59	17	2.71	-
128825	NexGen	GAR-19-033	394	394.5	Waste Rock	UGTMF	SPGN	SPGN		-	6.12	-	-	-	-	4.77	-	54	27	2.28	-
132099	NexGen	GAR-19-032	166	166.5	Waste Rock	UGTMF	SPGN	SPGN		-	5.92	-	-	-	-	3.07	-	49	31	2.14	-
132104	NexGen	GAR-19-032	216	216.5	Waste Rock	UGTMF	SPGN	SPGN		-	6.82	-	-	-	-	4.04	-	43	40	3.31	-
132109	NexGen	GAR-19-032	266	266.5	Waste Rock	UGTMF	SPGN	SPGN		-	9.63	-	-	-	-	3.18	-	54	44	2.27	-
132114	NexGen	GAR-19-032	316	316.5	Waste Rock	UGTMF	SPGN	SPGN		-	9.04	-	-	-	-	5.84	-	54	39	3.4	-
132119	NexGen	GAR-19-032	366	366.5	Waste Rock	UGTMF	SPGN	SPGN		-	6.45	-	-	-	-	3.42	-	61	14	2.32	-
132129	NexGen	GAR-19-032	466	466.5	Waste Rock	UGTMF	SPGN	SPGN		-	7.61	-	-	-	-	3.98	-	49	19	2.84	-
132134	NexGen	GAR-19-032	516	516.5	Waste Rock	UGTMF	SPGN	SPGN		-	5.79	-	-	-	-	3.13	-	48	31	2.32	-
132139	NexGen	GAR-19-032	566	566.5	Waste Rock	UGTMF	SPGN	SPGN		-	6.22	-	-	-	-	3.22	-	57	23	2.28	-
128840	NexGen	GAR-19-033	544	544.5	Waste Rock	UGTMF	SPGN	SPGN		-	5.62	-	-	-	-	3.54	-	44	25	2.57	-
128845	NexGen	GAR-19-033	594	594.5	Waste Rock	UGTMF	SPGN	SPGN		-	7.19	-	-	-	-	4.22	-	41	26	2.71	-
128850	NexGen	GAR-19-033	644	644.5	Waste Rock	UGTMF	SPGN	SPGN		-	7.91	-	-	-	-	3.76	-	52	11	2.02	-
128855	NexGen	GAR-19-033	694	694.5	Waste Rock	UGTMF	SPGN	SPGN		-	8.08	-	-	-	-	3.72	-	47	24	2.65	-
132148	NexGen	GAR-19-032	666	666.5	Waste Rock	UGTMF	SPGN	SPGN		-	10.2	-	-	-	-	4.37	-	58	20	2.75	-
132153	NexGen	GAR-19-032	716	716.5	Waste Rock	UGTMF	SPGN	SPGN		-	5.19	-	-	-	-	2.75	-	39	8	1.3	-
128898	NexGen	GAR-19-035	329	329.5	Waste Rock	UGTMF	SPGN	SPGN		-	5.13	-	-	-	-	2.76	-	51	9	2.02	-
128903	NexGen	GAR-19-035	379	379.5	Waste Rock	UGTMF	SPGN	SPGN		-	5.86	-	-	-	-	4.49	-	52	16	2.11	-
128908	NexGen	GAR-19-035	429	429.5	Waste Rock	UGTMF	SPGN	SPGN		-	5.73	-	-	-	-	3.12	-	53	15	2.2	-
128913	NexGen	GAR-19-035	479	479.5	Waste Rock	UGTMF	SPGN	SPGN		-	4.34	-	-	-	-	1.98	-	72	18	2.23	-
132209	NexGen	GAR-19-034	547	547.5	Waste Rock	UGTMF	SPGN	SPGN		-	7.79	-	-	-	-	4.74	-	55	16	2.43	-
132214	NexGen	GAR-19-034	597	597.5	Waste Rock	UGTMF	SPGN	SPGN		-	6.66	-	-	-	-	3.44	-	45	20	2.18	-
132219	NexGen	GAR-19-034	647	647.5	Waste Rock	UGTMF	SPGN	SPGN		-	4.43	-	-	-	-	2.26	-	33	12	1.25	-
132224	NexGen	GAR-19-034	697	697.5	Waste Rock	UGTMF	SPGN	SPGN		-	5.43	-	-	-	-	3.14	-	40	7	1.29	-
132229	NexGen	GAR-19-034	747	747.5	Waste Rock	UGTMF	SPGN	SPGN		-	4.64	-	-	-	-	3.23	-	43	8	1.23	-
128919	NexGen	GAR-19-035	539	539.5	Waste Rock	UGTMF	SPGN	SPGN		-	6.4	-	-	-	-	3.51	-	64	15	2.36	-
128924	NexGen	GAR-19-035	589	589.5	Waste Rock	UGTMF	SPGN	SPGN		-	8	-	-	-	-	4.06	-	51	28	2.9	-
128929	NexGen	GAR-19-035	639	639.5	Waste Rock	UGTMF	SPGN	SPGN		-	4	-	-	-	-	1.92	-	36	20	1.54	-
128934	NexGen	GAR-19-035	689	689.5	Waste Rock	UGTMF	SPGN	SPGN		-	9.5	-	-	-	-	4.87	-	47	18	2.85	-

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4 Acid Digestion and ICP-OES finish											
									Analyte	MnO	MnO	Mo	Na_2O	Nb	Nd	Ni	P_2O_5	P_2O_5	Pb	Pr	S
									Units	wt. %	wt. %	ppm	wt. %	ppm	ppm	ppm	wt. %	wt. %	ppm	ppm	ppm
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion
									Detection Limit	0.001	0.01	1	0.01	1	1	1	0.002	0.01	1	1	10
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$
143123	NexGen	GAR-18-015	8.5	9	Waste Rock	Shaft Pilot Hole	OVB	OVB		0.002	-	-	0.12	-	-	-	0.02	-	-	-	42
143124	NexGen	GAR-18-015	11.5	12	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.007	-	-	0.62	-	-	-	0.025	-	-	-	177
143125	NexGen	GAR-18-015	32	32.5	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.012	-	-	0.19	-	-	-	0.023	-	-	-	1520
143126	NexGen	GAR-18-015	45	45.5	Waste Rock	Shaft Pilot Hole	CRET	CRET		0.009	-	-	0.12	-	-	-	0.032	-	-	-	810
143127	NexGen	GAR-18-015	56.5	57	Waste Rock	Shaft Pilot Hole	CRET	CRET		0.045	-	-	0.12	-	-	-	0.089	-	-	-	6720
143128	NexGen	GAR-18-015	66	66.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		0.004	-	-	0.04	-	-	-	0.031	-	-	-	114
143129	NexGen	GAR-18-015	72	72.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		0.003	-	-	0.03	-	-	-	0.028	-	-	-	397
143130	NexGen	GAR-18-015	80.5	81	Waste Rock	Shaft Pilot Hole	ASST	ASST		< 0.001	-	-	< 0.010	-	-	-	0.006	-	-	-	27
143131	NexGen	GAR-18-015	91	91.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		< 0.001	-	-	0.01	-	-	-	0.008	-	-	-	30
143132	NexGen	GAR-18-015	101	101.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.014	-	-	0.06	-	-	-	0.042	-	-	-	59
143133	NexGen	GAR-18-015	151	151.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.012	-	-	0.02	-	-	-	0.037	-	-	-	2880
143134	NexGen	GAR-18-015	201	201.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.07	-	-	1.48	-	-	-	0.071	-	-	-	1860
143135	NexGen	GAR-18-015	251	251.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.056	-	-	1.88	-	-	-	0.109	-	-	-	612
143136	NexGen	GAR-18-015	301	301.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.045	-	-	0.06	-	-	-	0.626	-	-	-	1680
143137	NexGen	GAR-18-015	351	351.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.079	-	-	1.74	-	-	-	0.05	-	-	-	1840
143138	NexGen	GAR-18-015	402	402.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.06	-	-	1.55	-	-	-	0.066	-	-	-	5800
143139	NexGen	GAR-18-015	452.5	453	Waste Rock	Shaft Pilot Hole	INT	INT		0.075	-	-	1.67	-	-	-	0.073	-	-	-	861
143140	NexGen	GAR-18-015	502	502.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.11	-	-	0.67	-	-	-	0.044	-	-	-	552
143141	NexGen	GAR-18-015	551	551.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.052	-	-	0.71	-	-	-	0.026	-	-	-	180
143142	NexGen	GAR-18-015	601	601.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.068	-	-	0.77	-	-	-	0.052	-	-	-	167
143143	NexGen	GAR-18-015	651	651.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.054	-	-	0.2	-	-	-	0.038	-	-	-	244
143144	NexGen	GAR-18-015	699.75	700.25	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.015	-	-	0.09	-	-	-	0.028	-	-	-	500
128830	NexGen	GAR-19-033	444	444.5	Waste Rock	UGTMF	INT	INT		0.062	-	-	1.81	-	-	-	0.069	-	-	-	1610
132124	NexGen	GAR-19-032	416	416.5	Waste Rock	UGTMF	INT	INT		0.08	-	-	1.28	-	-	-	0.061	-	-	-	1100
132144	NexGen	GAR-19-032	616	616.5	Waste Rock	UGTMF	INT	INT		0.058	-	-	1.14	-	-	-	0.069	-	-	-	4780
128835	NexGen	GAR-19-033	494	494.5	Waste Rock	UGTMF	INT	INT		0.076	-	-	1.67	-	-	-	0.069	-	-	-	391
128860	NexGen	GAR-19-033	744	744.5	Waste Rock	UGTMF	INT	INT		0.044	-	-	1.59	-	-	-	0.055	-	-	-	1230
128874	NexGen	GAR-19-035	129	129.5	Waste Rock	UGTMF	INT	INT		0.005	-	-	0.12	-	-	-	0.106	-	-	-	110
128883	NexGen	GAR-19-035	179	179.5	Waste Rock	UGTMF	INT	INT		0.029	-	-	0.52	-	-	-	0.067	-	-	-	2580
128888	NexGen	GAR-19-035	229	229.5	Waste Rock	UGTMF	INT	INT		0.091	-	-	1.68	-	-	-	0.098	-	-	-	986
128893	NexGen	GAR-19-035	279	279.5	Waste Rock	UGTMF	INT	INT		0.075	-	-	1.94	-	-	-	0.071	-	-	-	4500
132169	NexGen	GAR-19-034	147	147.5	Waste Rock	UGTMF	INT	INT		0.015	-	-	0.11	-	-	-	0.115	-	-	-	126
132174	NexGen	GAR-19-034	197	197.5	Waste Rock	UGTMF	INT	INT		0.038	-	-	1.28	-	-	-	0.102	-	-	-	142
132179	NexGen	GAR-19-034	247	247.5	Waste Rock	UGTMF	INT	INT		0.062	-	-	1.2	-	-	-	0.074	-	-	-	11000
132184	NexGen	GAR-19-034	297	297.5	Waste Rock	UGTMF	INT	INT		0.075	-	-	1.92	-	-	-	0.094	-	-	-	2630
132189	NexGen	GAR-19-034	347	347.5	Waste Rock	UGTMF	INT	INT		0.086	-	-	1.78	-	-	-	0.086	-	-	-	1910
132194	NexGen	GAR-19-034	397	397.5	Waste Rock	UGTMF	INT	INT		0.086	-	-	1.79	-	-	-	0.104	-	-	-	1100
132199	NexGen	GAR-19-034	447	447.5	Waste Rock	UGTMF	INT	INT		0.094	-	-	1.68	-	-	-	0.088	-	-	-	907
132204	NexGen	GAR-19-034	497	497.5	Waste Rock	UGTMF	INT	INT		0.084	-	-	1.77	-	-	-	0.084	-	-	-	987
132245	NexGen	GAR-19-036	105	105.5	Waste Rock	UGTMF	INT	INT		0.006	-	-	0.03	-	-	-	0.061	-	-	-	51
128800	NexGen	GAR-19-033	143.65	144.15	Waste Rock	UGTMF	SPGN	SPGN		0.004	-	-	0.05	-	-	-	0.1	-	-	-	112
128805	NexGen	GAR-19-033	193.65	194.15	Waste Rock	UGTMF	SPGN	SPGN		0.07	-	-	1.25	-	-	-	0.07	-	-	-	8440
128810	NexGen	GAR-19-033	243.65	244.15	Waste Rock	UGTMF	SPGN	SPGN		0.066	-	-	1.54	-	-	-	0.07	-	-	-	1080
128815	NexGen	GAR-19-033	293.65	294.15	Waste Rock	UGTMF	SPGN	SPGN		0.023	-	-	0.08	-	-	-	0.073	-	-	-	8680
128820	NexGen	GAR-19-033	344	344.5	Waste Rock	UGTMF	SPGN	SPGN		0.082	-	-	1.89	-	-	-	0.083	-	-	-	1580
128825	NexGen	GAR-19-033	394	394.5	Waste Rock	UGTMF	SPGN	SPGN		0.077	-	-	1.57	-	-	-	0.066	-	-	-	1910
132099	NexGen	GAR-19-032	166	166.5	Waste Rock	UGTMF	SPGN	SPGN		0.066	-	-	0.52	-	-	-	0.058	-	-	-	638
132104	NexGen	GAR-19-032	216	216.5	Waste Rock	UGTMF	SPGN	SPGN		0.052	-	-	0.41	-	-	-	0.052	-	-	-	2540
132109	NexGen	GAR-19-032	266	266.5	Waste Rock	UGTMF	SPGN	SPGN		0.034	-	-	1.04	-	-	-	0.061	-	-	-	26600
132114	NexGen	GAR-19-032	316	316.5	Waste Rock	UGTMF	SPGN	SPGN		0.065	-	-	1.04	-	-	-	0.074	-	-	-	9250
132119	NexGen	GAR-19-032	366	366.5	Waste Rock	UGTMF	SPGN	SPGN		0.085	-	-	1.95	-	-	-	0.071	-	-	-	3810
132129	NexGen	GAR-19-032	466	466.5	Waste Rock	UGTMF	SPGN	SPGN		0.098	-	-	2.01	-	-	-	0.071	-	-	-	2020
132134	NexGen	GAR-19-032	516	516.5	Waste Rock	UGTMF	SPGN	SPGN		0.077	-	-	1.56	-	-	-	0.082	-	-	-	707
132139	NexGen	GAR-19-032	566	566.5	Waste Rock	UGTMF	SPGN	SPGN		0.076	-	-	1.75	-	-	-	0.073	-	-	-	2090
128840	NexGen	GAR-19-033	544	544.5	Waste Rock	UGTMF	SPGN	SPGN		0.032	-	-	0.94	-	-	-	0.067	-	-	-	2310
128845	NexGen	GAR-19-033	594	594.5	Waste Rock	UGTMF	SPGN	SPGN		0.058	-	-	0.46	-	-	-	0.046	-	-	-	219
128850	NexGen	GAR-19-033	644	644.5	Waste Rock	UGTMF	SPGN	SPGN		0.073	-	-	0.47	-	-	-	0.041	-	-	-	70
128855	NexGen	GAR-19-033	694	694.5	Waste Rock	UGTMF	SPGN	SPGN		0.097	-	-	0.23	-	-	-	0.039	-	-	-	610
132148	NexGen	GAR-19-032	666	666.5	Waste Rock	UGTMF	SPGN	SPGN		0.097	-	-	0.49	-	-	-	0.038	-	-	-	43
132153	NexGen	GAR-19-032	716	716.5	Waste Rock	UGTMF	SPGN	SPGN		0.046	-	-	0.37	-	-	-	0.026	-	-	-	187
128898	NexGen	GAR-19-035	329	329.5	Waste Rock	UGTMF	SPGN	SPGN		0.077	-	-	1.84	-	-	-	0.06	-	-	-	336
128903	NexGen	GAR-19-035	379	379.5	Waste Rock	UGTMF	SPGN	SPGN		0.072	-	-	1.79	-	-	-	0.074	-	-	-	3710
128908	NexGen	GAR-19-035	429	429.5	Waste Rock	UGTMF	SPGN	SPGN		0.075	-	-	1.81	-	-	-	0.061	-	-	-	1140
128913	NexGen	GAR-19-035	479	479.5	Waste Rock	UGTMF	SPGN	SPGN		0.044	-	-	2.18	-	-	-	0.065	-	-	-	286
132209	NexGen	GAR-19-034	547	547.5	Waste Rock	UGTMF	SPGN	SPGN		0.138	-	-	0.32	-	-	-	0.047	-	-	-	775
132214	NexGen	GAR-19-034	597	597.5	Waste Rock	UGTMF	SPGN	SPGN		0.058	-	-	0.35	-	-	-	0.033	-	-	-	253
132219	NexGen	GAR-19-034	647	647.5	Waste Rock	UGTMF	SPGN	SPGN		0.05	-	-	0.26	-	-	-	0.031	-	-	-	715
132224	NexGen	GAR-19-034	697	697.5	Waste Rock	UGTMF	SPGN	SPGN		0.058	-	-	0.72	-	-	-	0.029	-	-	-	397
132229	NexGen	GAR-19-034	747	747.5	Waste Rock	UGTMF	SPGN	SPGN		0.046	-	-	0.7	-	-	-	0.034	-	-	-	254
128919	NexGen	GAR-19-035	539	539.5	Waste Rock	UGTMF	SPGN	SPGN		0.076	-	-	1.68	-	-	-	0.073	-	-	-	2560
128924	NexGen	GAR-19-035	589	589.5	Waste Rock	UGTMF	SPGN	SPGN		0.093	-	-	1.49	-	-	-	0.068	-	-	-	5950
128929	NexGen	GAR-19-035	639	639.5	Waste Rock	UGTMF	SPGN	SPGN		0.012	-	-	0.11	-	-	-	0.019	-	-	-	66
128934	NexGen	GAR-19-035	689	689.5	Waste Rock	UGTMF	SPGN	SPGN		0.073	-	-	0.26	-	-	-	0.031	-	-	-	130

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4 Acid Digestion and ICP-OES finish											
									Analyte	Sc	Sm	Sn	Sr	Ta	Tb	Th	TiO_2	TiO_2	U	V	W
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	wt. %	wt. %	ppm	ppm	ppm
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion
									Detection Limit	1	1	1	1	1	1	1	0.002	0.01	2	0.1	1
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$
143123	NexGen	GAR-18-015	8.5	9	Waste Rock	Shaft Pilot Hole	OVB	OVB		-	-	-	86	-	-	-	0.053	-	-	4.2	-
143124	NexGen	GAR-18-015	11.5	12	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	-	-	103	-	-	-	0.291	-	-	24	-
143125	NexGen	GAR-18-015	32	32.5	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	-	-	41	-	-	-	0.687	-	-	42.4	-
143126	NexGen	GAR-18-015	45	45.5	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	-	-	49	-	-	-	0.533	-	-	45.9	-
143127	NexGen	GAR-18-015	56.5	57	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	-	-	130	-	-	-	0.813	-	-	125	-
143128	NexGen	GAR-18-015	66	66.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	-	-	71	-	-	-	0.413	-	-	60.7	-
143129	NexGen	GAR-18-015	72	72.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	-	-	64	-	-	-	0.242	-	-	37.6	-
143130	NexGen	GAR-18-015	80.5	81	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	-	-	14	-	-	-	0.046	-	-	1.2	-
143131	NexGen	GAR-18-015	91	91.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	-	-	17	-	-	-	0.1	-	-	1.8	-
143132	NexGen	GAR-18-015	101	101.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	88	-	-	-	0.673	-	-	75.8	-
143133	NexGen	GAR-18-015	151	151.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	15	-	-	-	0.332	-	-	49.5	-
143134	NexGen	GAR-18-015	201	201.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	111	-	-	-	0.636	-	-	96.4	-
143135	NexGen	GAR-18-015	251	251.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	137	-	-	-	0.679	-	-	85.2	-
143136	NexGen	GAR-18-015	301	301.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	26	-	-	-	0.392	-	-	60	-
143137	NexGen	GAR-18-015	351	351.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	128	-	-	-	0.49	-	-	76.5	-
143138	NexGen	GAR-18-015	402	402.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	121	-	-	-	0.45	-	-	72.5	-
143139	NexGen	GAR-18-015	452.5	453	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	161	-	-	-	0.478	-	-	73.9	-
143140	NexGen	GAR-18-015	502	502.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	71	-	-	-	0.71	-	-	104	-
143141	NexGen	GAR-18-015	551	551.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	92	-	-	-	0.555	-	-	70.9	-
143142	NexGen	GAR-18-015	601	601.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	60	-	-	-	0.774	-	-	112	-
143143	NexGen	GAR-18-015	651	651.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	26	-	-	-	0.663	-	-	82.1	-
143144	NexGen	GAR-18-015	699.75	700.25	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	15	-	-	-	0.45	-	-	52.7	-
128830	NexGen	GAR-19-033	444	444.5	Waste Rock	UGTMF	INT	INT		-	-	-	151	-	-	-	0.64	-	-	95	-
132124	NexGen	GAR-19-032	416	416.5	Waste Rock	UGTMF	INT	INT		-	-	-	131	-	-	-	0.556	-	-	79.6	-
132144	NexGen	GAR-19-032	616	616.5	Waste Rock	UGTMF	INT	INT		-	-	-	94	-	-	-	0.72	-	-	108	-
128835	NexGen	GAR-19-033	494	494.5	Waste Rock	UGTMF	INT	INT		-	-	-	391	-	-	-	0.43	-	-	69.6	-
128860	NexGen	GAR-19-033	744	744.5	Waste Rock	UGTMF	INT	INT		-	-	-	1230	-	-	-	0.544	-	-	71.3	-
128874	NexGen	GAR-19-035	129	129.5	Waste Rock	UGTMF	INT	INT		-	-	-	200	-	-	-	0.806	-	-	130	-
128883	NexGen	GAR-19-035	179	179.5	Waste Rock	UGTMF	INT	INT		-	-	-	60	-	-	-	0.634	-	-	90.6	-
128888	NexGen	GAR-19-035	229	229.5	Waste Rock	UGTMF	INT	INT		-	-	-	154	-	-	-	0.649	-	-	93.8	-
128893	NexGen	GAR-19-035	279	279.5	Waste Rock	UGTMF	INT	INT		-	-	-	152	-	-	-	0.674	-	-	97.9	-
132169	NexGen	GAR-19-034	147	147.5	Waste Rock	UGTMF	INT	INT		-	-	-	230	-	-	-	0.776	-	-	112	-
132174	NexGen	GAR-19-034	197	197.5	Waste Rock	UGTMF	INT	INT		-	-	-	96	-	-	-	0.626	-	-	96.2	-
132179	NexGen	GAR-19-034	247	247.5	Waste Rock	UGTMF	INT	INT		-	-	-	86	-	-	-	0.779	-	-	130	-
132184	NexGen	GAR-19-034	297	297.5	Waste Rock	UGTMF	INT	INT		-	-	-	162	-	-	-	0.534	-	-	86	-
132189	NexGen	GAR-19-034	347	347.5	Waste Rock	UGTMF	INT	INT		-	-	-	174	-	-	-	0.666	-	-	118	-
132194	NexGen	GAR-19-034	397	397.5	Waste Rock	UGTMF	INT	INT		-	-	-	198	-	-	-	0.695	-	-	99.7	-
132199	NexGen	GAR-19-034	447	447.5	Waste Rock	UGTMF	INT	INT		-	-	-	153	-	-	-	0.595	-	-	89.5	-
132204	NexGen	GAR-19-034	497	497.5	Waste Rock	UGTMF	INT	INT		-	-	-	182	-	-	-	0.561	-	-	97.4	-
132245	NexGen	GAR-19-036	105	105.5	Waste Rock	UGTMF	INT	INT		-	-	-	149	-	-	-	0.534	-	-	74.9	-
128800	NexGen	GAR-19-033	143.65	144.15	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	188	-	-	-	0.563	-	-	99.6	-
128805	NexGen	GAR-19-033	193.65	194.15	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	72	-	-	-	0.725	-	-	135	-
128810	NexGen	GAR-19-033	243.65	244.15	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	136	-	-	-	0.658	-	-	98.3	-
128815	NexGen	GAR-19-033	293.65	294.15	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	25	-	-	-	0.692	-	-	126	-
128820	NexGen	GAR-19-033	344	344.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	153	-	-	-	0.697	-	-	111	-
128825	NexGen	GAR-19-033	394	394.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	197	-	-	-	0.559	-	-	95.3	-
132099	NexGen	GAR-19-032	166	166.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	50	-	-	-	0.453	-	-	72	-
132104	NexGen	GAR-19-032	216	216.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	35	-	-	-	0.707	-	-	104	-
132109	NexGen	GAR-19-032	266	266.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	55	-	-	-	0.602	-	-	112	-
132114	NexGen	GAR-19-032	316	316.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	96	-	-	-	1.03	-	-	170	-
132119	NexGen	GAR-19-032	366	366.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	137	-	-	-	0.592	-	-	97.9	-
132129	NexGen	GAR-19-032	466	466.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	176	-	-	-	0.804	-	-	121	-
132134	NexGen	GAR-19-032	516	516.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	151	-	-	-	0.618	-	-	93.5	-
132139	NexGen	GAR-19-032	566	566.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	137	-	-	-	0.647	-	-	91.8	-
128840	NexGen	GAR-19-033	544	544.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	2310	-	-	-	0.595	-	-	77.4	-
128845	NexGen	GAR-19-033	594	594.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	219	-	-	-	0.813	-	-	124	-
128850	NexGen	GAR-19-033	644	644.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	70	-	-	-	0.838	-	-	114	-
128855	NexGen	GAR-19-033	694	694.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	610	-	-	-	0.965	-	-	134	-
132148	NexGen	GAR-19-032	666	666.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	43	-	-	-	1.03	-	-	130	-
132153	NexGen	GAR-19-032	716	716.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	187	-	-	-	0.551	-	-	65	-
128898	NexGen	GAR-19-035	329	329.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	150	-	-	-	0.505	-	-	75.4	-
128903	NexGen	GAR-19-035	379	379.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	148	-	-	-	0.608	-	-	91.3	-
128908	NexGen	GAR-19-035	429	429.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	130	-	-	-	0.573	-	-	86.8	-
128913	NexGen	GAR-19-035	479	479.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	109	-	-	-	0.441	-	-	65.9	-
132209	NexGen	GAR-19-034	547	547.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	46	-	-	-	0.878	-	-	126	-
132214	NexGen	GAR-19-034	597	597.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	45	-	-	-	0.751	-	-	102	-
132219	NexGen	GAR-19-034	647	647.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	26	-	-	-	0.446	-	-	60.8	-
132224	NexGen	GAR-19-034	697	697.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	75	-	-	-	0.5	-	-	64.2	-
132229	NexGen	GAR-19-034	747	747.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	73	-	-	-	0.492	-	-	62.6	-
128919	NexGen	GAR-19-035	539	539.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	152	-	-	-	0.73	-	-	104	-
128924	NexGen	GAR-19-035	589	589.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	111	-	-	-	0.656	-	-	123	-
128929	NexGen	GAR-19-035	639	639.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	21	-	-	-	0.568	-	-	71.9	-
128934	NexGen	GAR-19-035	689	689.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	42	-	-	-	1.18	-	-	159	-

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4 Acid Digestion and ICP-OES finish				Partial -- Aqua Regia Digestion and ICP-MS finish											
									Analyte	Y	Yb	Zn	Zr	Ag	As	Be	Bi	Cd	Co	Cs	Cu	Dy	Er	Eu	Ga
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-OES Total Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion
									Detection Limit	1	0.1	1	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	$HF/HNO_3/HClO4$	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl
143123	NexGen	GAR-18-015	8.5	9	Waste Rock	Shaft Pilot Hole	OVB	OVB		-	-	-	88	0.51	0.28	0.03	0.1	< 0.0100	0.37	0.03	1.61	0.17	0.09	0.05	0.22
143124	NexGen	GAR-18-015	11.5	12	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	-	-	102	1.2	0.77	0.28	0.04	0.04	5.32	0.31	4.49	0.7	0.32	0.23	0.69
143125	NexGen	GAR-18-015	32	32.5	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	-	-	153	0.07	1.09	0.38	0.05	0.05	4.77	0.4	8.28	0.69	0.32	0.26	1.12
143126	NexGen	GAR-18-015	45	45.5	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	-	-	172	0.06	1.26	0.28	0.06	0.05	5.26	0.26	6.41	0.84	0.36	0.35	1.28
143127	NexGen	GAR-18-015	56.5	57	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	-	-	159	0.07	10.9	1.01	0.3	0.07	10.2	0.35	16.3	3.5	1.61	1.13	2.76
143128	NexGen	GAR-18-015	66	66.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	-	-	170	0.03	0.17	0.14	0.04	< 0.0100	0.19	0.1	5.27	0.28	0.13	0.09	0.54
143129	NexGen	GAR-18-015	72	72.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	-	-	129	< 0.0100	0.33	0.11	0.02	< 0.0100	0.6	0.06	11.6	0.24	0.11	0.07	0.38
143130	NexGen	GAR-18-015	80.5	81	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	-	-	121	< 0.0100	0.15	0.02	< 0.0100	< 0.0100	0.04	< 0.0100	4.12	0.07	0.04	0.02	0.13
143131	NexGen	GAR-18-015	91	91.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	-	-	146	< 0.0100	0.2	0.03	0.02	< 0.0100	0.08	< 0.0100	1.86	0.11	0.06	0.03	0.16
143132	NexGen	GAR-18-015	101	101.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	201	< 0.0100	0.48	0.24	0.01	0.01	0.6	0.06	1.14	0.13	0.06	0.1	0.44
143133	NexGen	GAR-18-015	151	151.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	153	0.02	0.59	0.4	0.08	0.02	7.6	0.06	9.63	0.66	0.25	0.52	3.43
143134	NexGen	GAR-18-015	201	201.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	331	0.04	0.34	0.12	0.03	0.02	9.84	0.28	8.03	0.89	0.38	0.47	3.55
143135	NexGen	GAR-18-015	251	251.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	306	0.04	2.13	0.2	0.08	0.3	10.5	0.4	7.52	1.45	0.75	0.43	4.08
143136	NexGen	GAR-18-015	301	301.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	136	0.08	1	0.34	0.13	0.06	13.8	0.32	23.9	2.43	1.22	0.62	3.98
143137	NexGen	GAR-18-015	351	351.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	186	0.06	1.15	0.09	0.03	0.06	10.4	0.28	19.2	1.37	0.6	0.38	2.99
143138	NexGen	GAR-18-015	402	402.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	244	0.13	0.32	0.06	0.07	0.05	11.8	0.08	71.1	0.76	0.35	0.23	1.86
143139	NexGen	GAR-18-015	452.5	453	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	206	0.03	1.98	0.06	0.01	0.05	7.95	0.13	11.8	0.75	0.4	0.18	1.97
143140	NexGen	GAR-18-015	502	502.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	220	0.02	0.79	0.02	0.06	0.02	11.9	0.66	9.52	0.93	0.47	0.35	3.18
143141	NexGen	GAR-18-015	551	551.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	347	< 0.0100	0.78	0.02	0.02	< 0.0100	6.96	1.22	3.47	0.91	0.32	0.4	2.69
143142	NexGen	GAR-18-015	601	601.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	243	0.01	7.49	0.02	0.05	0.02	12.3	0.43	7.16	0.65	0.28	0.33	3.81
143143	NexGen	GAR-18-015	651	651.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	247	< 0.0100	0.31	0.2	0.08	< 0.0100	8.91	1.1	2.9	0.48	0.19	0.34	2.98
143144	NexGen	GAR-18-015	699.75	700.25	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	263	< 0.0100	0.74	0.09	0.05	0.01	8.21	0.11	13.1	0.22	0.1	0.15	2.07
128830	NexGen	GAR-19-033	444	444.5	Waste Rock	UGTMF	INT	INT		-	-	-	198	0.03	0.16	0.08	0.02	0.02	9.93	0.87	13.2	1.99	0.66	0.57	3.72
132124	NexGen	GAR-19-032	416	416.5	Waste Rock	UGTMF	INT	INT		-	-	-	188	0.03	0.02	0.04	0.02	0.04	8.45	0.4	10.1	1.6	0.66	0.36	2.35
132144	NexGen	GAR-19-032	616	616.5	Waste Rock	UGTMF	INT	INT		-	-	-	215	0.09	< 0.0100	0.17	0.05	0.06	13.7	1.47	39.2	1.11	0.42	0.34	4.65
128835	NexGen	GAR-19-033	494	494.5	Waste Rock	UGTMF	INT	INT		-	-	-	247	0.02	0.2	0.05	0.01	0.02	5.51	0.09	3.88	0.5	0.23	0.17	1.54
128860	NexGen	GAR-19-033	744	744.5	Waste Rock	UGTMF	INT	INT		-	-	-	224	0.02	0.27	0.1	0.04	0.02	6.79	0.45	13	0.9	0.4	0.32	3.57
128874	NexGen	GAR-19-035	129	129.5	Waste Rock	UGTMF	INT	INT		-	-	-	206	0.01	0.53	0.23	0.05	< 0.0100	1.32	0.18	0.7	0.61	0.3	0.15	0.98
128883	NexGen	GAR-19-035	179	179.5	Waste Rock	UGTMF	INT	INT		-	-	-	193	0.02	2.66	0.37	0.16	0.02	13.9	0.4	13.6	0.82	0.29	0.42	3.86
128888	NexGen	GAR-19-035	229	229.5	Waste Rock	UGTMF	INT	INT		-	-	-	262	0.02	0.95	0.08	0.03	0.02	10.1	0.5	7.69	1.33	0.59	0.42	2.97
128893	NexGen	GAR-19-035	279	279.5	Waste Rock	UGTMF	INT	INT		-	-	-	186	0.07	0.44	0.05	0.04	0.03	12.7	0.63	35.6	1.36	0.52	0.43	3.29
132169	NexGen	GAR-19-034	147	147.5	Waste Rock	UGTMF	INT	INT		-	-	-	198	0.02	0.4	0.3	0.04	< 0.0100	1.51	0.12	0.82	0.66	0.36	0.2	1.24
132174	NexGen	GAR-19-034	197	197.5	Waste Rock	UGTMF	INT	INT		-	-	-	288	< 0.0100	0.34	0.59	0.05	0.01	7.63	0.36	1.32	1.1	0.38	0.63	3.64
132179	NexGen	GAR-19-034	247	247.5	Waste Rock	UGTMF	INT	INT		-	-	-	165	0.13	0.49	0.13	0.12	0.02	18.5	0.44	87.3	3.32	1.74	0.83	4.78
132184	NexGen	GAR-19-034	297	297.5	Waste Rock	UGTMF	INT	INT		-	-	-	211	0.04	0.3	0.05	0.02	0.06	10.7	0.22	21	1.28	0.71	0.33	2.68
132189	NexGen	GAR-19-034	347	347.5	Waste Rock	UGTMF	INT	INT		-	-	-	188	0.04	1.42	0.04	0.03	0.05	12	0.35	19.9	1.17	0.57	0.31	3.91
132194	NexGen	GAR-19-034	397	397.5	Waste Rock	UGTMF	INT	INT		-	-	-	224	0.04	0.7	0.05	0.02	0.05	11.2	0.23	14	1.02	0.54	0.25	3.06
132199	NexGen	GAR-19-034	447	447.5	Waste Rock	UGTMF	INT	INT		-	-	-	200	0.03	0.85	0.06	0.01	0.09	8.08	0.2	11.2	0.88	0.45	0.18	2.15
132204	NexGen	GAR-19-034	497	497.5	Waste Rock	UGTMF	INT	INT		-	-	-	214	0.04	0.5	0.06	0.01	0.02	6.93	0.09	13.3	0.56	0.33	0.13	1.37
132245	NexGen	GAR-19-036	105	105.5	Waste Rock	UGTMF	INT	INT		-	-	-	248	< 0.0100	0.04	0.23	0.02	< 0.0100	0.55	0.06	0.73	0.08	0.05	0.08	0.4
128800	NexGen	GAR-19-033	143.65	144.15	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	243	0.03	5.89	0.46	0.17	0.05	7.01	0.05	8.17	0.5	0.23	0.26	2.24
128805	NexGen	GAR-19-033	193.65	194.15	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	192	0.11	0.48	0.22	0.18	0.02	20.8	0.49	46.7	1.52	0.61	0.48	4.81
128810	NexGen	GAR-19-033	243.65	244.15	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	209	0.03	0.6	0.18	0.07	0.02	10.9	0.79	14	1.83	0.65	0.61	3.66
128815	NexGen	GAR-19-033	293.65	294.15	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	295	0.05	3.28	0.94	1.8	0.03	22.5	0.08	742	0.58	0.21	0.2	4.13
128820	NexGen	GAR-19-033	344	344.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	227	0.04	0.54	0.06	0.04	0.03	10.7	0.31	21.8	1.87	0.69	0.56	3.19
128825	NexGen	GAR-19-033	394	394.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	168	0.11	0.85	0.08	0.03	0.25	11.1	0.23	19.4	1.71	0.92	0.42	2.61
132099	NexGen	GAR-19-032	166	166.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	160	< 0.0100	0.34	0.26	0.02	0.02	7.51	0.42	3.08	1.19	0.36	0.6	3.06
132104	NexGen	GAR-19-032	216	216.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	233	0.03	0.27	0.38	0.13	0.02	9.26	0.52	10.8	0.65	0.3	0.27	4.75
132109	NexGen	GAR-19-032	266	266.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	168	0.2	0.28	0.18	0.26	0.04	23.9	0.15	122	1.26	0.31	0.36	4.29
132114	NexGen	GAR-19-032	316	316.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	201	0.15	0.43	0.1	0.13	0.03	26.2	0.54	44.4	2.26	0.9	0.62	6.2
132119	NexGen	GAR-19-032	366	366.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	201	0.05	< 0.0100	0.1	0.05	0.02	10.1	0.73	13.6	1.68	0.54	0.59	3.16
132129	NexGen	GAR-19-032	466	466.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	187	0.06	0.38	0.08	0.02	0.11	12	0.34	23.1	0.67	0.3	0.24	3.19
132134	NexGen	GAR-19-032	516	516.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	181	0.03	< 0.0100	0.1	0.01	0.06	9.42	0.33	8.04	2.11	0.88	0.57	3.32
132139	NexGen	GAR-19-032	566	566.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	259	0.05	< 0.0100	0.14	0.04	0.09	11.2	0.83	27.6	1.55	0.62	0.45	3.16
128840	NexGen	GAR-19-033	544	544.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	182	0.03	0.19	0.27	0.03	< 0.0100	8.34	0.71	27.5	0.59	0.23	0.21	3.24
128845	NexGen	GAR-19-033	594	594.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	229	0.01	0.7	0.23	0.11	0.01	7.3	0.49	4.12	0.99	0.43	0.39	3.18
128850	NexGen	GAR-19-033	644	644.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	249	0.01	1.5	0.02	0.04	0.02	7.32	0.35	4.5	0.9	0.33	0.52	2.68
128855	NexGen	GAR-19-033	694	694.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	263	0.01	2.08	0.22	0.04	0.01	10.7	0.28	9.61	0.85	0.36	0.39	3.31
132148	NexGen	GAR-19-032	666	666.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	264	< 0.0100	0.52	0.01	< 0.0100	< 0.0100	6.77	0.26	3.2	0.5	0.24	0.34	2.53
132153	NexGen	GAR-19-032	716	716.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	330	0.01	< 0.0100	< 0.0100	< 0.0100	0.02	3.27	0.1	14.1	0.28	0.15	0.15	0.92
128898	NexGen	GAR-19-035	329	329.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	249	0.01	0.42	0.03	0.02	< 0.0100	7.77	0.39	4.21	2	0.81	0.5	3.04
128903	NexGen	GAR-19-035	379	379.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	238	0.08	0.76	0.07	0.04	0.06	13.2	0.3	25.4	0.5	0.22	0.2	2.6
128908	NexGen	GAR-19-035	429	429.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	247	0.04	0.72	0.08	0.02	0.02	9.17	0.22	8.87	1.13	0.57	0.31	3.3
128913	NexGen	GAR-19-035	479	479.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	242	< 0.0100	0.32	0.23	0.02	< 0.0100	6.6	0.34	2.66	1.11	0.46	0.37	2.93
132209	NexGen	GAR-19-034	547	547.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	232	0.01	1.57	0.05	0.09	0.01	14.4	0.81	8.77	0.86	0.41	0.35	3.52
132214	NexGen	GAR-19-034	597	597.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	255	< 0.0100	1.28	0.14	0.12	0.01	9.03	0.83	8.45	0.69	0.33	0.34	3.16
132219	NexGen	GAR-19-034	647	647.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	279	0.02	1.22	< 0.0100	0.05	0.03	7.55	0.19	14.1	0.65	0.3	0.31	2.62
132224	NexGen	GAR-19-034	697	697.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	285	0.02	0.25	< 0.0100	0.02	0.02	5.66	0.11	19.1	0.36	0.19	0.18	1.25
132229	NexGen	GAR-19-034	747	747.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	273	0.02	1.83	0.01	0.04	0.03	6.86	0.16	15.7	0.31	0.14	0.22	1.63
128919	NexGen	GAR-19-035	539	539.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	191	0.04	0.03	0.06	0.03	< 0.0100	10.3	0.64	19.4	1.88	0.98	0.57	3.09
128924	NexGen	GAR-19-035	589	589.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	196	0.09	0.27	0.12	0.07	0.07	13.1	0.28	39	1.85	0.9	0.48	3.85
128929	NexGen	GAR-19-035	639	639.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	239	< 0.0100	0.2	0.08	0.04	< 0.0100	5.23	0.09	2.2	0.51	0.2	0.44	1.99
128934	NexGen	GAR-19-035	689	689.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	271	< 0.0100	2.75	0.07	0.04	< 0.0100	9.56	0.5	5.4	0.56	0.23	0.38	3.35

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping	Analyte	Gd	Ge	Hf	Hg	Ho	Mo	Nb	Nd	Ni	Pb204	Pb206	Pb207	Pb208	PbSUM	Pr	Rb	Sb	Sc
										Partial -- Aqua Regia Digestion and ICP-MS finish																	
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion
									Detection Limit	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.001	0.001	0.001	0.001	0.001	0.01	0.01	0.01	0.1
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl
143123	NexGen	GAR-18-015	8.5	9	Waste Rock	Shaft Pilot Hole	OVB	OVB		0.31	< 0.0100	0.07	< 0.0100	0.03	0.08	< 0.0100	1.91	0.66	0.007	0.146	0.104	0.279	0.537	0.54	0.84	< 0.0100	0.1
143124	NexGen	GAR-18-015	11.5	12	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.97	< 0.0100	0.24	0.03	0.12	0.16	0.03	6.34	6.03	0.043	0.778	0.659	1.63	3.12	1.64	4.03	0.02	0.8
143125	NexGen	GAR-18-015	32	32.5	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.91	< 0.0100	0.31	0.04	0.12	0.18	0.04	5.68	6.58	0.066	1.12	0.965	2.35	4.5	1.5	5.62	0.03	1
143126	NexGen	GAR-18-015	45	45.5	Waste Rock	Shaft Pilot Hole	CRET	CRET		1.49	< 0.0100	0.22	0.01	0.13	0.1	0.02	8.51	7.94	0.062	1.01	0.856	2.15	4.08	2.28	5.64	< 0.0100	1.3
143127	NexGen	GAR-18-015	56.5	57	Waste Rock	Shaft Pilot Hole	CRET	CRET		5.33	< 0.0100	0.22	0.06	0.59	0.24	0.05	26	20.3	0.207	3.31	2.83	7.17	13.5	6.53	12.9	< 0.0100	5.5
143128	NexGen	GAR-18-015	66	66.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		0.46	< 0.0100	0.24	< 0.0100	0.05	0.06	< 0.0100	2.71	1.26	0.015	0.29	0.212	0.592	1.11	0.72	2.73	< 0.0100	1.8
143129	NexGen	GAR-18-015	72	72.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		0.33	< 0.0100	0.12	< 0.0100	0.04	0.11	< 0.0100	1.39	5.5	0.019	0.387	0.27	0.724	1.4	0.37	1.52	0.01	1.3
143130	NexGen	GAR-18-015	80.5	81	Waste Rock	Shaft Pilot Hole	ASST	ASST		0.12	< 0.0100	0.08	< 0.0100	0.01	0.06	< 0.0100	1.08	0.17	0.004	0.152	0.069	0.19	0.415	0.33	0.12	< 0.0100	< 0.1000
143131	NexGen	GAR-18-015	91	91.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		0.19	< 0.0100	0.1	< 0.0100	0.02	0.1	< 0.0100	1.86	0.19	0.005	0.14	0.065	0.194	0.404	0.52	0.12	< 0.0100	< 0.1000
143132	NexGen	GAR-18-015	101	101.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.39	< 0.0100	0.21	< 0.0100	0.02	0.19	< 0.0100	3.98	4.2	0.01	0.279	0.154	0.642	1.09	1.16	1.2	< 0.0100	0.5
143133	NexGen	GAR-18-015	151	151.5	Waste Rock	Shaft Pilot Hole	INT	INT		1.8	< 0.0100	0.22	0.01	0.09	0.52	< 0.0100	15.1	26.7	0.035	0.842	0.548	1.54	2.97	4.16	4.08	< 0.0100	2.4
143134	NexGen	GAR-18-015	201	201.5	Waste Rock	Shaft Pilot Hole	INT	INT		1.8	0.06	0.06	< 0.0100	0.14	0.39	0.04	15.3	15.2	0.05	0.861	0.755	2.15	3.82	4.4	61.2	< 0.0100	4.6
143135	NexGen	GAR-18-015	251	251.5	Waste Rock	Shaft Pilot Hole	INT	INT		2.04	0.08	0.03	0.01	0.27	0.4	0.08	14.4	13.8	0.067	1.19	1.02	2.85	5.14	3.98	48.5	< 0.0100	5.9
143136	NexGen	GAR-18-015	301	301.5	Waste Rock	Shaft Pilot Hole	INT	INT		2.99	0.02	0.13	< 0.0100	0.45	2.72	0.05	18.8	28.3	0.054	1.1	0.838	2.33	4.32	4.64	17.9	< 0.0100	3.7
143137	NexGen	GAR-18-015	351	351.5	Waste Rock	Shaft Pilot Hole	INT	INT		2.06	0.08	0.04	< 0.0100	0.23	0.6	0.04	15.3	25.1	0.118	1.83	1.72	4.89	8.56	4.16	45	< 0.0100	5.9
143138	NexGen	GAR-18-015	402	402.5	Waste Rock	Shaft Pilot Hole	INT	INT		1.21	0.04	0.04	< 0.0100	0.13	1.98	0.02	9.23	39.1	0.062	1.08	0.939	2.72	4.81	2.62	29.8	< 0.0100	2.3
143139	NexGen	GAR-18-015	452.5	453	Waste Rock	Shaft Pilot Hole	INT	INT		1.25	0.03	0.05	< 0.0100	0.14	0.31	0.02	10.9	24	0.078	1.5	1.18	3.82	6.58	2.98	27.6	< 0.0100	1.7
143140	NexGen	GAR-18-015	502	502.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		1.35	0.04	0.03	< 0.0100	0.16	0.22	0.06	10.7	22.6	0.057	0.986	0.873	2.51	4.43	2.98	53.9	< 0.0100	2.7
143141	NexGen	GAR-18-015	551	551.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		1.61	0.04	0.03	< 0.0100	0.13	0.31	0.07	12.7	14.3	0.033	0.632	0.508	1.7	2.88	3.51	46.9	< 0.0100	3.2
143142	NexGen	GAR-18-015	601	601.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		1.39	0.05	0.03	< 0.0100	0.1	0.53	0.06	12.2	22.6	0.039	0.658	0.587	1.64	2.93	3.4	65.7	< 0.0100	4.6
143143	NexGen	GAR-18-015	651	651.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		1.26	0.04	0.02	< 0.0100	0.06	0.61	0.05	12.1	14.8	0.012	0.262	0.177	0.857	1.31	3.33	35.4	< 0.0100	3.4
143144	NexGen	GAR-18-015	699.75	700.25	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.69	0.02	0.02	< 0.0100	0.03	0.35	0.02	6.71	23.3	0.026	0.486	0.398	1.32	2.23	1.85	7.88	< 0.0100	1.5
128830	NexGen	GAR-19-033	444	444.5	Waste Rock	UGTMF	INT	INT		2.69	0.08	0.05	< 0.0100	0.29	0.78	0.06	15.2	29.3	0.079	1.41	1.16	3.69	6.33	3.94	69.1	< 0.0100	7.4
132124	NexGen	GAR-19-032	416	416.5	Waste Rock	UGTMF	INT	INT		1.64	0.07	0.02	< 0.0100	0.27	2.38	0.06	9.84	20.3	0.059	1.09	0.91	2.76	4.82	2.55	45.8	< 0.0100	6.4
132144	NexGen	GAR-19-032	616	616.5	Waste Rock	UGTMF	INT	INT		1.62	0.08	0.05	< 0.0100	0.17	1.16	0.06	11.3	31.3	0.088	1.56	1.3	3.68	6.64	3	69.7	< 0.0100	5.9
128835	NexGen	GAR-19-033	494	494.5	Waste Rock	UGTMF	INT	INT		0.99	0.04	0.04	< 0.0100	0.08	0.27	< 0.0100	9.82	8.67	0.047	0.873	0.726	2.42	4.07	2.58	29.7	< 0.0100	2.3
128860	NexGen	GAR-19-033	744	744.5	Waste Rock	UGTMF	INT	INT		1.5	0.05	0.03	< 0.0100	0.15	0.51	0.07	12.1	14.2	0.033	0.615	0.494	1.53	2.68	3.28	28.7	< 0.0100	4.6
128874	NexGen	GAR-19-035	129	129.5	Waste Rock	UGTMF	INT	INT		0.74	0.02	0.3	< 0.0100	0.11	0.22	0.02	5.54	8.43	0.025	0.607	0.39	1.11	2.13	1.4	11.6	< 0.0100	0.9
128883	NexGen	GAR-19-035	179	179.5	Waste Rock	UGTMF	INT	INT		1.52	0.04	0.1	< 0.0100	0.12	0.63	0.03	11	32.6	0.042	1.03	0.63	1.93	3.63	2.9	43.6	< 0.0100	4.4
128888	NexGen	GAR-19-035	229	229.5	Waste Rock	UGTMF	INT	INT		1.71	0.08	0.03	< 0.0100	0.23	0.41	0.03	10.4	27.1	0.058	1.02	0.89	2.51	4.48	2.74	71.3	< 0.0100	5.5
128893	NexGen	GAR-19-035	279	279.5	Waste Rock	UGTMF	INT	INT		2.2	0.09	0.04	< 0.0100	0.22	1.01	0.05	13.5	41.3	0.082	1.51	1.23	3.87	6.69	3.64	68.6	< 0.0100	5.4
132169	NexGen	GAR-19-034	147	147.5	Waste Rock	UGTMF	INT	INT		0.94	0.01	0.22	< 0.0100	0.13	0.08	< 0.0100	8.95	11.2	0.005	0.19	0.08	0.415	0.69	2.16	5.84	< 0.0100	1.1
132174	NexGen	GAR-19-034	197	197.5	Waste Rock	UGTMF	INT	INT		2.5	0.04	0.1	< 0.0100	0.15	0.27	0.02	18.3	23	0.024	0.66	0.382	1.27	2.34	4.94	35.2	< 0.0100	6.7
132179	NexGen	GAR-19-034	247	247.5	Waste Rock	UGTMF	INT	INT		3.7	0.05	0.05	< 0.0100	0.63	2.3	0.03	23.7	51.8	0.143	2.7	2.1	5.03	9.97	6.32	63.8	< 0.0100	3.8
132184	NexGen	GAR-19-034	297	297.5	Waste Rock	UGTMF	INT	INT		1.4	0.07	0.03	< 0.0100	0.25	0.35	0.02	8.27	28.7	0.12	1.9	1.77	4.51	8.3	2.1	46.5	< 0.0100	5.1
132189	NexGen	GAR-19-034	347	347.5	Waste Rock	UGTMF	INT	INT		1.41	0.09	0.04	< 0.0100	0.22	0.58	0.03	9.16	33.9	0.067	1.15	0.979	2.85	5.05	2.38	77.6	< 0.0100	6.6
132194	NexGen	GAR-19-034	397	397.5	Waste Rock	UGTMF	INT	INT		1.22	0.1	0.03	< 0.0100	0.2	0.54	0.04	7.72	37.3	0.106	1.66	1.5	3.86	7.12	1.93	69.1	< 0.0100	5.5
132199	NexGen	GAR-19-034	447	447.5	Waste Rock	UGTMF	INT	INT		1.3	0.09	0.04	< 0.0100	0.16	0.36	0.02	8.55	20.9	0.102	1.84	1.48	4.02	7.43	2.19	42.4	< 0.0100	3.9
132204	NexGen	GAR-19-034	497	497.5	Waste Rock	UGTMF	INT	INT		0.98	0.04	0.08	< 0.0100	0.11	0.45	0.01	9.12	29.8	0.034	0.871	0.534	2	3.44	2.34	20.8	< 0.0100	1.2
132245	NexGen	GAR-19-036	105	105.5	Waste Rock	UGTMF	INT	INT		0.32	0.01	0.26	< 0.0100	0.01	0.06	< 0.0100	3.55	3.05	0.005	0.188	0.094	0.425	0.713	1.06	1.36	< 0.0100	0.6
128800	NexGen	GAR-19-033	143.65	144.15	Waste Rock	UGTMF	SPGN	SPGN		1.04	0.01	0.38	< 0.0100	0.09	0.42	0.02	9.29	25	0.021	0.739	0.344	1.2	2.31	2.36	1.75	0.02	1.5
128805	NexGen	GAR-19-033	193.65	194.15	Waste Rock	UGTMF	SPGN	SPGN		1.93	0.04	0.12	0.01	0.24	2.88	0.08	11.6	52.4	0.111	1.93	1.67	4.41	8.13	3.17	51	< 0.0100	3.7
128810	NexGen	GAR-19-033	243.65	244.15	Waste Rock	UGTMF	SPGN	SPGN		2.8	0.06	0.07	< 0.0100	0.27	1.18	0.04	16.4	40.5	0.034	0.679	0.505	1.82	3.04	4.34	62.1	< 0.0100	6.5
128815	NexGen	GAR-19-033	293.65	294.15	Waste Rock	UGTMF	SPGN	SPGN		0.8	0.02	0.14	< 0.0100	0.08	1.43	0.01	6.29	34.5	0.122	2.12	1.78	4.62	8.64	1.58	7.5	< 0.0100	3.5
128820	NexGen	GAR-19-033	344	344.5	Waste Rock	UGTMF	SPGN	SPGN		2.1	0.07	0.04	< 0.0100	0.29	0.62	0.07	10.9	24.9	0.073	1.25	1.04	2.84	5.21	2.86	61.9	< 0.0100	6.7
128825	NexGen	GAR-19-033	394	394.5	Waste Rock	UGTMF	SPGN	SPGN		1.92	0.06	0.04	< 0.0100	0.35	0.58	0.02	12	34.7	0.461	7.3	6.75	17	31.5	3.15	49.6	0.01	6.1
132099	NexGen	GAR-19-032	166	166.5	Waste Rock	UGTMF	SPGN	SPGN		2.3	0.04	0.16	< 0.0100	0.16	0.29	0.02	18.1	20.3	0.059	1.01	0.873	2.51	4.45	4.97	46	< 0.0100	5.2
132104	NexGen	GAR-19-032	216	216.5	Waste Rock	UGTMF	SPGN	SPGN		1.06	0.05	0.14	< 0.0100	0.11	1.32	0.03	8.01	29.8	0.036	0.81	0.56	1.68	3.09	2.16	36.9	< 0.0100	6.3
132109	NexGen	GAR-19-032	266	266.5	Waste Rock	UGTMF	SPGN	SPGN		1.74	0.04	0.09	< 0.0100	0.16	4.85	0.02	8.91	75.8	0.171	2.72	2.51	6.28	11.7	2.26	14.7	< 0.0100	3.3
132114	NexGen	GAR-19-032	316	316.5	Waste Rock	UGTMF	SPGN	SPGN		2.9	0.07	0.07	< 0.0100	0.37	2.21	0.05	17.9	88.6	0.169	2.68	2.42	6.27	11.5	4.78	80	< 0.0100	5.3
132119	NexGen	GAR-19-032	366	366.5	Waste Rock	UGTMF	SPGN	SPGN		2.59	0.08	0.06	< 0.0100	0.24	0.61	0.04	14.6	25.2	0.042	0.785	0.629	1.95	3.4	3.83	65.6	< 0.0100	6.6
132129	NexGen	GAR-19-032	466	466.5	Waste Rock	UGTMF	SPGN	SPGN		0.99	0.06	0.05	< 0.0100	0.1	0.58	0.02	7.04	38.9	0.151	2.34	2.18	5.51	10.2	1.84	58.2	< 0.0100	5.1
132134	NexGen	GAR-19-032	516	516.5	Waste Rock	UGTMF	SPGN	SPGN		2.52	0.09	0.05	< 0.0100	0.36	0.33	0.04	12.9	16.3	0.416	7.94	6.21	16	30.6	3.41	61.1	< 0.0100	6.1
132139	NexGen	GAR-19-032	566	566.5	Waste Rock	UGTMF	SPGN	SPGN		2.19	0.07	0.05	< 0.0100	0.25	0.61	0.04	13.7	43.2	0.135	2.48	2.02	5.7	10.3	3.55	59.2	< 0.0100	6.6
128840	NexGen	GAR-19-033	544	544.5	Waste Rock	UGTMF	SPGN	SPGN		0.8	0.04	0.03	< 0.0100	0.09	0.58	0.06	6.4	16.7	0.03	0.571	0.452	1.39	2.44	1.74	41.4	< 0.0100	3.8
128845	NexGen	GAR-19-033	594	594.5	Waste Rock	UGTMF	SPGN	SPGN		1.63	0.04	0.04	< 0.0100	0.16	0.83	0.08	15.2	21.9	0.023	0.488	0.365	1.28	2.15	4.12	39.3	0.01	4.1
128850	NexGen	GAR-19-033	644	644.5	Waste Rock	UGTMF	SPGN	SPGN		1.92	0.03	0.04	< 0.0100	0.12	0.9	0.06	18.9	15.4	0.027	0.52	0.41	1.47	2.42	5.21	38.3	< 0.0100	3.4
128855	NexGen	GAR-19-033	694	694.5	Waste Rock	UGTMF	SPGN	SPGN		1.65	0.03	0.06	< 0.0100	0.13	0.91	0.12	16.1	29.9	0.016	0.392	0.268	1.06	1.74	4.42	23.1	< 0.0100	4.3
132148	NexGen	GAR-19-032	666	666.5	Waste Rock	UGTMF	SPGN	SPGN		1.12	0.03	0.04	< 0.0100	0.08	0.42	0.02	12.5	24.7	0.011	0.275	0.174	0.92	1.38	3.43	29.4	< 0.0100	3.2
132153	NexGen	GAR-19-032	716	716.5	Waste Rock	UGTMF	SPGN	SPGN		0.61	0.01	0.03	< 0.0100	0.05	0.22	0.01	7.17	17.2	0.036	0.635	0.56	1.62	2.85	2.17	11.3	< 0.0100	1.1
128898	NexGen	GAR-19-035	329	329.5	Waste Rock	UGTMF	SPGN	SPGN		2.5	0.08	0.06	< 0.0100	0.33	0.32	0.04	14.9	7.36	0.034	0.699	0.5	1.85	3.08	3.96	64.6	< 0.0100	5.3
128903	NexGen	GAR-19-035	379	379.5	Waste Rock	UGTMF	SPGN	SPGN		0.85	0.06	0.04	< 0.0100	0.08	0.63	0.02	5.7	56.9	0.196	3.06	2.8	6.98	13	1.5	58.2	< 0.0100	4
128908	NexGen	GAR-19-035	429	429.5	Waste Rock	UGTMF	SPGN	SPGN		1.65	0.08	0.05	< 0.0100	0.21	0.31	0.03	10.9	19.7	0.047	0.847	0.687	2.25	3.83	2.86	55.5	< 0.0100	5.4
128913	NexGen	GAR-19-035	479	479.5	Waste Rock	UGTMF	SPGN	SPGN		1.92	0.06	0.03	< 0.0100	0.18	0.29	0.03	14.3	4.84	0.013	0.311	0.186	0.967	1.48	3.92	29.4	< 0.0100	5.1
132209	NexGen	GAR-19-034	547	547.5	Waste Rock	UGTMF	SPGN	SPGN		1.36	0.04	0.04	< 0.0100	0.15	0.95	0.03	11.2	34.1	0.03	0.536	0.437	1.3	2.31	3.02	58.6	< 0.0100	4.2
132214	NexGen	GAR-19-034	597	597.5	Waste Rock	UGTMF	SPGN	SPGN		1.49	0.05	0.04	< 0.0100	0.12	0.63	0.03	14	24.2	0.025	0.451	0.364	1.08	1.92	3.68	38.1	< 0.0100	3.7
132219	NexGen	GAR-19-034	647	647.5	Waste Rock	UGTMF	SPGN	SPGN		1.32	0.04	0.02	< 0.0100	0.1	0.38	0.02	11.3	27.2	0.079	1.24	1.14	2.92	5.38	3.08	22.9	< 0.0100	2.4
132224	NexGen	GAR-19-034	697	697.5	Waste Rock	UGTMF	SPGN	SPGN		0.79	0.04	0.02	< 0.0100	0.06	0.18	< 0.0100	8.5	20.1	0.066	1.09	0.942	2.65	4.75	2.2	18.9	< 0.0100	1.8
132229	NexGen	GAR-19-034	747	747.5	Waste Rock	UGTMF	SPGN	SPGN		0.76	0.04	0.02	< 0.0100	0.05	0.29	0.01	7.31	25.8	0.106	1.63	1.55	3.89	7.18	1.96	35.1	< 0.0100	3.7
128919	NexGen	GAR-19-035	539	539.5	Waste Rock	UGTMF	SPGN	SPGN		2.38	0.05	0.05	< 0.0100	0.35	0.6	0.07	16.4	27	0.053	1.01	0.81	2.65	4.52	4.41	55.4	< 0.0100	4.6
128924	NexGen	GAR-19-035	589	589.5	Waste Rock	UGTMF	SPGN	SPGN		2.18	0.05	0.04	< 0.0100	0.34	1.6	0.03	13.8	34.9	0.167	2.57	2.39	6.09	11.2	3.69	46.7	< 0.0100	4.8
128929	NexGen	GAR-19-035	639	639.5	Waste Rock	UGTMF	SPGN	SPGN		1.58	0.02	0.03	< 0.0100	0.07	0.22	0.02	14.3	13.8	0.008	0.189	0.119	0.549	0.865	3.79	5.84	< 0.0100	2.4
128934	NexGen	GAR-19-035	689	689.5	Waste Rock	UGTMF	SPGN	SPGN		1.26	0.03	0.03	< 0.0100	0.08	0.39	0.02	9.77	29.5	0.022	0.423	0.32	1.02	1.78	2.86	53.6	< 0.0100	4.8

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Partial -- Aqua Regia Digestion and ICP-MS finish														Total - 4-Acid Digestion and ICP-MS finish		
									Analyte	Se	Sm	Sn	Ta	Tb	Te	Th	U	V	W	Y	Yb	Zn	Zr	Ag	Be	Bi
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Partial Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion
									Detection Limit	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.1	0.1	0.01	0.01	0.1	0.01	0.02	0.1	0.1
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$
143123	NexGen	GAR-18-015	8.5	9	Waste Rock	Shaft Pilot Hole	OVB	OVB		< 0.1000	0.33	0.06	< 0.010	0.03	< 0.0100	0.82	0.2	1.4	0.8	0.85	0.06	1.4	3.6	0.55	0.2	0.1
143124	NexGen	GAR-18-015	11.5	12	Waste Rock	Shaft Pilot Hole	LITL	LITL		< 0.1000	1.29	0.12	< 0.010	0.12	< 0.0100	2.38	0.44	6.2	1.3	2.77	0.24	14	8.59	1.26	0.6	0.1
143125	NexGen	GAR-18-015	32	32.5	Waste Rock	Shaft Pilot Hole	LITL	LITL		< 0.1000	1.21	0.16	< 0.010	0.12	< 0.0100	2.65	0.43	6.9	< 0.1000	2.71	0.24	23.8	11.7	0.26	0.7	0.1
143126	NexGen	GAR-18-015	45	45.5	Waste Rock	Shaft Pilot Hole	CRET	CRET		0.4	1.54	0.16	< 0.010	0.16	< 0.0100	2.95	0.48	5.2	< 0.1000	3.72	0.21	21.6	9.97	0.2	0.8	0.1
143127	NexGen	GAR-18-015	56.5	57	Waste Rock	Shaft Pilot Hole	CRET	CRET		0.9	5.23	0.41	< 0.010	0.62	0.02	8.86	1.46	12.5	< 0.1000	15.8	1.04	51.4	11.2	0.3	2.4	0.4
143128	NexGen	GAR-18-015	66	66.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		0.1	0.5	0.2	< 0.010	0.05	< 0.0100	4.53	0.43	2.3	< 0.1000	1.24	0.08	0.9	10.1	0.17	0.7	< 0.1000
143129	NexGen	GAR-18-015	72	72.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		< 0.1000	0.31	0.09	< 0.010	0.04	< 0.0100	2.38	0.22	1.8	< 0.1000	1.03	0.07	0.9	4.96	0.13	0.7	< 0.1000
143130	NexGen	GAR-18-015	80.5	81	Waste Rock	Shaft Pilot Hole	ASST	ASST		< 0.1000	0.16	0.17	< 0.010	0.01	< 0.0100	0.68	0.15	0.2	< 0.1000	0.4	0.03	0.6	3.95	0.05	< 0.1000	< 0.1000
143131	NexGen	GAR-18-015	91	91.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		< 0.1000	0.28	0.37	< 0.010	0.02	< 0.0100	1.31	0.26	0.5	< 0.1000	0.6	0.05	0.7	4.79	0.06	0.2	< 0.1000
143132	NexGen	GAR-18-015	101	101.5	Waste Rock	Shaft Pilot Hole	INT	INT		< 0.1000	0.64	0.06	< 0.010	0.02	0.02	6.16	0.29	14.5	< 0.1000	0.44	0.05	2.6	5.01	0.23	0.8	< 0.1000
143133	NexGen	GAR-18-015	151	151.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.1	2.84	0.02	< 0.010	0.15	0.02	5.53	0.86	18.3	< 0.1000	1.68	0.16	9.4	6.41	0.12	0.5	0.1
143134	NexGen	GAR-18-015	201	201.5	Waste Rock	Shaft Pilot Hole	INT	INT		< 0.1000	2.86	0.07	< 0.010	0.18	< 0.0100	11.1	0.53	36.3	< 0.1000	3.02	0.25	50.4	1.96	0.24	0.4	< 0.1000
143135	NexGen	GAR-18-015	251	251.5	Waste Rock	Shaft Pilot Hole	INT	INT		< 0.1000	2.78	0.07	0.01	0.26	< 0.0100	15.7	1.58	59.4	< 0.1000	6.17	0.61	192	1.06	0.23	0.6	< 0.1000
143136	NexGen	GAR-18-015	301	301.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.2	4.02	0.08	< 0.0100	0.42	0.02	15.4	1.76	37.6	0.1	11.2	0.91	51.2	4.93	0.18	0.5	0.2
143137	NexGen	GAR-18-015	351	351.5	Waste Rock	Shaft Pilot Hole	INT	INT		< 0.1000	2.7	0.07	< 0.0100	0.26	0.01	17.1	0.55	53.7	< 0.1000	5.24	0.44	45	1.13	0.22	0.6	< 0.1000
143138	NexGen	GAR-18-015	402	402.5	Waste Rock	Shaft Pilot Hole	INT	INT		< 0.1000	1.69	0.06	< 0.0100	0.14	0.04	8.01	0.5	32.7	< 0.1000	2.8	0.27	33.1	1.18	0.3	0.4	0.1
143139	NexGen	GAR-18-015	452.5	453	Waste Rock	Shaft Pilot Hole	INT	INT		< 0.1000	1.94	0.06	< 0.0100	0.13	< 0.0100	14.8	0.84	26.8	< 0.1000	3.39	0.31	45.8	1.58	0.17	0.5	< 0.1000
143140	NexGen	GAR-18-015	502	502.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.1000	1.92	0.05	< 0.0100	0.16	0.02	13.1	0.67	29	< 0.1000	3.67	0.34	36.1	0.95	0.22	0.1	0.1
143141	NexGen	GAR-18-015	551	551.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.1000	2.55	0.06	0.01	0.18	0.01	10.3	0.31	23.8	< 0.1000	2.54	0.2	30.8	0.6	0.21	< 0.1000	0.3
143142	NexGen	GAR-18-015	601	601.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.1000	2.3	0.08	< 0.0100	0.14	0.02	9.47	0.45	34	< 0.1000	2.07	0.19	53.5	0.67	0.24	< 0.1000	0.1
143143	NexGen	GAR-18-015	651	651.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.1000	2.18	0.07	< 0.0100	0.1	0.02	9.59	0.4	28	< 0.1000	1.32	0.12	27.2	1.64	0.22	0.3	0.2
143144	NexGen	GAR-18-015	699.75	700.25	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		< 0.1000	1.11	0.03	< 0.0100	0.05	0.02	6.41	0.26	15.4	< 0.1000	0.68	0.06	11.8	0.78	0.14	0.1	0.1
128830	NexGen	GAR-19-033	444	444.5	Waste Rock	UGTMF	INT	INT		< 0.1000	3.04	0.12	< 0.0100	0.37	0.01	14.1	0.88	53.1	< 0.1000	5.86	0.37	55.7	1.31	0.22	0.5	< 0.1000
132124	NexGen	GAR-19-032	416	416.5	Waste Rock	UGTMF	INT	INT		< 0.1000	1.79	0.07	< 0.0100	0.26	0.01	8.29	0.59	47	< 0.1000	5.52	0.46	47.8	0.6	0.17	0.4	< 0.1000
132144	NexGen	GAR-19-032	616	616.5	Waste Rock	UGTMF	INT	INT		< 0.1000	1.99	0.15	< 0.0100	0.2	0.03	13.9	1.24	48.8	< 0.1000	3.45	0.29	85.7	1.17	0.29	0.4	0.1
128835	NexGen	GAR-19-033	494	494.5	Waste Rock	UGTMF	INT	INT		< 0.1000	1.63	0.08	< 0.0100	0.1	< 0.0100	8.8	0.56	22.5	0.2	1.52	0.17	31.6	1.36	0.14	0.3	< 0.1000
128860	NexGen	GAR-19-033	744	744.5	Waste Rock	UGTMF	INT	INT		< 0.1000	2.14	0.07	< 0.0100	0.18	0.01	11.1	0.73	39.7	< 0.1000	2.7	0.28	32.9	1.22	0.17	0.6	0.1
128874	NexGen	GAR-19-035	129	129.5	Waste Rock	UGTMF	INT	INT		< 0.1000	0.94	0.03	< 0.0100	0.11	< 0.0100	7.55	1.17	11.2	0.1	2.35	0.23	4.4	9	0.24	0.9	0.2
128883	NexGen	GAR-19-035	179	179.5	Waste Rock	UGTMF	INT	INT		< 0.1000	1.99	0.08	< 0.0100	0.17	0.02	9.14	0.66	42.3	< 0.1000	2.29	0.19	32.1	3.99	0.16	0.6	0.3
128888	NexGen	GAR-19-035	229	229.5	Waste Rock	UGTMF	INT	INT		< 0.1000	2.04	0.08	0.01	0.23	< 0.0100	7.54	0.57	50.4	< 0.1000	5.16	0.41	43.2	1.1	0.18	0.5	0.1
128893	NexGen	GAR-19-035	279	279.5	Waste Rock	UGTMF	INT	INT		< 0.1000	2.68	0.11	0.01	0.26	0.02	14.8	0.63	47.9	< 0.1000	4.55	0.32	53.6	1.15	0.25	0.4	0.1
132169	NexGen	GAR-19-034	147	147.5	Waste Rock	UGTMF	INT	INT		< 0.1000	1.44	0.03	< 0.0100	0.11	< 0.0100	6.19	0.52	10.6	< 0.1000	2.71	0.27	4.4	4.1	0.22	0.9	0.1
132174	NexGen	GAR-19-034	197	197.5	Waste Rock	UGTMF	INT	INT		0.2	3.39	0.07	< 0.0100	0.24	0.01	10.5	0.8	50.6	< 0.1000	2.76	0.22	30	3.07	0.16	1.1	0.1
132179	NexGen	GAR-19-034	247	247.5	Waste Rock	UGTMF	INT	INT		0.5	4.34	0.07	0.02	0.53	0.06	20.2	1.21	52.1	< 0.1000	14.4	1.29	61.4	2.75	0.28	0.4	0.2
132184	NexGen	GAR-19-034	297	297.5	Waste Rock	UGTMF	INT	INT		< 0.1000	1.65	0.05	< 0.0100	0.2	0.02	6.95	0.45	48.7	< 0.1000	5.5	0.55	51	0.64	0.18	0.4	< 0.1000
132189	NexGen	GAR-19-034	347	347.5	Waste Rock	UGTMF	INT	INT		< 0.1000	1.66	0.08	0.01	0.19	0.02	8.44	0.56	59.4	< 0.1000	4.81	0.42	63.8	0.99	0.21	0.4	0.1
132194	NexGen	GAR-19-034	397	397.5	Waste Rock	UGTMF	INT	INT		< 0.1000	1.5	0.06	< 0.0100	0.17	0.02	6.54	0.39	55.6	< 0.1000	4.52	0.42	50.7	0.82	0.2	0.4	0.1
132199	NexGen	GAR-19-034	447	447.5	Waste Rock	UGTMF	INT	INT		< 0.1000	1.71	0.1	< 0.0100	0.16	< 0.0100	8.18	0.51	43.8	< 0.1000	3.65	0.38	65.6	1.09	0.19	0.6	< 0.1000
132204	NexGen	GAR-19-034	497	497.5	Waste Rock	UGTMF	INT	INT		< 0.1000	1.42	0.08	< 0.0100	0.1	0.01	10.2	0.63	26.4	< 0.1000	2.37	0.27	37.9	2.18	0.18	0.4	< 0.1000
132245	NexGen	GAR-19-036	105	105.5	Waste Rock	UGTMF	INT	INT		< 0.1000	0.46	0.03	< 0.0100	0.02	< 0.0100	7.33	0.32	5.6	< 0.1000	0.29	0.04	1.5	5.52	0.15	0.7	< 0.1000
128800	NexGen	GAR-19-033	143.65	144.15	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	1.44	0.13	< 0.0100	0.1	0.03	6.86	1.18	18.1	0.2	1.68	0.15	7.6	7.4	0.19	0.8	0.3
128805	NexGen	GAR-19-033	193.65	194.15	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	2.08	0.09	< 0.0100	0.28	0.05	17.1	1.57	44.5	0.2	4.94	0.43	50.1	3.7	0.32	0.5	0.3
128810	NexGen	GAR-19-033	243.65	244.15	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	3.1	0.12	< 0.0100	0.36	0.02	13.8	0.85	49.3	0.1	5.56	0.41	50.4	1.82	0.22	0.5	0.1
128815	NexGen	GAR-19-033	293.65	294.15	Waste Rock	UGTMF	SPGN	SPGN		0.4	0.99	0.02	< 0.0100	0.09	0.02	12.7	0.5	28.1	0.1	1.56	0.17	14.9	3.36	0.26	1.4	2.2
128820	NexGen	GAR-19-033	344	344.5	Waste Rock	UGTMF	SPGN	SPGN		0.5	2.2	0.04	< 0.0100	0.32	0.01	7.69	0.58	50.8	0.1	6.05	0.42	57.9	0.97	0.25	0.3	0.1
128825	NexGen	GAR-19-033	394	394.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	2.2	0.08	< 0.0100	0.28	0.02	12.8	0.71	46.8	< 0.1000	7.06	0.76	82.6	0.88	0.28	0.4	< 0.1000
132099	NexGen	GAR-19-032	166	166.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	2.86	0.07	< 0.0100	0.25	0.02	13.7	0.71	37.8	< 0.1000	2.88	0.2	38.5	5.02	0.14	0.5	< 0.1000
132104	NexGen	GAR-19-032	216	216.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	1.27	0.12	< 0.0100	0.12	0.02	16.9	0.99	51.4	< 0.1000	2.31	0.22	34.3	4.21	0.21	0.6	0.2
132109	NexGen	GAR-19-032	266	266.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	1.72	0.06	< 0.0100	0.26	0.08	21.1	0.86	46.2	< 0.1000	3.4	0.15	25.1	3.24	0.4	0.4	0.4
132114	NexGen	GAR-19-032	316	316.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	3.39	0.09	< 0.0100	0.4	0.04	12.6	0.8	55.4	< 0.1000	8.28	0.61	78.5	1.8	0.4	0.5	0.2
132119	NexGen	GAR-19-032	366	366.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	2.99	0.12	< 0.0100	0.34	0.02	12.6	0.78	48.8	< 0.1000	4.57	0.35	64.4	1.6	0.22	0.5	0.1
132129	NexGen	GAR-19-032	466	466.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	1.24	0.07	< 0.0100	0.12	0.02	6.85	0.53	58.3	< 0.1000	2.24	0.24	38.2	1.23	0.26	0.6	< 0.1000
132134	NexGen	GAR-19-032	516	516.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	2.6	0.09	< 0.0100	0.37	< 0.0100	7.8	0.56	53.4	< 0.1000	7.84	0.57	63.8	1.01	0.18	0.5	< 0.1000
132139	NexGen	GAR-19-032	566	566.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	2.58	0.11	< 0.0100	0.29	0.02	14.1	1.02	45.9	< 0.1000	5.17	0.44	73.1	1.35	0.25	0.5	0.1
128840	NexGen	GAR-19-033	544	544.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	1.11	0.09	< 0.0100	0.1	0.02	13.2	1.07	29.6	0.1	1.73	0.16	28	0.89	0.21	0.7	0.1
128845	NexGen	GAR-19-033	594	594.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	2.49	0.06	< 0.0100	0.18	0.03	11.1	0.6	25.5	< 0.1000	3.11	0.29	34.2	1.08	0.27	0.4	0.2
128850	NexGen	GAR-19-033	644	644.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	2.82	0.06	< 0.0100	0.19	0.02	12.5	0.86	20	< 0.1000	2.37	0.24	41.5	1	0.27	< 0.1000	0.1
128855	NexGen	GAR-19-033	694	694.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	2.44	0.06	< 0.0100	0.17	0.01	18.5	1.39	24.4	< 0.1000	2.36	0.26	38.4	1.83	0.27	0.4	0.1
132148	NexGen	GAR-19-032	666	666.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	1.66	0.06	< 0.0100	0.1	0.02	6.65	0.51	21.5	< 0.1000	2.11	0.19	16.9	1.32	0.22	< 0.1000	< 0.1000
132153	NexGen	GAR-19-032	716	716.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	0.89	0.03	< 0.0100	0.05	< 0.0100	4.51	0.27	10.5	< 0.1000	0.88	0.11	20.1	0.91	0.18	< 0.1000	< 0.1000
128898	NexGen	GAR-19-035	329	329.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	2.81	0.1	0.01	0.35	< 0.0100	14.4	0.85	42.7	< 0.1000	7.11	0.5	49.4	1.62	0.17	0.4	< 0.1000
128903	NexGen	GAR-19-035	379	379.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	1.14	0.08	< 0.0100	0.1	0.02	5.76	0.4	37.8	< 0.1000	1.8	0.17	46.8	1.17	0.24	0.5	0.1
128908	NexGen	GAR-19-035	429	429.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	2.19	0.09	< 0.0100	0.2	< 0.0100	16.7	0.71	44	< 0.1000	4.52	0.44	42.4	1.34	0.2	0.4	< 0.1000
128913	NexGen	GAR-19-035	479	479.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	2.5	0.08	< 0.0100	0.22	< 0.0100	13.5	0.72	38.8	< 0.1000	3.47	0.3	33.7	0.9	0.17	0.7	< 0.1000
132209	NexGen	GAR-19-034	547	547.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	1.84	0.09	< 0.0100	0.15	0.03	14.4	0.74	28	< 0.1000	3.15	0.3	42.1	1.22	0.23	0.2	0.2
132214	NexGen	GAR-19-034	597	597.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	2.27	0.07	< 0.0100	0.14	0.02	12.5	0.56	29.8	< 0.1000	2.03	0.24	34.3	1.08	0.22	0.2	0.2
132219	NexGen	GAR-19-034	647	647.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	1.87	0.04	< 0.0100	0.13	0.04	10.9	0.7	19.5	< 0.1000	2.06	0.22	36.6	0.82	0.16	< 0.1000	0.1
132224	NexGen	GAR-19-034	697	697.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	1.18	0.06	< 0.0100	0.07	0.01	6.73	0.39	13.6	0.1	1.28	0.14	28.2	0.87	0.15	< 0.1000	< 0.1000
132229	NexGen	GAR-19-034	747	747.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	1.22	0.06	< 0.0100	0.06	0.03	5.95	0.28	20.8	< 0.1000	0.92	0.09	36.7	0.69	0.15	< 0.1000	0.1
128919	NexGen	GAR-19-035	539	539.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	2.8	0.06	0.02	0.32	0.02	18.8	0.82	41.2	0.2	8.05	0.7	48.6	1.19	0.22	0.4	0.3
128924	NexGen	GAR-19-035	589	589.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	2.66	0.06	0.01	0.31	0.03	12.5	0.7	44.6	0.1	7.64	0.66	60.5	1.1	0.27	0.5	0.2
128929	NexGen	GAR-19-035	639	639.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	2.65	0.01	< 0.0100	0.12	0.01	8.5	0.34	16	< 0.1000	1.19	0.14	12.7	0.84	0.18	< 0.1000	0.1
128934	NexGen	GAR-19-035	689	689.5	Waste Rock	UGTMF	SPGN	SPGN		< 0.1000	1.65	0.04	< 0.0100	0.12	0.03	7.11	0.5	23.7	< 0.1000	1.46	0.16	35.2	0.87	0.28	0.1	0.1

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4-Acid Digestion and ICP-MS finish												
									Analyte	Cd	Co	Cs	Cu	Dy	Er	Eu	Ga	Gd	Hf	Ho	Mo	Nb
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion
									Detection Limit	0.1	0.02	0.1	0.1	0.02	0.02	0.02	0.1	0.1	0.1	0.02	0.01	0.1
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$
143123	NexGen	GAR-18-015	8.5	9	Waste Rock	Shaft Pilot Hole	OVB	OVB		< 0.1000	0.66	0.1	2.5	0.89	0.49	0.29	1.7	1.5	1.9	0.15	0.15	1.2
143124	NexGen	GAR-18-015	11.5	12	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.2	6.88	1.2	7.3	1.66	0.94	0.55	6.8	2	2.9	0.3	0.35	5.8
143125	NexGen	GAR-18-015	32	32.5	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.2	7.25	1.9	13.3	2.33	1.4	0.68	8.6	2.4	4.5	0.43	0.47	13.1
143126	NexGen	GAR-18-015	45	45.5	Waste Rock	Shaft Pilot Hole	CRET	CRET		0.2	7.95	2	10.6	2.72	1.57	0.79	9.4	3.7	4.2	0.48	0.5	10.8
143127	NexGen	GAR-18-015	56.5	57	Waste Rock	Shaft Pilot Hole	CRET	CRET		0.2	16.4	8	27.4	5.65	3.16	1.58	22	7.3	3.8	1	1.71	17.9
143128	NexGen	GAR-18-015	66	66.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		0.1	0.98	2.2	9	2.81	1.48	0.87	10	3.9	3.7	0.47	0.5	10.2
143129	NexGen	GAR-18-015	72	72.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		< 0.1000	1.85	1.4	22.6	2.88	1.48	0.74	6.9	3.5	2.8	0.48	0.58	9.3
143130	NexGen	GAR-18-015	80.5	81	Waste Rock	Shaft Pilot Hole	ASST	ASST		< 0.1000	0.14	< 0.1000	5.5	0.59	0.37	0.12	0.7	0.7	2.8	0.11	0.3	0.9
143131	NexGen	GAR-18-015	91	91.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		0.1	0.2	< 0.1000	3	1.08	0.67	0.19	1.2	1	4.4	0.21	0.19	1.6
143132	NexGen	GAR-18-015	101	101.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.2	3.64	0.3	3.2	2.22	1.46	0.7	18.7	2.6	6	0.44	0.42	14.2
143133	NexGen	GAR-18-015	151	151.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.2	9.41	0.4	12.6	2.7	1.92	0.87	12	3.4	4.4	0.5	0.69	6.1
143134	NexGen	GAR-18-015	201	201.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.3	13.4	0.5	12.2	4.94	2.89	1.52	18.3	5.7	9.7	0.87	0.71	13.9
143135	NexGen	GAR-18-015	251	251.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.6	13	0.6	12	4.88	2.16	1.38	14.8	5.5	8.6	0.74	0.52	13.8
143136	NexGen	GAR-18-015	301	301.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.2	17.3	1.2	35.1	3.51	1.98	0.88	10.2	3.9	4	0.69	3.77	7.8
143137	NexGen	GAR-18-015	351	351.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.2	12.9	0.4	22.8	3.48	1.97	1.06	13.7	4.7	5.3	0.62	0.79	10.6
143138	NexGen	GAR-18-015	402	402.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.3	15.2	0.1	87.3	4.79	2.52	1.26	13.4	5.3	7.1	0.8	1.98	9.2
143139	NexGen	GAR-18-015	452.5	453	Waste Rock	Shaft Pilot Hole	INT	INT		0.3	13.7	0.3	16.3	4.9	3.03	1.29	15.8	5.5	6.1	0.94	0.52	8.9
143140	NexGen	GAR-18-015	502	502.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.2	17.1	1	14.2	3.8	2.23	1.19	18.5	4.1	6.6	0.72	0.51	15.1
143141	NexGen	GAR-18-015	551	551.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.2	10.4	1.6	6.7	2.32	1.24	1.01	15.2	2.9	10.2	0.41	0.49	14.3
143142	NexGen	GAR-18-015	601	601.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.2	16.6	0.6	10.5	3.98	2.39	1.34	19.7	5	7.2	0.75	2.04	17.5
143143	NexGen	GAR-18-015	651	651.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.2	13.9	2.3	4.6	2.77	1.59	1.07	15.9	3.5	7.4	0.5	0.98	15.2
143144	NexGen	GAR-18-015	699.75	700.25	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.2	10.6	0.3	16.1	2.11	1.2	0.69	11.7	2.7	7.9	0.37	0.47	11
128830	NexGen	GAR-19-033	444	444.5	Waste Rock	UGTMF	INT	INT		0.2	13.8	1.5	19.6	4.04	1.83	1.4	17.7	5.2	5.8	0.65	1.63	14.2
132124	NexGen	GAR-19-032	416	416.5	Waste Rock	UGTMF	INT	INT		0.2	12.7	0.6	13.4	3.55	1.8	1.16	11.8	4.6	5.4	0.61	2.87	9.9
132144	NexGen	GAR-19-032	616	616.5	Waste Rock	UGTMF	INT	INT		0.3	17	2.6	48.4	3.99	2.09	1.46	20.4	5.1	6.3	0.69	1.48	15
128835	NexGen	GAR-19-033	494	494.5	Waste Rock	UGTMF	INT	INT		0.3	11.1	0.2	6.7	4.85	2.76	1.42	14.8	5.4	7.3	0.96	0.36	8.1
128860	NexGen	GAR-19-033	744	744.5	Waste Rock	UGTMF	INT	INT		0.2	10.6	1	19	2.72	1.47	1.25	14.7	3.8	6.8	0.48	0.57	11.2
128874	NexGen	GAR-19-035	129	129.5	Waste Rock	UGTMF	INT	INT		0.2	4.47	0.7	3.5	10.2	5.24	3.3	28.2	13.3	6.4	1.79	0.58	18.7
128883	NexGen	GAR-19-035	179	179.5	Waste Rock	UGTMF	INT	INT		0.2	18.3	1	22.1	4.5	2.31	1.38	15.5	5	5.8	0.74	0.88	12.8
128888	NexGen	GAR-19-035	229	229.5	Waste Rock	UGTMF	INT	INT		0.3	15.2	0.8	13.8	4.66	2.37	1.62	16.4	5.9	7.5	0.81	0.64	12.5
128893	NexGen	GAR-19-035	279	279.5	Waste Rock	UGTMF	INT	INT		0.2	16.4	1	50	3.85	1.91	1.43	17.3	4.6	5.4	0.63	1.17	14.4
132169	NexGen	GAR-19-034	147	147.5	Waste Rock	UGTMF	INT	INT		0.2	4.94	0.6	2.8	12.2	6.53	3.28	24.8	13.6	6.1	2.22	0.27	15.7
132174	NexGen	GAR-19-034	197	197.5	Waste Rock	UGTMF	INT	INT		0.2	11.8	0.8	3.7	4.46	2.37	1.45	16.3	5.5	8.2	0.78	0.47	12.5
132179	NexGen	GAR-19-034	247	247.5	Waste Rock	UGTMF	INT	INT		0.2	23.5	0.8	104	4.73	2.94	1.6	20.2	5.3	4.8	0.92	2.5	14.7
132184	NexGen	GAR-19-034	297	297.5	Waste Rock	UGTMF	INT	INT		0.3	14.2	0.3	28.4	4.7	2.78	1.62	16	5.4	6	0.91	0.37	9.6
132189	NexGen	GAR-19-034	347	347.5	Waste Rock	UGTMF	INT	INT		0.2	19.9	0.5	28.8	4.77	2.58	1.6	20	5	5.4	0.86	0.85	12.7
132194	NexGen	GAR-19-034	397	397.5	Waste Rock	UGTMF	INT	INT		0.3	16.7	0.3	20.4	4.21	2.44	1.51	16.9	5.1	6.3	0.81	0.67	12.3
132199	NexGen	GAR-19-034	447	447.5	Waste Rock	UGTMF	INT	INT		0.4	13.4	0.3	18.1	5.23	3.13	1.35	14.7	5.6	5.7	0.99	0.53	11.1
132204	NexGen	GAR-19-034	497	497.5	Waste Rock	UGTMF	INT	INT		0.3	15.9	0.3	17.4	6.95	4.24	1.68	18.5	6.4	6.3	1.37	0.82	11.6
132245	NexGen	GAR-19-036	105	105.5	Waste Rock	UGTMF	INT	INT		0.2	3.2	0.3	2.7	2.13	1.47	1.16	18	3.4	7.4	0.42	0.26	10.4
128800	NexGen	GAR-19-033	143.65	144.15	Waste Rock	UGTMF	SPGN	SPGN		0.3	9.36	0.4	10.4	4.65	2.67	2.12	17	7.1	6.9	0.84	0.67	12.1
128805	NexGen	GAR-19-033	193.65	194.15	Waste Rock	UGTMF	SPGN	SPGN		0.2	28.1	1	60.2	4.24	2.12	1.47	23.6	4.5	5.5	0.74	4.41	15.9
128810	NexGen	GAR-19-033	243.65	244.15	Waste Rock	UGTMF	SPGN	SPGN		0.2	15.9	1.6	17.5	4.54	2.16	1.5	18.9	5.4	6	0.78	1.77	13.9
128815	NexGen	GAR-19-033	293.65	294.15	Waste Rock	UGTMF	SPGN	SPGN		0.3	29.4	0.5	948	4.74	2.78	1.07	22.7	4.7	9.7	0.91	2.11	15.1
128820	NexGen	GAR-19-033	344	344.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	16.4	0.6	23.5	4.17	1.99	1.64	18	6	6.5	0.73	1.09	15
128825	NexGen	GAR-19-033	394	394.5	Waste Rock	UGTMF	SPGN	SPGN		0.5	15.9	0.4	24.9	5.18	3.05	2	16.7	5.2	4.8	0.99	1.51	12.4
132099	NexGen	GAR-19-032	166	166.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	12.9	0.8	5.2	3.81	1.91	1.22	14	4.8	4.5	0.66	0.53	9.3
132104	NexGen	GAR-19-032	216	216.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	12.8	1.3	28.4	3.67	2.13	1.32	17.6	4.2	6.7	0.69	1.97	14.2
132109	NexGen	GAR-19-032	266	266.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	30.4	0.4	163	2.86	0.79	1.53	18.1	5.5	4.8	0.35	5.98	10.2
132114	NexGen	GAR-19-032	316	316.5	Waste Rock	UGTMF	SPGN	SPGN		0.3	31.6	1	60.4	4.54	2.28	1.46	31.3	5.6	6.1	0.77	3.18	19.6
132119	NexGen	GAR-19-032	366	366.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	14.6	1.2	20.1	3.96	1.94	1.47	18.2	5.6	5.6	0.64	0.68	12.2
132129	NexGen	GAR-19-032	466	466.5	Waste Rock	UGTMF	SPGN	SPGN		0.5	17.9	0.6	32.8	5.04	2.77	1.7	20.1	5.2	5.4	0.94	0.82	14.8
132134	NexGen	GAR-19-032	516	516.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	13.3	0.5	12.1	4.08	2.17	1.42	16.2	4.8	5	0.72	0.5	12.1
132139	NexGen	GAR-19-032	566	566.5	Waste Rock	UGTMF	SPGN	SPGN		0.4	15.3	1.4	36	5.13	2.78	1.46	17.1	5.8	7.4	0.93	0.9	14.1
128840	NexGen	GAR-19-033	544	544.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	12.7	1.8	45.2	3.13	1.49	1.39	15.7	4.7	7	0.52	0.86	13.4
128845	NexGen	GAR-19-033	594	594.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	16.2	1.2	6.6	3.69	2.06	1.27	21.7	4.1	6.9	0.68	1.82	19.2
128850	NexGen	GAR-19-033	644	644.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	17.8	0.8	7.7	5.48	3.09	1.57	21.8	5.7	7.7	1.02	1	18.8
128855	NexGen	GAR-19-033	694	694.5	Waste Rock	UGTMF	SPGN	SPGN		0.3	19.7	0.7	15	5.16	2.91	1.44	23.3	5.8	8.2	0.98	1.19	19.9
132148	NexGen	GAR-19-032	666	666.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	22.9	0.8	6.7	7.81	4.6	1.92	21.5	7.4	8	1.51	0.81	15.8
132153	NexGen	GAR-19-032	716	716.5	Waste Rock	UGTMF	SPGN	SPGN		0.3	11.4	0.3	19.5	4.33	2.56	1.24	11.4	4.5	9.9	0.85	0.57	11.3
128898	NexGen	GAR-19-035	329	329.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	11.6	0.6	6.8	4.17	2.33	1.3	15	4.8	7.2	0.73	0.41	11.3
128903	NexGen	GAR-19-035	379	379.5	Waste Rock	UGTMF	SPGN	SPGN		0.3	18.1	0.6	40.1	4.36	2.36	1.62	19.1	4.8	7	0.77	0.7	12.4
128908	NexGen	GAR-19-035	429	429.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	14.1	0.4	15.3	4.29	2.56	1.36	16.5	5	7.1	0.78	0.56	12.2
128913	NexGen	GAR-19-035	479	479.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	9.77	0.6	8.1	4.04	1.94	1.37	15.2	5.9	7.2	0.68	0.37	12.8
132209	NexGen	GAR-19-034	547	547.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	24.7	1.8	13.2	5.07	3.03	1.58	22.9	5.3	7	0.96	1.01	18.3
132214	NexGen	GAR-19-034	597	597.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	16	1.6	19.8	4.11	2.5	1.38	17.7	4.4	7.9	0.79	0.73	18.6
132219	NexGen	GAR-19-034	647	647.5	Waste Rock	UGTMF	SPGN	SPGN		0.3	11.7	0.4	18.1	2.9	1.68	0.85	11.7	3.4	8.2	0.56	0.86	9.3
132224	NexGen	GAR-19-034	697	697.5	Waste Rock	UGTMF	SPGN	SPGN		0.3	12.1	0.3	25.8	4.47	2.78	1.27	12.4	4.3	8.5	0.9	0.95	10
132229	NexGen	GAR-19-034	747	747.5	Waste Rock	UGTMF	SPGN	SPGN		0.3	10.7	0.3	20.1	3.3	2.07	1.29	11.5	3.8	7.8	0.72	0.49	9.5
128919	NexGen	GAR-19-035	539	539.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	17	1.3	27.1	4.83	2.74	1.84	17.5	5.7	5.6	0.92	1.36	15.2
128924	NexGen	GAR-19-035	589	589.5	Waste Rock	UGTMF	SPGN	SPGN		0.3	18	0.6	48.2	5.7	3.53	1.73	21.6	5.5	6	1.12	1.67	14.6
128929	NexGen	GAR-19-035	639	639.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	9.86	0.2	3.7	2.73	1.6	1.04	11.6	3.4	7.1	0.52	0.28	14.3
128934	NexGen	GAR-19-035	689	689.5	Waste Rock	UGTMF	SPGN	SPGN		0.2	26.9	1.1	10.6	6.9	3.99	1.64	28.4	5.8	9	1.28	0.66	22.8

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4-Acid Digestion and ICP-MS finish											
									Analyte	Nd	Ni	Pb204	Pb206	Pb207	Pb208	PbSUM	Pr	Rb	Sc	Sm	Sn
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion
									Detection Limit	0.1	0.1	0.001	0.001	0.001	0.001	0.001	0.1	0.1	0.1	0.1	0.02
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
									Digestion	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$
143123	NexGen	GAR-18-015	8.5	9	Waste Rock	Shaft Pilot Hole	OVB	OVB		10	1.2	0.059	1.01	0.82	1.95	3.84	2.8	5.3	0.7	1.7	0.19
143124	NexGen	GAR-18-015	11.5	12	Waste Rock	Shaft Pilot Hole	LITL	LITL		16	9.6	0.112	1.9	1.65	4.05	7.71	4.3	25.2	3.1	2.8	0.63
143125	NexGen	GAR-18-015	32	32.5	Waste Rock	Shaft Pilot Hole	LITL	LITL		17.4	11.5	0.122	2.14	1.73	4.38	8.38	4.7	46.1	5.2	3.2	1.04
143126	NexGen	GAR-18-015	45	45.5	Waste Rock	Shaft Pilot Hole	CRET	CRET		24.3	13.2	0.169	2.9	2.4	5.72	11.2	6.5	51.6	5.4	4.2	1
143127	NexGen	GAR-18-015	56.5	57	Waste Rock	Shaft Pilot Hole	CRET	CRET		43.7	34.6	0.348	6.07	5	11.8	23.3	11.2	130	14.5	8.1	2.81
143128	NexGen	GAR-18-015	66	66.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		27.9	9.1	0.073	1.42	1.06	2.69	5.24	7.8	40.6	7.8	4.8	1.11
143129	NexGen	GAR-18-015	72	72.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		22.9	16.4	0.088	1.76	1.26	3.21	6.31	6.3	27.3	6.1	4	0.66
143130	NexGen	GAR-18-015	80.5	81	Waste Rock	Shaft Pilot Hole	ASST	ASST		4.6	0.5	0.017	0.659	0.283	0.761	1.72	1.3	0.4	0.5	0.8	0.32
143131	NexGen	GAR-18-015	91	91.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		7.1	0.8	0.017	0.704	0.278	0.767	1.77	1.8	0.4	0.9	1.3	0.64
143132	NexGen	GAR-18-015	101	101.5	Waste Rock	Shaft Pilot Hole	INT	INT		22.5	34.8	0.038	0.79	0.534	1.92	3.29	6.6	41.2	14.1	3.3	0.51
143133	NexGen	GAR-18-015	151	151.5	Waste Rock	Shaft Pilot Hole	INT	INT		25.8	36.7	0.05	1.15	0.742	2.22	4.16	7.3	47.6	10.5	4.4	0.17
143134	NexGen	GAR-18-015	201	201.5	Waste Rock	Shaft Pilot Hole	INT	INT		48.2	19.7	0.288	4.62	4.13	10.8	19.8	13.4	137	17.6	8.1	0.48
143135	NexGen	GAR-18-015	251	251.5	Waste Rock	Shaft Pilot Hole	INT	INT		45.6	18.5	0.208	3.48	2.99	8.07	14.8	12.9	83.4	13.8	7.7	0.18
143136	NexGen	GAR-18-015	301	301.5	Waste Rock	Shaft Pilot Hole	INT	INT		30.6	38.2	0.063	1.35	0.921	2.74	5.07	7.5	105	7.5	5.6	0.27
143137	NexGen	GAR-18-015	351	351.5	Waste Rock	Shaft Pilot Hole	INT	INT		48.6	30.7	0.298	4.78	4.27	12.1	21.4	13.6	74	12.7	6.9	0.22
143138	NexGen	GAR-18-015	402	402.5	Waste Rock	Shaft Pilot Hole	INT	INT		46.3	49.6	0.322	5.24	4.68	12.6	22.8	13.1	104	10.9	7.3	0.28
143139	NexGen	GAR-18-015	452.5	453	Waste Rock	Shaft Pilot Hole	INT	INT		42.6	31.9	0.414	6.68	6.01	15.4	28.5	12.1	120	12.9	7.2	0.4
143140	NexGen	GAR-18-015	502	502.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		32.5	27.2	0.174	2.99	2.55	6.82	12.5	9.2	139	16.2	5.6	0.63
143141	NexGen	GAR-18-015	551	551.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		23.8	22.8	0.124	2.08	1.82	4.58	8.6	6.8	102	12.6	4.1	0.43
143142	NexGen	GAR-18-015	601	601.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		42.5	27.5	0.167	2.77	2.37	6.44	11.7	11.8	145	17.9	7.1	0.59
143143	NexGen	GAR-18-015	651	651.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		33.3	22.5	0.062	1.26	0.936	3.16	5.42	9.4	102	13.6	5.3	0.67
143144	NexGen	GAR-18-015	699.75	700.25	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		24.3	31.6	0.087	1.58	1.25	3.8	6.72	6.9	63.1	8.2	3.9	0.43
128830	NexGen	GAR-19-033	444	444.5	Waste Rock	UGTMF	INT	INT		46.5	40.4	0.281	4.72	4.06	11.1	20.1	12.7	132	15.6	8	0.39
132124	NexGen	GAR-19-032	416	416.5	Waste Rock	UGTMF	INT	INT		37.9	26.6	0.204	3.51	3.01	8.22	14.9	10.2	86.7	12.6	6.5	0.19
132144	NexGen	GAR-19-032	616	616.5	Waste Rock	UGTMF	INT	INT		42.9	42.7	0.198	3.53	2.91	7.91	14.5	11.6	154	17.2	7.6	0.6
128835	NexGen	GAR-19-033	494	494.5	Waste Rock	UGTMF	INT	INT		46.7	12.9	0.349	5.71	5.08	13.4	24.5	12.9	116	12.7	7.8	0.3
128860	NexGen	GAR-19-033	744	744.5	Waste Rock	UGTMF	INT	INT		36.7	21.7	0.15	2.56	2.09	5.66	10.5	10.2	78.3	11.4	6	0.3
128874	NexGen	GAR-19-035	129	129.5	Waste Rock	UGTMF	INT	INT		122	36.4	0.118	2.35	1.78	5.04	9.28	28.1	112	20.5	23.3	0.6
128883	NexGen	GAR-19-035	179	179.5	Waste Rock	UGTMF	INT	INT		46.6	44.6	0.118	2.52	1.79	5.74	10.2	12.5	93.2	14.6	7.6	0.35
128888	NexGen	GAR-19-035	229	229.5	Waste Rock	UGTMF	INT	INT		54.2	38.4	0.267	4.58	3.84	10.9	19.6	14.5	119	14.6	8.8	0.32
128893	NexGen	GAR-19-035	279	279.5	Waste Rock	UGTMF	INT	INT		40.1	54.2	0.29	4.73	4.15	11.2	20.3	10.7	115	15.6	6.7	0.42
132169	NexGen	GAR-19-034	147	147.5	Waste Rock	UGTMF	INT	INT		123	46.1	0.07	1.42	1.05	3.29	5.83	27.3	90.9	19.1	22.8	0.54
132174	NexGen	GAR-19-034	197	197.5	Waste Rock	UGTMF	INT	INT		46.3	36.6	0.141	2.77	2.11	5.98	11	12.4	65.8	16	7.8	0.21
132179	NexGen	GAR-19-034	247	247.5	Waste Rock	UGTMF	INT	INT		43.1	65.7	0.24	4.62	3.55	8.8	17.2	11.5	140	16.6	7.1	0.46
132184	NexGen	GAR-19-034	297	297.5	Waste Rock	UGTMF	INT	INT		44.6	36.2	0.355	5.67	5.14	13	24.1	11.8	90.4	14.2	7.5	0.23
132189	NexGen	GAR-19-034	347	347.5	Waste Rock	UGTMF	INT	INT		40.4	44.3	0.298	4.79	4.4	11	20.5	10.8	130	18.4	6.9	0.31
132194	NexGen	GAR-19-034	397	397.5	Waste Rock	UGTMF	INT	INT		39.8	46	0.498	7.68	7.2	17.6	32.9	10.6	111	15.7	6.9	0.2
132199	NexGen	GAR-19-034	447	447.5	Waste Rock	UGTMF	INT	INT		47.7	24.2	0.36	5.91	5.28	13.4	25	12.6	81.4	16.3	8	0.34
132204	NexGen	GAR-19-034	497	497.5	Waste Rock	UGTMF	INT	INT		47.5	37.2	0.355	5.78	5.18	13.2	24.6	12.6	138	17.3	8.2	0.48
132245	NexGen	GAR-19-036	105	105.5	Waste Rock	UGTMF	INT	INT		41.7	30.2	0.03	0.79	0.492	1.94	3.26	11.6	42.4	14	5.3	0.35
128800	NexGen	GAR-19-033	143.65	144.15	Waste Rock	UGTMF	SPGN	SPGN		72.7	45.9	0.043	1.31	0.726	2.69	4.77	20.1	40.9	14	12.4	0.42
128805	NexGen	GAR-19-033	193.65	194.15	Waste Rock	UGTMF	SPGN	SPGN		35.3	71.1	0.205	3.47	2.99	7.41	14.1	9.6	167	16.6	6.5	0.53
128810	NexGen	GAR-19-033	243.65	244.15	Waste Rock	UGTMF	SPGN	SPGN		44.8	55.2	0.218	3.7	3.21	8.33	15.5	12.1	134	16.2	8	0.35
128815	NexGen	GAR-19-033	293.65	294.15	Waste Rock	UGTMF	SPGN	SPGN		34.9	50	0.168	3.25	2.5	6.85	12.8	9.4	95.3	21.3	6.3	0.46
128820	NexGen	GAR-19-033	344	344.5	Waste Rock	UGTMF	SPGN	SPGN		49.2	35.3	0.303	5.08	4.42	11.6	21.4	13.5	134	17.5	8.5	0.31
128825	NexGen	GAR-19-033	394	394.5	Waste Rock	UGTMF	SPGN	SPGN		39.3	44.7	0.862	13.4	12.4	29.7	56.4	11	145	16.9	7	0.43
132099	NexGen	GAR-19-032	166	166.5	Waste Rock	UGTMF	SPGN	SPGN		41.1	28.3	0.118	2.16	1.79	5.34	9.41	11.4	98.1	12.2	7.2	0.23
132104	NexGen	GAR-19-032	216	216.5	Waste Rock	UGTMF	SPGN	SPGN		34.2	40.2	0.08	1.79	1.21	3.3	6.38	9.6	130	18.1	6	0.54
132109	NexGen	GAR-19-032	266	266.5	Waste Rock	UGTMF	SPGN	SPGN		46.5	98.3	0.243	4	3.49	8.8	16.5	12.7	104	13.6	8.2	0.58
132114	NexGen	GAR-19-032	316	316.5	Waste Rock	UGTMF	SPGN	SPGN		44.8	108	0.339	5.7	4.89	12.7	23.7	12	202	18.6	8	0.54
132119	NexGen	GAR-19-032	366	366.5	Waste Rock	UGTMF	SPGN	SPGN		50.1	34.8	0.206	3.61	3.05	8.36	15.2	14	133	16.6	8.4	0.37
132129	NexGen	GAR-19-032	466	466.5	Waste Rock	UGTMF	SPGN	SPGN		38.8	47.9	0.486	7.74	7.11	17.5	32.8	10.7	143	19.1	7	0.32
132134	NexGen	GAR-19-032	516	516.5	Waste Rock	UGTMF	SPGN	SPGN		39.6	21.6	0.671	11.9	9.82	24.8	47.2	10.8	110	14.2	7	0.28
132139	NexGen	GAR-19-032	566	566.5	Waste Rock	UGTMF	SPGN	SPGN		47.5	55.3	0.328	5.73	4.9	13.3	24.2	12.7	114	15.8	8.4	0.37
128840	NexGen	GAR-19-033	544	544.5	Waste Rock	UGTMF	SPGN	SPGN		44.7	26.2	0.096	1.97	1.43	4.38	7.87	12.2	136	12.8	7.7	0.44
128845	NexGen	GAR-19-033	594	594.5	Waste Rock	UGTMF	SPGN	SPGN		33.8	44	0.138	2.35	1.96	5.38	9.83	9.4	158	19.7	6.1	0.65
128850	NexGen	GAR-19-033	644	644.5	Waste Rock	UGTMF	SPGN	SPGN		43.4	26.9	0.188	3.24	2.73	7.54	13.7	11.9	146	20.4	8	0.64
128855	NexGen	GAR-19-033	694	694.5	Waste Rock	UGTMF	SPGN	SPGN		43.4	49.1	0.166	2.91	2.37	6.21	11.7	11.7	128	22.6	8.3	0.56
132148	NexGen	GAR-19-032	666	666.5	Waste Rock	UGTMF	SPGN	SPGN		48.9	41	0.288	4.64	4.08	10.9	19.9	13.2	182	26.9	9.8	0.56
132153	NexGen	GAR-19-032	716	716.5	Waste Rock	UGTMF	SPGN	SPGN		33.4	24.1	0.267	4.36	3.9	9.96	18.5	9.3	97.4	12.5	6	0.22
128898	NexGen	GAR-19-035	329	329.5	Waste Rock	UGTMF	SPGN	SPGN		39	9.2	0.212	3.66	3.17	8.18	15.2	10.8	101	13	6.6	0.29
128903	NexGen	GAR-19-035	379	379.5	Waste Rock	UGTMF	SPGN	SPGN		39.7	71.3	0.597	9.19	8.62	21.1	39.5	10.9	155	14.2	6.8	0.42
128908	NexGen	GAR-19-035	429	429.5	Waste Rock	UGTMF	SPGN	SPGN		43.3	26.9	0.287	4.66	4.18	10.8	20	11.6	110	14.8	7.1	0.36
128913	NexGen	GAR-19-035	479	479.5	Waste Rock	UGTMF	SPGN	SPGN		55.2	7.4	0.152	2.95	2.26	7.02	12.4	15.2	58.1	11.7	9	0.26
132209	NexGen	GAR-19-034	547	547.5	Waste Rock	UGTMF	SPGN	SPGN		45.1	47.3	0.135	2.5	2.03	5.53	10.2	12	171	20.4	7.8	0.76
132214	NexGen	GAR-19-034	597	597.5	Waste Rock	UGTMF	SPGN	SPGN		36	49.2	0.116	2.03	1.68	4.44	8.27	9.7	124	17.8	6.3	0.62
132219	NexGen	GAR-19-034	647	647.5	Waste Rock	UGTMF	SPGN	SPGN		28.7	34.1	0.149	2.55	2.14	5.64	10.5	7.6	81.3	9.6	4.9	0.42
132224	NexGen	GAR-19-034	697	697.5	Waste Rock	UGTMF	SPGN	SPGN		32.8	24.6	0.334	5.32	4.82	12.1	22.6	8.8	110	12.8	5.7	0.46
132229	NexGen	GAR-19-034	747	747.5	Waste Rock	UGTMF	SPGN	SPGN		32.5	30.9	0.314	4.85	4.53	11.1	20.8	9	113	11.2	5.3	0.45
128919	NexGen	GAR-19-035	539	539.5	Waste Rock	UGTMF	SPGN	SPGN		51.8	42.9	0.213	6.22	3.32	8.76	18.5	14	125	16.4	8.2	0.36
128924	NexGen	GAR-19-035	589	589.5	Waste Rock	UGTMF	SPGN	SPGN		44.3	47.8	0.403	6.71	5.86	14.3	27.2	11.7	153	20.5	7.6	0.48
128929	NexGen	GAR-19-035	639	639.5	Waste Rock	UGTMF	SPGN	SPGN		27.6	23.4	0.06	1.2	0.907	2.66	4.82	7.4	56.1	11	5	0.21
128934	NexGen	GAR-19-035	689	689.5	Waste Rock	UGTMF	SPGN	SPGN		36.2	51.1	0.167	2.9	2.54	6.38	12	10.3	172	26.2	7.3	0.62

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Total - 4-Acid Digestion and ICP-MS finish								Partial - Aqua Regia Digestion and ICP-OES Finish					
									Analyte	Ta	Tb	Th	U	W	Y	Yb	Zn	Ag	As	Bi	Co	Cu	Ge
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-MS Total Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion
									Detection Limit	0.02	0.02	0.02	0.02	0.1	0.1	0.02	1	0.2	1	1	1	1	1
									Analytical Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	$HF/HNO_3/HClO_4$	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl
143123	NexGen	GAR-18-015	8.5	9	Waste Rock	Shaft Pilot Hole	OVB	OVB		0.09	0.17	3.06	0.71	2.9	4.3	0.47	2	-	-	-	-	-	-
143124	NexGen	GAR-18-015	11.5	12	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.32	0.27	5.62	1.36	6.5	8	0.9	22	-	-	-	-	-	-
143125	NexGen	GAR-18-015	32	32.5	Waste Rock	Shaft Pilot Hole	LITL	LITL		0.68	0.34	6.49	2.03	1.4	11.8	1.49	36	-	-	-	-	-	-
143126	NexGen	GAR-18-015	45	45.5	Waste Rock	Shaft Pilot Hole	CRET	CRET		0.68	0.49	8.51	2.23	1.1	13.9	1.58	34	-	-	-	-	-	-
143127	NexGen	GAR-18-015	56.5	57	Waste Rock	Shaft Pilot Hole	CRET	CRET		1.16	1.01	14.8	3.83	2	28.1	3	83	-	-	-	-	-	-
143128	NexGen	GAR-18-015	66	66.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		0.56	0.51	11	1.99	1.2	13.2	1.54	8	-	-	-	-	-	-
143129	NexGen	GAR-18-015	72	72.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		0.44	0.49	8.38	1.46	0.9	13.5	1.4	6	-	-	-	-	-	-
143130	NexGen	GAR-18-015	80.5	81	Waste Rock	Shaft Pilot Hole	ASST	ASST		0.07	0.1	2.69	0.9	< 0.1000	3.5	0.41	1	-	-	-	-	-	-
143131	NexGen	GAR-18-015	91	91.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		0.11	0.17	3.81	1.32	0.2	6.3	0.74	1	-	-	-	-	-	-
143132	NexGen	GAR-18-015	101	101.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.72	0.32	26.3	1.5	0.7	12.6	1.56	13	-	-	-	-	-	-
143133	NexGen	GAR-18-015	151	151.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.37	0.44	9.53	2.14	0.3	13.2	1.85	20	-	-	-	-	-	-
143134	NexGen	GAR-18-015	201	201.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.68	0.72	25.4	2.73	0.6	23.4	2.74	89	-	-	-	-	-	-
143135	NexGen	GAR-18-015	251	251.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.74	0.65	25.7	3	0.2	20.4	2.04	220	-	-	-	-	-	-
143136	NexGen	GAR-18-015	301	301.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.41	0.55	18.8	2.74	0.7	18.4	1.7	66	-	-	-	-	-	-
143137	NexGen	GAR-18-015	351	351.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.49	0.63	34.6	1.69	0.3	16.8	1.88	71	-	-	-	-	-	-
143138	NexGen	GAR-18-015	402	402.5	Waste Rock	Shaft Pilot Hole	INT	INT		0.56	0.68	30.5	2.65	0.3	22	2.51	84	-	-	-	-	-	-
143139	NexGen	GAR-18-015	452.5	453	Waste Rock	Shaft Pilot Hole	INT	INT		0.48	0.74	26.6	2.64	0.3	26.1	2.76	76	-	-	-	-	-	-
143140	NexGen	GAR-18-015	502	502.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.76	0.57	19.6	2.2	1.8	18.7	2.14	58	-	-	-	-	-	-
143141	NexGen	GAR-18-015	551	551.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.7	0.37	10.4	1.18	1.7	10.1	1.67	49	-	-	-	-	-	-
143142	NexGen	GAR-18-015	601	601.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.8	0.63	19.9	1.94	1	19.6	2.31	91	-	-	-	-	-	-
143143	NexGen	GAR-18-015	651	651.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.71	0.44	18.3	1.74	1.5	13.7	1.58	47	-	-	-	-	-	-
143144	NexGen	GAR-18-015	699.75	700.25	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		0.54	0.32	17.7	1.43	1.1	9.7	1.2	21	-	-	-	-	-	-
128830	NexGen	GAR-19-033	444	444.5	Waste Rock	UGTMF	INT	INT		0.77	0.67	27.4	2.18	0.7	15.9	1.6	83	-	-	-	-	-	-
132124	NexGen	GAR-19-032	416	416.5	Waste Rock	UGTMF	INT	INT		0.46	0.62	20.5	1.82	0.2	15.2	1.55	71	-	-	-	-	-	-
132144	NexGen	GAR-19-032	616	616.5	Waste Rock	UGTMF	INT	INT		0.8	0.65	35.2	3.71	1	18	1.89	119	-	-	-	-	-	-
128835	NexGen	GAR-19-033	494	494.5	Waste Rock	UGTMF	INT	INT		0.47	0.75	26.4	2.08	0.2	23.9	2.88	61	-	-	-	-	-	-
128860	NexGen	GAR-19-033	744	744.5	Waste Rock	UGTMF	INT	INT		0.59	0.43	18.1	1.9	0.6	12.6	1.48	55	-	-	-	-	-	-
128874	NexGen	GAR-19-035	129	129.5	Waste Rock	UGTMF	INT	INT		1.04	1.62	30.3	4.23	1.2	45.1	3.86	19	-	-	-	-	-	-
128883	NexGen	GAR-19-035	179	179.5	Waste Rock	UGTMF	INT	INT		0.71	0.63	25.1	2.31	0.4	17.8	1.88	50	-	-	-	-	-	-
128888	NexGen	GAR-19-035	229	229.5	Waste Rock	UGTMF	INT	INT		0.72	0.74	31.1	2.91	0.3	19.4	1.82	70	-	-	-	-	-	-
128893	NexGen	GAR-19-035	279	279.5	Waste Rock	UGTMF	INT	INT		0.85	0.55	21.7	1.97	0.8	15.5	1.58	87	-	-	-	-	-	-
132169	NexGen	GAR-19-034	147	147.5	Waste Rock	UGTMF	INT	INT		0.88	1.81	25.4	2.52	1	55.5	4.73	20	-	-	-	-	-	-
132174	NexGen	GAR-19-034	197	197.5	Waste Rock	UGTMF	INT	INT		0.72	0.68	20	2.42	0.4	18.4	2.02	48	-	-	-	-	-	-
132179	NexGen	GAR-19-034	247	247.5	Waste Rock	UGTMF	INT	INT		0.89	0.69	21	2.84	0.4	23.2	2.48	94	-	-	-	-	-	-
132184	NexGen	GAR-19-034	297	297.5	Waste Rock	UGTMF	INT	INT		0.53	0.7	18.1	1.88	0.3	22.4	2.43	71	-	-	-	-	-	-
132189	NexGen	GAR-19-034	347	347.5	Waste Rock	UGTMF	INT	INT		0.69	0.68	16.9	1.67	0.5	20.6	2.15	112	-	-	-	-	-	-
132194	NexGen	GAR-19-034	397	397.5	Waste Rock	UGTMF	INT	INT		0.67	0.63	14.3	1.5	0.3	18.9	1.94	84	-	-	-	-	-	-
132199	NexGen	GAR-19-034	447	447.5	Waste Rock	UGTMF	INT	INT		0.64	0.76	19.9	1.78	0.2	23.8	2.85	85	-	-	-	-	-	-
132204	NexGen	GAR-19-034	497	497.5	Waste Rock	UGTMF	INT	INT		0.7	0.96	24.6	2.46	0.3	33.1	3.7	103	-	-	-	-	-	-
132245	NexGen	GAR-19-036	105	105.5	Waste Rock	UGTMF	INT	INT		0.61	0.32	32.5	1.52	0.3	10.1	1.65	12	-	-	-	-	-	-
128800	NexGen	GAR-19-033	143.65	144.15	Waste Rock	UGTMF	SPGN	SPGN		0.7	0.75	29.1	4.05	1	23.2	2.38	17	-	-	-	-	-	-
128805	NexGen	GAR-19-033	193.65	194.15	Waste Rock	UGTMF	SPGN	SPGN		0.89	0.65	18.2	2.95	1.1	18.7	2.03	82	-	-	-	-	-	-
128810	NexGen	GAR-19-033	243.65	244.15	Waste Rock	UGTMF	SPGN	SPGN		0.8	0.76	20.4	2.16	1	20.3	2.03	80	-	-	-	-	-	-
128815	NexGen	GAR-19-033	293.65	294.15	Waste Rock	UGTMF	SPGN	SPGN		0.84	0.74	23.1	3.18	0.6	24.6	2.81	32	-	-	-	-	-	-
128820	NexGen	GAR-19-033	344	344.5	Waste Rock	UGTMF	SPGN	SPGN		0.76	0.74	25.2	1.99	0.4	18	1.93	100	-	-	-	-	-	-
128825	NexGen	GAR-19-033	394	394.5	Waste Rock	UGTMF	SPGN	SPGN		0.86	0.73	17.2	1.75	0.7	26.8	3.19	108	-	-	-	-	-	-
132099	NexGen	GAR-19-032	166	166.5	Waste Rock	UGTMF	SPGN	SPGN		0.5	0.62	26.3	1.9	0.3	17.4	1.75	64	-	-	-	-	-	-
132104	NexGen	GAR-19-032	216	216.5	Waste Rock	UGTMF	SPGN	SPGN		0.82	0.59	20.1	3.04	1.5	18.4	2.12	54	-	-	-	-	-	-
132109	NexGen	GAR-19-032	266	266.5	Waste Rock	UGTMF	SPGN	SPGN		0.53	0.63	23.5	2.08	0.3	9.2	0.44	63	-	-	-	-	-	-
132114	NexGen	GAR-19-032	316	316.5	Waste Rock	UGTMF	SPGN	SPGN		0.93	0.76	20.7	2.74	0.4	20.7	1.91	157	-	-	-	-	-	-
132119	NexGen	GAR-19-032	366	366.5	Waste Rock	UGTMF	SPGN	SPGN		0.61	0.76	26.6	2.76	0.5	16.3	1.79	102	-	-	-	-	-	-
132129	NexGen	GAR-19-032	466	466.5	Waste Rock	UGTMF	SPGN	SPGN		0.84	0.77	21	2.11	0.5	24.9	2.58	102	-	-	-	-	-	-
132134	NexGen	GAR-19-032	516	516.5	Waste Rock	UGTMF	SPGN	SPGN		0.57	0.64	17.8	1.78	0.4	18.8	2.01	91	-	-	-	-	-	-
132139	NexGen	GAR-19-032	566	566.5	Waste Rock	UGTMF	SPGN	SPGN		0.8	0.8	30.5	2.46	0.7	24.4	2.72	107	-	-	-	-	-	-
128840	NexGen	GAR-19-033	544	544.5	Waste Rock	UGTMF	SPGN	SPGN		1.01	0.55	29.4	3.04	1.3	13.4	1.38	55	-	-	-	-	-	-
128845	NexGen	GAR-19-033	594	594.5	Waste Rock	UGTMF	SPGN	SPGN		1.02	0.56	22.6	1.85	1.7	17.2	2.14	82	-	-	-	-	-	-
128850	NexGen	GAR-19-033	644	644.5	Waste Rock	UGTMF	SPGN	SPGN		0.96	0.82	24.4	2.42	1.2	26.1	3.12	94	-	-	-	-	-	-
128855	NexGen	GAR-19-033	694	694.5	Waste Rock	UGTMF	SPGN	SPGN		1	0.85	23.5	3.02	1.2	23.2	2.89	89	-	-	-	-	-	-
132148	NexGen	GAR-19-032	666	666.5	Waste Rock	UGTMF	SPGN	SPGN		0.79	1.16	22.4	2.32	0.7	38.9	4.56	115	-	-	-	-	-	-
132153	NexGen	GAR-19-032	716	716.5	Waste Rock	UGTMF	SPGN	SPGN		0.62	0.67	17.3	1.52	0.6	21.4	2.67	72	-	-	-	-	-	-
128898	NexGen	GAR-19-035	329	329.5	Waste Rock	UGTMF	SPGN	SPGN		0.74	0.64	19.4	2.33	0.3	17.2	1.91	74	-	-	-	-	-	-
128903	NexGen	GAR-19-035	379	379.5	Waste Rock	UGTMF	SPGN	SPGN		0.76	0.62	20.8	2.32	0.3	18.7	2.3	99	-	-	-	-	-	-
128908	NexGen	GAR-19-035	429	429.5	Waste Rock	UGTMF	SPGN	SPGN		0.72	0.62	25.1	2.3	0.3	18.7	2.12	70	-	-	-	-	-	-
128913	NexGen	GAR-19-035	479	479.5	Waste Rock	UGTMF	SPGN	SPGN		1.03	0.67	32.4	3.5	0.6	15.7	1.57	51	-	-	-	-	-	-
132209	NexGen	GAR-19-034	547	547.5	Waste Rock	UGTMF	SPGN	SPGN		0.96	0.73	24.9	2.28	2.3	23.4	2.85	79	-	-	-	-	-	-
132214	NexGen	GAR-19-034	597	597.5	Waste Rock	UGTMF	SPGN	SPGN		1.09	0.59	18.1	4.29	3.1	18.3	2.33	62	-	-	-	-	-	-
132219	NexGen	GAR-19-034	647	647.5	Waste Rock	UGTMF	SPGN	SPGN		0.49	0.42	16.9	1.87	1.1	12.7	1.52	77	-	-	-	-	-	-
132224	NexGen	GAR-19-034	697	697.5	Waste Rock	UGTMF	SPGN	SPGN		0.52	0.62	17.1	1.8	0.8	20.6	2.54	64	-	-	-	-	-	-
132229	NexGen	GAR-19-034	747	747.5	Waste Rock	UGTMF	SPGN	SPGN		0.49	0.5	14.9	1.32	0.8	15.2	1.97	61	-	-	-	-	-	-
128919	NexGen	GAR-19-035	539	539.5	Waste Rock	UGTMF	SPGN	SPGN		0.83	0.72	28.7	6.98	0.4	21.8	2.28	101	-	-	-	-	-	-
128924	NexGen	GAR-19-035	589	589.5	Waste Rock	UGTMF	SPGN	SPGN		0.75	0.78	14.2	6.75	0.5	27.6	3.03	122	-	-	-	-	-	-
128929	NexGen	GAR-19-035	639	639.5	Waste Rock	UGTMF	SPGN	SPGN		0.77	0.43	15.4	1.86	1.3	12	1.5	34	-	-	-	-	-	-
128934	NexGen	GAR-19-035	689	689.5	Waste Rock	UGTMF	SPGN	SPGN		1.23	0.95	17.5	2.79	1.2	30.2	3.42	99	-	-	-	-	-	-

Sample ID	Sampled By	Hole ID	Sample From (m)	Sample To (m)	Sample Classification	Location	Logged Lithology	Lithology Grouping		Partial - Aqua Regia Digestion and ICP-OES Finish									
									Analyte	Hg	Mo	Ni	Pb	Sb	Se	Te	U	V	Zn
									Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
									Method Code	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion	ICP-OES Partial Digestion
									Detection Limit	1	1	1	1	1	1	1	1	1	1
									Analytical Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
									Digestion	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl	HNO_3/HCl
143123	NexGen	GAR-18-015	8.5	9	Waste Rock	Shaft Pilot Hole	OVB	OVB		-	-	-	-	-	-	-	-	-	-
143124	NexGen	GAR-18-015	11.5	12	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	-	-	-	-	-	-	-	-	-
143125	NexGen	GAR-18-015	32	32.5	Waste Rock	Shaft Pilot Hole	LITL	LITL		-	-	-	-	-	-	-	-	-	-
143126	NexGen	GAR-18-015	45	45.5	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	-	-	-	-	-	-	-	-	-
143127	NexGen	GAR-18-015	56.5	57	Waste Rock	Shaft Pilot Hole	CRET	CRET		-	-	-	-	-	-	-	-	-	-
143128	NexGen	GAR-18-015	66	66.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	-	-	-	-	-	-	-	-	-
143129	NexGen	GAR-18-015	72	72.5	Waste Rock	Shaft Pilot Hole	DEVO	DEVO		-	-	-	-	-	-	-	-	-	-
143130	NexGen	GAR-18-015	80.5	81	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	-	-	-	-	-	-	-	-	-
143131	NexGen	GAR-18-015	91	91.5	Waste Rock	Shaft Pilot Hole	ASST	ASST		-	-	-	-	-	-	-	-	-	-
143132	NexGen	GAR-18-015	101	101.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	-	-	-	-	-	-	-
143133	NexGen	GAR-18-015	151	151.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	-	-	-	-	-	-	-
143134	NexGen	GAR-18-015	201	201.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	-	-	-	-	-	-	-
143135	NexGen	GAR-18-015	251	251.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	-	-	-	-	-	-	-
143136	NexGen	GAR-18-015	301	301.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	-	-	-	-	-	-	-
143137	NexGen	GAR-18-015	351	351.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	-	-	-	-	-	-	-
143138	NexGen	GAR-18-015	402	402.5	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	-	-	-	-	-	-	-
143139	NexGen	GAR-18-015	452.5	453	Waste Rock	Shaft Pilot Hole	INT	INT		-	-	-	-	-	-	-	-	-	-
143140	NexGen	GAR-18-015	502	502.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
143141	NexGen	GAR-18-015	551	551.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
143142	NexGen	GAR-18-015	601	601.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
143143	NexGen	GAR-18-015	651	651.5	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
143144	NexGen	GAR-18-015	699.75	700.25	Waste Rock	Shaft Pilot Hole	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
128830	NexGen	GAR-19-033	444	444.5	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
132124	NexGen	GAR-19-032	416	416.5	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
132144	NexGen	GAR-19-032	616	616.5	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
128835	NexGen	GAR-19-033	494	494.5	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
128860	NexGen	GAR-19-033	744	744.5	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
128874	NexGen	GAR-19-035	129	129.5	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
128883	NexGen	GAR-19-035	179	179.5	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
128888	NexGen	GAR-19-035	229	229.5	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
128893	NexGen	GAR-19-035	279	279.5	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
132169	NexGen	GAR-19-034	147	147.5	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
132174	NexGen	GAR-19-034	197	197.5	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
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132184	NexGen	GAR-19-034	297	297.5	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
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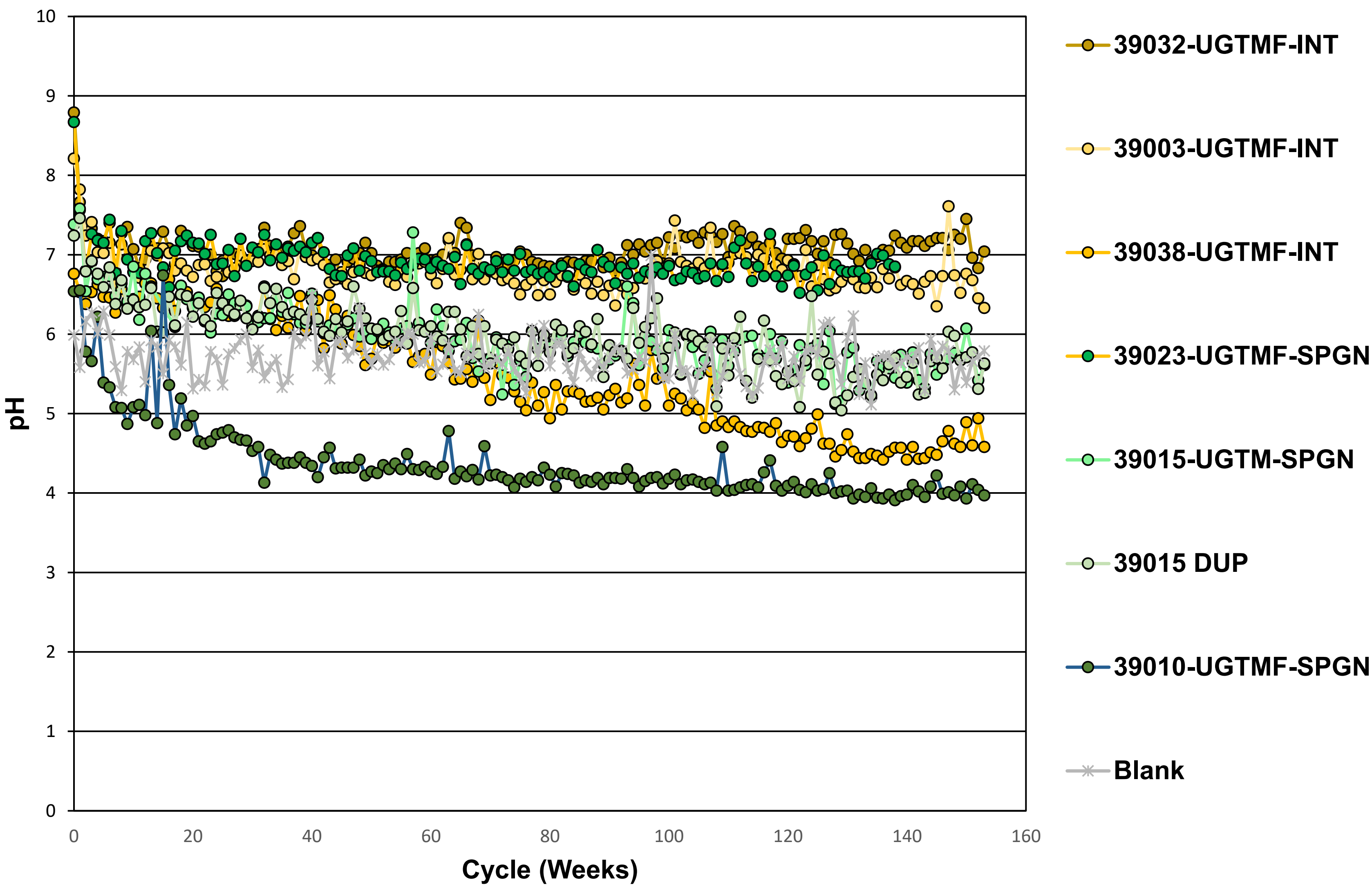
132204	NexGen	GAR-19-034	497	497.5	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
132245	NexGen	GAR-19-036	105	105.5	Waste Rock	UGTMF	INT	INT		-	-	-	-	-	-	-	-	-	-
128800	NexGen	GAR-19-033	143.65	144.15	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
128805	NexGen	GAR-19-033	193.65	194.15	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
128810	NexGen	GAR-19-033	243.65	244.15	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
128815	NexGen	GAR-19-033	293.65	294.15	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
128820	NexGen	GAR-19-033	344	344.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
128825	NexGen	GAR-19-033	394	394.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
132099	NexGen	GAR-19-032	166	166.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
132104	NexGen	GAR-19-032	216	216.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
132109	NexGen	GAR-19-032	266	266.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
132114	NexGen	GAR-19-032	316	316.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
132119	NexGen	GAR-19-032	366	366.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
132129	NexGen	GAR-19-032	466	466.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
132134	NexGen	GAR-19-032	516	516.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
132139	NexGen	GAR-19-032	566	566.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
128840	NexGen	GAR-19-033	544	544.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
128845	NexGen	GAR-19-033	594	594.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
128850	NexGen	GAR-19-033	644	644.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
128855	NexGen	GAR-19-033	694	694.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
132148	NexGen	GAR-19-032	666	666.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
132153	NexGen	GAR-19-032	716	716.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
128898	NexGen	GAR-19-035	329	329.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
128903	NexGen	GAR-19-035	379	379.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
128908	NexGen	GAR-19-035	429	429.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
128913	NexGen	GAR-19-035	479	479.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
132209	NexGen	GAR-19-034	547	547.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
132214	NexGen	GAR-19-034	597	597.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
132219	NexGen	GAR-19-034	647	647.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
132224	NexGen	GAR-19-034	697	697.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
132229	NexGen	GAR-19-034	747	747.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
128919	NexGen	GAR-19-035	539	539.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
128924	NexGen	GAR-19-035	589	589.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
128929	NexGen	GAR-19-035	639	639.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-
128934	NexGen	GAR-19-035	689	689.5	Waste Rock	UGTMF	SPGN	SPGN		-	-	-	-	-	-	-	-	-	-

Appendix C HCT Concentration Trends



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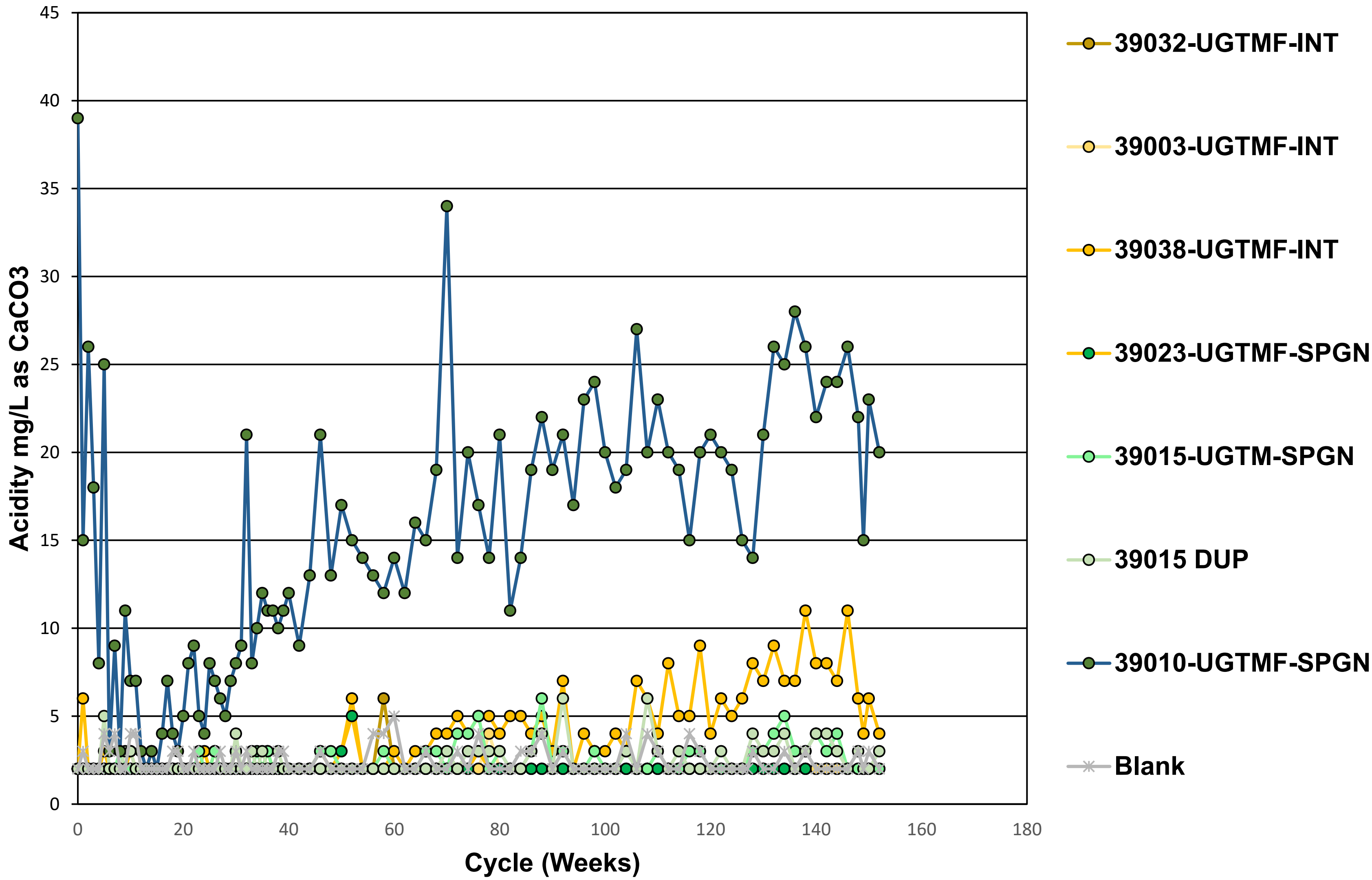

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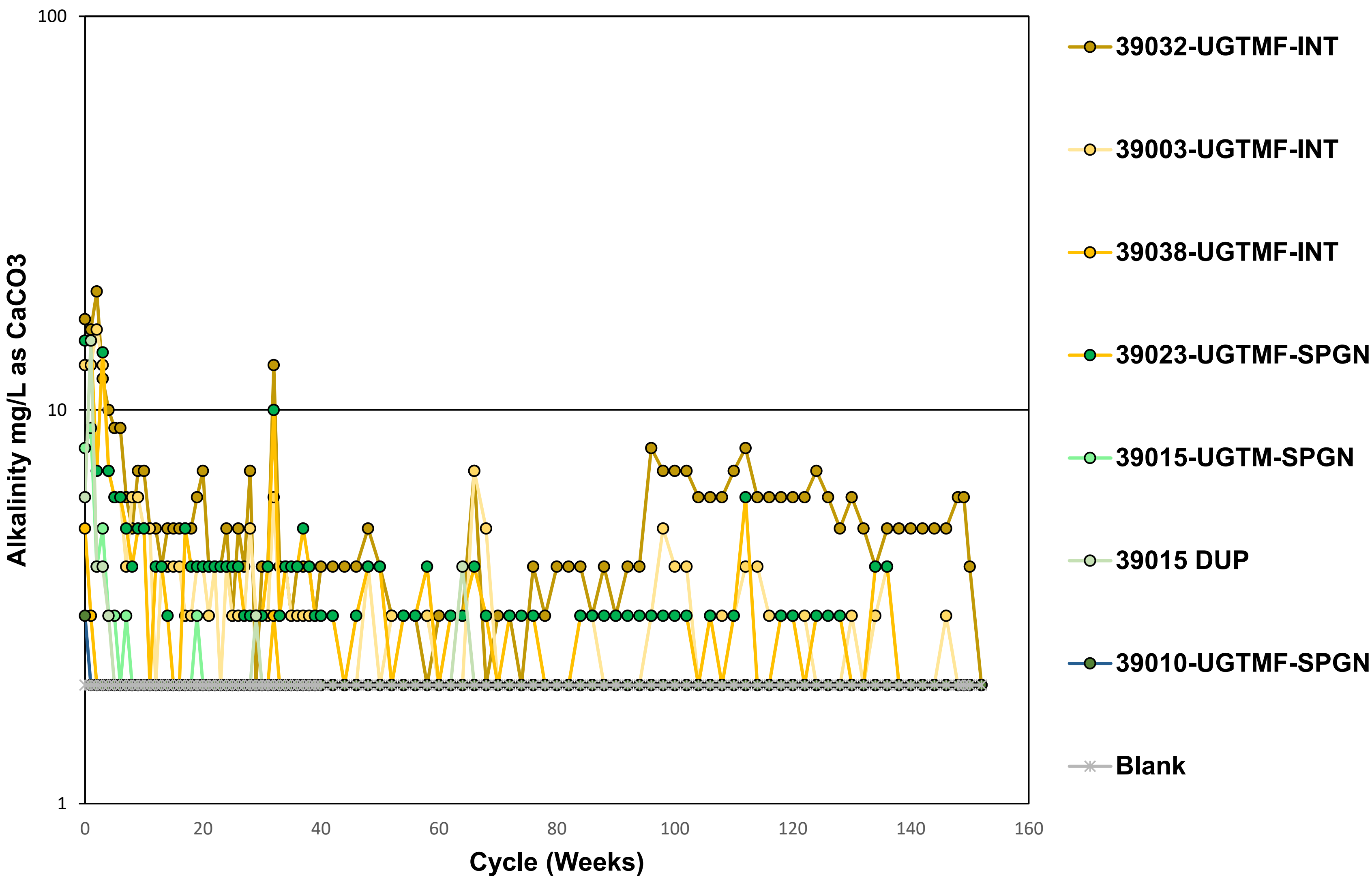

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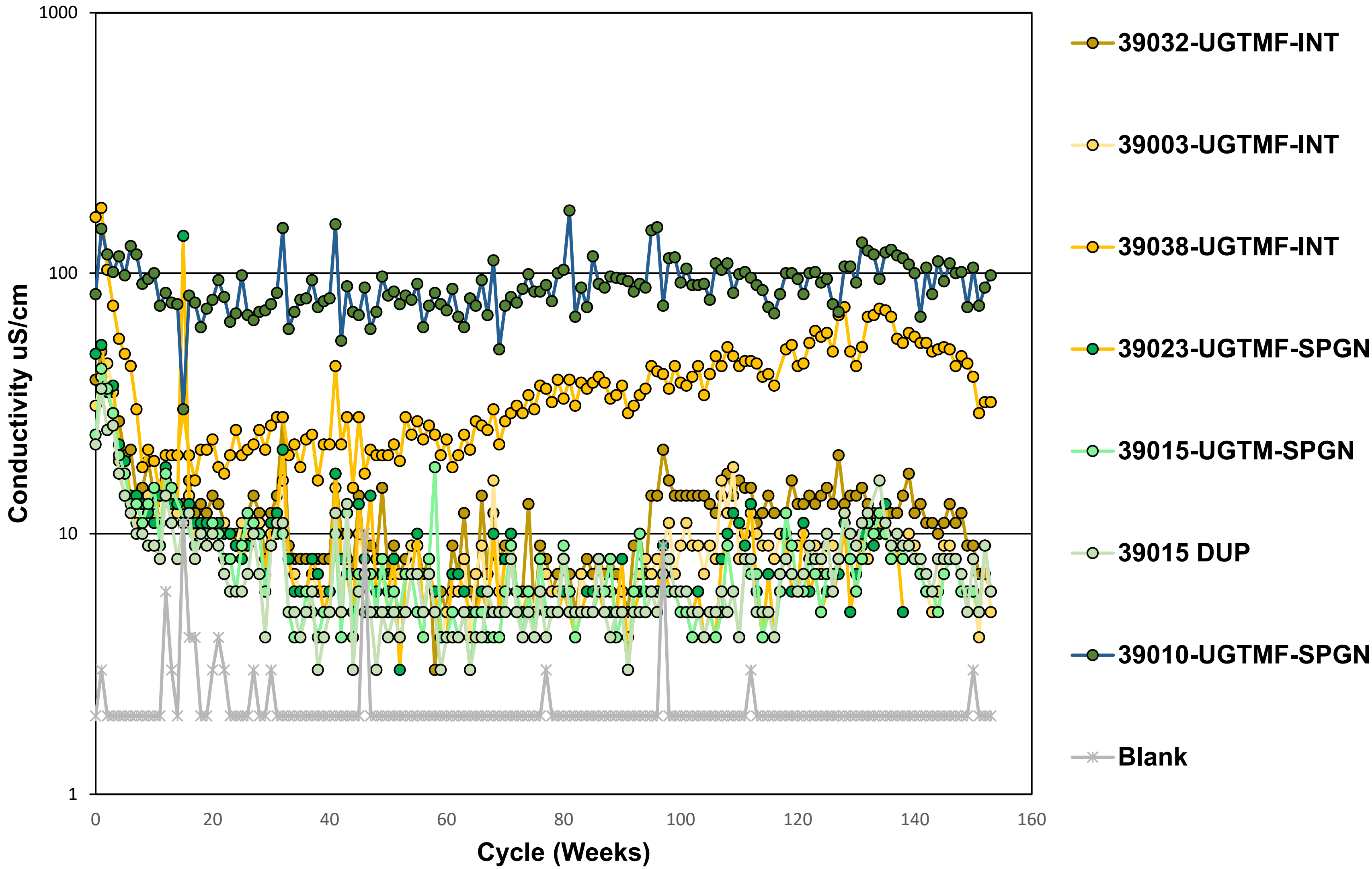

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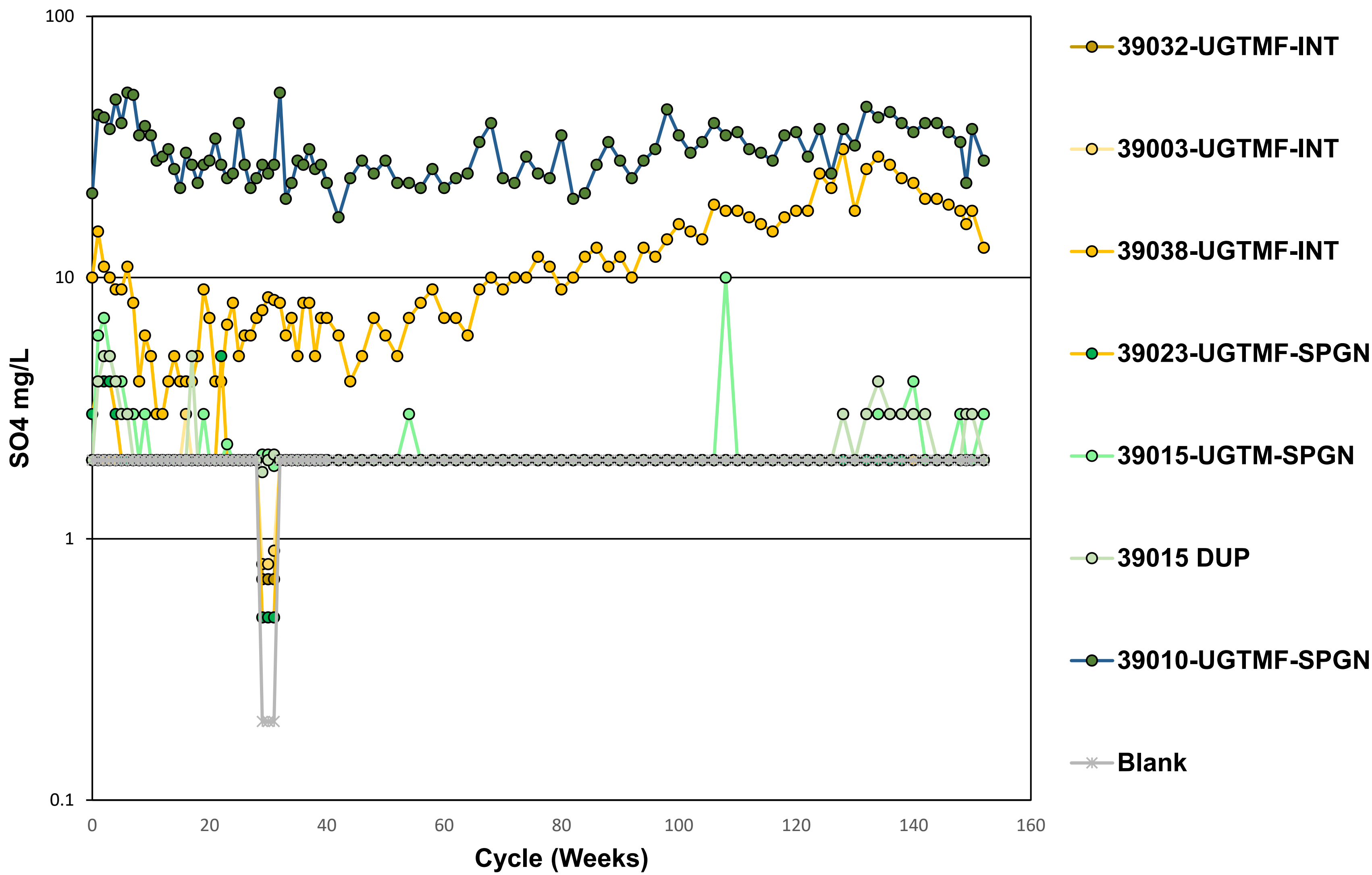

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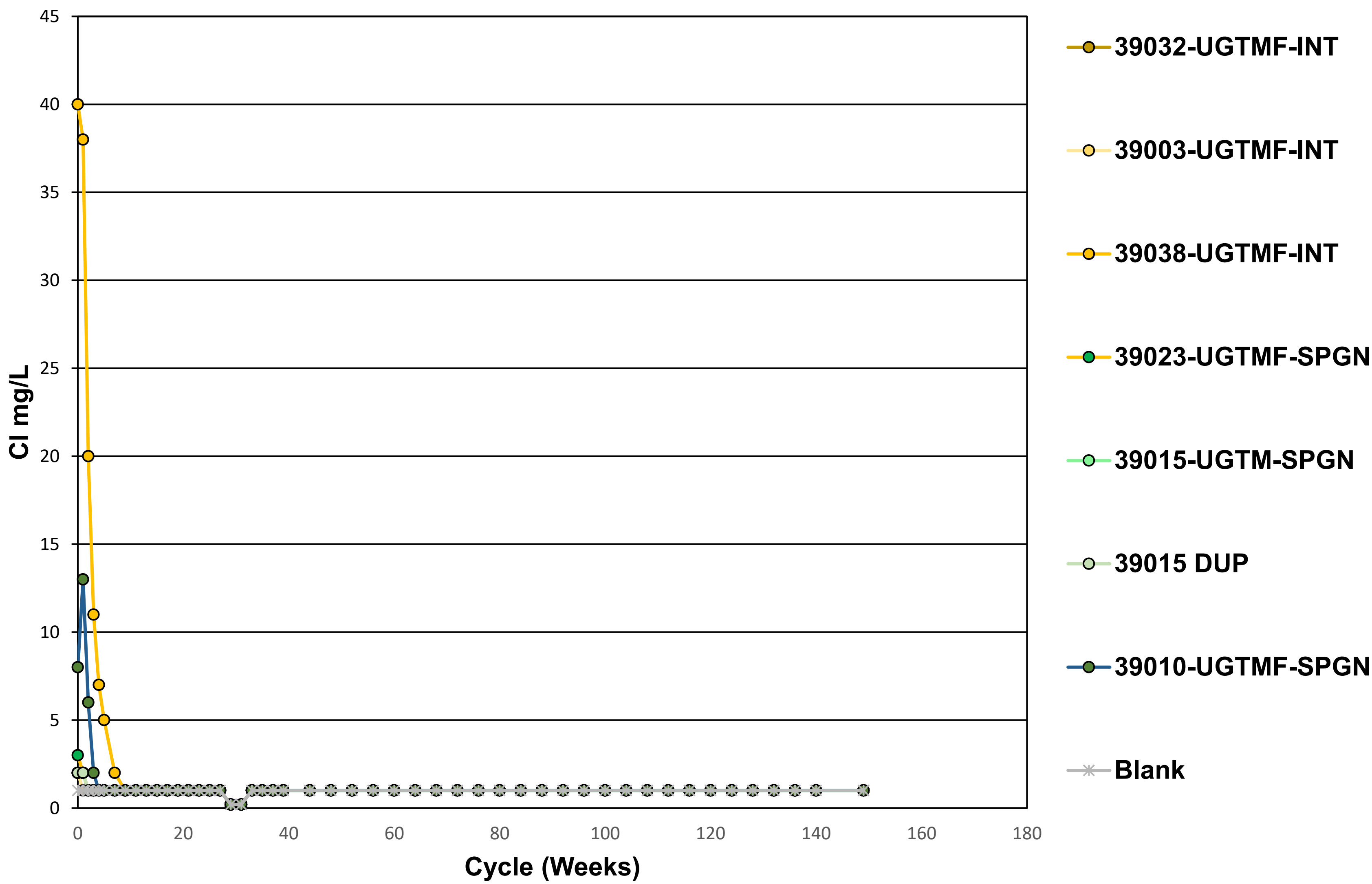

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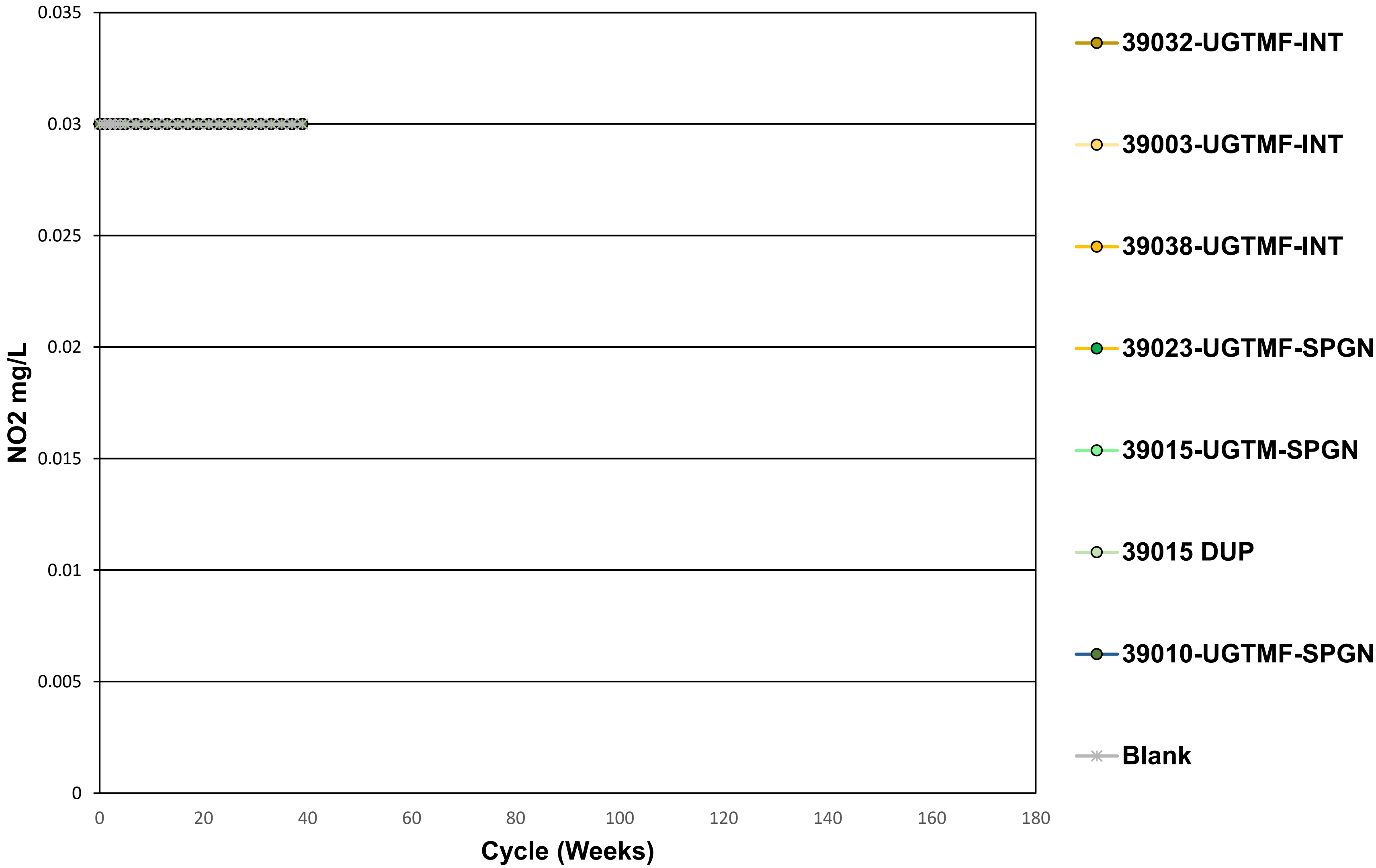

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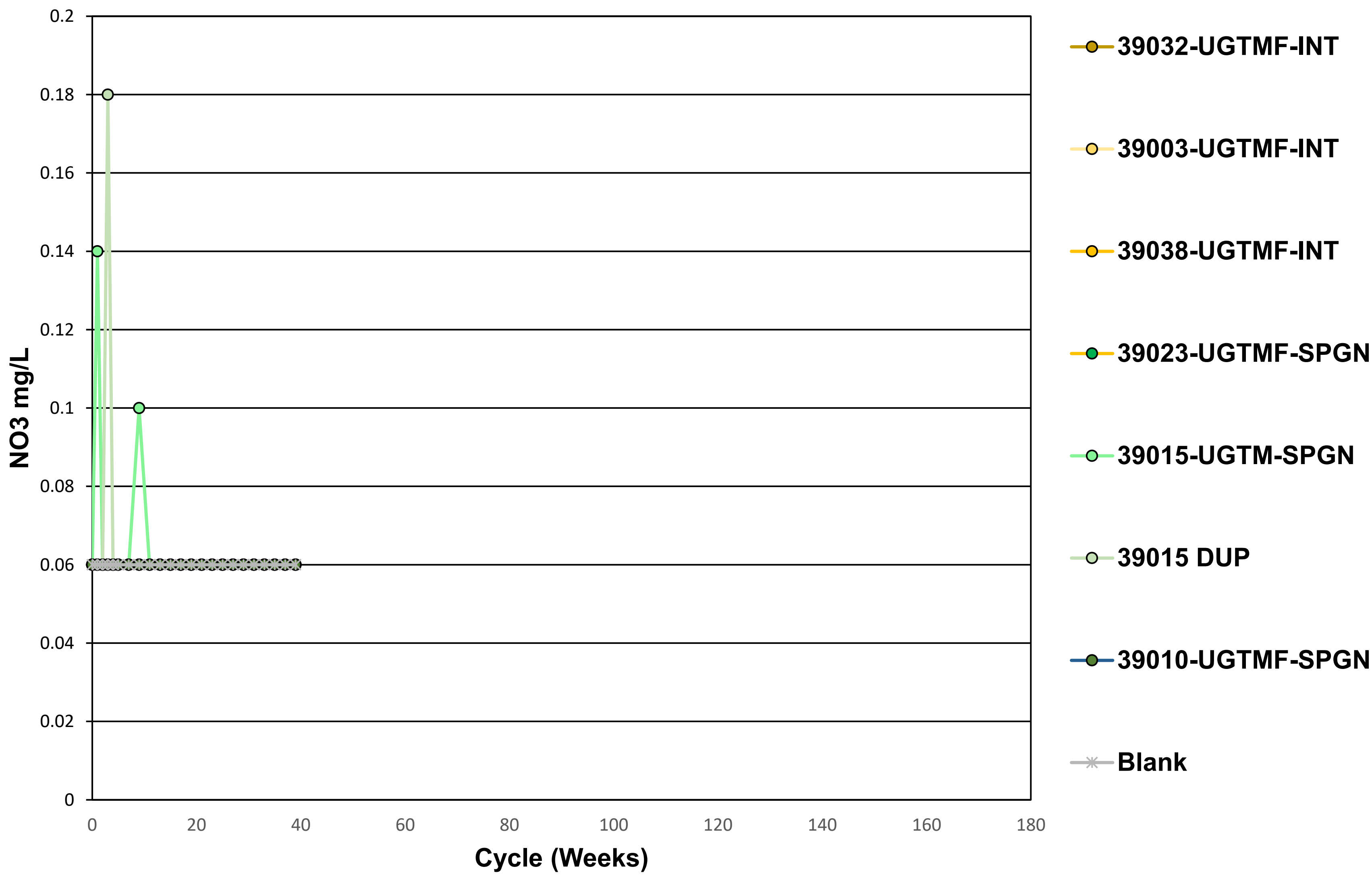

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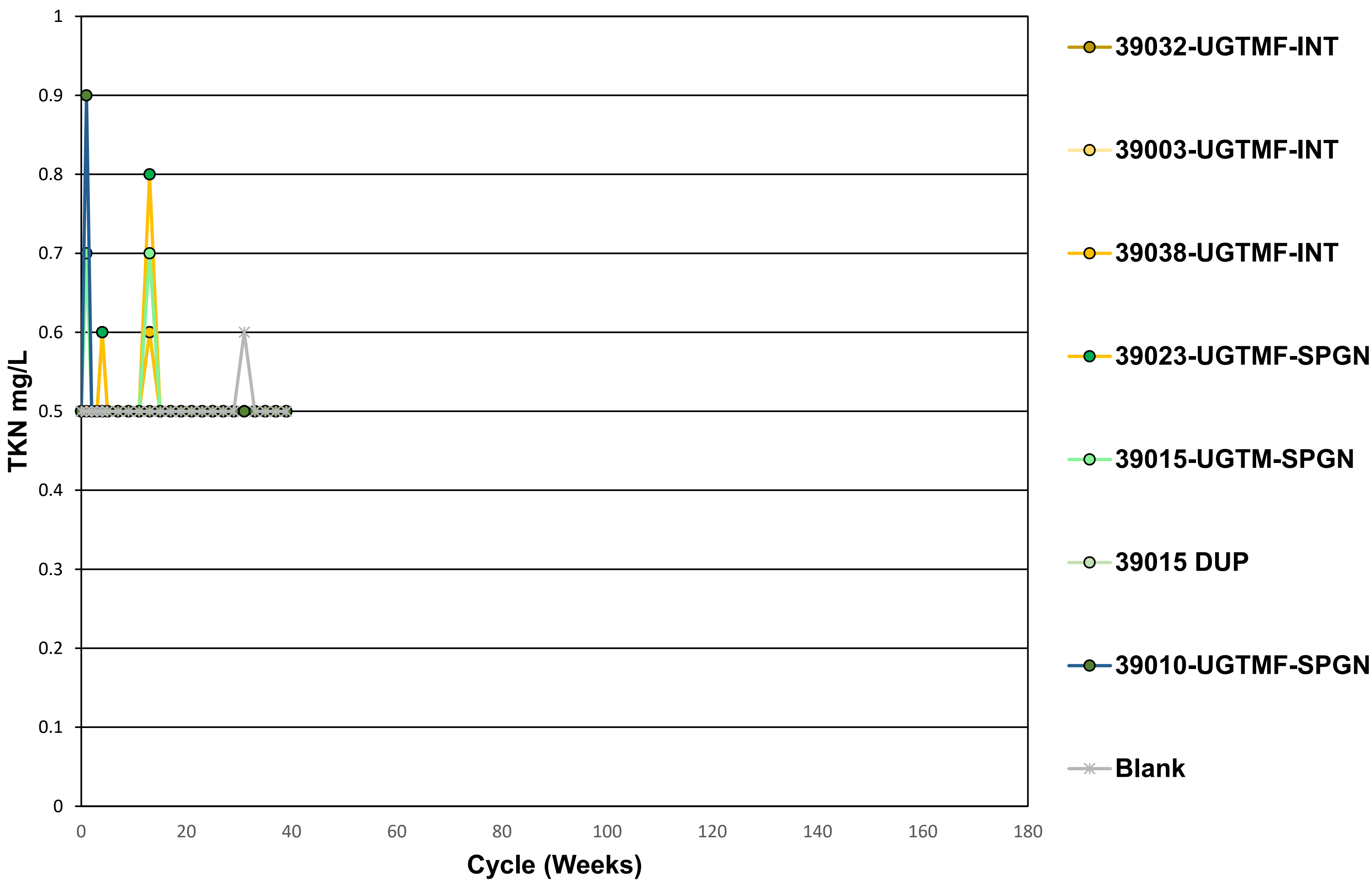

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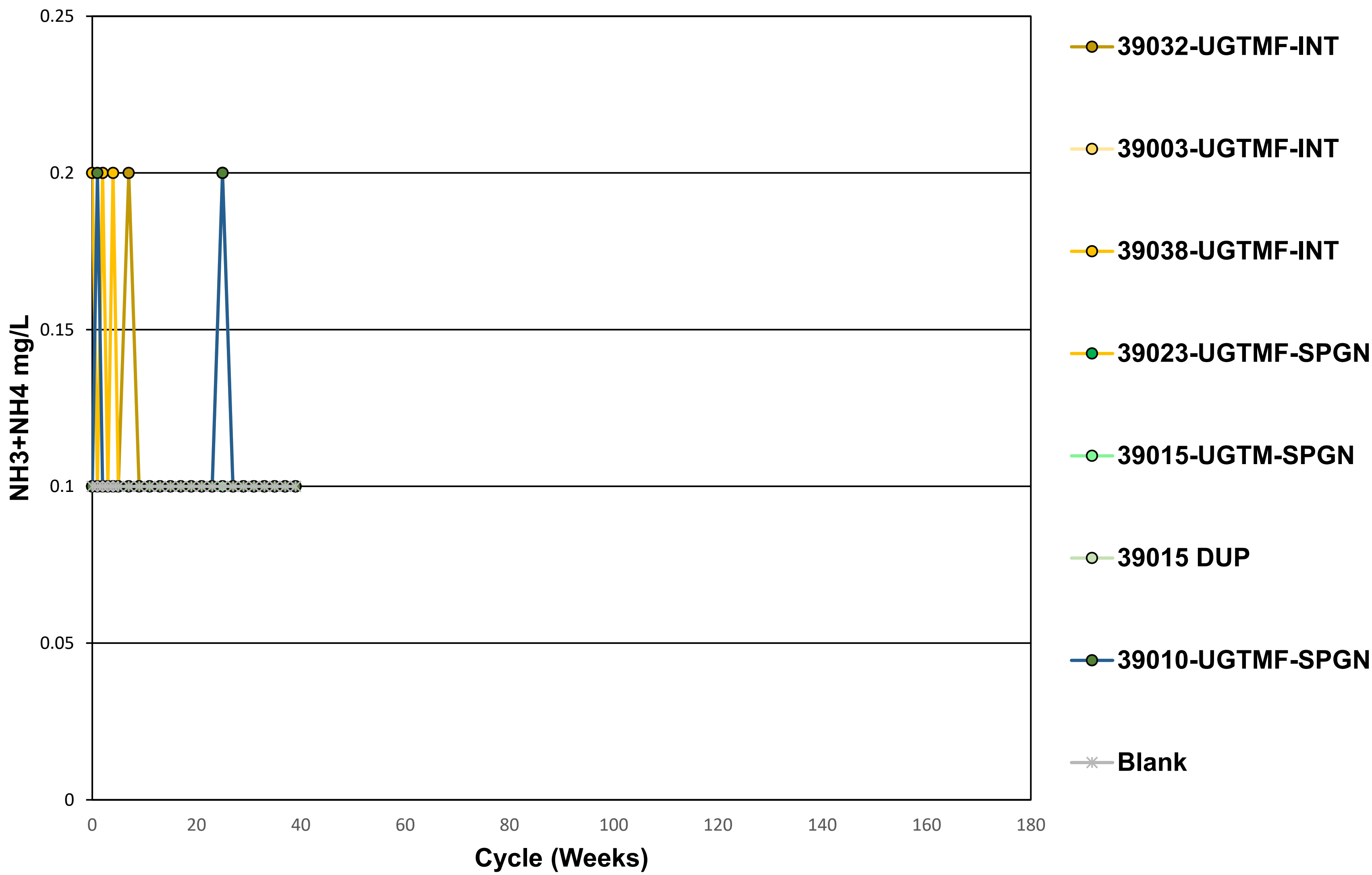

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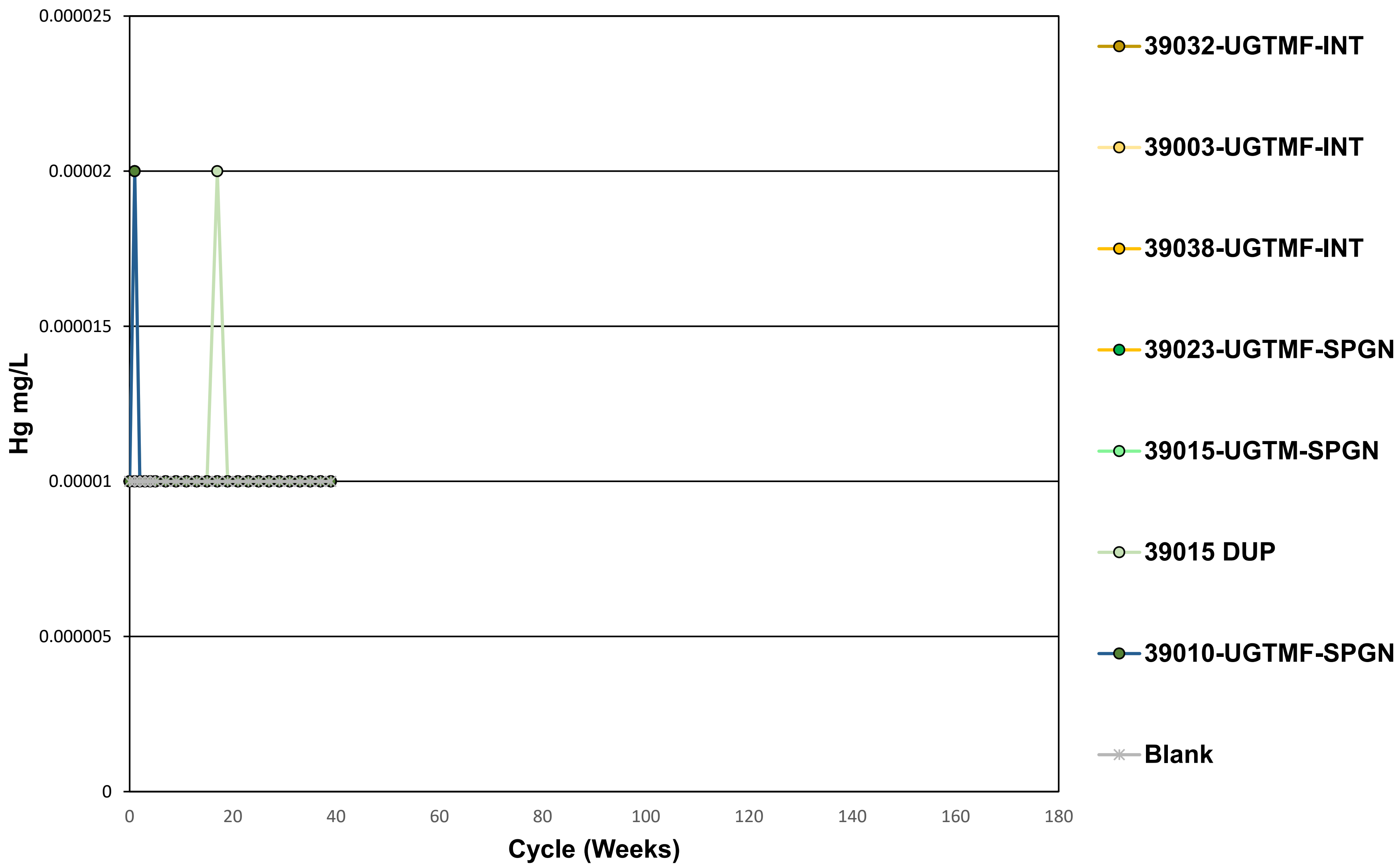

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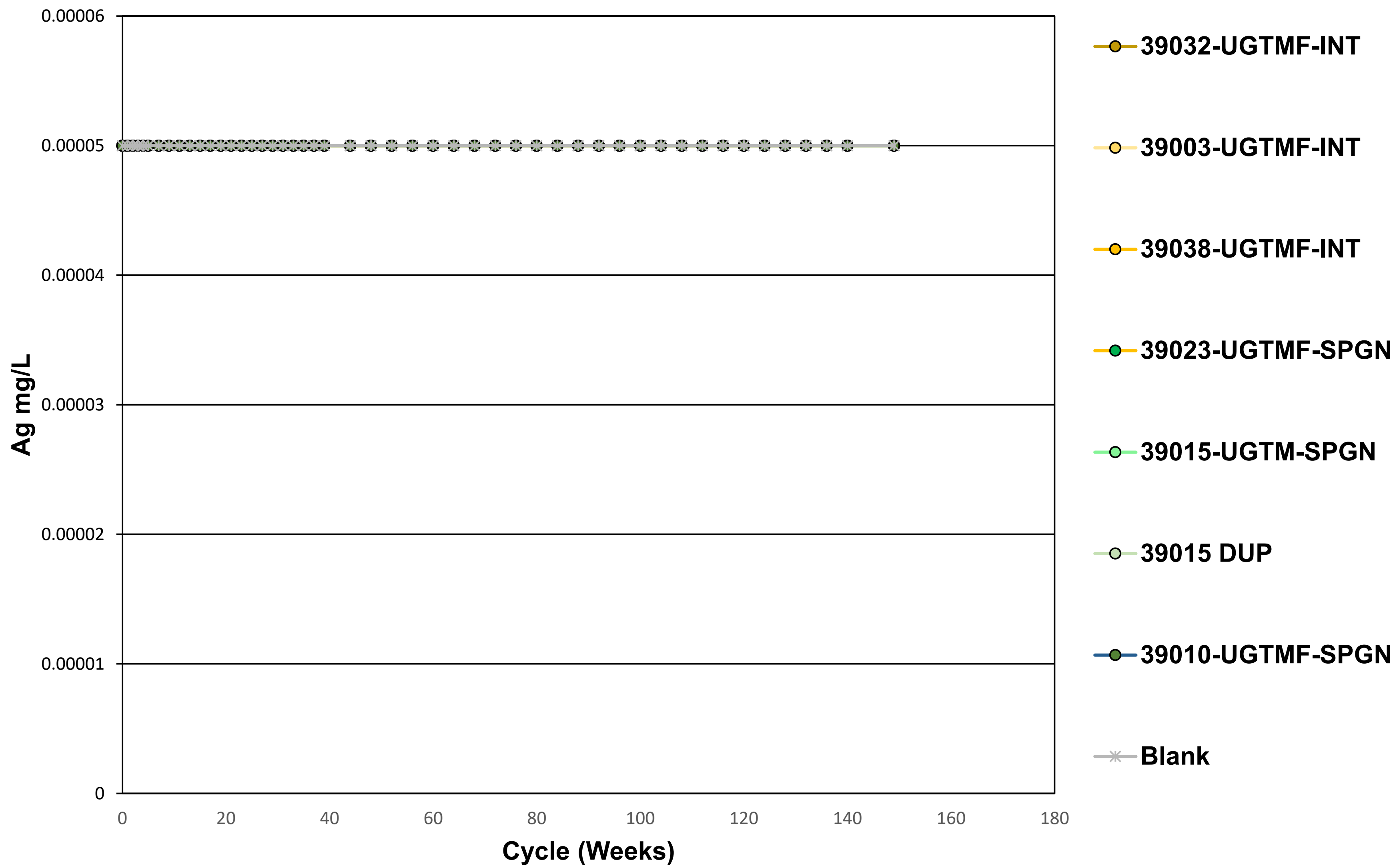

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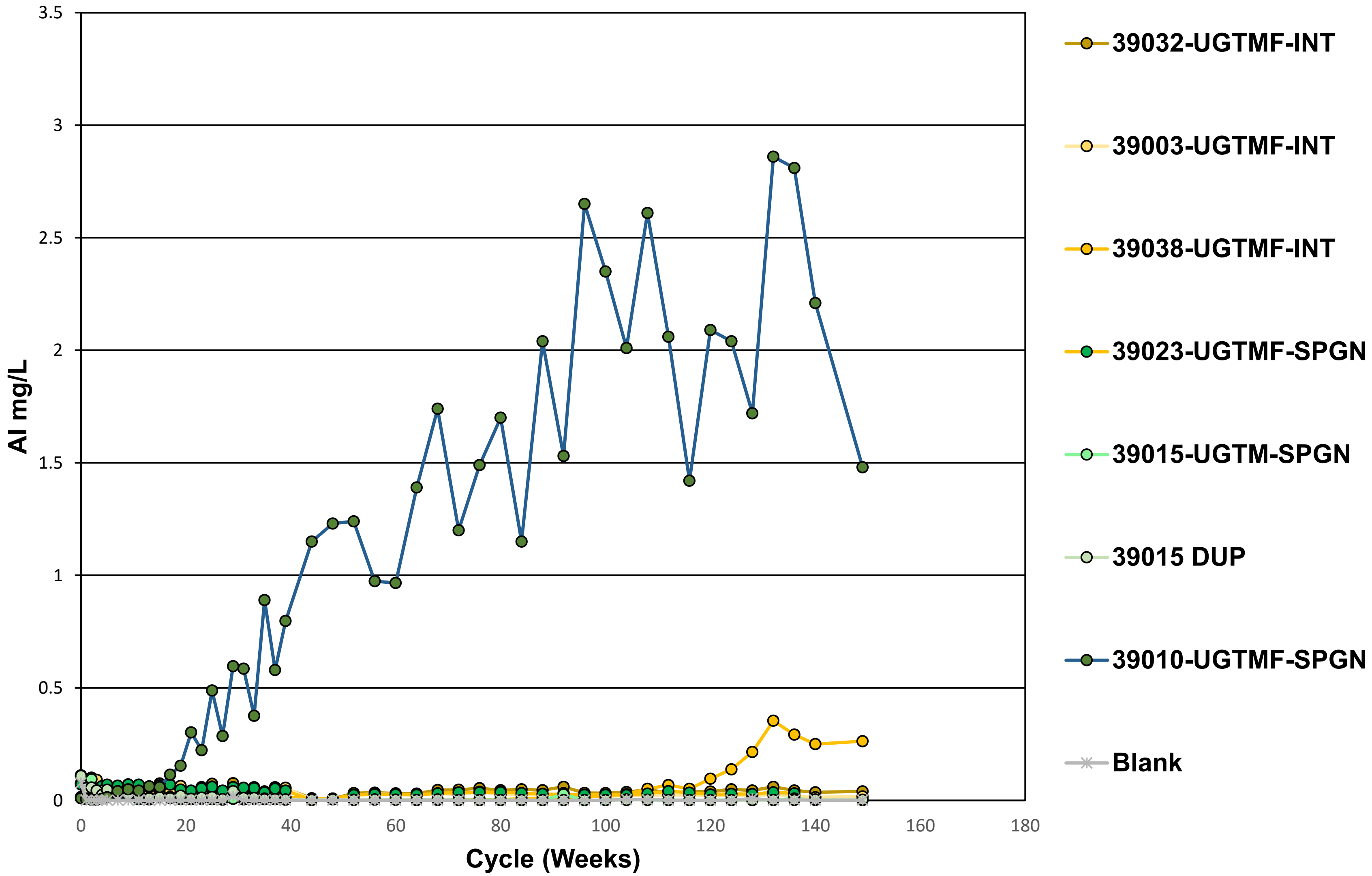

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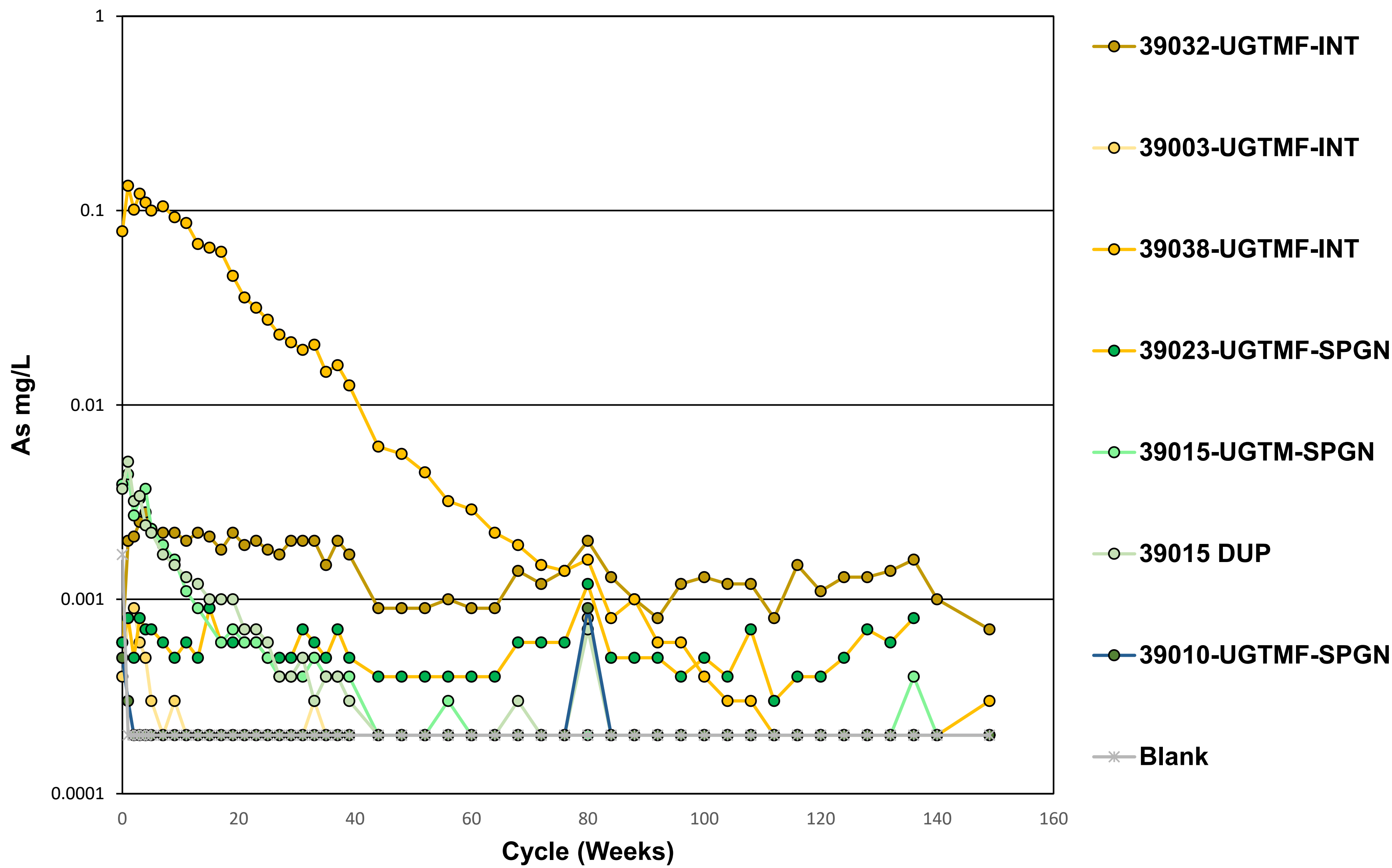

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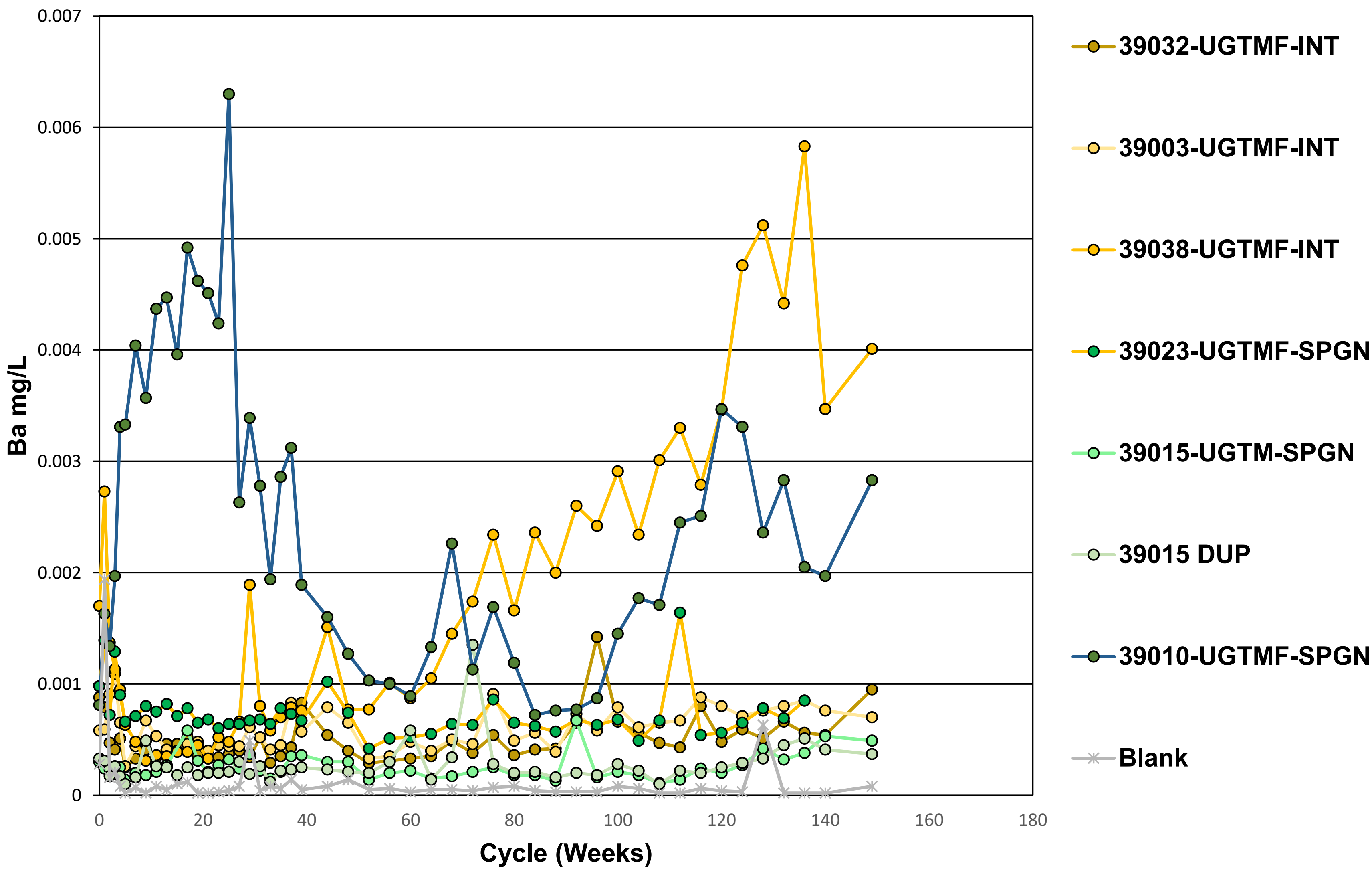

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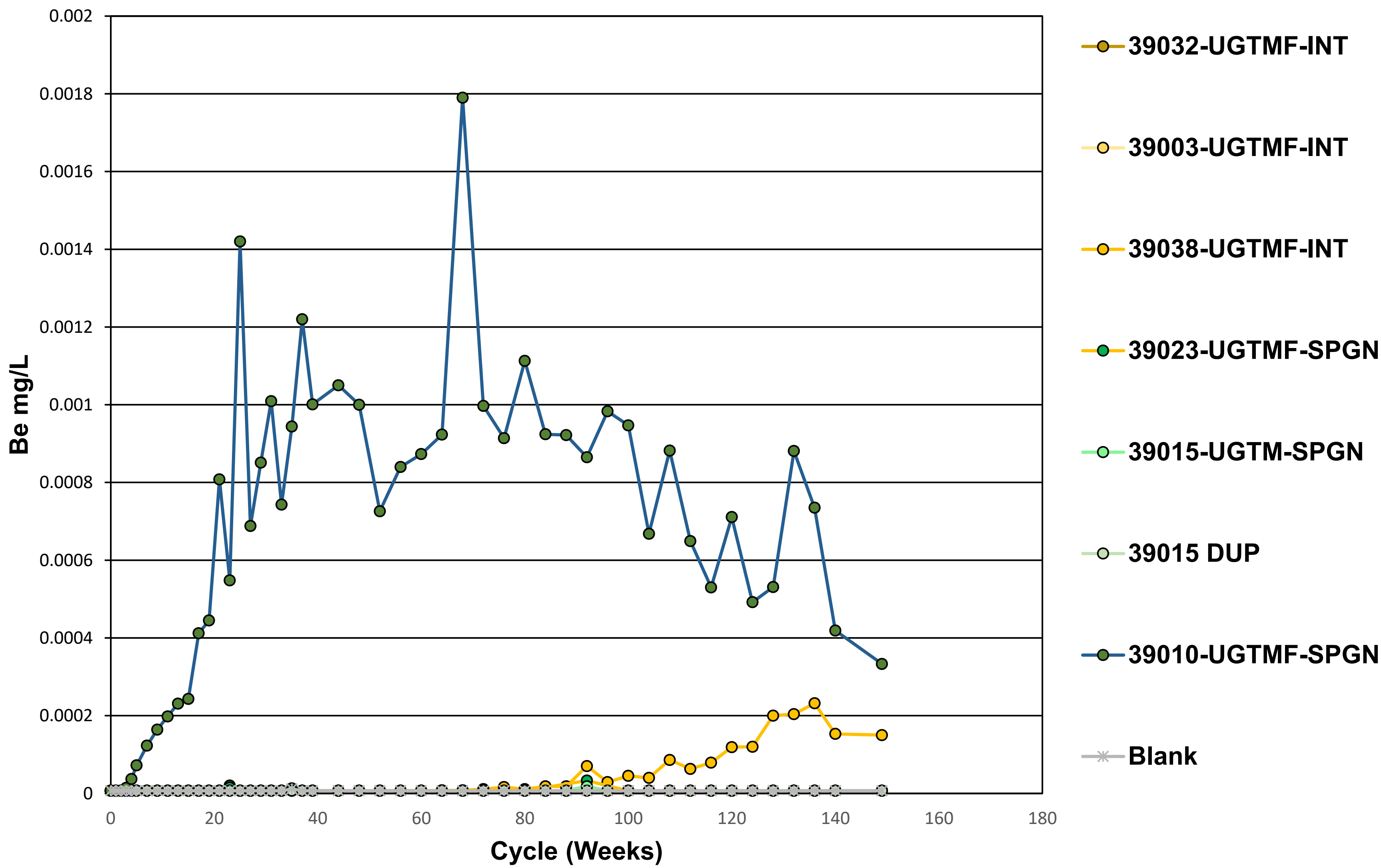

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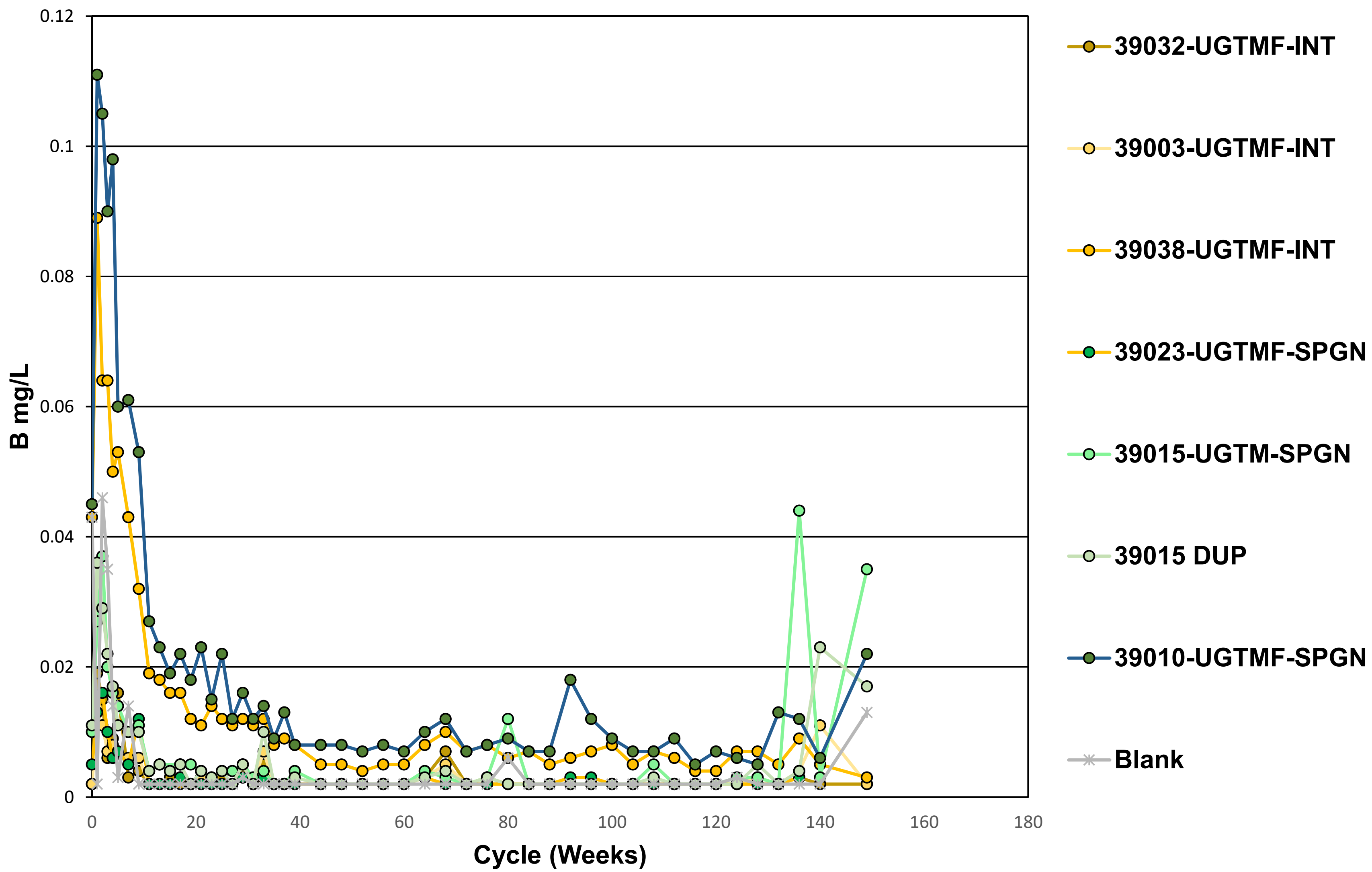

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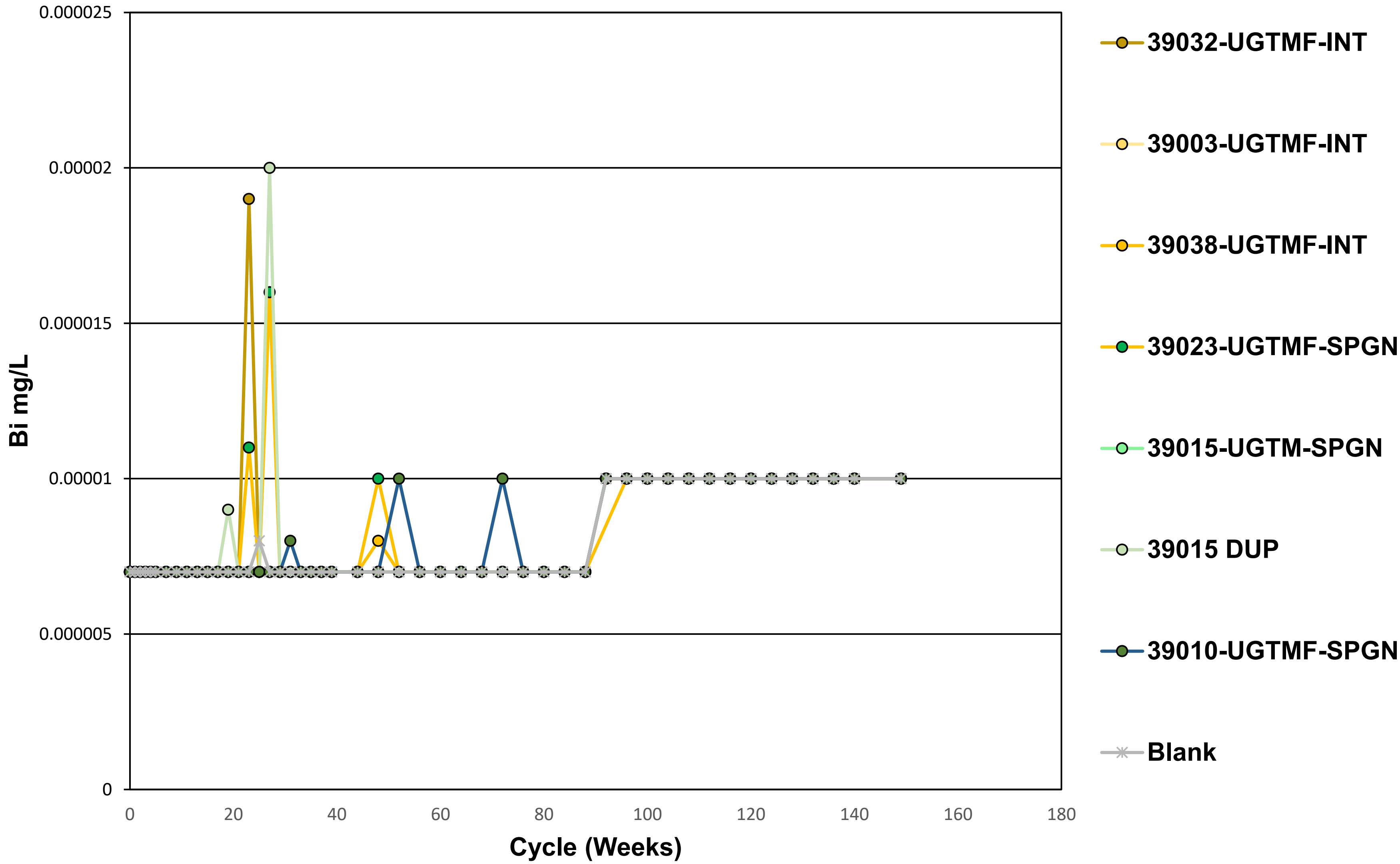

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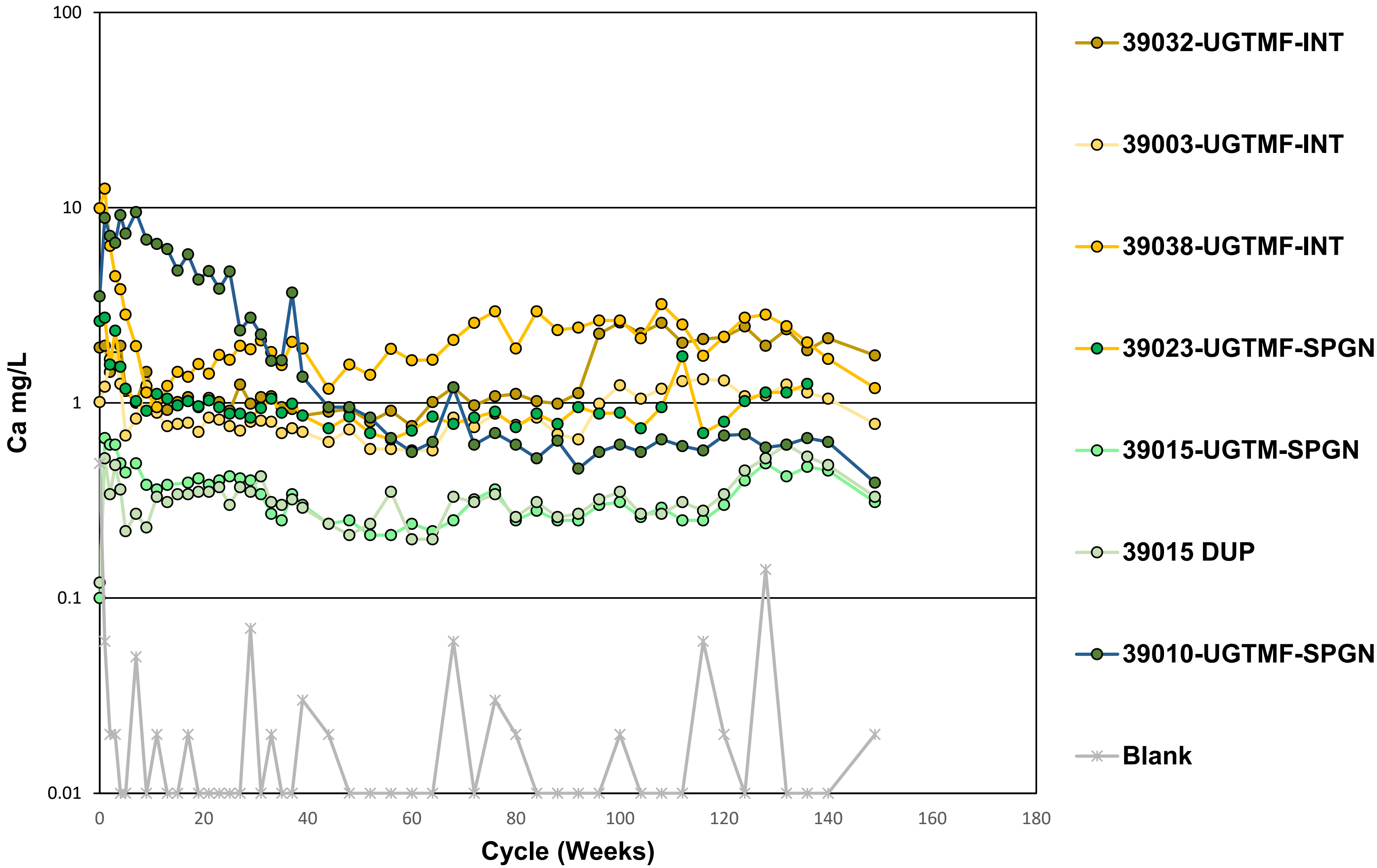

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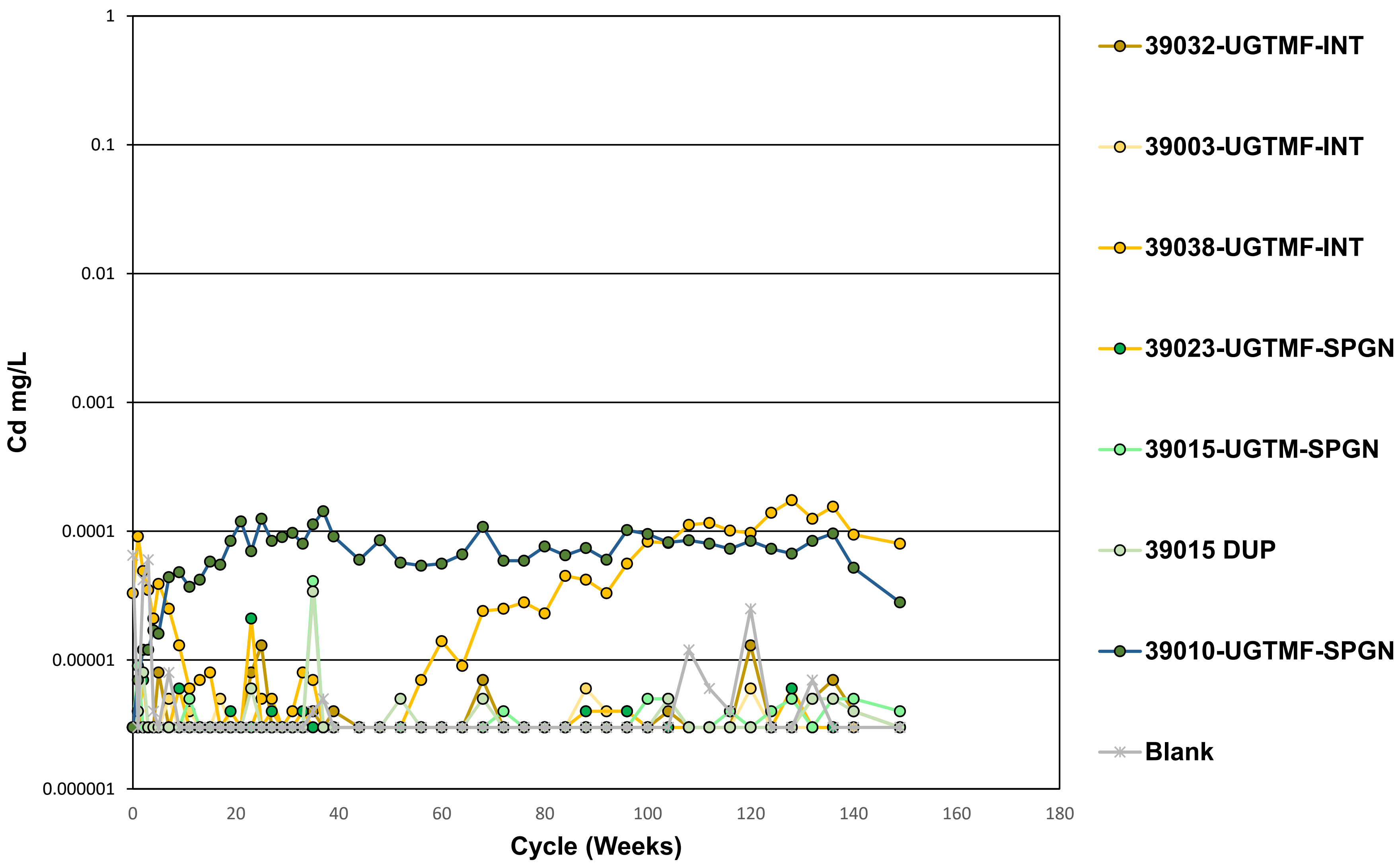

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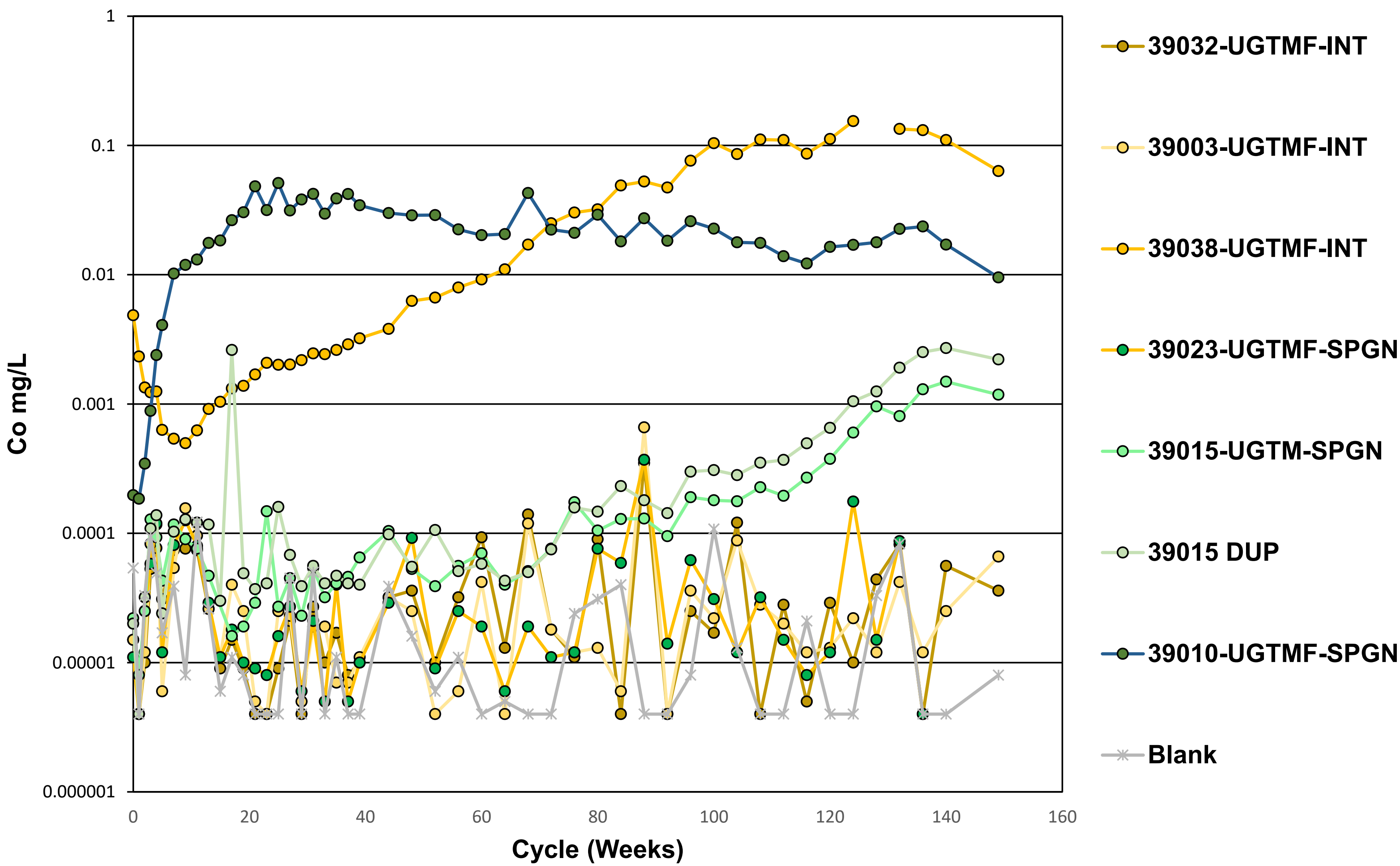

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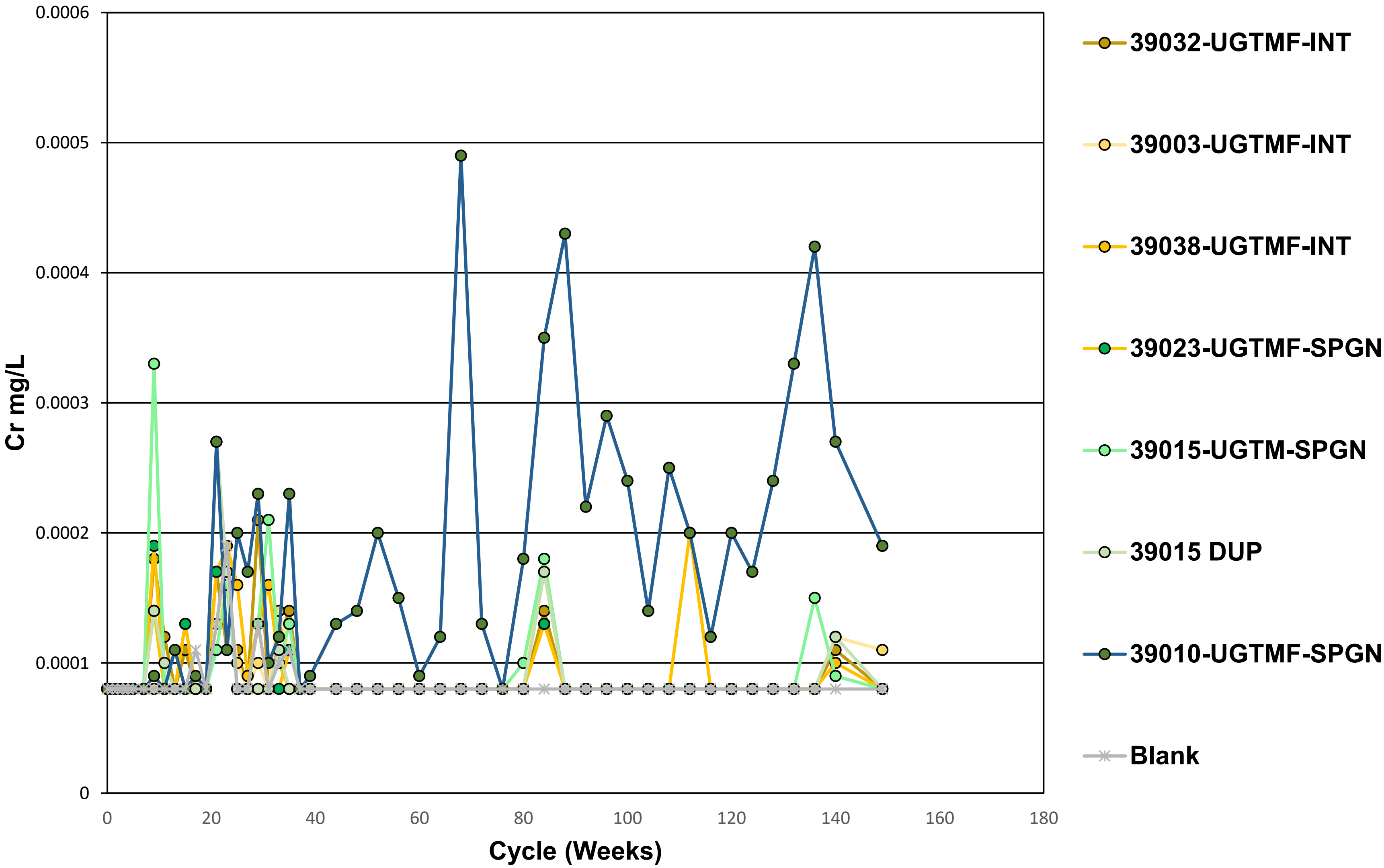

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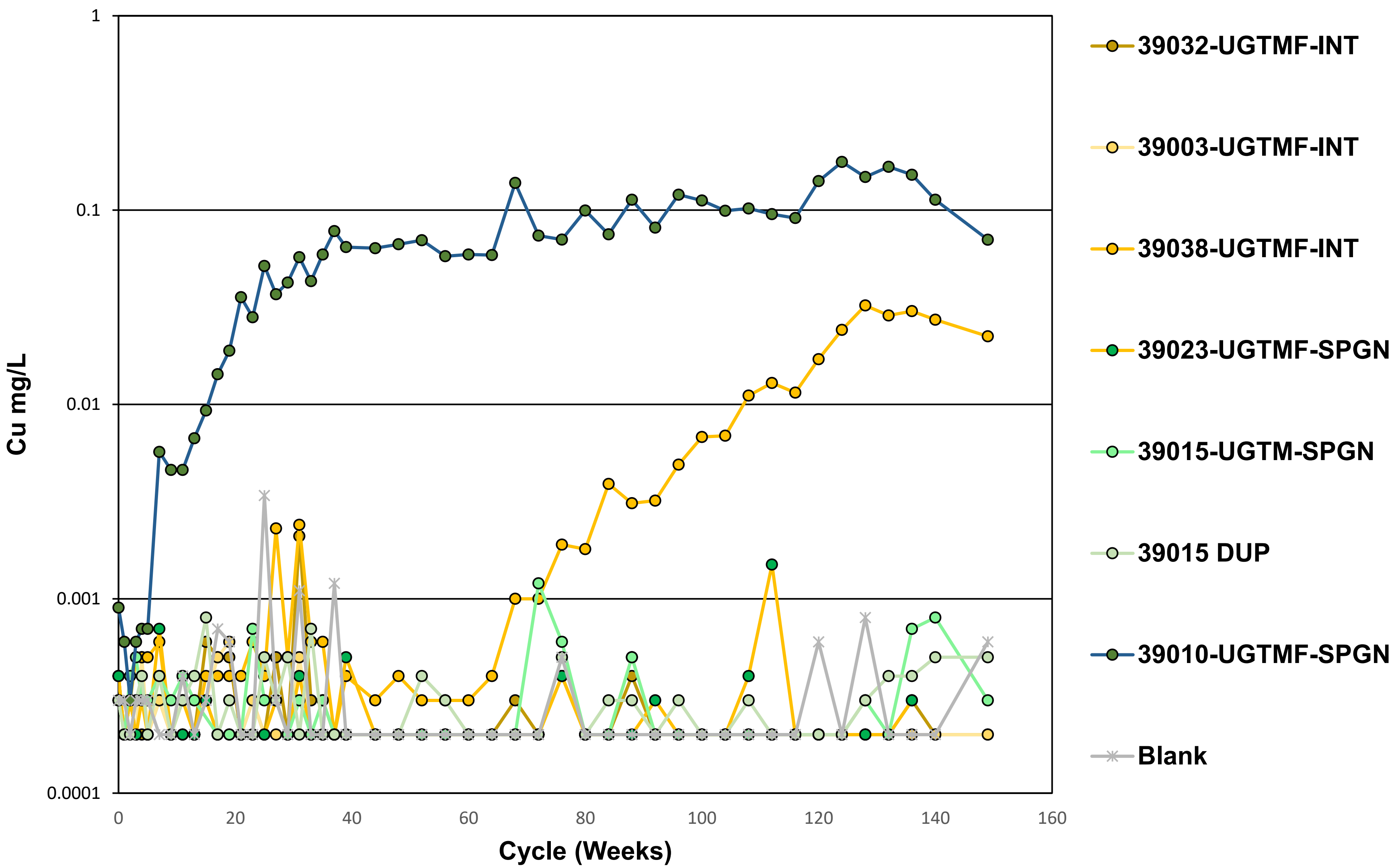

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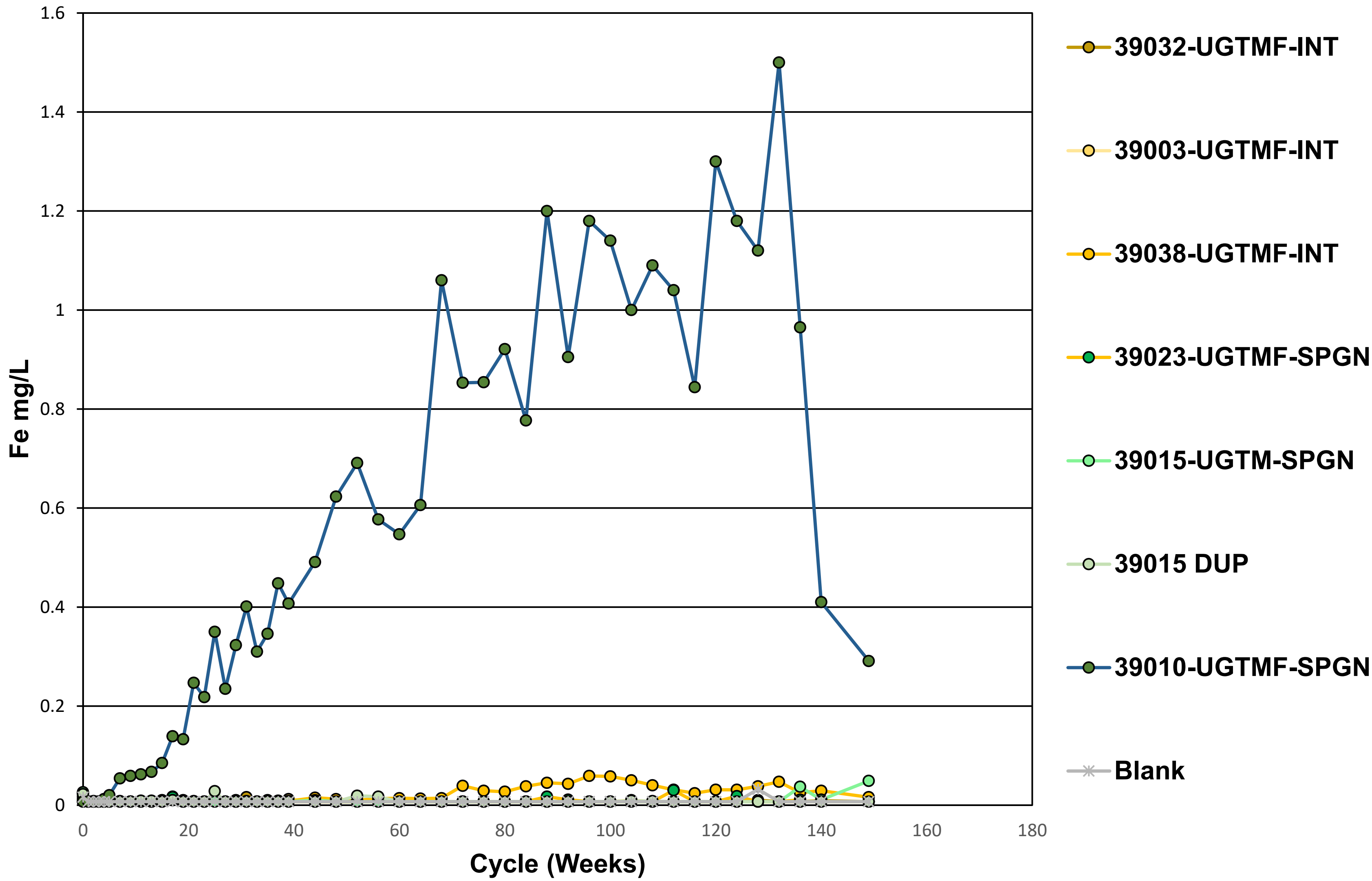

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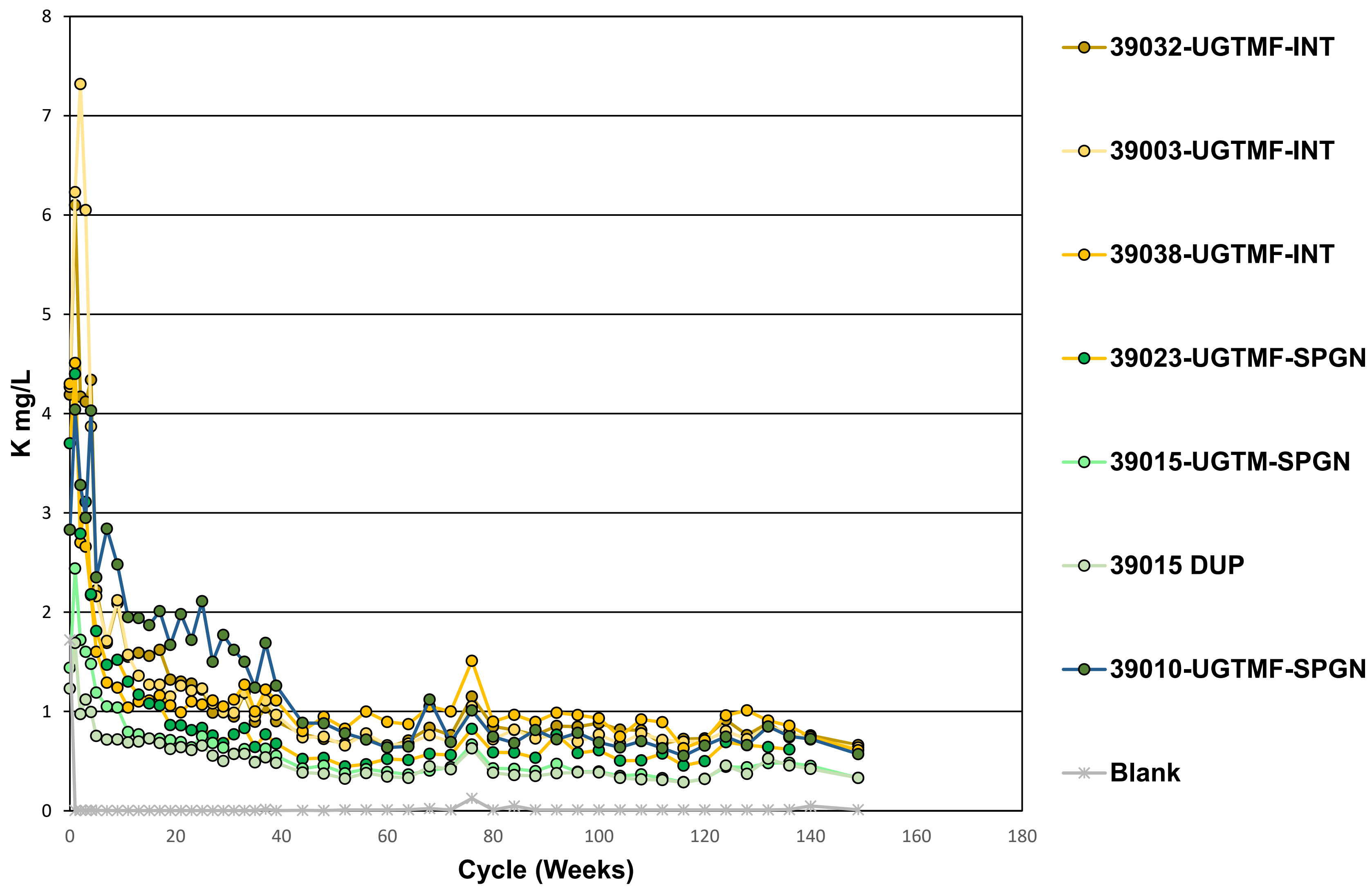

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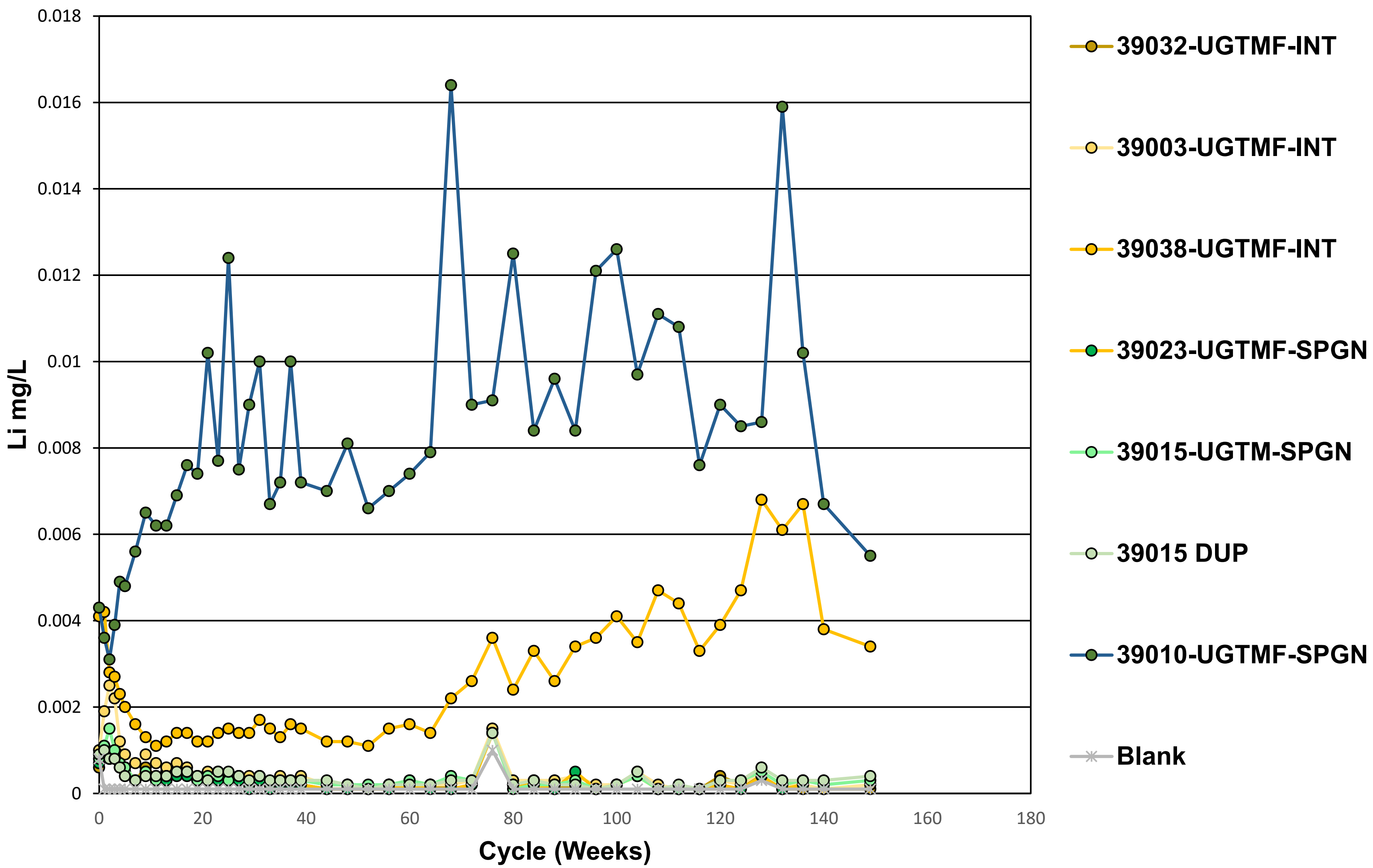

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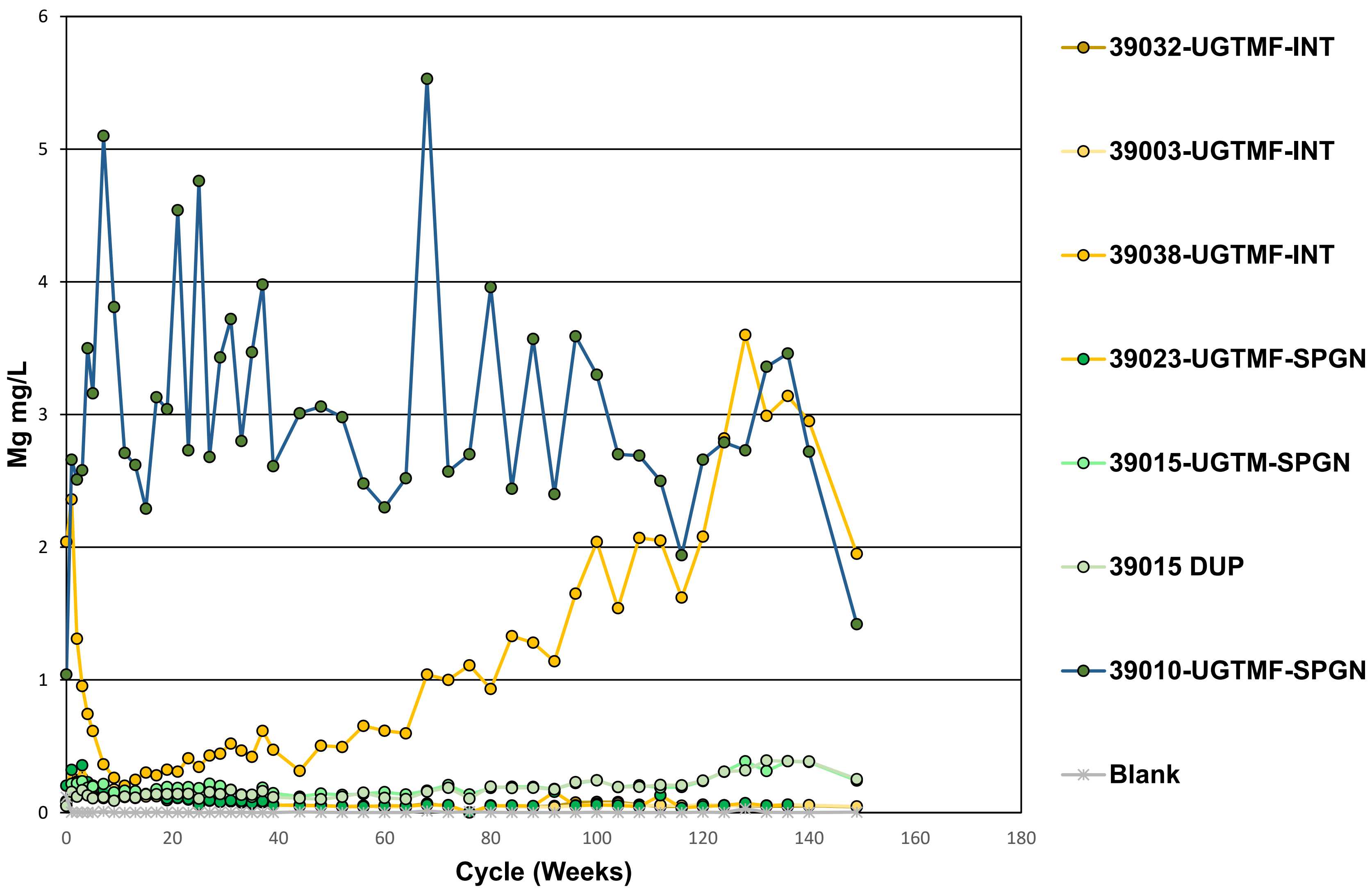

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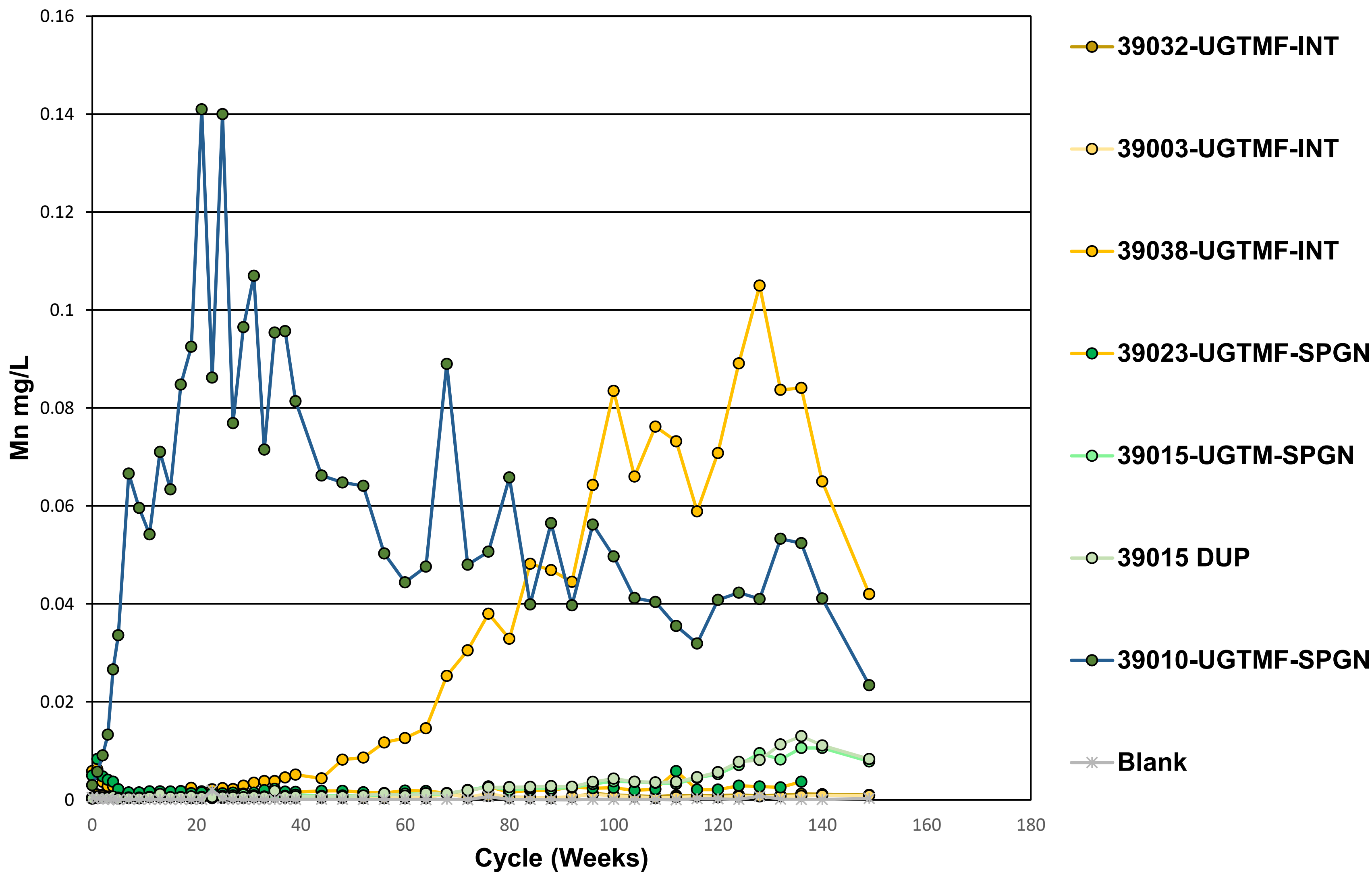

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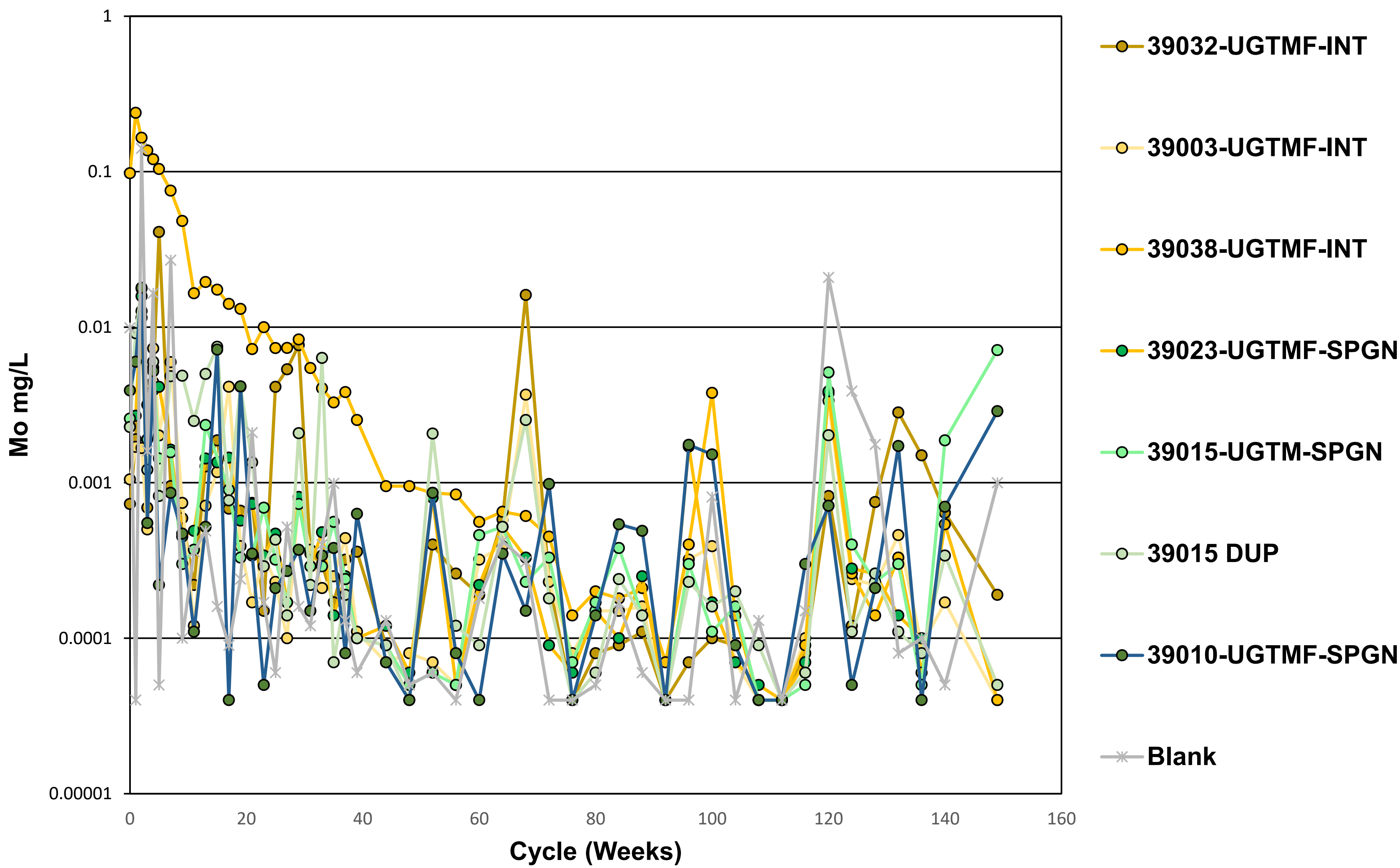

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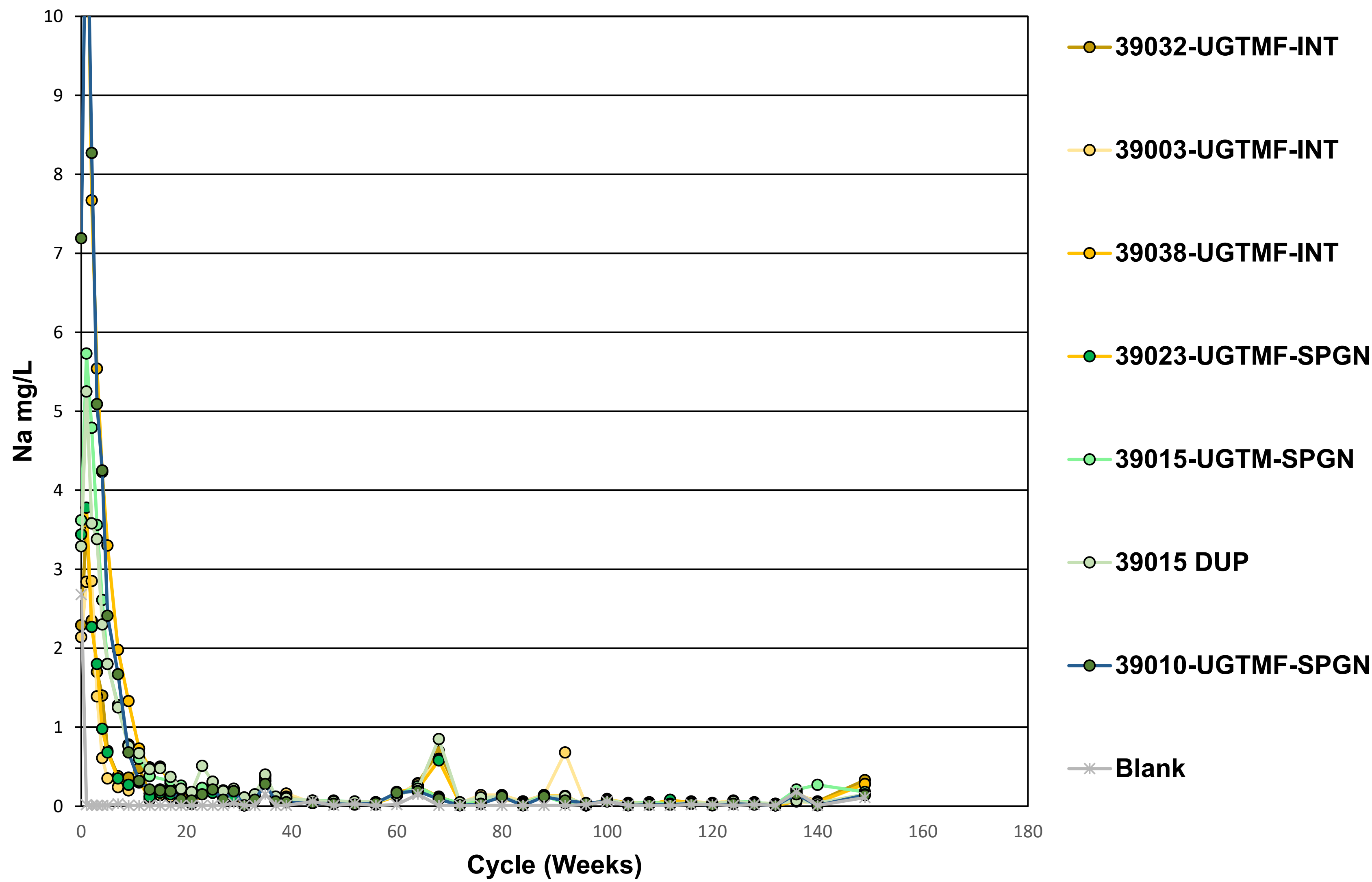

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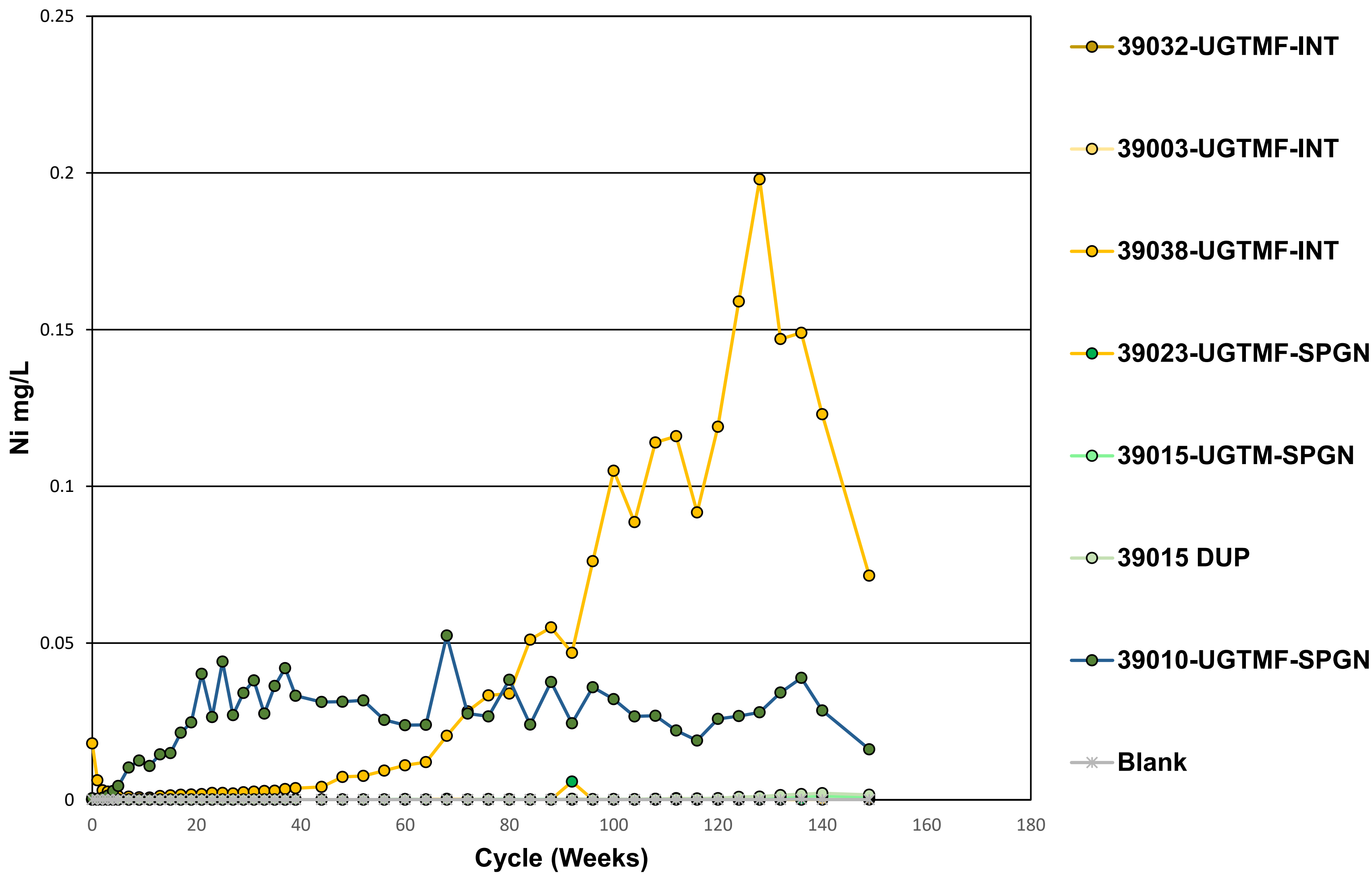

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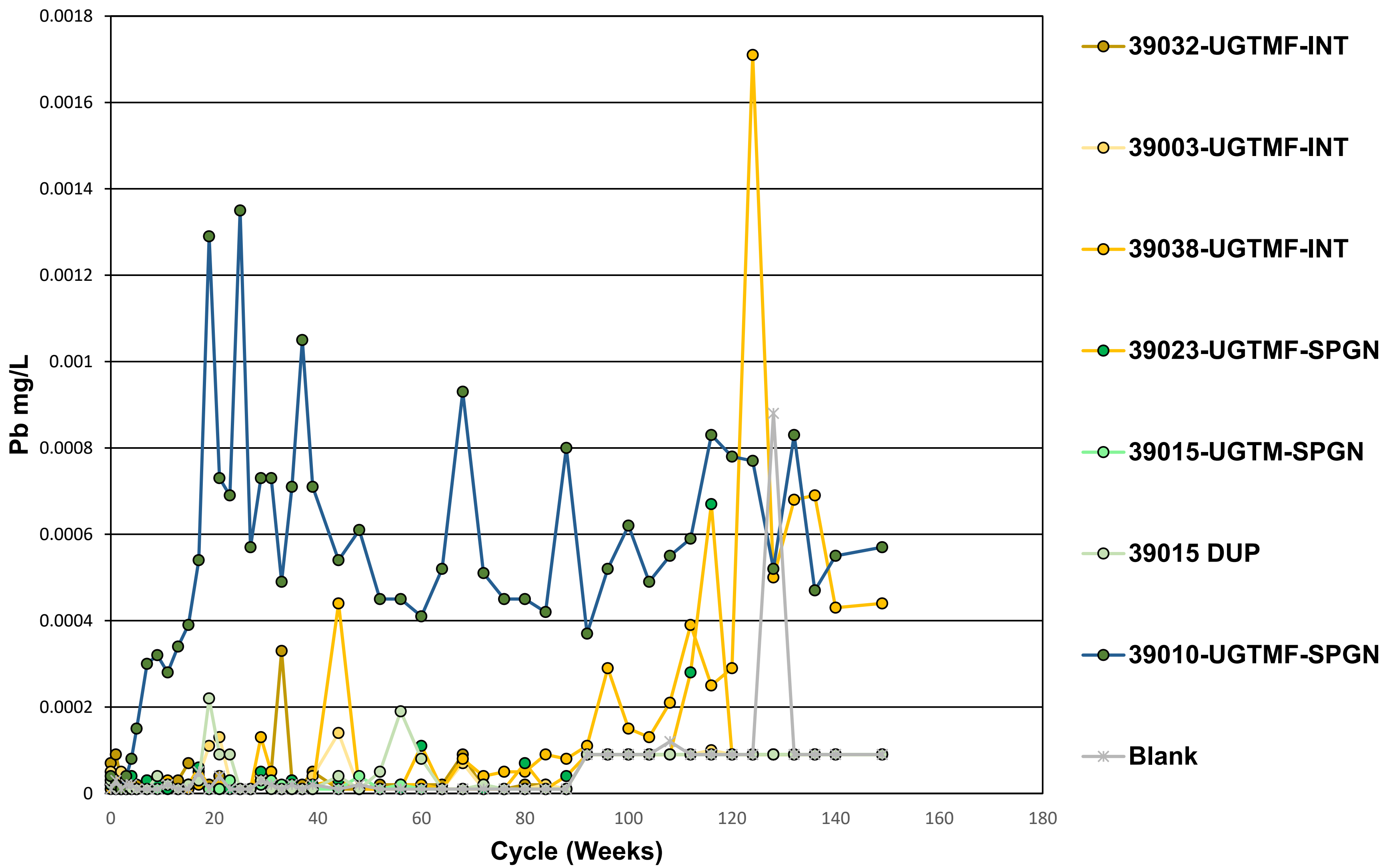

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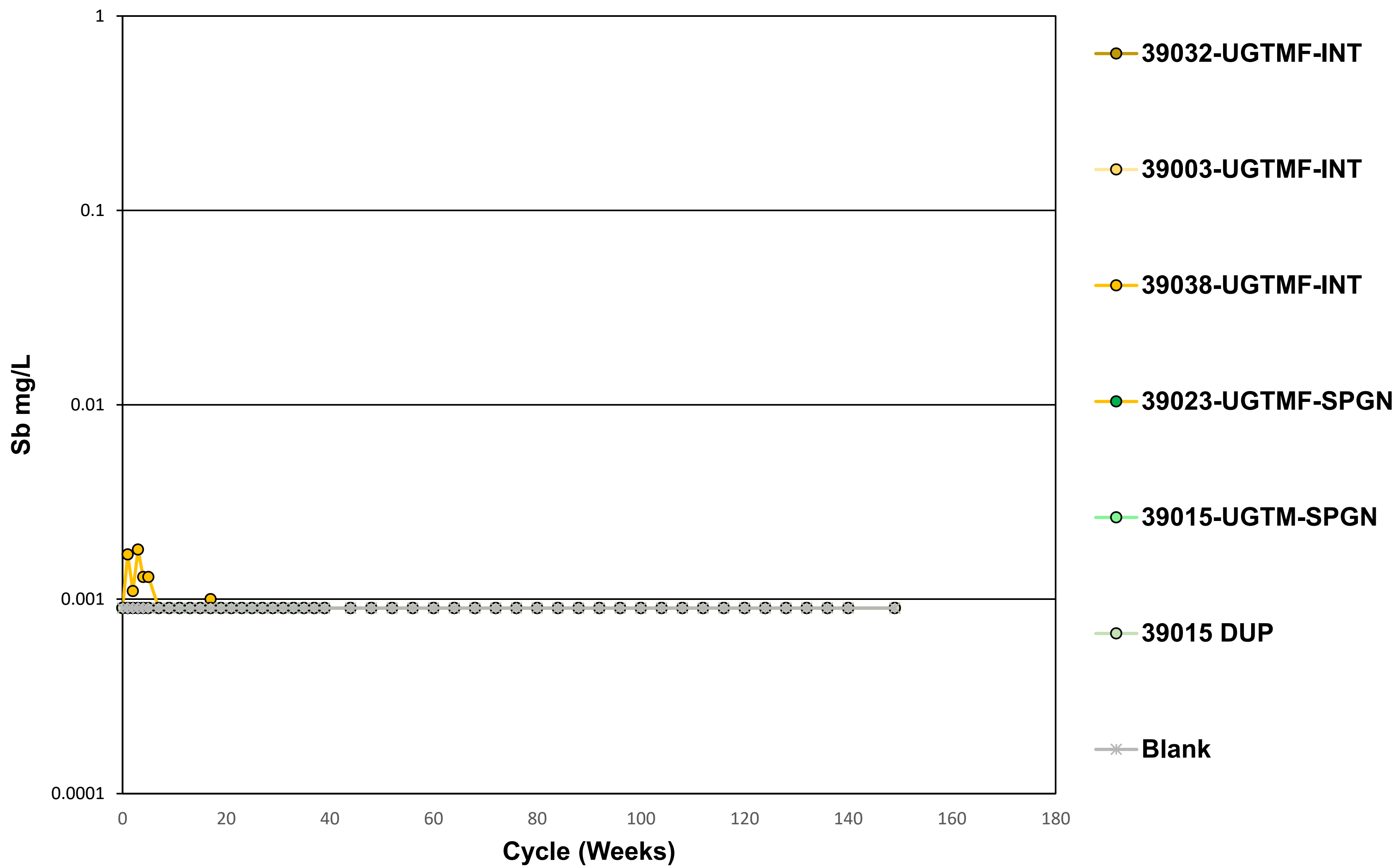

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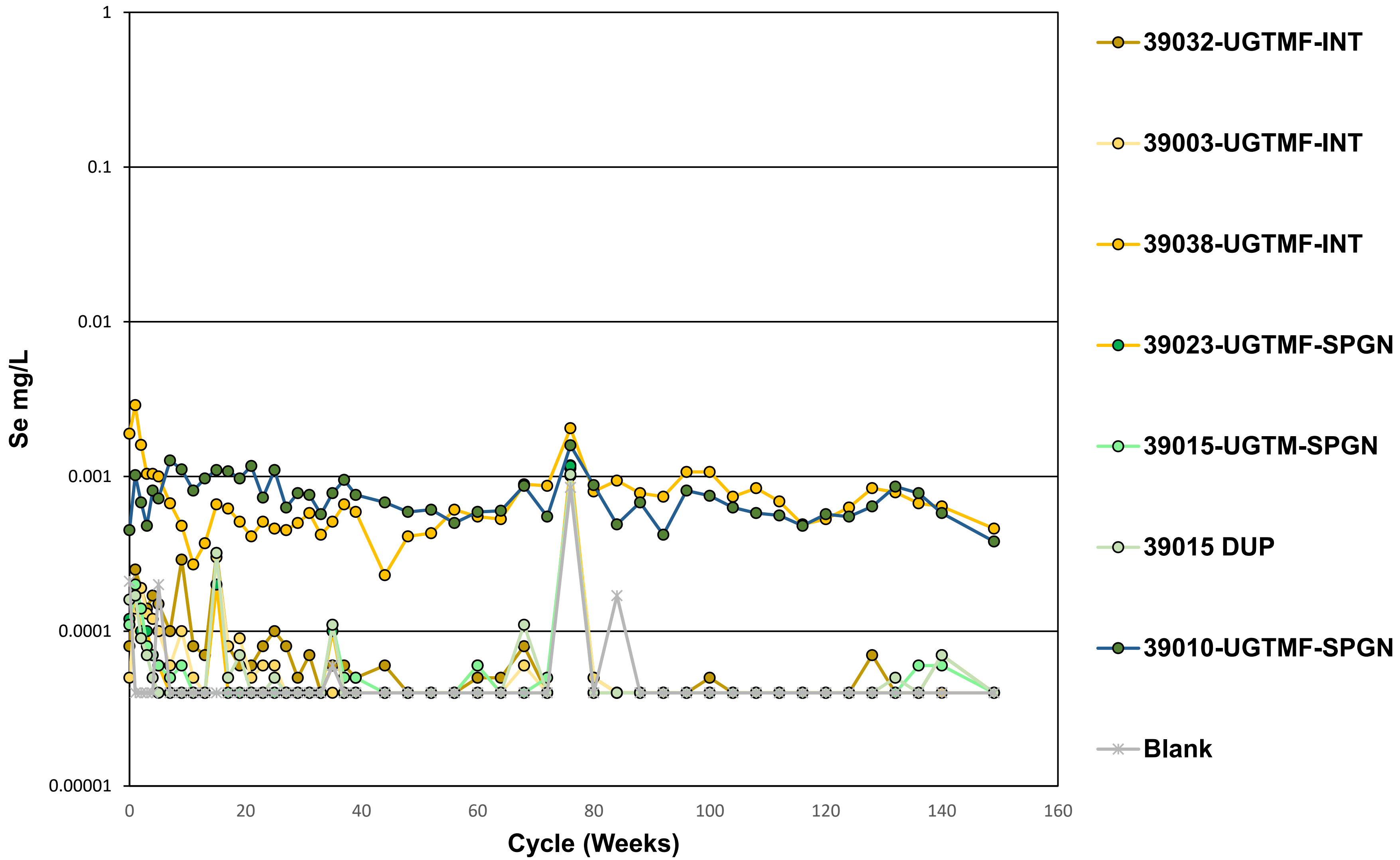

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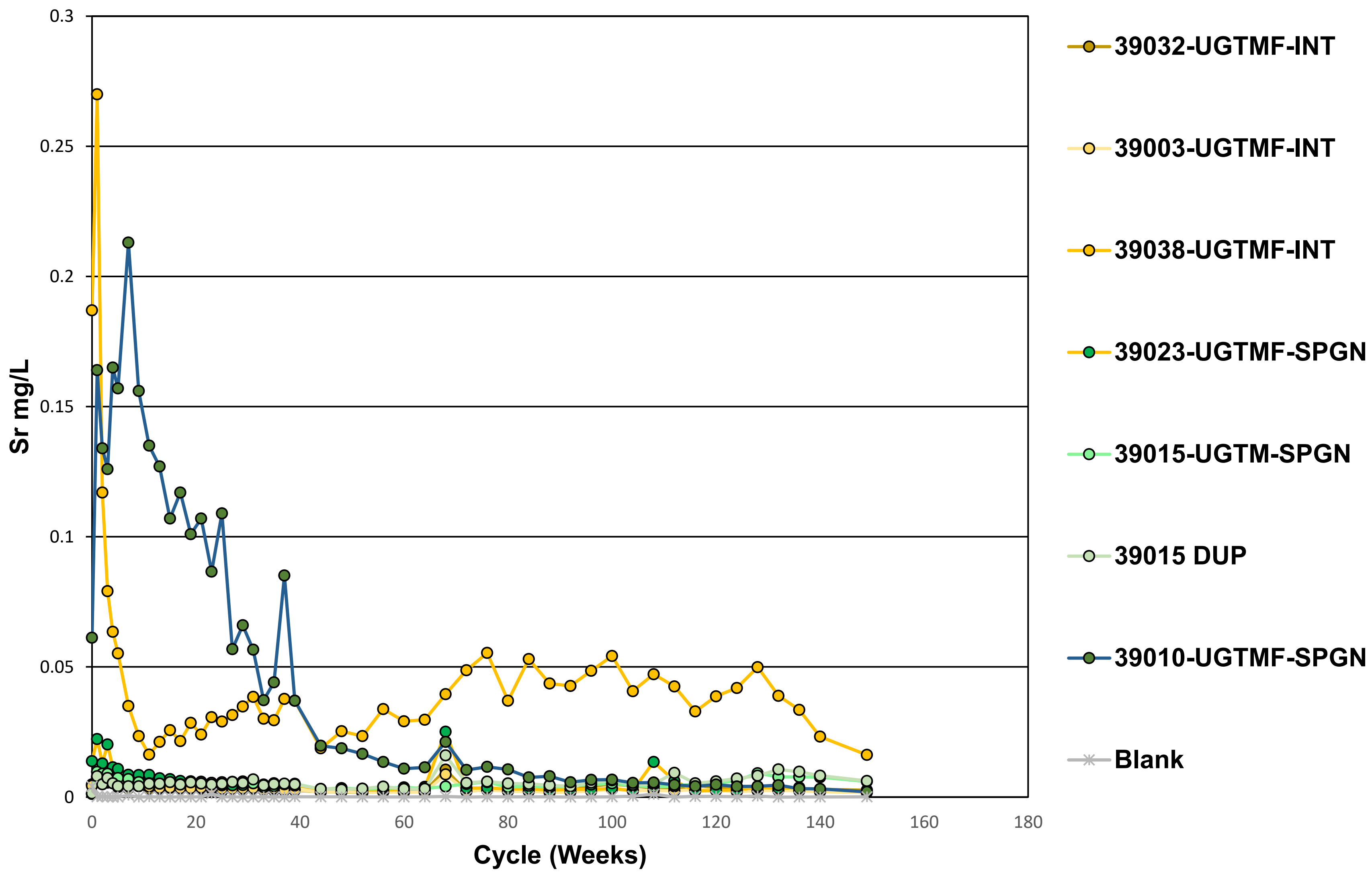

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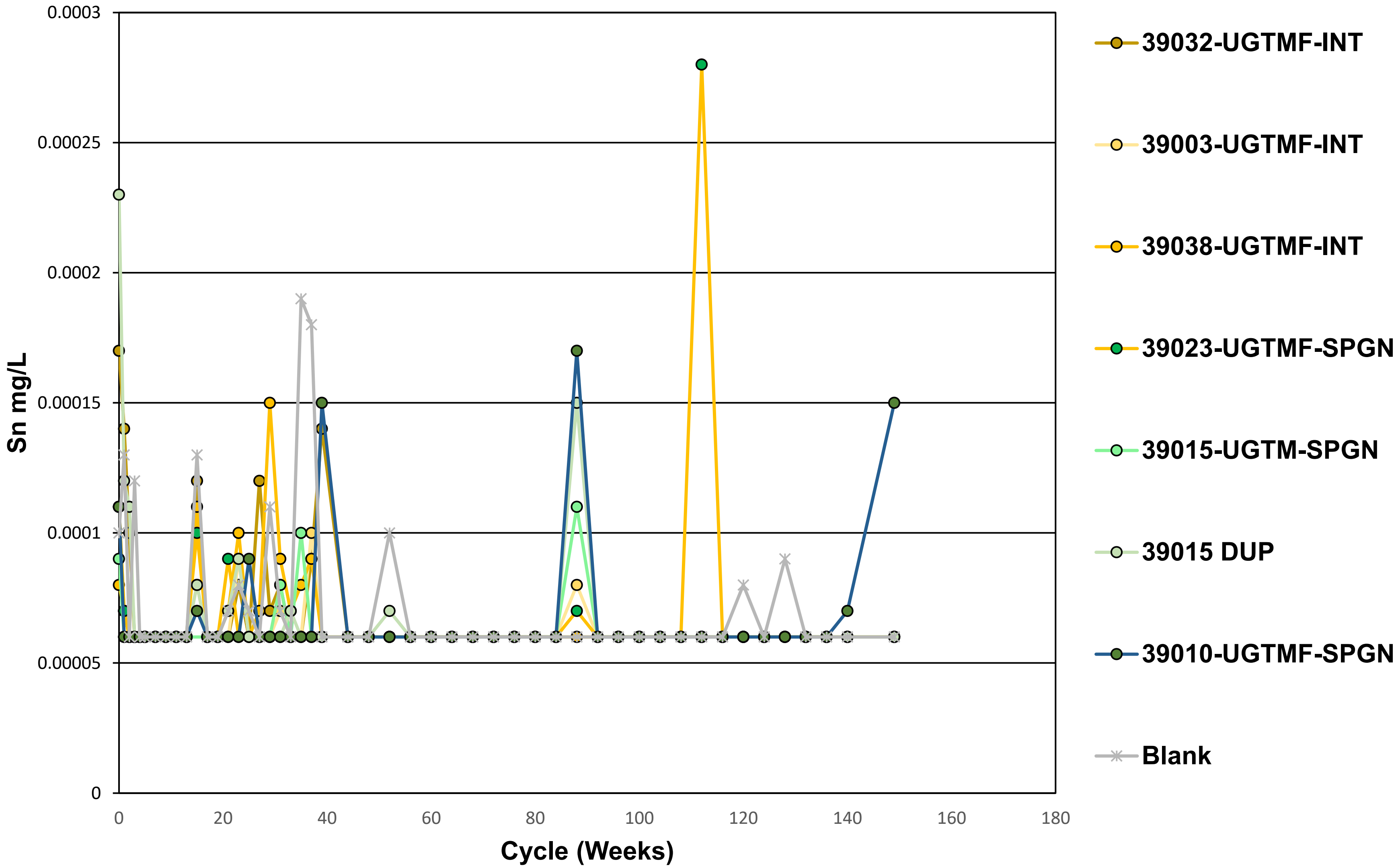

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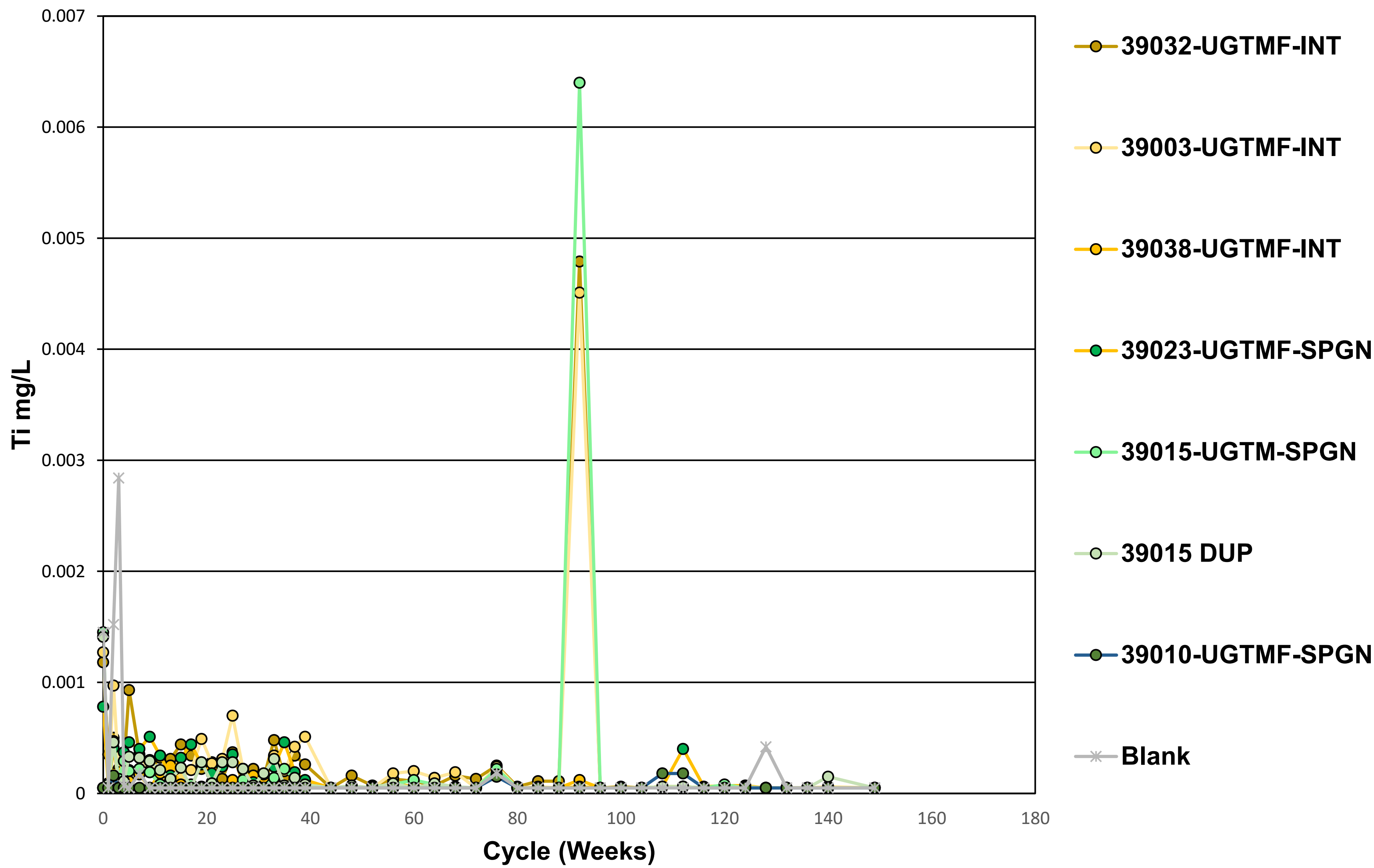

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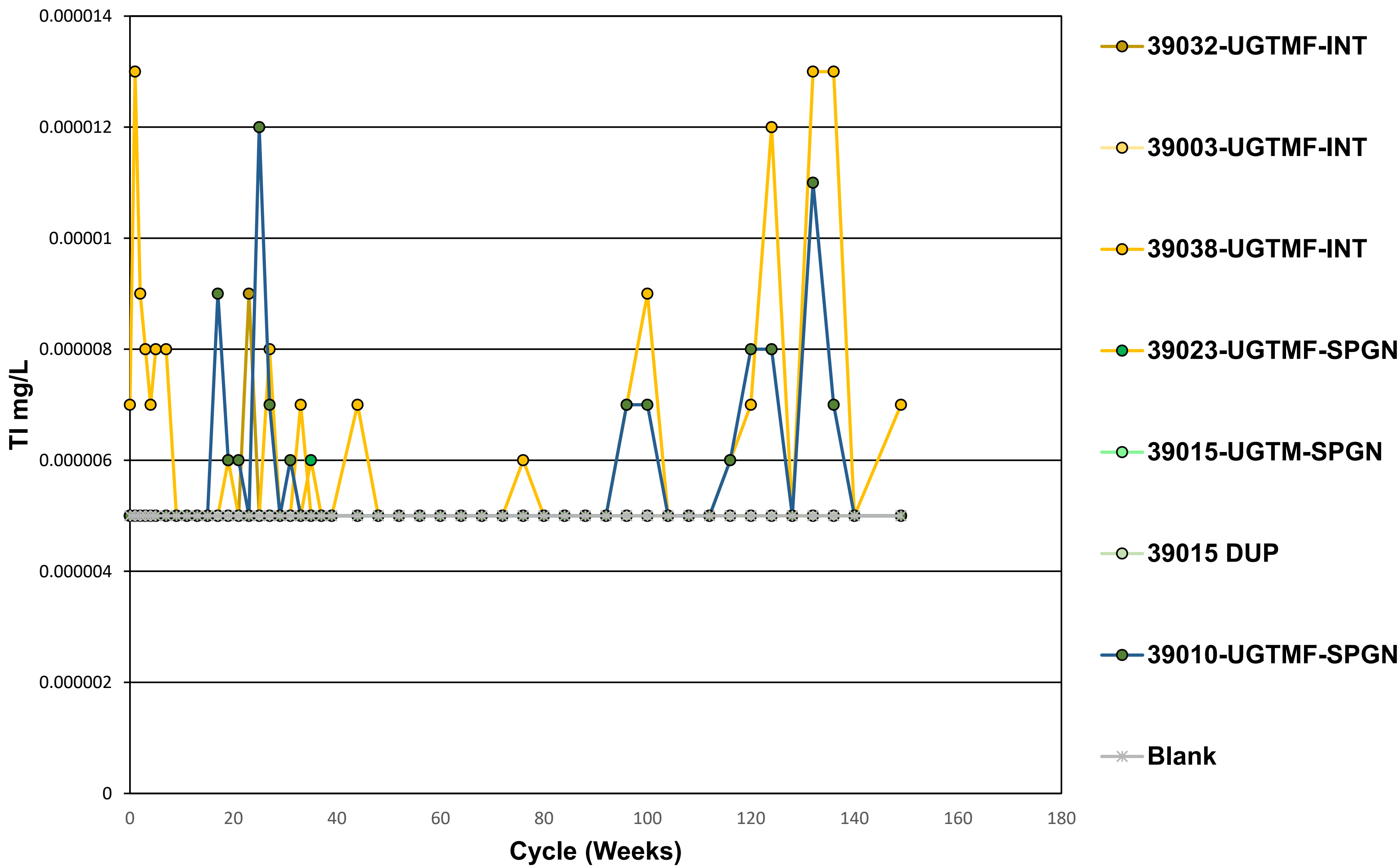

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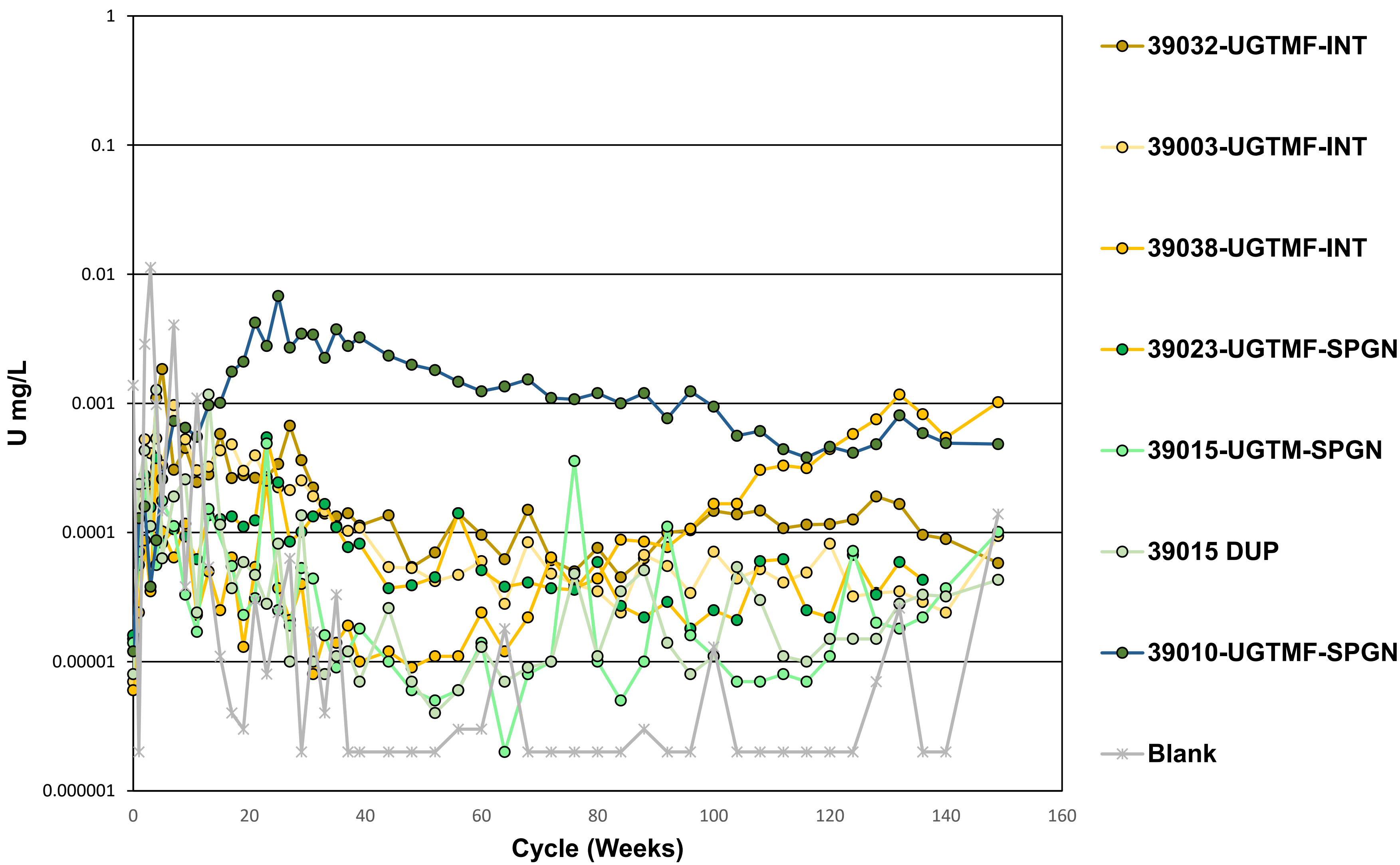

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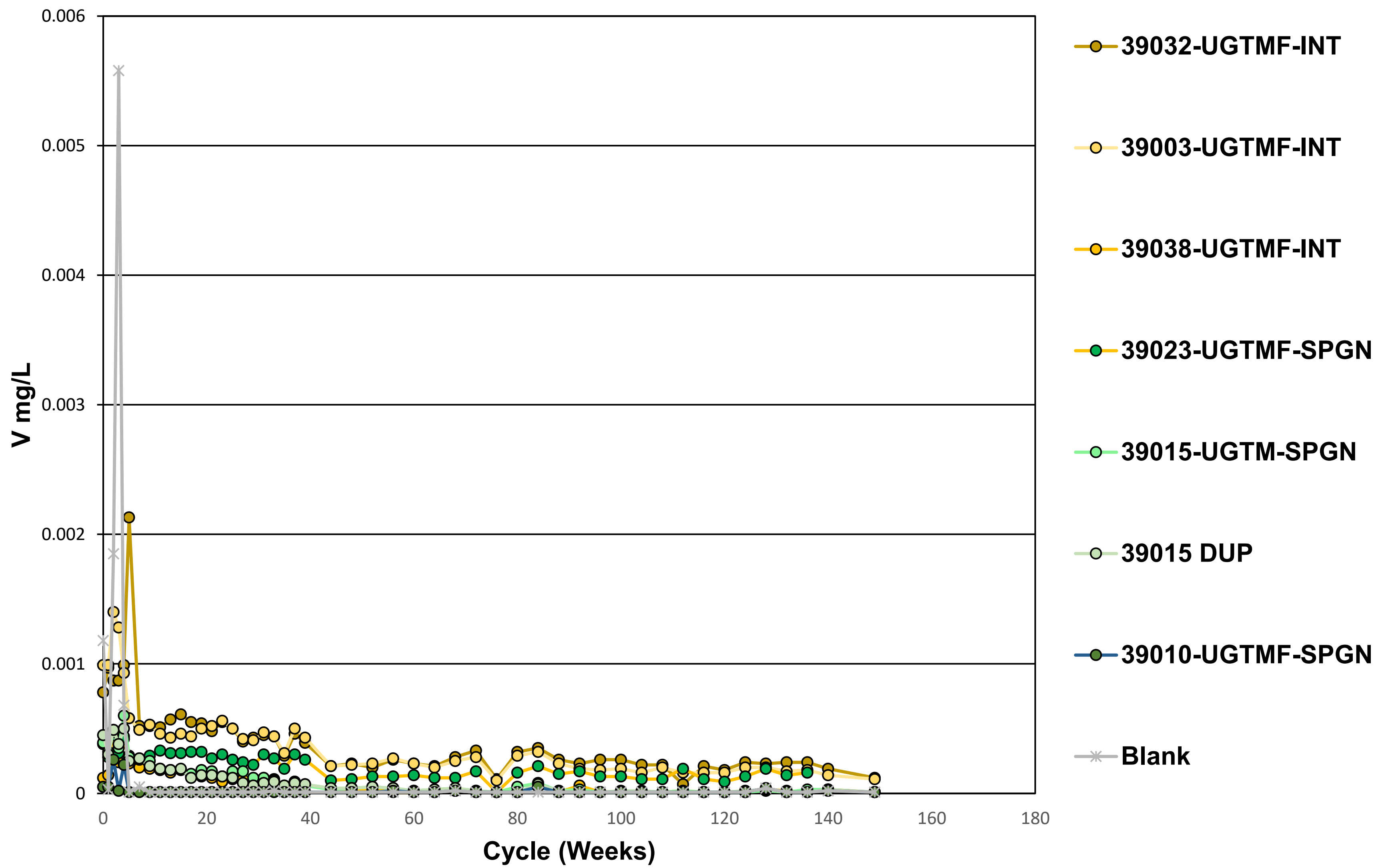

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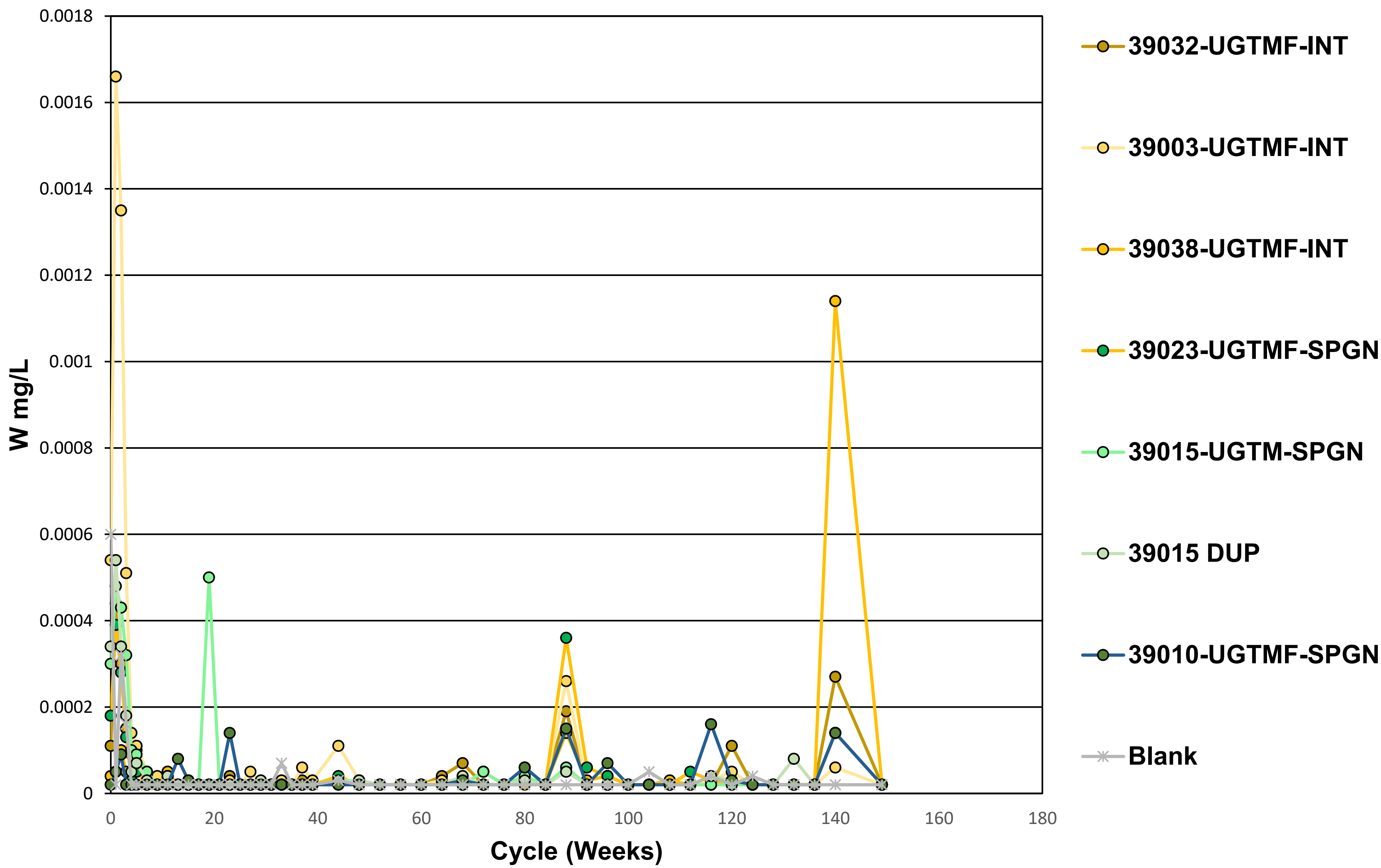

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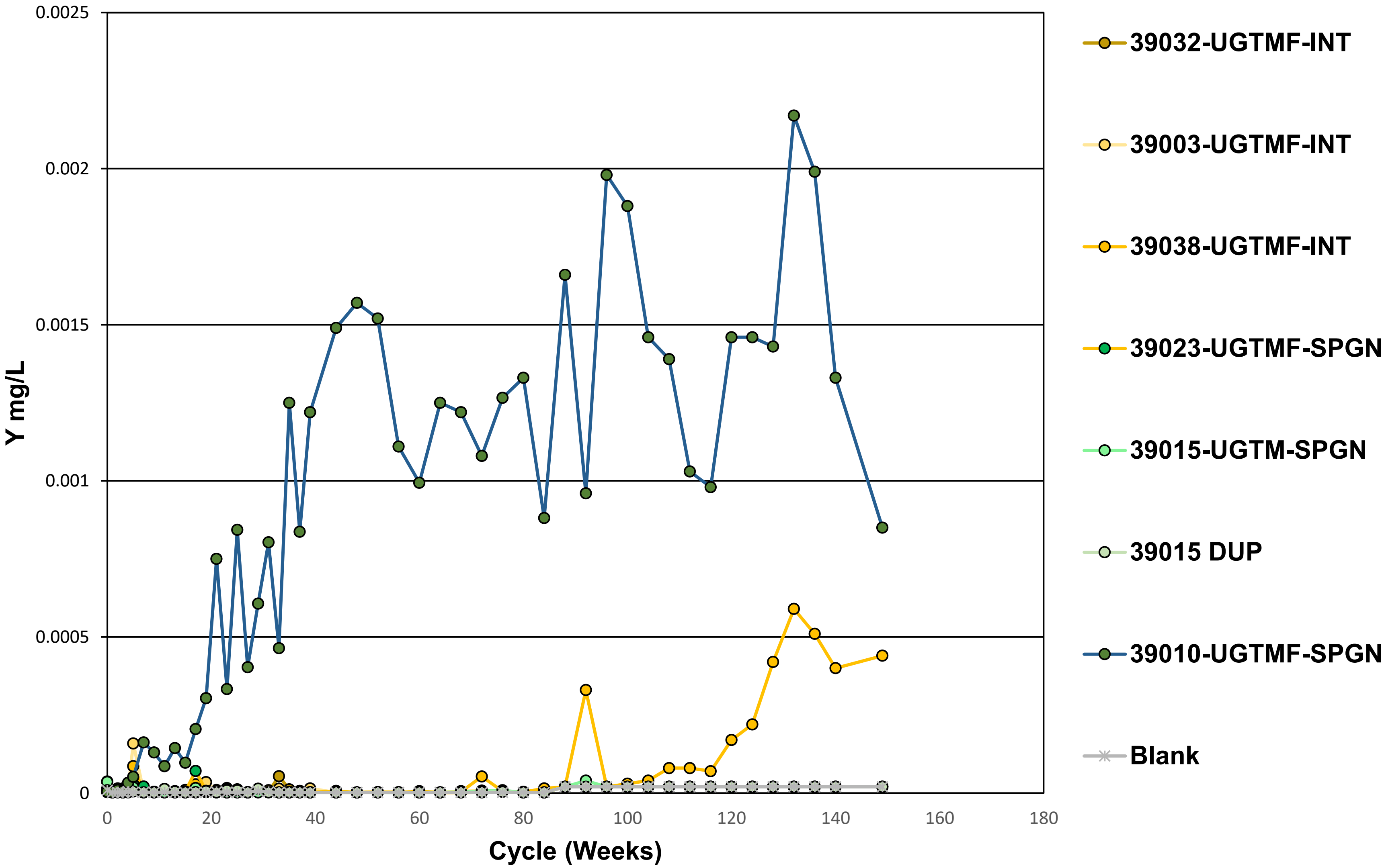

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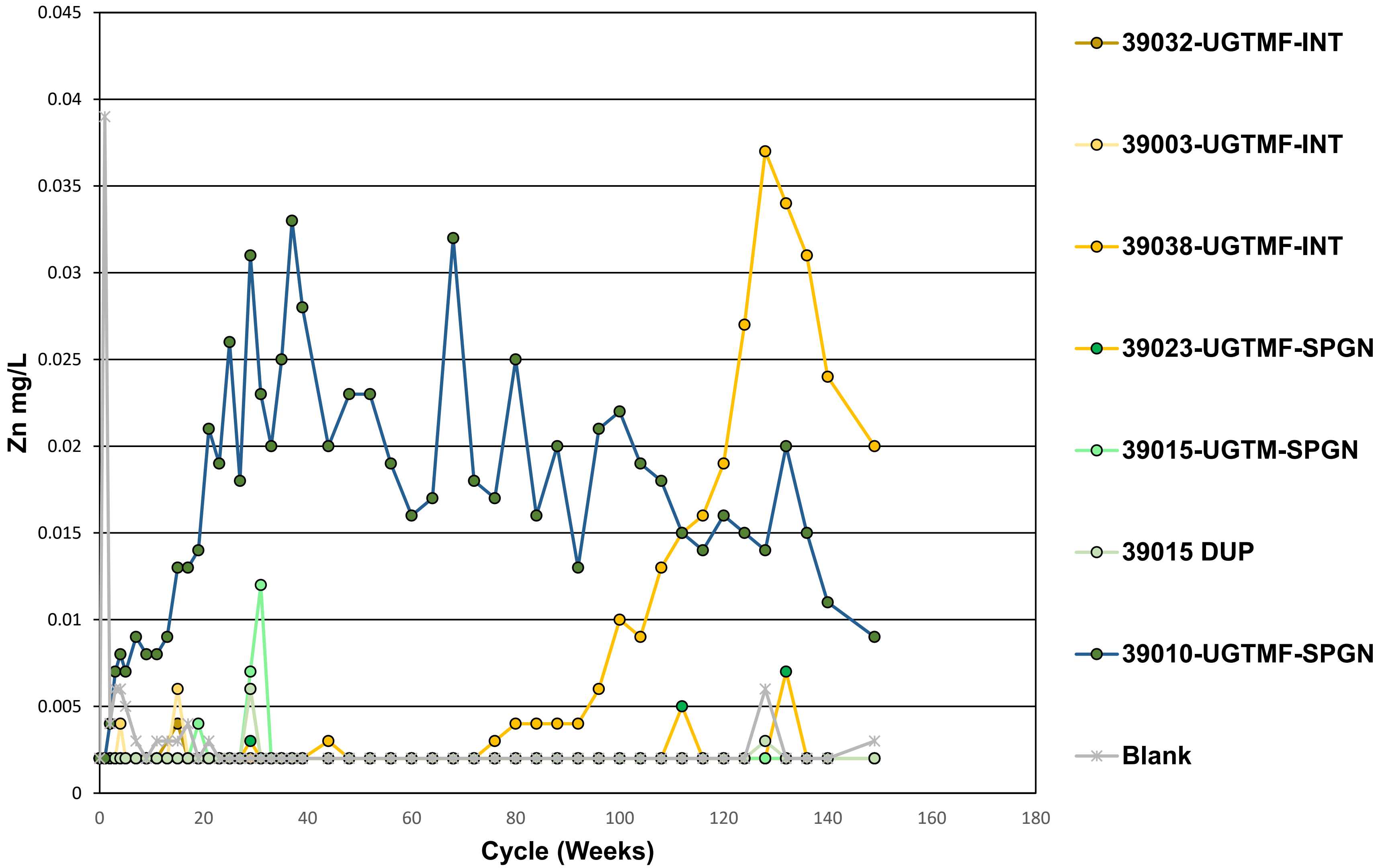

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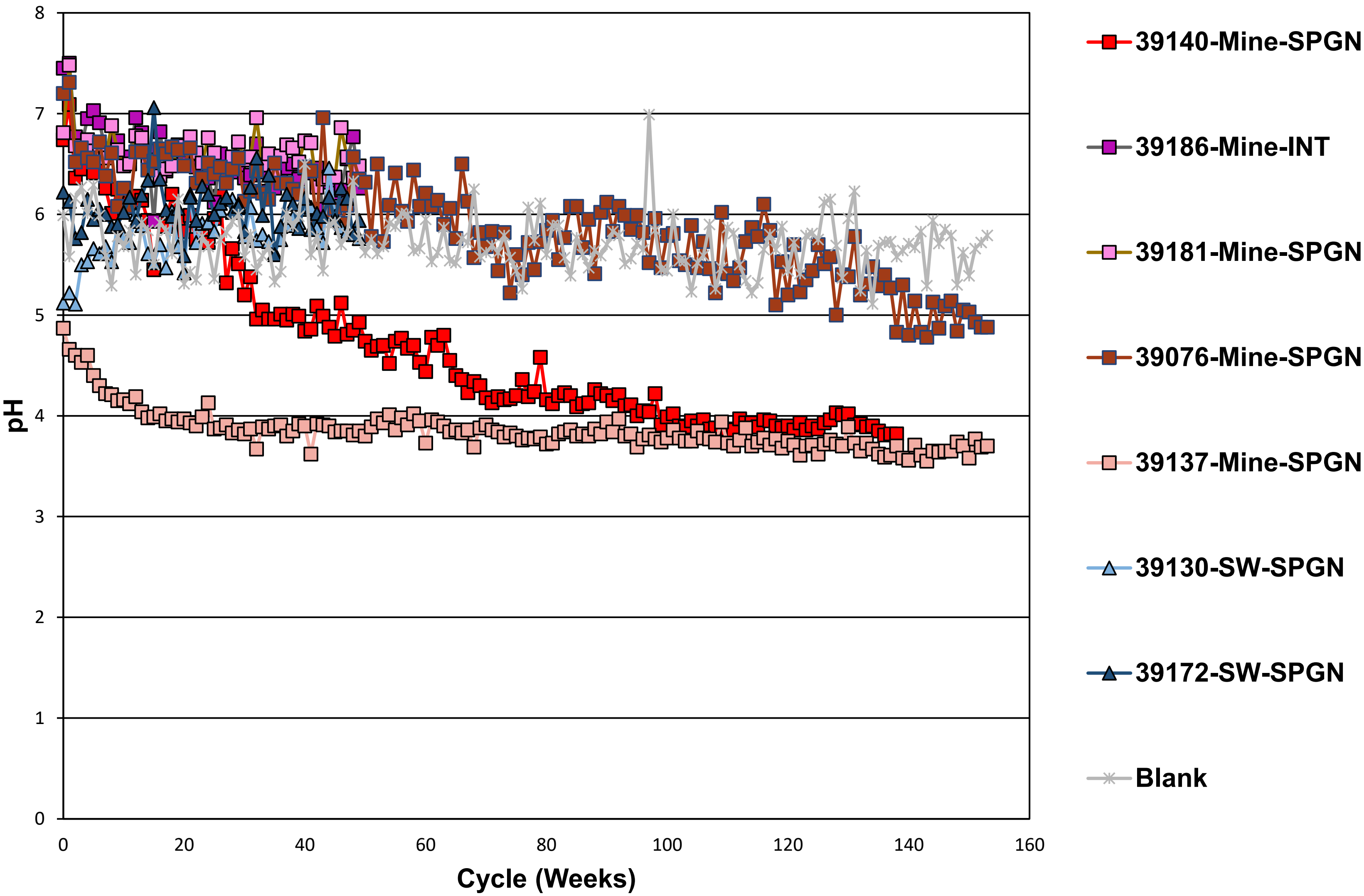

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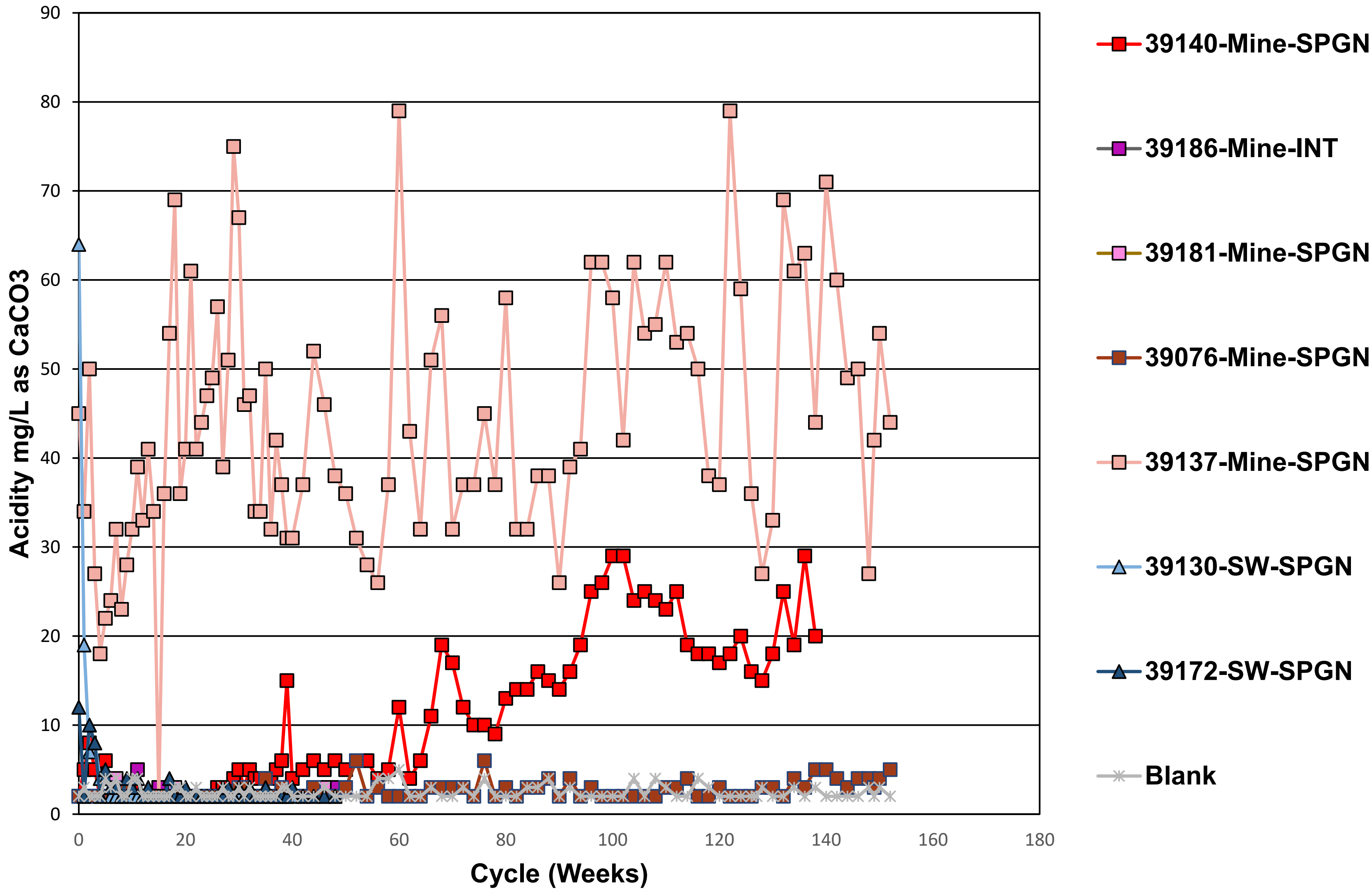

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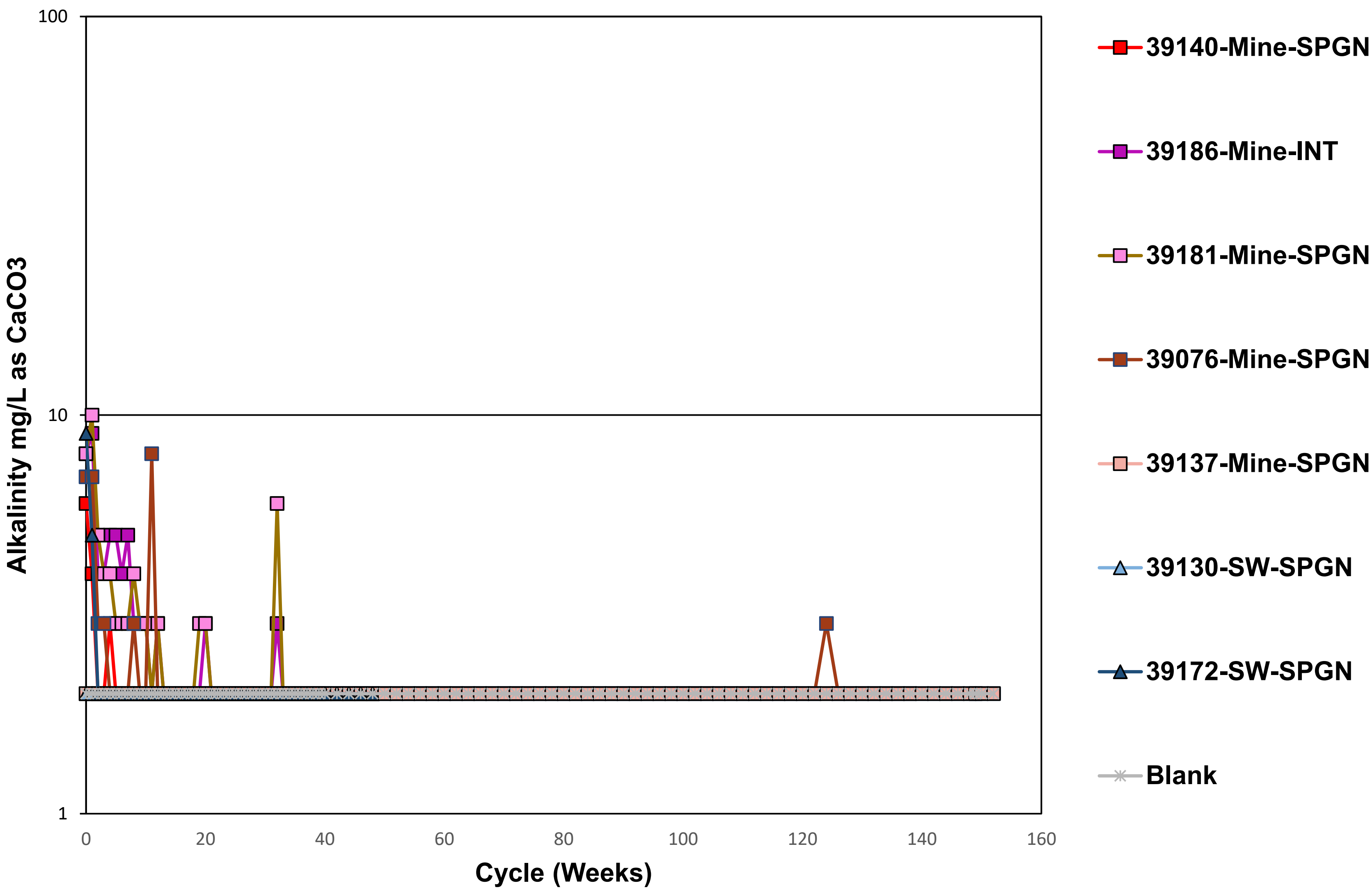

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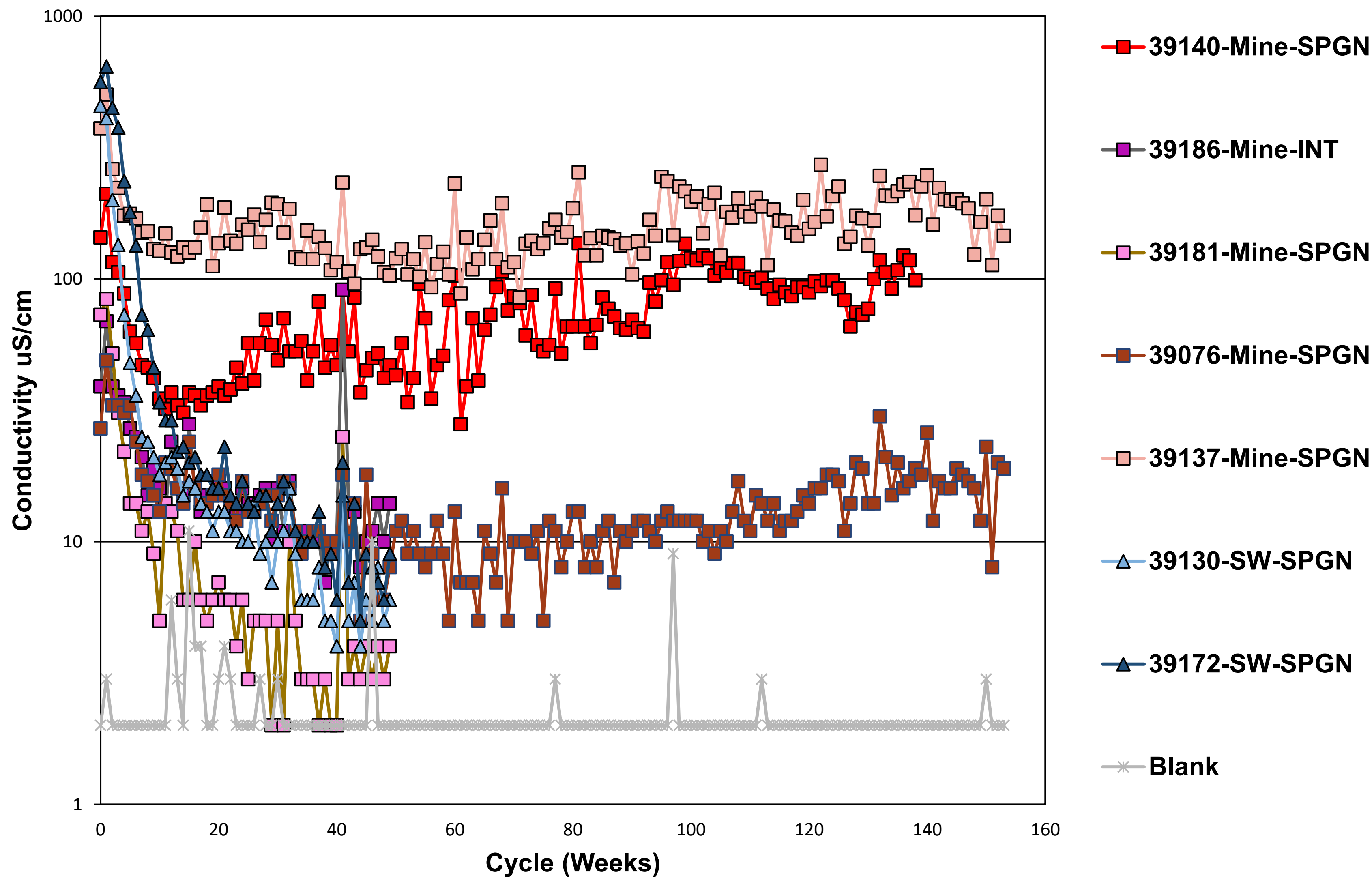

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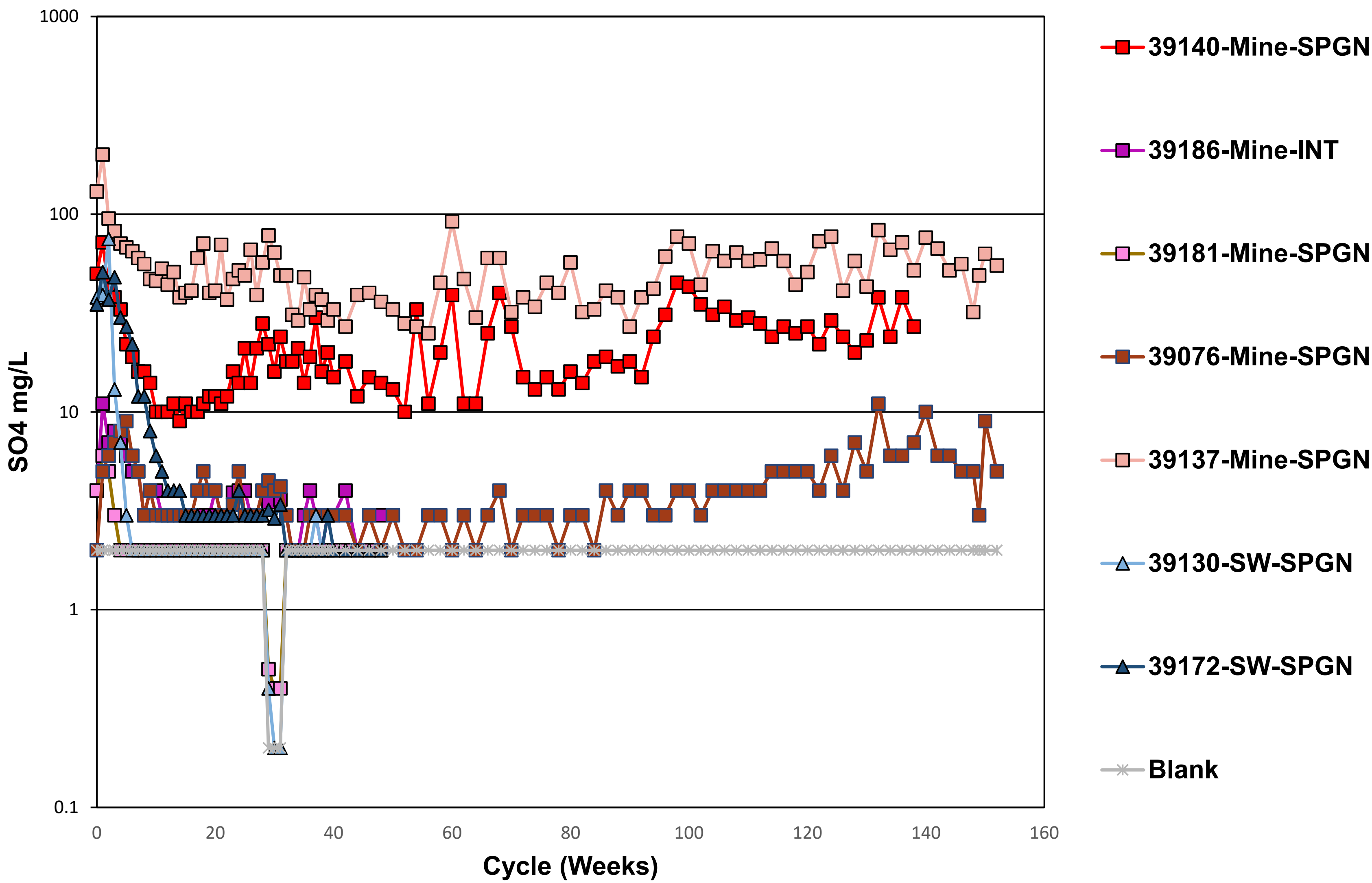

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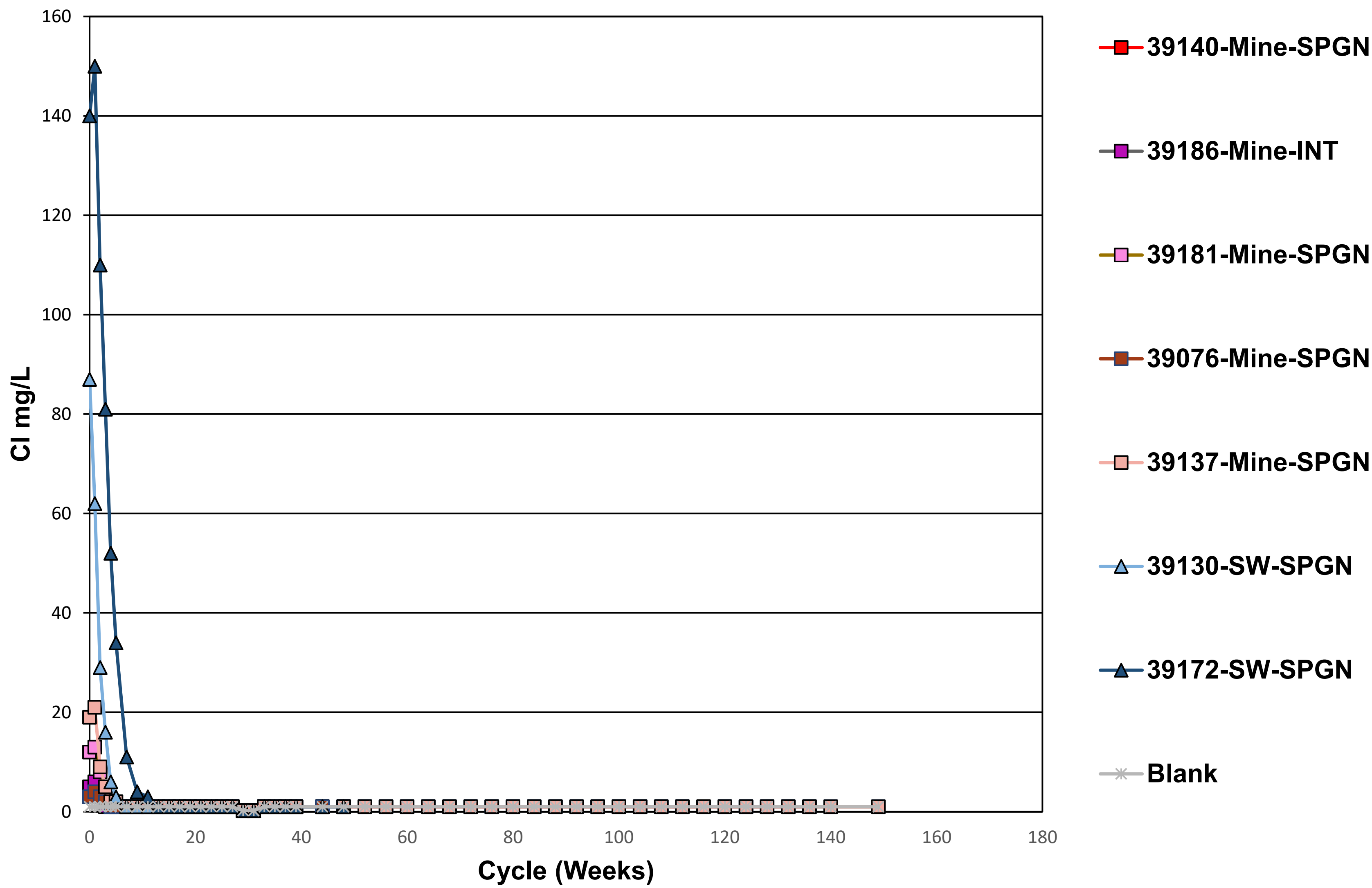

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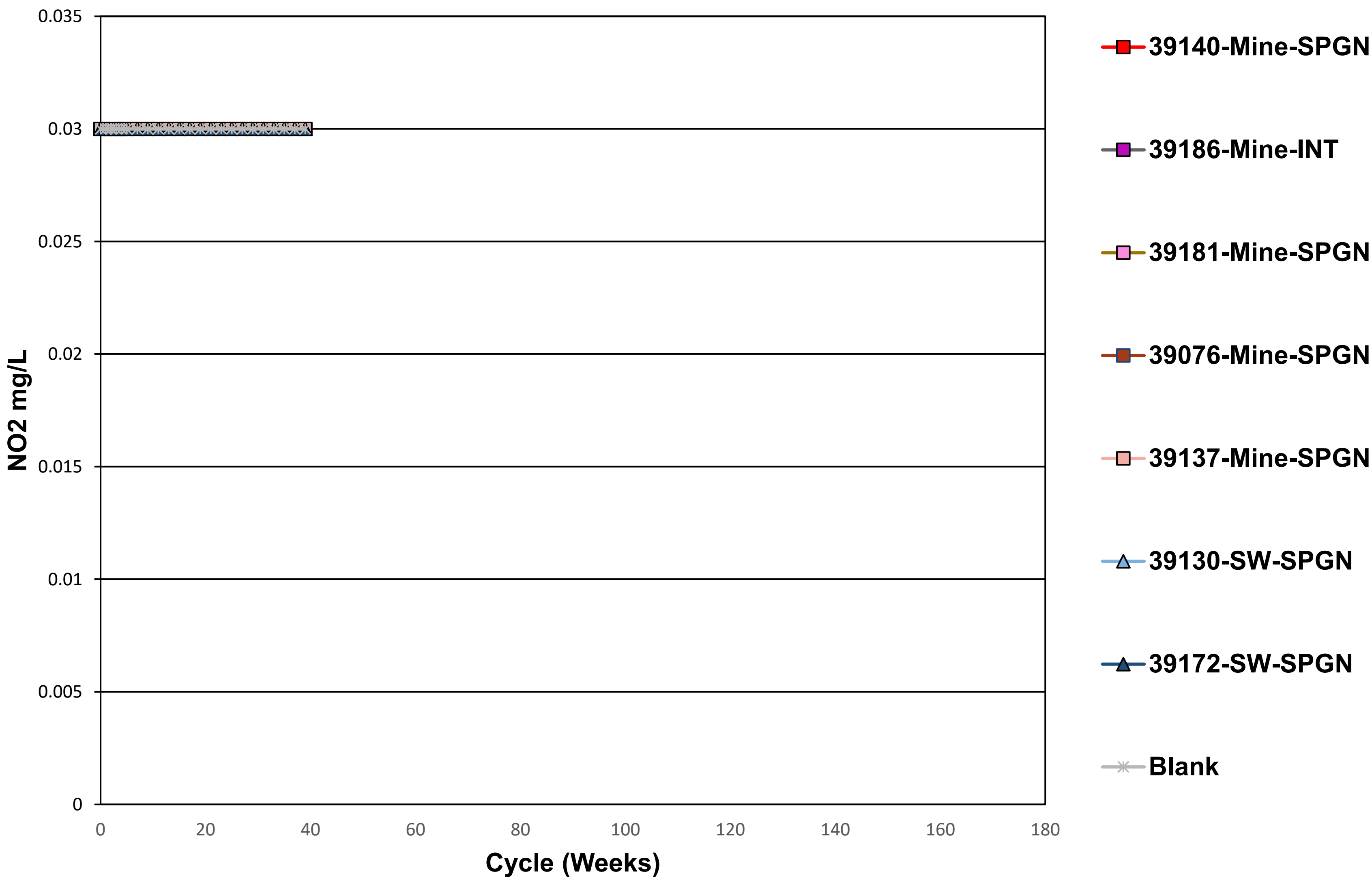

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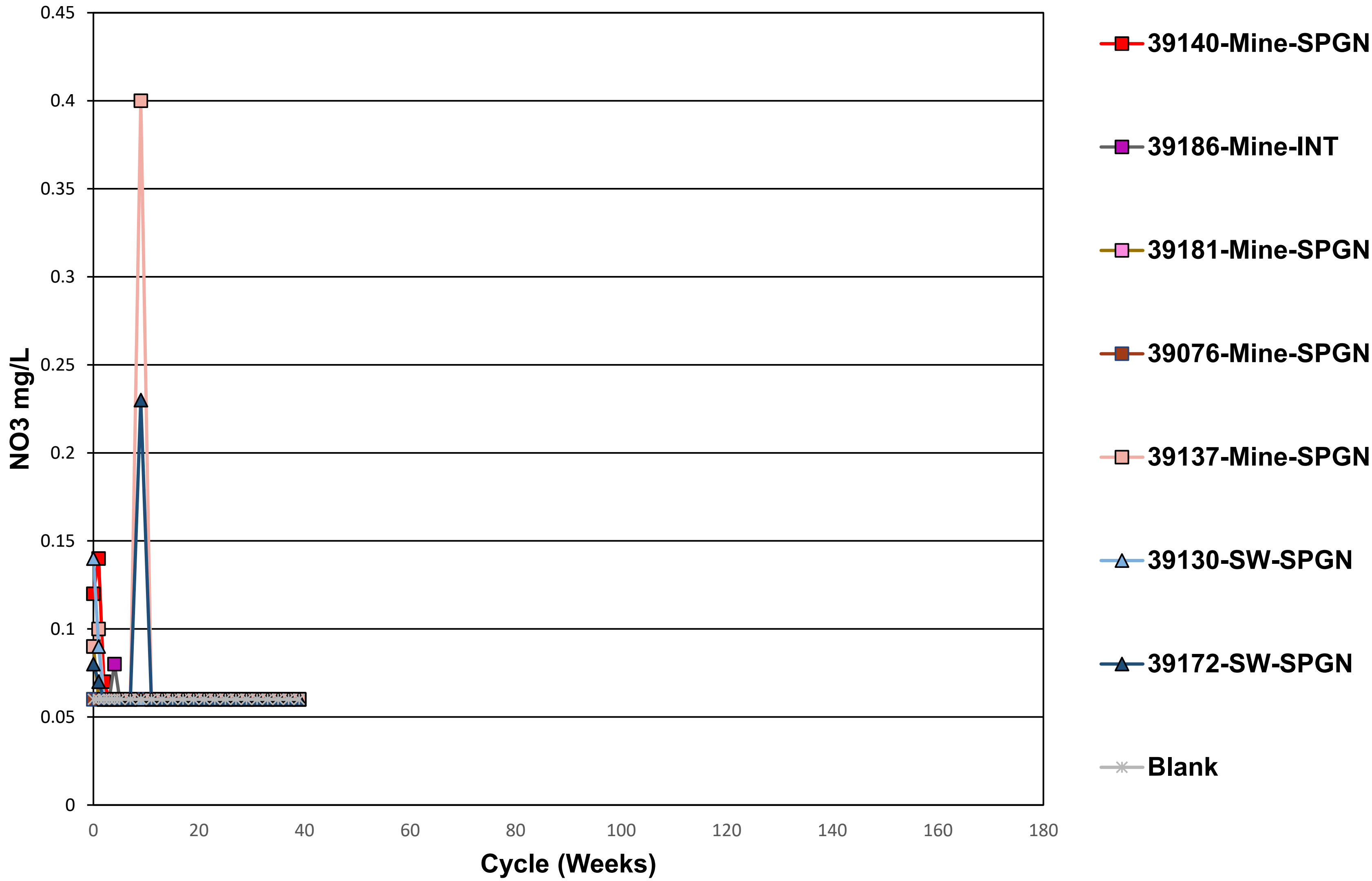

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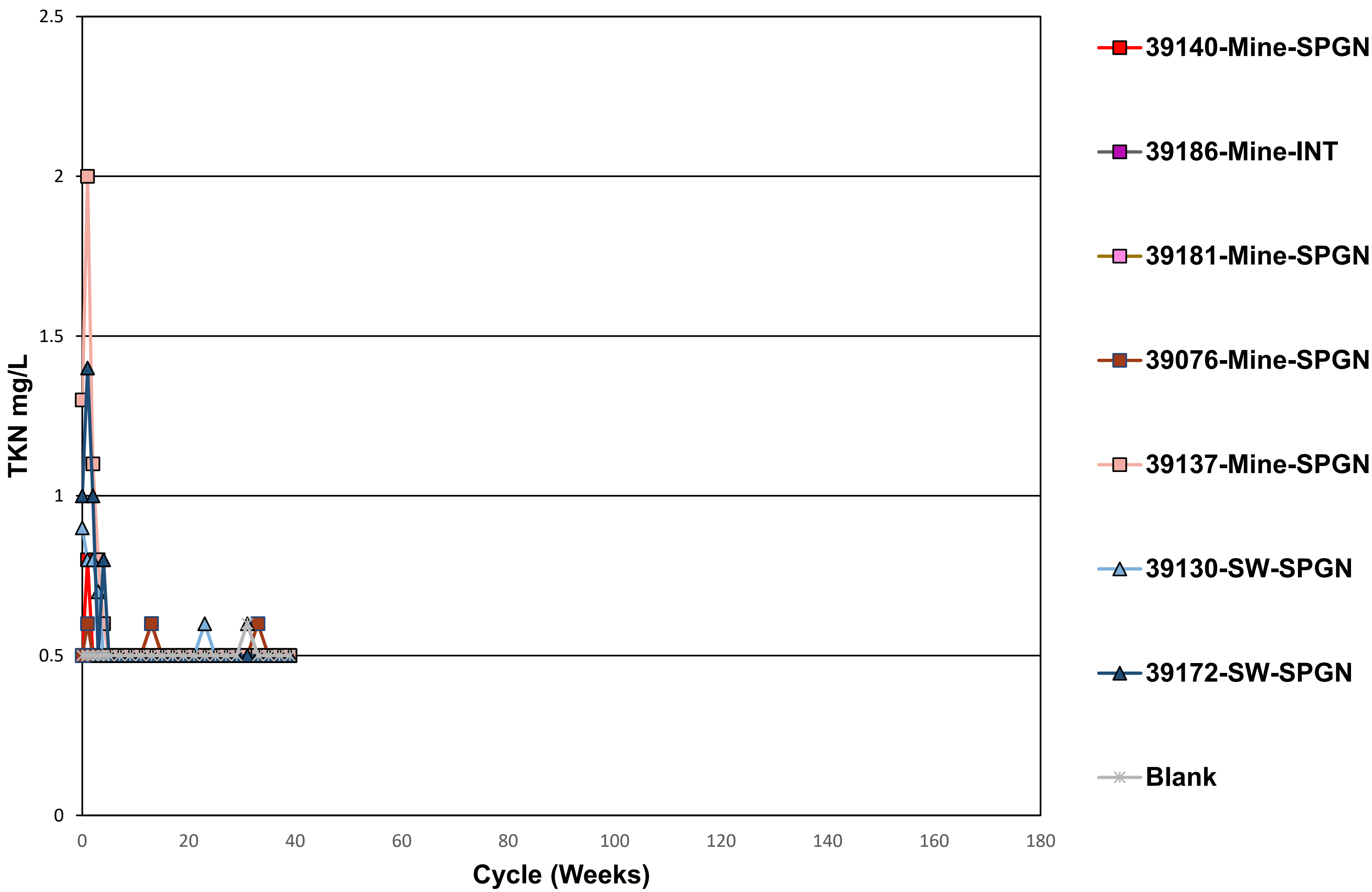

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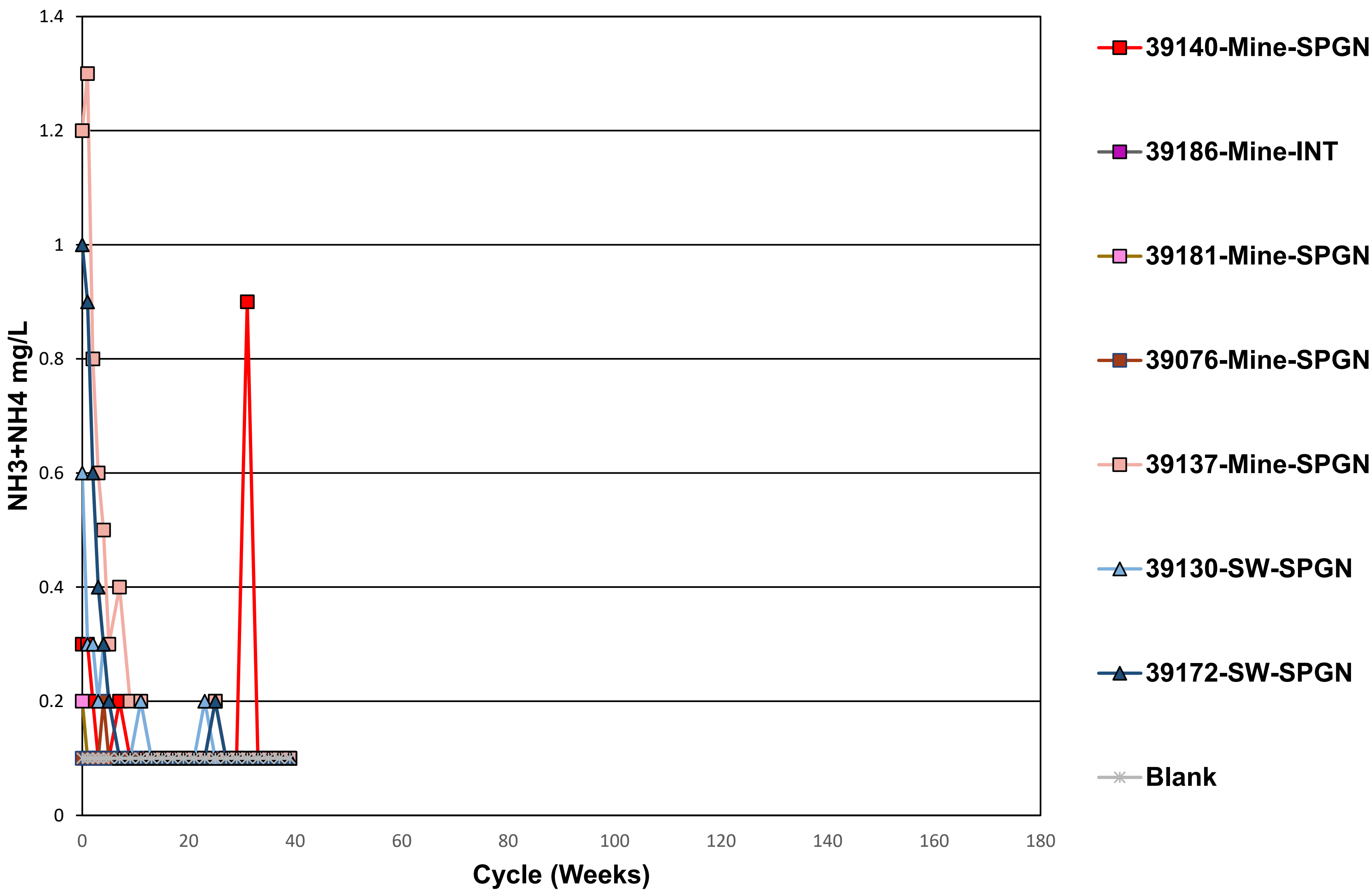

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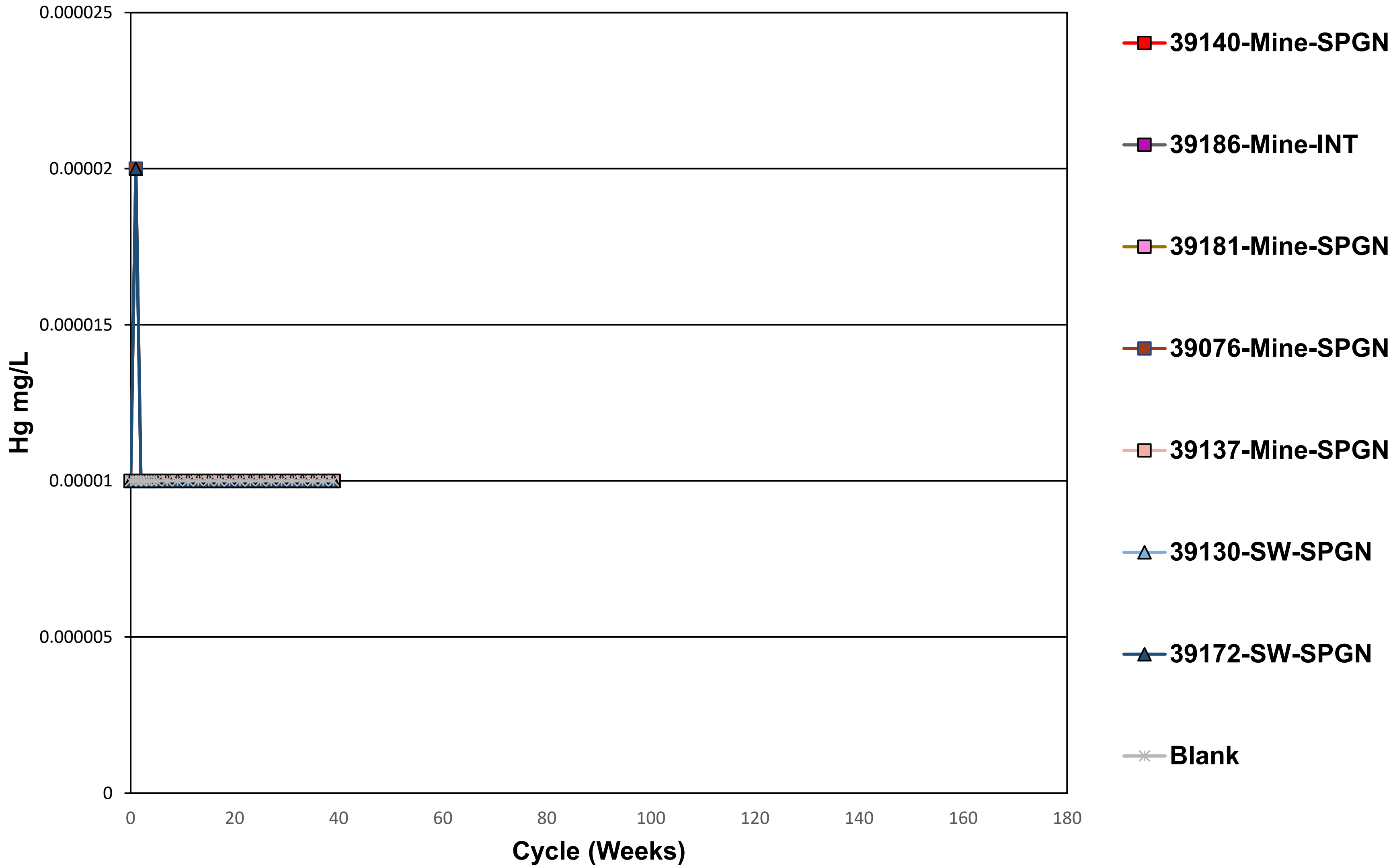

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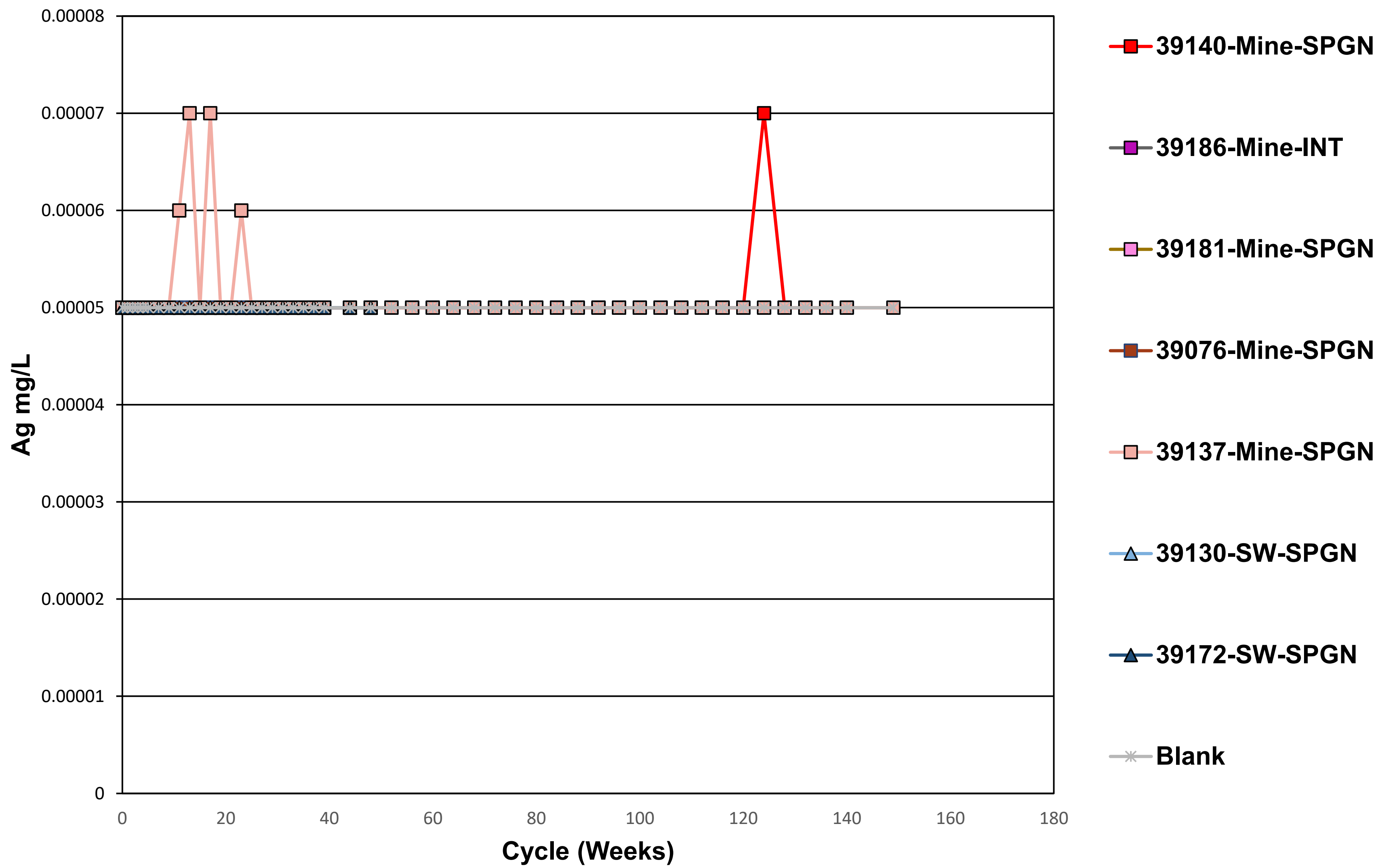

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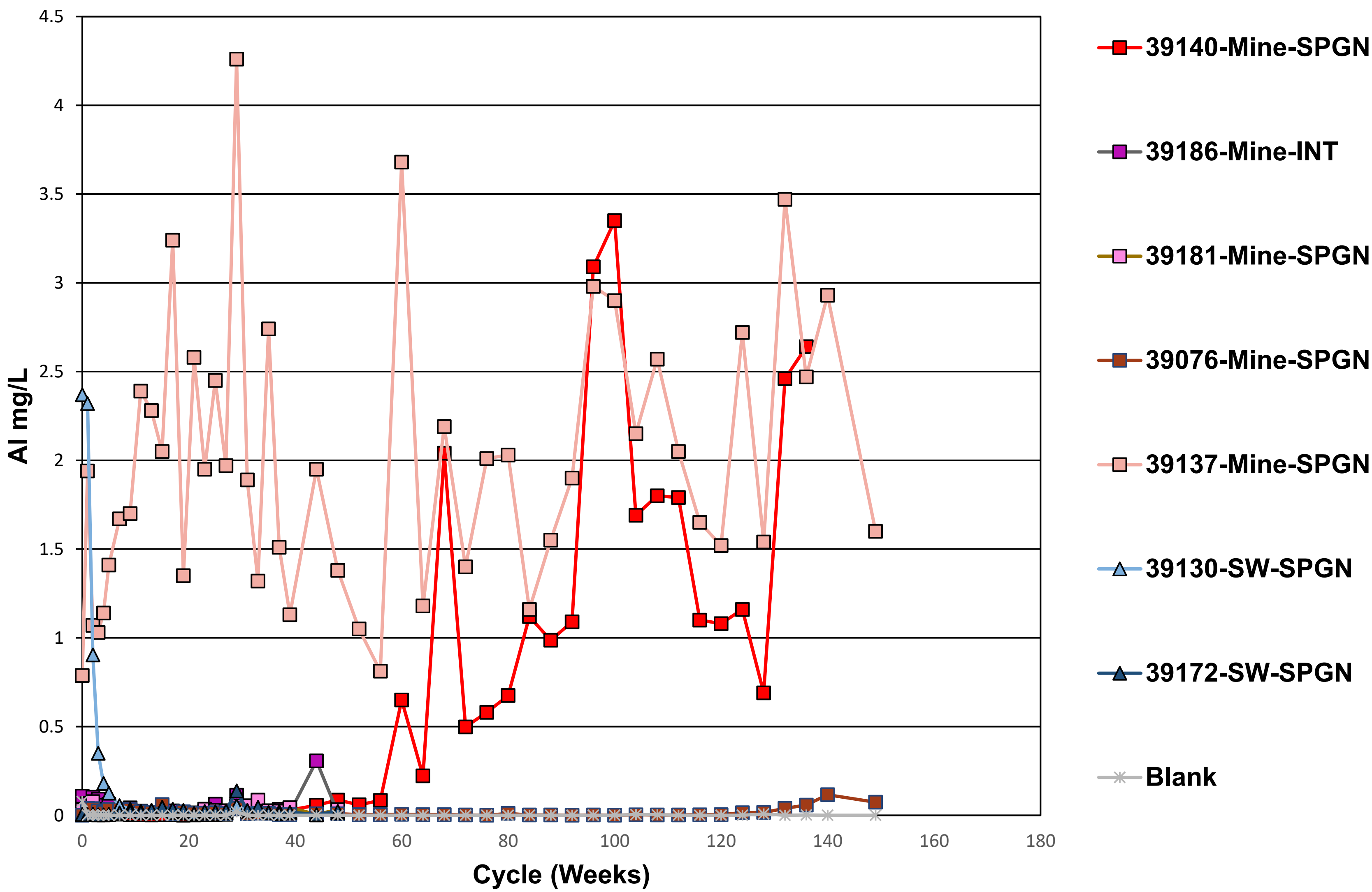

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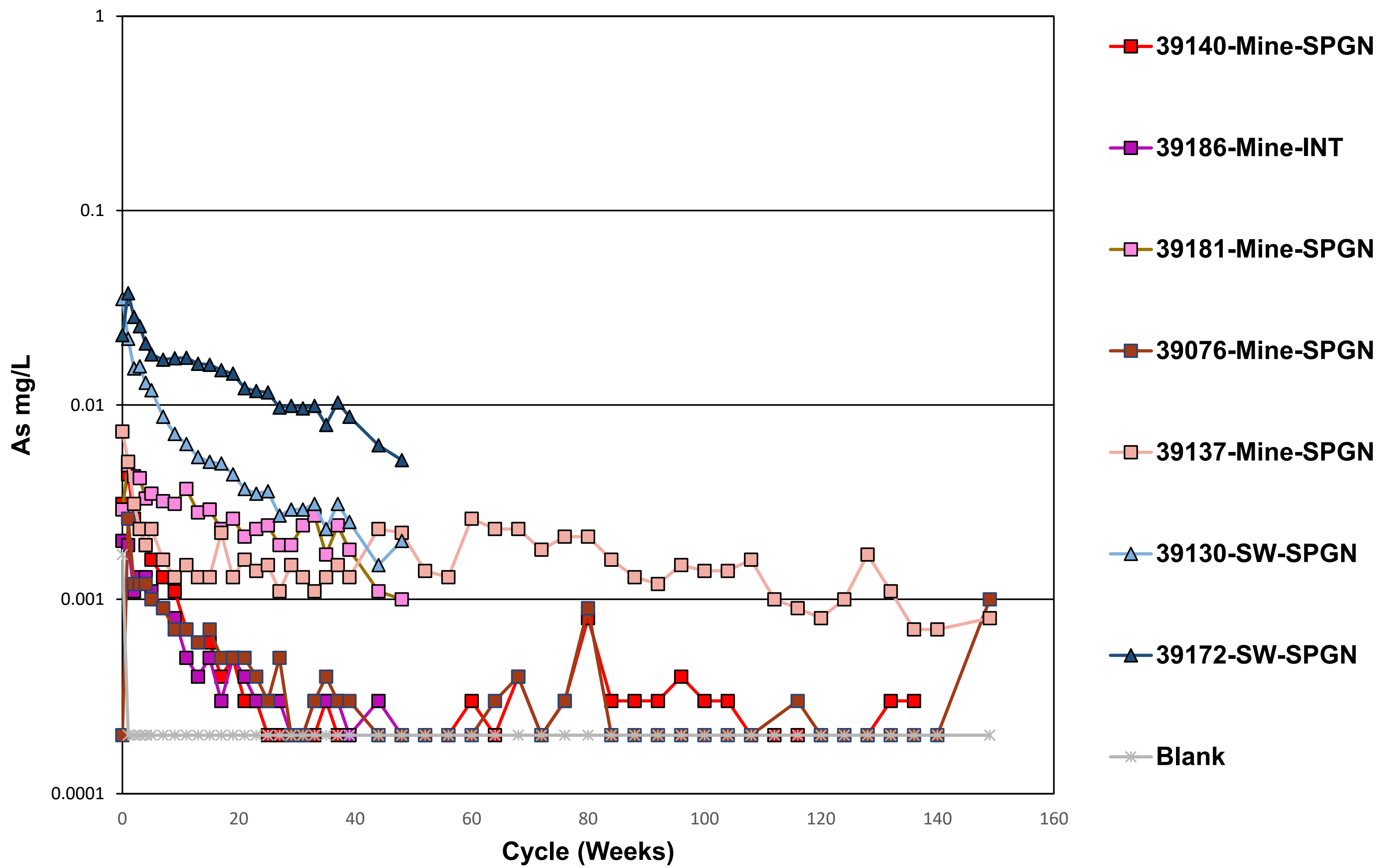

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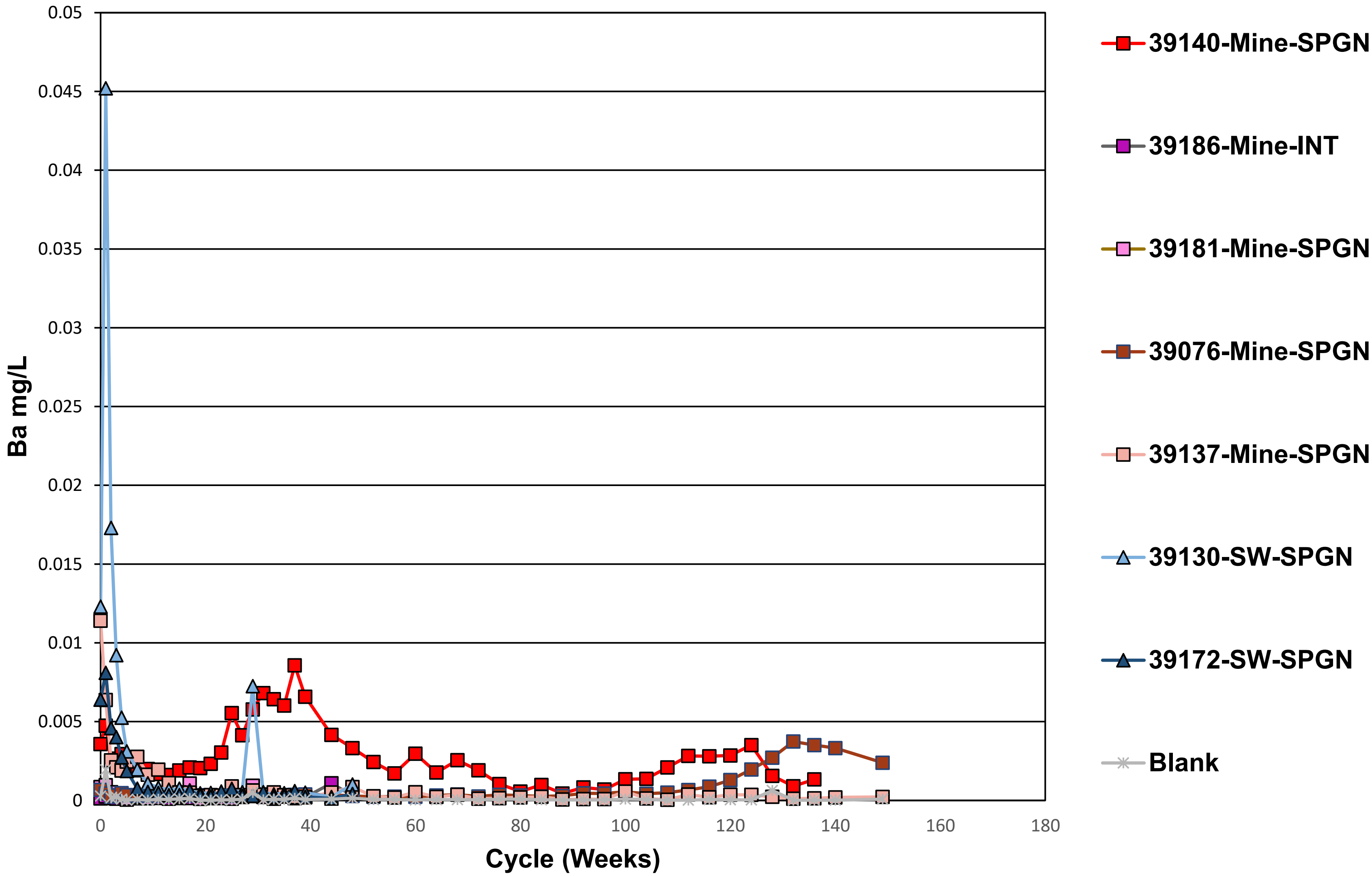

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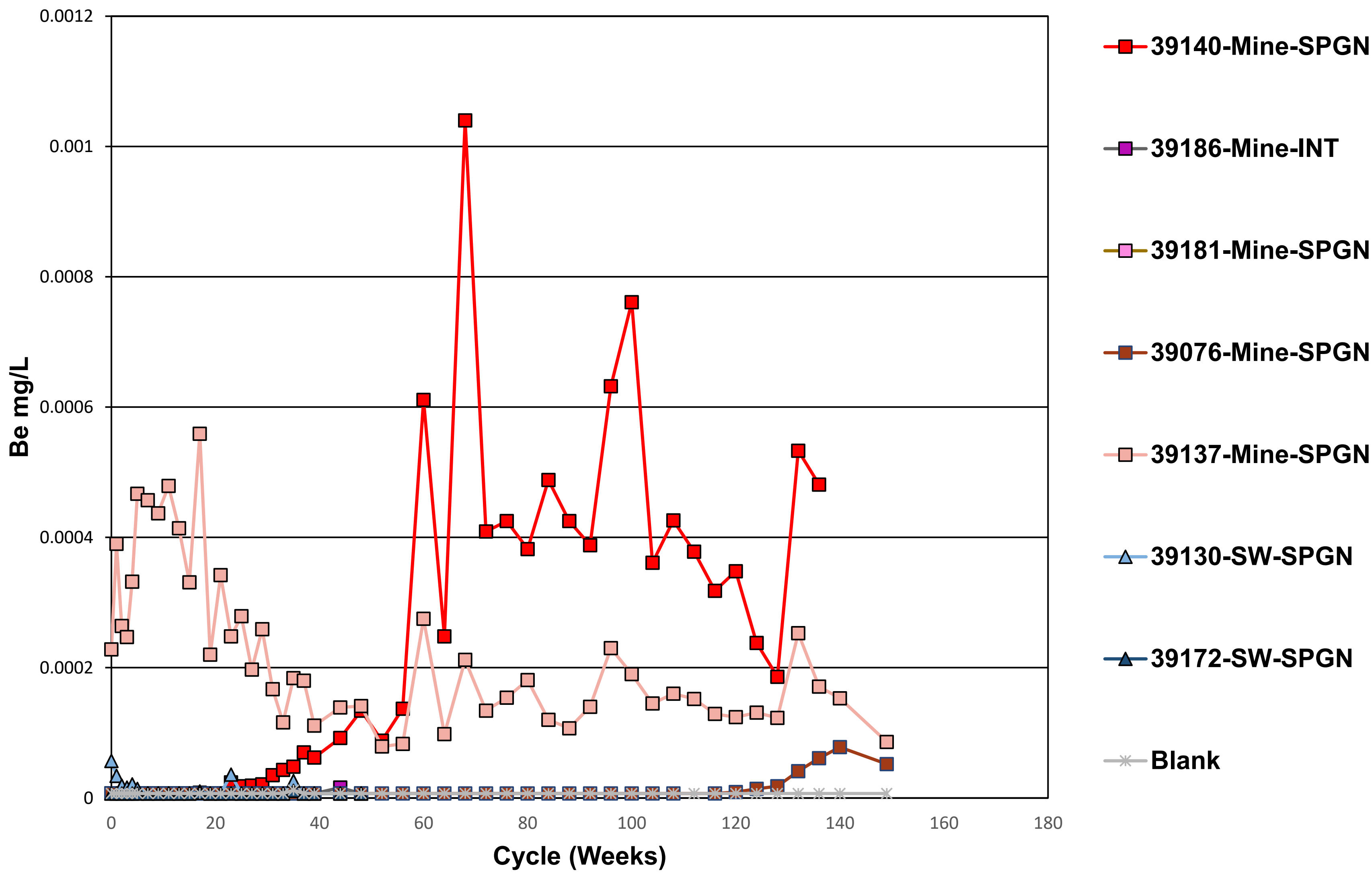

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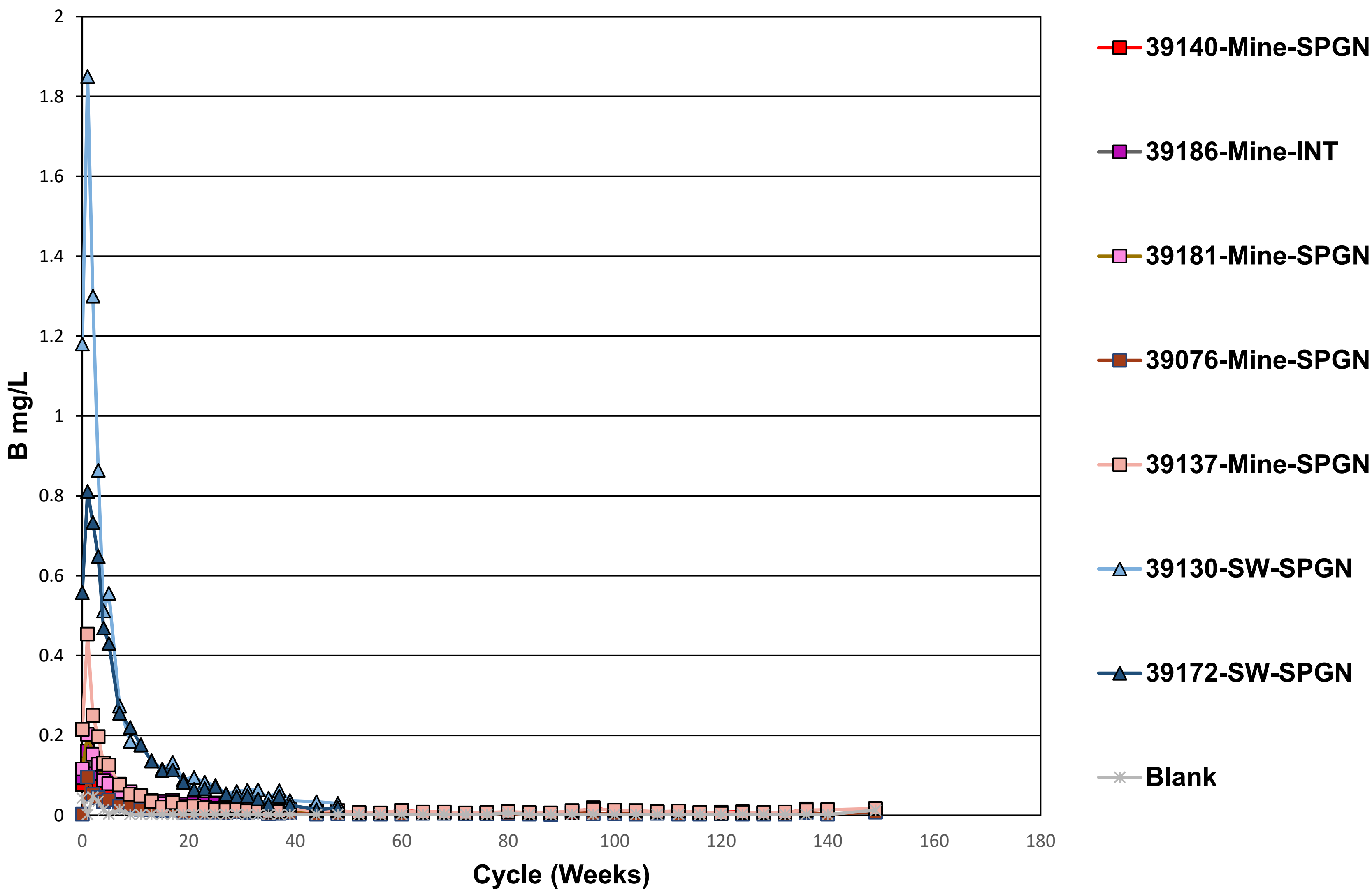

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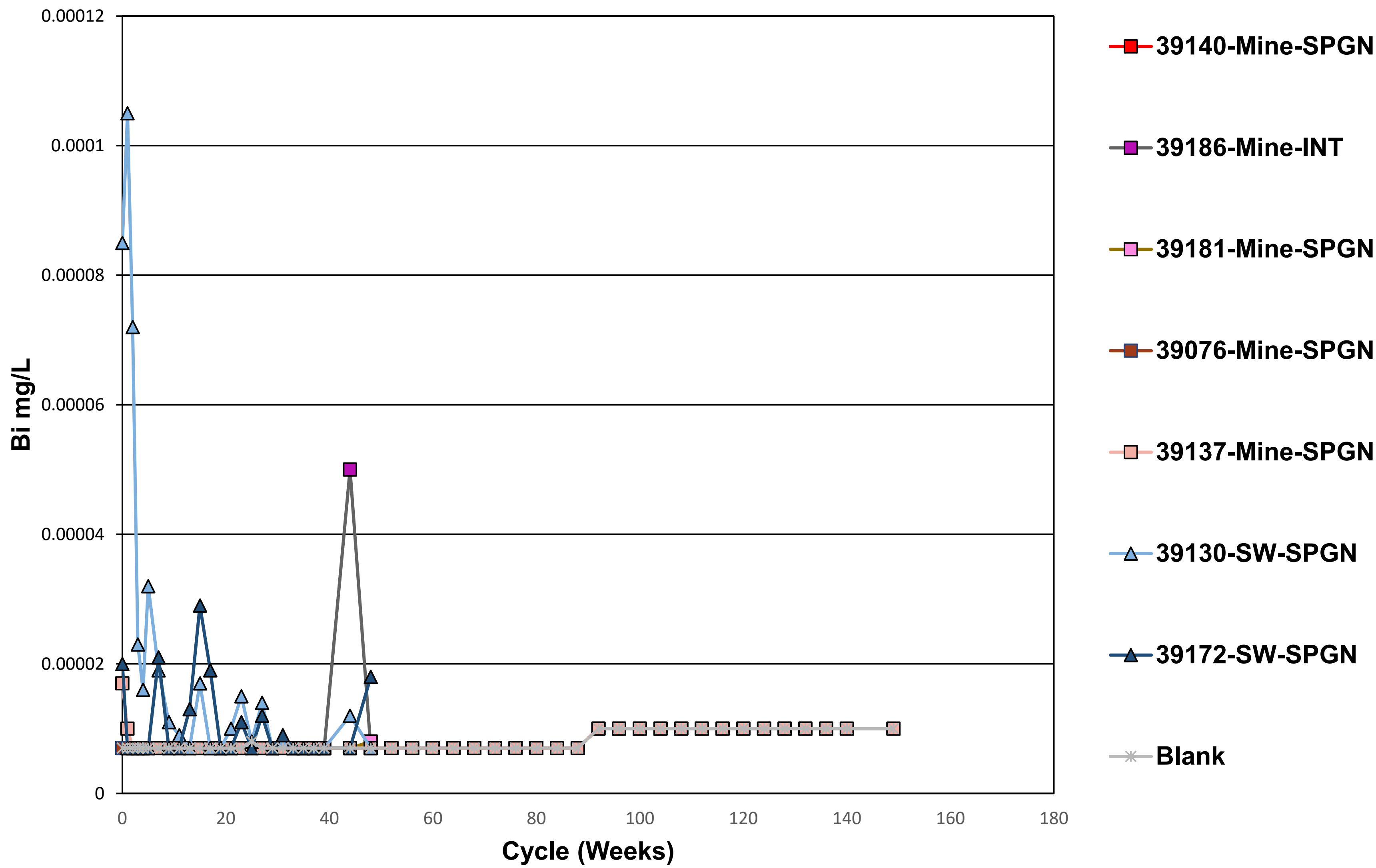

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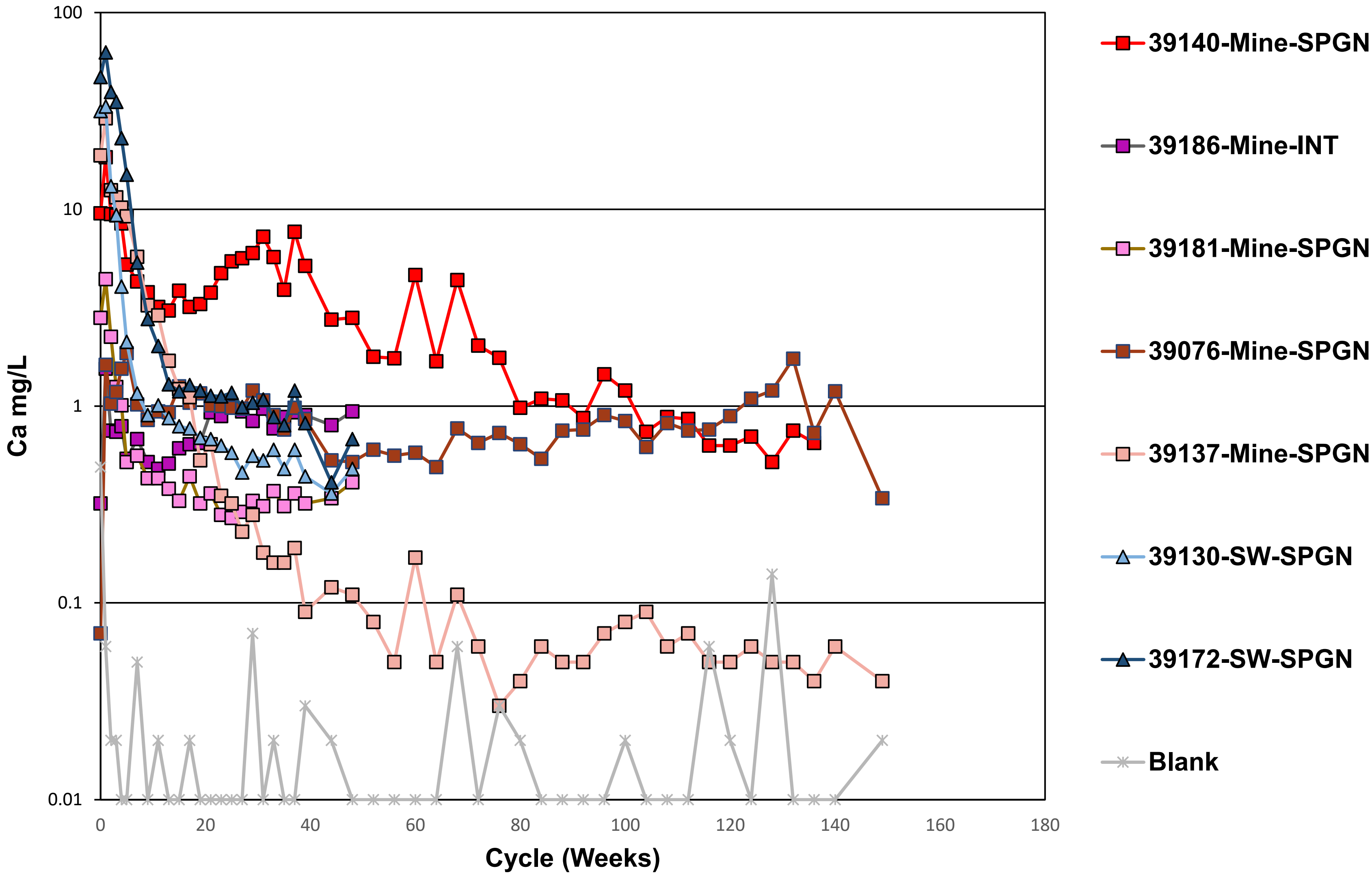

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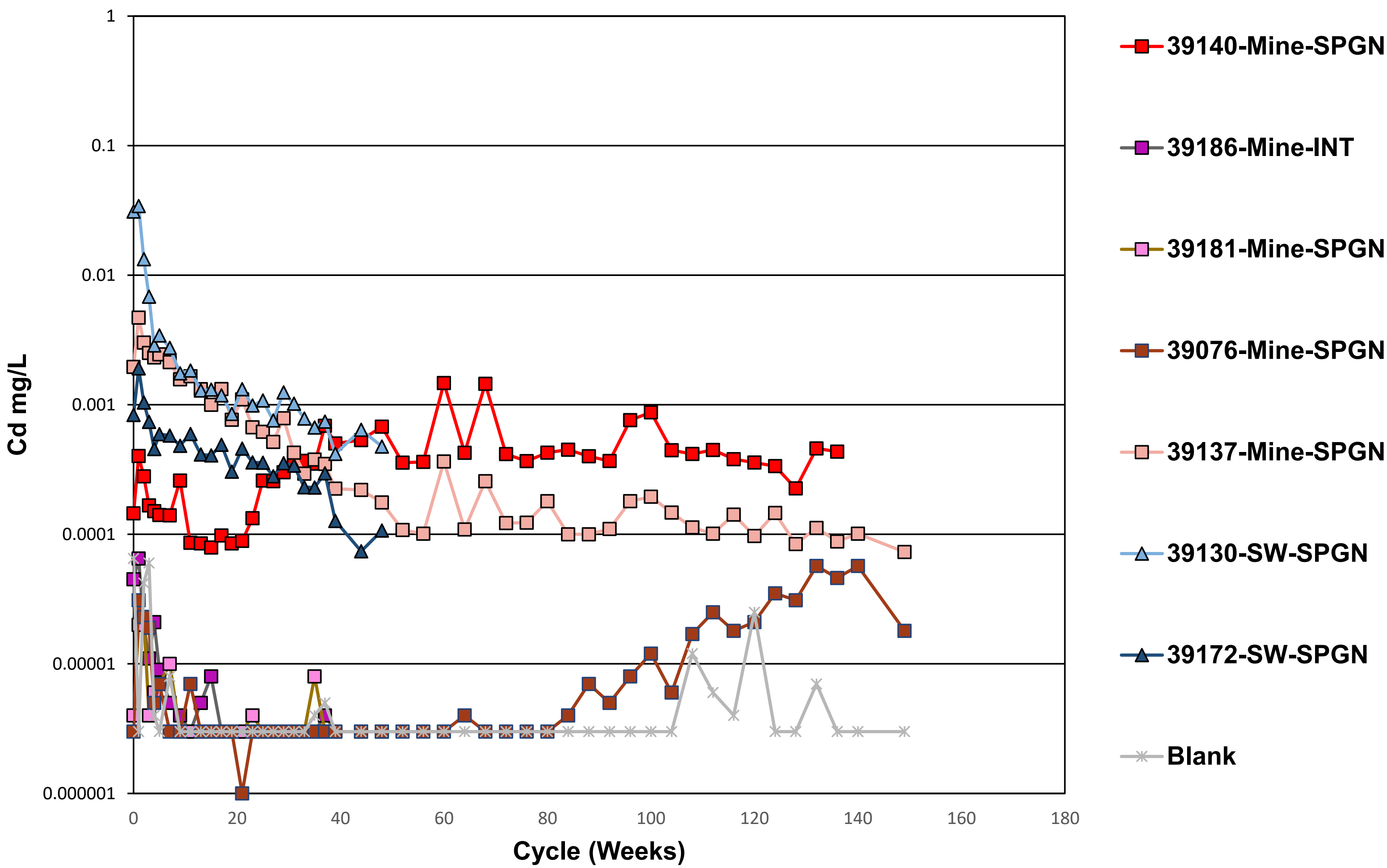

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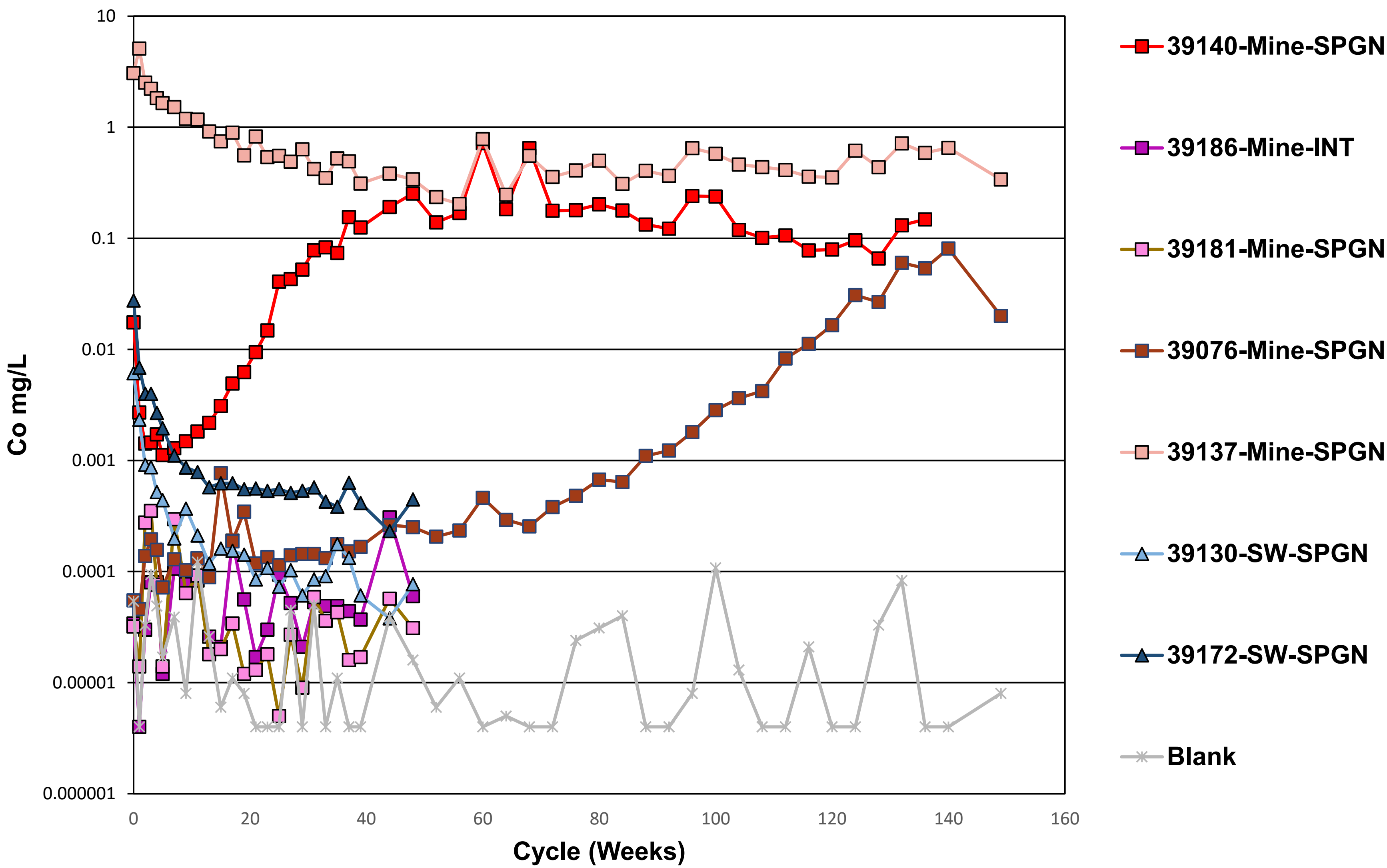

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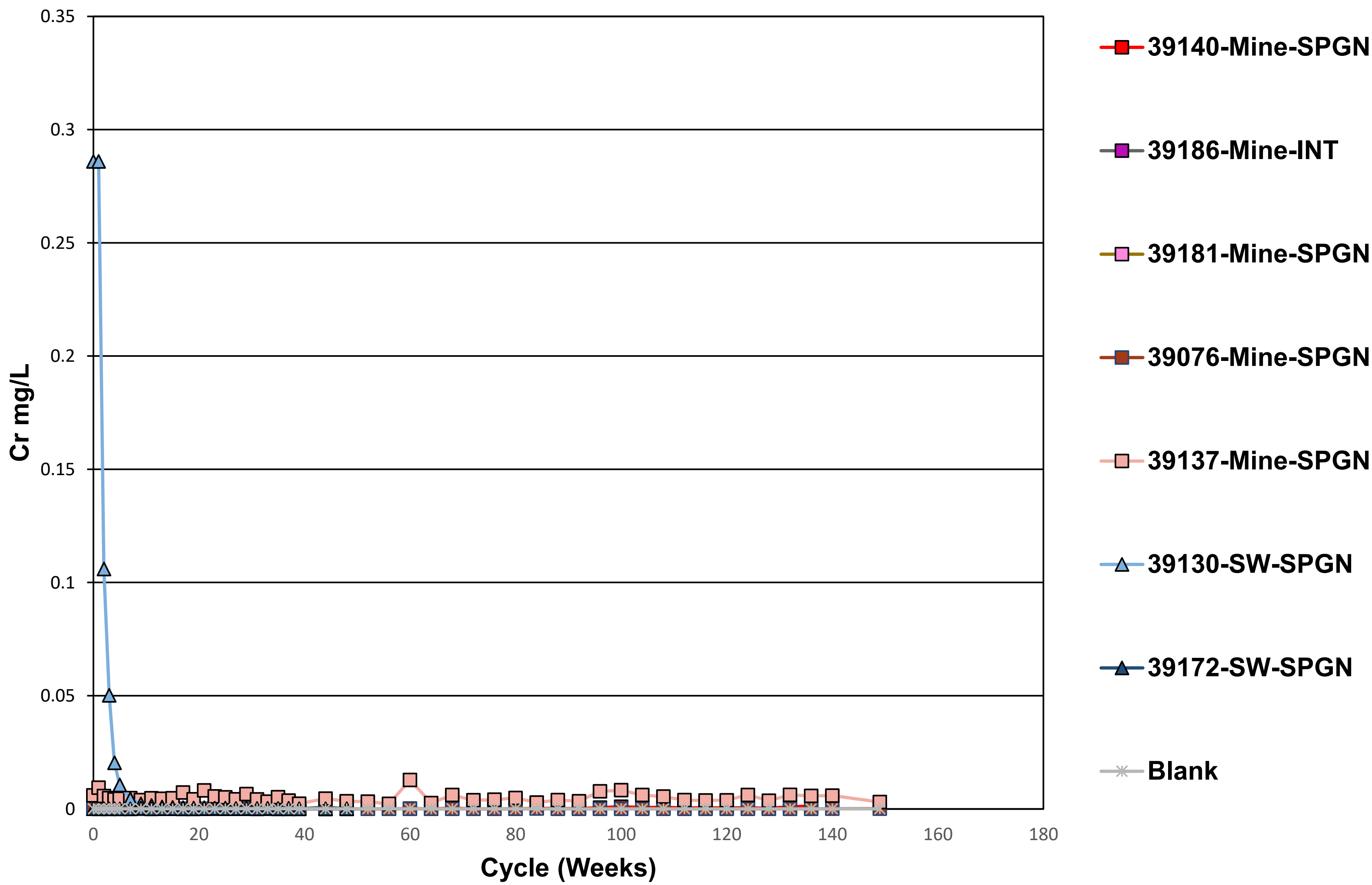

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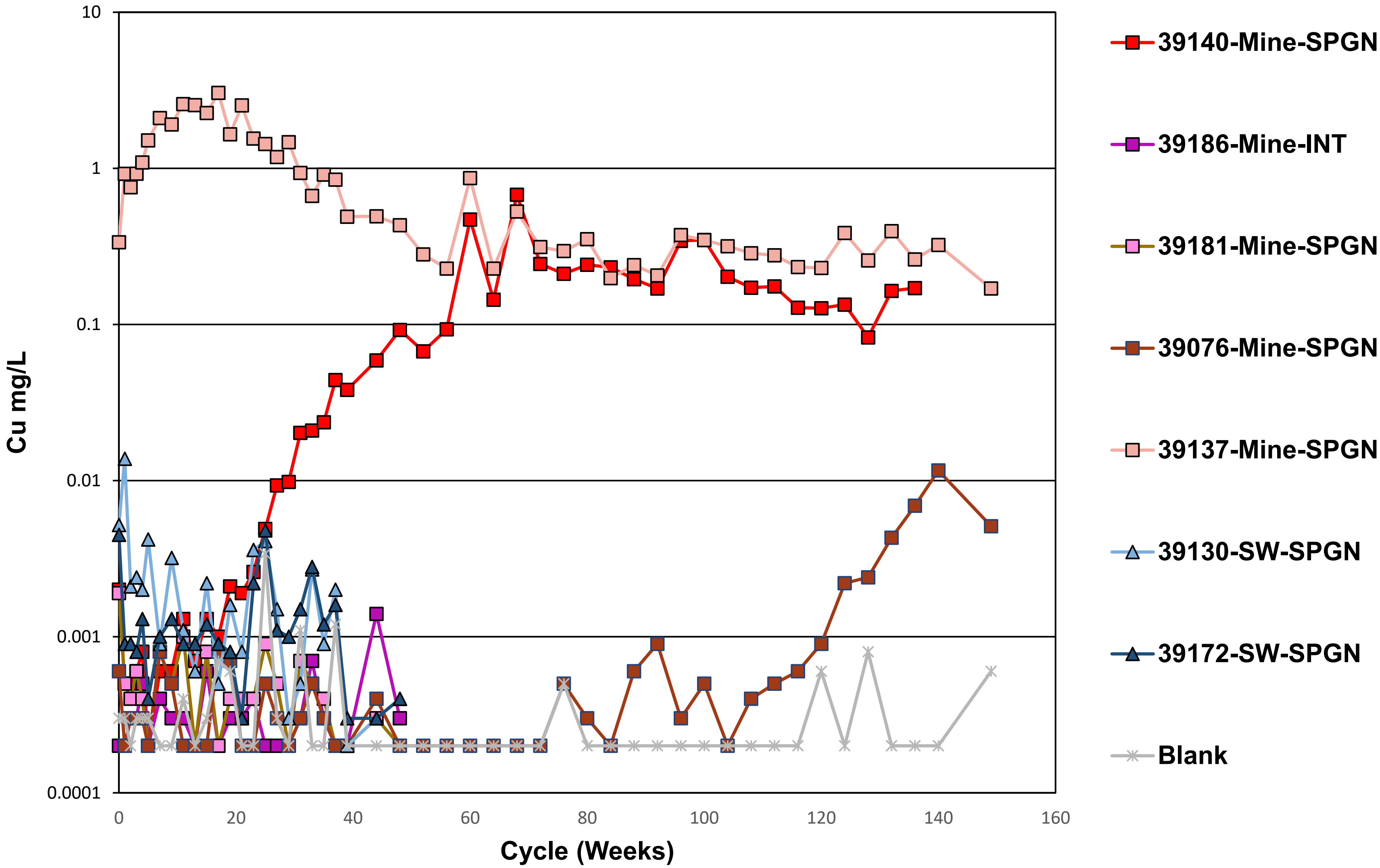

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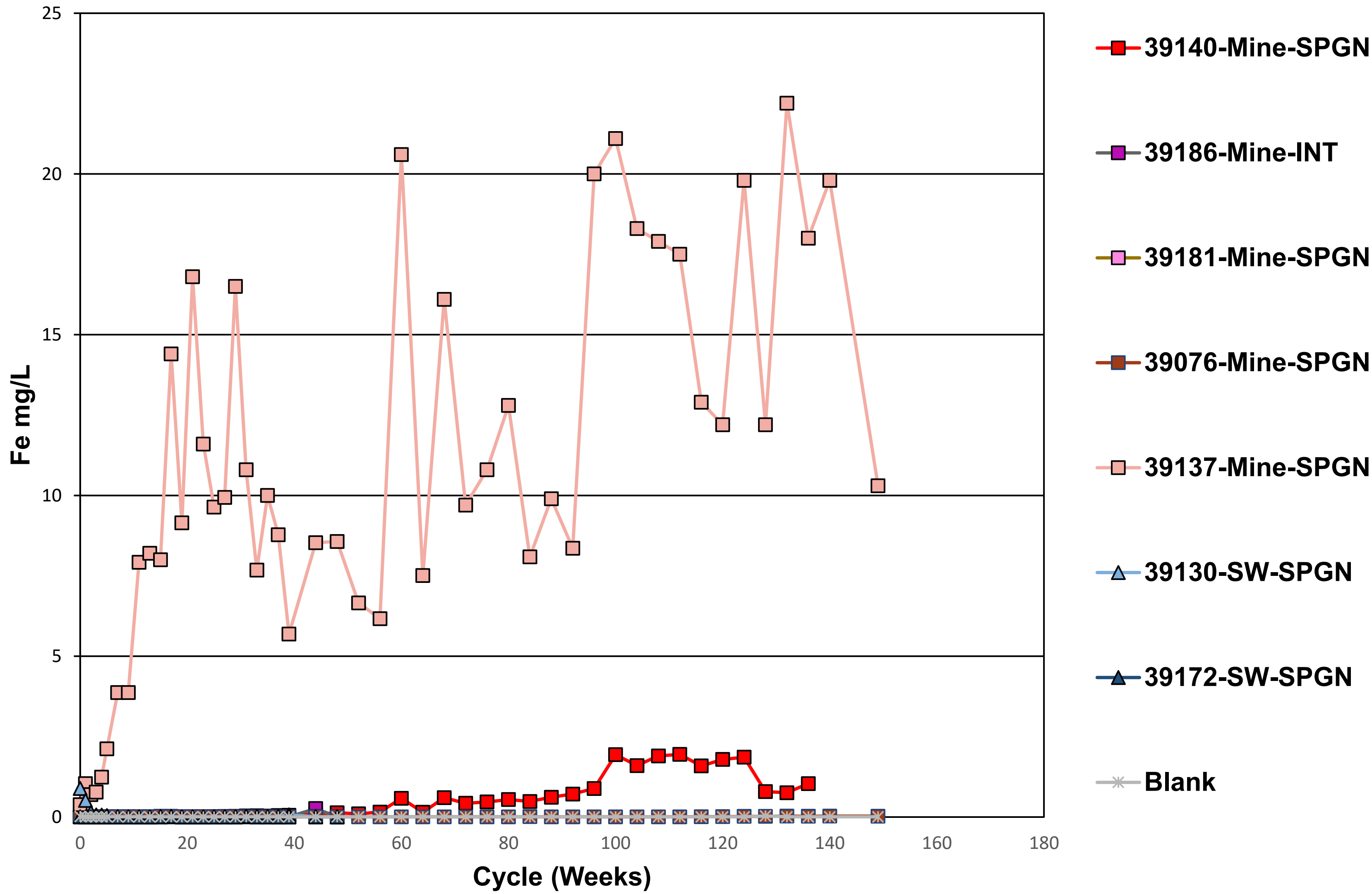

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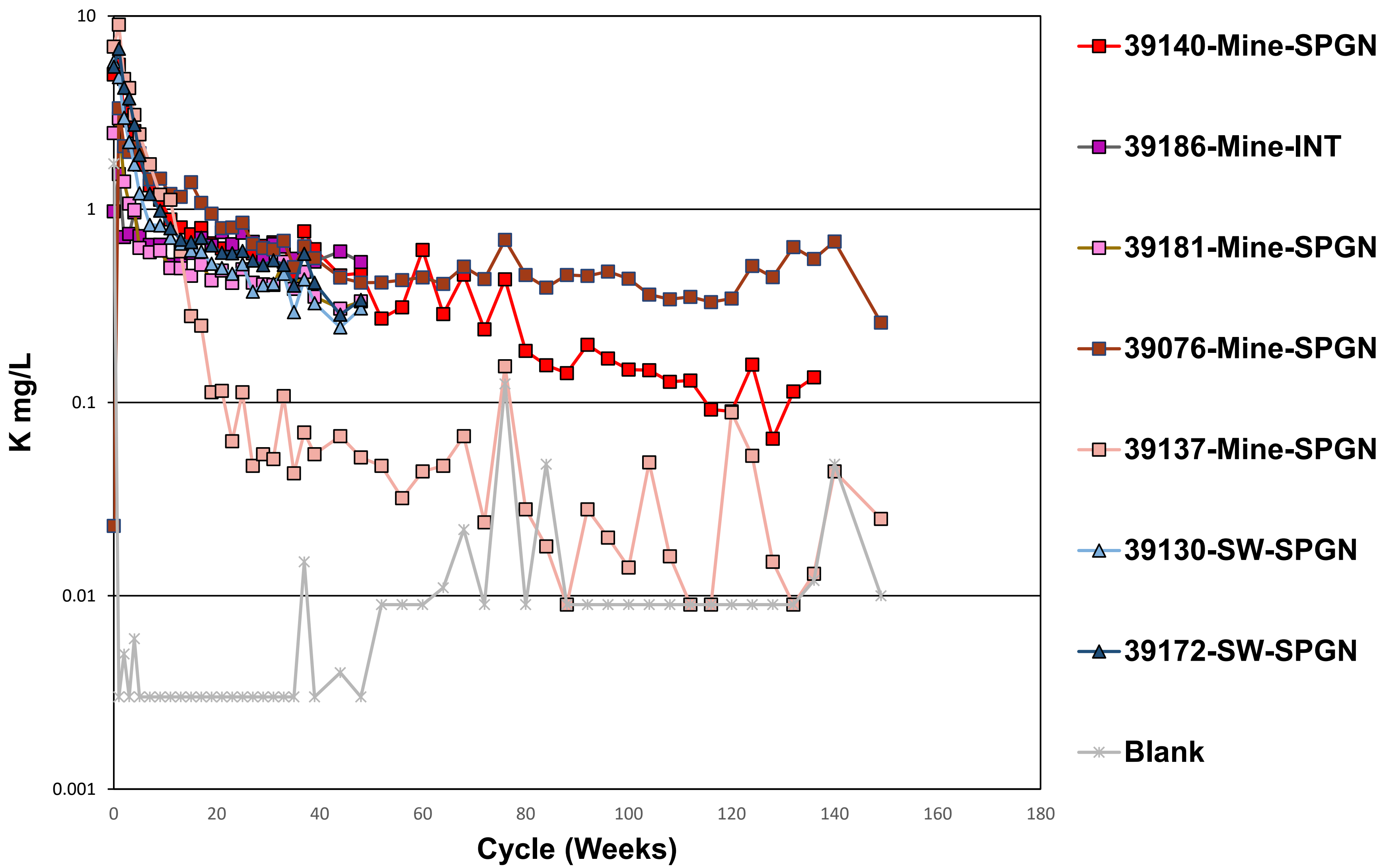

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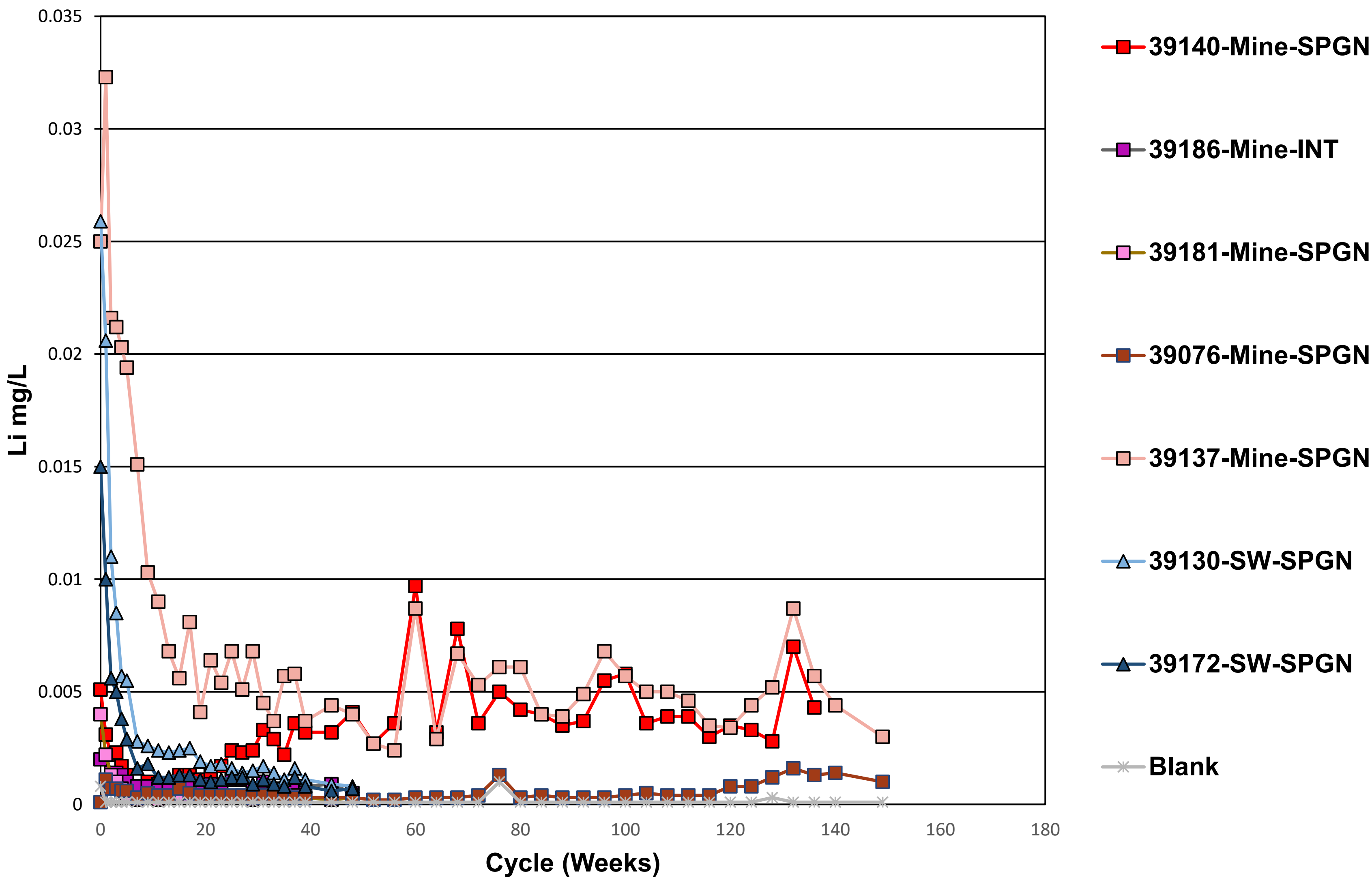

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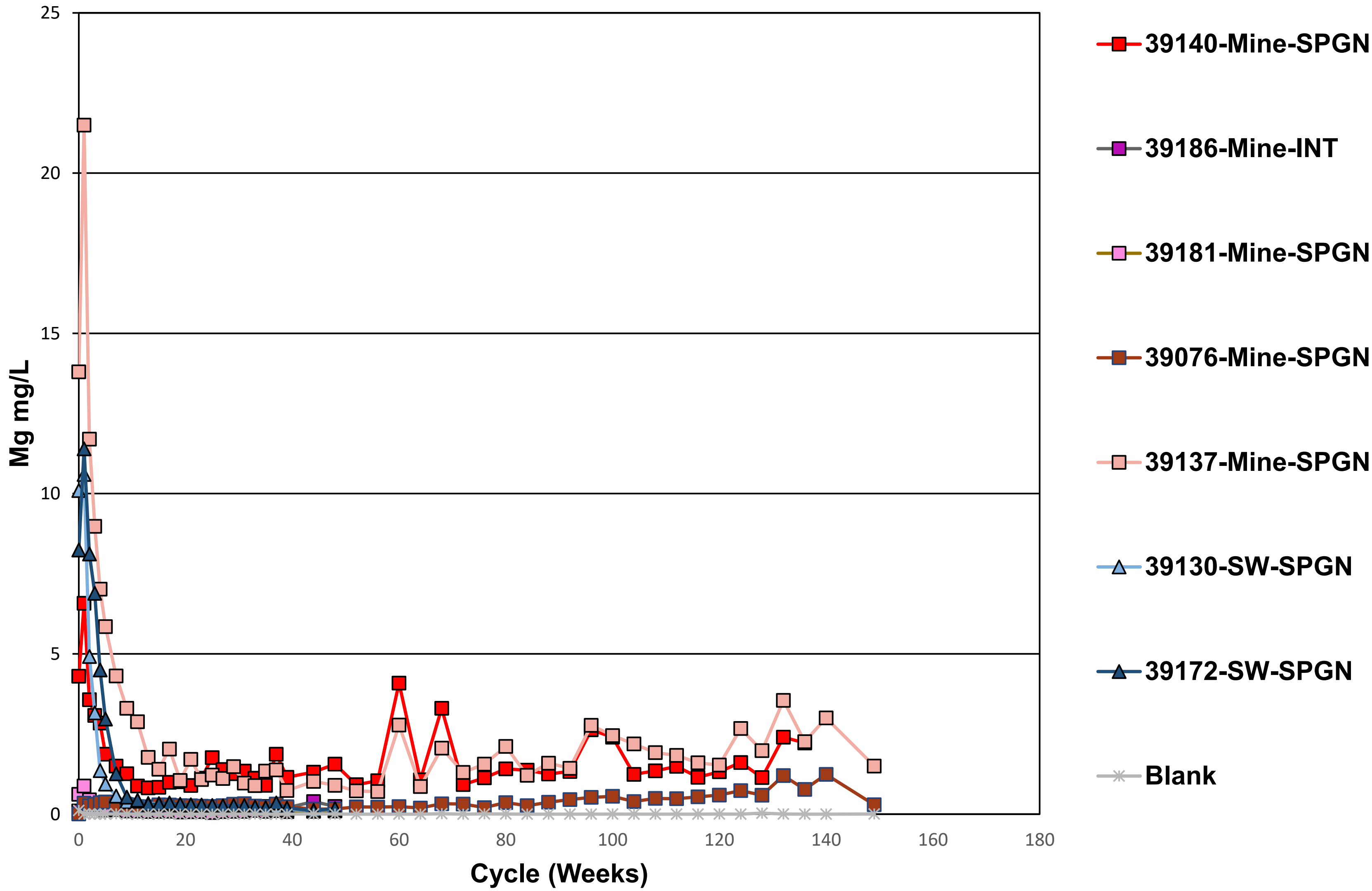

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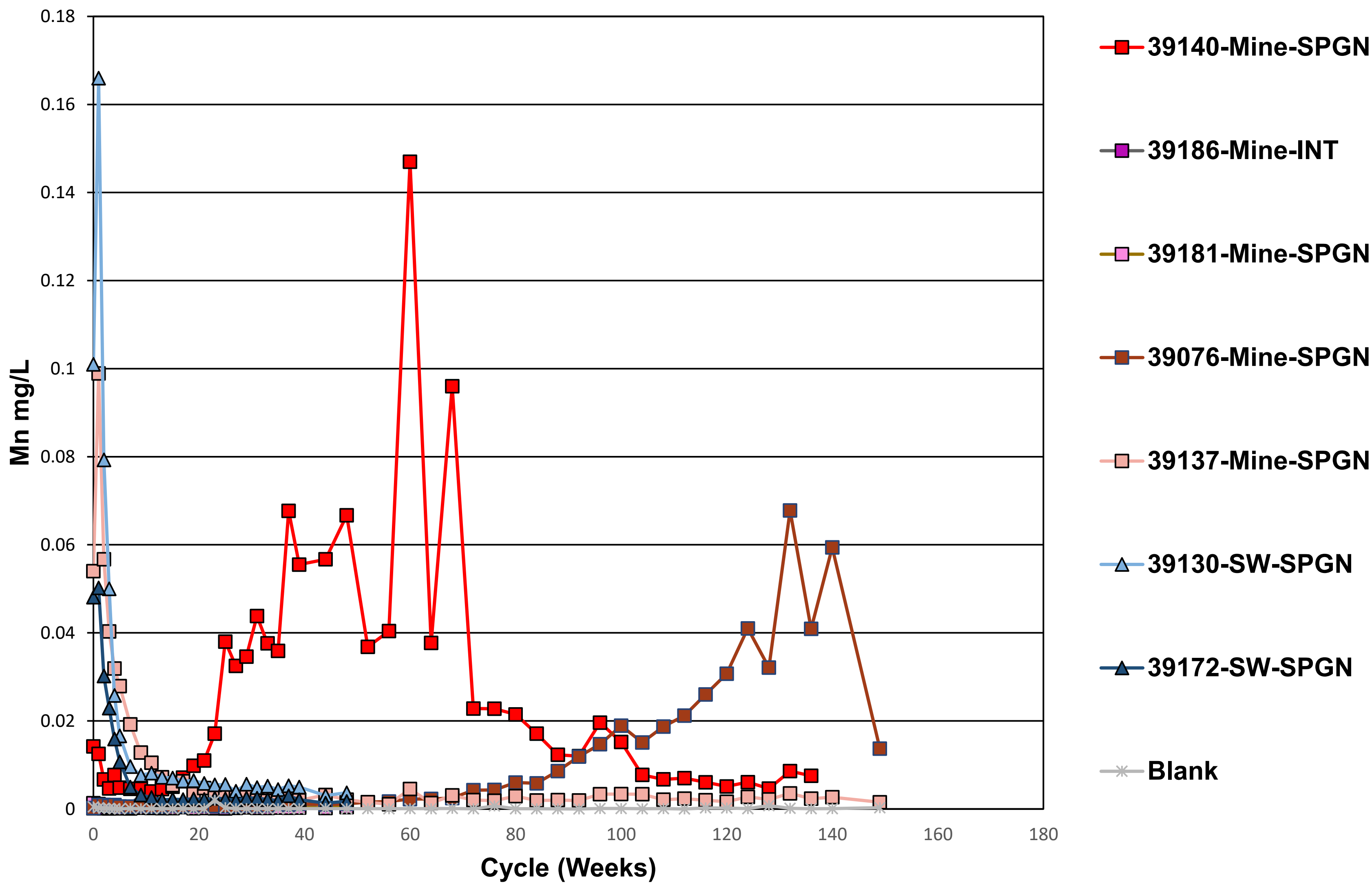

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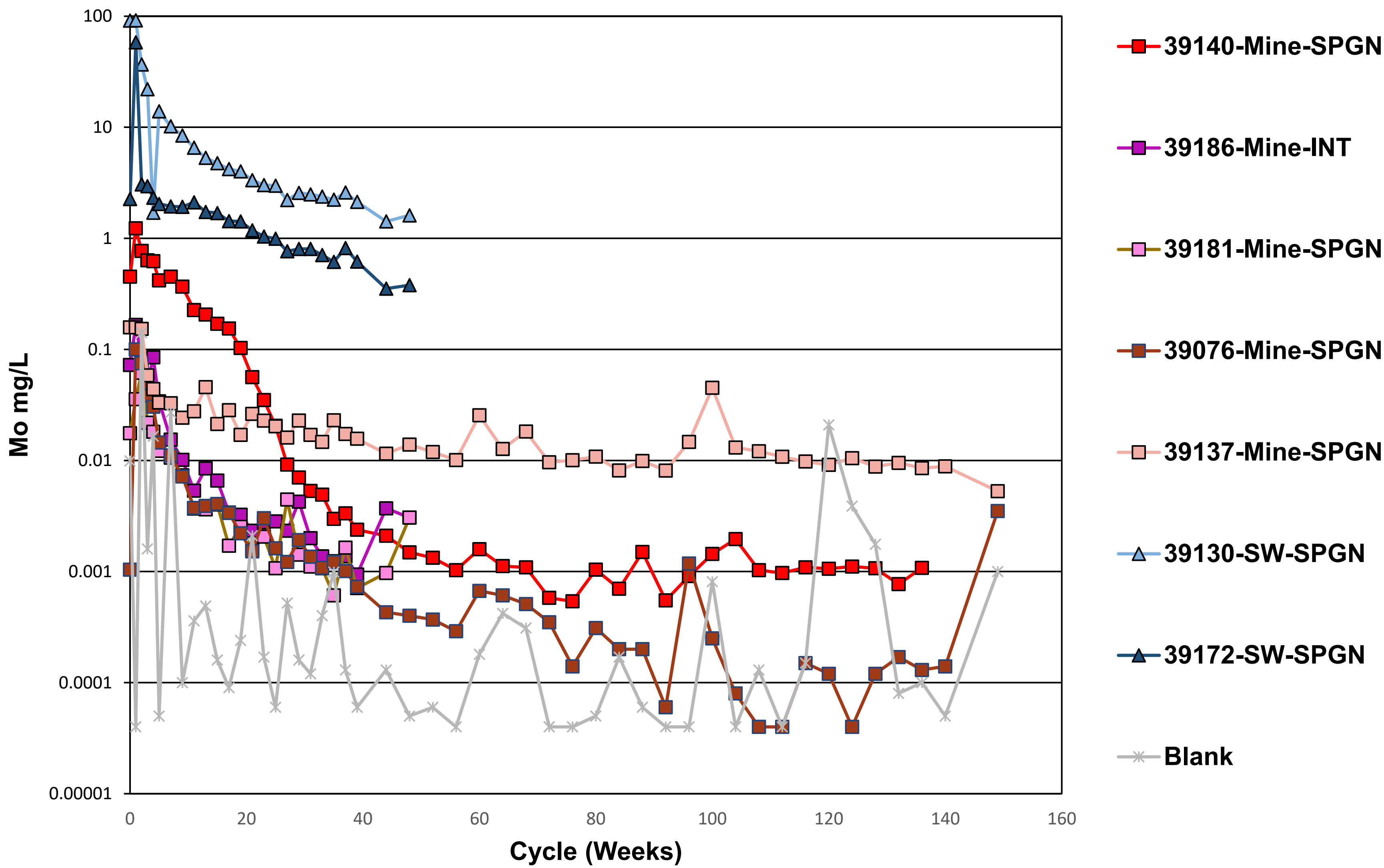

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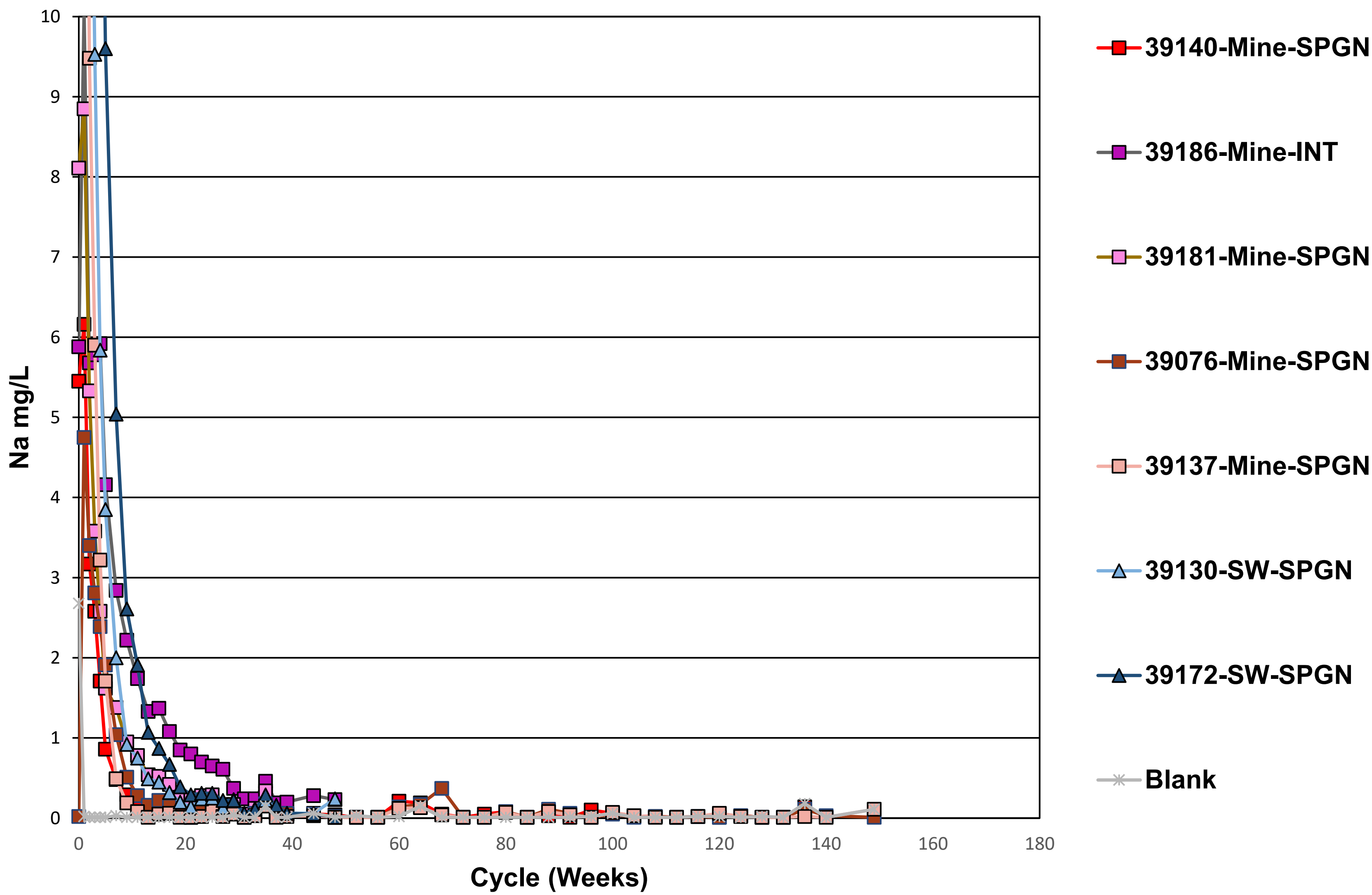

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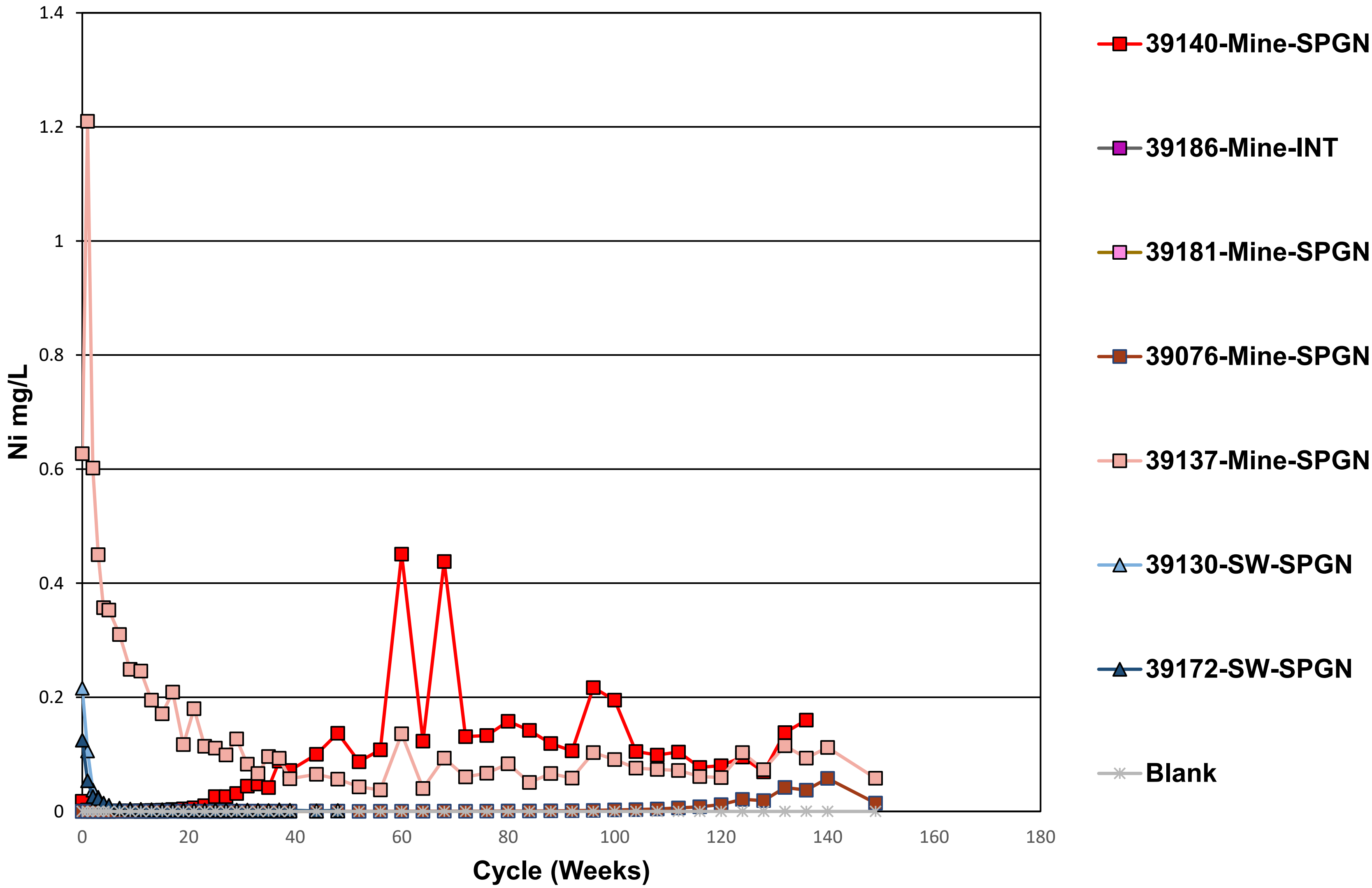

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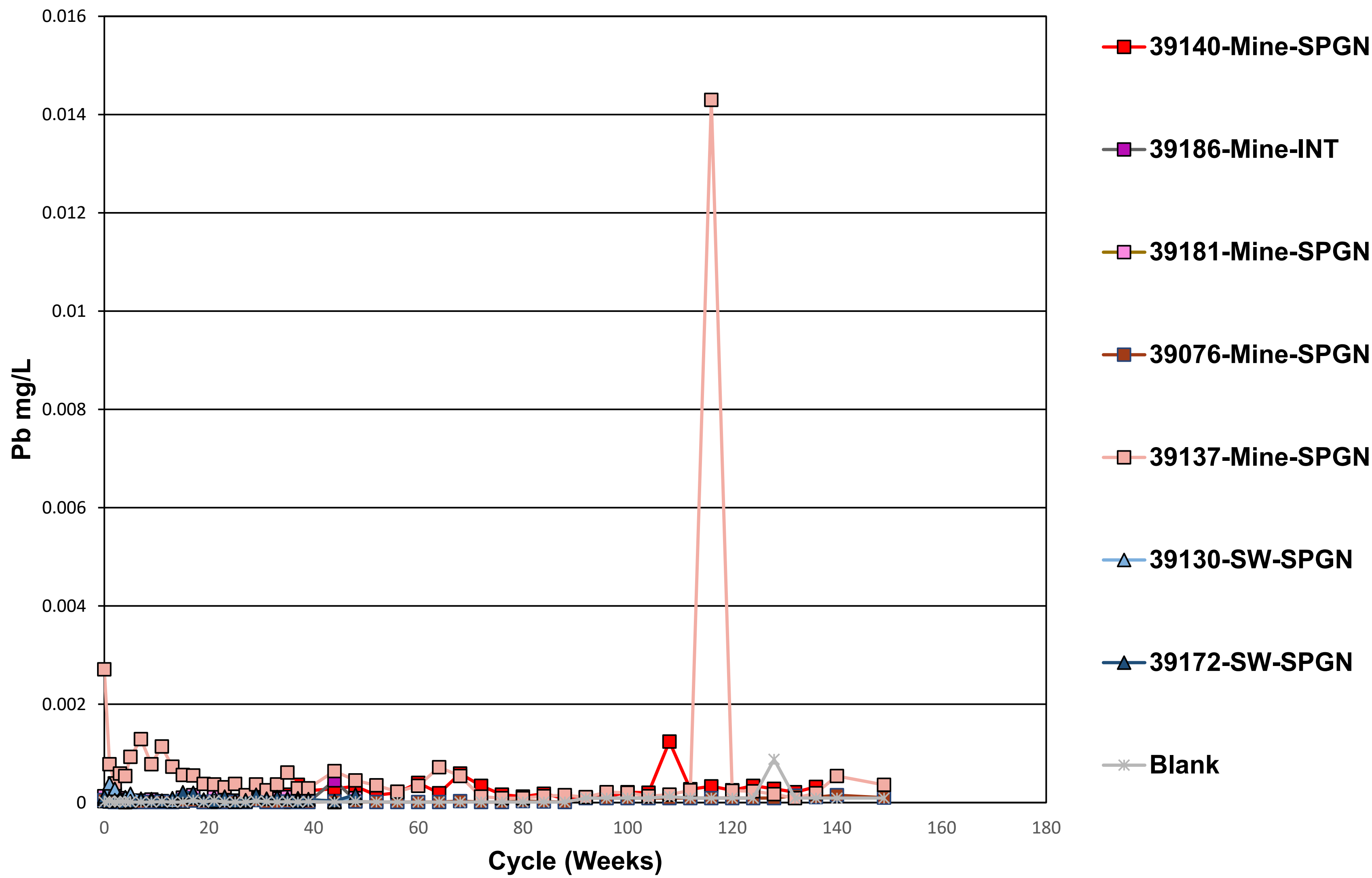

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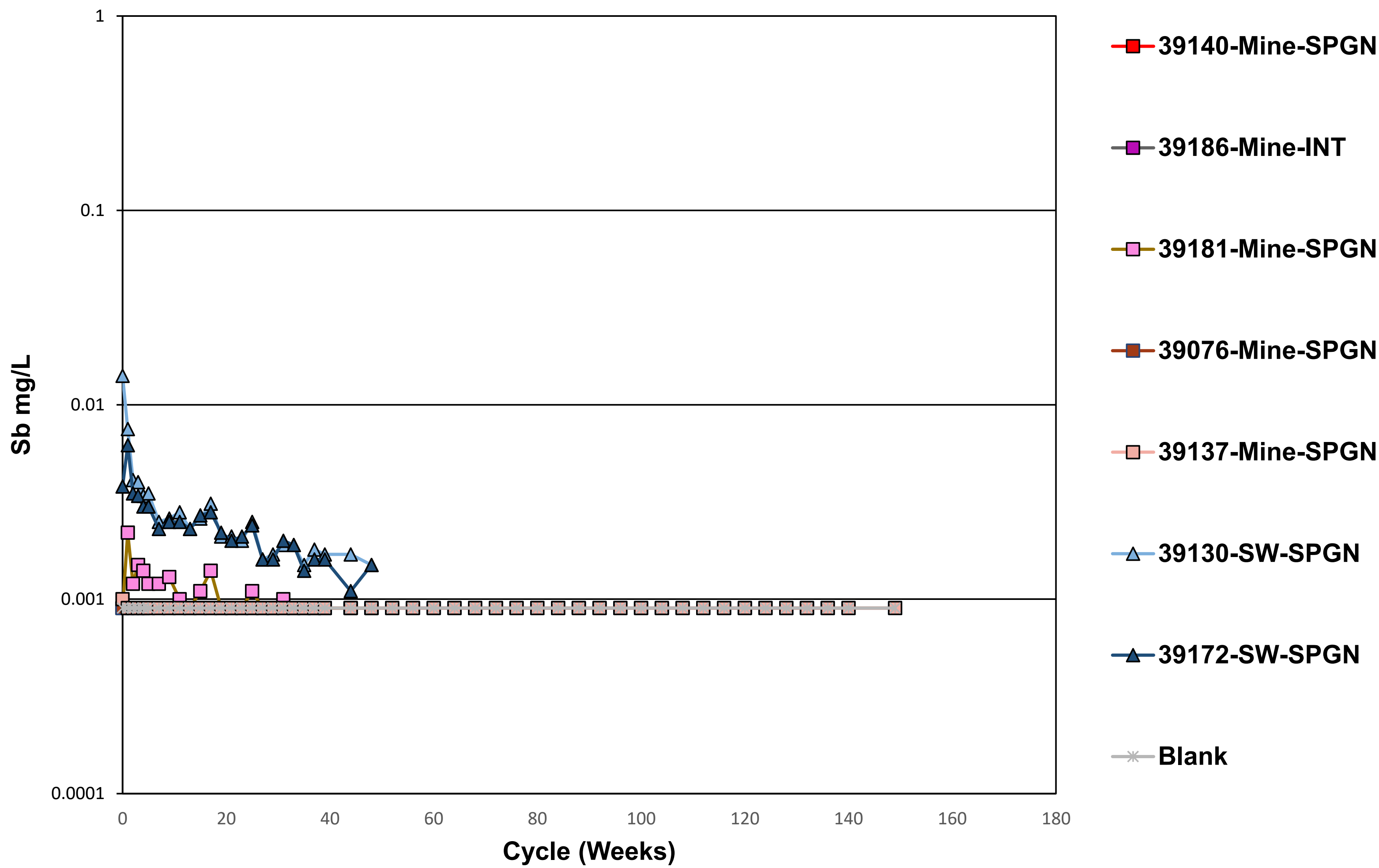

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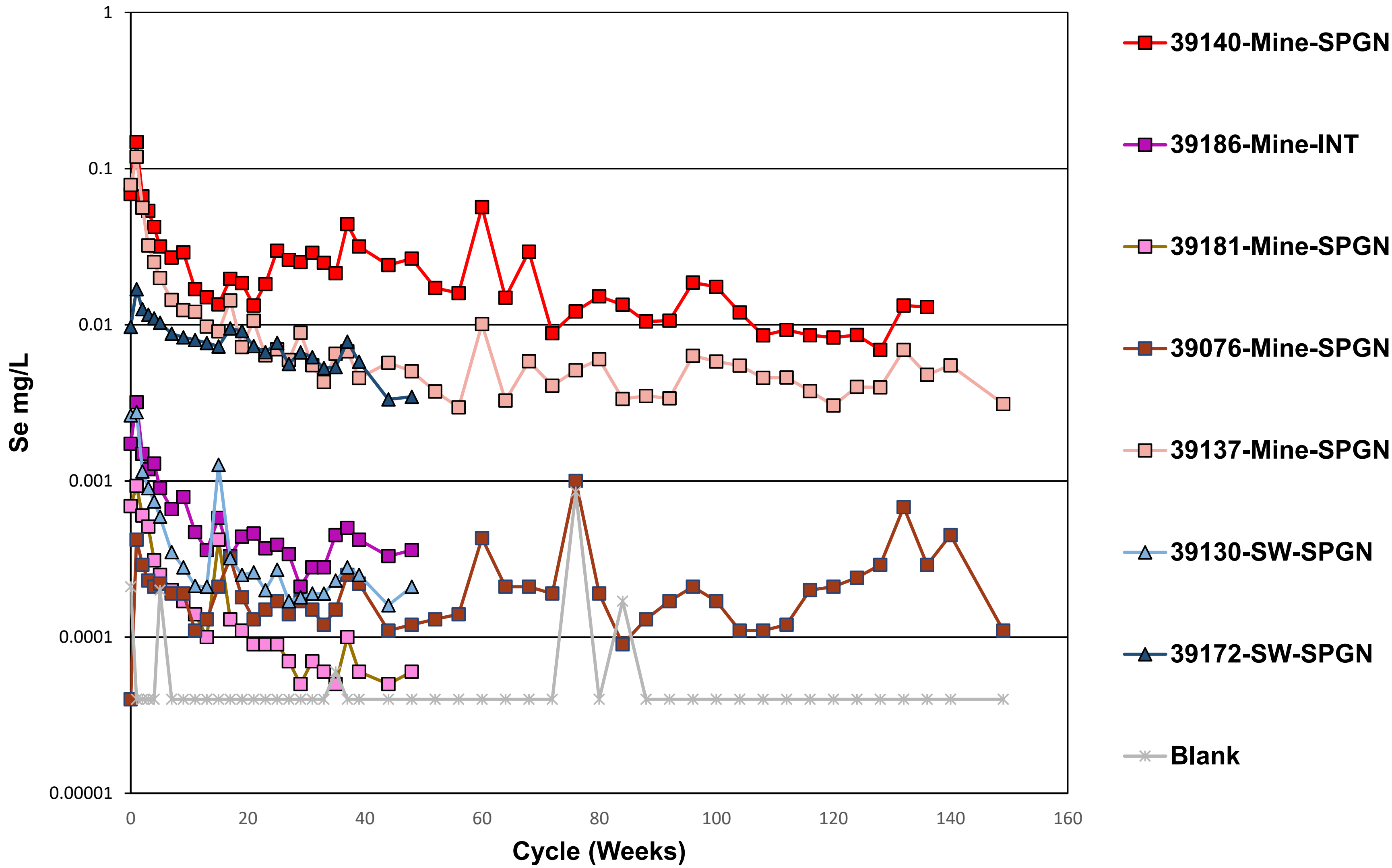

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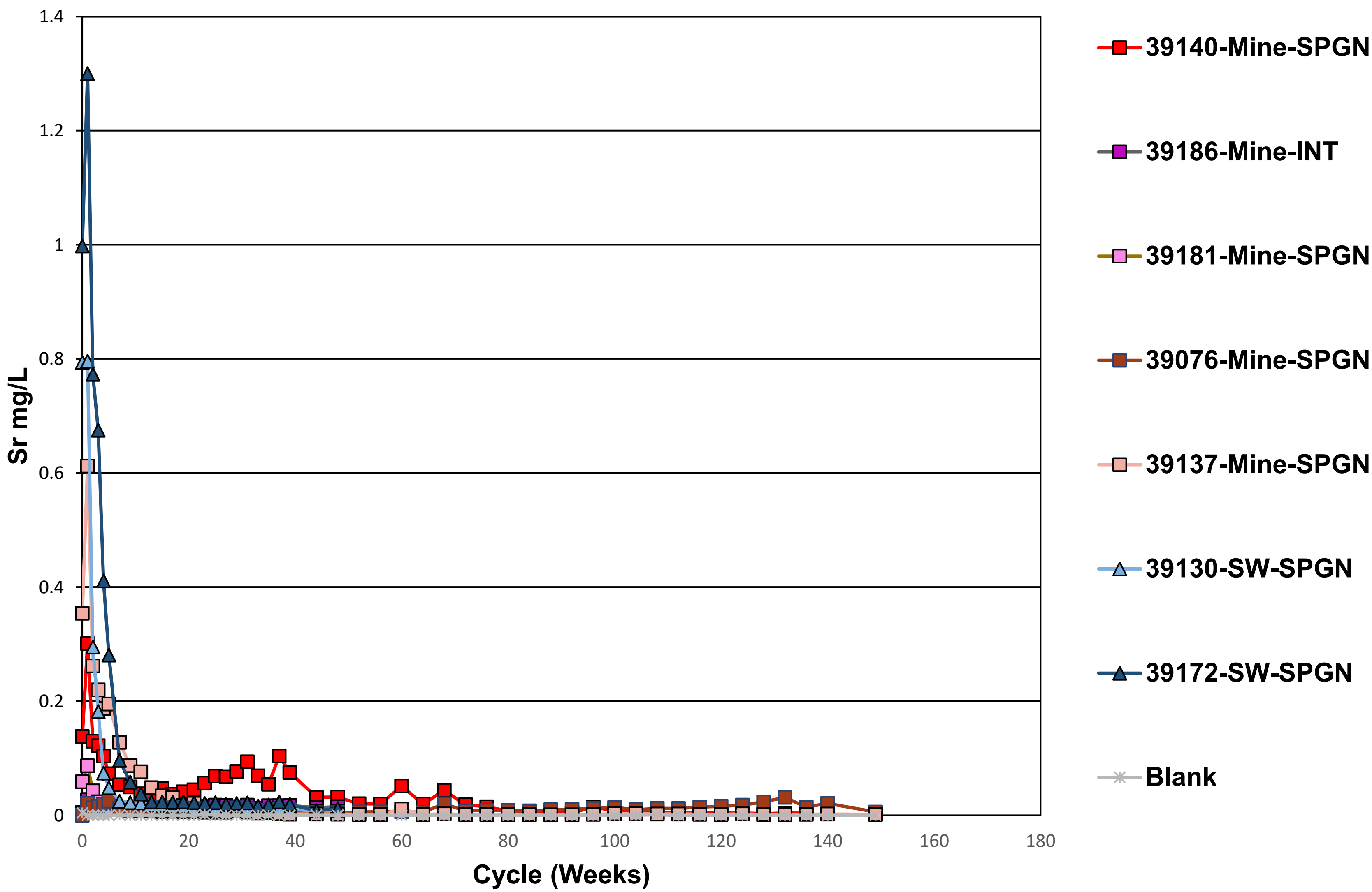

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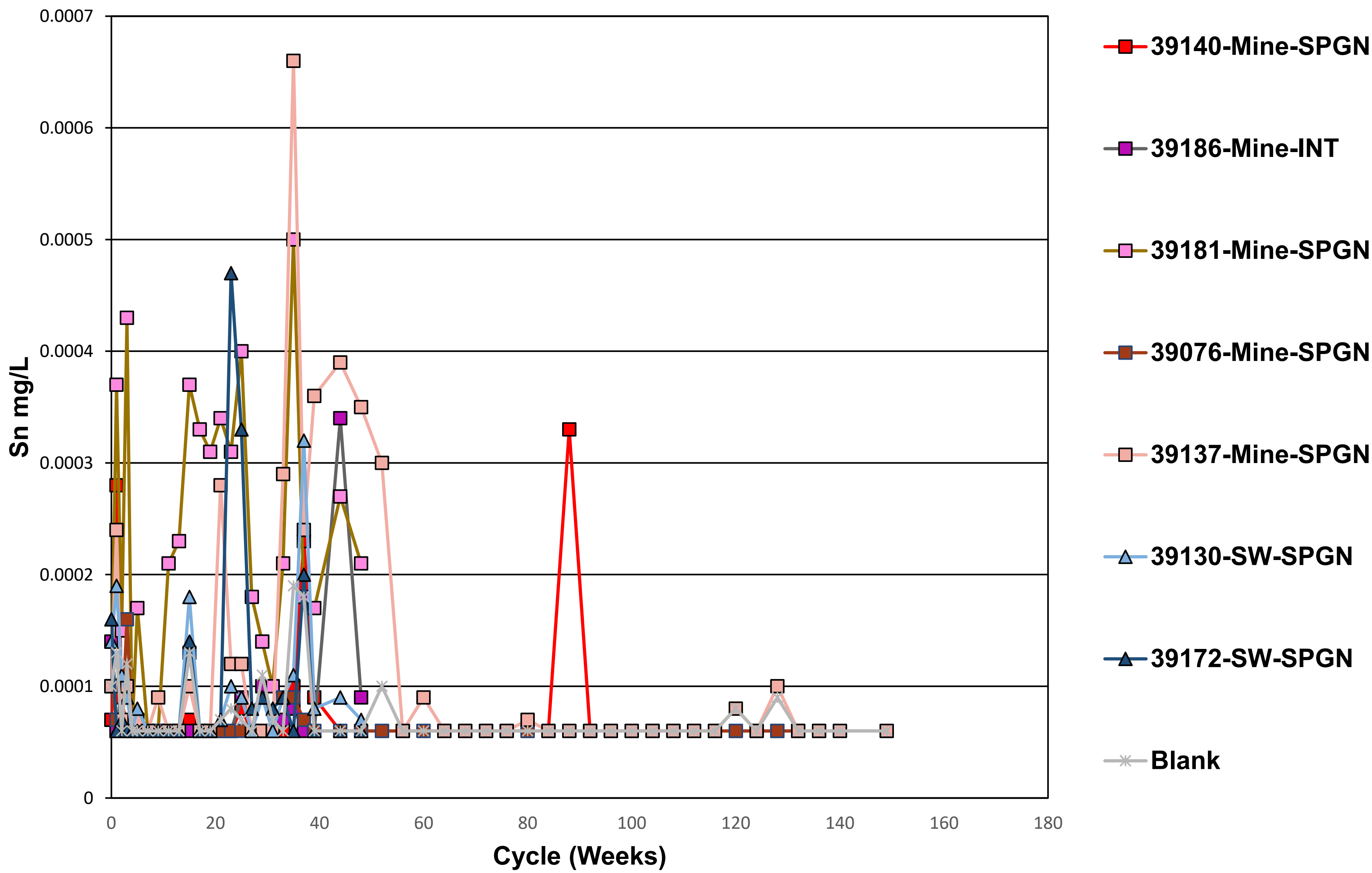

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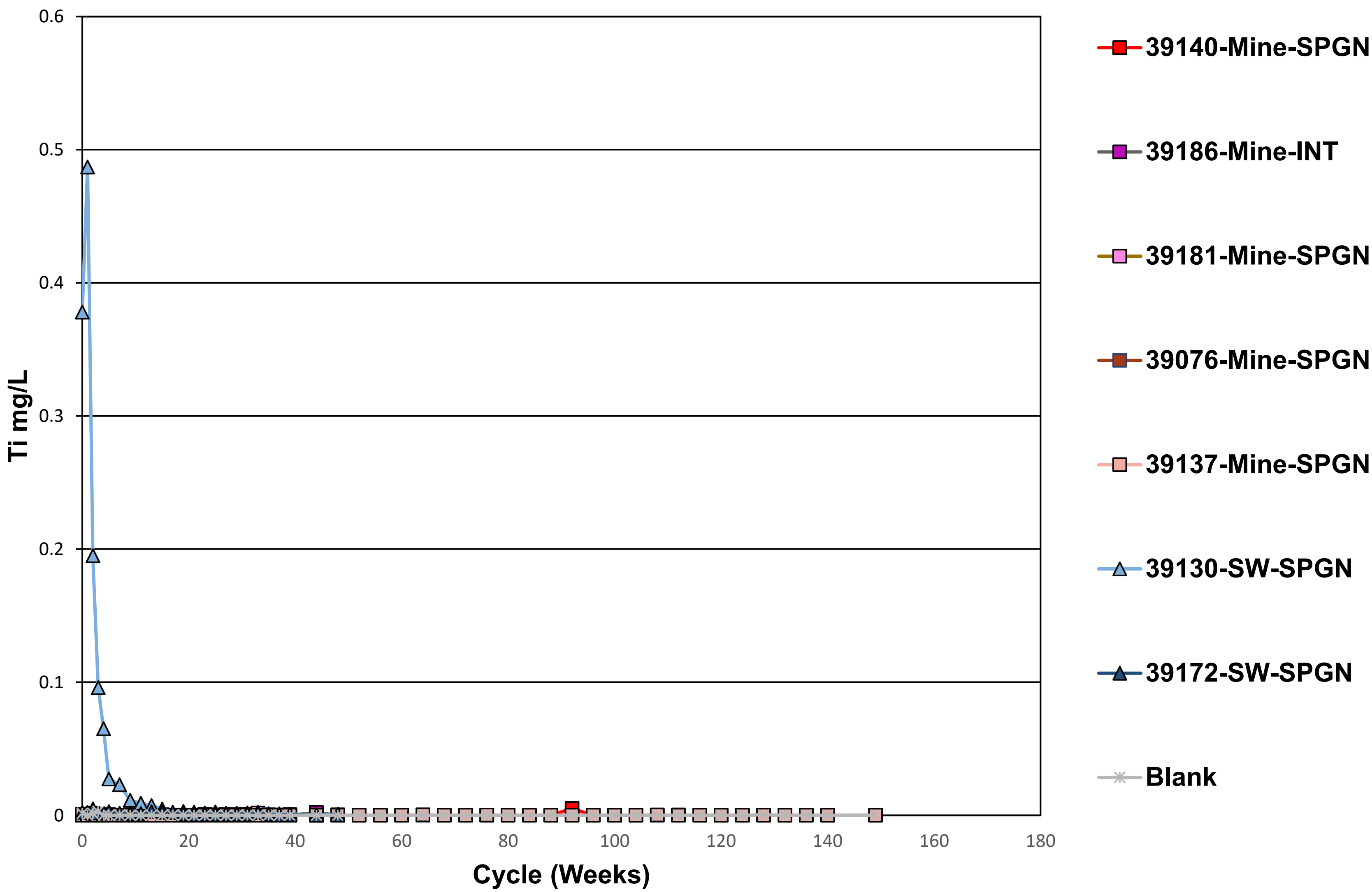

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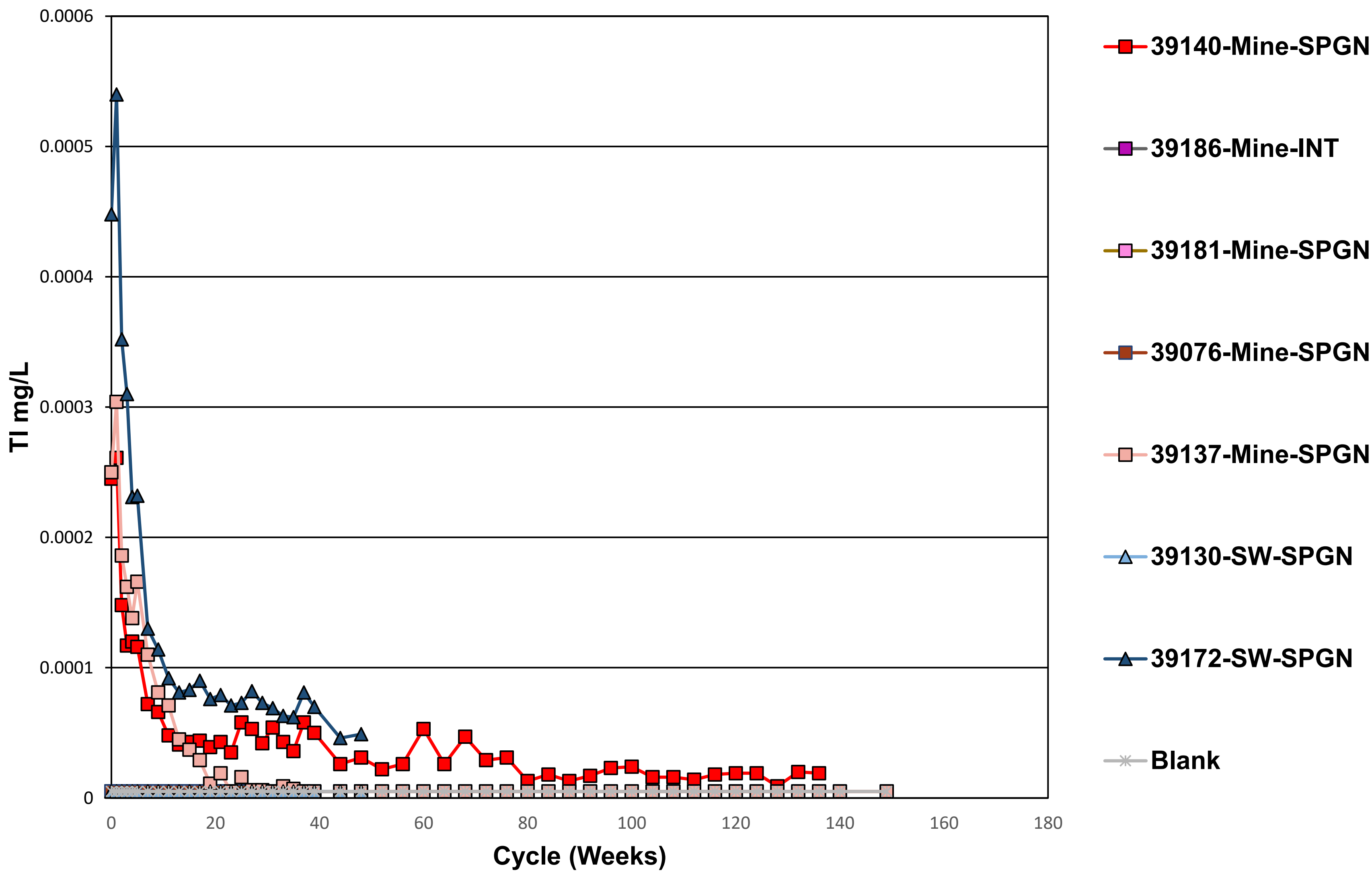

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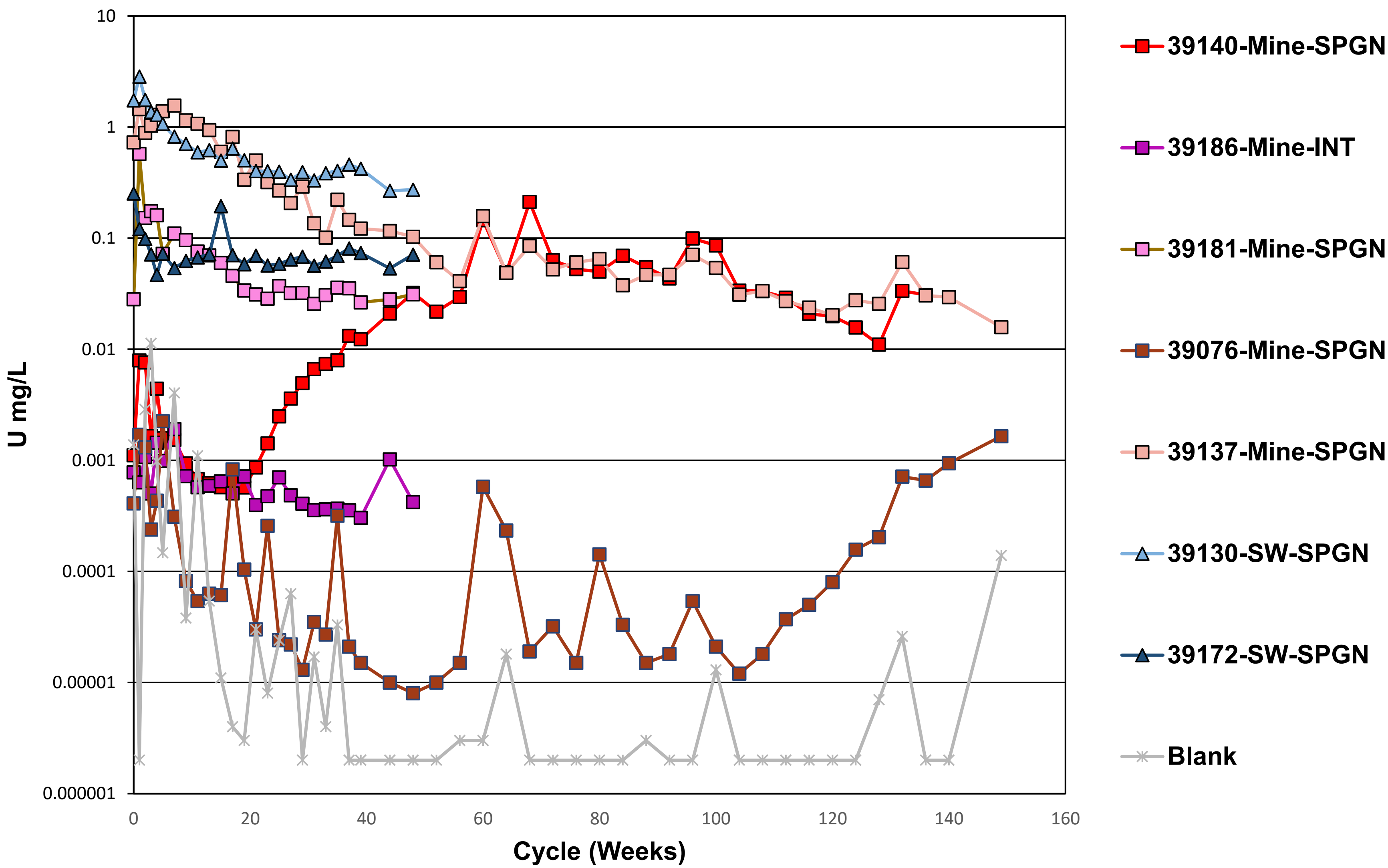

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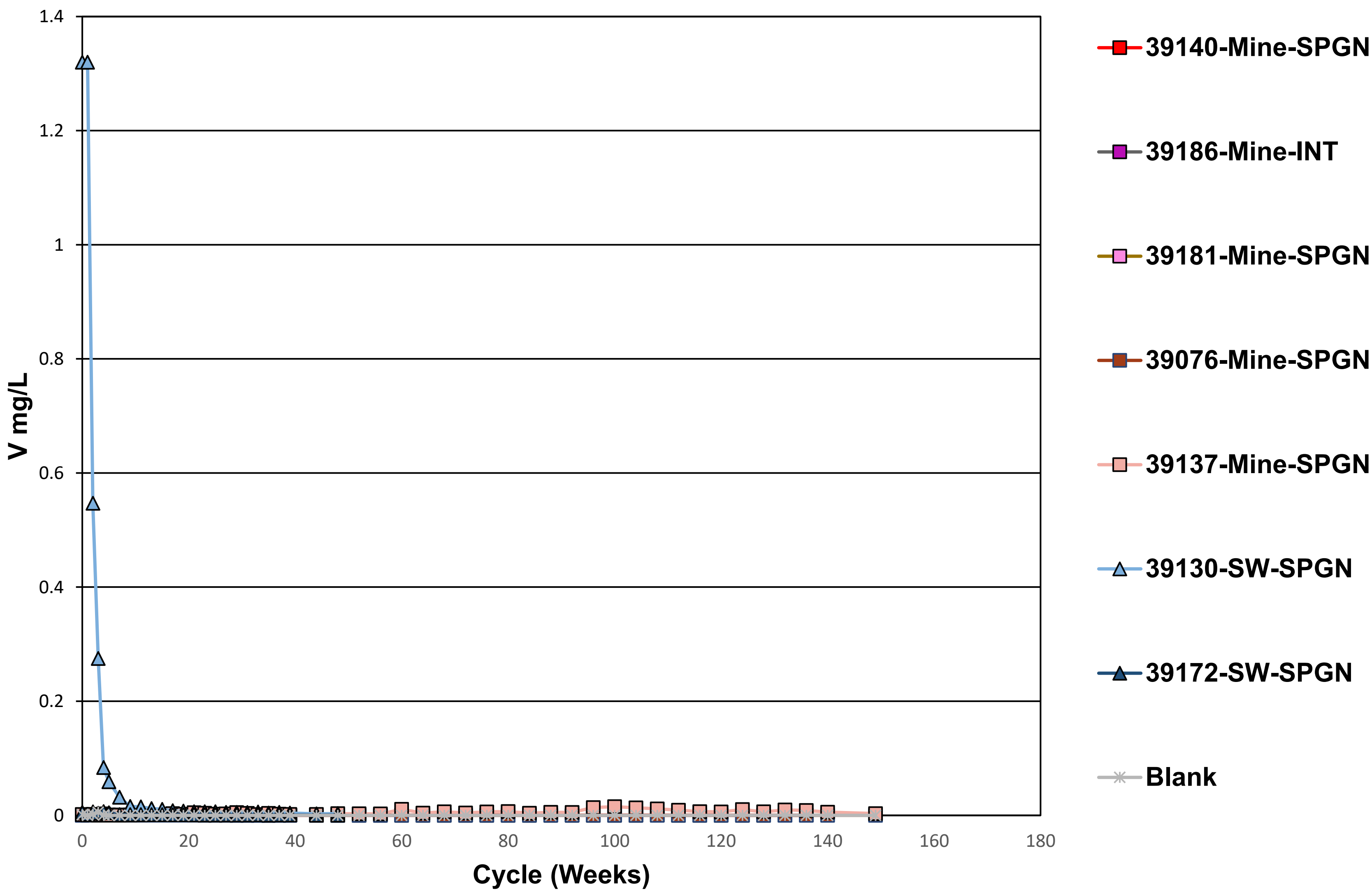

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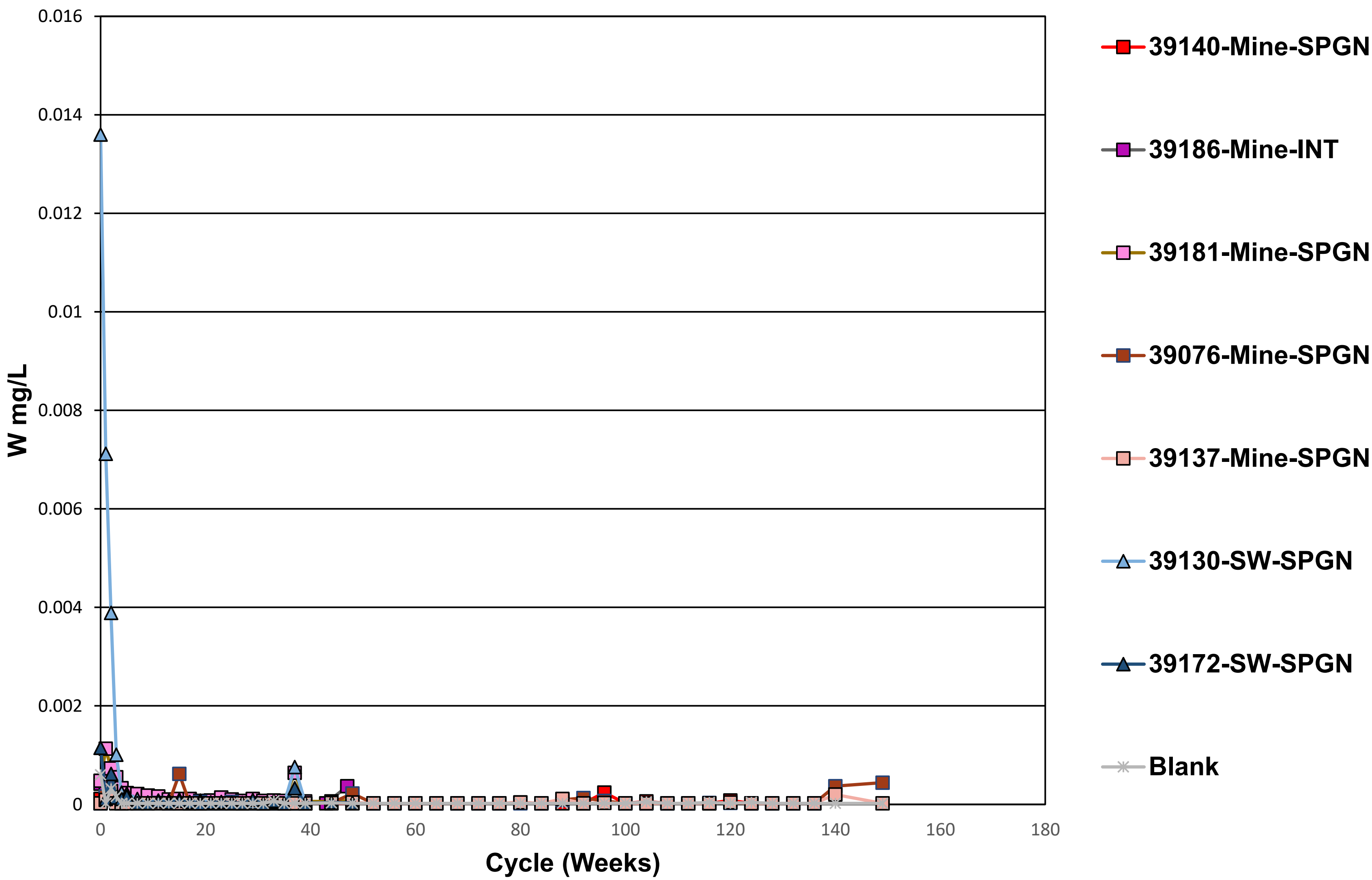

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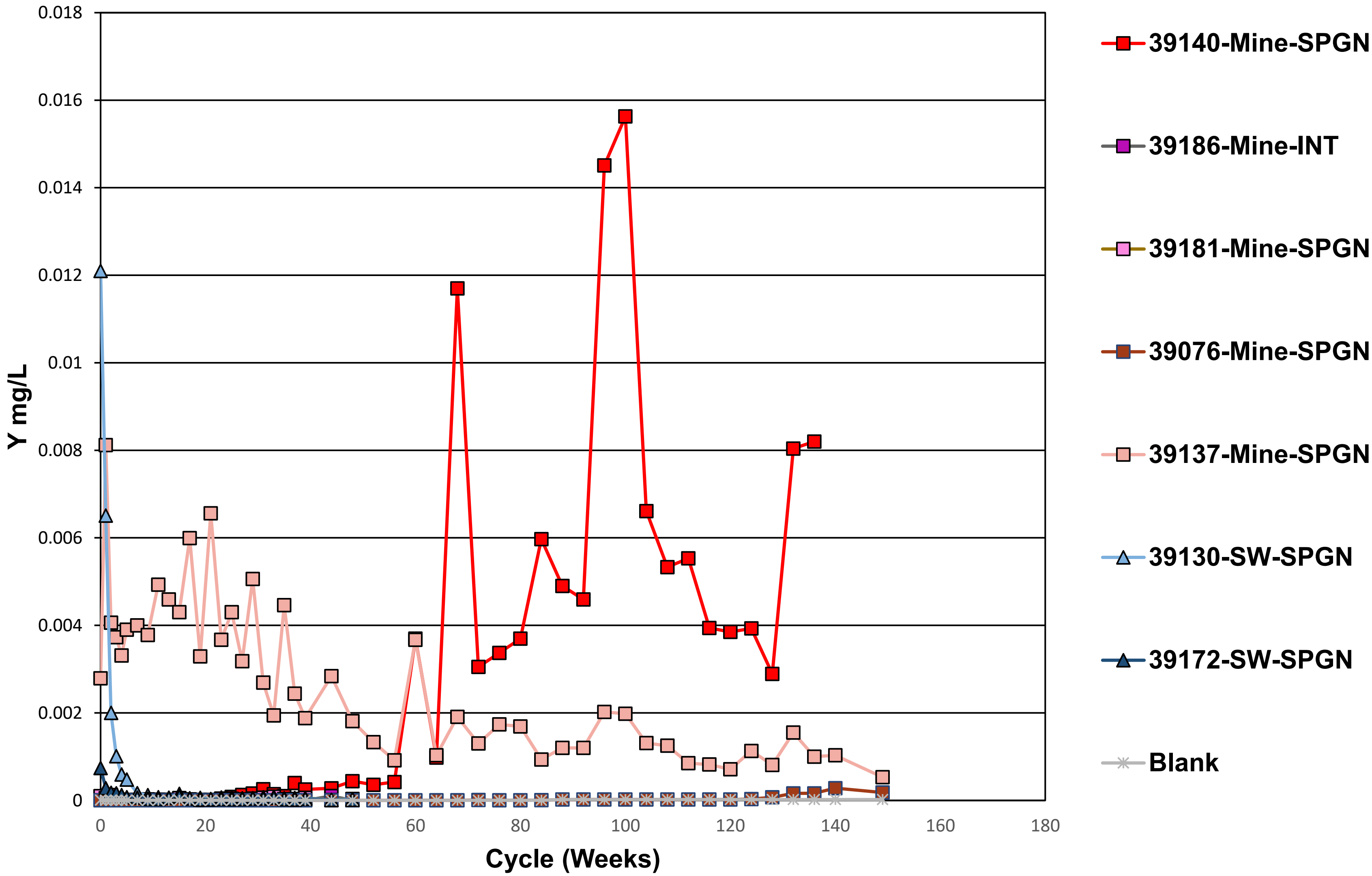

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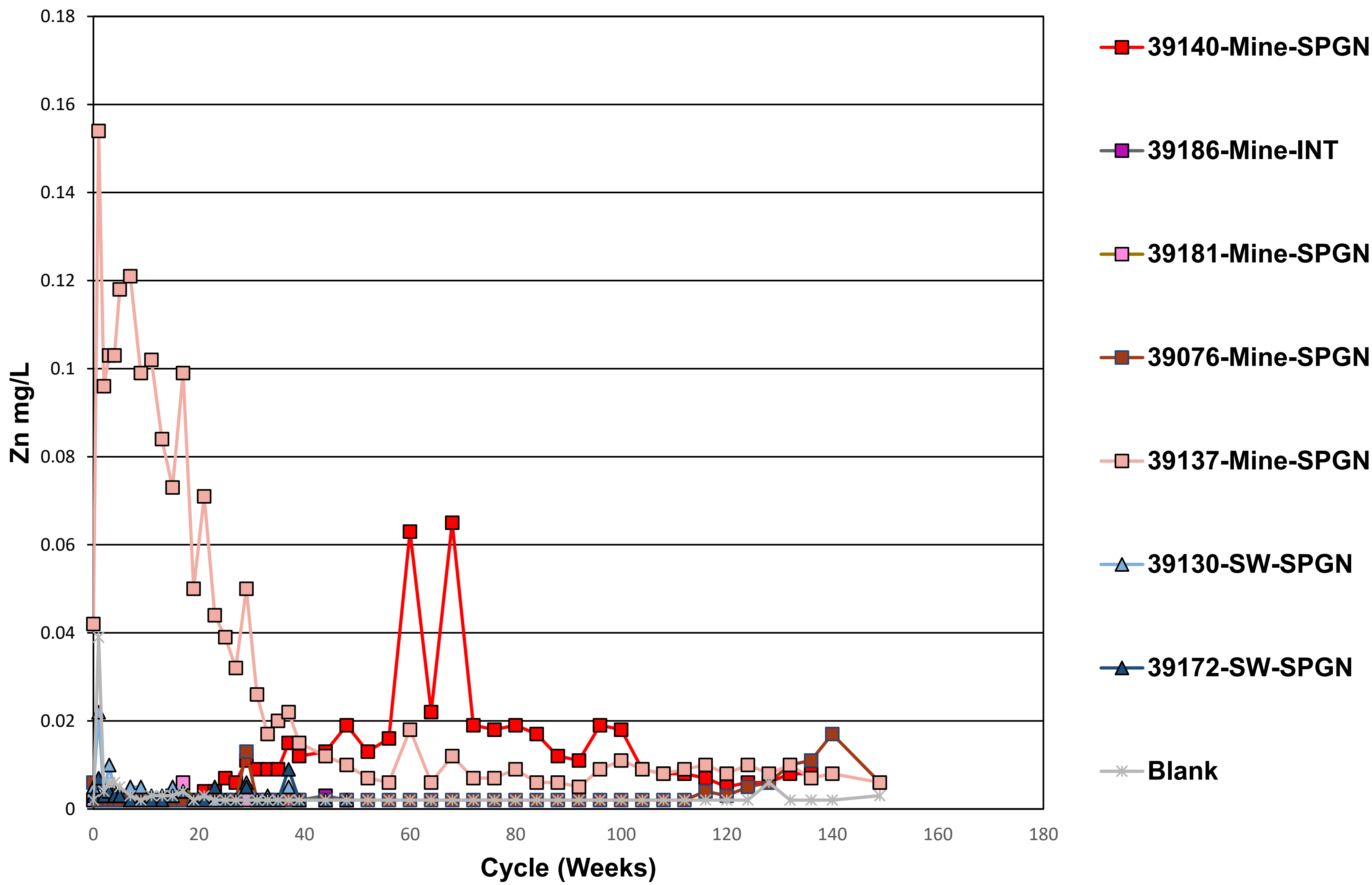

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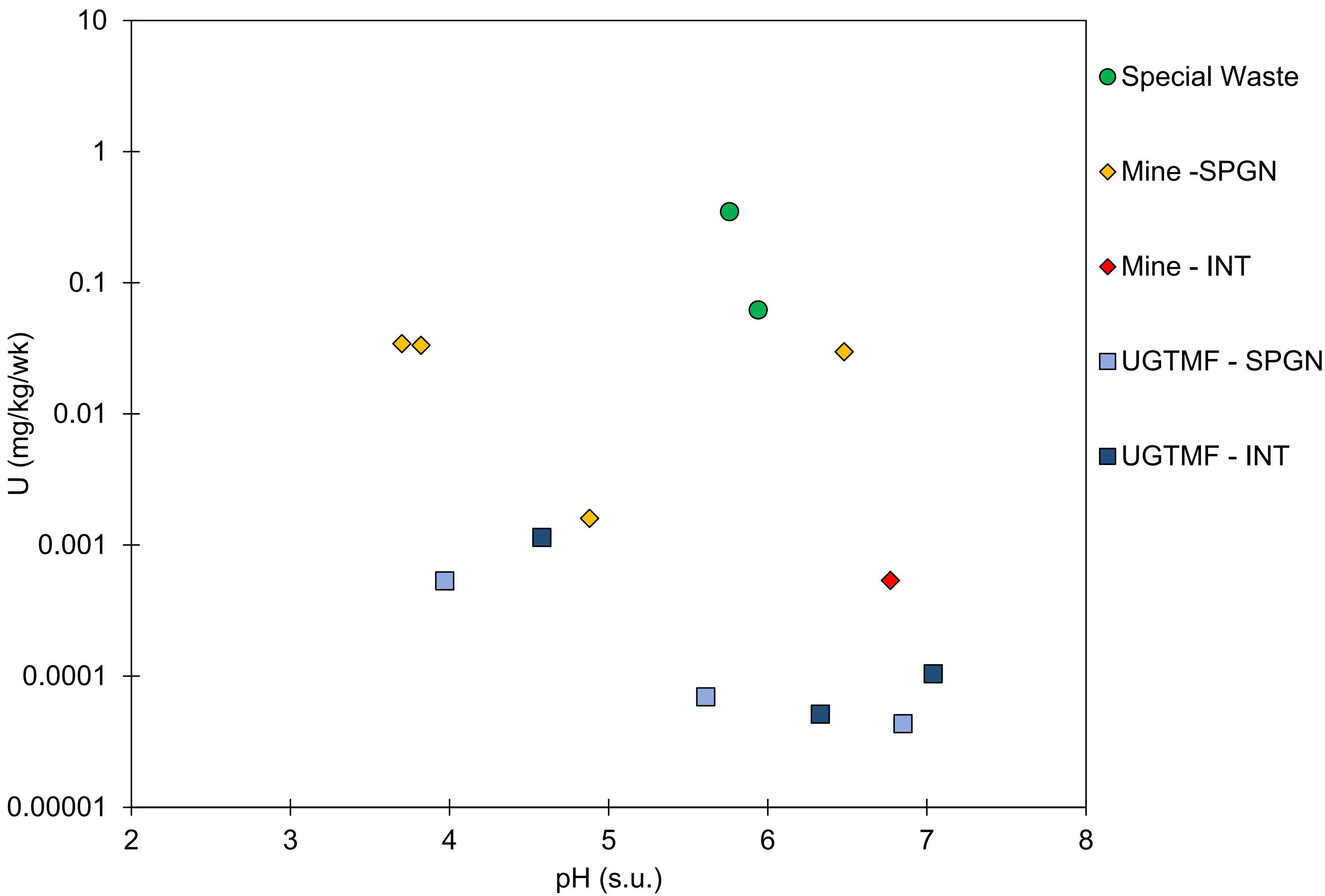
Appendix D Stable Humidity Cell Test Rates versus pH, Sulfate and Solid-Phase Content



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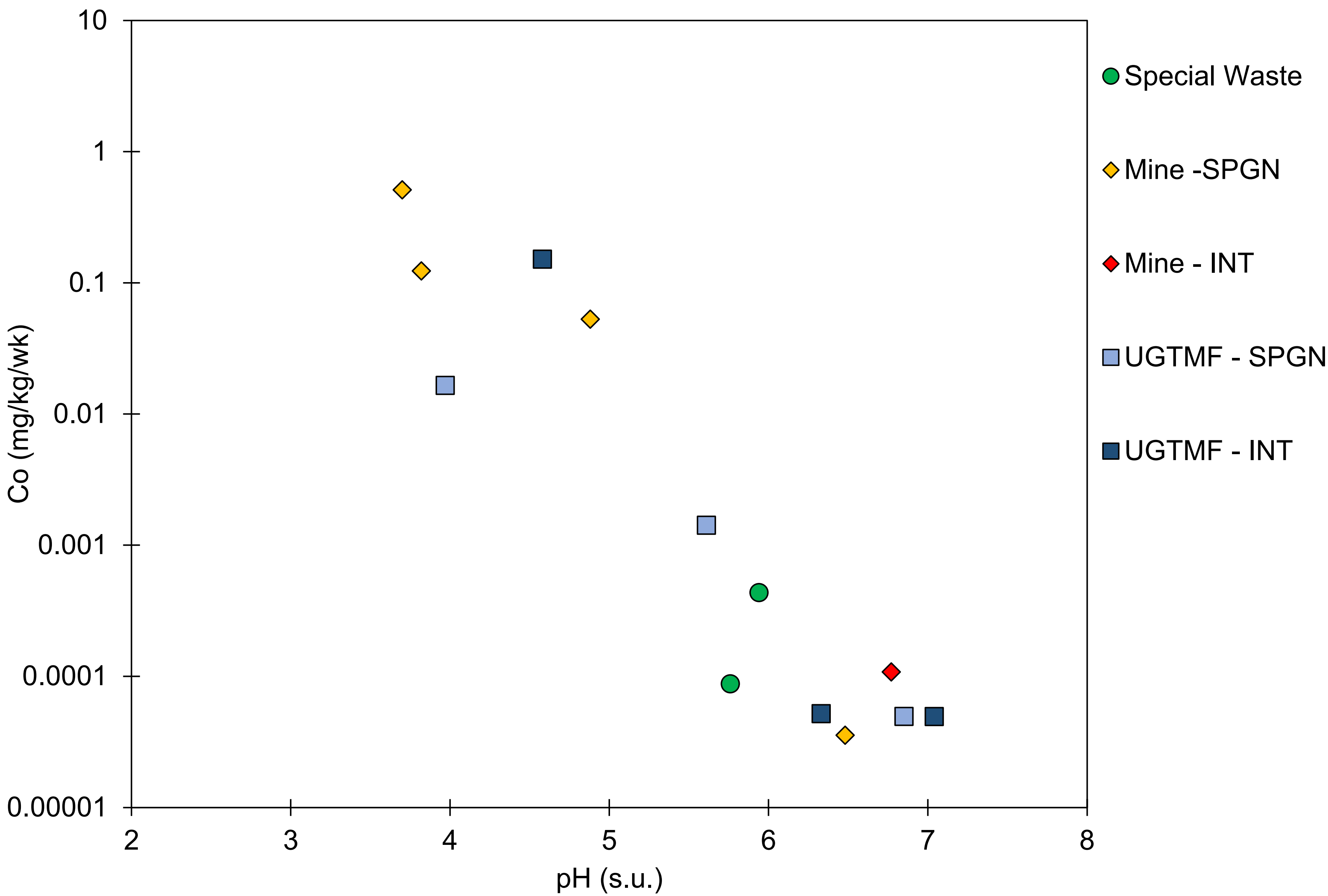

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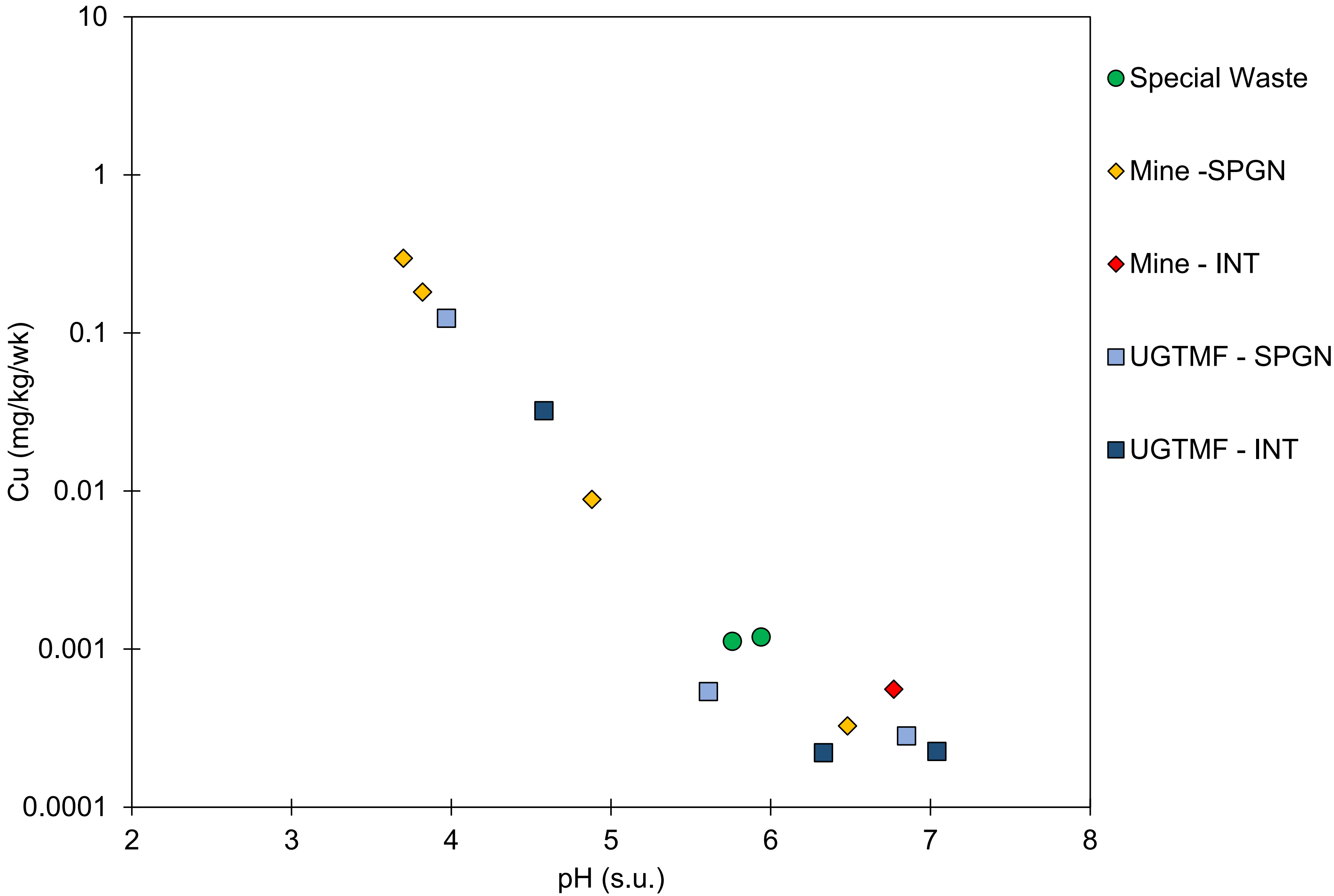

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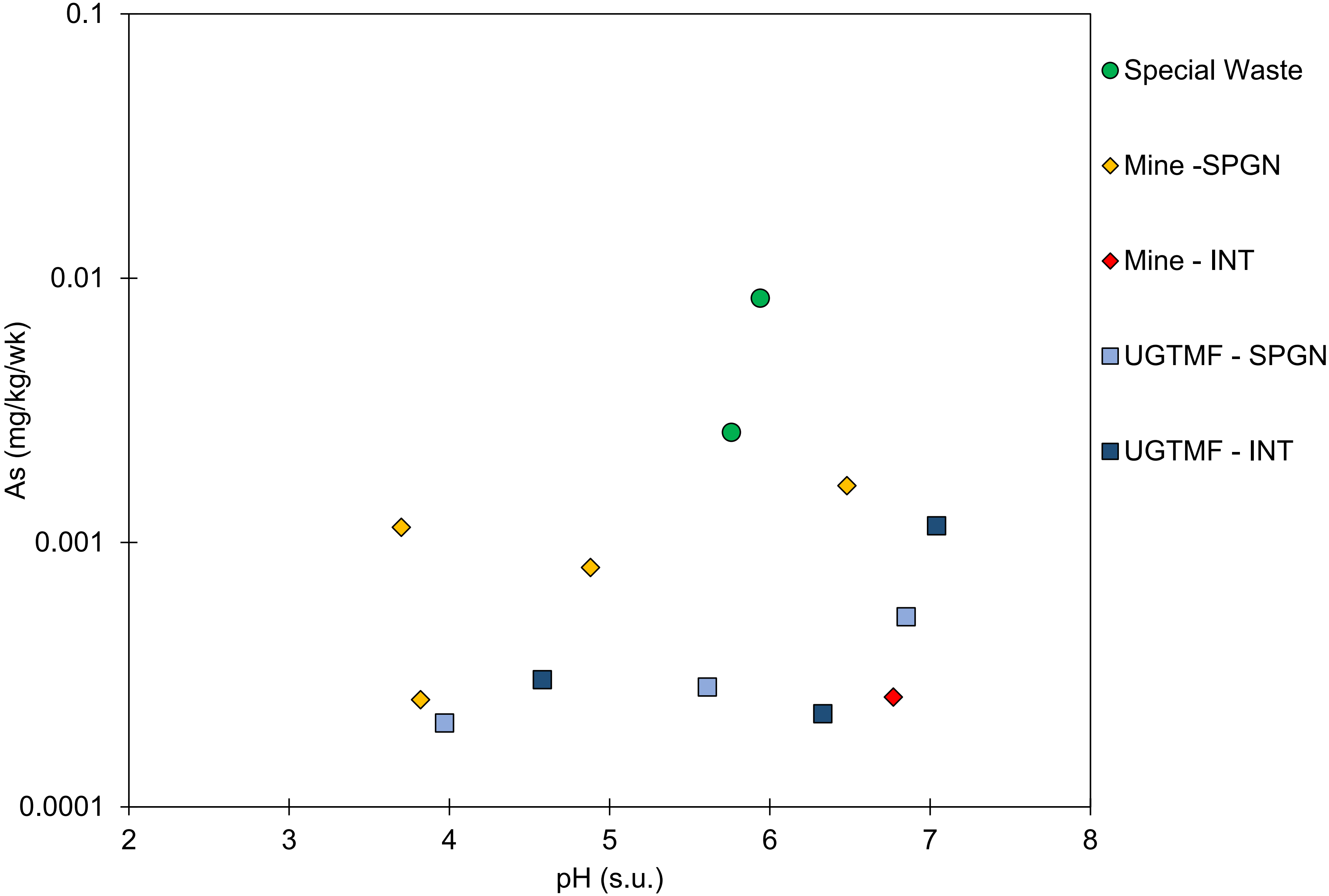

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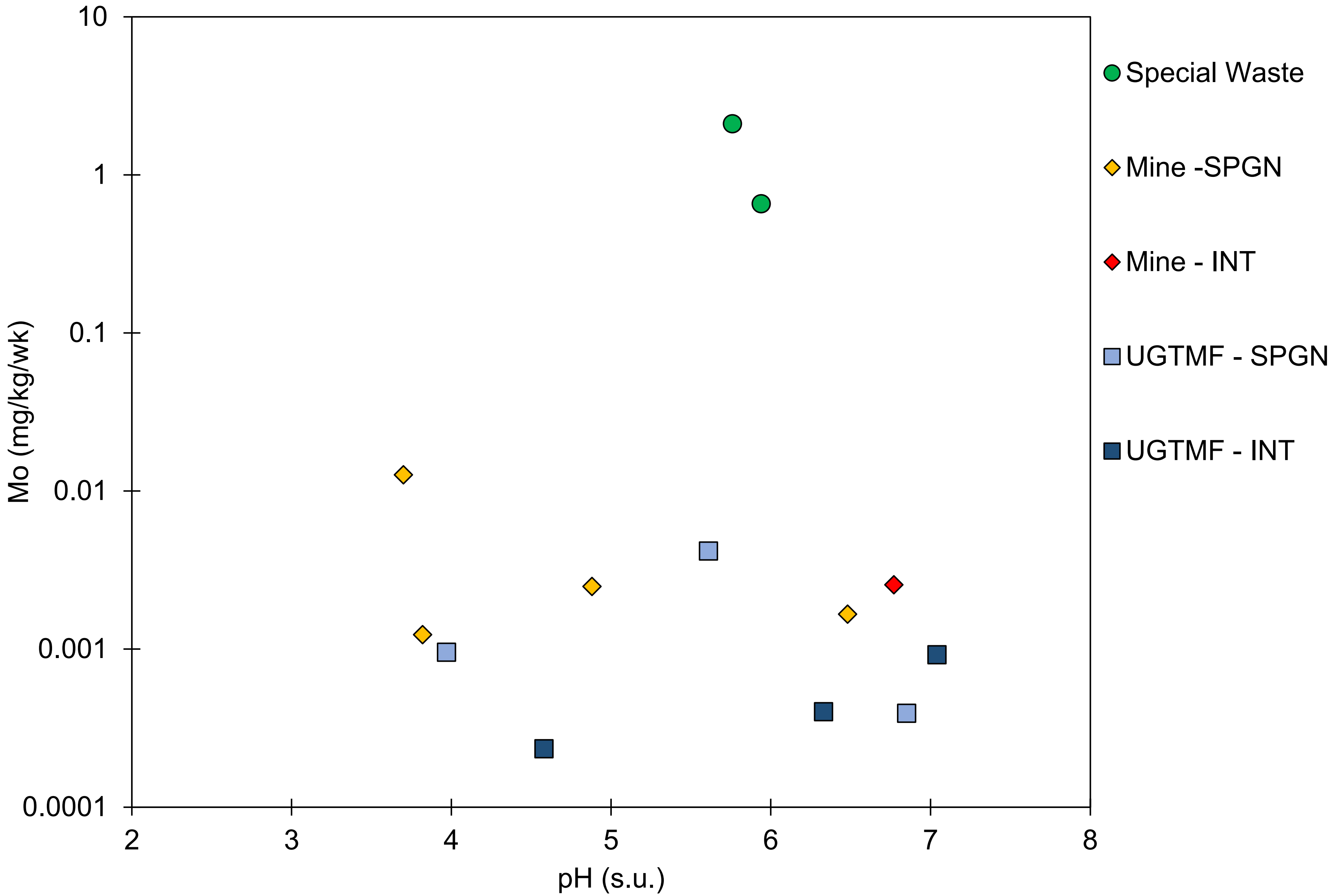

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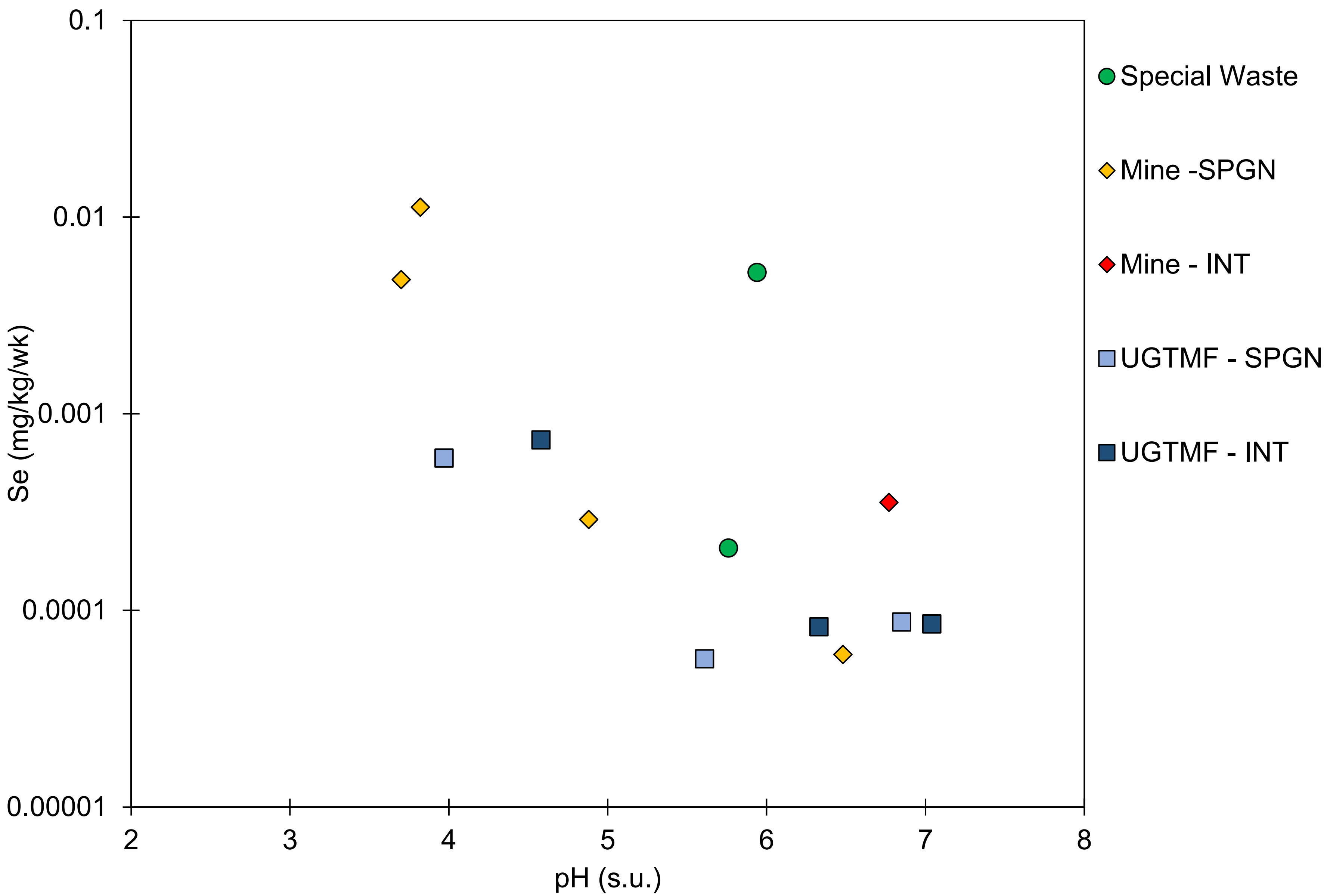

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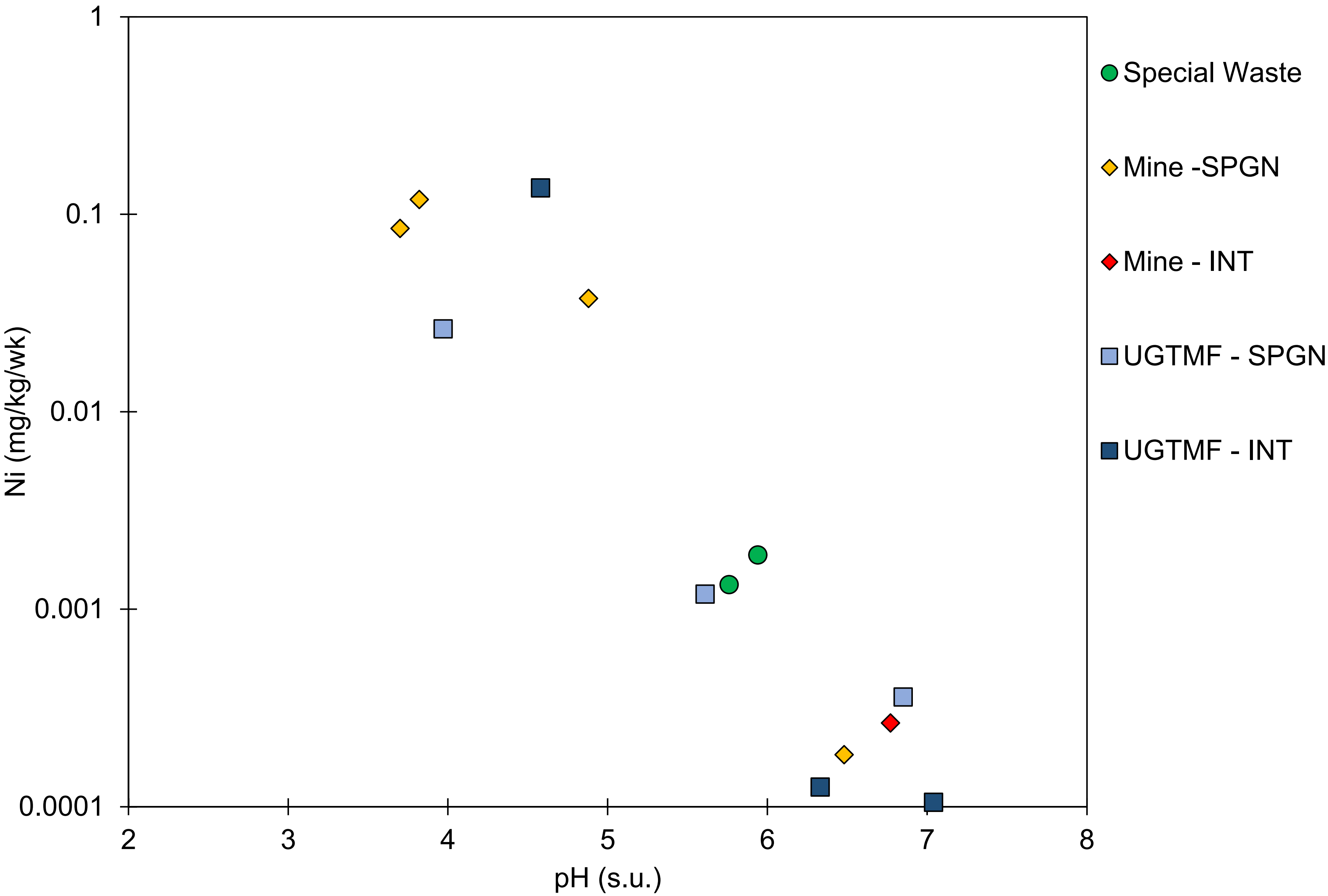

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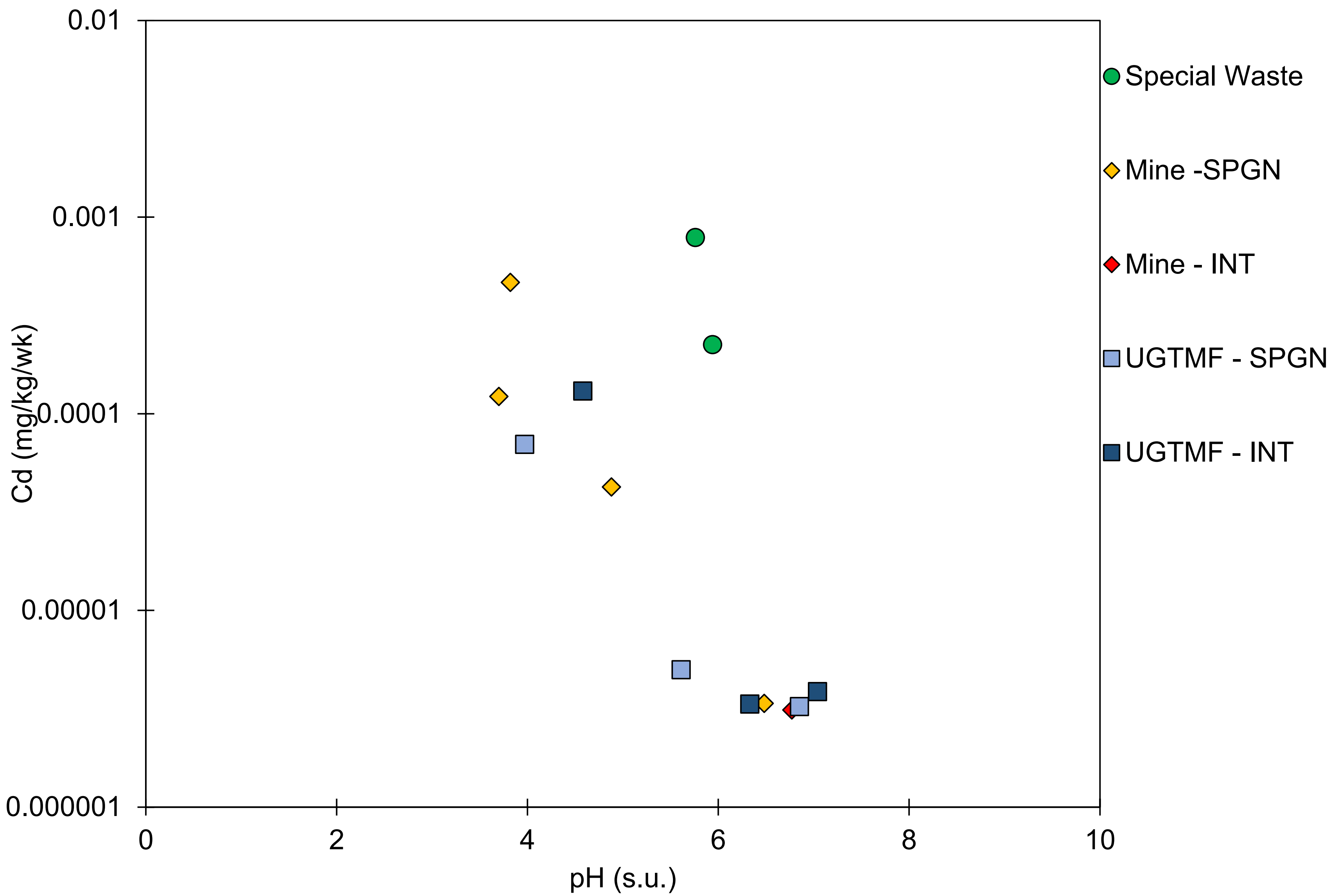

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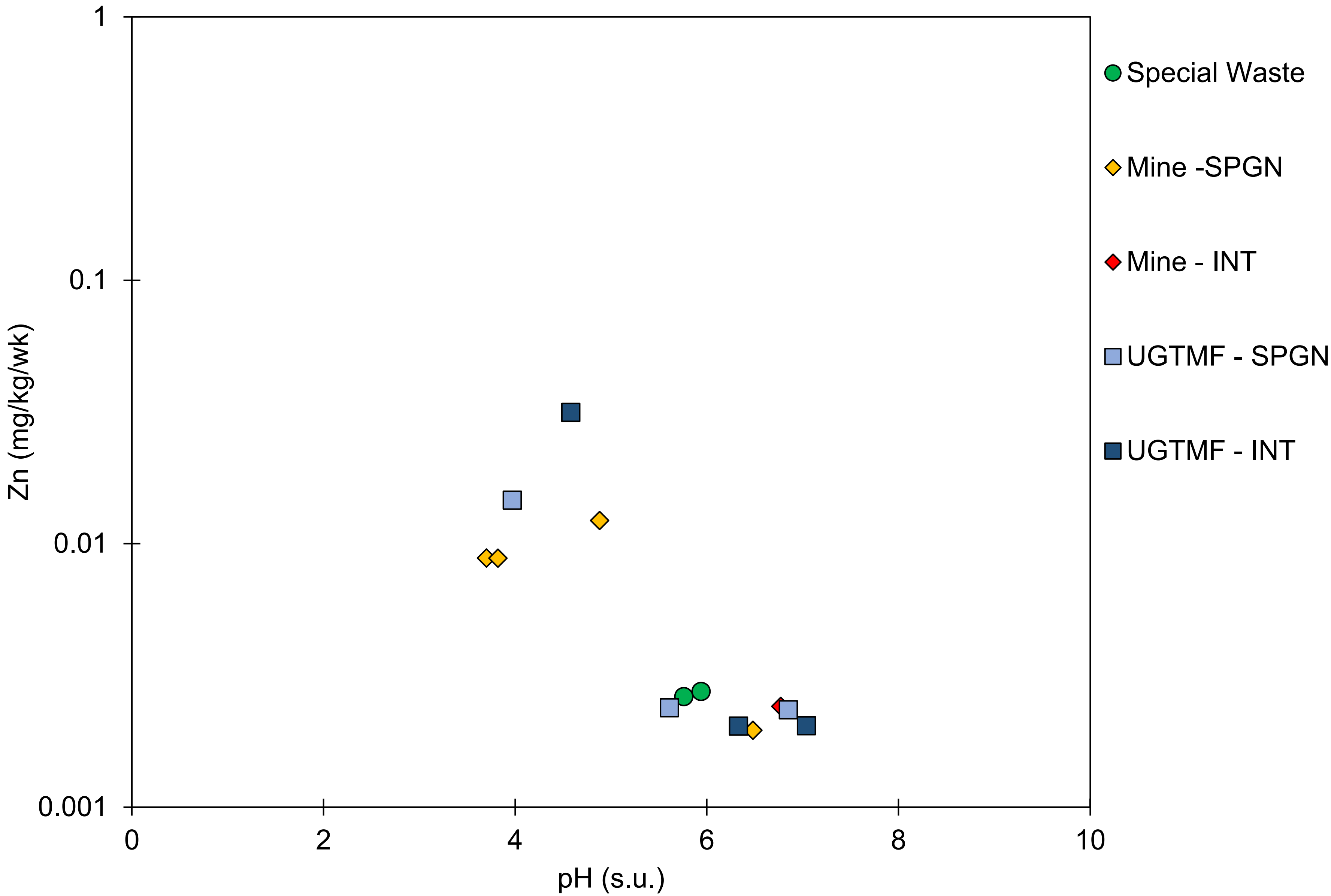

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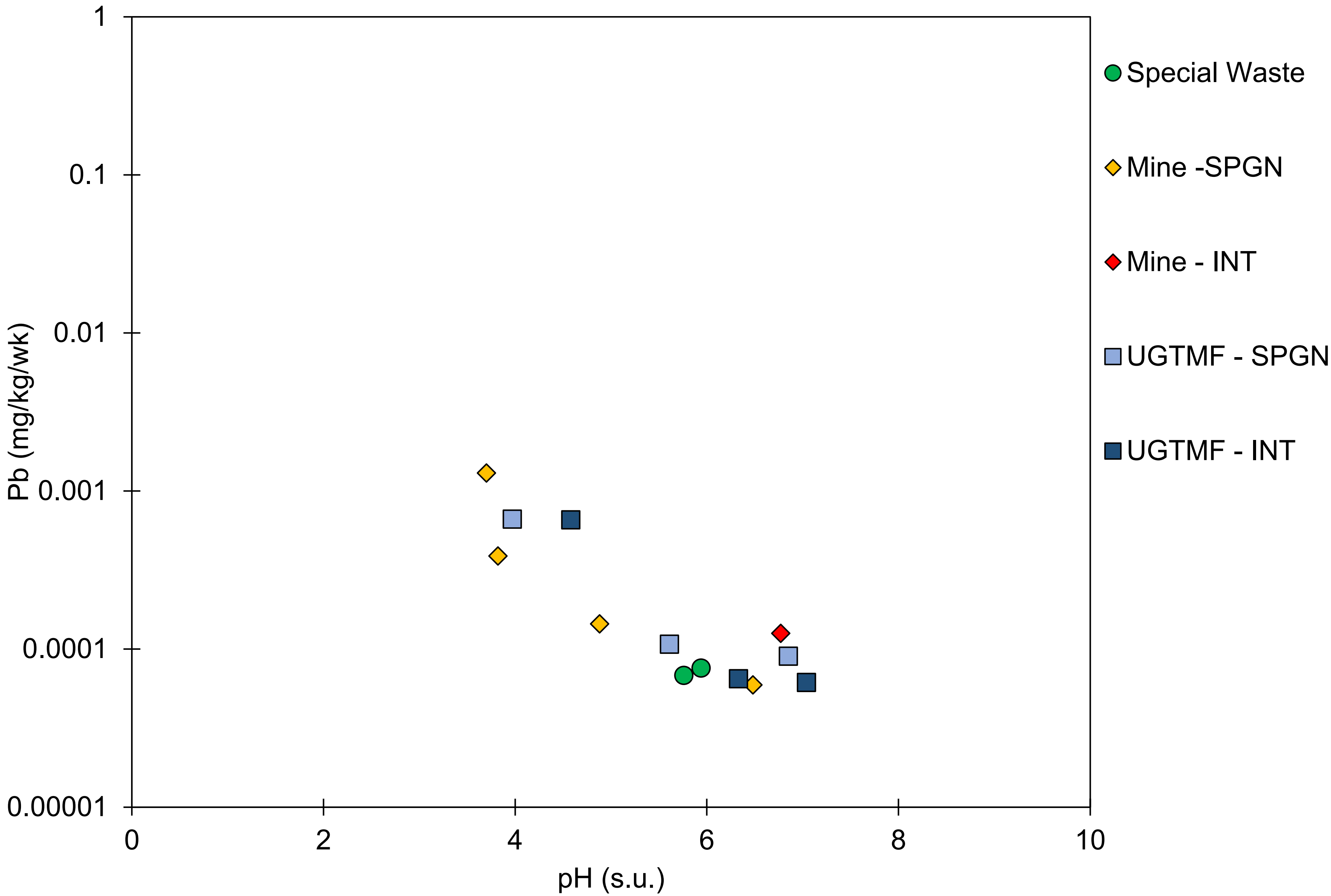

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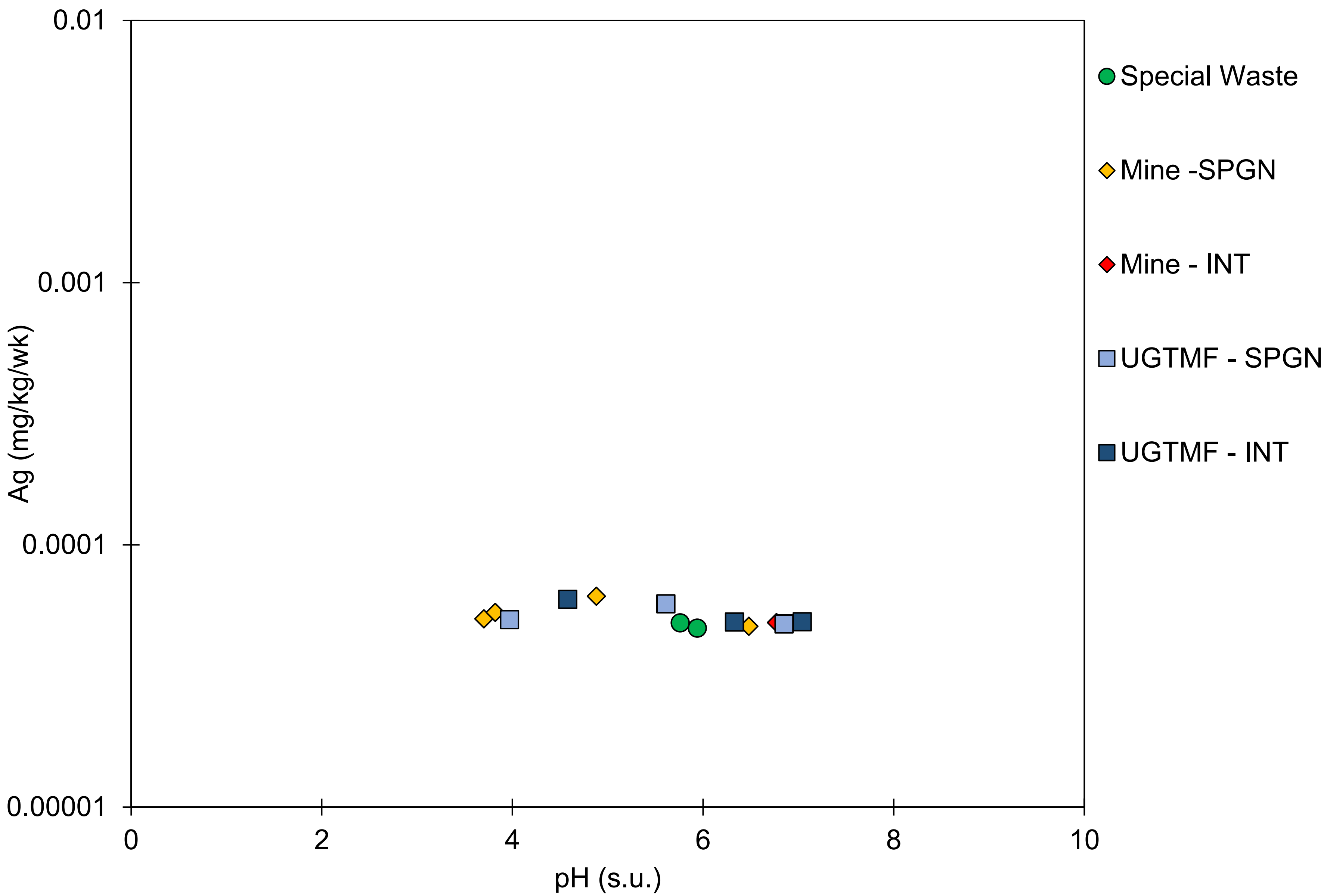

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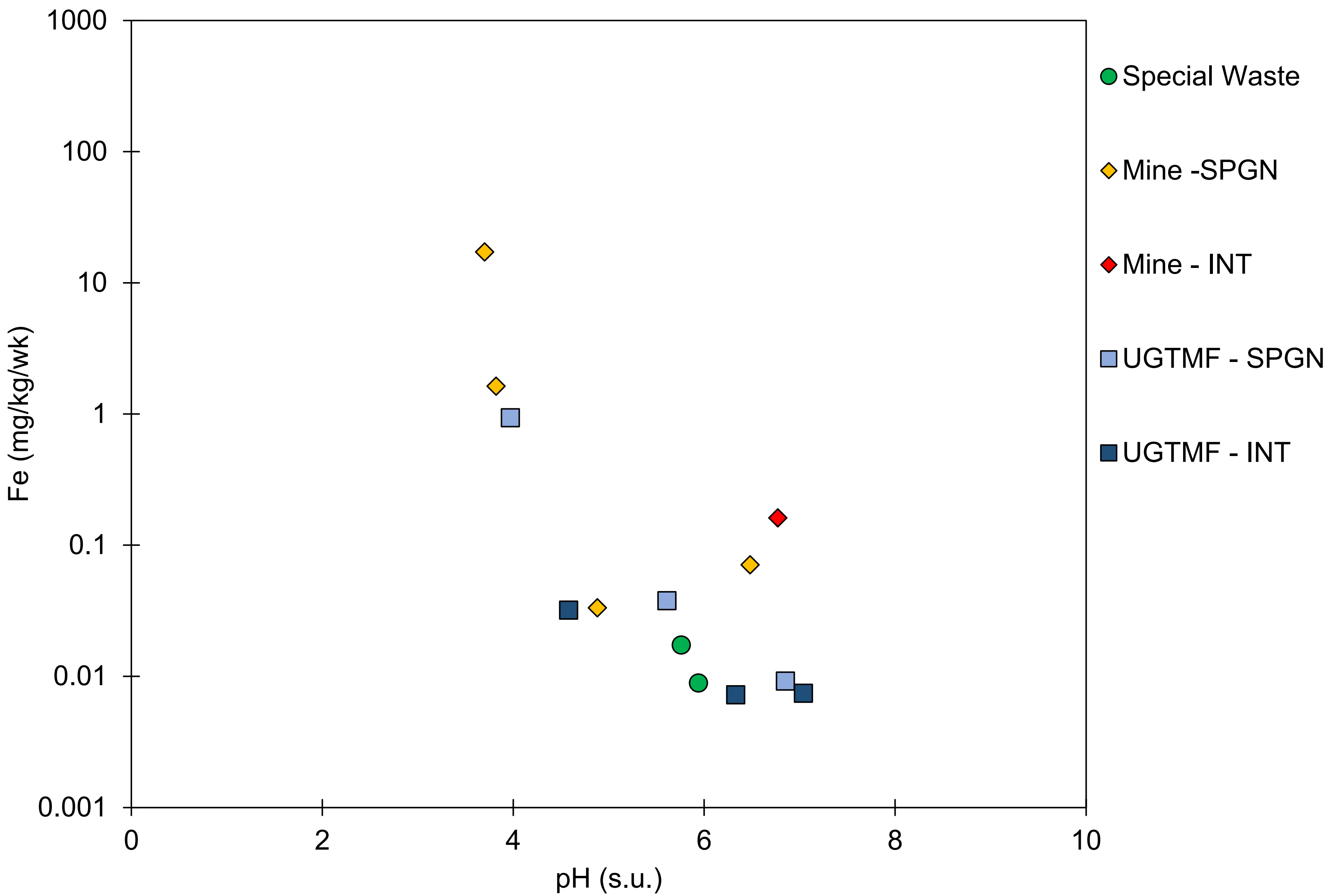

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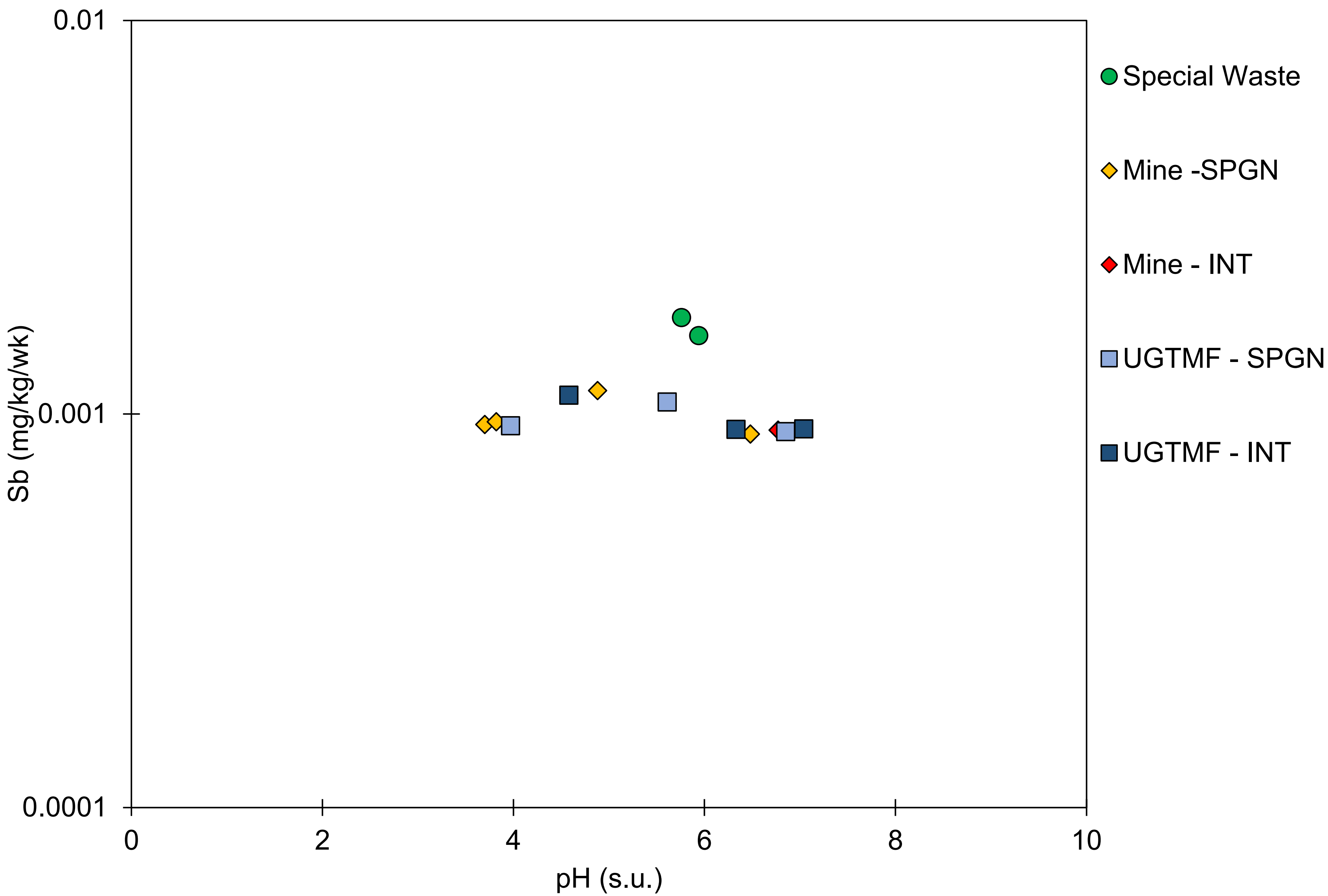

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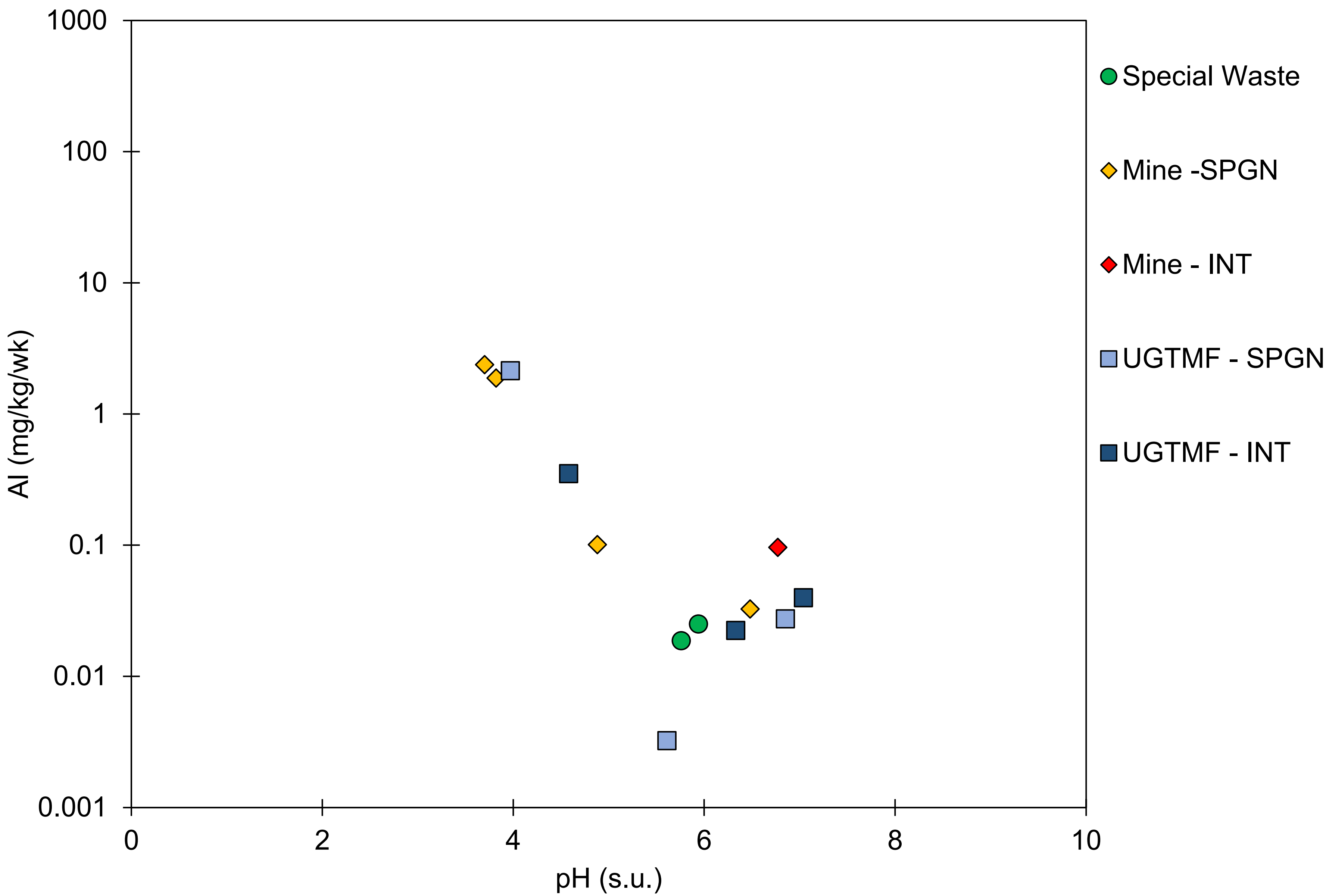

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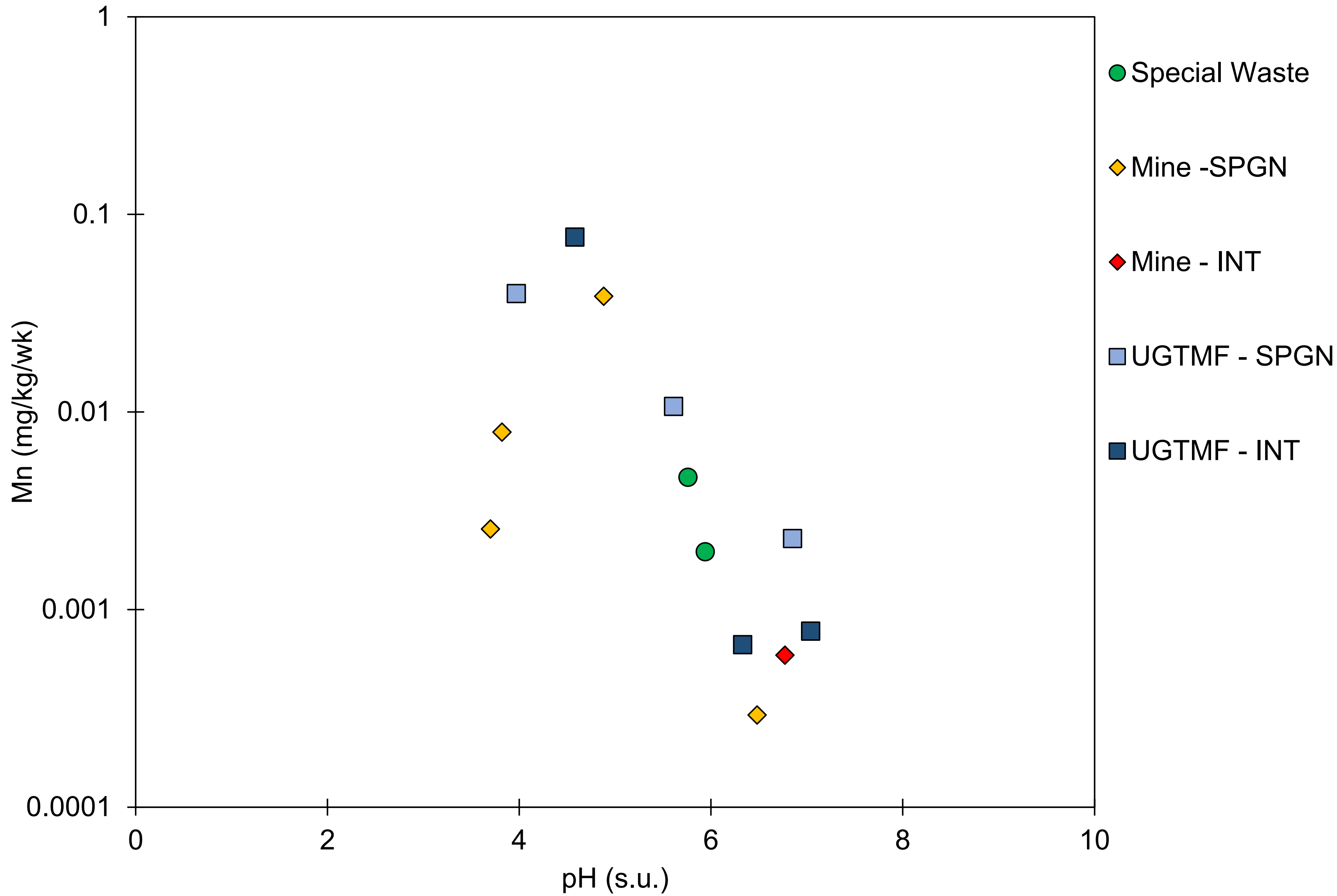

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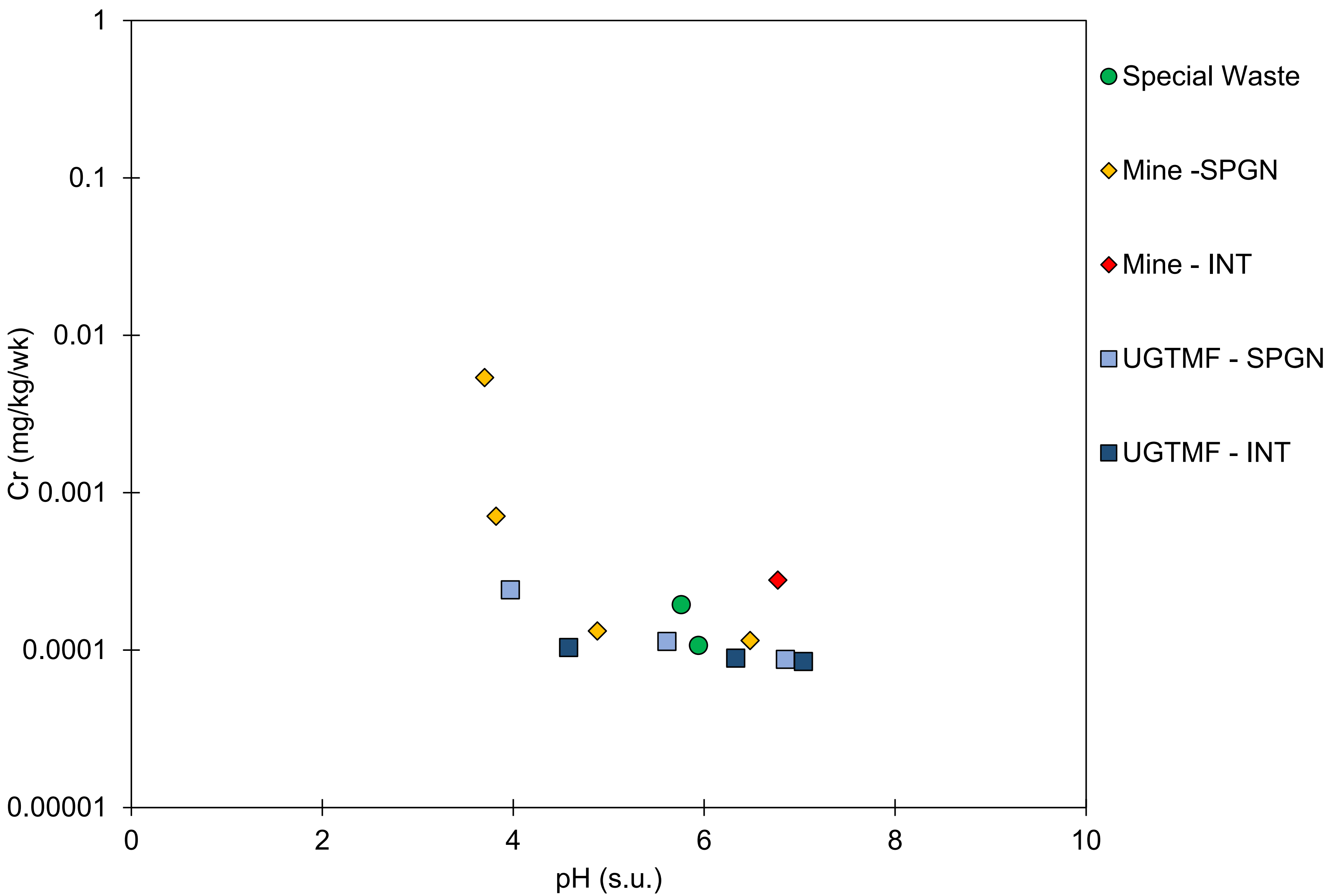

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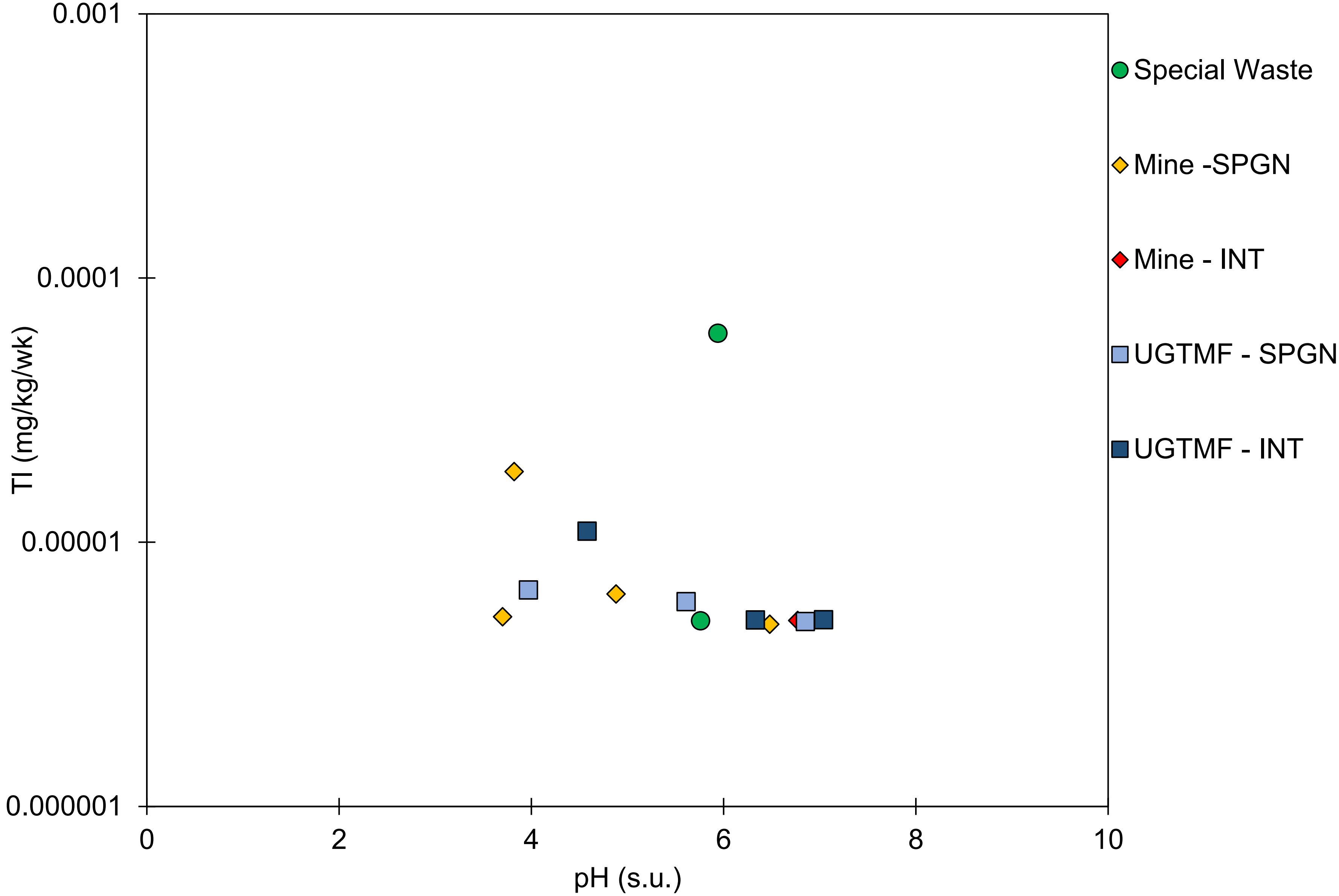

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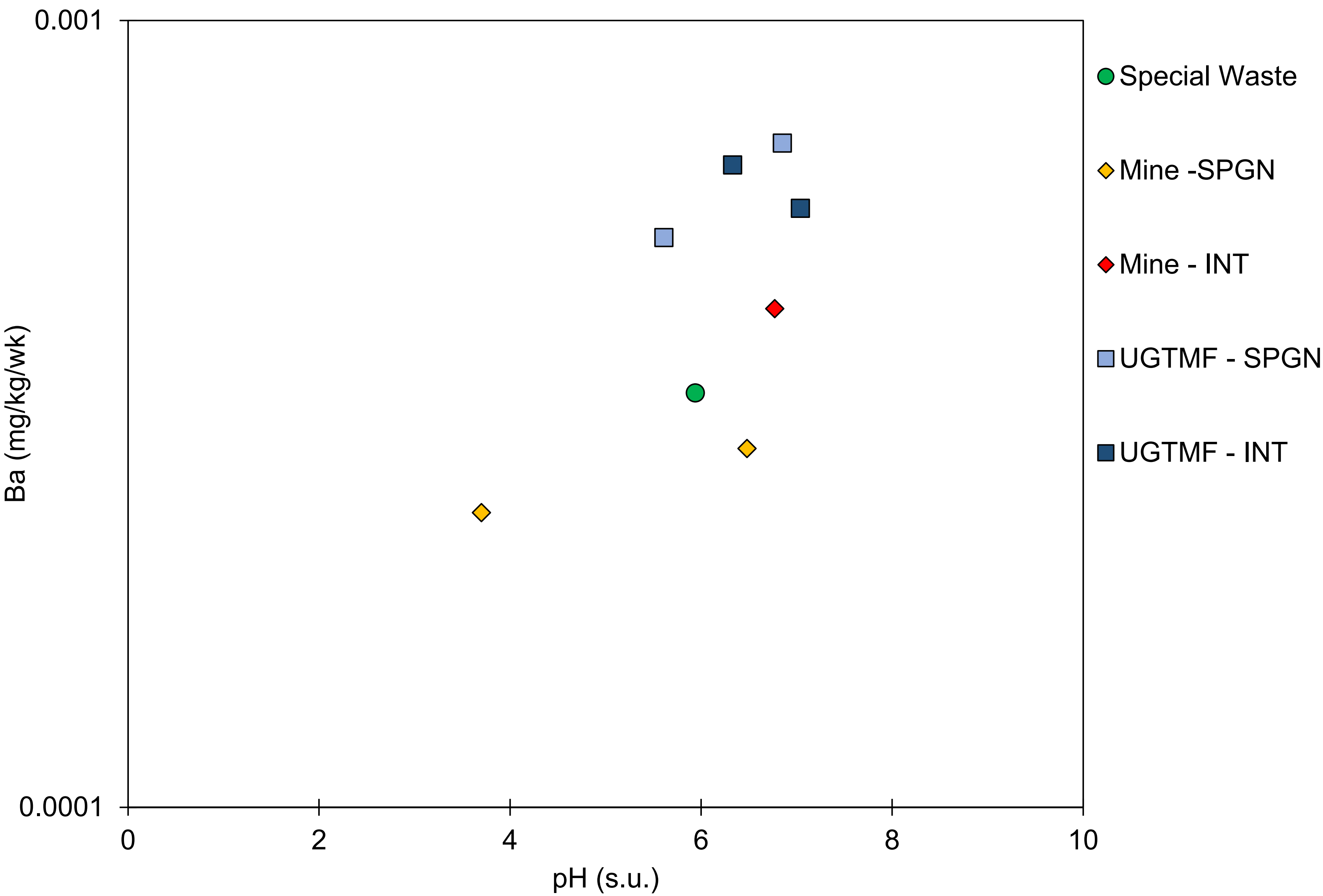

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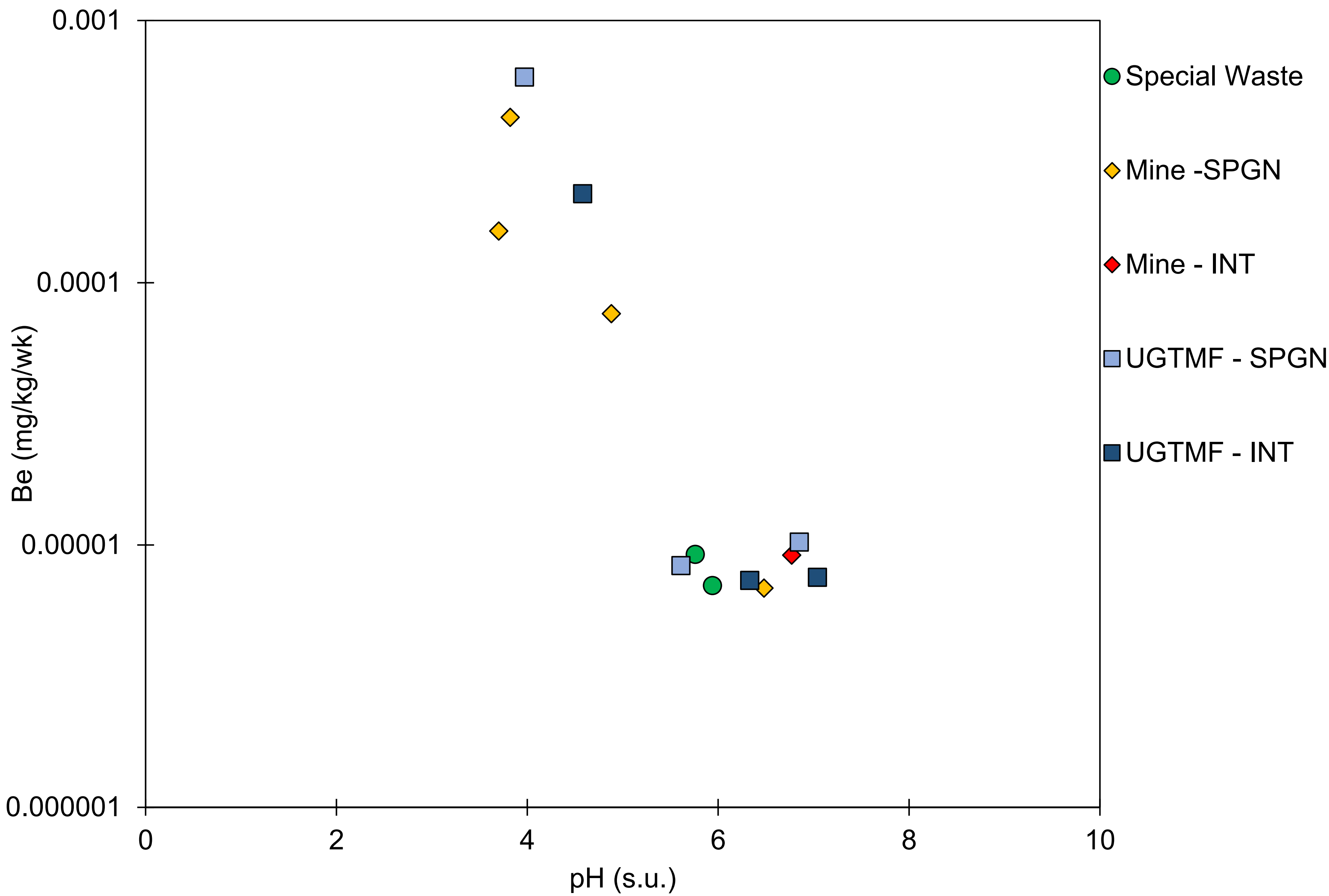

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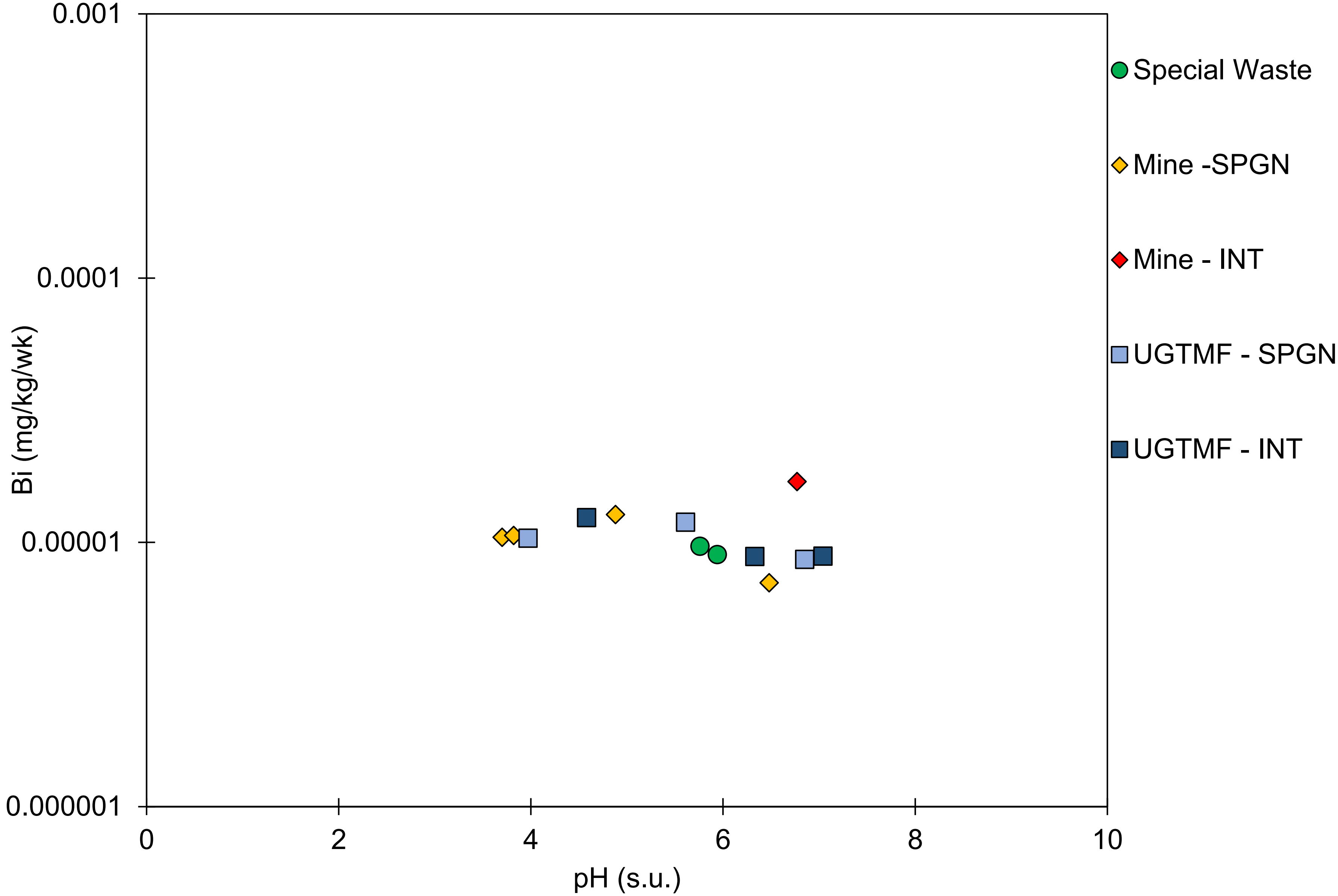

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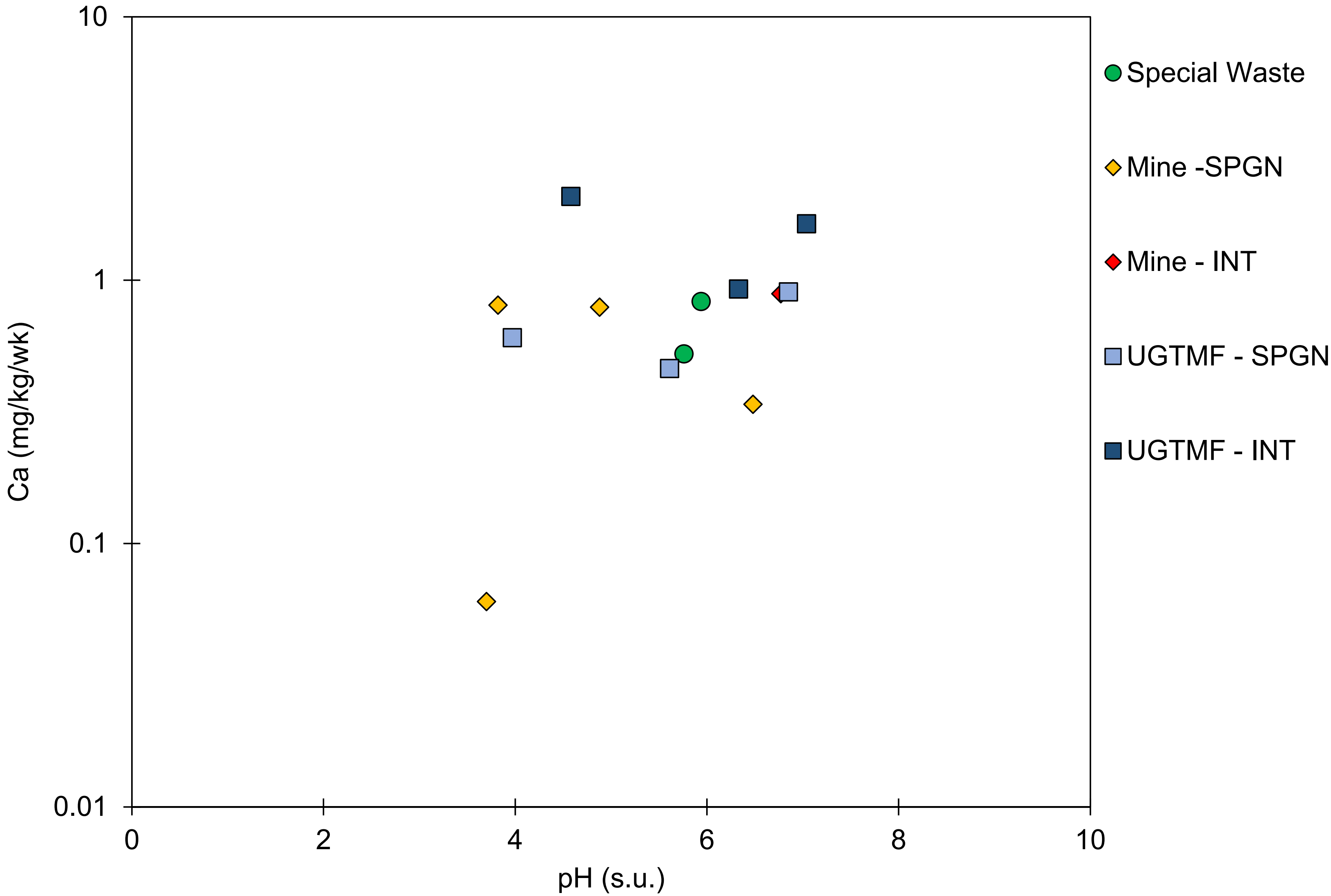

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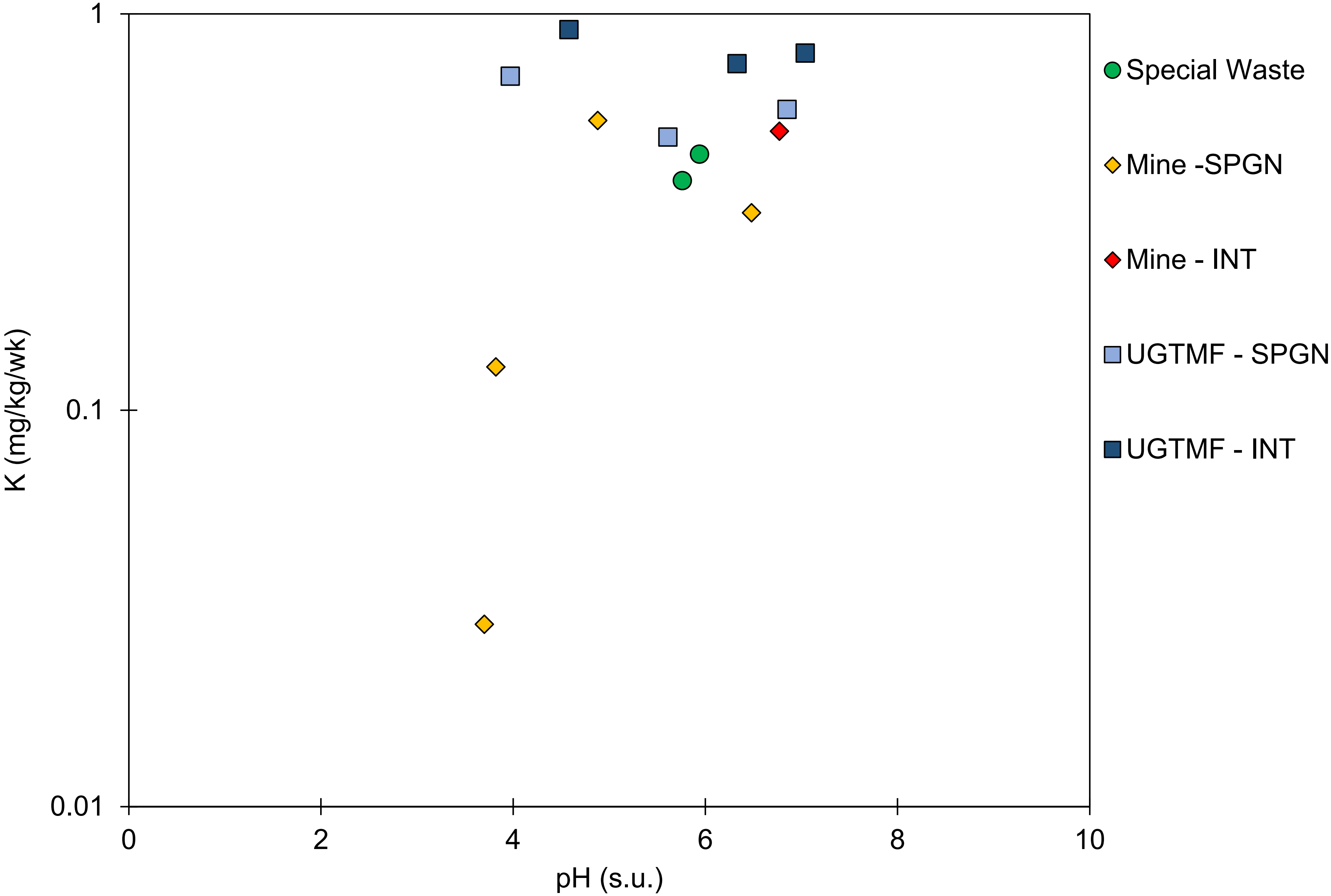

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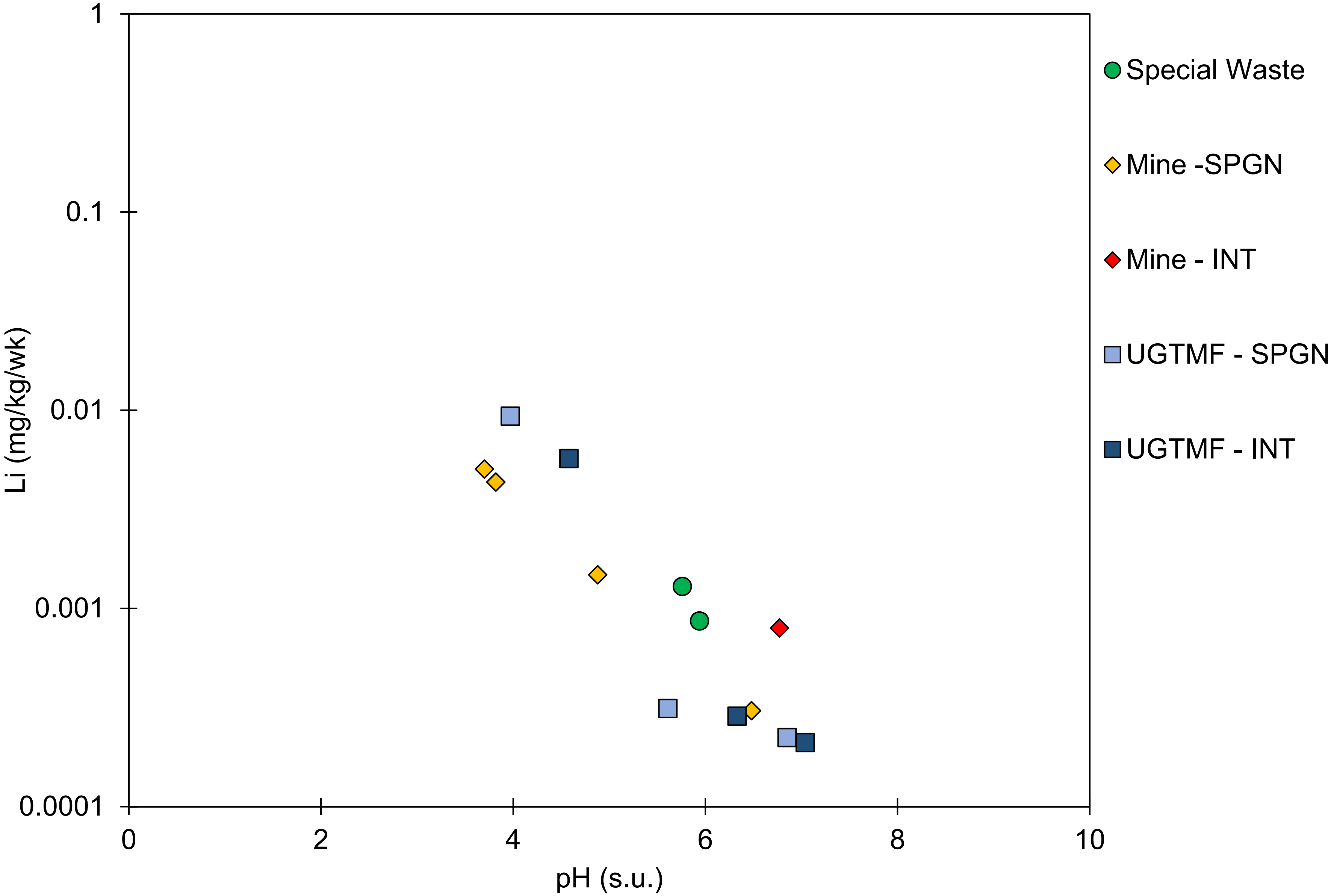

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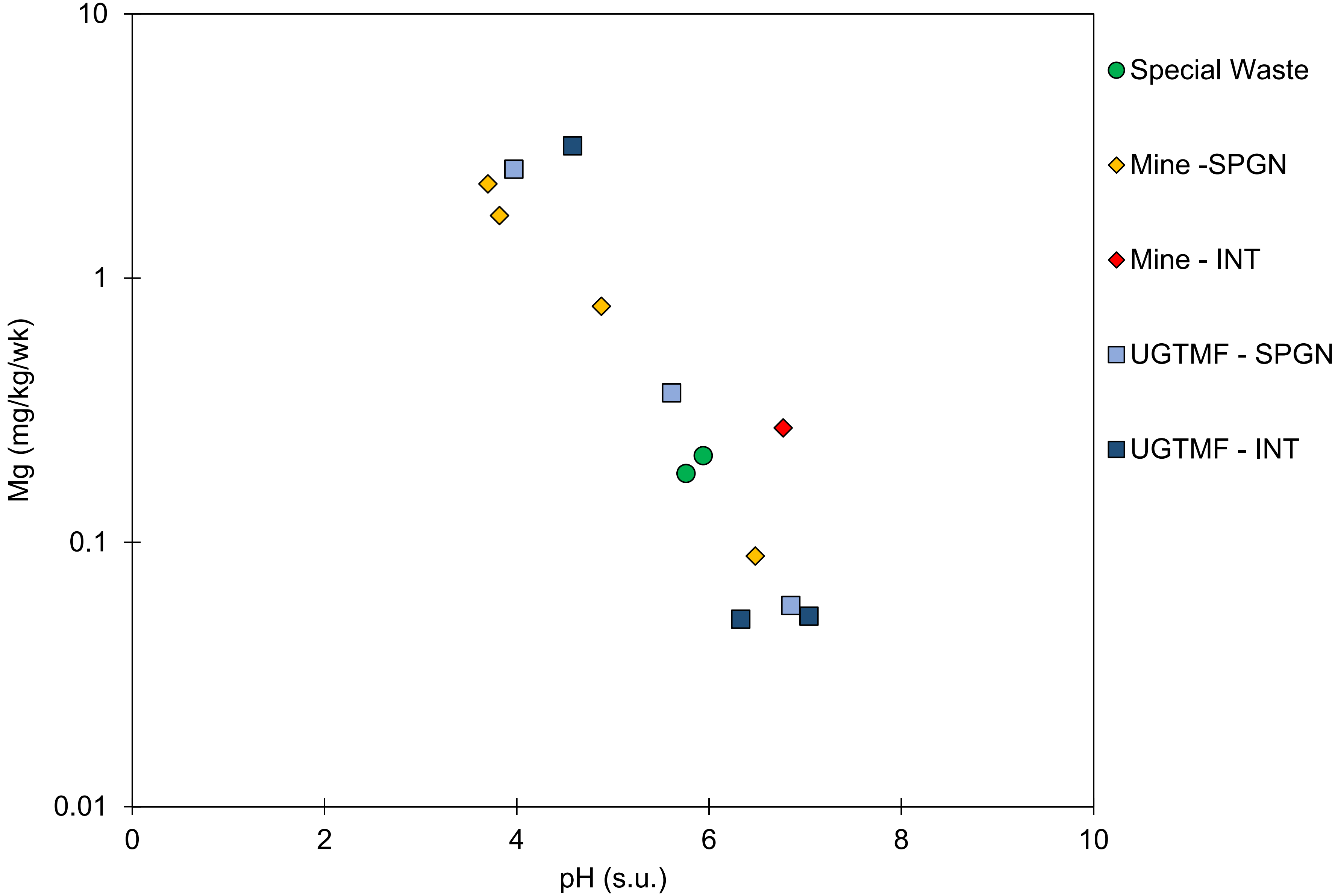

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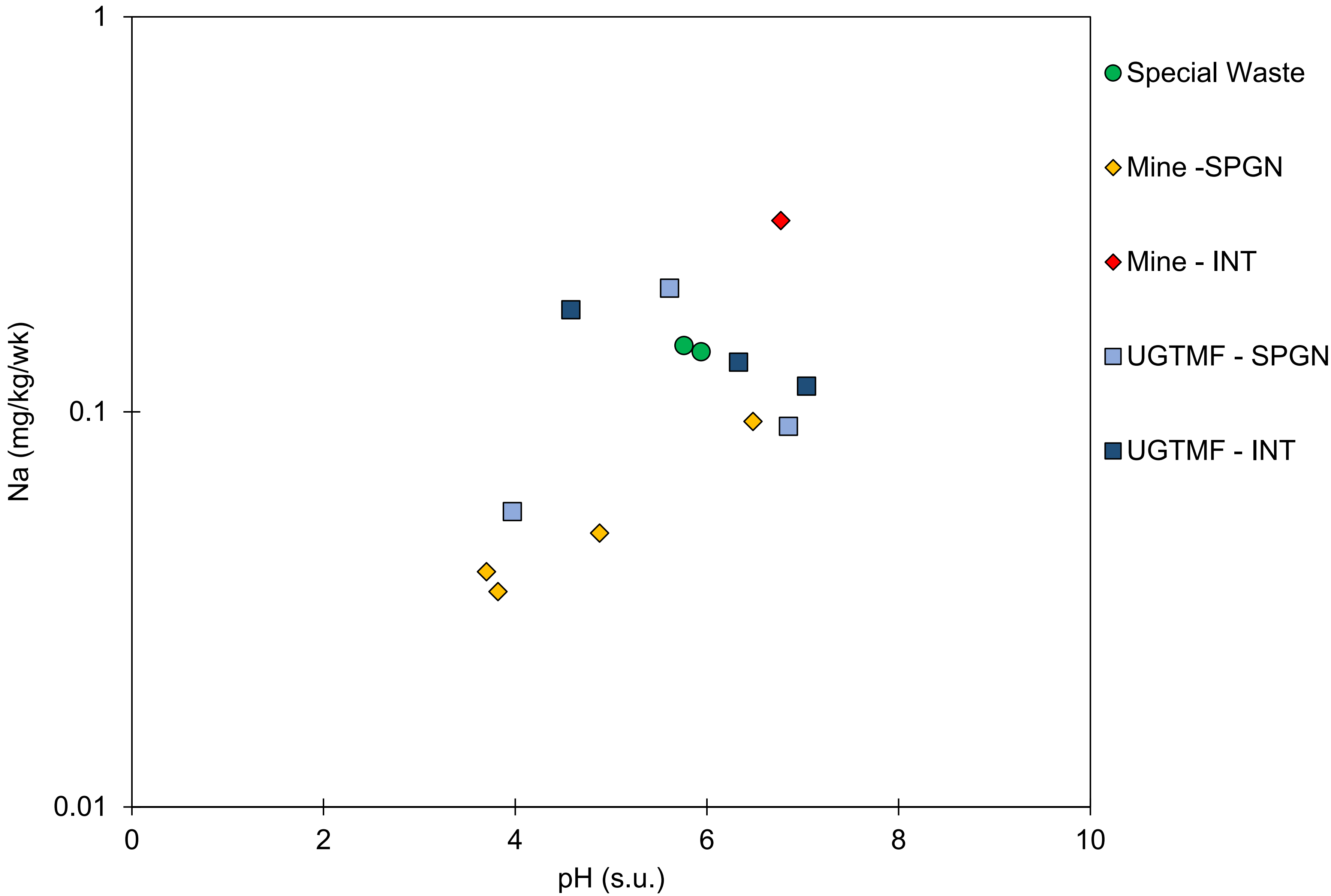

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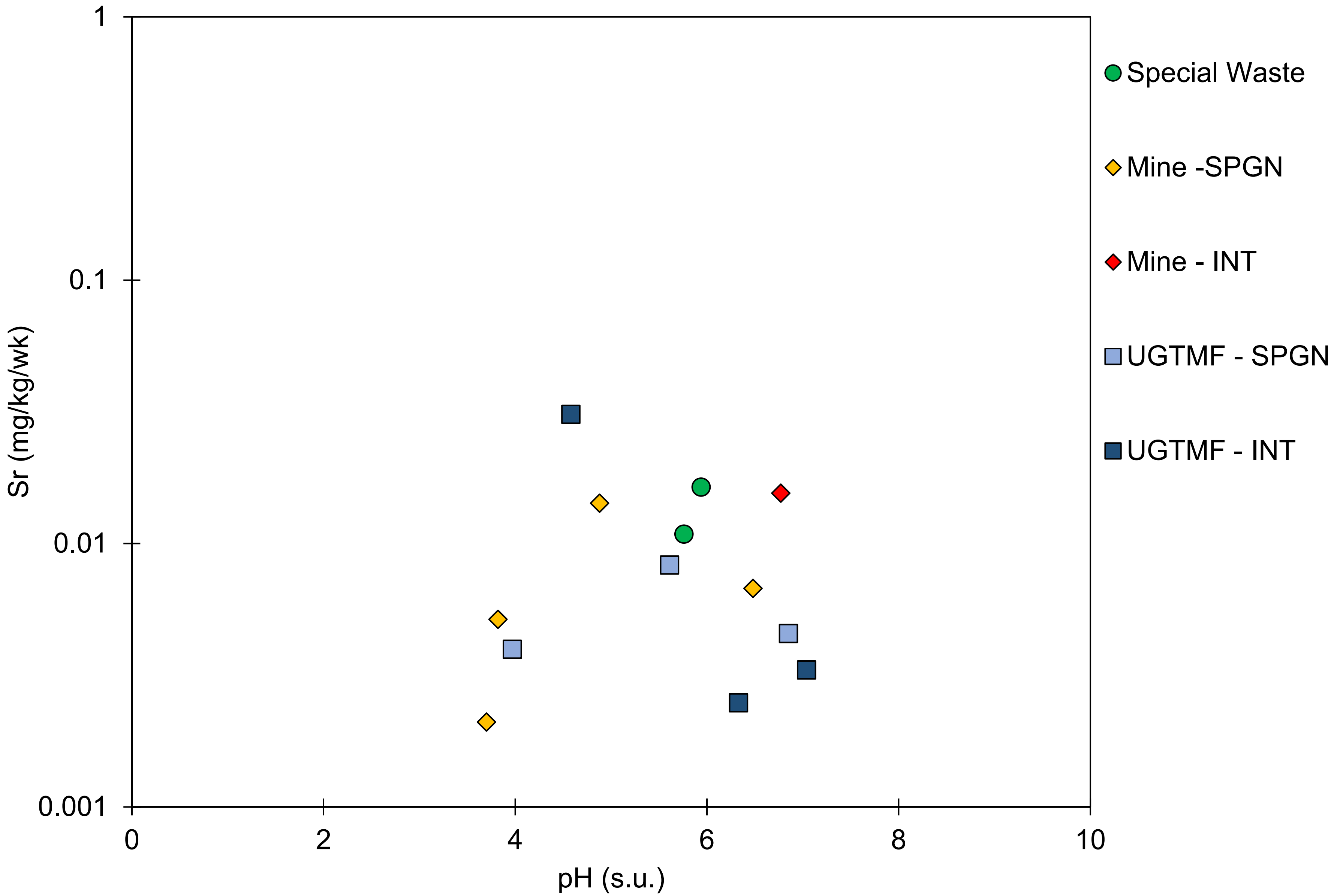

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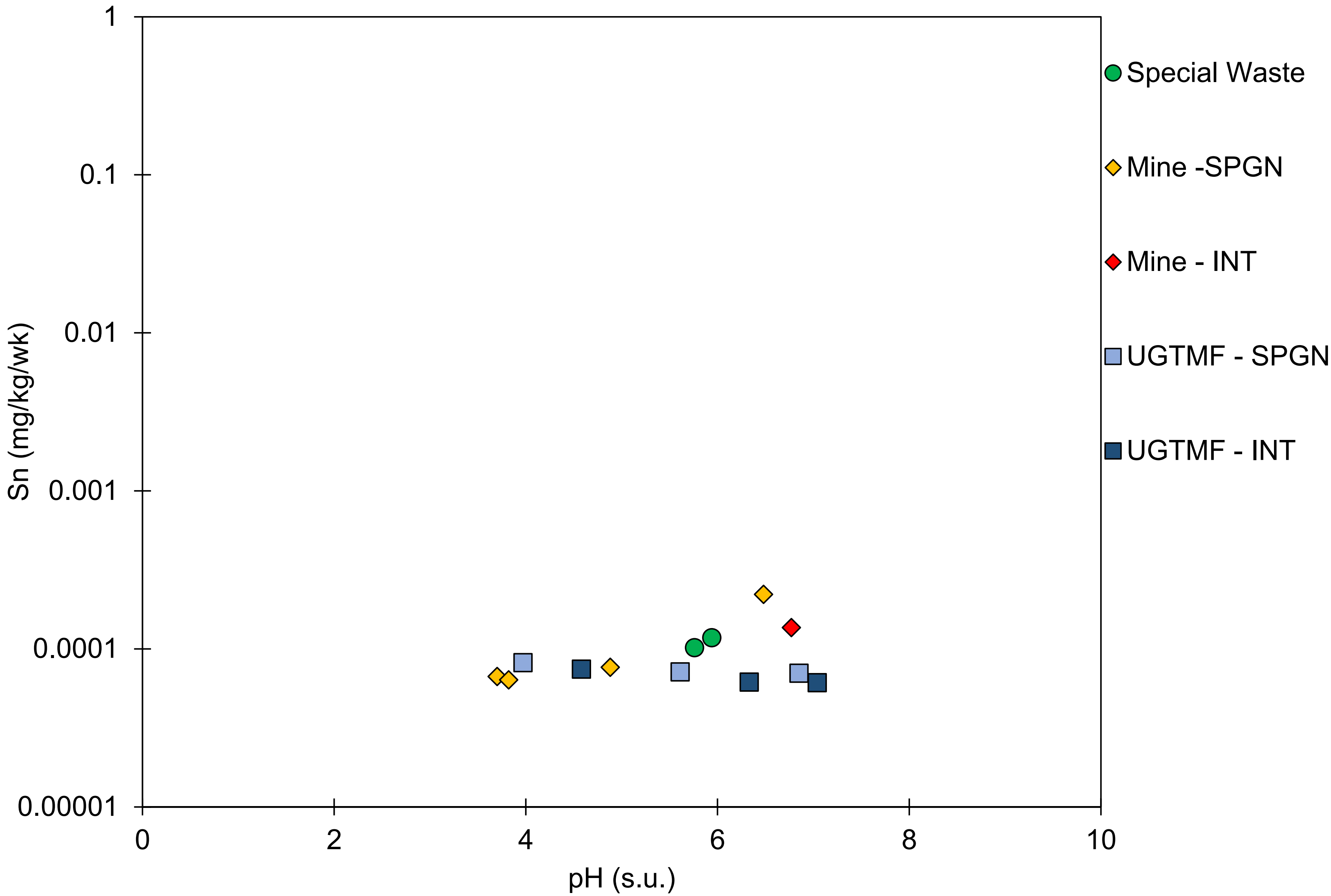

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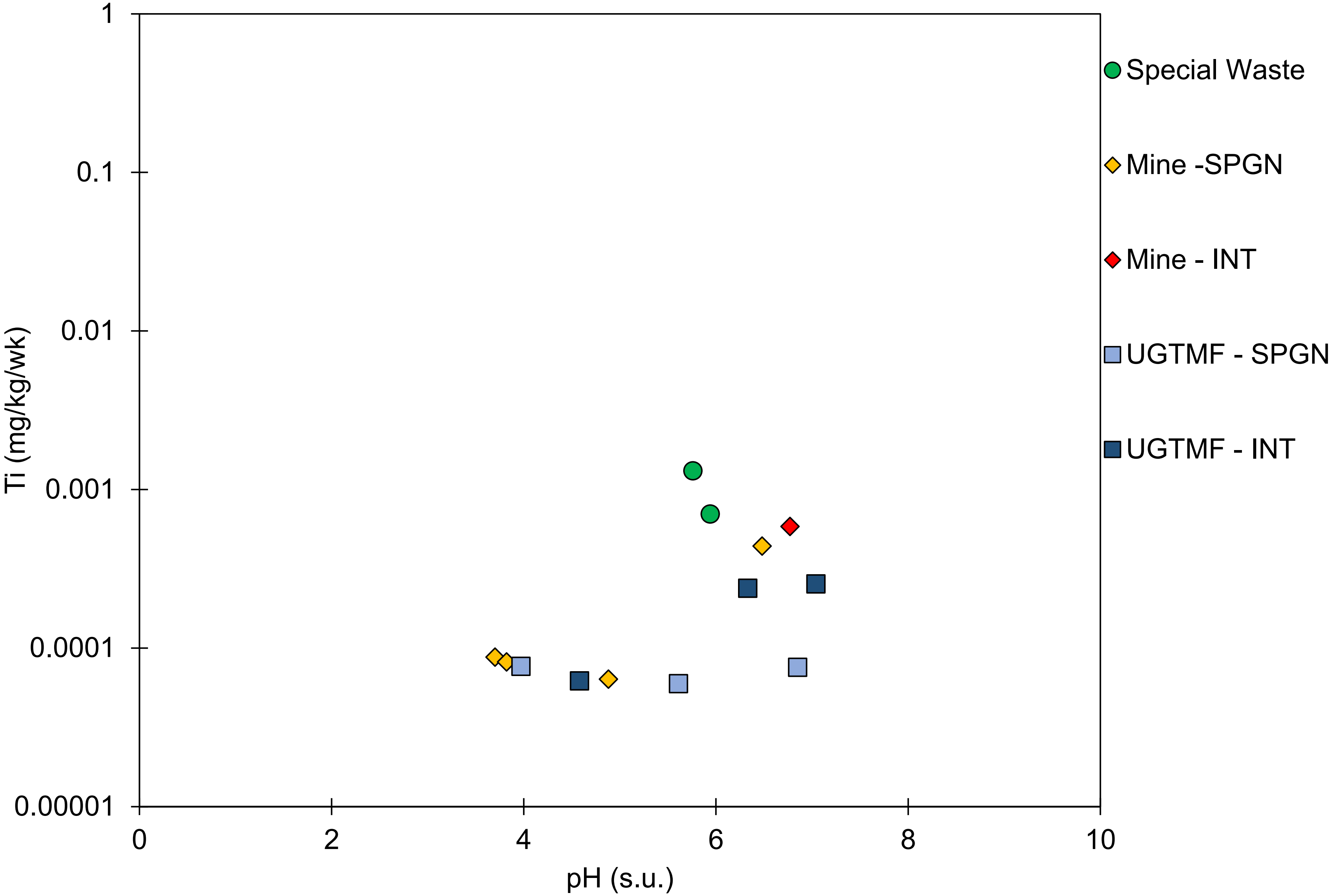

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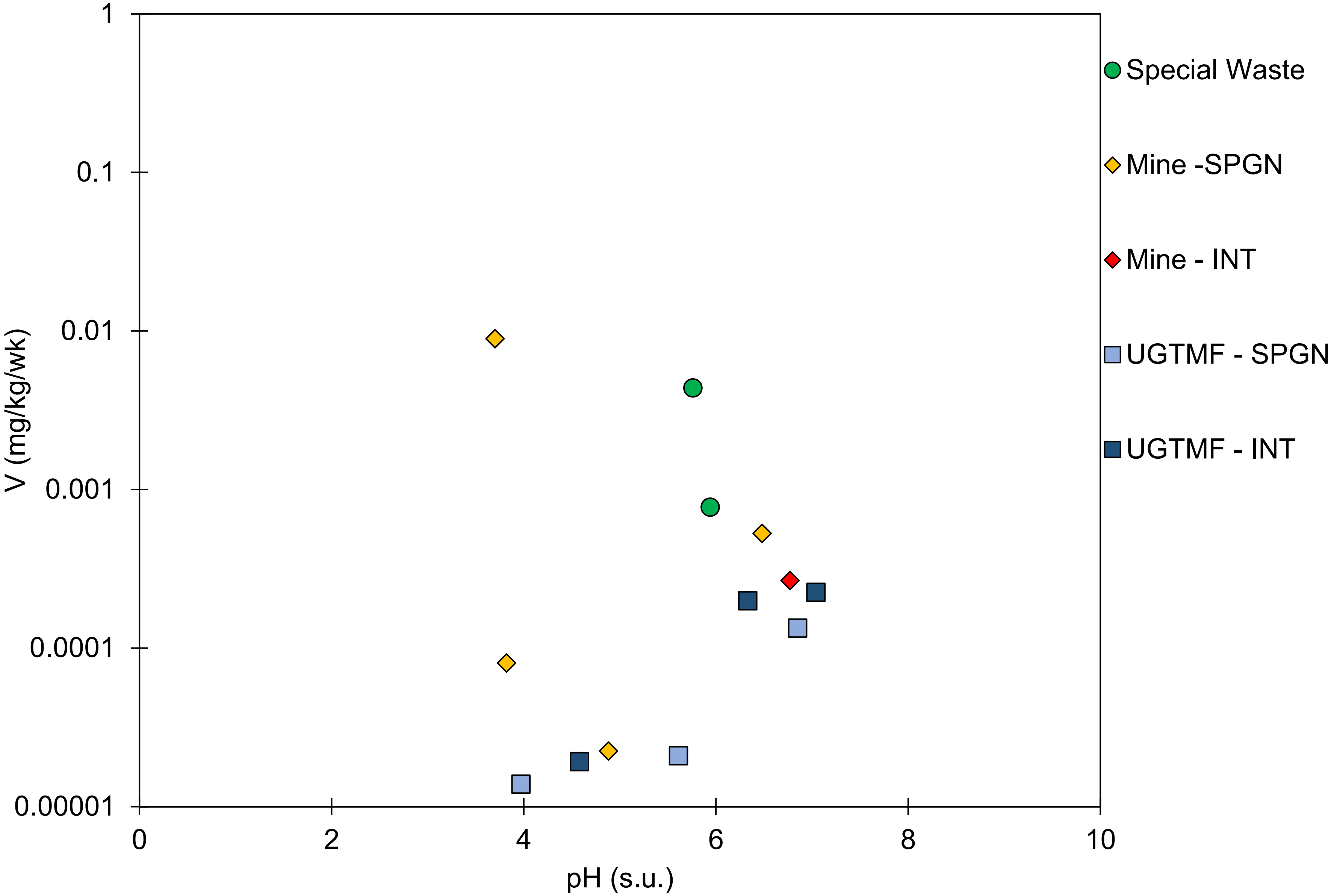

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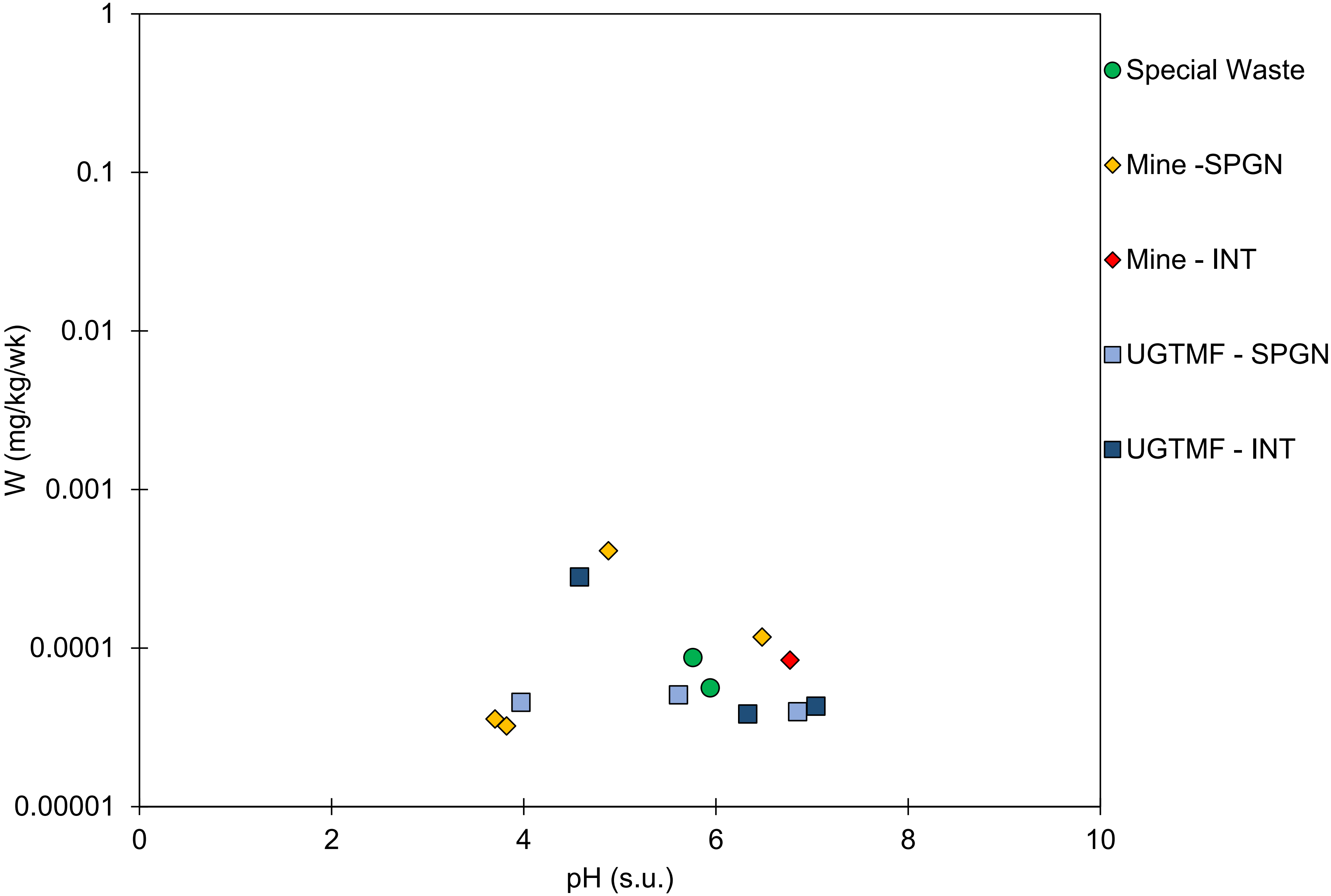

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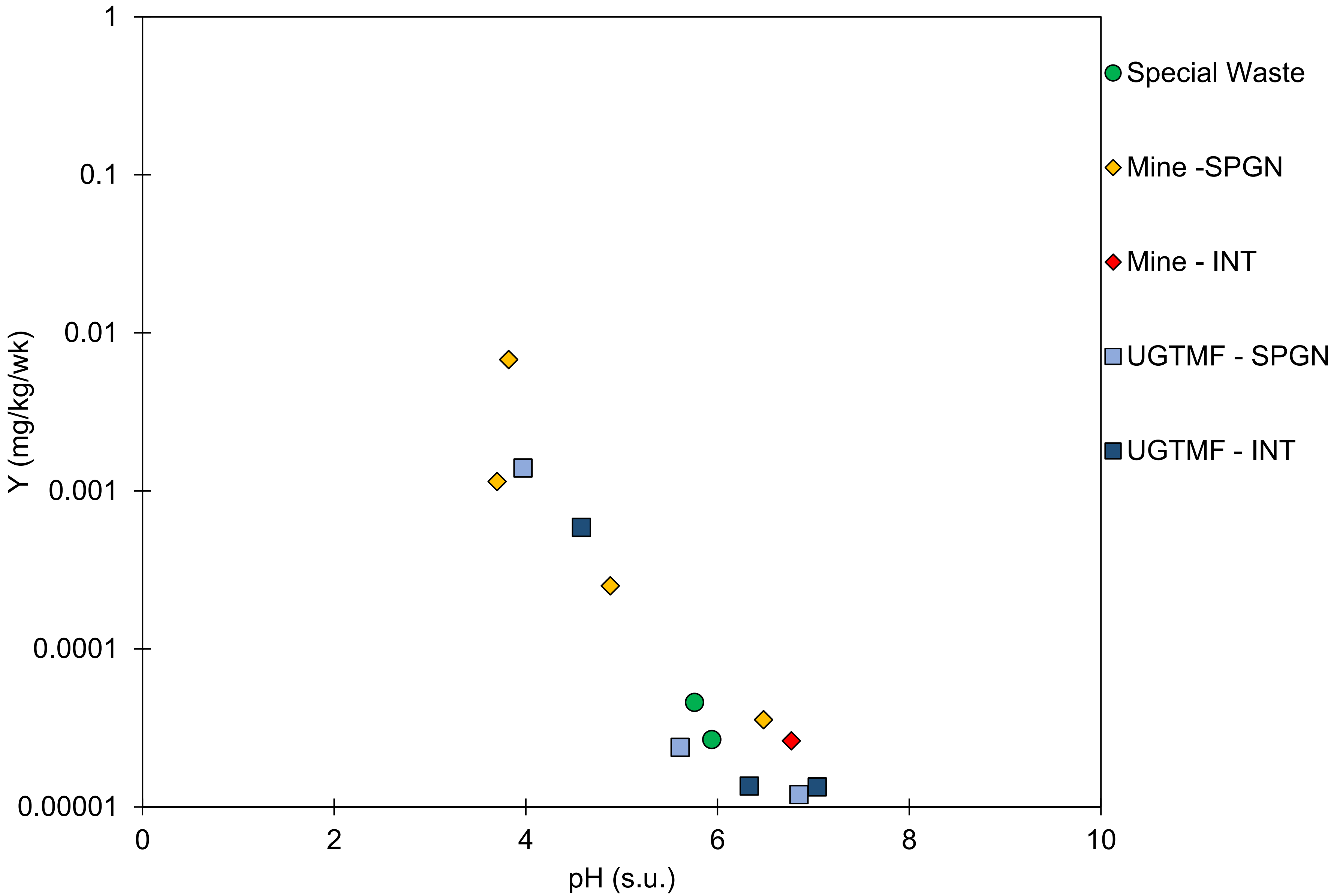

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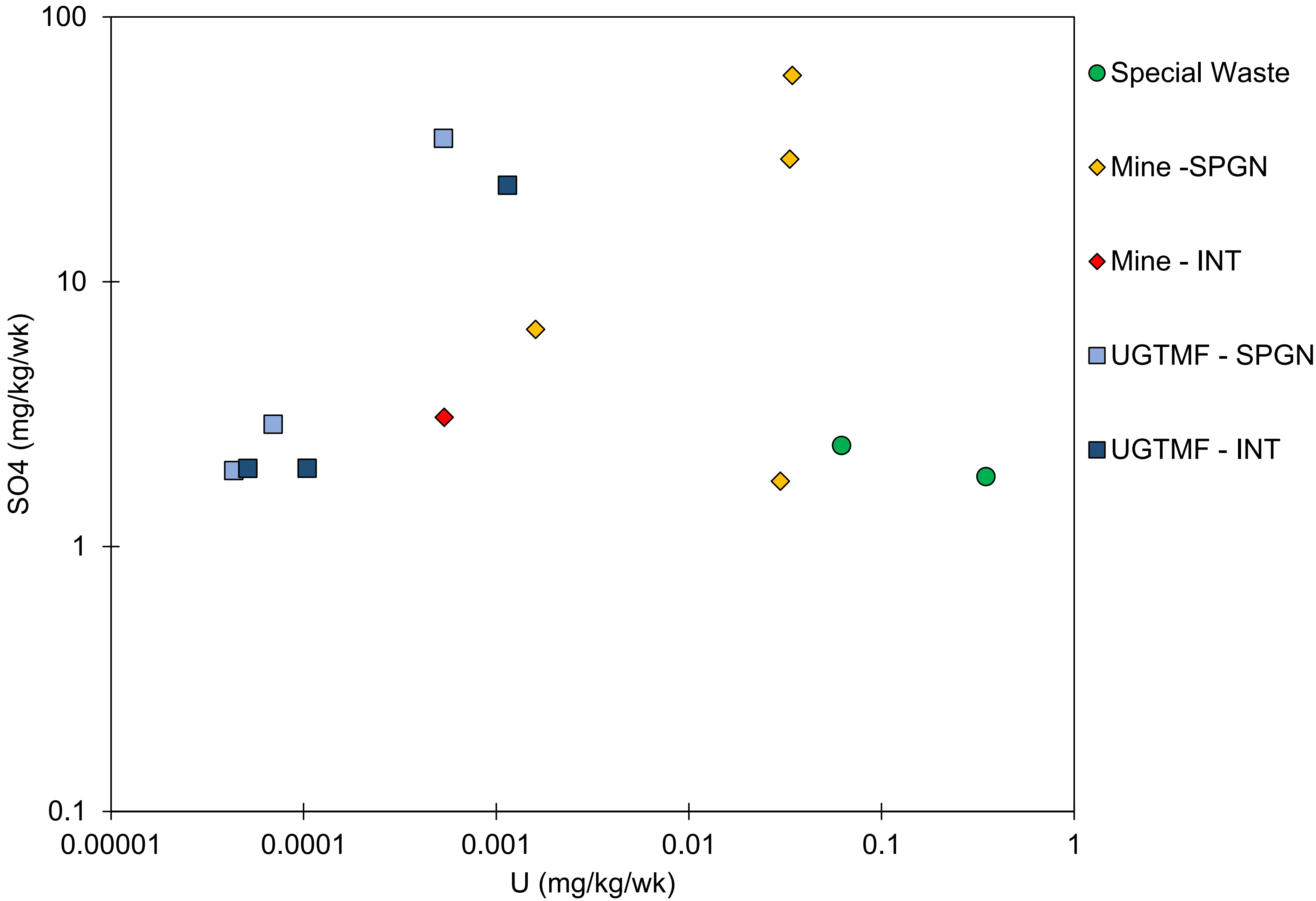

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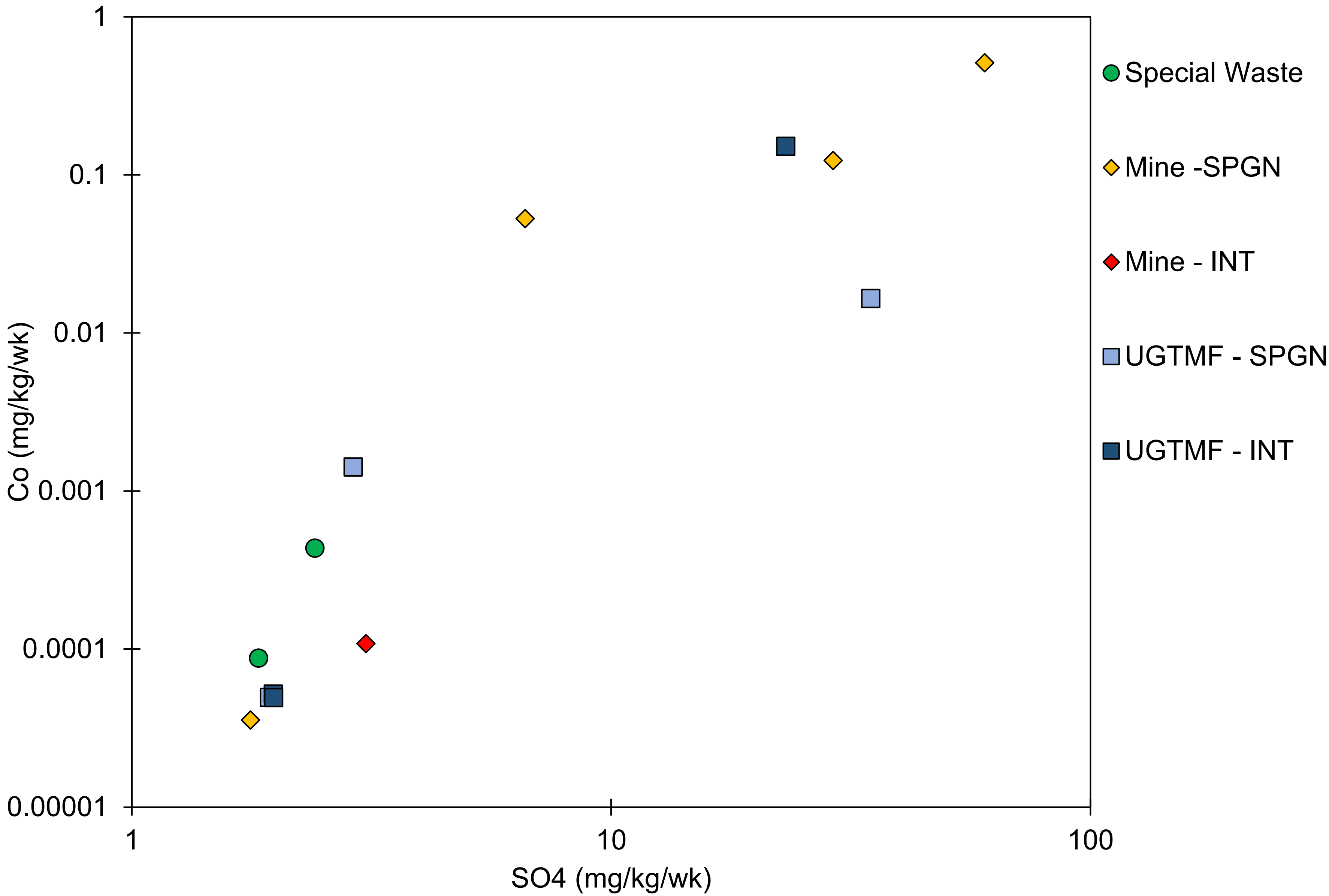

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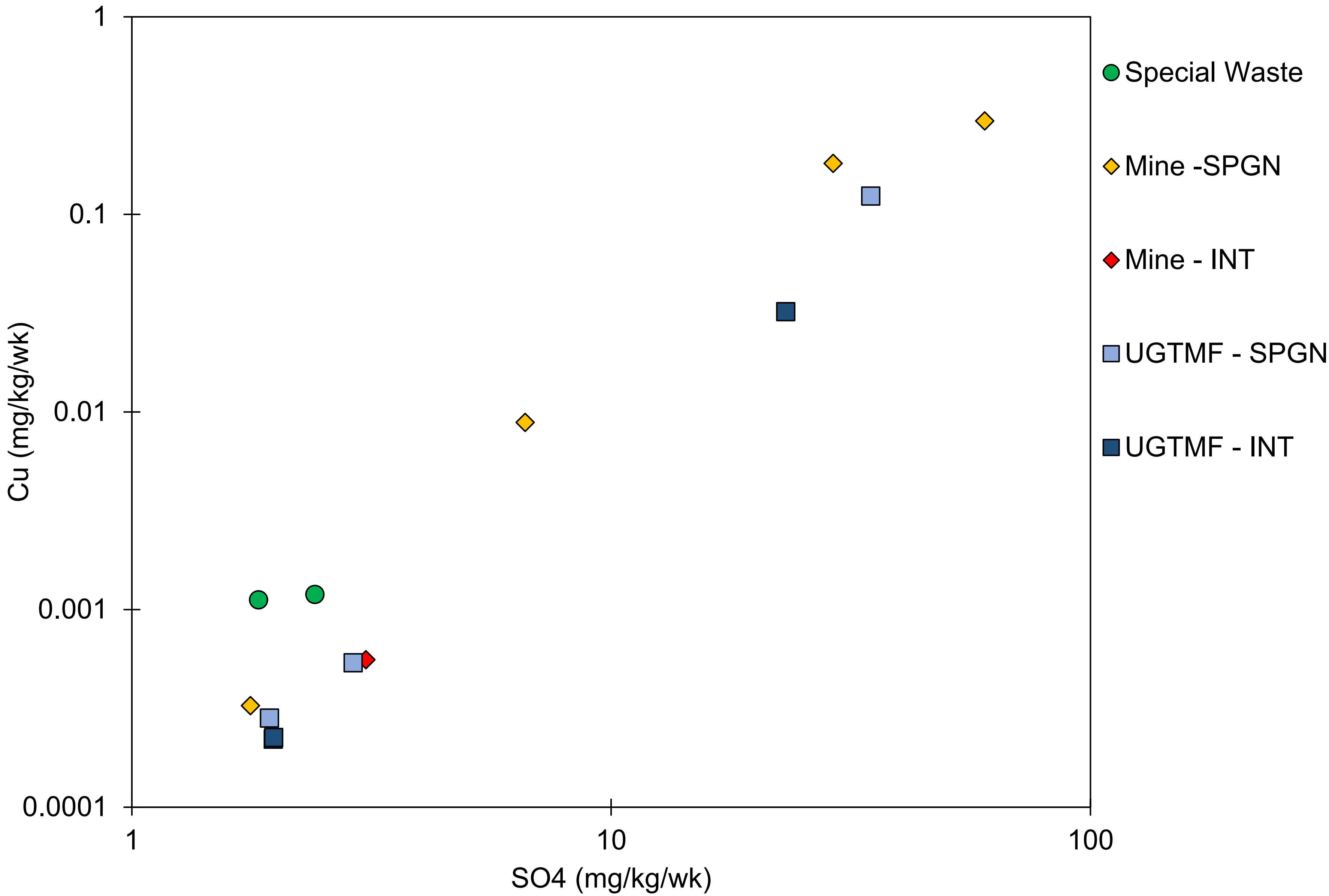

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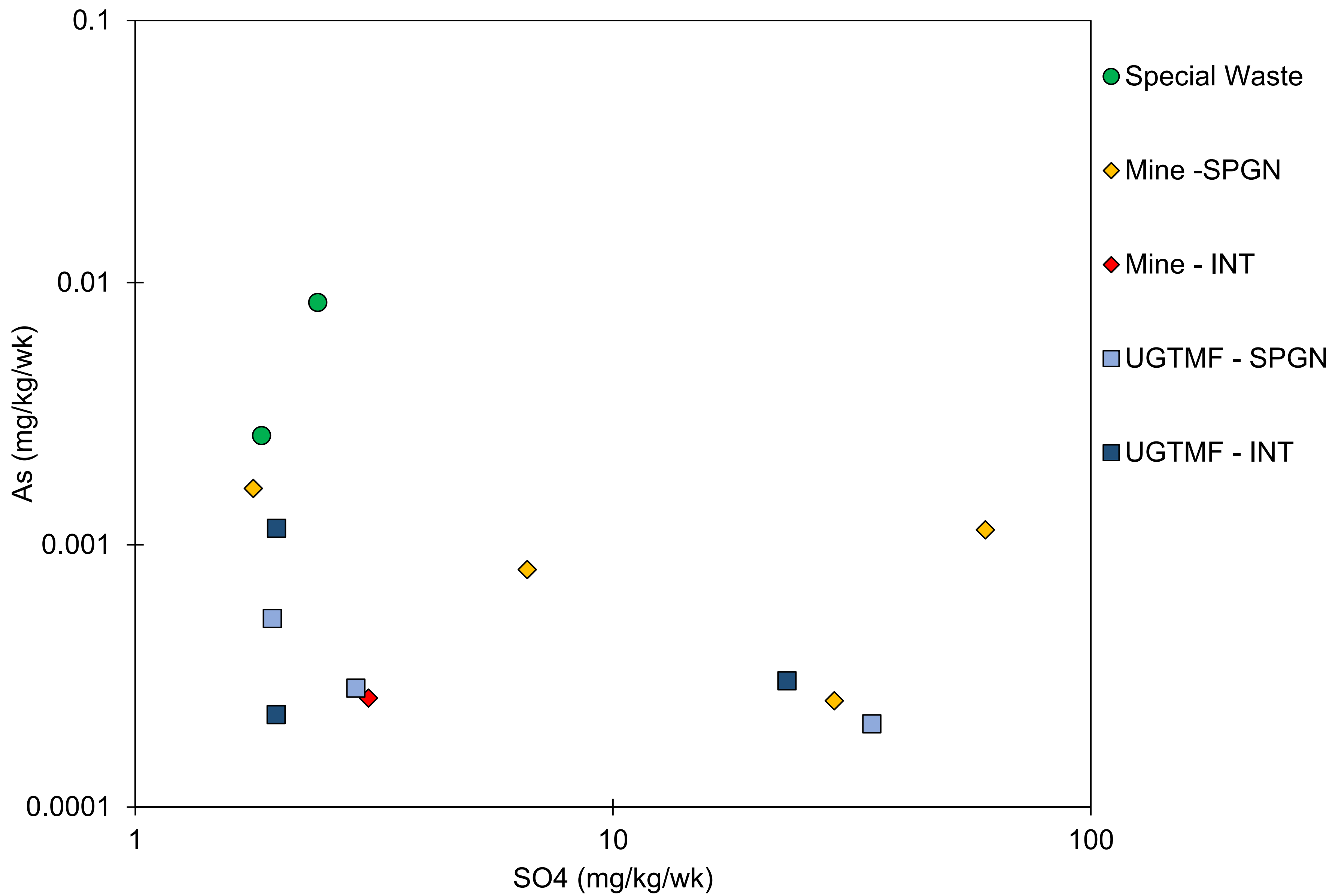

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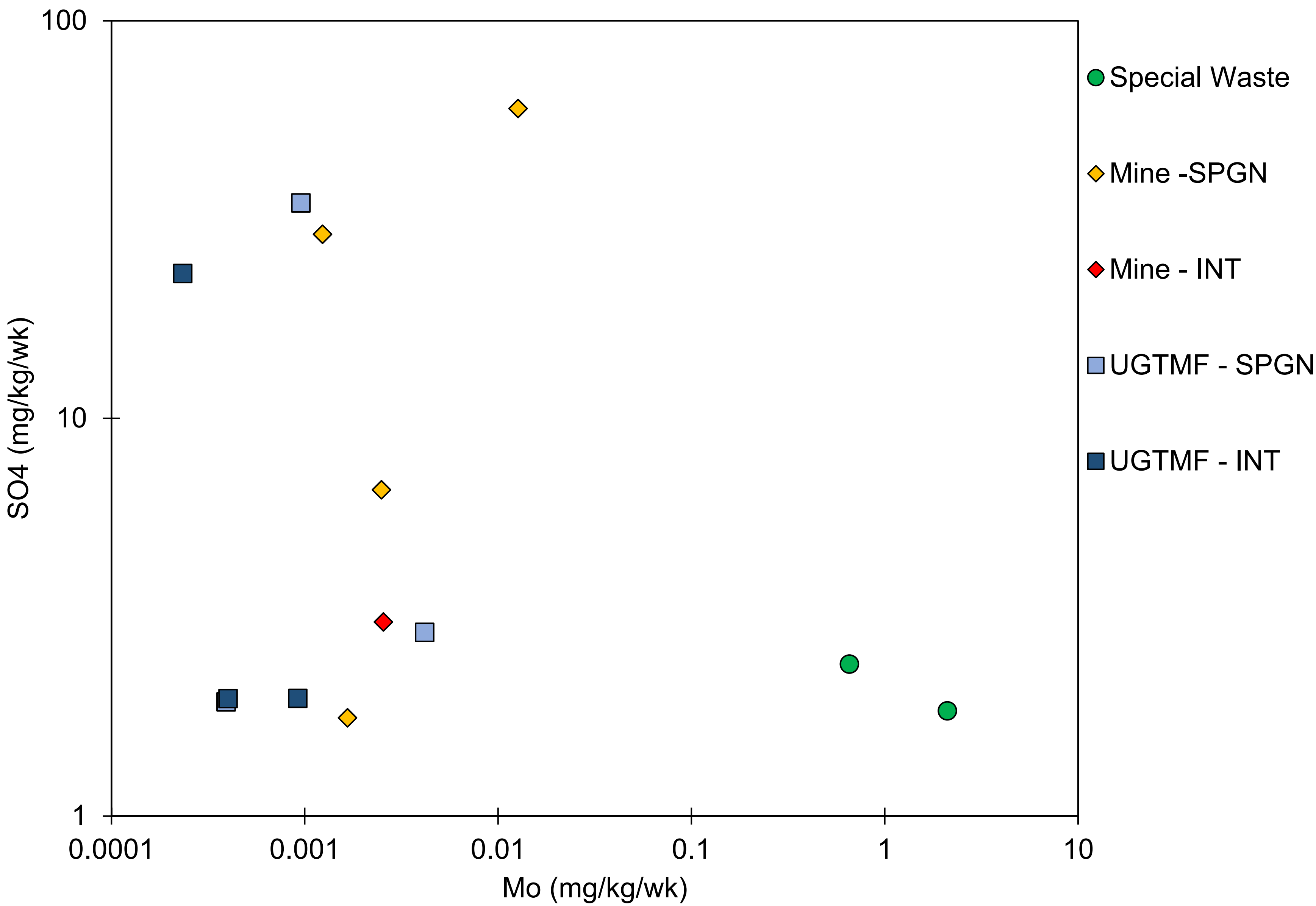

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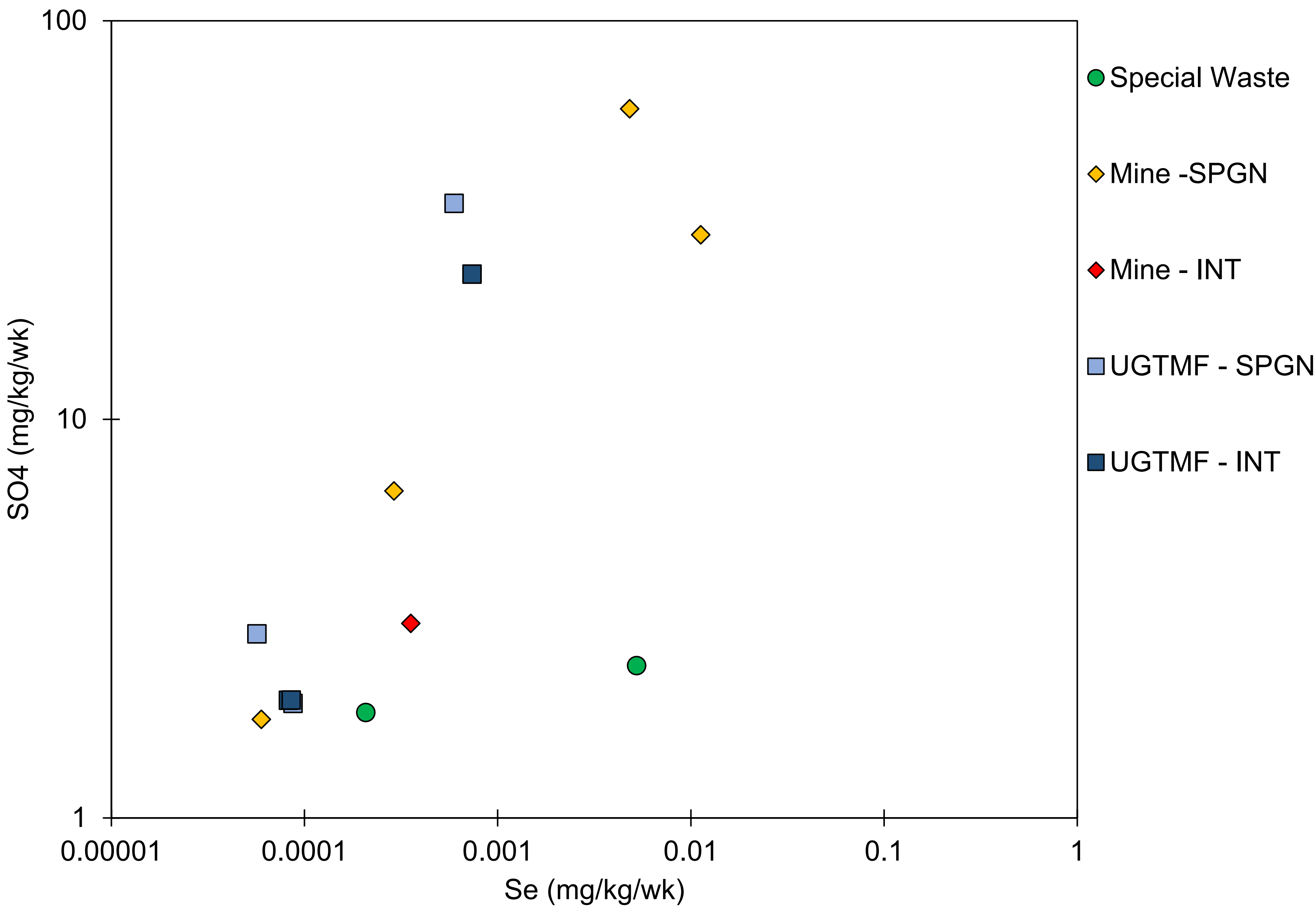

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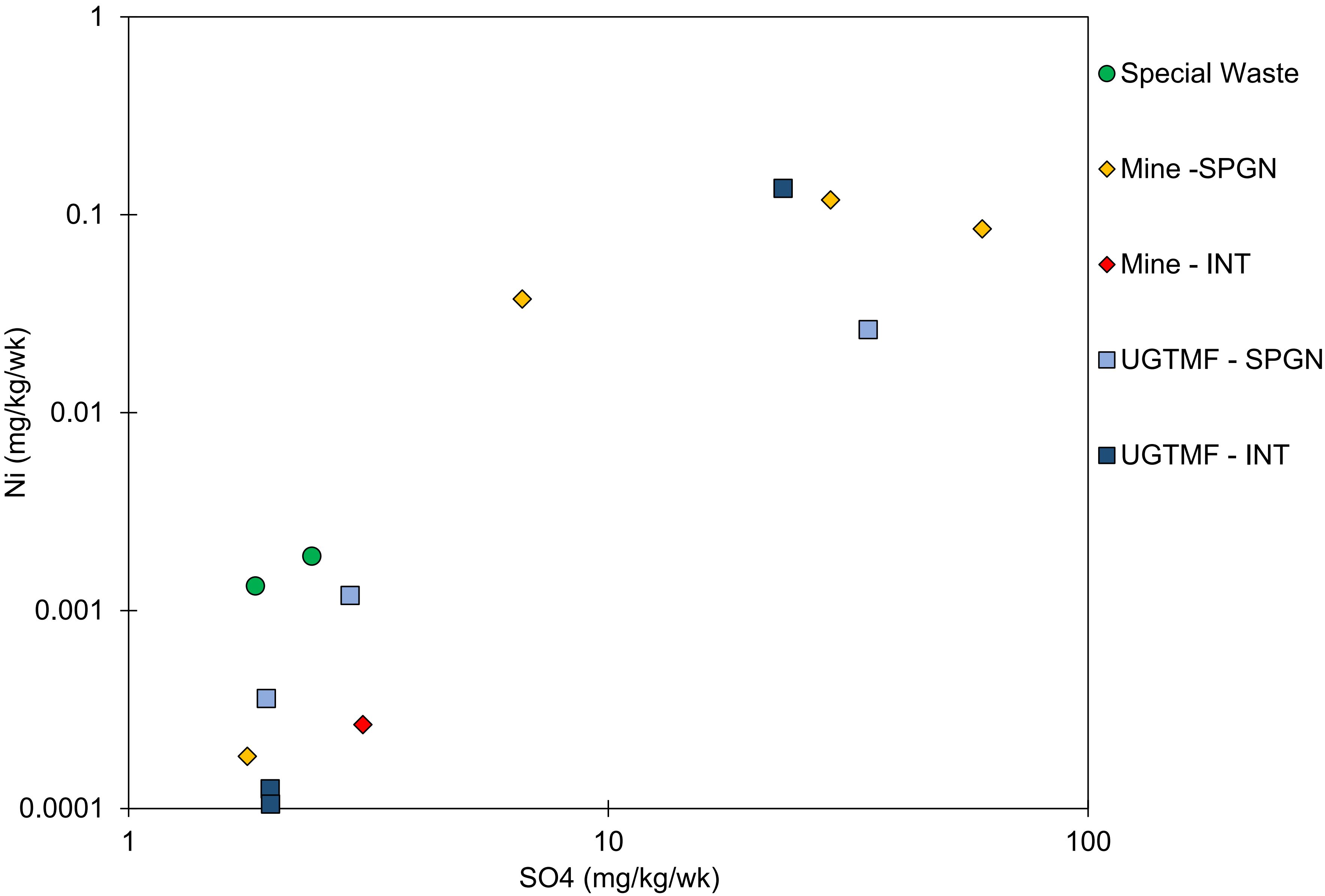

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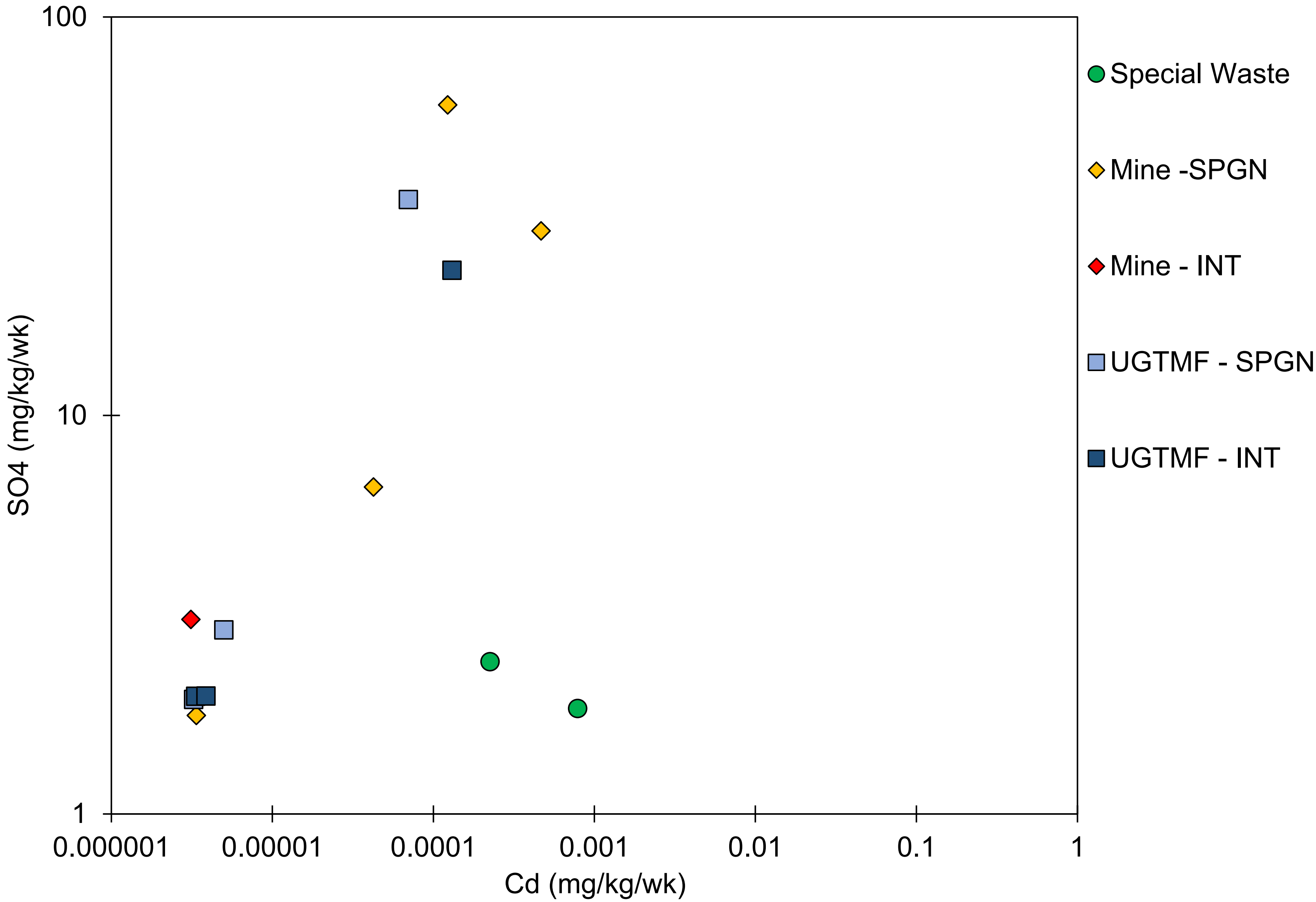

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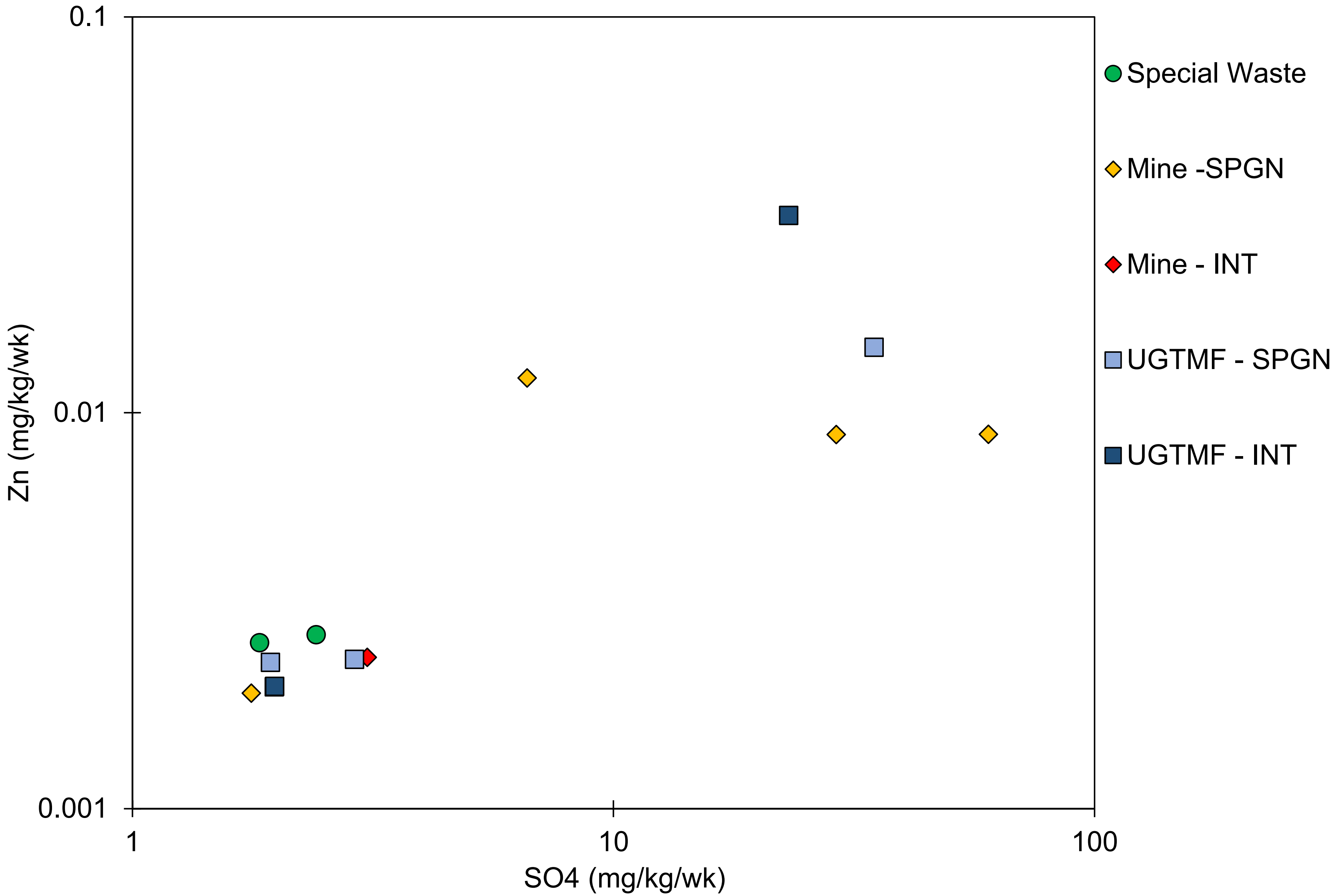

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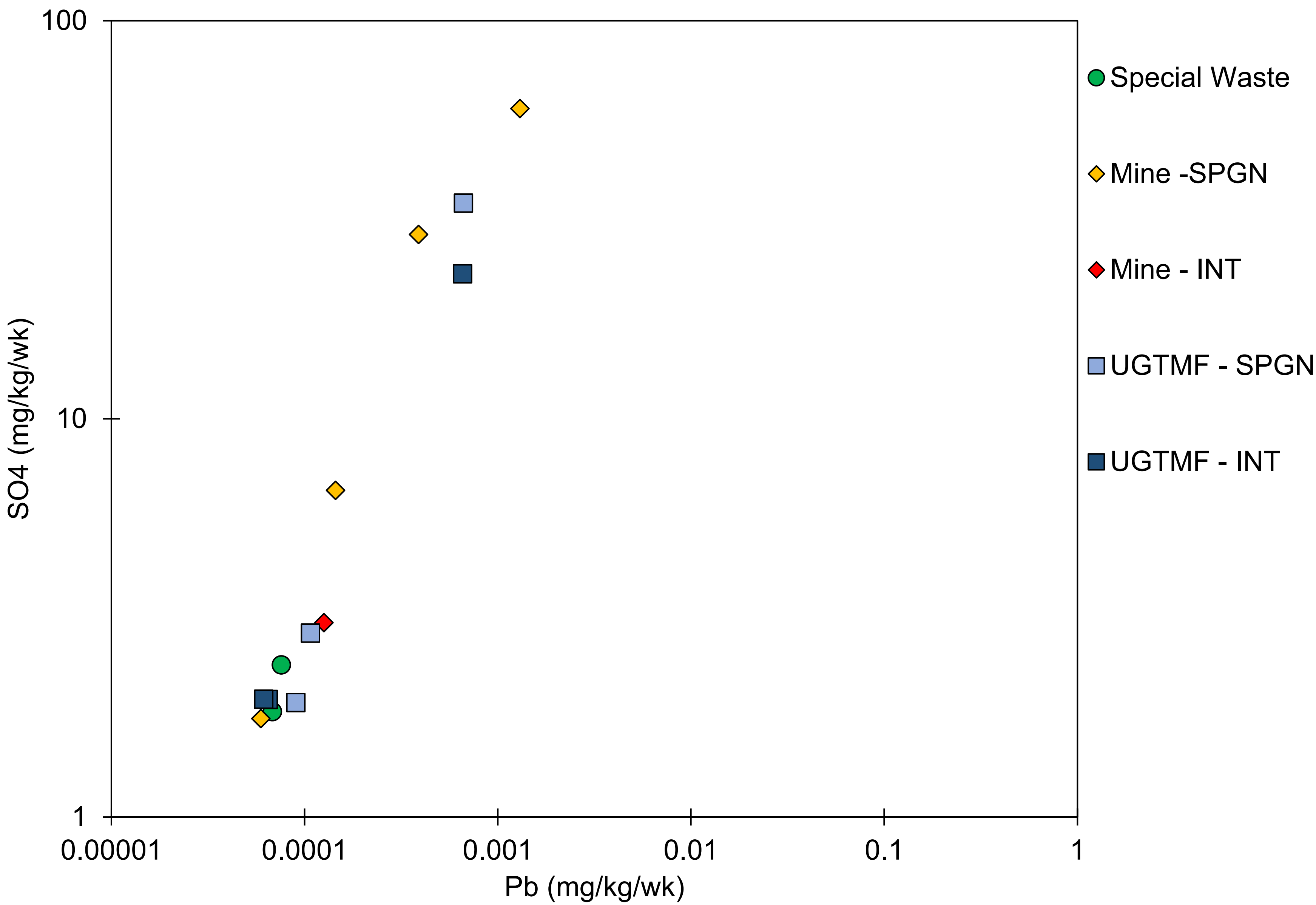

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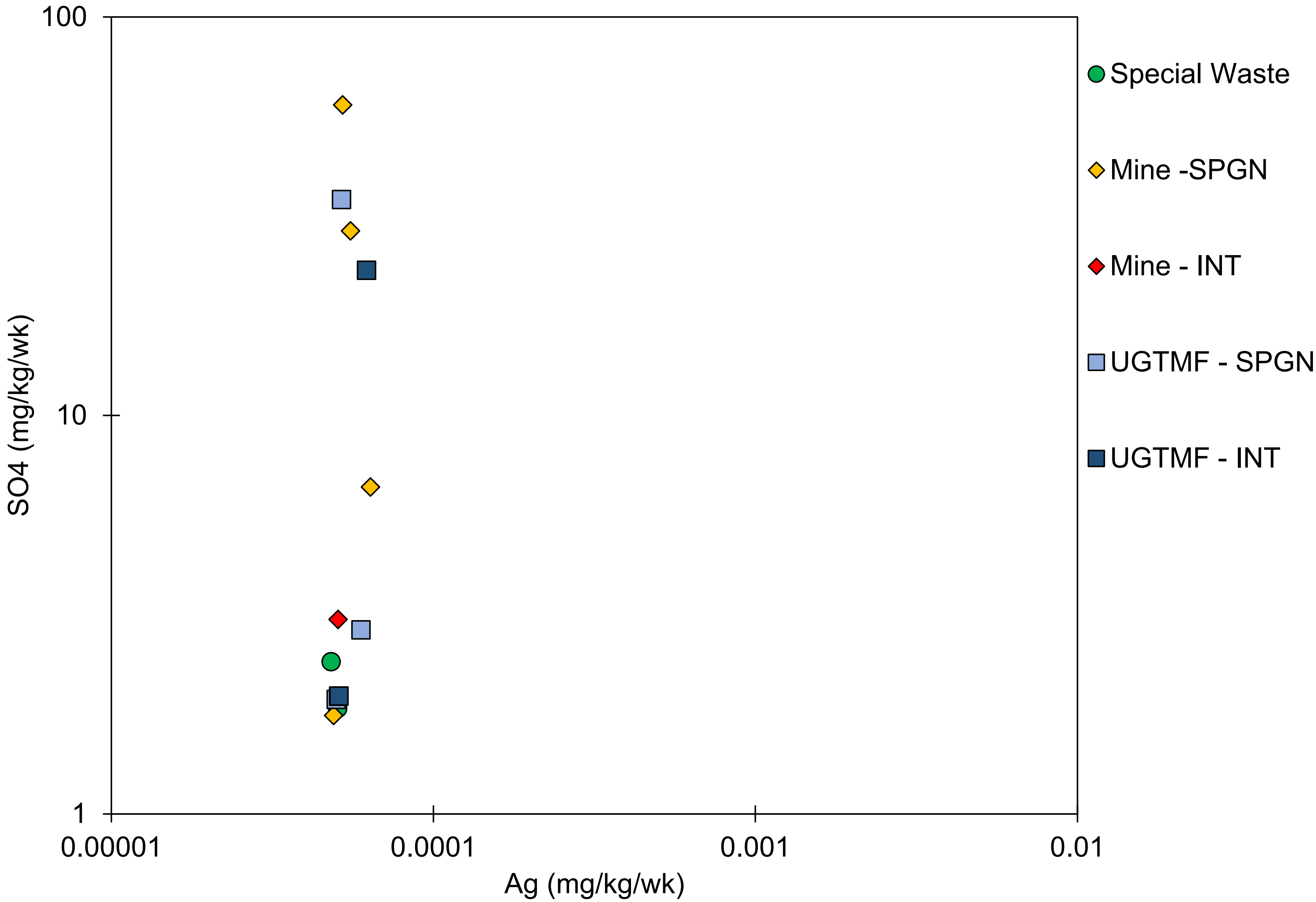

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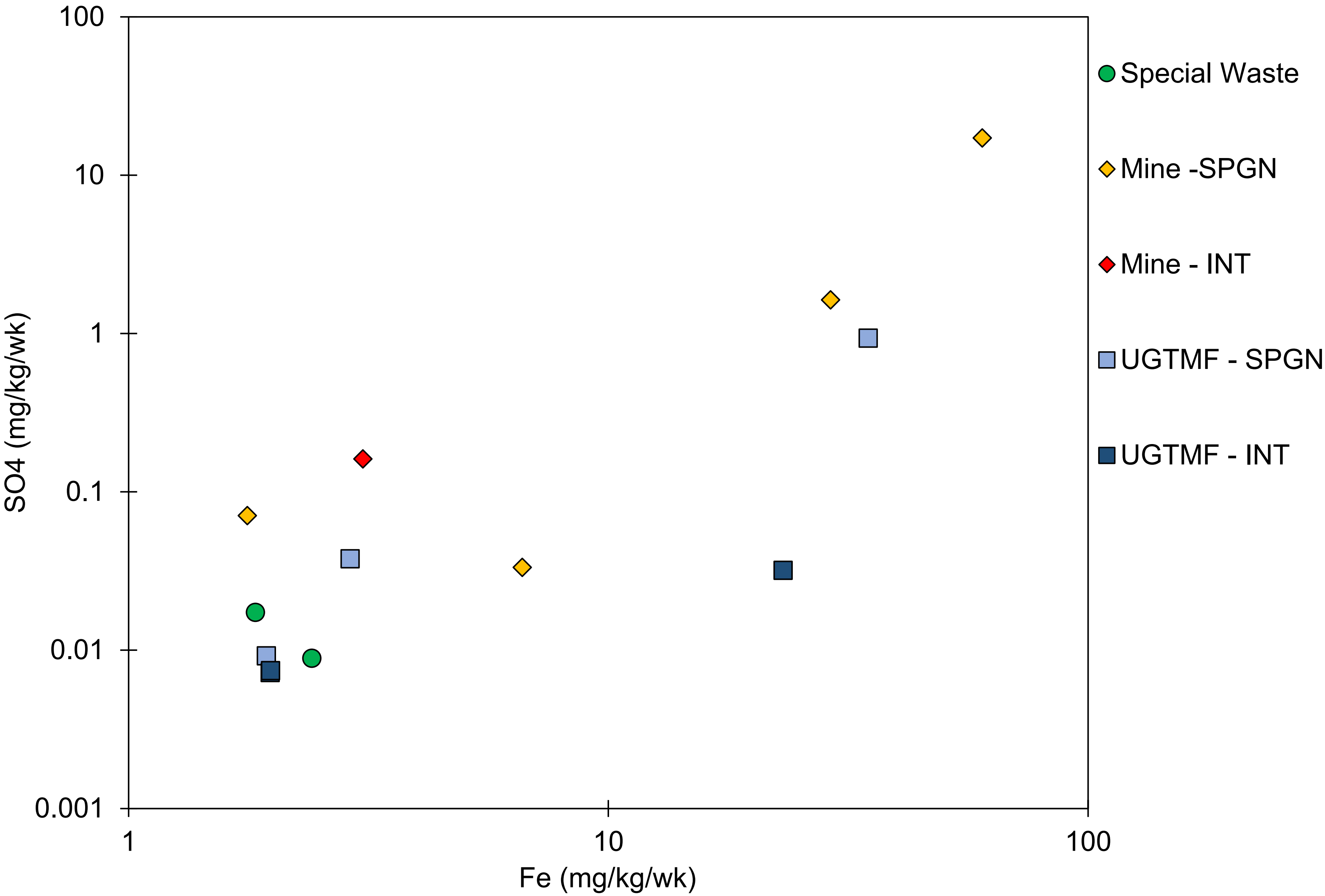

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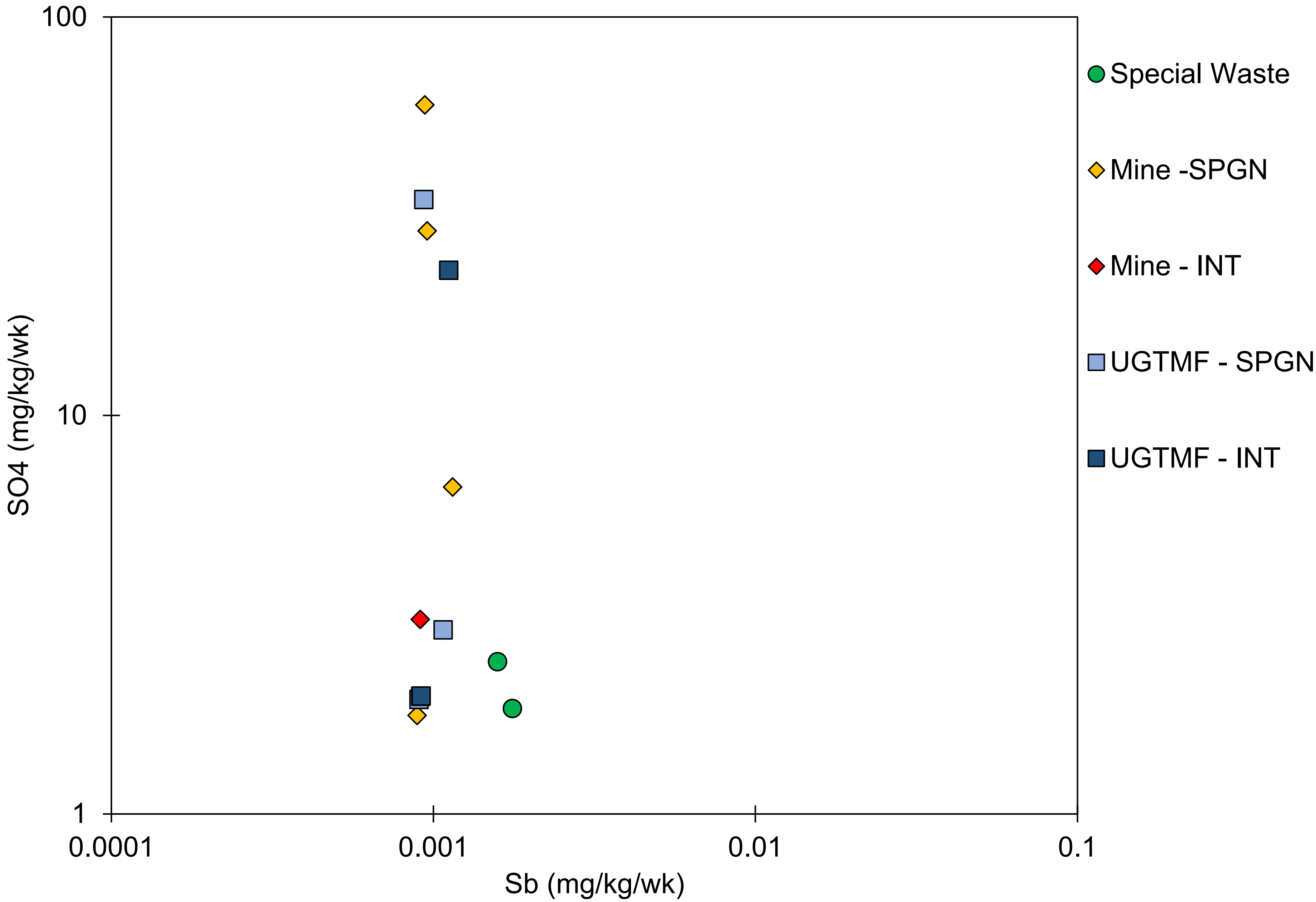

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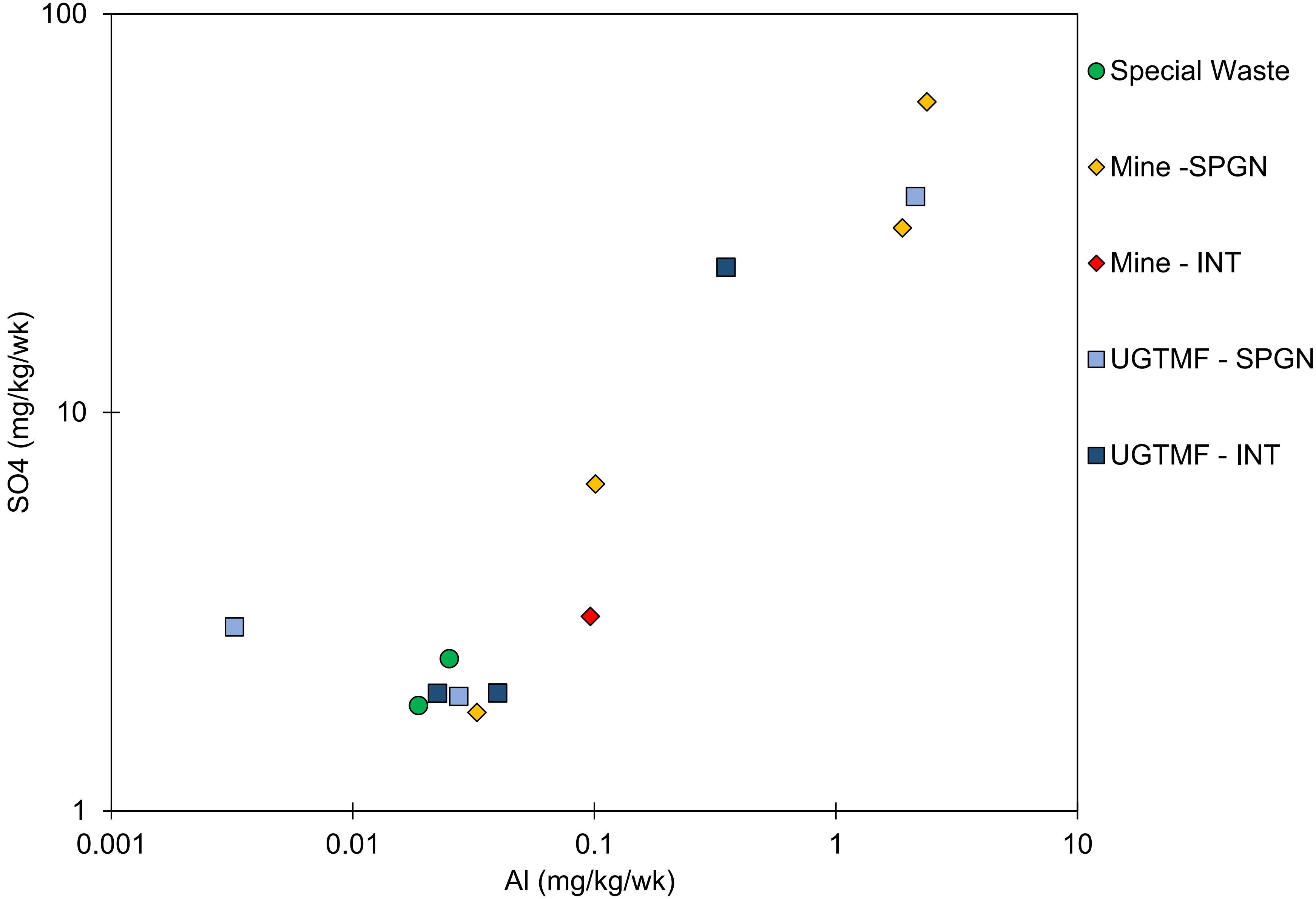

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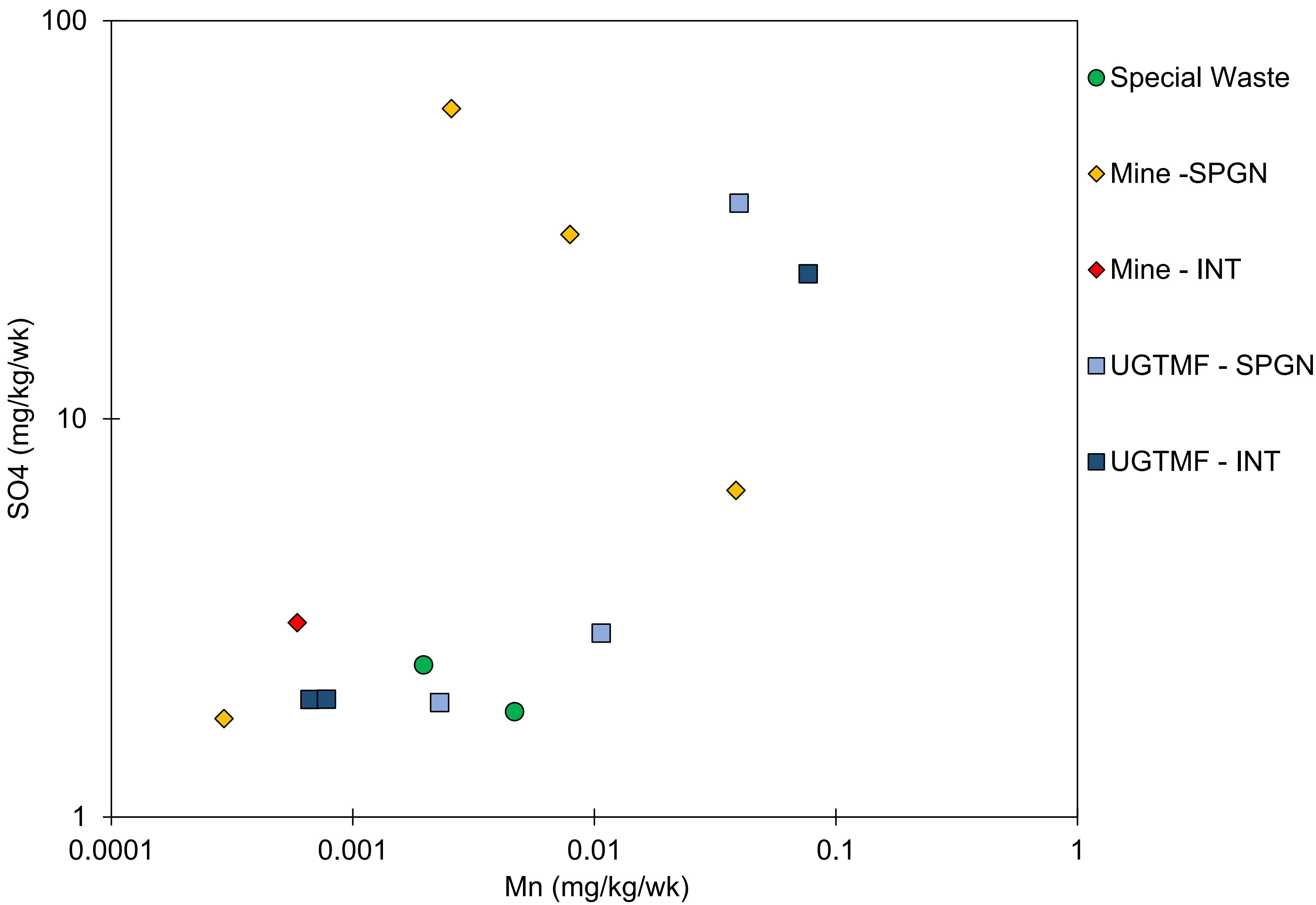

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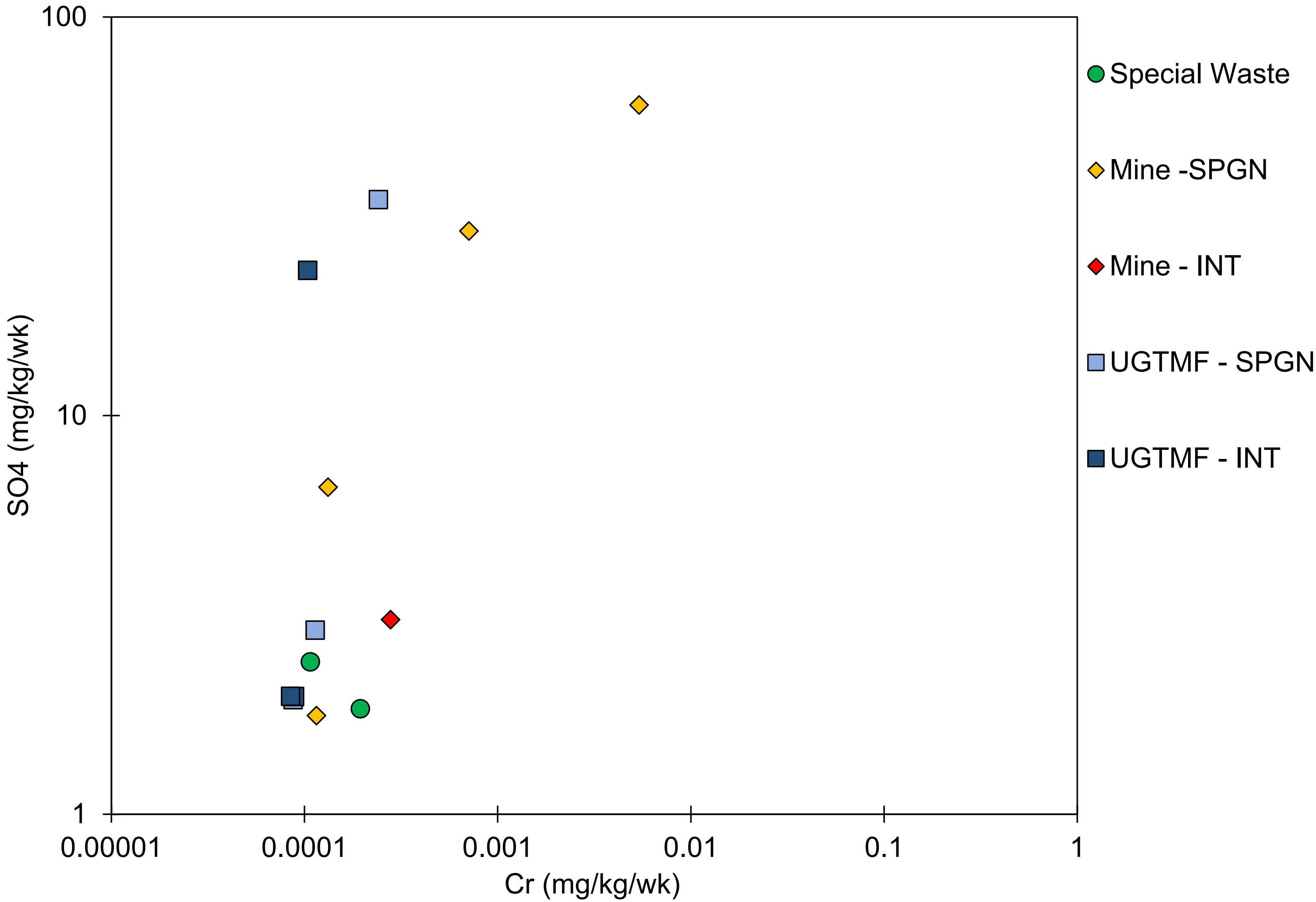

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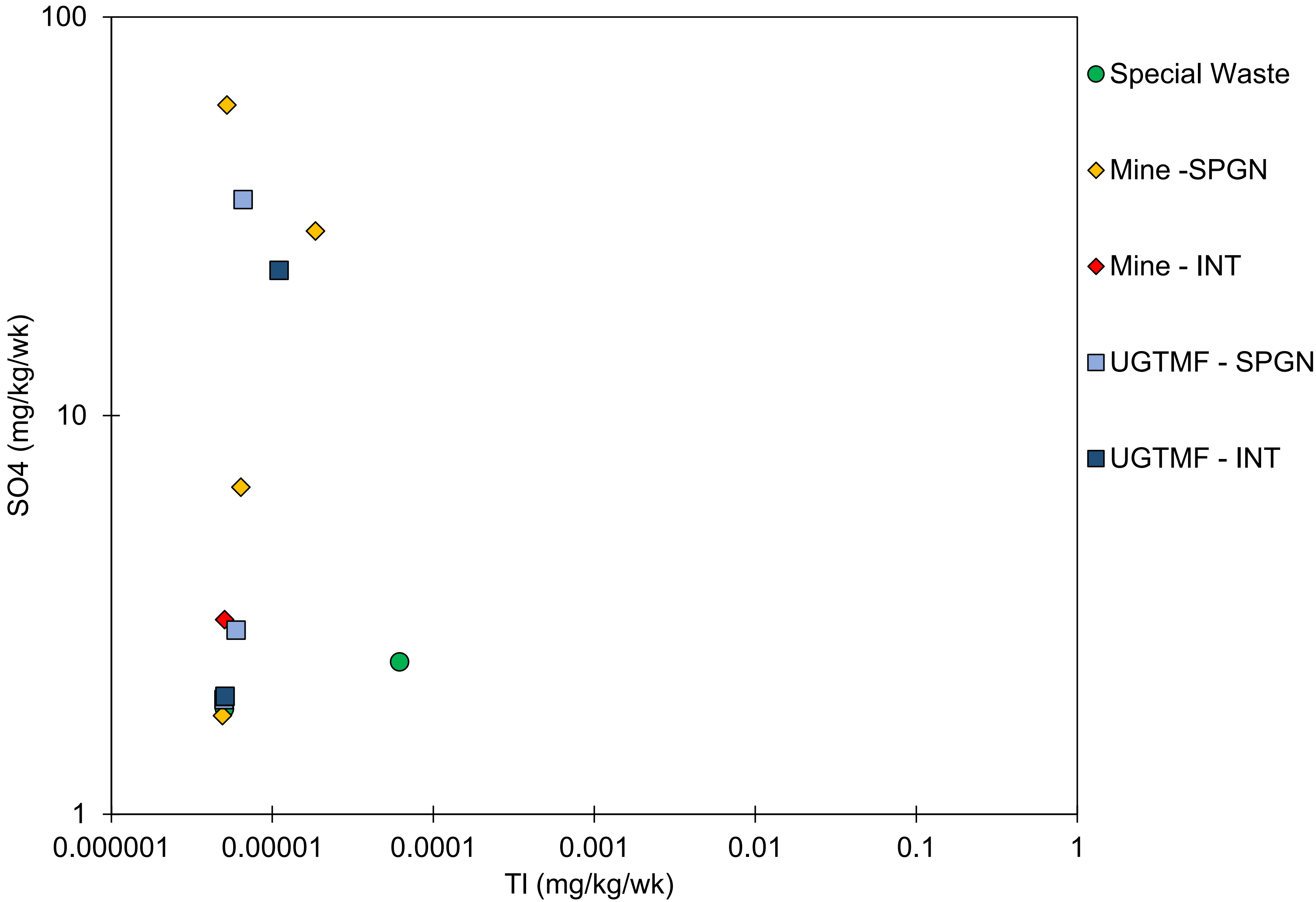

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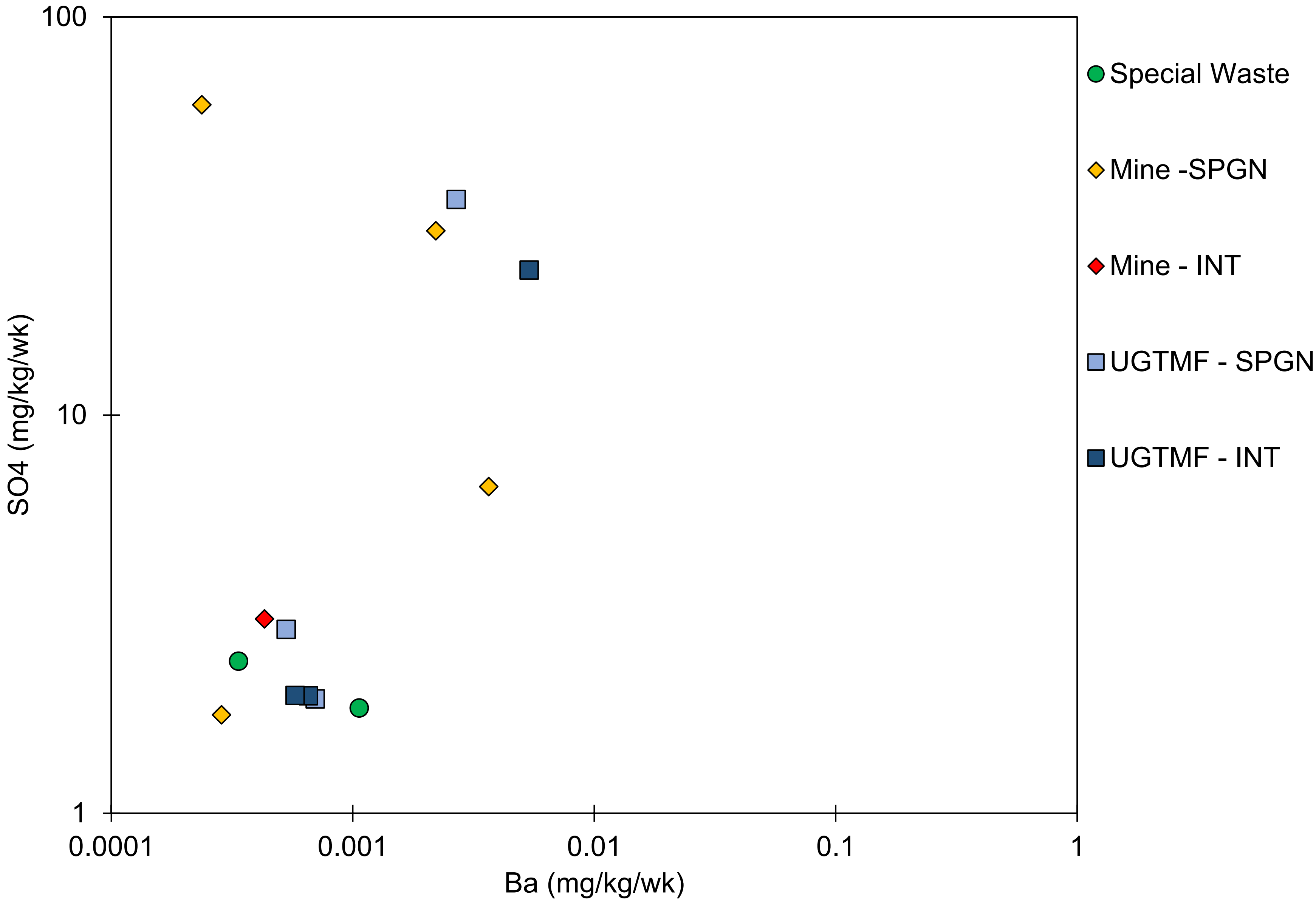

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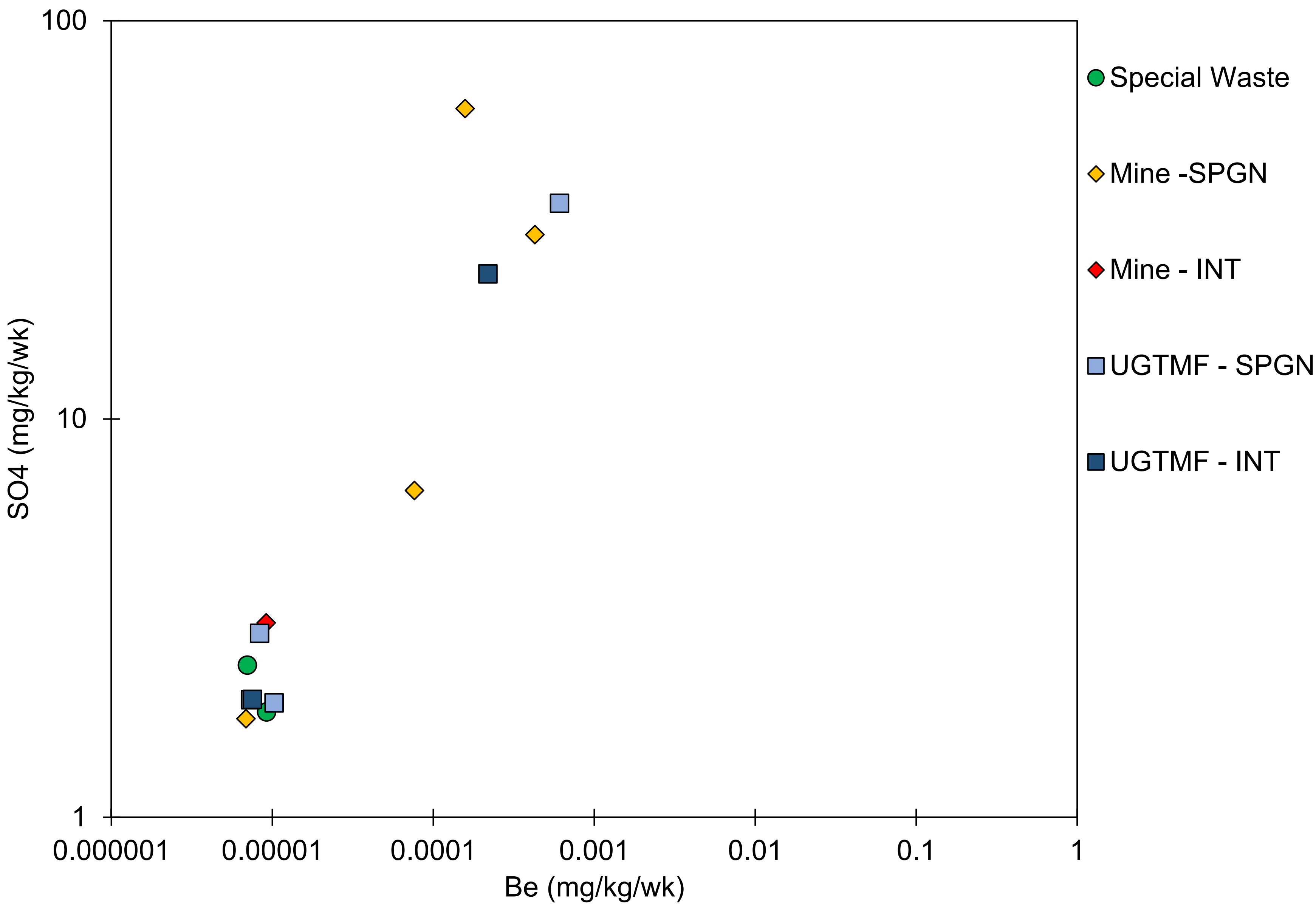

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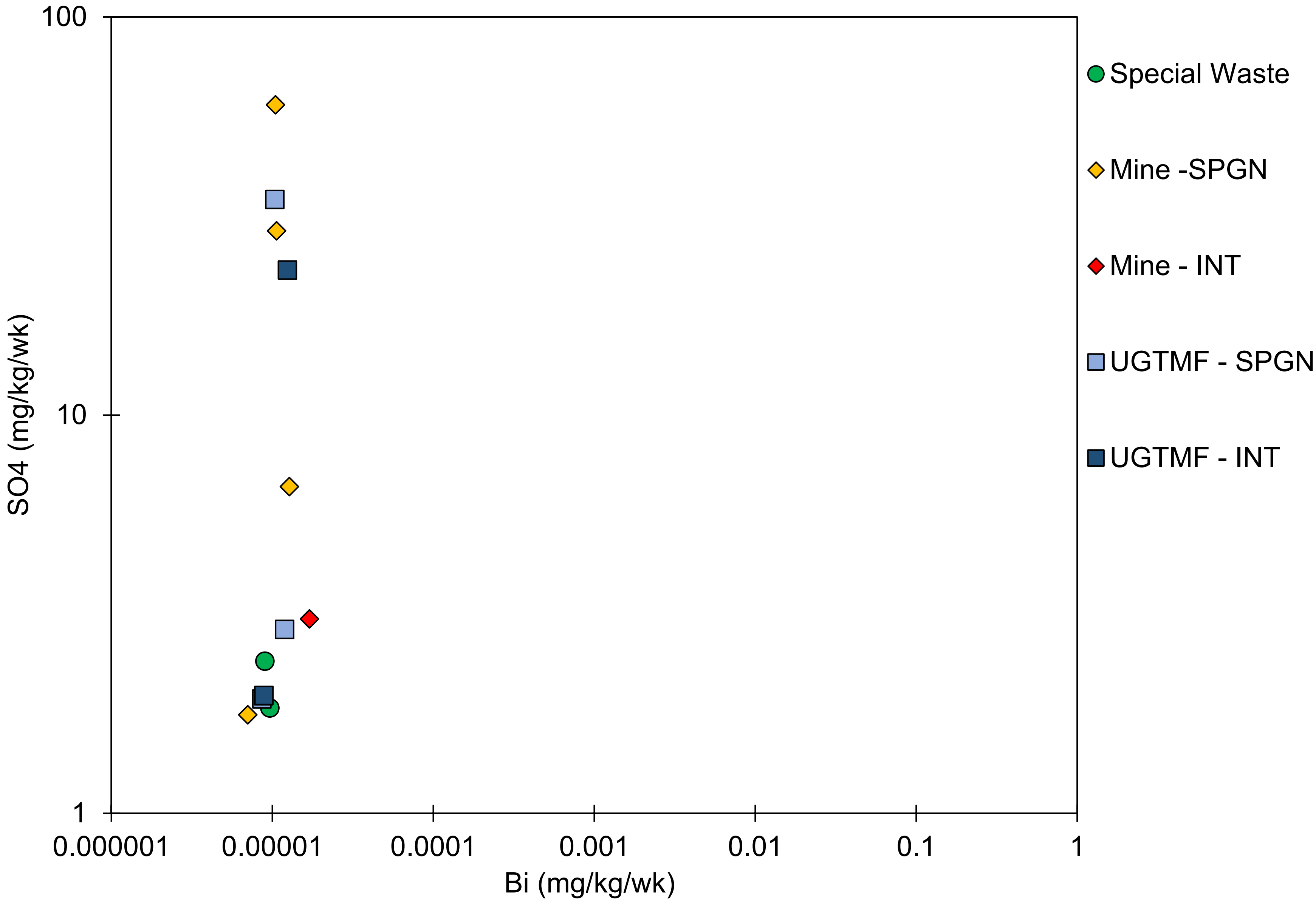

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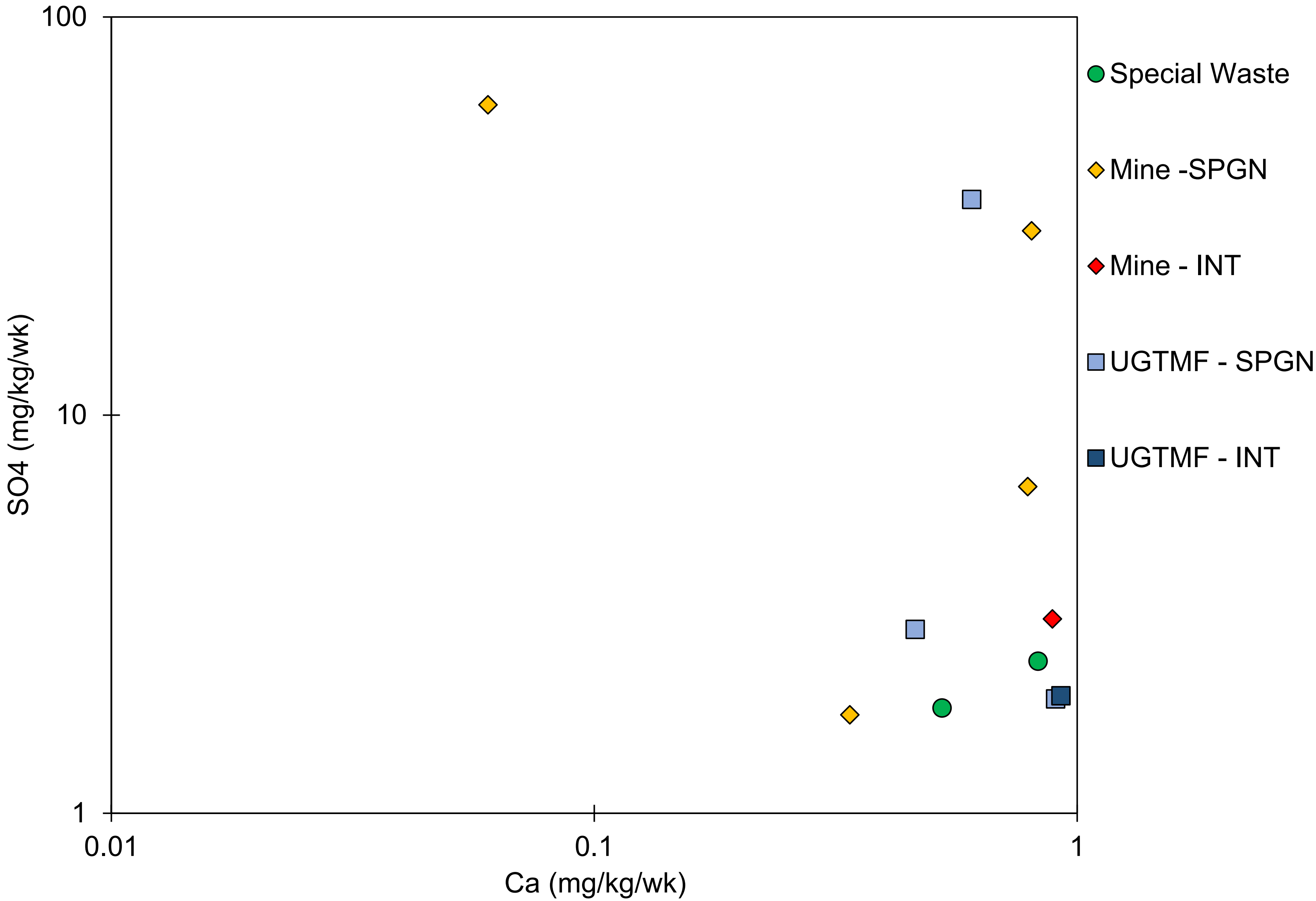

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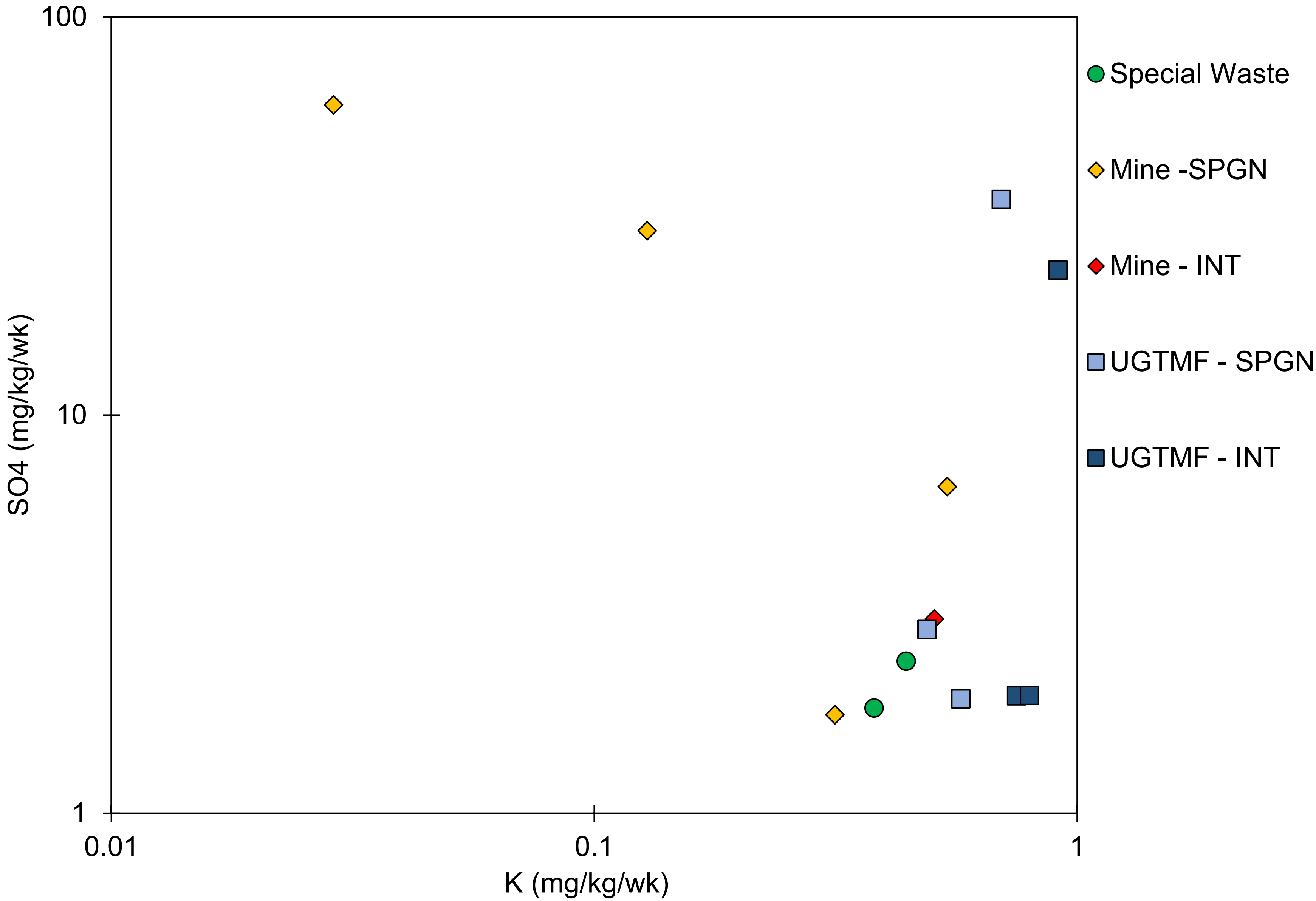

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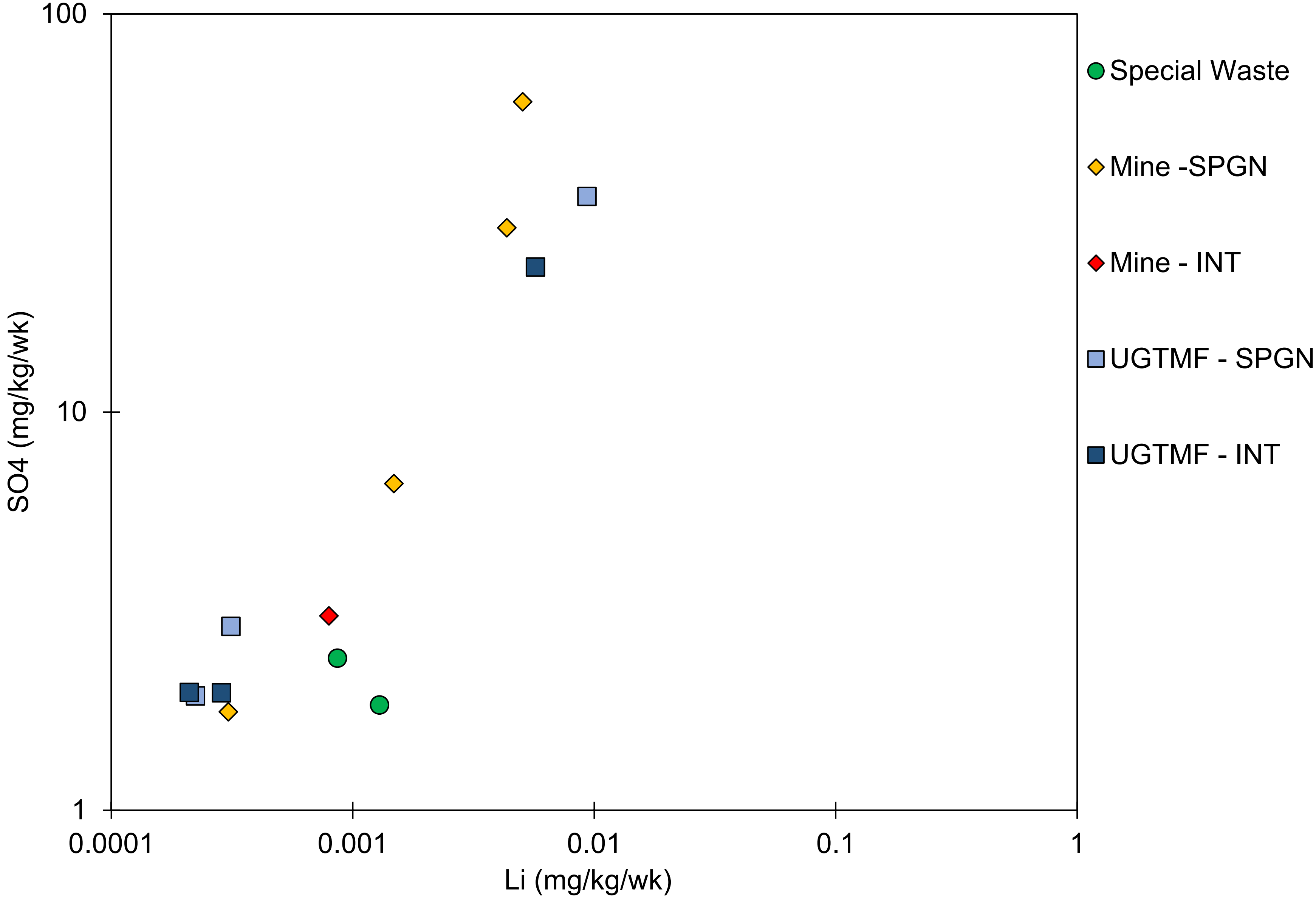

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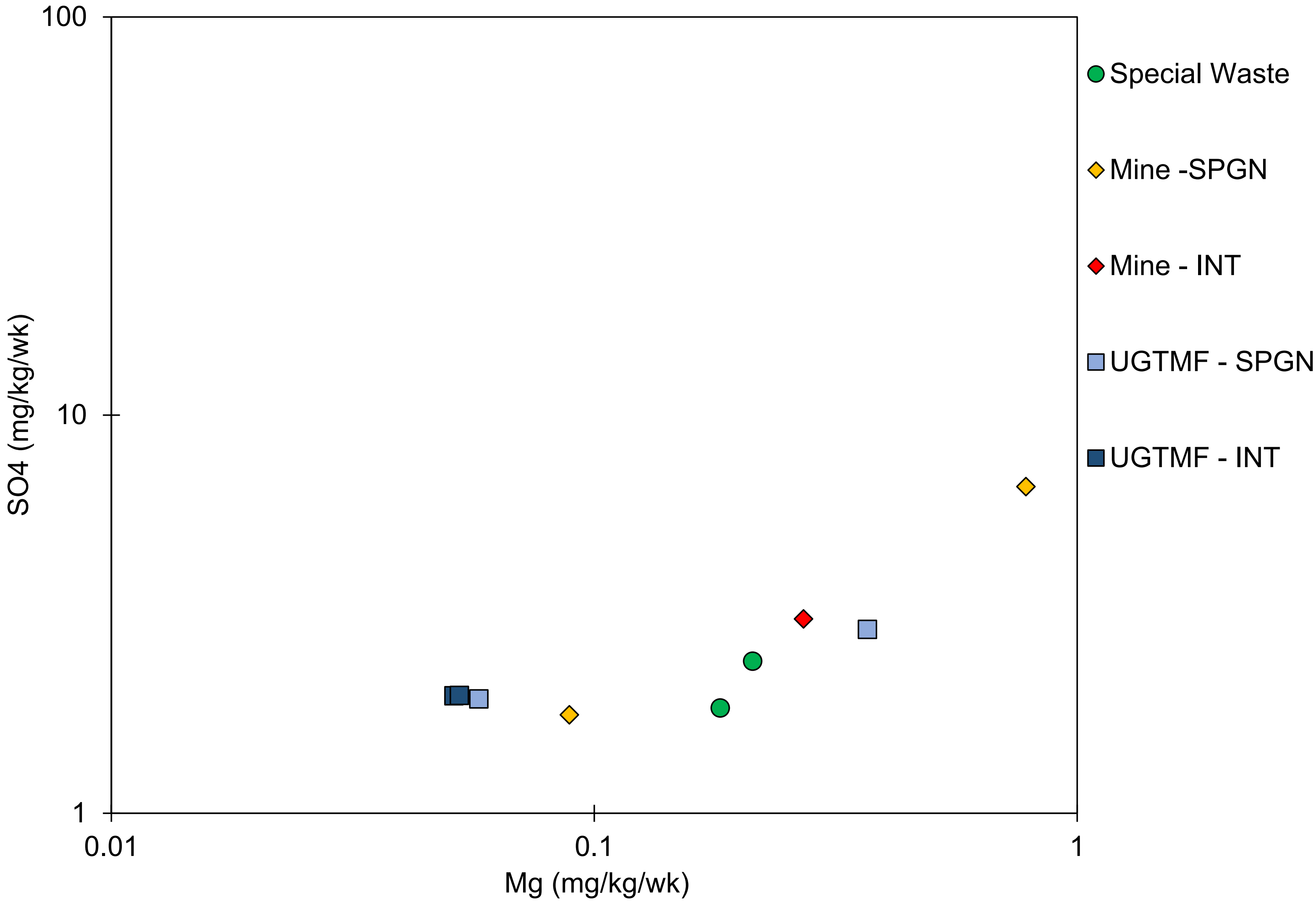

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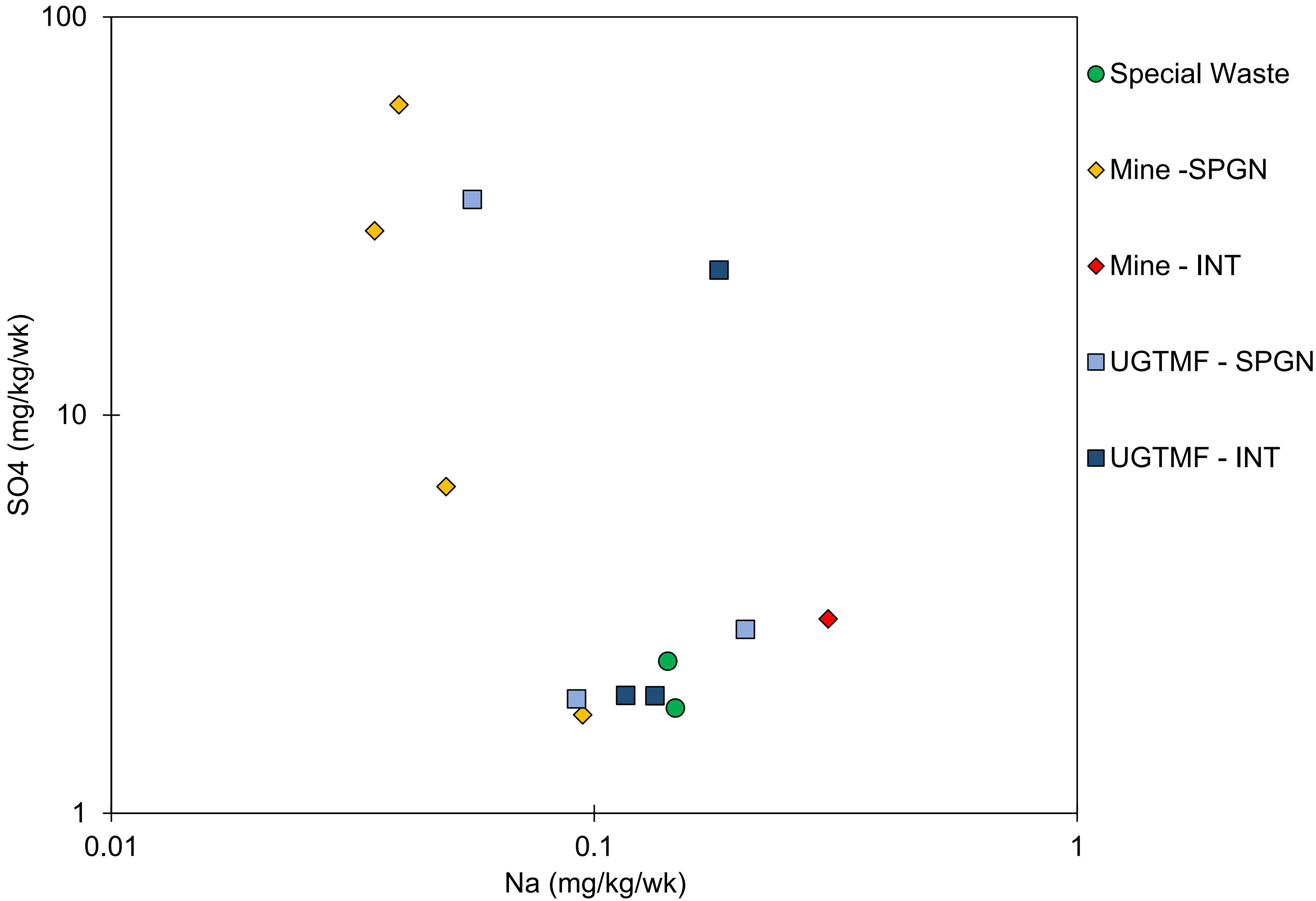

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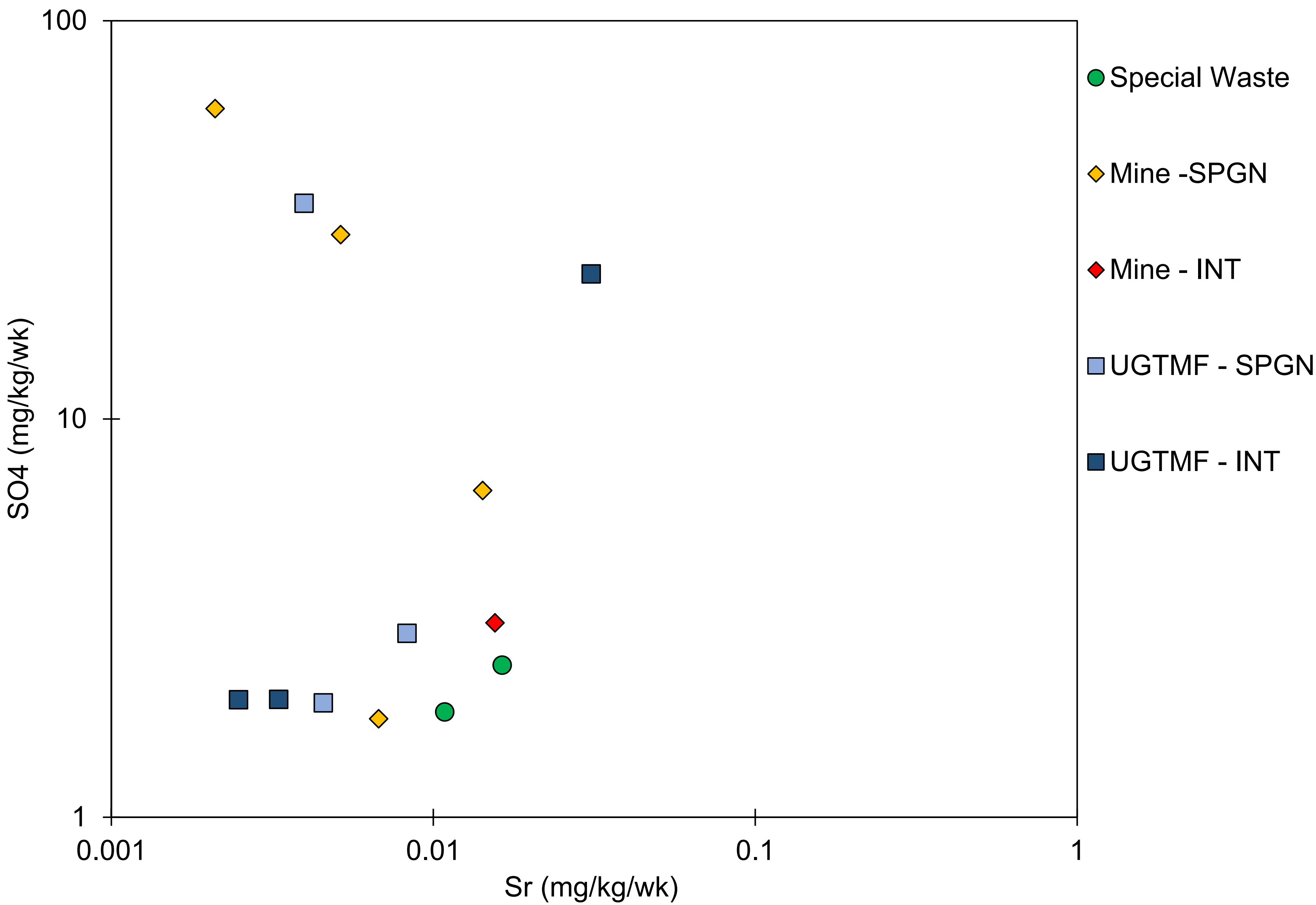

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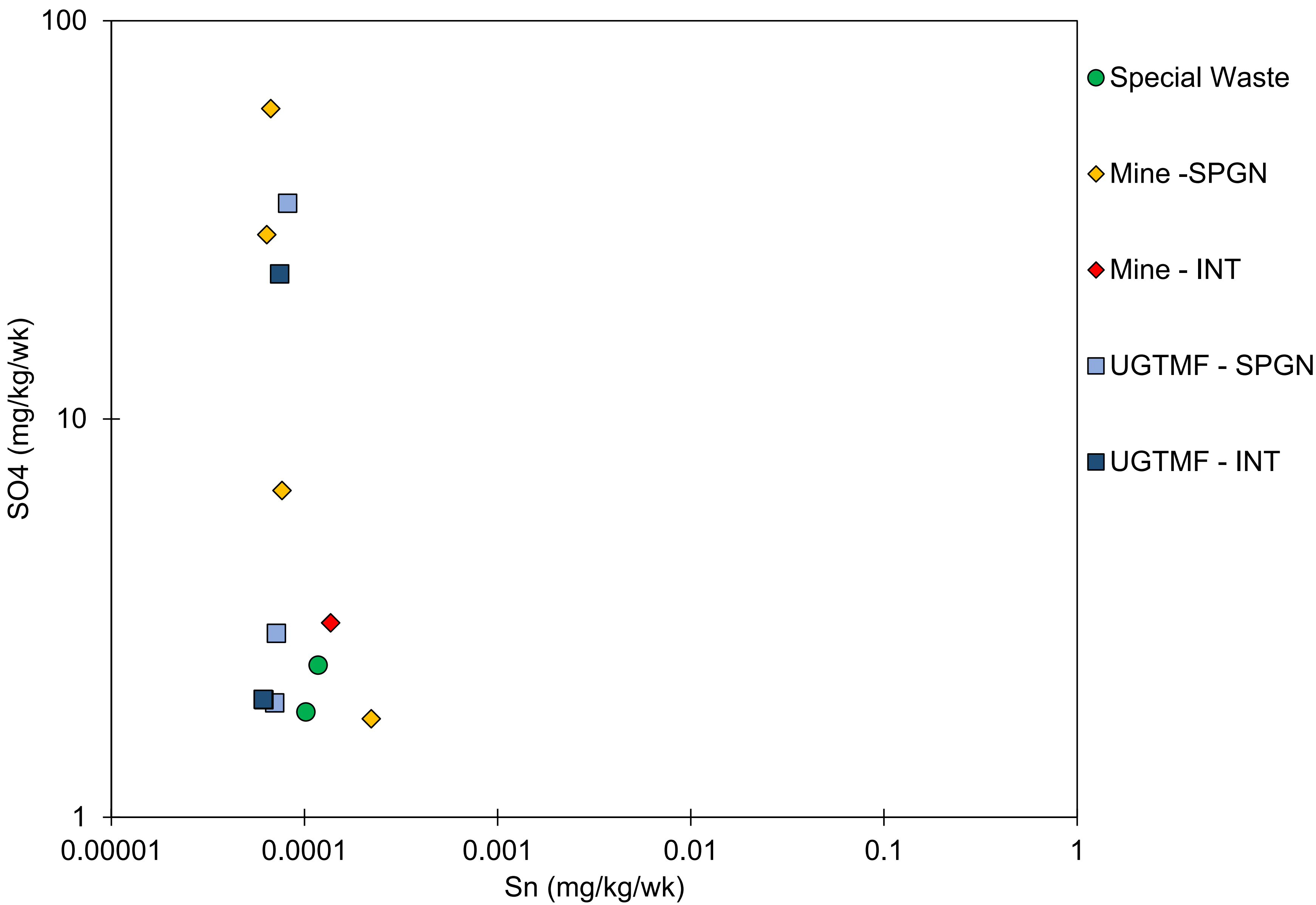

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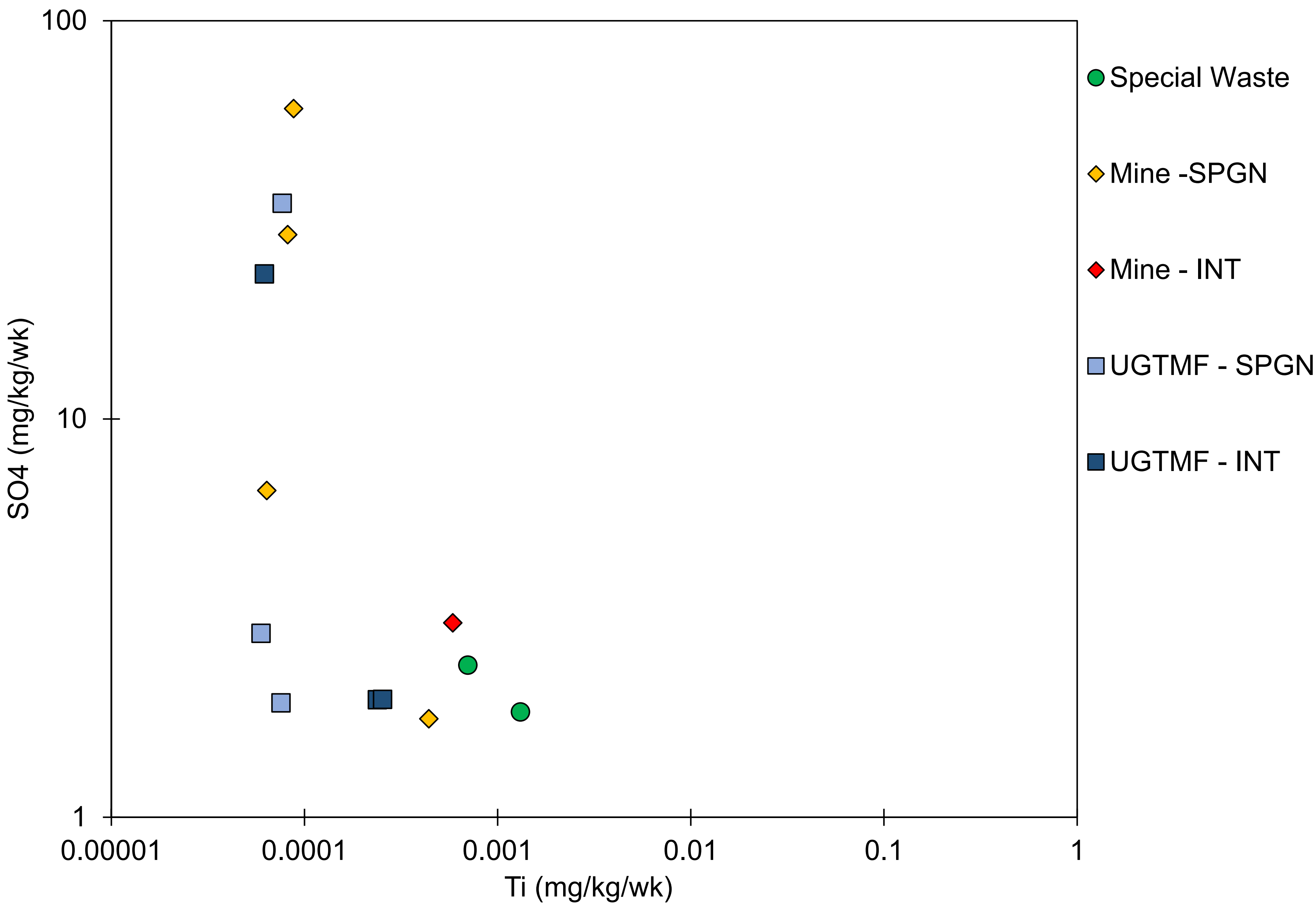

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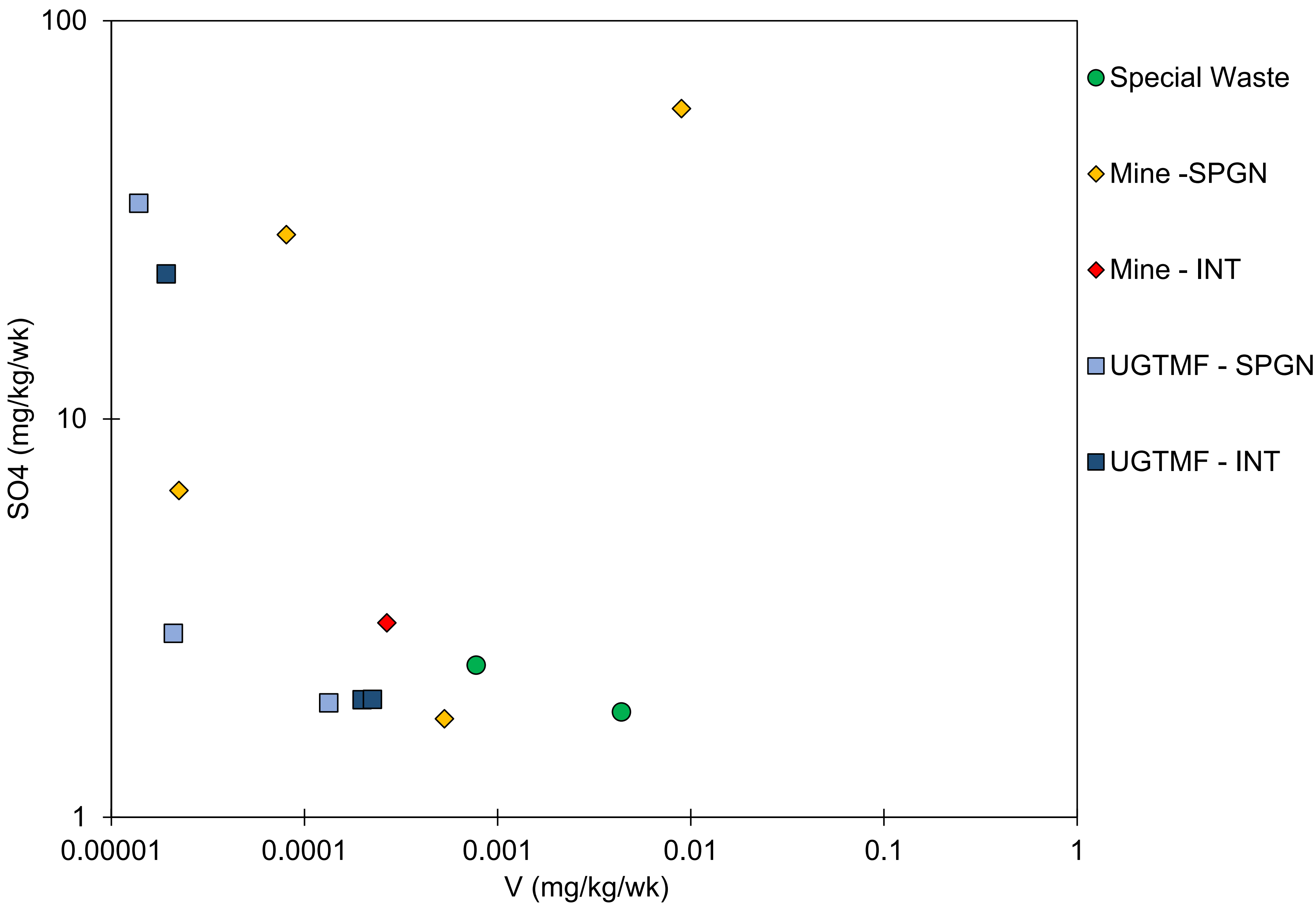

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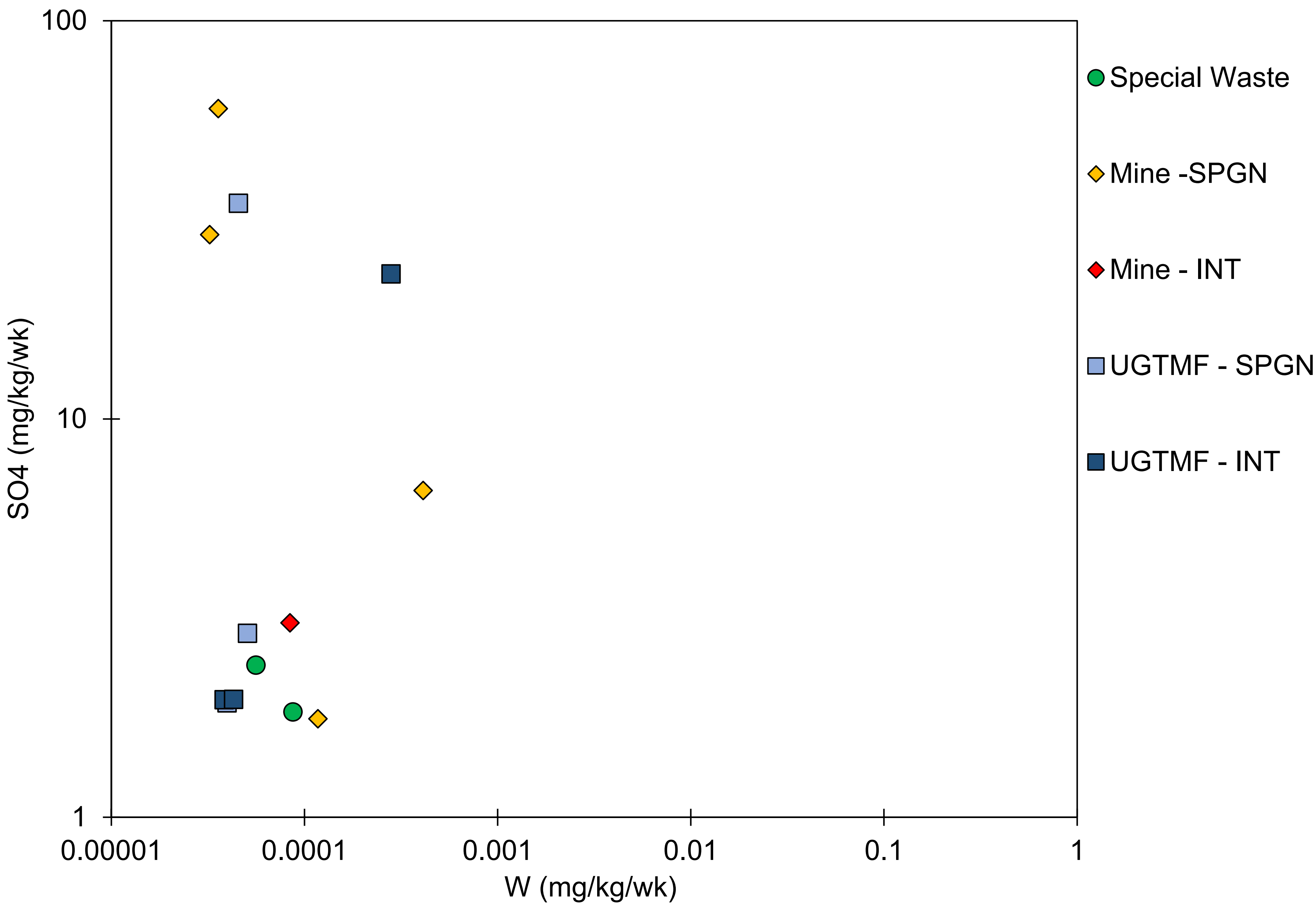

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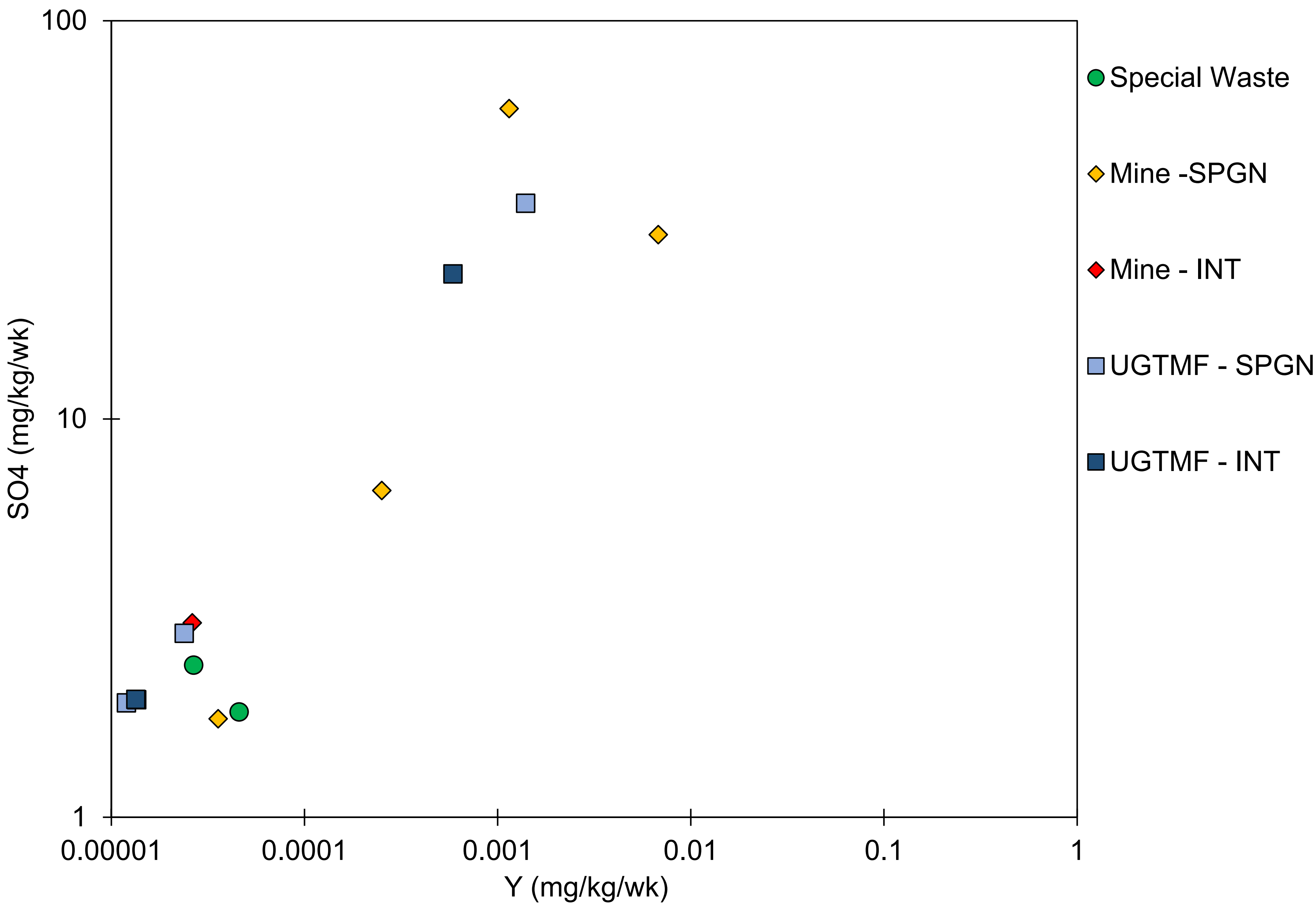

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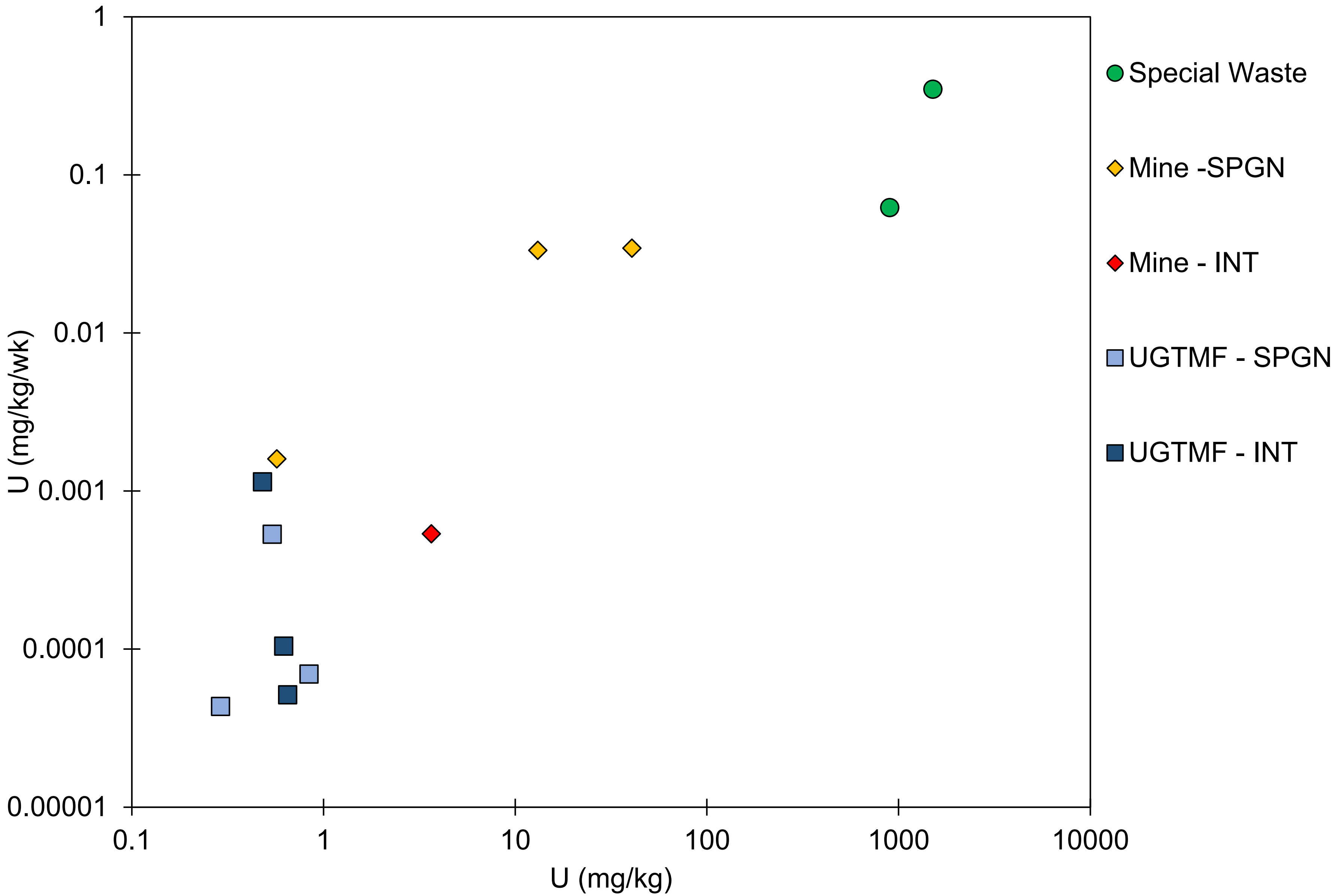

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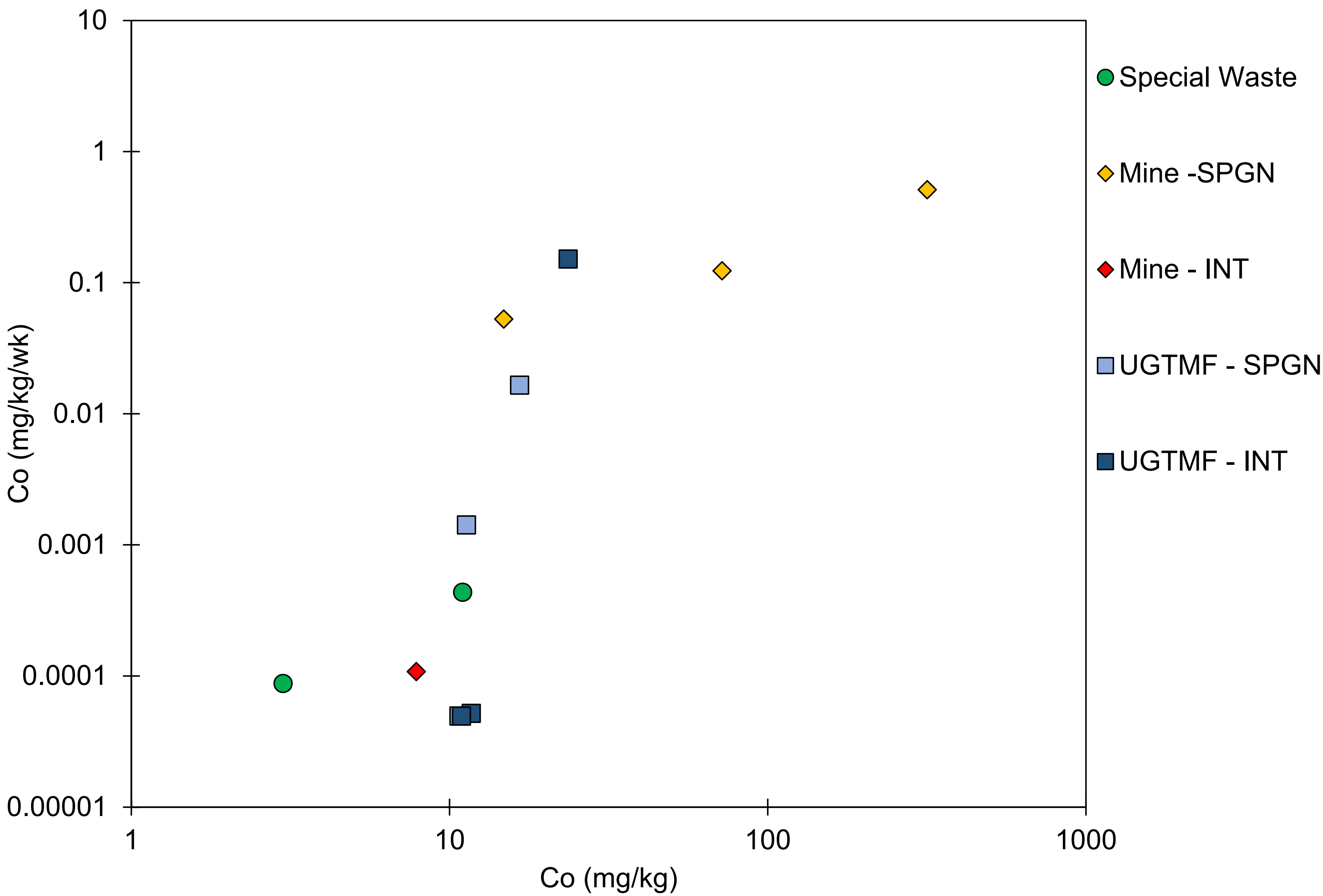

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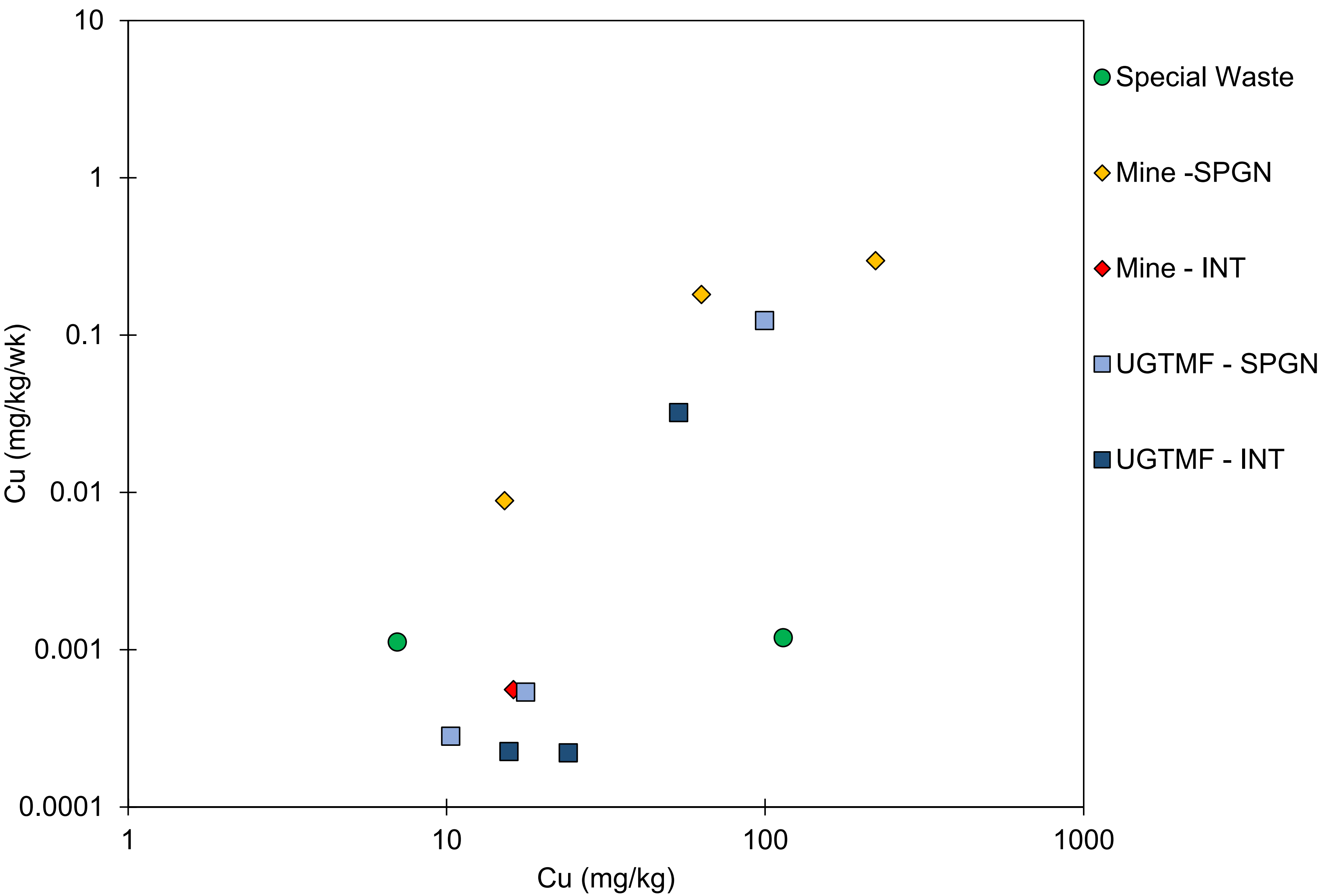

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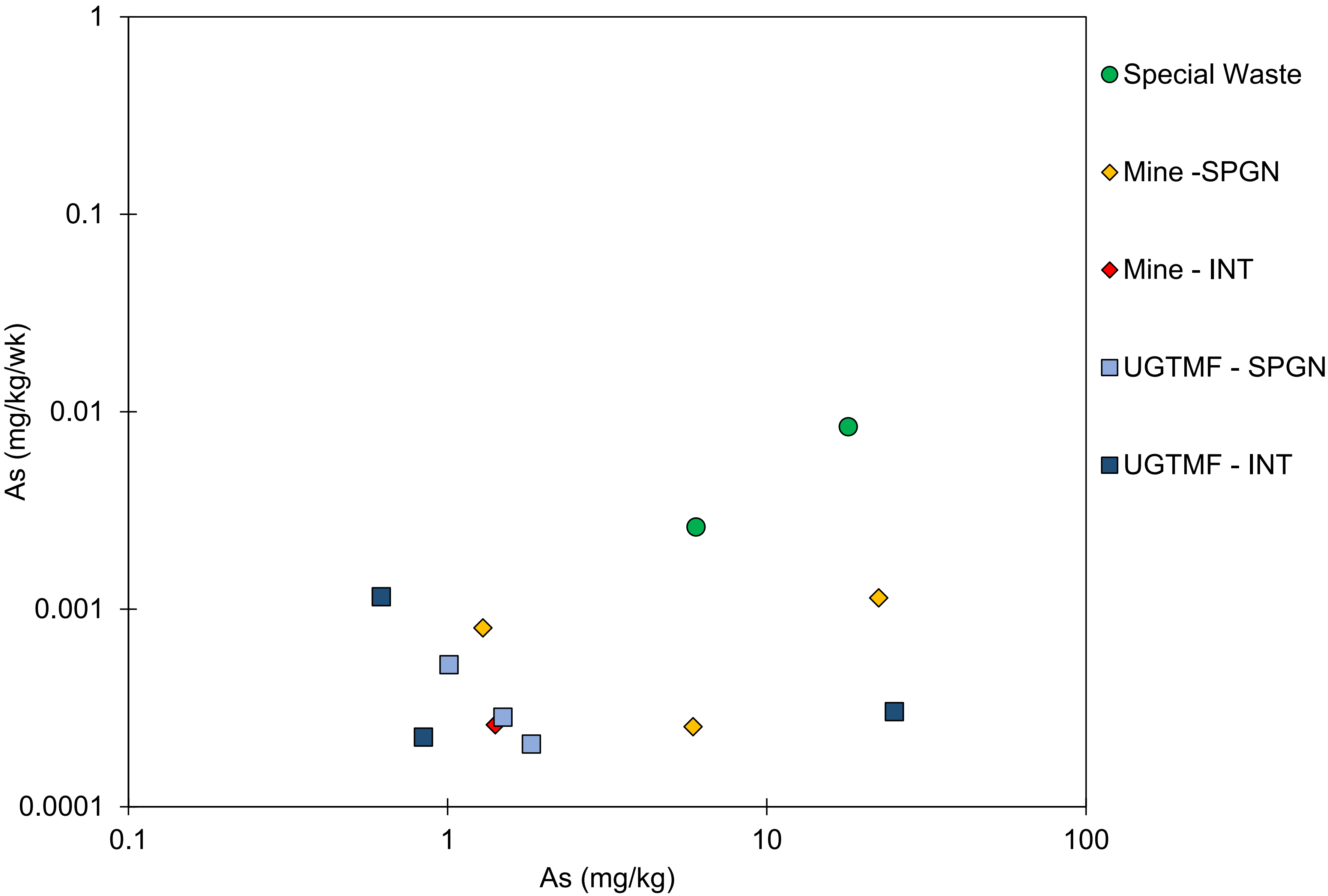

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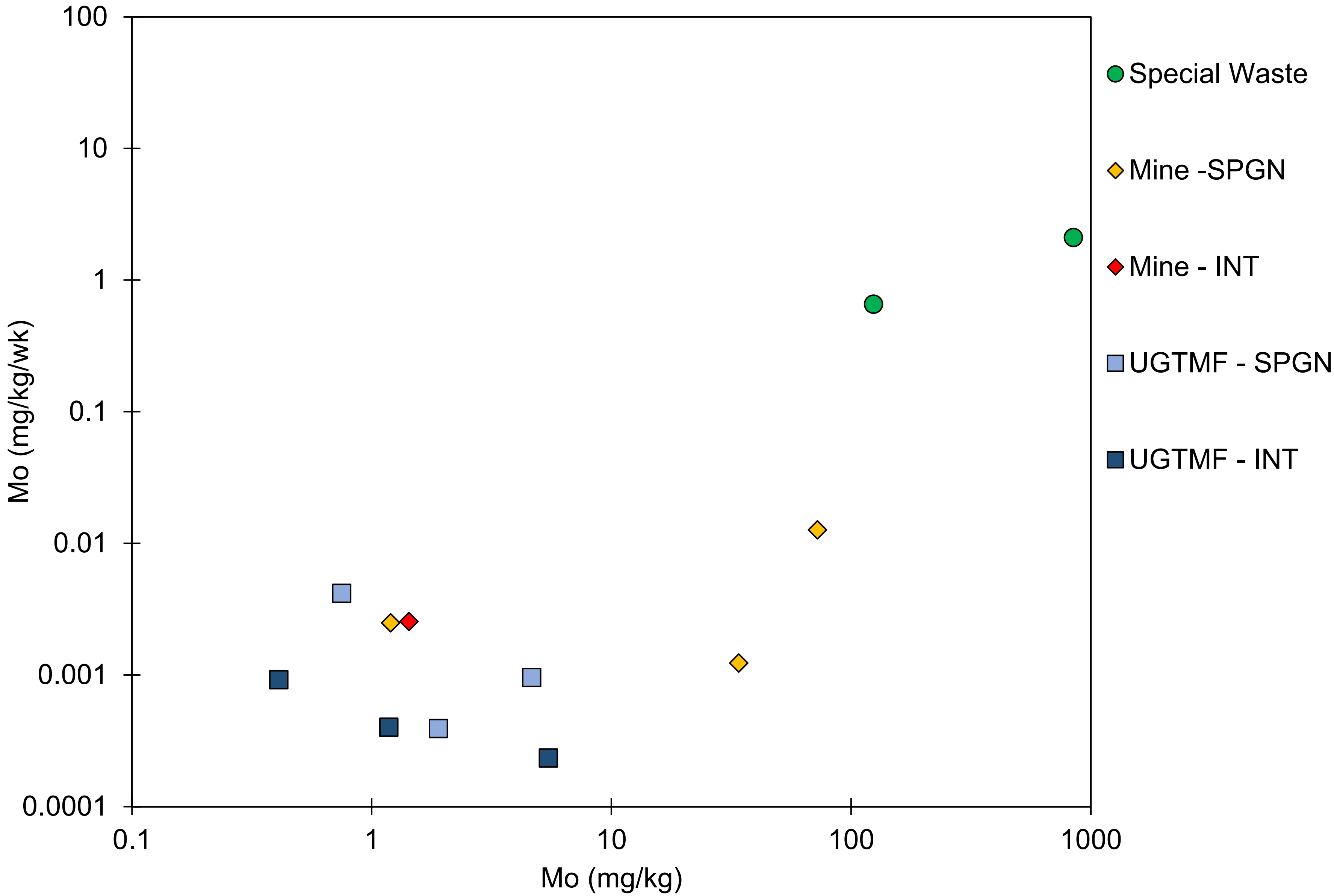

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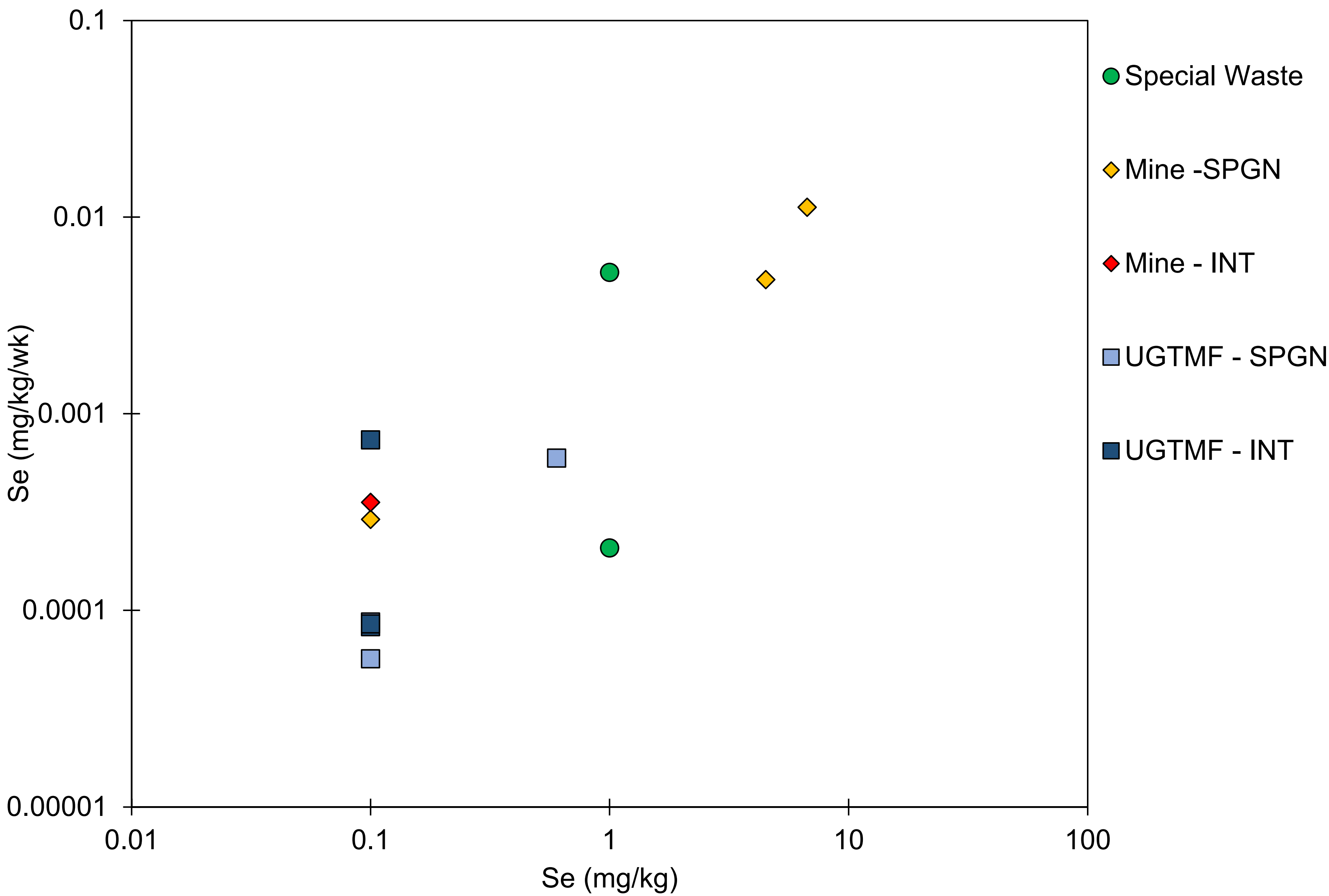

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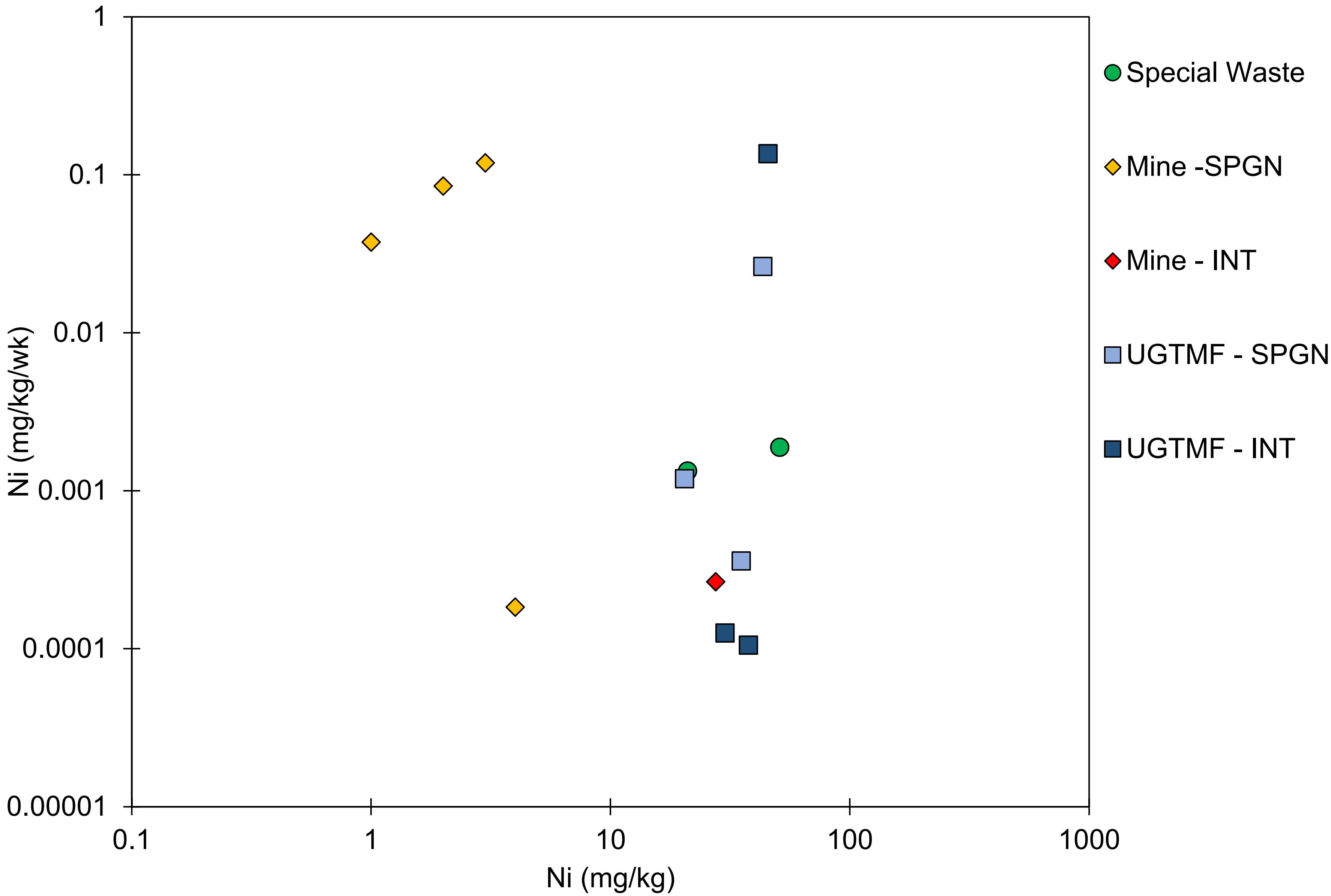

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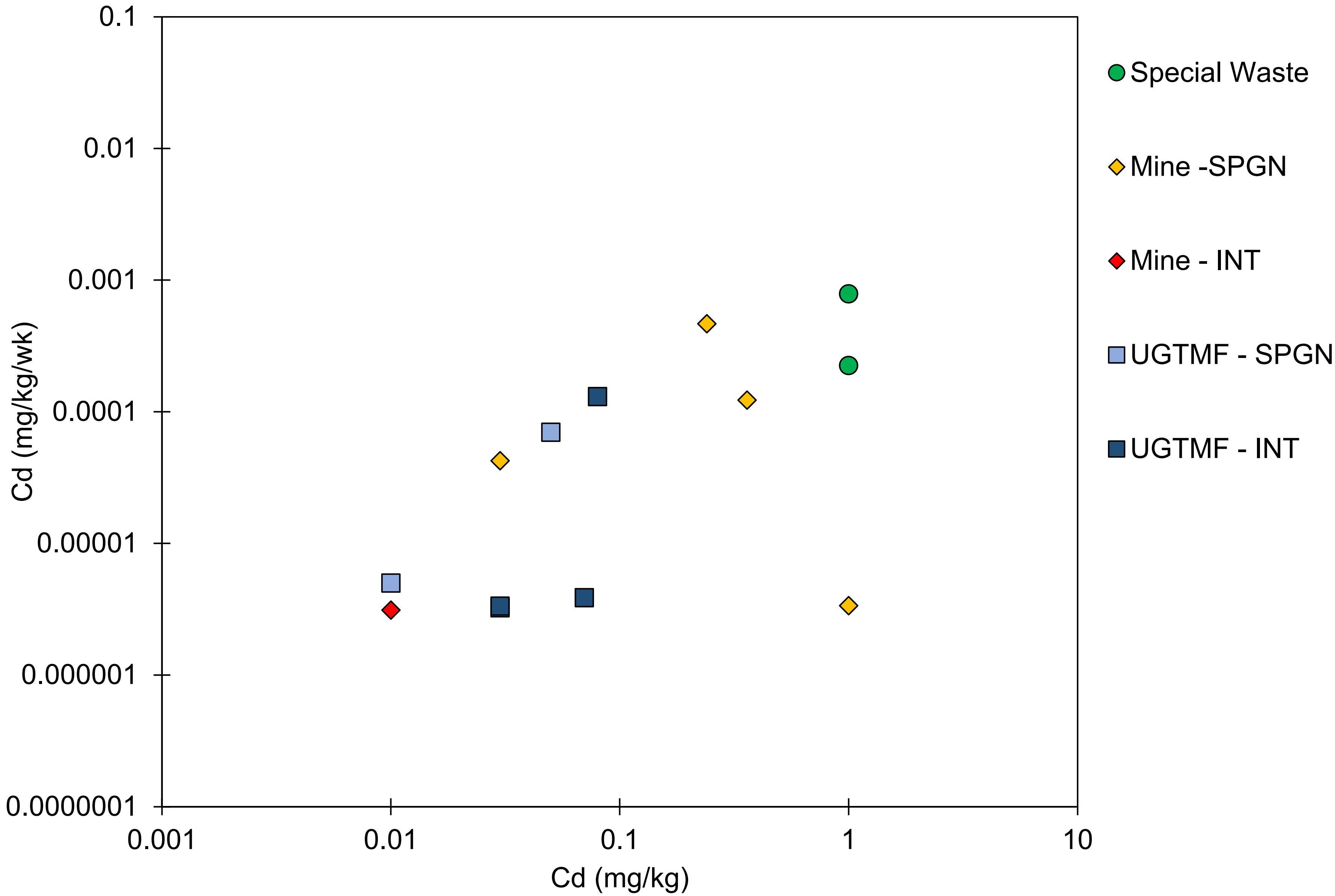

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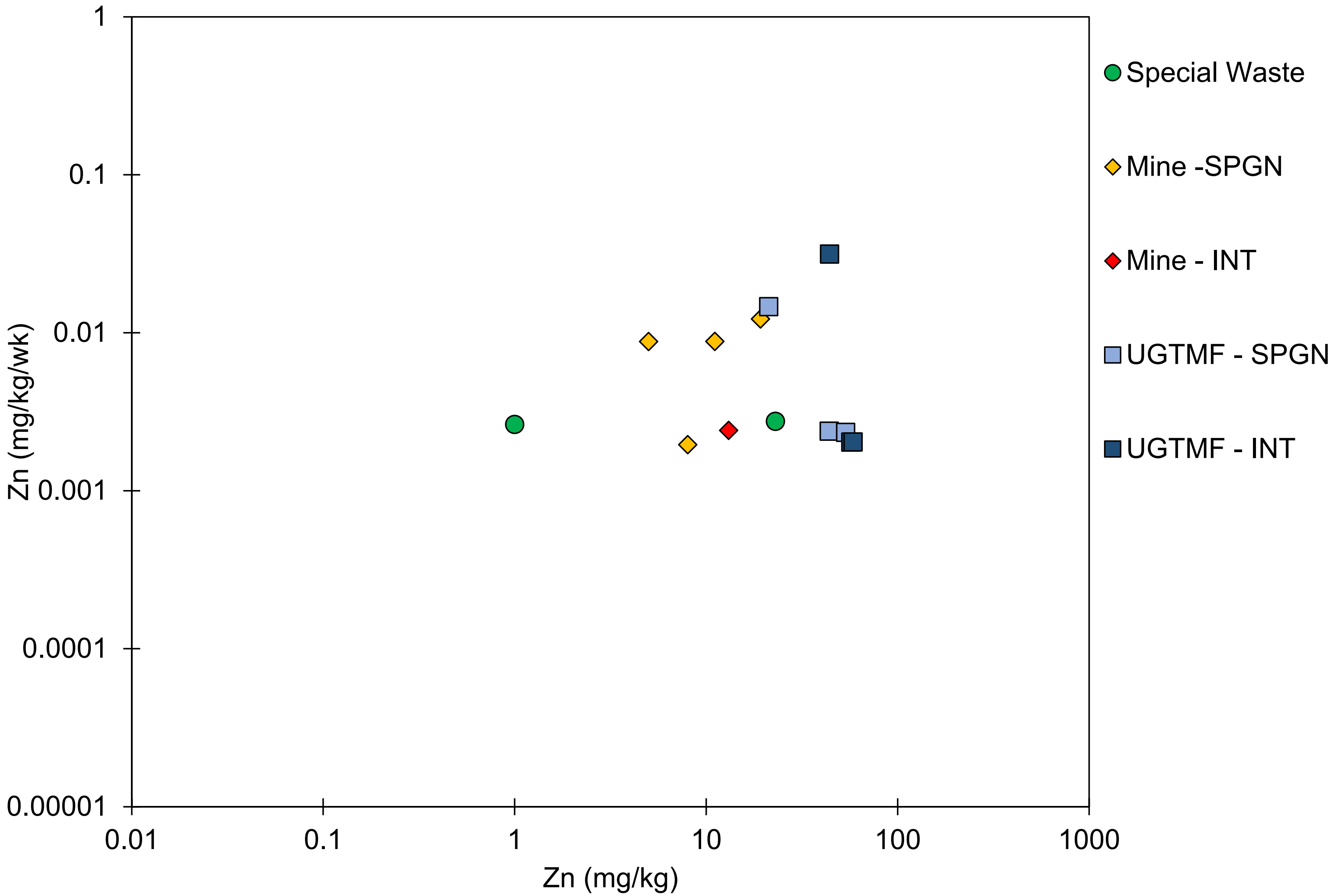

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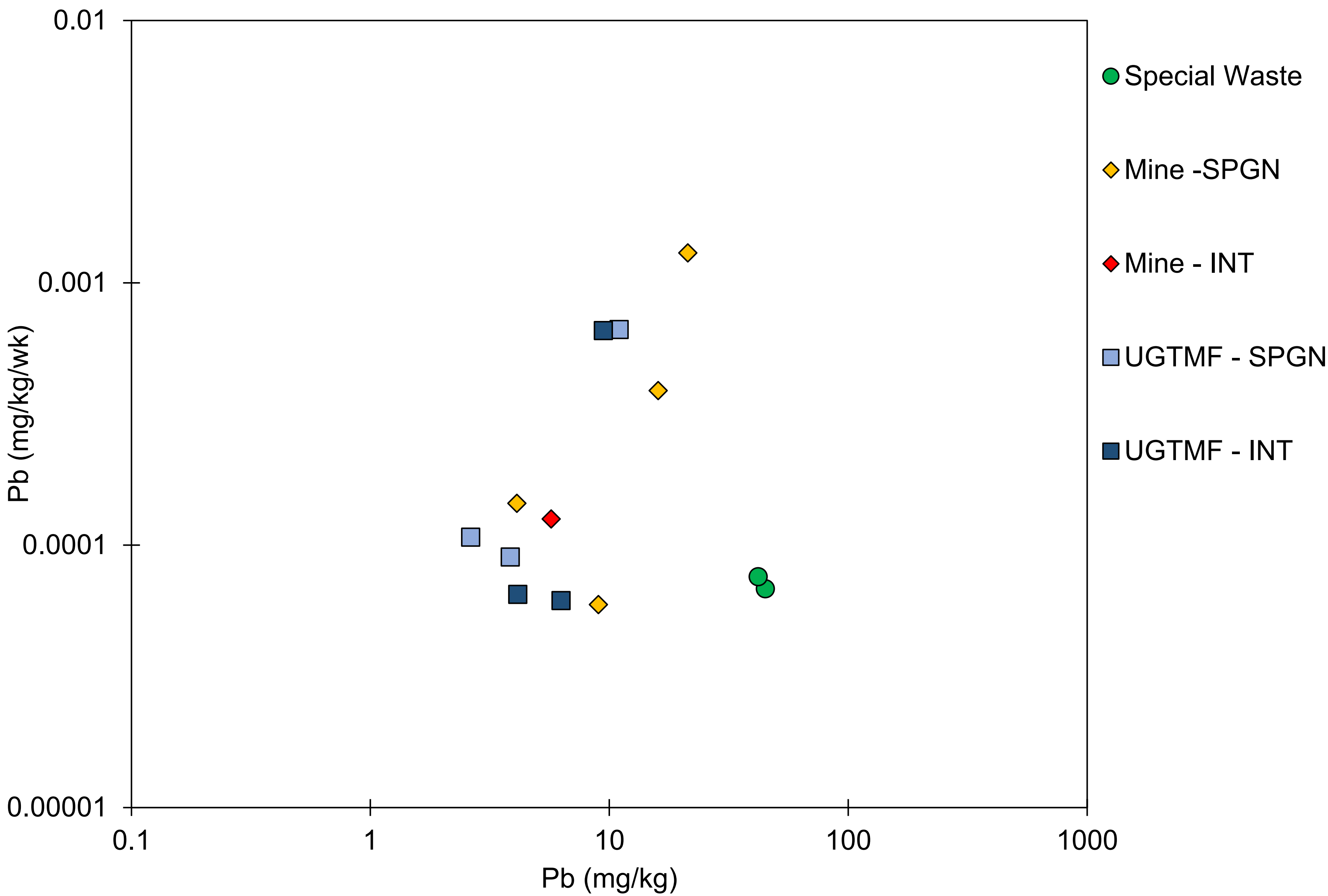

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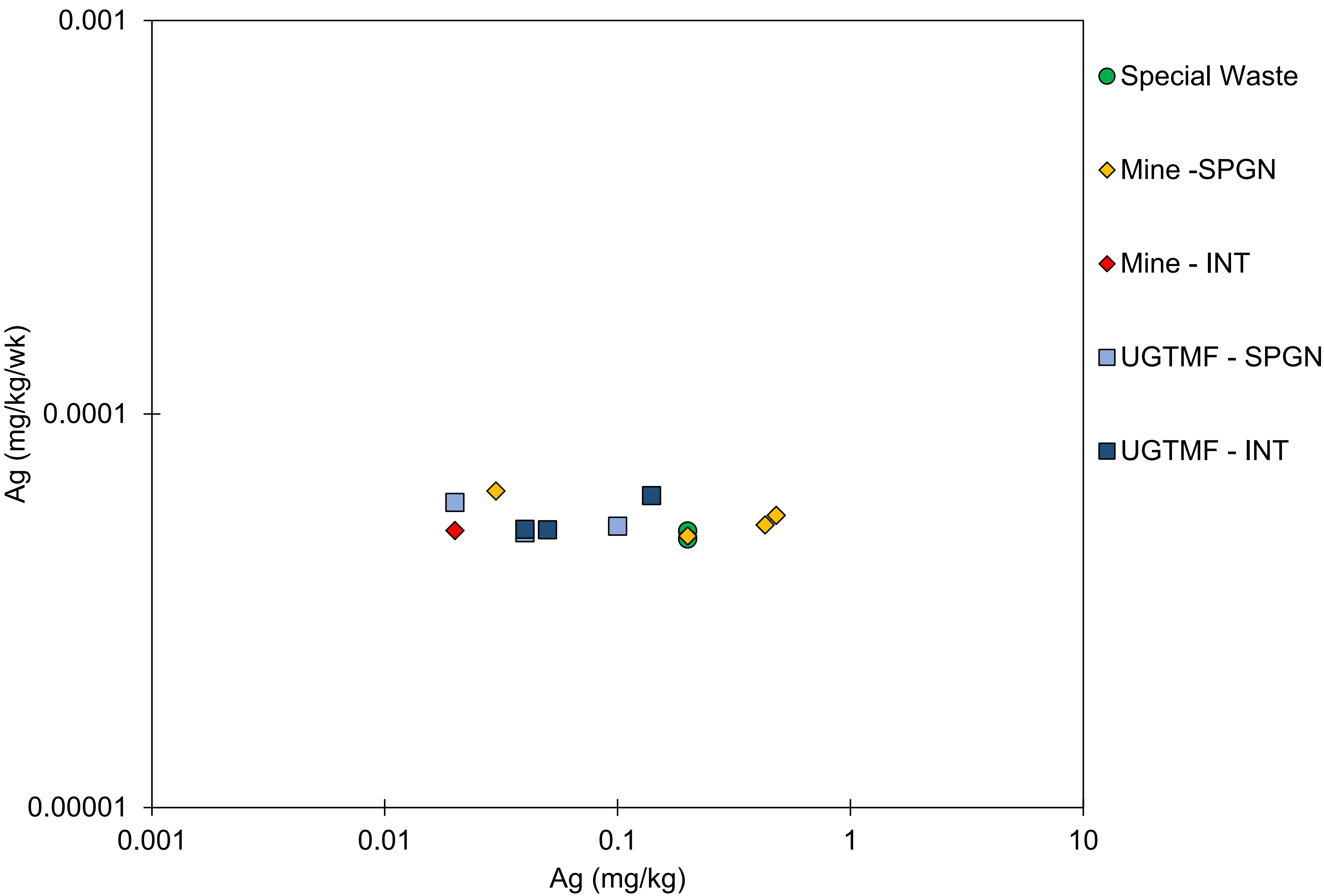

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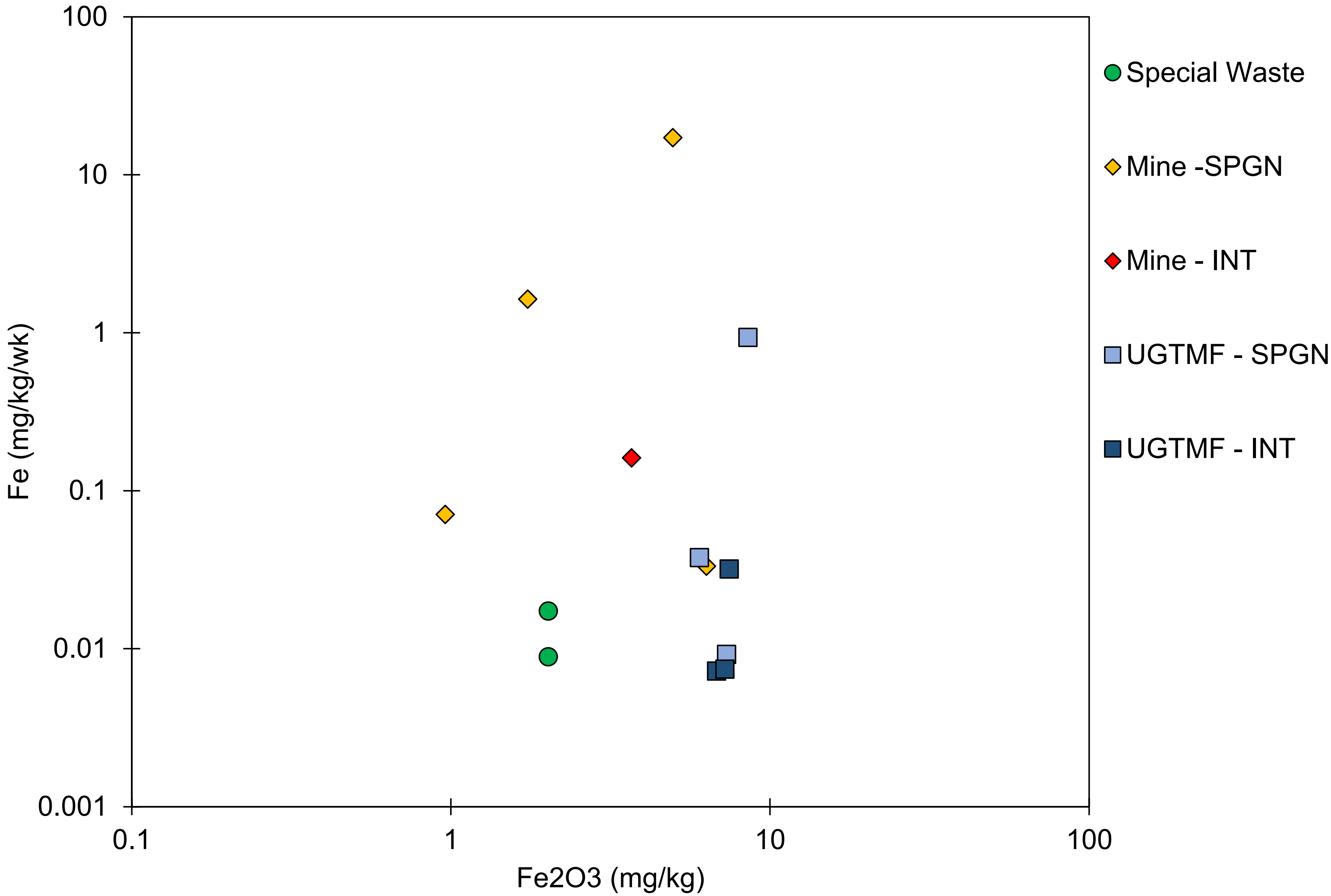

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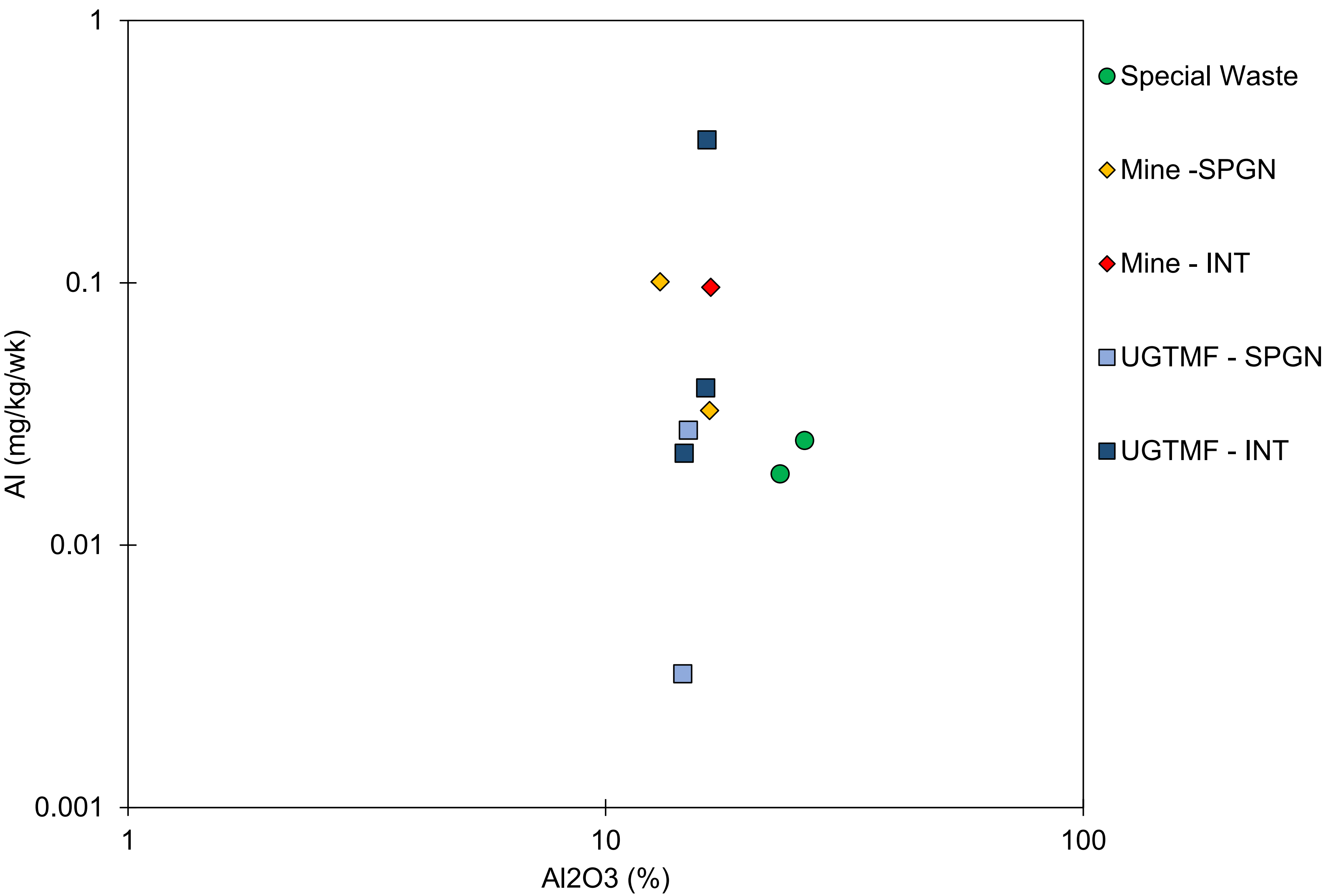

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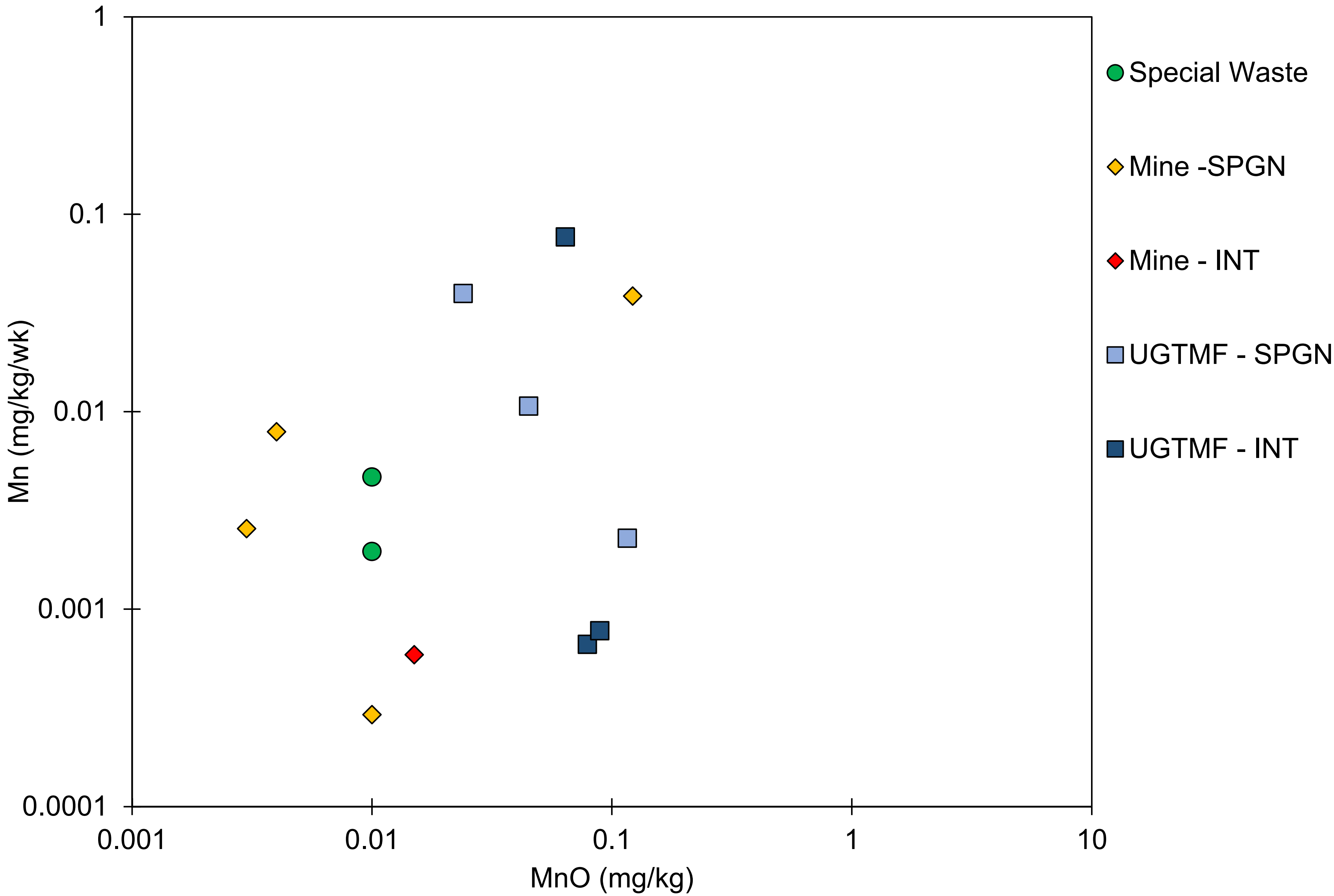

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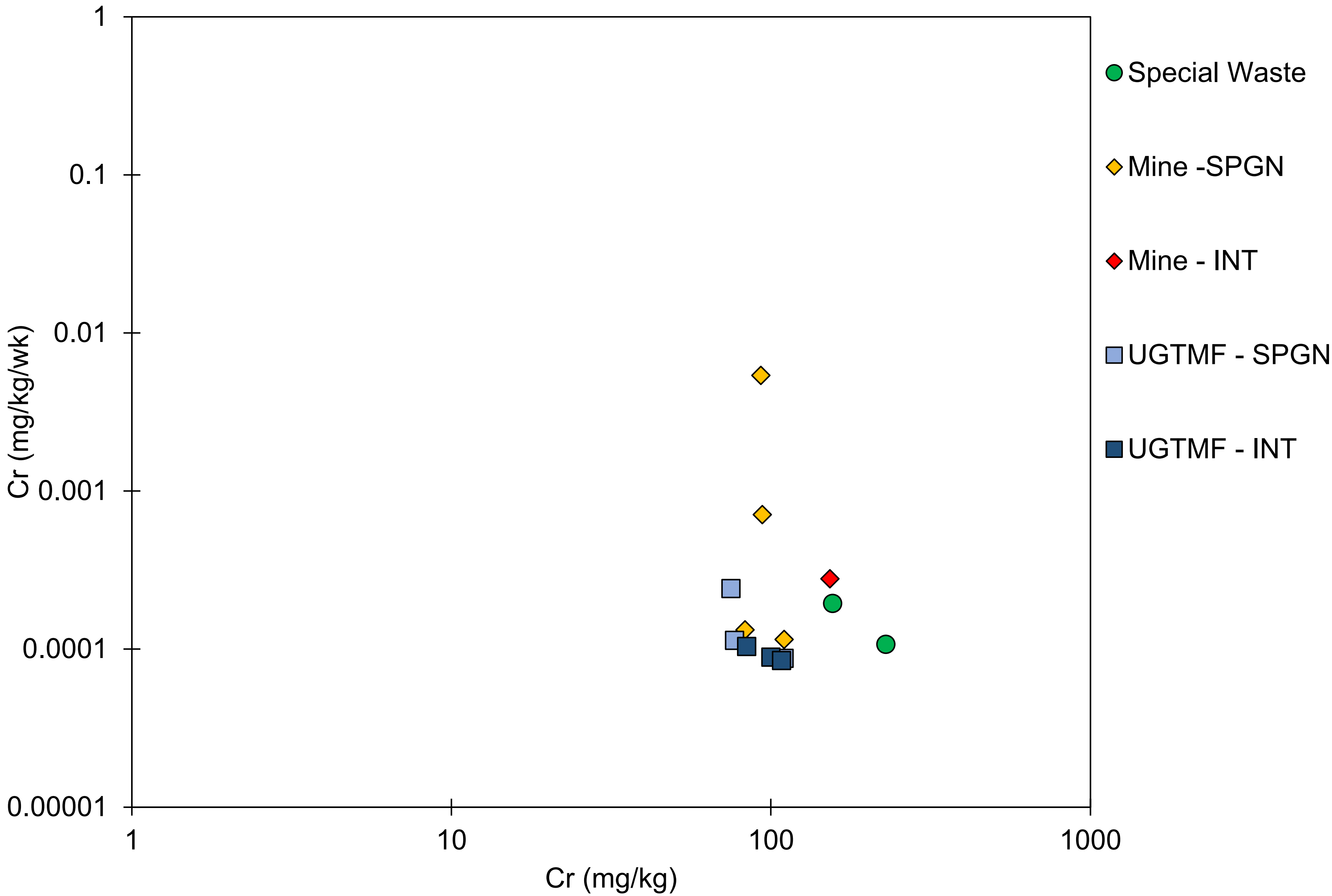

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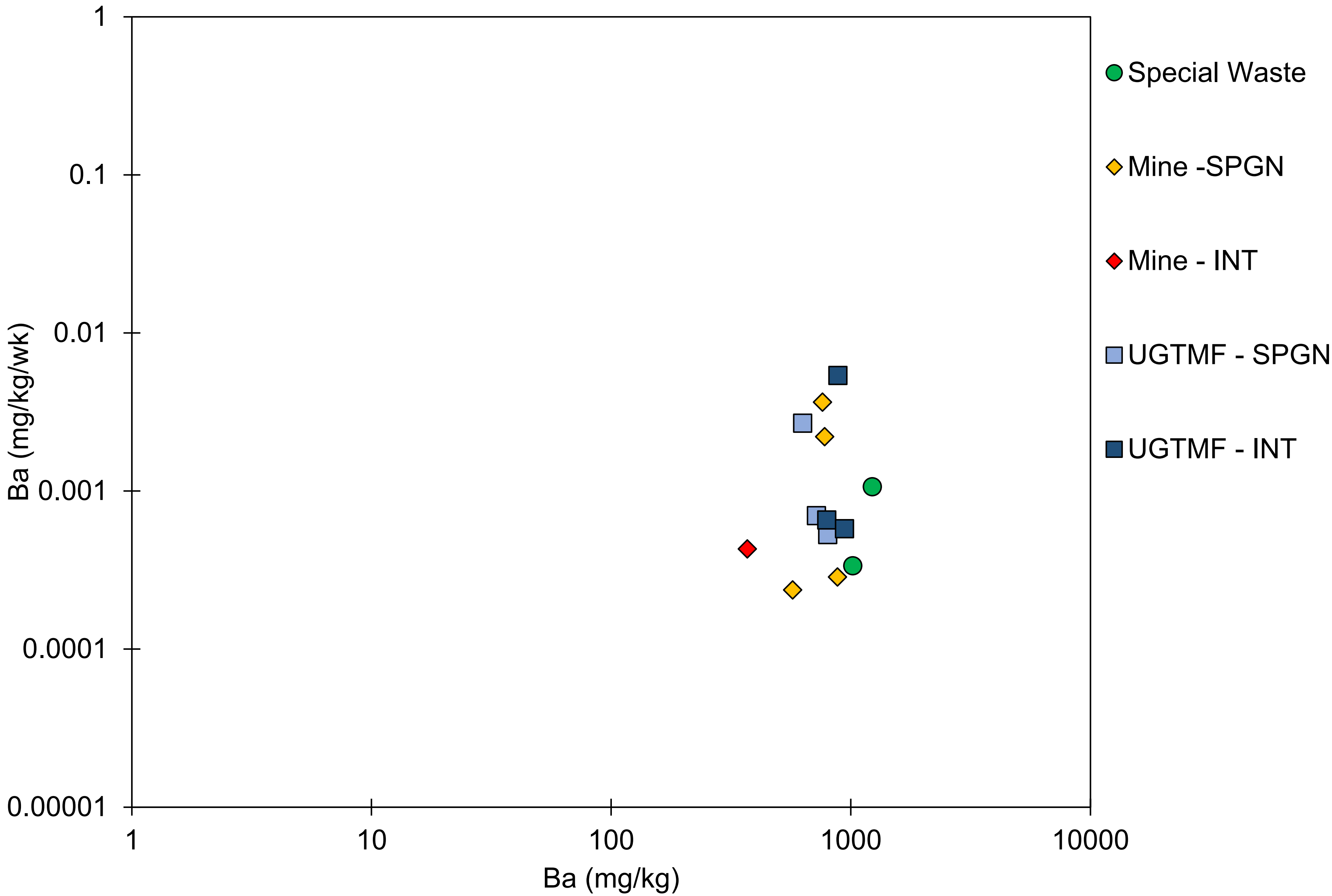

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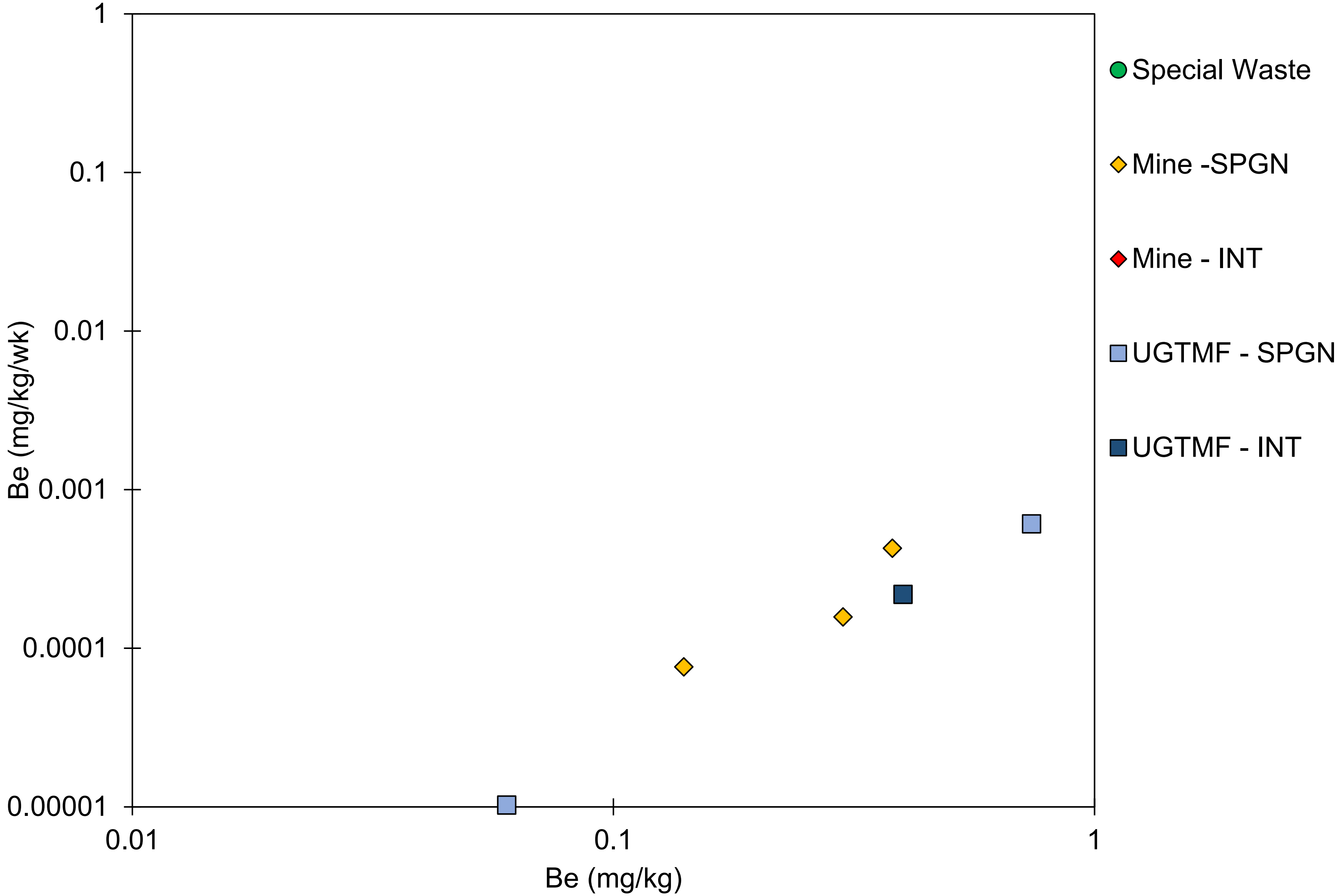

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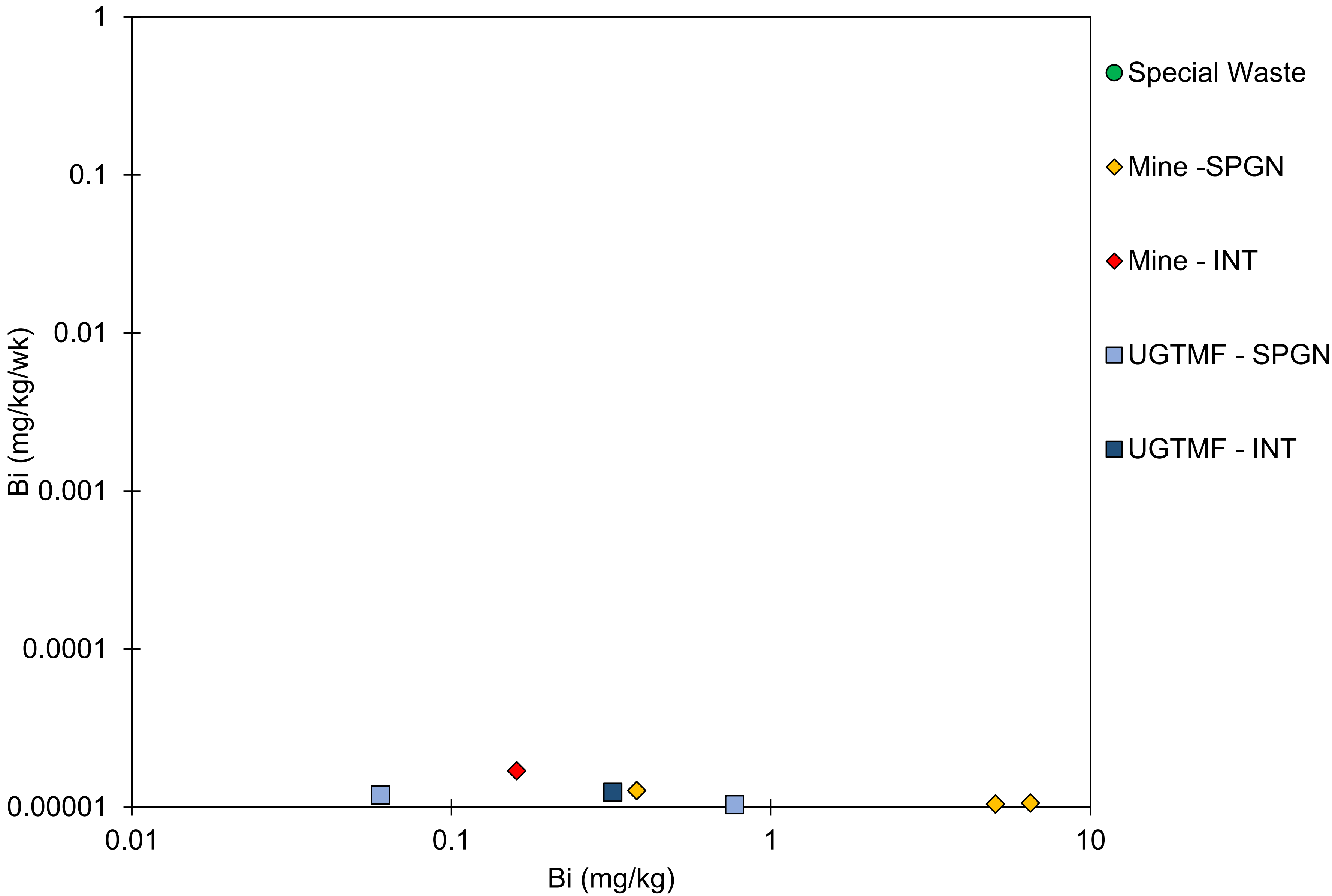

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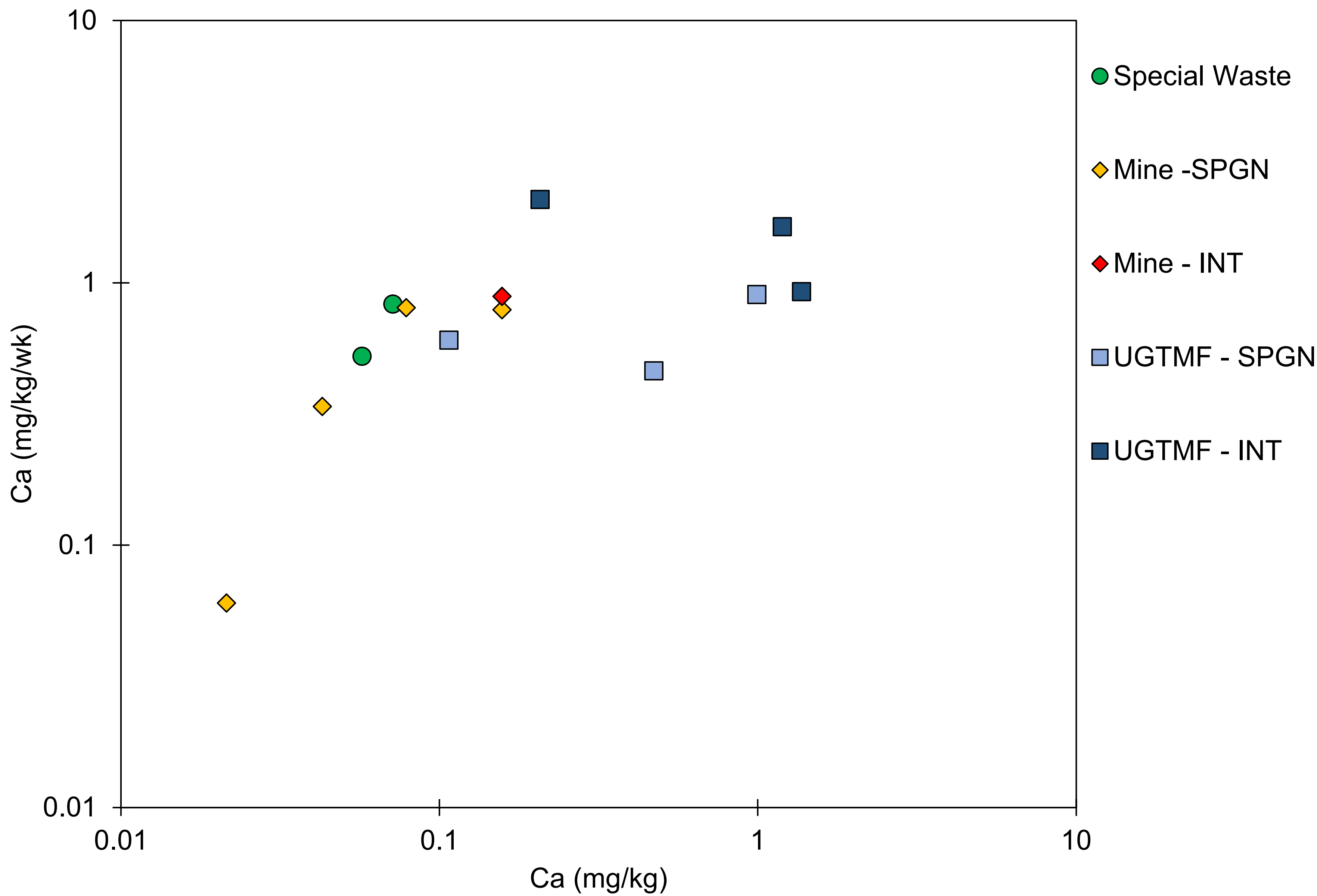

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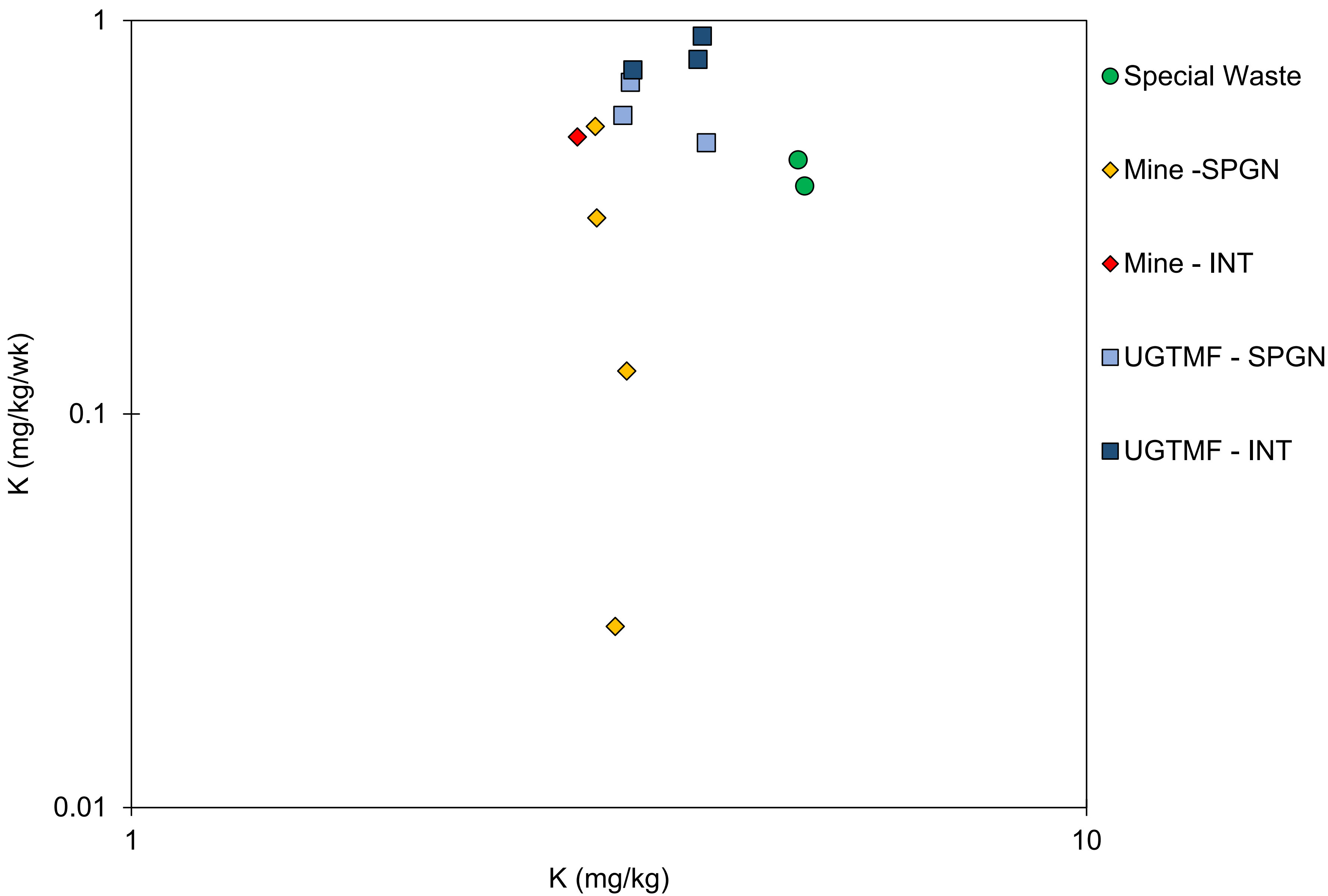

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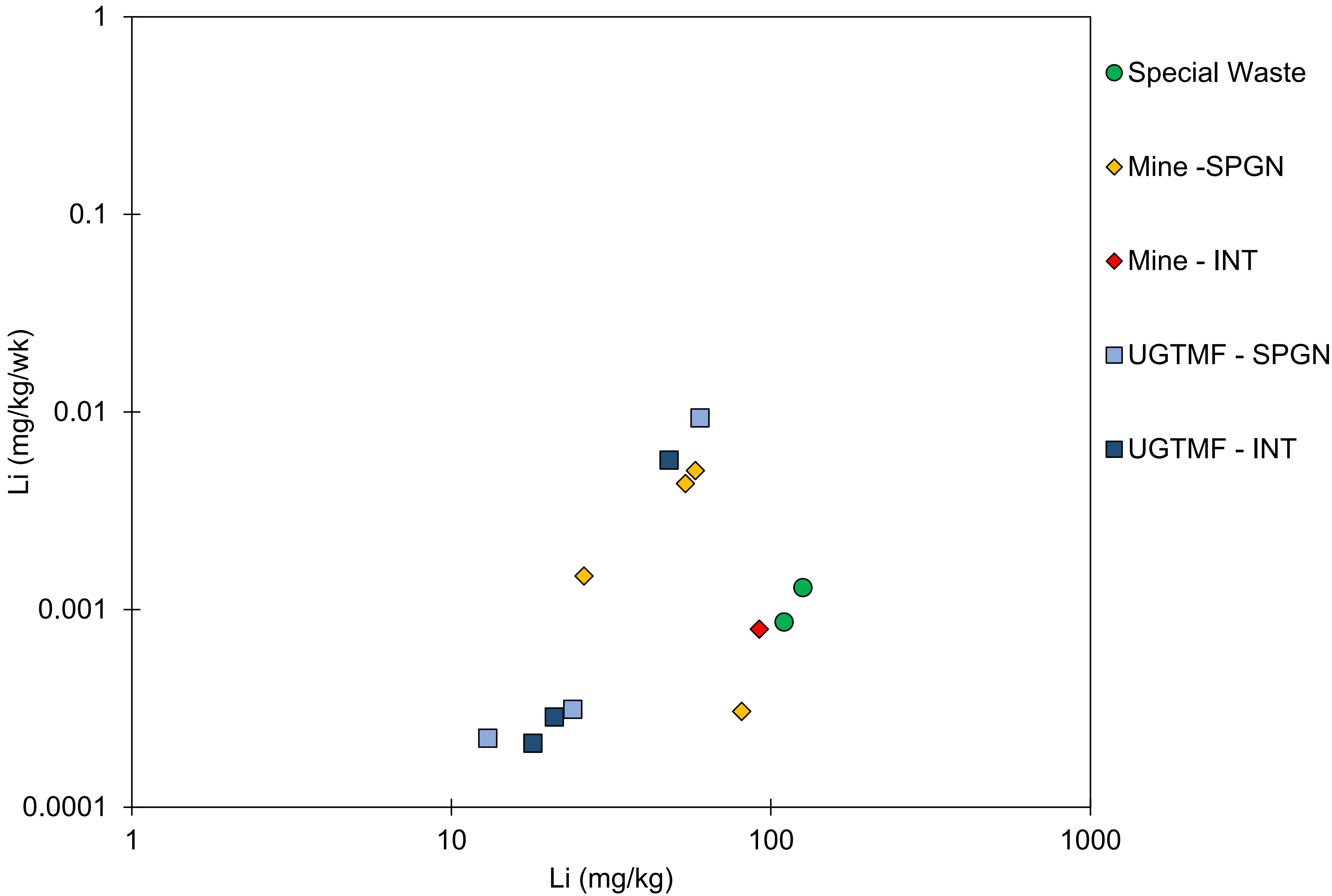

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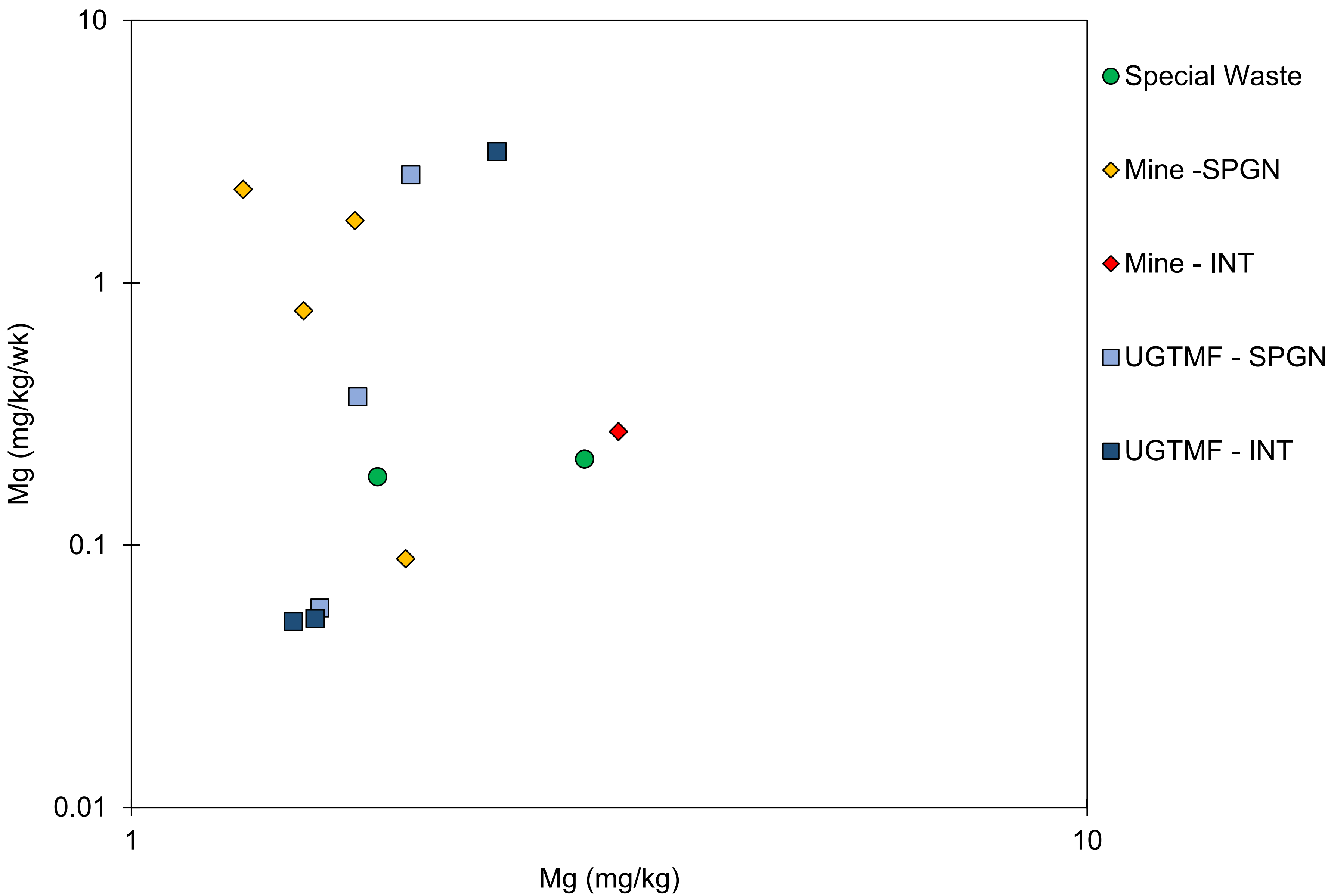

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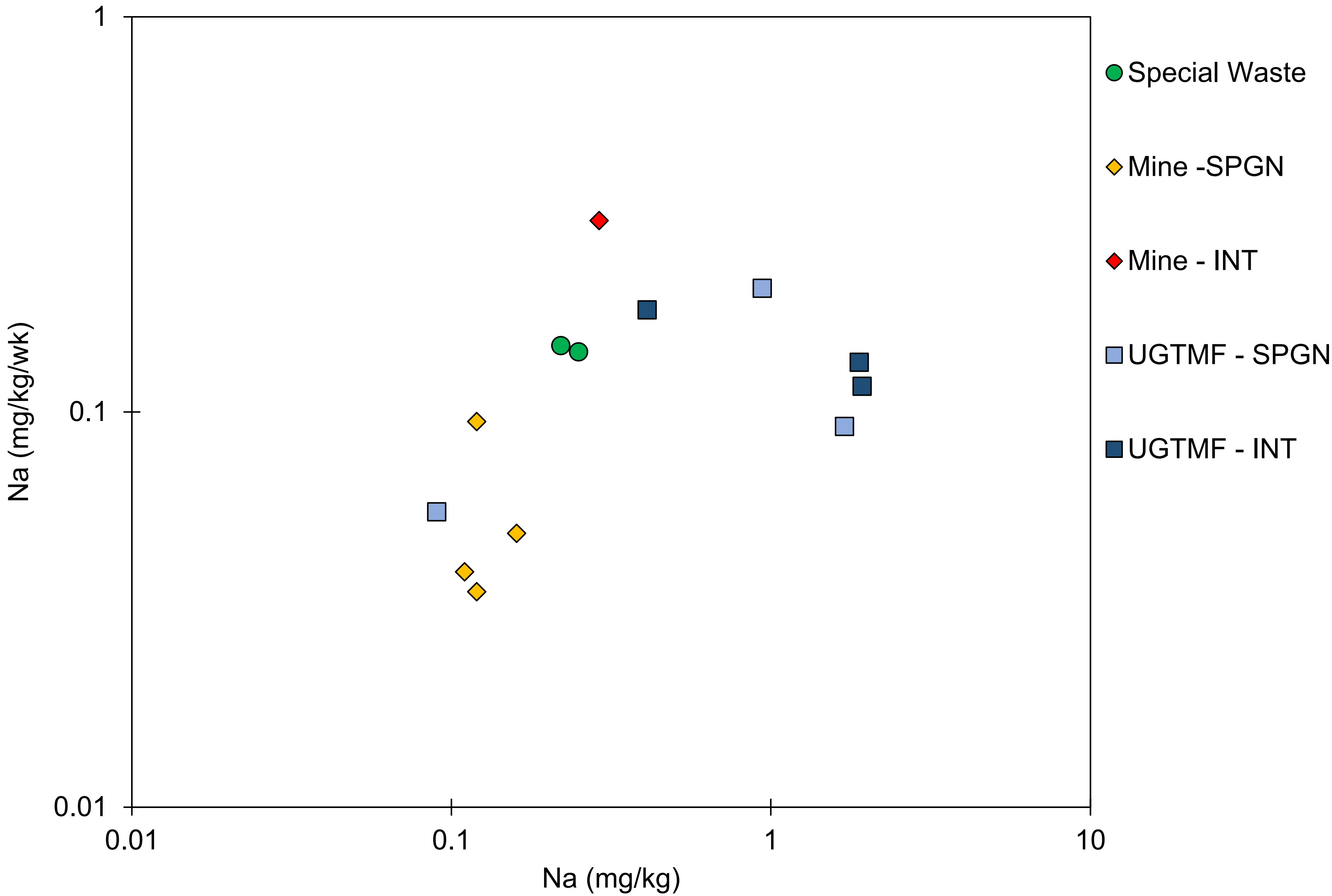

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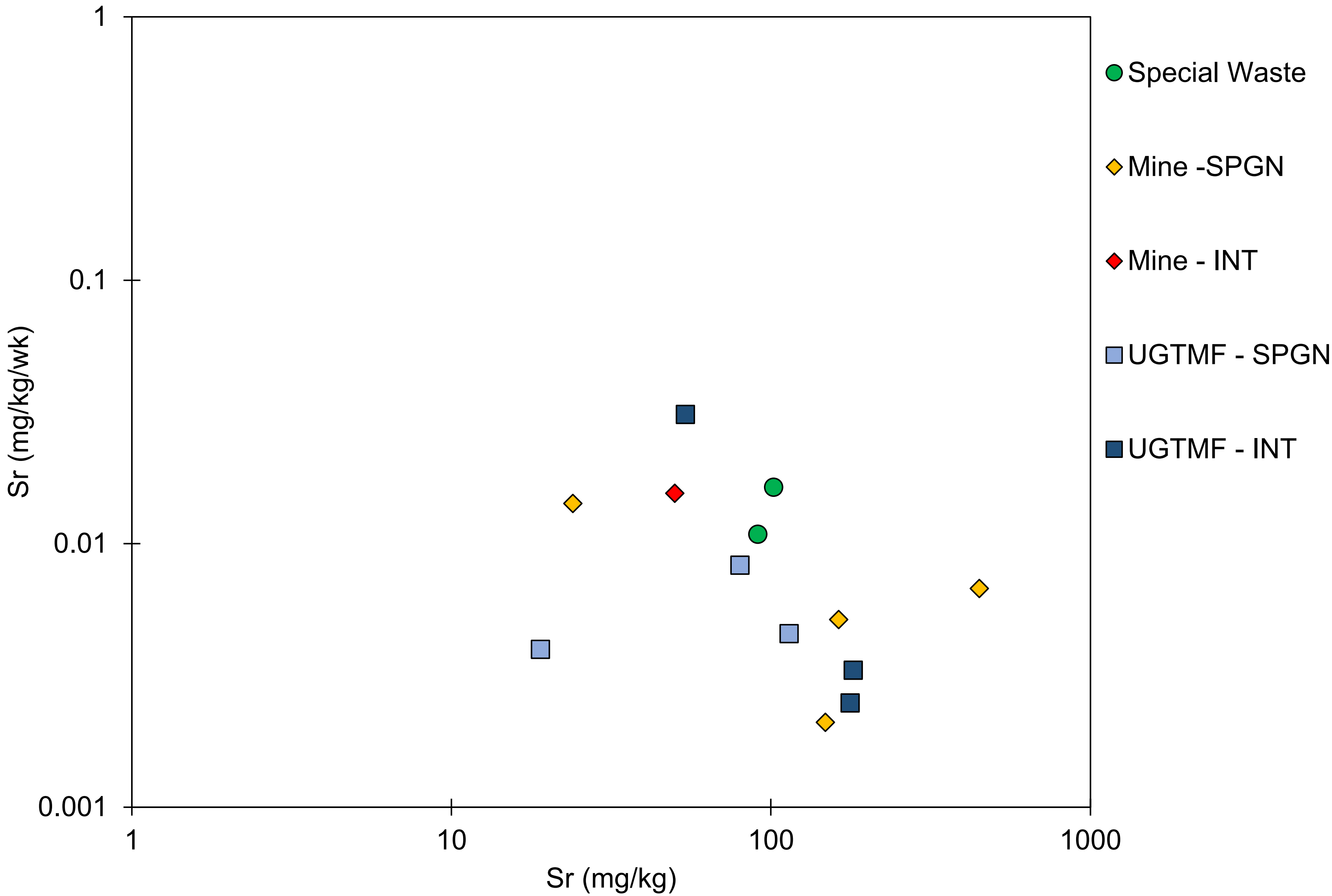

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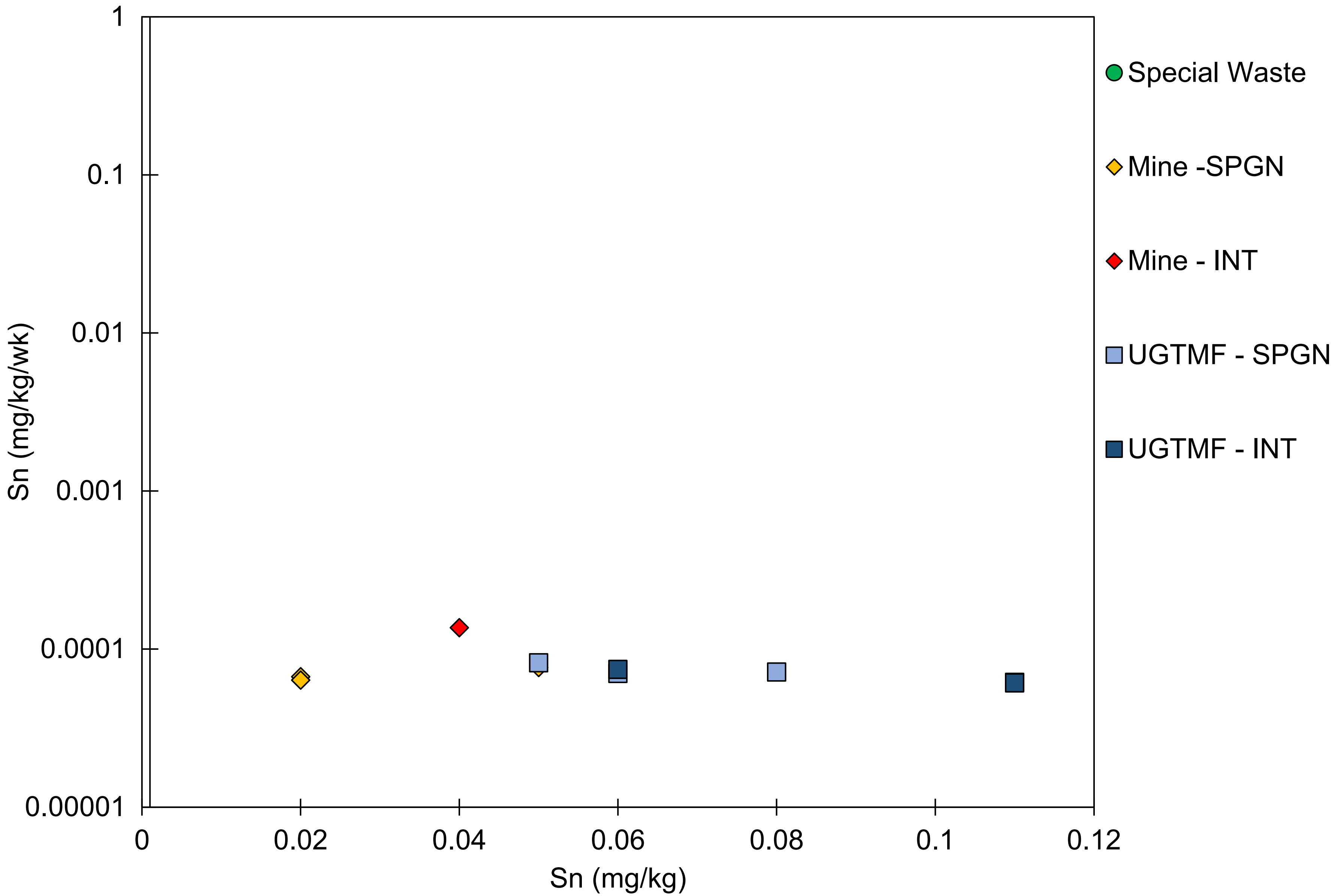

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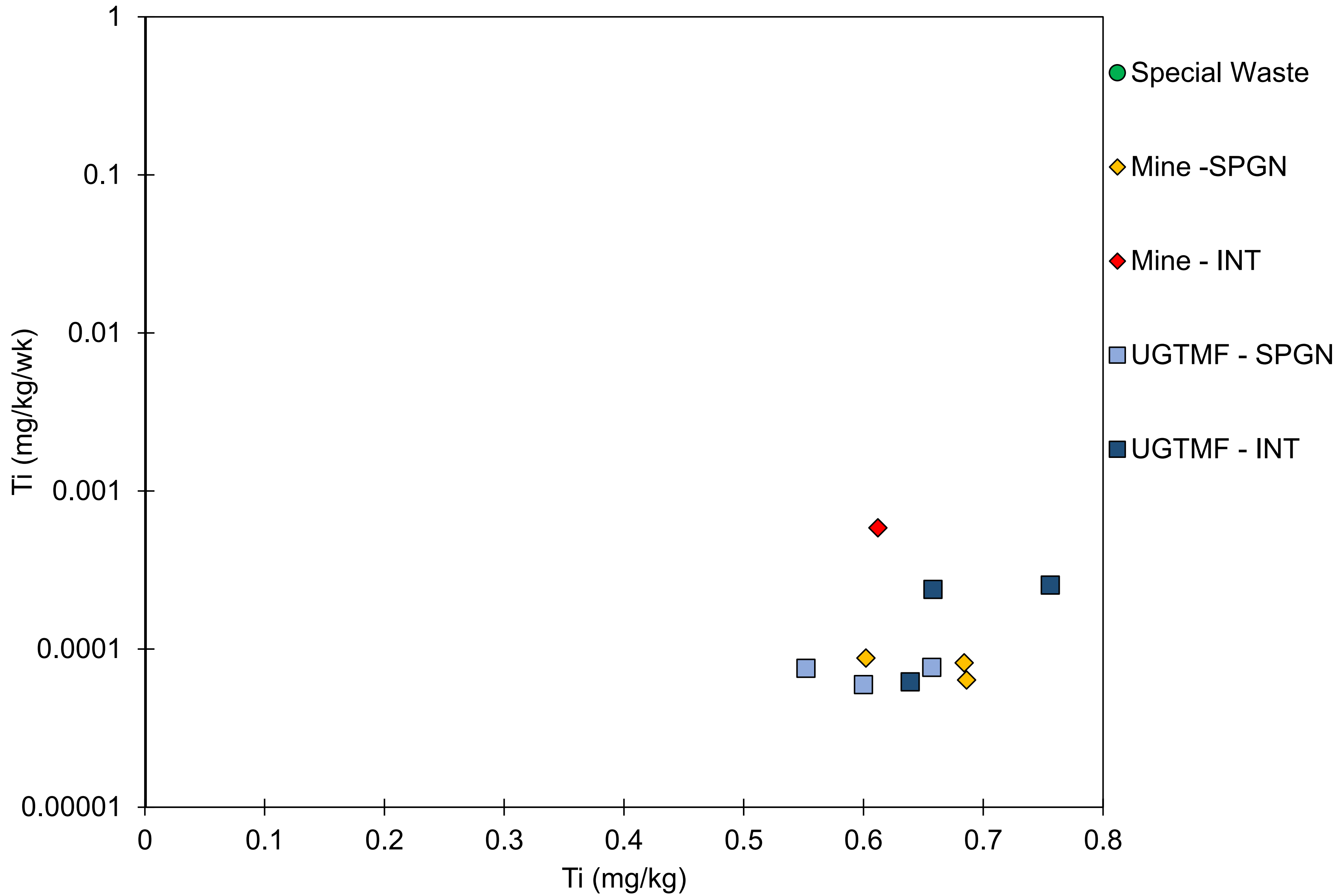

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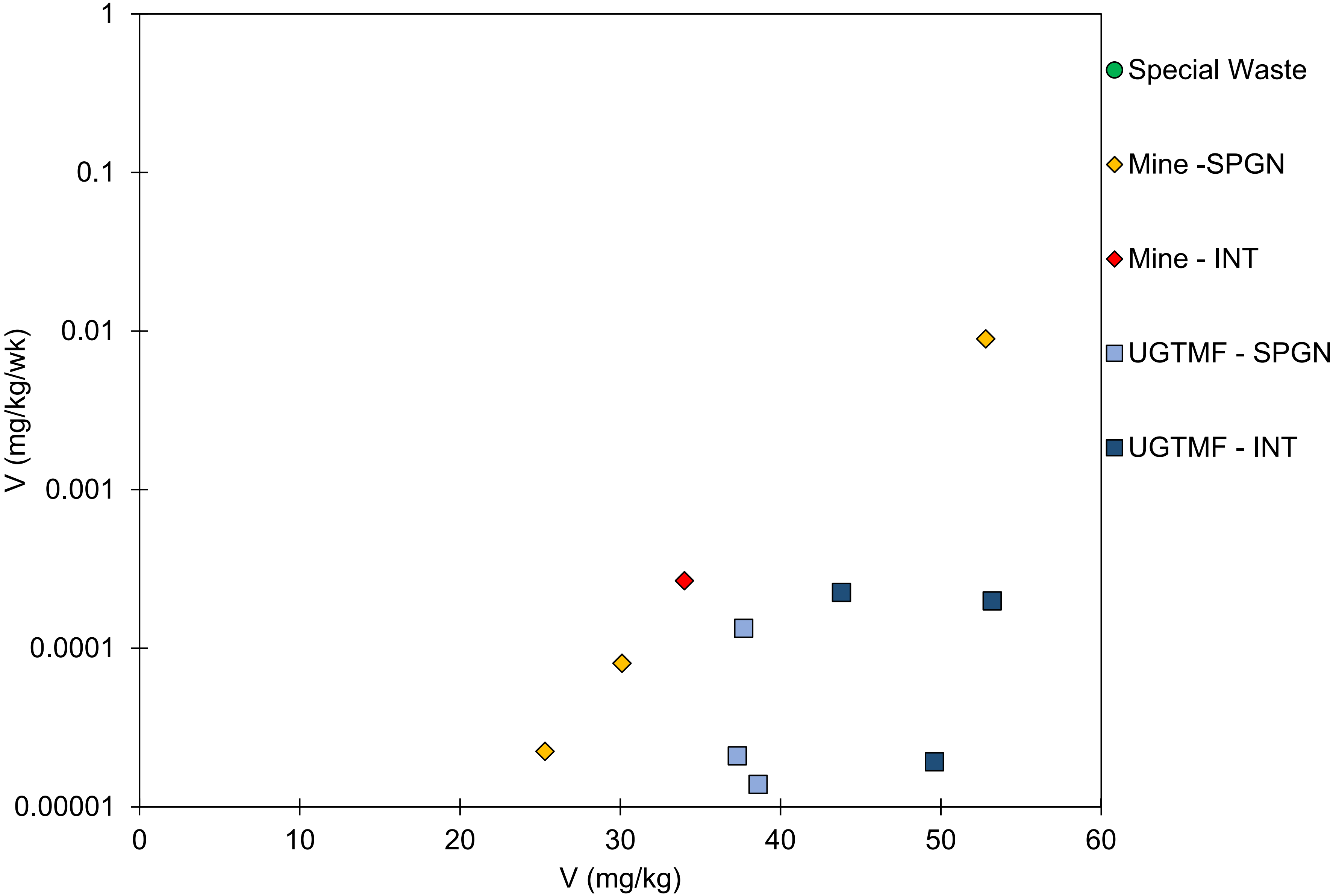

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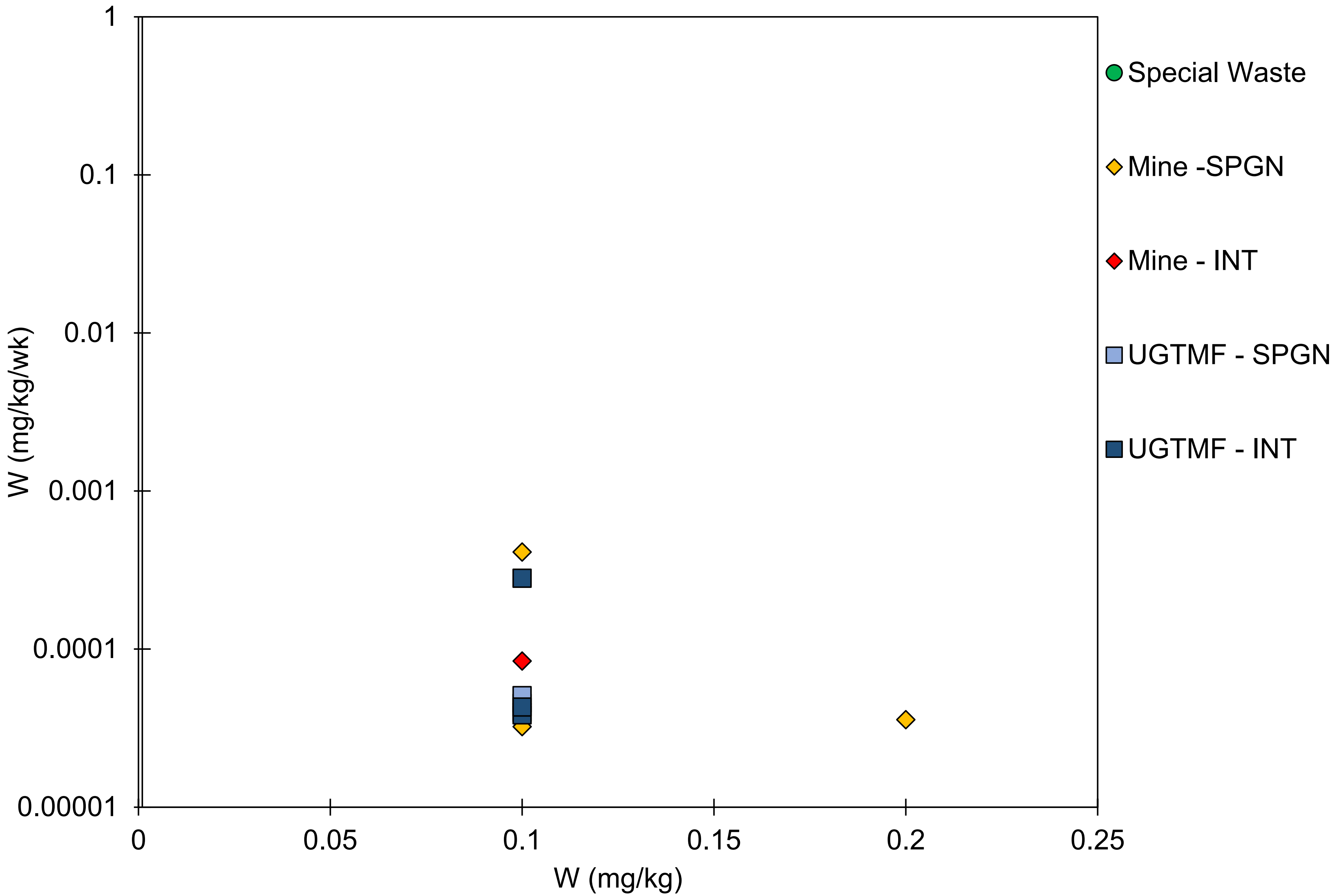

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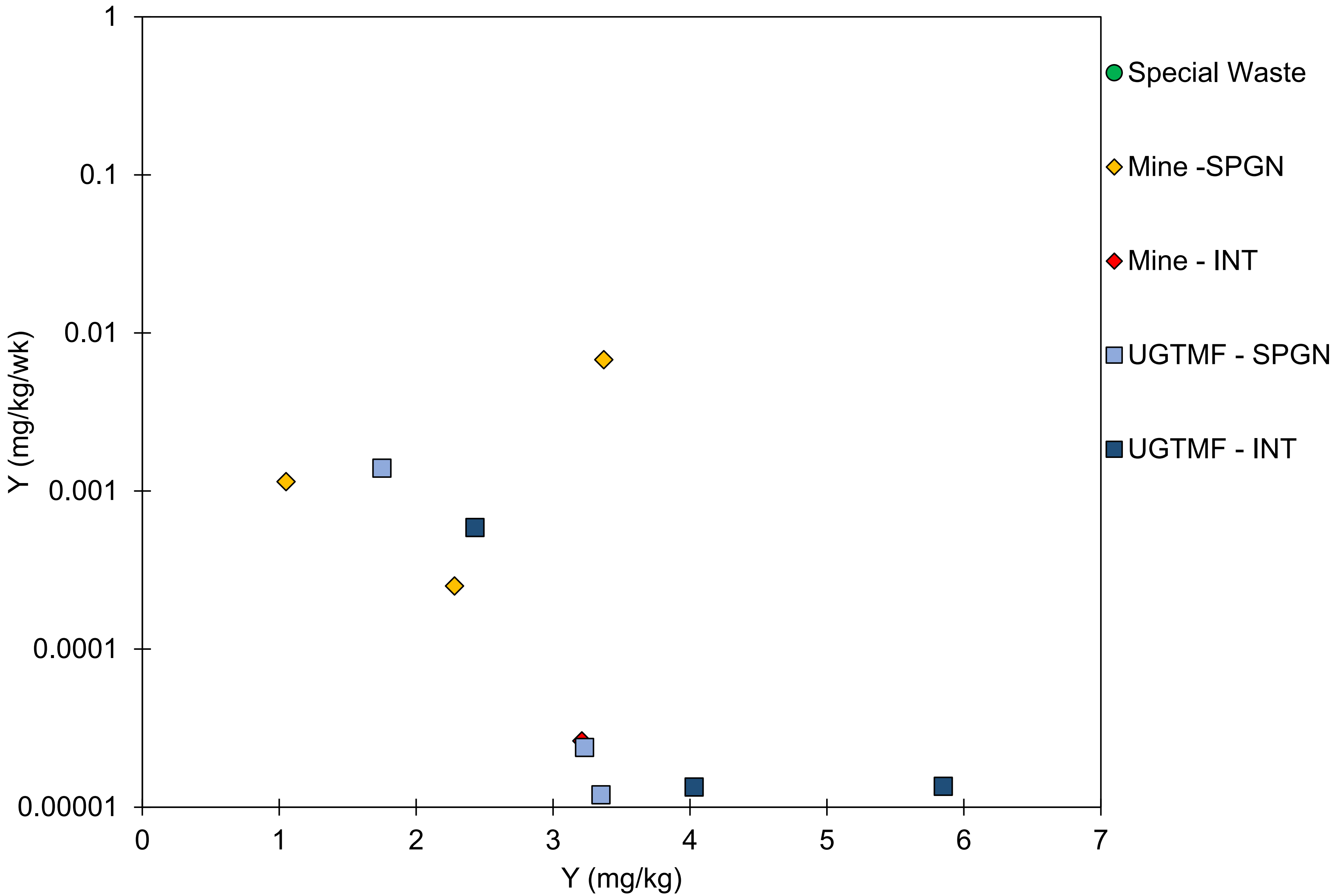

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Attachment IR 30-1

NexGen - Rook I - Feasibility Study
Site-Wide Power Loading Summary (by Area)

Area		Final	
		kW (Nominal)	kW (Peak)
Underground	Dewatering	608	608
Underground	Infrastructure	1,393	1,393
Underground	Ventilation	1,446	1,446
Underground	Crews	2,294	2,294
Surface	Headframe	636	804
Surface	Hoist House	4,812	7,068
Surface	Fresh Air Vent	473	473
Surface	Exhaust Air Vent	1,383	1,383
Surface	Batch Plant	317	317
Surface	Mill Terrace	8,562	8,562
Surface	Water Distribution	669	669
Surface	Other Infrastructure	1,471	1,471
	Total (kW)	24,064	26,487
	Total (MW)	24.1	26
	Generators Required	7.29	8.03
	Generators Required	8.0	9.0

Input Power Cost → **Power Cost:**

Area	Unit	Qty	Voltage	Name Plate Power hp	Total hp	kw	Draw Factor	Operating (= 1)	Nominal Load (kW)	Nominal Load (kW)	Peak Factor	Peak Load (kW)	Peak Load (kW)
UNDERGROUND DEWATERING										608			608
Dewatering - Main Stn	Main Pump #1	1	600	550.0	550.0	410.3	0.85	1	349		1.00	349	
Dewatering - Main Stn	Main Pump #2	1	600	550.0	550.0	410.3	0.85	0	0		1.00	0	
Dewatering - Main Stn	2 Tonne Monorail	1	600	5.0	5.0	3.7	0.85	0	0		1.00	0	
Dewatering - Main Stn	Submersible Pump #1	1	600	15.0	15.0	11.2	0.85	1	10		1.00	10	
Dewatering - Main Stn	Submersible Pump #2	1	600	15.0	15.0	11.2	0.85	0	0		1.00	0	
Dewatering - Main Stn	Vent Fan	1	600	30.0	30.0	22.4	0.85	1	19		1.00	19	
Dewatering - 500 Level Sump	Submersible Pump #1	1	600	30.0	30.0	22.4	0.85	1	19		1.00	19	
Dewatering - 500 Level Sump	Submersible Pump #2	1	600	30.0	30.0	22.4	0.85	1	19		1.00	19	
Dewatering - 500 Level Sump	Submersible Pump #3	1	600	30.0	30.0	22.4	0.85	0	0		1.00	0	
Dewatering - 500 Level Sump	Submersible Pump #4	1	600	30.0	30.0	22.4	0.85	0	0		1.00	0	
Dewatering - 500 Level Sump	2 Tonne Monorail #1	1	600	5.0	5.0	3.7	0.85	0	0		1.00	0	
Dewatering - 500 Level Sump	2 Tonne Monorail #2	1	600	5.0	5.0	3.7	0.85	0	0		1.00	0	
Dewatering - 500 Exhaust Shaft Sump	Submersible Pump	1	600	6.0	6.0	4.5	0.85	1	4		1.00	4	
Dewatering - 500 Shaft Station Sump	Submersible Pump	1	600	6.0	6.0	4.5	0.85	1	4		1.00	4	
Dewatering - 590 Shaft Station Sump	Submersible Pump	1	600	6.0	6.0	4.5	0.85	1	4		1.00	4	
Dewatering - 620 Shaft Station Sump	Submersible Pump	1	600	6.0	6.0	4.5	0.85	1	4		1.00	4	
Dewatering - 620 Level Sump	Submersible Pump #1	1	600	100.0	100.0	74.6	0.85	1	63		1.00	63	
Dewatering - 620 Level Sump	Submersible Pump #2	1	600	100.0	100.0	74.6	0.85	1	63		1.00	63	
Dewatering - 620 Level Sump	Submersible Pump #3	1	600	100.0	100.0	74.6	0.85	0	0		1.00	0	
Dewatering - 620 Level Sump	Submersible Pump #4	1	600	100.0	100.0	74.6	0.85	0	0		1.00	0	
Dewatering - 620 Level Sump	2 Tonne Monorail #1	1	600	5.0	5.0	3.7	0.85	0	0		1.00	0	
Dewatering - 620 Level Sump	2 Tonne Monorail #2	1	600	5.0	5.0	3.7	0.85	0	0		1.00	0	
Dewatering - 650 Shaft Bottom Sump	Submersible Pump #1	1	600	20.0	20.0	14.9	0.85	1	13		1.00	13	
Dewatering - 680 Level Sump	Submersible Pump #1	1	600	60.0	60.0	44.8	0.85	1	38		1.00	38	
Dewatering - 680 Level Sump	Submersible Pump #2	1	600	60.0	60.0	44.8	0.85	0	0		1.00	0	
Dewatering - 680 Level Sump	2 Tonne Monorail #1	1	600	5.0	5.0	3.7	0.85	0	0		1.00	0	
Dewatering - 680 Level Sump	2 Tonne Monorail #2	1	600	5.0	5.0	3.7	0.85	0	0		1.00	0	
UNDERGROUND INFRASTRUCTURE										1393			1393
UG Primary Electrical Room	Vent Fan	14	600	25.0	350.0	261.1	0.85	1	222		1.00	222	
UG Secondary Electrical Room	Vent Fan	6	600	15.0	90.0	67.1	0.85	1	57		1.00	57	
UG Fuel Distribution	Satstat #1	1	600	5.0	5.0	3.7	0.85	1	3		1.00	3	
UG Fuel Distribution	Satstat #2	1	600	5.0	5.0	3.7	0.85	1	3		1.00	3	
UG Fuel Distribution	Satstat #3	1	600	2.0	2.0	1.5	0.85	1	1		1.00	1	
UG Fuel Distribution	Satstat #4	1	600	2.0	2.0	1.5	0.85	1	1		1.00	1	
UG Fuel Distribution	Satstat #5	1	600	2.0	2.0	1.5	0.85	1	1		1.00	1	
UG Fuel Distribution	Satstat #6	1	600	2.0	2.0	1.5	0.85	1	1		1.00	1	
UG Fuel Distribution	Satstat #7	1	600	2.0	2.0	1.5	0.85	1	1		1.00	1	
UG Fuel Distribution	Fire door 1	1	600	2.0	2.0	1.5	0.85	0	0		1.00	0	
UG Fuel Distribution	Fire door 2	1	600	2.0	2.0	1.5	0.85	0	0		1.00	0	
UG Fuel Distribution	Mini Power Centre	1	600	40.0	40.0	29.8	0.75	1	22		1.00	22	
UG Cap Magazine	Vent Fan	1	600	25.0	25.0	18.7	0.85	1	16		1.00	16	
UG Cap Magazine	Mini Power Centre	1	600	40.0	40.0	29.8	0.75	1	22		1.00	22	
UG Explosive Magazine	Jib Crane	1	600	10.0	10.0	7.5	0.85	1	6		1.00	6	
UG Explosive Magazine	Mini Power Centre	1	600	40.0	40.0	29.8	0.75	1	22		1.00	22	
UG Explosive Magazine	Vent Fan	1	600	25.0	25.0	18.7	0.85	1	16		1.00	16	
UG Explosive Magazine	Emulsion Transfer Pump	1	600	6.7	6.7	5.0	0.85	1	4		1.00	4	
Refuge Station	Refuge Station Lighting Panel	4	600	80.0	320.0	238.7	0.85	1	203		1.00	203	
UG Garage	Lighting Panel #1	1	600	80.0	80.0	59.7	0.75	1	45		1.00	45	
UG Garage	Lighting Panel #2	1	600	80.0	80.0	59.7	0.75	1	45		1.00	45	
UG Garage	3 Tonne Crane	1	600	5.0	5.0	3.7	0.85	0	0		1.00	0	
UG Garage	Vent Fan	1	600	10.0	10.0	7.5	0.85	1	6		1.00	6	
UG Garage	Utility Outlet #1	1	600	60.0	60.0	44.8	1.00	1	45		1.00	45	
UG Garage	Crane Bay 1 - Crane A	1	600	10.0	10.0	7.5	0.85	0	0		1.00	0	
UG Garage	Crane Bay 1 - Crane B	1	600	10.0	10.0	7.5	0.85	1	6		1.00	6	
UG Garage	Crane Bay 1 - Utility Outlet	2	600	60.0	120.0	89.5	1.00	1	90		1.00	90	
UG Garage	Crane Bay 1 - Overhead Door #1	1	600	2.0	2.0	1.5	0.85	0	0		1.00	0	
UG Garage	Crane Bay 1 - Overhead Door #2	1	600	2.0	2.0	1.5	0.85	0	0		1.00	0	
UG Garage	Crane Bay 2 - Crane A	1	600	10.0	10.0	7.5	0.85	1	6		1.00	6	
UG Garage	Crane Bay 2 - Crane B	1	600	10.0	10.0	7.5	0.85	0	0		1.00	0	
UG Garage	Crane Bay 2 - Utility Outlet	2	600	60.0	120.0	89.5	1.00	1	90		1.00	90	
UG Garage	Crane Bay 2 - Overhead Door #1	1	600	2.0	2.0	1.5	0.85	0	0		1.00	0	
UG Garage	Crane Bay 2 - Overhead Door #2	1	600	2.0	2.0	1.5	0.85	0	0		1.00	0	
UG Garage	Service Bay - Crane A	1	600	10.0	10.0	7.5	0.85	1	6		1.00	6	
UG Garage	Service Bay - Crane B	1	600	10.0	10.0	7.5	0.85	0	0		1.00	0	
UG Garage	Service Bay - Utility Outlet #1	1	600	60.0	60.0	44.8	1.00	1	45		1.00	45	
UG Garage	Service Bay - Utility Outlet #2	1	600	60.0	60.0	44.8	1.00	1	45		1.00	45	
UG Garage	Service Bay - Overhead Door #1	1	600	2.0	2.0	1.5	0.85	0	0		1.00	0	
UG Garage	Service Bay - Overhead Door #2	1	600	2.0	2.0	1.5	0.85	0	0		1.00	0	
UG Garage	Welding Bay - Utility Outlet #1	1	600	60.0	60.0	44.8	1.00	1	45		1.00	45	
UG Garage	Welding Bay - Utility Outlet #2	1	600	60.0	60.0	44.8	1.00	1	45		1.00	45	
UG Garage	Welding Bay - Utility Outlet #3	1	600	60.0	60.0	44.8	0.85	0	0		1.00	0	
UG Garage	Welding Bay - Utility Outlet #4	1	600	60.0	60.0	44.8	0.85	0	0		1.00	0	
UG Garage	Welding Bay - Vent Fan	1	600	40.0	40.0	29.8	0.85	1	25		1.00	25	
UG Garage	Storage Bay - Vent Fan	1	600	40.0	40.0	29.8	0.85	1	25		1.00	25	
UG Garage	Hose Shop - Hose Machine	1	600	10.0	10.0	7.5	0.85	1	6		1.00	6	
UG Warehouse	Vent Fan	1	600	25.0	25.0	18.7	0.85	1	16		1.00	16	
UG Warehouse	Mini Power Centre	1	600	20.0	20.0	14.9	0.75	1	11		1.00	11	
UG Wash Bay	Pressure Washer	1	600	50.0	50.0	37.3	0.85	1	32		1.00	32	
UG Wash Bay	Water Tank Heater	1	600	12.0	12.0	9.0	0.85	1	8		1.00	8	
UG Wash Bay	Sump Pump	1	600	5.0	5.0	3.7	0.85	1	3		1.00	3	
UG Wash Bay	Vent Fan	1	600	50.0	50.0	37.3	0.85	1	32		1.00	32	
UG Wash Bay	Mini Power Centre	1	600	40.0	40.0	29.8	0.75	1	22		1.00	22	
UG Material Handling	Hydraulic Power Unit - RockBreaker Stn #1	1	600	100.0	100.0	74.6	0.85	1	63		1.00	63	
UG Material Handling	Monorail #1 - RockBreaker Stn #1	1	600	2.0	2.0	1.5	0.85	1	1		1.00	1	
UG Material Handling	Monorail #2 - RockBreaker Stn #1	1	600	2.0	2.0	1.5	0.85	1	1		1.00	1	
UG Material Handling	Mini Power Centre - RockBreaker Stn #1	1	600	20.0	20.0	14.9	0.75	1	11		1.00	11	
UG Material Handling	Utility Outlet	1	600	60.0	60.0	44.8	1.00	0	0		1.00	0	
UG Material Handling	Hydraulic Power Unit - RockBreaker Stn #2	1	600	100.0	100.0	74.6	0.85	1	63		1.00	63	
UG Material Handling	Monorail #1 - RockBreaker Stn #2	1	600	2.0	2.0	1.5	0.85	1	1		1.00	1	
UG Material Handling	Monorail #2 - RockBreaker Stn #2	1	600	2.0	2.0	1.5	0.85	1	1		1.00	1	
UG Material Handling	Mini Power Centre - RockBreaker Stn #2	1	600	20.0	20.0	14.9	0.75	1	11		1.00	11	
UG Material Handling	Utility Outlet	1	600	60.0	60.0	44.8	1.00	0	0		1.00	0	
UG Material Handling	Hydraulic Power Unit - RockBreaker Stn #3	1	600	100.0	100.0	74.6	0.85	1	63		1.00	63	
UG Material Handling	Monorail #1 - RockBreaker Stn #3	1	600	2.0	2.0	1.5	0.85	1	1		1.00	1	
UG Material Handling	Monorail #2 - RockBreaker Stn #3	1	600	2.0	2.0	1.5	0.85	1	1		1.00	1	
UG Material Handling	Mini Power Centre - RockBreaker Stn #3	1	600	20.0	20.0	14.9	0.75	1	11		1.00	11	
UG Material Handling	Utility Outlet	1	600	60.0	60.0	44.8	1.00	0	0		1.00	0	
UG Material Handling	Hydraulic Power Unit - Rock Pass Stn #1	1	600	25.0	25.0	18.7	0.85	1	16		1.00	16	
UG Material Handling	Vibratory Feeder - Rock Pass Stn #1	1	600	25.0	25.0	18.7	0.85	1	16		1.00	16	
UG Material Handling	Belt Magnet - Rock Pass Stn #1	1	600	25.0	25.0	18.7	0.85	1	16		1.00	16	
UG Material Handling	Belt Magnet Conveyor - Rock Pass Stn #1	1	600	15.0	15.0	11.2	0.85	1	10		1.00	10	
UG Material Handling	Mini Power Centre - Rock Pass Stn #1	1	600	20.0	20.0	14.9	0.75	1	11		1.00	11	
UG Material Handling	Utility Outlet	1	600	60.0	60.0	44.8	1.00	0	0		1.00	0	
UG Material Handling	Hydraulic Power Unit - Rock Pass Stn #2	1	600	25.0	25.0	18.7	0.85	0	0		1.00	0	
UG Material Handling	Vibratory Feeder - Rock Pass Stn #2	1	600	25.0	25.0	18.7	0.85	0	0		1.00	0	
UG Material Handling	Belt Magnet - Rock Pass Stn #2	1	600	25.0	25.0	18.7	0.85	0	0		1.00	0	
UG Material Handling	Belt Magnet Conveyor - Rock Pass Stn #2	1	600	15.0	15.0	11.2	0.85	0	0		1.00	0	
UG Material Handling	Mini Power Centre - Rock Pass Stn #2	1	600	20.0	20.0	14.9	0.75	1	11		1.00	11	
UG Material Handling	Utility Outlet	1	600	60.0	60.0	44.8	1.00	0	0		1.00	0	
UG Material Handling	Hydraulic Power Unit - Rock Pass Stn #3	1	600	25.0	25.0	18.7	0.85	0	0		1.00	0	
UG Material Handling	Vibratory Feeder - Rock Pass Stn #3	1	600	25.0	25.0	18.7	0.85	0	0		1.00	0	
UG Material Handling	Belt Magnet - Rock Pass Stn #3	1	600	25.0	25.0	18.7	0.85	0	0		1.00	0	
UG Material Handling	Belt Magnet Conveyor - Rock Pass Stn #3	1	600	15.0	15.0	11.2	0.85	0	0		1.00	0	
UG Material Handling	Mini Power Centre - Rock Pass Stn #3	1	600	20.0	20.0	14.9	0.75	1	11		1.00	11	
UG Material Handling	Utility Outlet	1	600	60.0	60.0	44.8	1.00	0	0		1.00	0	
UG Material Handling	Hydraulic Power Pack - Conveyor	1	600	37.5	37.5	28.0	0.85	1	24		1.00	24	
UG Material Handling	Hydraulic Power Pack - Loading Pocket	1	600	37.5	37.5	28.0	0.85	1	24		1.00	24	
UNDERGROUND VENTILATION										1446			1446
UG Ventilation Exhaust	Vent Fan #1 - 12	12	600	75.0	900.0	671.4	0.85	1	571		1.00	571	
UG Ventilation Fresh air	Vent Fan #1 - 12	12	600	75.0	900.0	671.4	0.85	1	571		1.00	571	
UG Ventilation	Air Monitoring Stations	12	600	5.0	60.0	44.8	0.85	1	38		1.00	38	
UG Ventilation Ore/Waste Pass Exhaust	Vent Fan #1 - 6	6	600	20.0	120.0	89.5	0.85	1	76		1.00	76	
UG Ventilation UGTMF	Vent Fan #1 - 3	3	600	100.0	300.0	223.8	0.85	1	190		1.00	190	
UG Ventilation	Ramp Development Fans - Covered with Dev. C	0	600	0.0	0.0	0.0	0.85	0	0		1.00	0	
UNDERGROUND PROD/DEV CREWS										2294			2294
UG Production/Development	Mine Power Centre - Development Crew #1	1	600	725.0	725.0	540.9	1.00	1	541		1.00	541	
UG Production/Development	Mine Power Centre - Development Crew #2	1	600	725.0	725.0	540.9	1.00	1	541		1.00	541	
UG Production/Development	Mine Power Centre - Development Crew #3	1	600	725.0	725.0	540.9	1.00	1	541		1.00	541	
UG Production/Development	Mine Power Centre - Production Crew #1	1	600	300.0	300.0	223.8	1.00	1	224		1.00	224	
UG Production/Development	Mine Power Centre - Production Crew #2	1	600	300.0	300.0	223.8	1.00	1	224		1.00	224	
UG Production/Development	Mine Power Centre - Production Crew #3	1	600	300.0	300.0	223.8	1.00	1	224		1.00	224	
HEADFRAME										636			804
Headframe	Building Services Loads	1	600	175.0	175.0	130.6	0.85	1	111		1.00	111	

Surface - Mine

	Headframe	Hydraulic Power Pack - Ore/Waste Diverter Gat	1	600	30.0	30.0	22.4	0.85	1	19		1.00	19	
	Headframe	Hydraulic Power Pack - Arc Gates	1	600	30.0	30.0	22.4	0.85	1	19		1.00	19	
	Headframe	Hyrdaulic Power Pack - Maintenance Doors (Sha	1	600	10.0	10.0	7.5	0.85	0	0		1.00	0	
	Headframe	HVAC (winter load)	1	600	105.0	105.0	78.3	0.85	1	67		1.00	67	
	Headframe	Process Water Booster Pump	1	600	20.0	20.0	14.9	0.85	1	13		1.00	13	
	Headframe	Fresh Water Tank Heater (winter load)	1	600	20.0	20.0	14.9	0.85	1	13		1.00	13	
	Headframe	Utility Outlet	1	600	60.0	60.0	44.8	1.00	0	0		1.00	0	
	Headframe	Utility Outlet	1	600	60.0	60.0	44.8	1.00	0	0		1.00	0	
	Headframe	Utility Outlet	1	600	60.0	60.0	44.8	1.00	0	0		1.00	0	
	Headframe	Alimak Elevator	1	600	20.0	20.0	14.9	0.85	1	13		1.00	13	
	Headframe	Monorail	2	600	40.0	80.0	59.7	0.85	0	0		1.00	0	
	Headframe	O/H Crane	1	600	25.0	25.0	18.7	0.85	0	0		1.00	0	
	Headframe	Lighting Panel	1	600	75.0	75.0	56.0	0.75	1	42		1.00	42	
	Headframe	Auxiliary Hoist	1	600	300.0	300.0	223.8	1.00	1	224		1.75	392	
	Headframe	Aux Hoist Auxiliaries	1	600	133.0	133.0	99.2	0.75	1	74		1.00	74	
	Headframe	Lighting Panel (Sheave deck)	1	600	75.0	75.0	56.0	0.75	1	42		1.00	42	
	HOIST HOUSE										4812			7068
	Hoist House	Production Hoist	1	TBD	2400.0	2400.0	1790.4	1.00	1	1790		1.75	3133	
	Hoist House	Service/Cage Hoist	1	TBD	2400.0	2400.0	1790.4	1.00	1	1790		1.51	2704	
	Hoist House	Hoist Auxiliaries	1	600	500.0	500.0	373.0	0.75	1	280		1.00	280	
	Hoist House	Building Services Loads	1	600	450.0	450.0	335.7	0.85	1	285		1.00	285	
	Hoist House	Compressor #1	1	600	250.0	250.0	186.5	0.85	1	159		1.00	159	
	Hoist House	Compressor #2	1	600	250.0	250.0	186.5	0.85	1	159		1.00	159	
	Hoist House	Compressor #3	1	600	250.0	250.0	186.5	0.85	0	0		1.00	0	
	Hoist House	Utility Outlet	1	600	60.0	60.0	44.8	1.00	0	0		1.00	0	
	Hoist House	Utility Outlet	1	600	60.0	60.0	44.8	1.00	0	0		1.00	0	
	Hoist House	O/H Crane	1	600	81.0	81.0	60.4	0.85	0	0		1.00	0	
	Hoist House	HVAC (winter load)	1	600	550.0	550.0	410.3	0.85	1	349		1.00	349	
	FRESH AIR VENT FAN										473			473
	Fresh Air Vent Fan	Fresh Air Fan #1	1	600	300.0	300.0	223.8	0.85	1	190		1.00	190	
	Fresh Air Vent Fan	Fresh Air Fan #2	1	600	300.0	300.0	223.8	0.85	1	190		1.00	190	
	Fresh Air Vent Fan	Building Services Loads	1	600	55.0	55.0	41.0	0.85	1	35		1.00	35	
	Fresh Air Vent Fan	HVAC (winter load)	1	600	15.0	15.0	11.2	0.85	1	10		1.00	10	
	Fresh Air Vent Fan	Welding Outlet	1	600	60.0	60.0	44.8	1.00	0	0		1.00	0	
	Fresh Air Vent Fan	Vent fan	1	600	10.0	10.0	7.5	0.85	1	6		1.00	6	
	Fresh Air Vent Fan	Lighting Panel	1	600	75.0	75.0	56.0	0.75	1	42		1.00	42	
	EXHAUST SHAFT FAN FACILITY										1383			1383
	Exhaust Shaft Fan Facility	Exhaust Fan #1	1	4160	1000.0	1000.0	746.0	0.85	1	634		1.00	634	
	Exhaust Shaft Fan Facility	Exhaust Fan #2	1	4160	1000.0	1000.0	746.0	0.85	1	634		1.00	634	
	Exhaust Shaft Fan Facility	Building Services Loads	1	600	55.0	55.0	41.0	0.85	1	35		1.00	35	
	Exhaust Shaft Fan Facility	Condensate Pump	1	600	25.0	25.0	18.7	0.85	1	16		1.00	16	
	Exhaust Shaft Fan Facility	HVAC (winter load)	1	600	25.0	25.0	18.7	0.85	1	16		1.00	16	
	Exhaust Shaft Fan Facility	Welding Outlet	1	600	60.0	60.0	44.8	1.00	0	0		1.00	0	
	Exhaust Shaft Fan Facility	Vent fan	1	600	10.0	10.0	7.5	0.85	1	6		1.00	6	
	Exhaust Shaft Fan Facility	Lighting Panel	1	600	75.0	75.0	56.0	0.75	1	42		1.00	42	
	BATCH PLANT										317			317
	Batch Plant - Estimated	Bulk Load	1	600	500.0	500.0	373.0	0.85	1	317		1.00	317	
	MILL TERRACE										8562			8562
Surface - Mill	**5200-MCC-5002**										1,417			1417
	Mill Load List (see Wood doc)	SAG Mill c/w all accessories	1		1275.0	1275.0	951.2	0.80	1	761		1.00	761	
	Mill Load List (see Wood doc)	Ball Mill c/w all accessories	1		1000.0	1000.0	746.0	0.80	1	597		1.00	597	
	Mill Load List (see Wood doc)	Future Mill c/w all accessories	1		1500.0	1500.0	1119.0	0.80	0	0		1.00	0	
	5200-MCC-5003A1										513			513
	3600	Gypsum Reactor Tank Agitator #1	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3600	Gypsum Reactor Tank Agitator #2	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3600	Gypsum Reactor Tank Agitator #3	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3600	Gypsum Reactor Tank Agitator #4	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3600	Gypsum Reactor Tank Agitator #5	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3600	Gypsum Reactor Tank Agitator #6	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3600	Gypsum Reactor Tank Agitator #7	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3600	Gypsum Wash Transfer Pump	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	3600	Gypsum Clarifier Rake and Drive	1		25.0	25.0	18.7	0.80	1	15		1.00	15	
	3600	Gypsum Clarifier U/F Pump	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3600	Gypsum Area Sump Pump	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
	3600	Flocculant Mixing Unit	1		2.0	2.0	1.5	0.80	1	1		1.00	1	
	3600	Yellow Cake Precipitation Tank #1 Agitator	1		30.0	30.0	22.4	0.80	1	18		1.00	18	
	3600	Yellow Cake Precipitation Tank #2 Agitator	1		30.0	30.0	22.4	0.80	1	18		1.00	18	
	3600	Yellow Cake Wash Tank #1 Agitator	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3600	Yellow Cake Wash Feed Pump #1	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3600	Yellow Cake Wash Thickener Rake and Drive #1	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	3600	Barren Strip Pump	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3600	Yellow Cake Area Sump Pump	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
	3600	Yellow Cake Screw Conveyor	1		30.0	30.0	22.4	0.80	1	18		1.00	18	
	3600	Magnesium Oxide Mixing Tank Agitator	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	3600	Magnesium Oxide Transfer Pump #1	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
	3600	Magnesium Oxide Transfer Pump #2	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
	3600	Hydrogen Peroxide Transfer Pump #1	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
	3600	Hydrogen Peroxide Transfer Pump #2	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
	3600	Hydrogen Peroxide Transfer Pump #3	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
	3600	Hydrogen Peroxide Transfer Pump #4	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
	3600	Flocculant Mixing Unit	1		2.0	2.0	1.5	0.80	1	1		1.00	1	
	3600	Magnesium Oxide Holding Tank Agitator	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	3600	Barren Strip Filter #1	1		30.0	30.0	22.4	0.80	1	18		1.00	18	
	3600	Barren Strip Filter #2	1		30.0	30.0	22.4	0.80	1	18		1.00	18	
	3600	Barren Strip Filter #3	1		30.0	30.0	22.4	0.80	1	18		1.00	18	
	3600	Barren Strip Filter #4	1		30.0	30.0	22.4	0.80	1	18		1.00	18	
	3600	Lime Mix Tank Agitator	1		30.0	30.0	22.4	0.80	1	18		1.00	18	
	3600	Lime Unloading Blower	1		30.0	30.0	22.4	0.80	1	18		1.00	18	
	3600	Barren Strip Filter Feed Pump	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
	3600	Barren Strip Filter Back Wash Pump	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
	3600	Lime Feed Tank Agitator	1		30.0	30.0	22.4	0.80	1	18		1.00	18	
	3600	Lime Transfer Pump #1	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3600	Lime Transfer Pump #2	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3600	Lime Feed Loop Pump #1	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3600	Lime Feed Loop Pump #2	1		15.0	15.0	11.2	0.80	0	0		1.00	0	
	3600	Lime Screw Conveyor	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	3600	Lime Silo Bag House	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
	3600	Transformer for lighting panel	1		53.6	53.6	40.0	0.80	1	32		1.00	32	
	3600	Reject Gypsum Screw Conveyor	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	3600	Filtrate Pump	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	3600	Filtrate Pump	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	3600	Filtrate Pump	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	3600	Filtrate Pump	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	3600	Filtrate Pump	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	3600	Intake Fan	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
	3600	Exhaust Fan	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
	3600	YC Filter Feed Pump	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
	3600	Exhaust Fan	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
	3600	Heater / Blower	1		40.2	40.2	30.0	0.80	1	24		1.00	24	
-	3600	Electric Unit Heater	1		53.6	53.6	40.0	1.00	1	40		1.00	40	
	3600	Yellow Cake Wash Thickener U/F Pump #1	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	3600	Precipitation Area Process Ventilation Fan #1	1		3.0	3.0	2.2	0.80	1	2		1.00	2	
	3600	Precipitation Area Process Ventilation Fan #2	1		3.0	3.0	2.2	0.80	1	2		1.00	2	
	3600	Precipitation Area Process Ventilation Fan #3	1		3.0	3.0	2.2	0.80	1	2		1.00	2	
	5200-MCC-5003A2										343			343
	3400	Transformer for lighting panel in Drum Storage A	1		53.6	53.6	40.0	0.80	1	32		1.00	32	
	3400	CCD Thickener Area Sump Pump	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3400	Clarifier Area Sump Pump	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	3400	Reactor Clarifier Rake and Drive	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3400	SX Feed Pump	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3400	Flocculant Mixing Unit/Coagulant Mixing Unit	1		2.0	2.0	1.5	0.80	1	1		1.00	1	
	3400	Residue Neutralization Tank Agitator	1		40.0	40.0	29.8	0.80	1	24		1.00	24	
	3400	Residue Transfer Pump #1	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
	3400	Residue Transfer Pump #2	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
	3400	Flash Mix Tank Agitator	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	3400	Reactor Clarifier U/F Pump	1		30.0	30.0	22.4	0.80	1	18		1.00	18	
	3400	CCD Flocculant Transfer Pump #1	1		40.0	40.0	29.8	0.80	1	24		1.00	24	
	3400	CCD Flocculant Transfer Pump #2	1		40.0	40.0	29.8	0.80	1	24		1.00	24	
	3400	Gypsum Belt Filter	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	3400	Yellowcake Belt Filter	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	3400	Vacuum Pump	1		120.0	120.0	89.5	0.80	1	72		1.00	72	
	3400	Vacuum Pump	1		120.0	120.0	89.5	0.80	1	72		1.00	72	
	5200-MCC-5003A3										390			390
	4300	ETP Feed Pump #1	1	600	50.0	50.0	37.3	0.80	1	30		1.00	30	
	4300	Effluent Discharge Pump #1	1	600	120.0	120.0	89.5	0.80	1	72		1.00	72	
	4300	Effluent Discharge Pump #2	1	600	120.0	120.0	89.5	0.80	1	72		1.00	72	
	4300	Effluent Discharge Pump #3	1	600	120.0	120.0	89.5	0.80	1	72		1.00	72	

4300	Effluent Discharge Pump #4	1	600	120.0	120.0	89.5	0.80	1	72		1.00	72	
4300	Treated Water Distribution Pump	1	600	30.0	30.0	22.4	0.80	1	18		1.00	18	
4300	Run Off Pond Pump	1	600	15.0	15.0	11.2	0.80	1	9		1.00	9	
4300	Transformer for lighting panel in Settling Ponds /	1	600	53.6	53.6	40.0	0.80	1	32		1.00	32	
5200-MCC-5003B1										231			231
3200	Ore Transport Conveyor	1		40.0	40.0	29.8	0.80	1	24		1.00	24	
3200	Primary Cyclone Feed Pump #1	1		60.0	60.0	44.8	0.80	1	36		1.00	36	
3200	Primary Cyclone Feed Pump #2	1		60.0	60.0	44.8	0.80	0	0		1.00	0	
3200	Leaching Feed Pump #1	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3200	Leaching Feed Pump #2	1		10.0	10.0	7.5	0.80	0	0		1.00	0	
3200	Mill Sump Pump	1		25.0	25.0	18.7	0.80	1	15		1.00	15	
3200	Ore Storage Tank #1 Agitator	1		75.0	75.0	56.0	0.80	1	45		1.00	45	
3200	Ore Stockpile Sump Pump	1		25.0	25.0	18.7	0.80	1	15		1.00	15	
3200	Ore Storage Tank #2 Agitator	1		75.0	75.0	56.0	0.80	1	45		1.00	45	
3200	Ore Hopper/Grizzly Feed	1		50.0	50.0	37.3	0.80	1	30		1.00	30	
3200	Wet Scrubber Pump	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3200	Crushing Area Overhead Crane	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3200	Grinding Area Process Ventilation Fan	1		3.0	3.0	2.2	0.80	1	2		1.00	2	
5200-MCC-5003B2										199			199
3300	Leach Tank #1 Agitator	1		50.0	50.0	37.3	0.80	1	30		1.00	30	
3300	Leach Tank #2 Agitator	1		50.0	50.0	37.3	0.80	1	30		1.00	30	
3300	Leach Tank #3 Agitator	1		50.0	50.0	37.3	0.80	1	30		1.00	30	
3300	Leach Tank #4 Agitator	1		50.0	50.0	37.3	0.80	1	30		1.00	30	
3300	Leach Tank #5Agitator	1		50.0	50.0	37.3	0.80	1	30		1.00	30	
3300	Leach Tank #6Agitator	1		50.0	50.0	37.3	0.80	1	30		1.00	30	
3300	Leaching Transfer Pump #1	1		7.5	7.5	5.6	0.80	1	4		1.00	4	
3300	Leaching Transfer Pump #2	1		7.5	7.5	5.6	0.80	0	0		1.00	0	
3300	Leaching Area Sump Pump	1		15.0	15.0	11.2	0.80	0	0		1.00	0	
3300	Leaching Area Process Ventilation Fan	1		3.0	3.0	2.2	0.80	1	2		1.00	2	
5200-MCC-5003B3										371			371
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Steam Unit Heater	1		1.5	1.5	1.1	0.80	1	1		1.00	1	
3000	Exhaust Fan	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3000	Exhaust Fan	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3000	Exhaust Fan	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3000	Exhaust Fan	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3000	Exhaust Fan	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3000	Exhaust Fan	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3000	Exhaust Fan	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3000	Exhaust Fan	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3000	Self Contained AC Unit	1		455.8	455.8	340.0	0.80	1	272		1.00	272	
3000	Self Contained AC Unit	1		482.6	482.6	360.0	0.80	1	288		1.00	288	
3000	Electric Unit Heater	1		26.8	26.8	20.0	1.00	1	20		1.00	20	
3000	Electric Unit Heater	1		26.8	26.8	20.0	1.00	1	20		1.00	20	
3000	Electric Unit Heater	1		26.8	26.8	20.0	1.00	1	20		1.00	20	
3000	Electric Unit Heater	1		26.8	26.8	20.0	1.00	1	20		1.00	20	
3000	Electric Unit Heater	1		20.1	20.1	15.0	1.00	1	15		1.00	15	
3000	Electric Unit Heater	1		20.1	20.1	15.0	1.00	1	15		1.00	15	
3000	Electric Unit Heater	1		20.1	20.1	15.0	1.00	1	15		1.00	15	
3000	Electric Unit Heater	1		20.1	20.1	15.0	1.00	1	15		1.00	15	
3000	Electric Unit Heater	1		20.1	20.1	15.0	1.00	1	15		1.00	15	
3000	Electric Unit Heater	1		20.1	20.1	15.0	1.00	1	15		1.00	15	
3000	Electric Unit Heater	1		6.7	6.7	5.0	1.00	1	5		1.00	5	
3000	Electric Unit Heater	1		6.7	6.7	5.0	1.00	1	5		1.00	5	
3000	Electric Unit Heater	1		6.7	6.7	5.0	1.00	1	5		1.00	5	
3000	Electric Unit Heater	1		6.7	6.7	5.0	1.00	1	5		1.00	5	
3000	Electric Unit Heater	1		6.7	6.7	5.0	1.00	1	5		1.00	5	
3000	Electric Unit Heater	1		6.7	6.7	5.0	1.00	1	5		1.00	5	
3000	Electric Unit Heater	1		13.4	13.4	10.0	1.00	1	10		1.00	10	
3000	Electric Unit Heater	1		13.4	13.4	10.0	1.00	1	10		1.00	10	
3000	Liquids/Solids Separating Area Process Ventilati	1		3.0	3.0	2.2	0.80	1	2		1.00	2	
3000	Liquids/Solids Separating Area Process Ventilati	1		3.0	3.0	2.2	0.80	1	2		1.00	2	
5200-MCC-5004A1										393			393
3400	CCD Thickener U/F Pump #1	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3400	CCD Thickener U/F Pump #2	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3400	CCD Thickener U/F Pump #3	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3400	CCD Thickener U/F Pump #4	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3400	CCD Thickener U/F Pump #5	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3400	CCD Thickener U/F Pump #6	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3400	CCD Thickener U/F Pump #7	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3400	CCD Thickener Feed Pump #1	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3400	CCD Thickener Feed Pump #2	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3400	CCD Thickener Feed Pump #3	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3400	CCD Thickener Feed Pump #4	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3400	CCD Thickener Feed Pump #5	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3400	CCD Thickener Feed Pump #6	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3400	CCD Thickener O/F Pump #1	1		30.0	30.0	22.4	0.80	1	18		1.00	18	
3400	CCD Thickener Rake and Drive #1	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3400	CCD Thickener Rake and Drive #2	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3400	CCD Thickener Rake and Drive #3	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3400	CCD Thickener Rake and Drive #4	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3400	CCD Thickener Rake and Drive #5	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3400	CCD Thickener Rake and Drive #6	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3400	CCD Thickener Mix Tank Agitator #1	1		40.0	40.0	29.8	0.80	1	24		1.00	24	
3400	CCD Thickener Mix Tank Agitator #2	1		40.0	40.0	29.8	0.80	1	24		1.00	24	
3400	CCD Thickener Mix Tank Agitator #3	1		40.0	40.0	29.8	0.80	1	24		1.00	24	
3400	CCD Thickener Mix Tank Agitator #4	1		40.0	40.0	29.8	0.80	1	24		1.00	24	
3400	CCD Thickener Mix Tank Agitator #5	1		40.0	40.0	29.8	0.80	1	24		1.00	24	
3400	CCD Thickener Mix Tank Agitator #6	1		40.0	40.0	29.8	0.80	1	24		1.00	24	
3400	CCD Flocculant Distribution Pump #1	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
3400	CCD Flocculant Distribution Pump #2	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
3400	CCD Flocculant Mix Agitator	1		40.0	40.0	29.8	0.80	1	24		1.00	24	
3400	Reactor Clarifier O/F Pump	1		50.0	50.0	37.3	0.80	1	30		1.00	30	
5200-MCC-5004A2										695			695
3800	Make Up Air Unit	1		25.0	25.0	18.7	0.80	1	15		1.00	15	
3800	Make Up Air Unit	1		25.0	25.0	18.7	0.80	1	15		1.00	15	
3800	Make Up Air Unit	1		25.0	25.0	18.7	0.80	1	15		1.00	15	
3800	Make Up Air Unit	1		25.0	25.0	18.7	0.80	1	15		1.00	15	
3800	Calciner	1		50.0	50.0	37.3	0.80	1	30		1.00	30	
3800	Calcine Discharge Screw Conveyor	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3800	Calcine Bin Baghouse Fan	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3800	Calcine Bin Discharge Screw Conveyor	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3800	Calcine Drum Packaging System	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
3800	Drying Area Sump Pump	1		40.0	40.0	29.8	0.80	1	24		1.00	24	
3800	Sweep Air ID Fan	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3800	Cooling Air FD Fan	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3800	Cooling Air ID Fan	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3800	Calciner Scrubber Recirculation Pump	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
3800	Heat Recovery Loop Pump	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3800	Calcine Bin Baghouse	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
3800	Combustion Air FD Fan	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3800	Combustion Air ID Fan	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3800	Transformer for lighting panel	1		53.6	53.6	40.0	0.80	1	32		1.00	32	
3800	Exhaust Fan	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
3800	Steam Unit Heater	1		0.5	0.5	0.4	0.80	1	0		1.00	0	

3800	Steam Unit Heater	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
3800	Make Up Air Unit	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
3800	Electric Unit Heater	1		26.8	26.8	20.0	1.00	1	20		1.00	20	
3800	Exhaust Fan	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
3800	Exhaust Fan	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
3800	Intake Fan	1		2.0	2.0	1.5	0.80	1	1		1.00	1	
3800	Product Drying & Packaging Area Process Venti	1		3.0	3.0	2.2	0.80	1	2		1.00	2	
3800	Heater / Blower	1		40.2	40.2	30.0	0.80	1	24		1.00	24	
3800	Admin Building & Dry	1		268.1	268.1	200.0	0.80	1	160		1.00	160	
3800	Plant Air Compressor	1		150.0	150.0	111.9	0.80	1	90		1.00	90	
3800	Plant Air Compressor	1		150.0	150.0	111.9	0.80	1	90		1.00	90	
3800	Instrument Air Compressor	1		100.0	100.0	74.6	0.80	1	60		1.00	60	
3800	Product Drying & Packaging Area Process Venti	1		3.0	3.0	2.2	0.80	1	2		1.00	2	
5200-MCC-5004B1										884			884
4500	Incline Conveyor #1	1		20.1	20.1	15.0	0.80	1	12		1.00	12	
4500	Incline Conveyor #2	1		20.1	20.1	15.0	0.80	1	12		1.00	12	
4500	Reversible Conveyor #1	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
4500	Reversible Conveyor #1	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
4500	Twin shaft paste mixer for Continuous Paste Mix	1		49.9	49.9	37.2	0.80	1	30		1.00	30	
4500	Hydraulic unit for mixer drain valves for Continuc	1		2.9	2.9	2.2	0.80	1	2		1.00	2	
4500	Twin shaft paste mixer for Continuous Paste Mix	1		49.9	49.9	37.2	0.80	0	0		1.00	0	
4500	Hydraulic unit for mixer drain valves for Continuc	1		2.9	2.9	2.2	0.80	0	0		1.00	0	
4500	Twin shaft paste mixer for Continuous Paste Mix	1		49.9	49.9	37.2	0.80	1	30		1.00	30	
4500	Hydraulic unit for mixer drain valves for Continuc	1		2.9	2.9	2.2	0.80	1	2		1.00	2	
4500	Continuous Paste Mixers Dust Collector No. 1	1		10.1	10.1	7.5	0.80	1	6		1.00	6	
4500	Continuous Paste Mixers Dust Collector No. 2	1		10.1	10.1	7.5	0.80	1	6		1.00	6	
4500	High Pressure Wash System No. 1	1		29.5	29.5	22.0	0.80	0	0		1.00	0	
4500	High Pressure Wash System No. 2	1		29.5	29.5	22.0	0.80	0	0		1.00	0	
4500	Internal and external hopper vibrator for Paste Hc	1		1.3	1.3	1.0	0.80	1	1		1.00	1	
4500	Internal and external hopper vibrator for Paste Hc	1		1.3	1.3	1.0	0.80	0	0		1.00	0	
4500	Internal and external hopper vibrator for Paste Hc	1		1.3	1.3	1.0	0.80	1	1		1.00	1	
4500	Paste Pump No. 1	1		2.7	2.7	2.0	0.80	1	2		1.00	2	
4500	Paste Pump Hydraulic Power Pack No. 1	1		422.3	422.3	315.0	0.80	1	252		1.00	252	
4500	Cooling unit motor 1 for Paste Pump Hydraulic I	1		1.1	1.1	0.8	0.80	1	1		1.00	1	
4500	Cooling unit motor 2 for Paste Pump Hydraulic F	1		0.7	0.7	0.5	0.80	1	0		1.00	0	
4500	Paste Pump No. 2	1		2.7	2.7	2.0	0.80	0	0		1.00	0	
4500	Paste Pump Hydraulic Power Pack No. 2	1		422.3	422.3	315.0	0.80	0	0		1.00	0	
4500	Cooling unit motor 1 for Paste Pump Hydraulic I	1		1.1	1.1	0.8	0.80	0	0		1.00	0	
4500	Cooling unit motor 2 for Paste Pump Hydraulic I	1		0.7	0.7	0.5	0.80	0	0		1.00	0	
4500	Paste Pump No. 3	1		2.7	2.7	2.0	0.80	1	2		1.00	2	
4500	Paste Pump Hydraulic Power Pack No. 3	1		422.3	422.3	315.0	0.80	1	252		1.00	252	
4500	Cooling unit motor 1 for Paste Pump Hydraulic I	1		1.1	1.1	0.8	0.80	1	1		1.00	1	
4500	Cooling unit motor 2 for Paste Pump Hydraulic F	1		0.7	0.7	0.5	0.80	1	0		1.00	0	
4500	Flush Pump	1		248.0	248.0	185.0	0.80	1	148		1.00	148	
4500	Blower	1		76.4	76.4	57.0	0.80	0	0		1.00	0	
4500	Binder silo and Silo dust collector for Binder Silo	1		9.4	9.4	7.0	0.80	1	6		1.00	6	
4500	Binder silo and Silo dust collector for Binder Silo	1		9.4	9.4	7.0	0.80	1	6		1.00	6	
4500	Weight Belt Feeder No. 1	1		0.9	0.9	0.7	0.80	1	1		1.00	1	
4500	Weight Belt Feeder No. 2	1		0.9	0.9	0.7	0.80	1	1		1.00	1	
4500	Incline Screw Conveyor No. 1	1		7.4	7.4	5.5	0.80	1	4		1.00	4	
4500	Screw Conveyor No. 1	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
4500	Incline Screw Conveyor No. 2	1		7.4	7.4	5.5	0.80	1	4		1.00	4	
4500	Screw Conveyor No. 2	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
4500	Paste Area Drive-in Sump Pump	1		40.2	40.2	30.0	0.80	0	0		1.00	0	
4500	Transformer for lighting panel in Paste Plant	1		53.6	53.6	40.0	0.80	1	32		1.00	32	
4500	Discharge hopper with rotary airlock for 4500-DC	1		2.0	2.0	1.5	0.80	1	1		1.00	1	
4500	Discharge hopper with rotary airlock for 4500-DC	1		2.0	2.0	1.5	0.80	1	1		1.00	1	
4500	Discharge hopper with rotary airlock for 4500-DC	1		2.0	2.0	1.5	0.80	1	1		1.00	1	
4500	Paste Plant Area Overhead Crane	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
5200-MCC-5004B2										439			439
3700	Leach Residue Pachuca Compressor	1		200.0	200.0	149.2	0.80	1	119		1.00	119	
3700	Residue Dewatering Belt Filter	1		25.0	25.0	18.7	0.80	1	15		1.00	15	
3700	Leach Residue Area Sump Pump	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3700	Leach Residue Pachuca Recirc Pump #1	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3700	Tails Mix Tank Feed Pump #1	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3700	Tails Mix Tank Feed Pump #2	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3700	Dewatering Belt Filter Feed Pump #1	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3700	Dewatering Belt Filter Feed Pump #2	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3700	Leach Residue Filtrate Pump	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3700	Vacuum Pump	1		120.0	120.0	89.5	0.80	1	72		1.00	72	
3700	Flocculant Mixing Unit	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
3700	Residue Dewatering Flocculant Pump #1	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
3700	Residue Dewatering Flocculant Pump #2	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
3700	FSET Precipitate Storage Tank Agitator	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3700	SSET Precipitate Storage Tank Agitator	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
3700	Tailings Mix Tank Agitator	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
3700	Tailings Belt Filter	1		25.0	25.0	18.7	0.80	1	15		1.00	15	
3700	FSET Precipitate Pump	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
3700	SSET Precipitate Pump	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
3700	Tailings Belt Filter Feed Pump #1	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3700	Tailings Belt Filter Feed Pump #2	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3700	Vacuum Pump	1		120.0	120.0	89.5	0.80	1	72		1.00	72	
3700	Tailings Filtrate Pump	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3700	Filtrate Transfer Pump	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
3700	Tails Neutralization Area Process Ventilation Far	1		3.0	3.0	2.2	0.80	1	2		1.00	2	
3700	Tails Neutralization Area Process Ventilation Far	1		3.0	3.0	2.2	0.80	1	2		1.00	2	
5200-MCC-5005A1										511			511
4300	FSET Reactor Tank #1 Agitator	1		25.0	25.0	18.7	0.80	1	15		1.00	15	
4300	FSET Reactor Tank #2 Agitator	1		25.0	25.0	18.7	0.80	1	15		1.00	15	
4300	FSET Clarifier Feed Pump	1		75.0	75.0	56.0	0.80	1	45		1.00	45	
4300	FSET Clarifier Rake and Drive	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
4300	FSET Clarifier U/F Pump #1	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
4300	FSET Clarifier U/F Pump #2	1		5.0	5.0	3.7	0.80	0	0		1.00	0	
4300	SSET Reactor Tank #1 Agitator	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
4300	SSET Reactor Tank #2 Agitator	1		15.0	15.0	11.2	0.80	0	0		1.00	0	
4300	SSET Clarifier Feed Pump	1		75.0	75.0	56.0	0.80	1	45		1.00	45	
4300	SSET Clarifier Rake and Drive	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
4300	SSET Clarifier U/F Pump #1	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
4300	SSET Clarifier U/F Pump #2	1		10.0	10.0	7.5	0.80	0	0		1.00	0	
4300	pH Adjustment Tank Agitator	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
4300	Treated Water Feed Pump	1		100.0	100.0	74.6	0.80	1	60		1.00	60	
4300	FSET Area Sump Pump	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
4300	Self Contained AC Unit	1		127.3	127.3	95.0	0.80	1	76		1.00	76	
4300	Self Contained AC Unit	1		127.3	127.3	95.0	0.80	1	76		1.00	76	
4300	Self Contained AC Unit	1		40.2	40.2	30.0	0.80	1	24		1.00	24	
4300	Exhaust Fan	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
4300	Exhaust Fan	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
4300	Exhaust Fan	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
4300	Electric Unit Heater	1		53.6	53.6	40.0	1.00	1	40		1.00	40	
4300	Electric Unit Heater	1		53.6	53.6	40.0	1.00	1	40		1.00	40	
4300	Electric Unit Heater	1		53.6	53.6	40.0	1.00	1	40		1.00	40	
4300	Electric Unit Heater	1		53.6	53.6	40.0	1.00	1	40		1.00	40	
4300	Electric Unit Heater	1		53.6	53.6	40.0	1.00	1	40		1.00	40	
4300	Electric Unit Heater	1		53.6	53.6	40.0	1.00	1	40		1.00	40	
4300	Electric Unit Heater	1		53.6	53.6	40.0	1.00	1	40		1.00	40	
4300	Electric Unit Heater	1		53.6	53.6	40.0	1.00	1	40		1.00	40	
4300	Electric Unit Heater	1		20.1	20.1	15.0	1.00	1	15		1.00	15	
4300	Electric Unit Heater	1		20.1	20.1	15.0	1.00	1	15		1.00	15	
4300	Electric Unit Heater	1		13.4	13.4	10.0	1.00	1	10		1.00	10	
4300	Electric Unit Heater	1		13.4	13.4	10.0	1.00	1	10		1.00	10	
4300	Electric Unit Heater	1		6.7	6.7	5.0	1.00	1	5		1.00	5	
4300	Electric Unit Heater	1		6.7	6.7	5.0	1.00	1	5		1.00	5	
4300	Make Up Air Unit	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
4300	Transformer for lighting panel	1		53.6	53.6	40.0	0.80	1	32		1.00	32	
4300	Transformer for lighting panel	1		53.6	53.6	40.0	0.80	1	32		1.00	32	
4300	Effluent Treatment Area Process Ventilation Fan	1		3.0	3.0	2.2	0.80	1	2		1.00	2	
5200-MCC-5005A2										434			434
3500	SX Extraction Mixer Settler Mixer #1	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3500	SX Extraction Mixer Settler Mixer #2	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3500	SX Extraction Mixer Settler Mixer #3	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3500	SX Extraction Mixer Settler Mixer #4	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
3500	SX Scrub Mixer Settler Mixer #1	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
3500	SX Scrub Mixer Settler Mixer #2	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
3500	SX Strip Mixer Settler Mixer #1	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
3500	SX Strip Mixer Settler Mixer #2	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
3500	SX Strip Mixer Settler Mixer #3	1		15.0	15.0	11.2	0.80	1	9		1.00	9	

	3500	SX Strip Mixer Settler Mixer #4	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3500	SX Strip Mixer Settler Mixer #5	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3500	SX Strip Mixer Settler Mixer #6	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3500	SX Acid Wash Mixer Settler Mixer	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3500	SX Regen Mixer Settler Mixer	1		2.0	2.0	1.5	0.80	1	1		1.00	1	
	3500	SX Regen Discharge Pump	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	3500	Extraction Sump Pump	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	3500	Stripping Sump Pump	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	3500	Raffinate Transfer Pump	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
	3500	Barren Organic Transfer Pump	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3500	Strip Make-up Tank Agitator	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	3500	Strip Make-up Transfer Pump	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	3500	Loaded Strip Transfer Pump	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	3500	Sodium Carbonate Mix Tank Agitator	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	3500	Sodium Carbonate Transfer Pump	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	3500	Sodium Carbonate Distribution Pump	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	3500	Acid Water Mix Tank Agitator	1		3.0	3.0	2.2	0.80	1	2		1.00	2	
	3500	Acid Water Mix Feed Pump	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	3500	Raffinate Pump	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
	3500	Scrub Pump	1		60.0	60.0	44.8	0.80	1	36		1.00	36	
	3500	Loaded Strip Transfer Pump	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	3500	Organic Pump	1		20.0	20.0	14.9	0.80	1	12		1.00	12	
	3500	Strip Make-up Pump	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	3500	Barren Organic Transfer Pump	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	3500	Split AC Unit	1		40.2	40.2	30.0	0.80	1	24		1.00	24	
	3500	Exhaust Fan	1		7.5	7.5	5.6	0.80	1	4		1.00	4	
	3500	Exhaust Fan	1		7.5	7.5	5.6	0.80	1	4		1.00	4	
	3500	Exhaust Fan	1		7.5	7.5	5.6	0.80	1	4		1.00	4	
	3500	Exhaust Fan	1		7.5	7.5	5.6	0.80	1	4		1.00	4	
	3500	Electric Unit Heater	1		26.8	26.8	20.0	0.80	1	16		1.00	16	
	3500	Electric Unit Heater	1		6.7	6.7	5.0	0.80	1	4		1.00	4	
	3500	Steam Unit Heater	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
	3500	Steam Unit Heater	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
	3500	Steam Unit Heater	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
	3500	Steam Unit Heater	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
	3500	Steam Unit Heater	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
	3500	Steam Unit Heater	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
	3500	Steam Unit Heater	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
	3500	Steam Unit Heater	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
	3500	Steam Unit Heater	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
	3500	Steam Unit Heater	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
	3500	Steam Unit Heater	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
	3500	Steam Unit Heater	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
	3500	Steam Unit Heater	1		0.5	0.5	0.4	0.80	1	0		1.00	0	
	3500	Make Up Air Unit	1		25.0	25.0	18.7	0.80	1	15		1.00	15	
	3500	Make Up Air Unit	1		25.0	25.0	18.7	0.80	1	15		1.00	15	
	3500	Self Contained AC Unit	1		40.2	40.2	30.0	0.80	1	24		1.00	24	
	3500	Transformer for lighting panel in Solvent Extracti	1		53.6	53.6	40.0	0.80	1	32		1.00	32	
	3500	Transformer for lighting panel in Solvent Extracti	1		53.6	53.6	40.0	0.80	1	32		1.00	32	
	3500	SX Area Sump Pump	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3500	SX Process Ventilation Fan #1	1		3.0	3.0	2.2	0.80	1	2		1.00	2	
	3500	SX Process Ventilation Fan #2	1		3.0	3.0	2.2	0.80	1	2		1.00	2	
	3500	SX Process Ventilation Fan #3	1		3.0	3.0	2.2	0.80	1	2		1.00	2	
	3500	SX Area Overhead Crane	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	5200-MCC-5005A3										427			427
	3300	Sulphuric Acid Mix Tank Agitator	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
	3300	FSET Sulphuric Acid Metering Pump #1	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
	3300	FSET Sulphuric Acid Metering Pump #2	1		1.0	1.0	0.7	0.80	0	0		1.00	0	
	3300	SSET Sulphuric Acid Metering Pump #1	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
	3300	SSET Sulphuric Acid Metering Pump #2	1		1.0	1.0	0.7	0.80	0	0		1.00	0	
	3300	Ferric Sulphate Distribution Pump #1	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
	3300	Ferric Sulphate Distribution Pump #2	1		1.0	1.0	0.7	0.80	0	0		1.00	0	
	3300	FSET Ferric Sulphate Metering Pump #1	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
	3300	FSET Ferric Sulphate Metering Pump #2	1		1.0	1.0	0.7	0.80	0	0		1.00	0	
	3300	SSET Ferric Sulphate Metering Pump #1	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
	3300	SSET Ferric Sulphate Metering Pump #2	1		1.0	1.0	0.7	0.80	0	0		1.00	0	
	3300	Lime Unloading Blower	1		30.0	30.0	22.4	0.80	1	18		1.00	18	
	3300	Lime Screw Conveyor	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	3300	Lime Mix Tank Agitator	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	3300	Lime Transfer Pump #1	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3300	Lime Transfer Pump #2	1		15.0	15.0	11.2	0.80	0	0		1.00	0	
	3300	Lime Feed Loop Pump #1	1		15.0	15.0	11.2	0.80	1	9		1.00	9	
	3300	Lime Feed Loop Pump #2	1		15.0	15.0	11.2	0.80	0	0		1.00	0	
	3300	Barium Chloride Transfer Pump #1	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	3300	Barium Chloride Transfer Pump #2	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	3300	FSET Barium Chloride Metering Pump #1	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
	3300	FSET Barium Chloride Metering Pump #2	1		1.0	1.0	0.7	0.80	0	0		1.00	0	
	3300	SSET Barium Chloride Metering Pump #1	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
	3300	SSET Barium Chloride Metering Pump #2	1		1.0	1.0	0.7	0.80	0	0		1.00	0	
	3300	Flocculant Mixing Unit	1		2.0	2.0	1.5	0.80	1	1		1.00	1	
	3300	Residue Neut Barium Chloride Dist. Pump #1	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	3300	Residue Neut Barium Chloride Dist. Pump #2	1		2.0	2.0	1.5	0.80	1	1		1.00	1	
	3300	Lime Feed Tank Agitator	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	3300	Barium Chloride Mix Tank Agitator	1		3.0	3.0	2.2	0.80	1	2		1.00	2	
	3300	Barium Chloride Feed Tank Agitator	1		3.0	3.0	2.2	0.80	1	2		1.00	2	
	3300	Lime Silo Bag House	1		1.0	1.0	0.7	0.80	1	1		1.00	1	
	3300	Transformer for lighting panel	1		53.6	53.6	40.0	0.80	1	32		1.00	32	
	3300	Warehouse	1		134.0	134.0	100.0	1.00	1	100		1.00	100	
	3300	Maintenance Shop	1		268.1	268.1	200.0	1.00	1	200		1.00	200	
	5200-MCC-5005B1										228			228
	5400	Acid Plant	1		201.0	201.0	149.9	0.80	1	120		1.00	120	
	5400	Exhaust Fan	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	5400	Exhaust Fan	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	5400	Exhaust Fan	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	5400	Exhaust Fan	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	5400	Exhaust Fan	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	5400	Exhaust Fan	1		5.0	5.0	3.7	0.80	1	3		1.00	3	
	5400	Make Up Air Unit	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	5400	Make Up Air Unit	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	5400	Make Up Air Unit	1		10.0	10.0	7.5	0.80	1	6		1.00	6	
	5400	Transformer for lighting panel in Acid Plant	1		53.6	53.6	40.0	0.80	1	32		1.00	32	
	5400	Transformer for lighting panel in Acid Plant	1		53.6	53.6	40.0	0.80	1	32		1.00	32	
	5200-MCC-5005B2										1,087			1087
	5400	Oxygen Plant	1	600	1822.0	1822.0	1359.2	0.80	1	1087		1.00	1087	
	WATER DISTRIBUTION FACILITIES										669			669
Surface - Water	Water Distribution Facilities	Intake Faciltiy - North	1		800.0	800.0	596.8	0.85	1	507		1.00	507	
	Water Distribution Facilities	Fresh/Fire Water Pump Station - Fresh Water	1		200.0	200.0	149.2	0.85	1	127		1.00	127	
	Water Distribution Facilities	Fresh/Fire Water Pump Station - Fire Water	1		1500.0	1500.0	1119.0	0.85	0	0		1.00	0	
	Water Distribution Facilities	Sewage Lift Station	1		30.0	30.0	22.4	0.85	1	19		1.00	19	
	Water Distribution Facilities	Sewage Lagoon	1		25.0	25.0	18.7	0.85	1	16		1.00	16	
	SURFACE INFRASTRUCTURE										1471			1471
Surface - Other	Surface Infrastructure	Trailer Farm - NexGen	1		200.0	200.0	149.2	0.85	1	127		1.00	127	
	Surface Infrastructure	Trailer Farm - EPCM	1		200.0	200.0	149.2	0.85	1	127		1.00	127	
	Surface Infrastructure	Trailer Farm - Contractors	1		200.0	200.0	149.2	0.85	1	127		1.00	127	
	Surface Infrastructure	Fuel Distribution Station	1		20.0	20.0	14.9	0.85	1	13		1.00	13	
	Surface Infrastructure	Communication Building	1		275.0	275.0	205.2	0.85	1	174		1.00	174	
	Surface Infrastructure	Airstrip Terminal	1		75.0	75.0	56.0	0.85	1	48		1.00	48	
Solar for lighting	Surface Infrastructure	Explosive Magazine	1		15.0	15.0	11.2	0.85	0	0		1.00	0	
	Surface Infrastructure	Permanent Camp	1		1350.0	1350.0	1007.1	0.85	1	856		1.00	856	
Solar/Generator	Surface Infrastructure	Guard House - Generator	0		75.0	0.0	0.0	0.85	1	0		1.00	0	
										Total Loading (Nominal)	24064		Total Loading (Peak)	26487

Attachment IR 43-1

REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN BY	DES BY	DWG CHK	DES CHK	ENG MGR	PM
F	01MAR21	ISSUED FOR DESIGN	CJE	BEP	[signature]	[signature]	[signature]	[signature]
E	16DEC20	ISSUED FOR DESIGN	CJE	BEP	BEP	CLC	ABB	PO
D	27NOV20	ISSUED FOR APPROVAL	CJE	BEP	BEP	CLC	ABB	PO
C	30OCT19	ISSUED FOR DESIGN	BJS	BEP	BEP	CLC	ABB	PO
B	18OCT19	ISSUED FOR APPROVAL	BJS	BEP	BEP	CLC	ABB	PO
A	19SEP19	ISSUED FOR REVIEW	BJS	BEP	BEP	CJE	ABB	PO

ISO A1-594x841

REFERENCES

REF	NUMBER	TITLE
01	2000-DD10-GAD-00001	OVERALL AREA PLAN

STAMP/SEAL

ASSOCIATION OF PROFESSIONAL ENGINEERS & GEOSCIENTISTS OF SASKATCHEWAN
CERTIFICATE OF AUTHORIZATION
Wood Canada Limited
NUMBER C0577
PERMISSION TO CONSULT HELD BY:
DISCIPLINE Sk. Reg. No. SIGNATURE

APPROVED FOR FEASIBILITY STUDY

R. WEYMARK 08DEC20	B.E. POZNIAK	P. O'HARA
CLIENT PROJECT MGR	DEPARTMENT MGR	PROJECT MGR

PROJECT PHASE: ROOK I FEASIBILITY STUDY

PROJECT NO.: 246061

SCALE: 1:4000

	BY	DDMMMYY
DES	B.E. POZNIAK	16SEP19
DRN	B. SWERHONE	16SEP19
CHK	C.L. CHIN	17DEC20
APP	A.B. BOEHM	17DEC20

NexGen Energy Ltd.

SUBJECT: CIVIL SURFACE INFRASTRUCTURE GENERAL SITE DRAINAGE PLAN

CONSULTANT LOGO: wood.

AREA: 2500

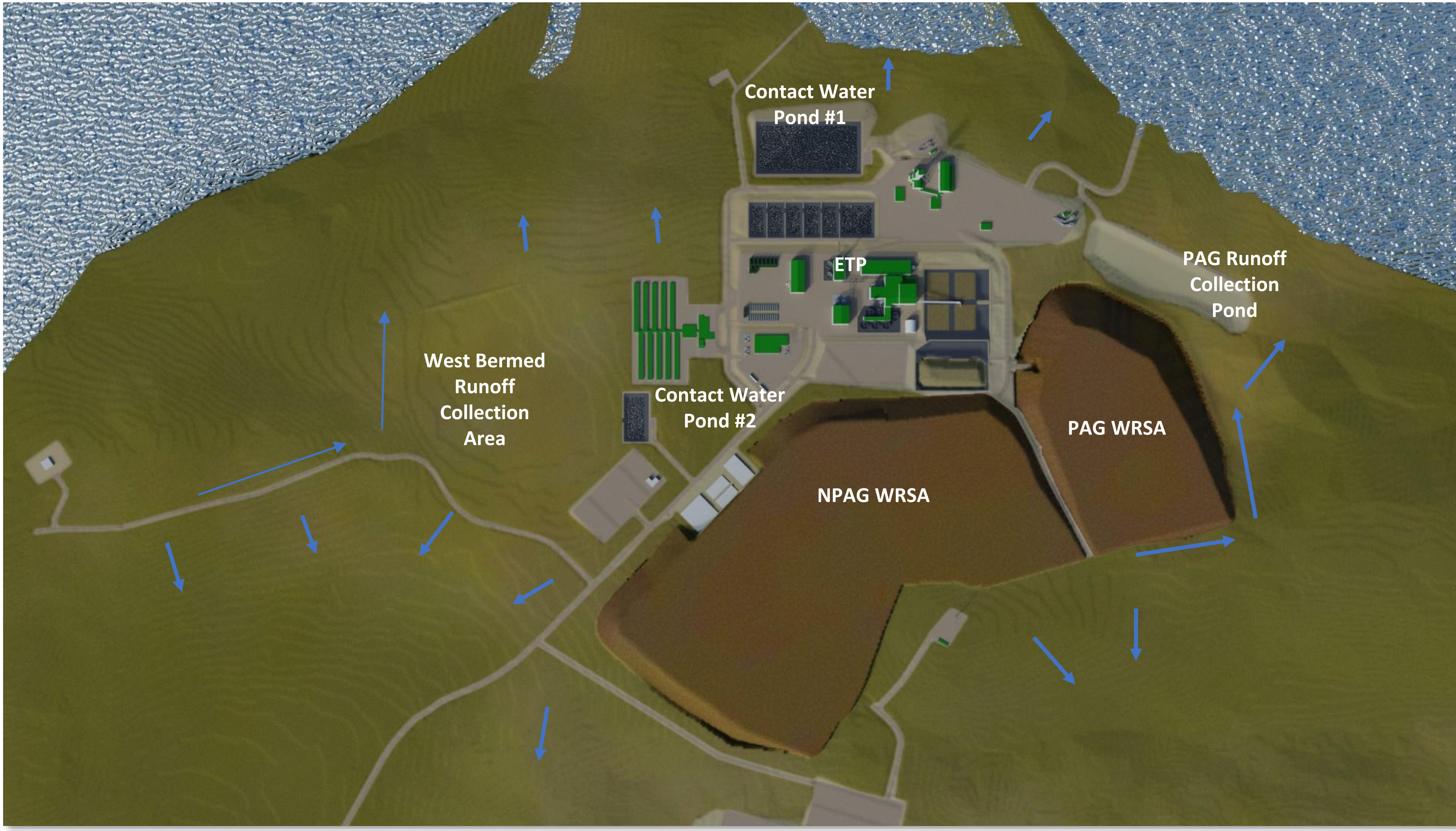
AREA DESCRIPTION: SITE WATER MANAGEMENT

DRAWING NO.: Figure 1

REV: F

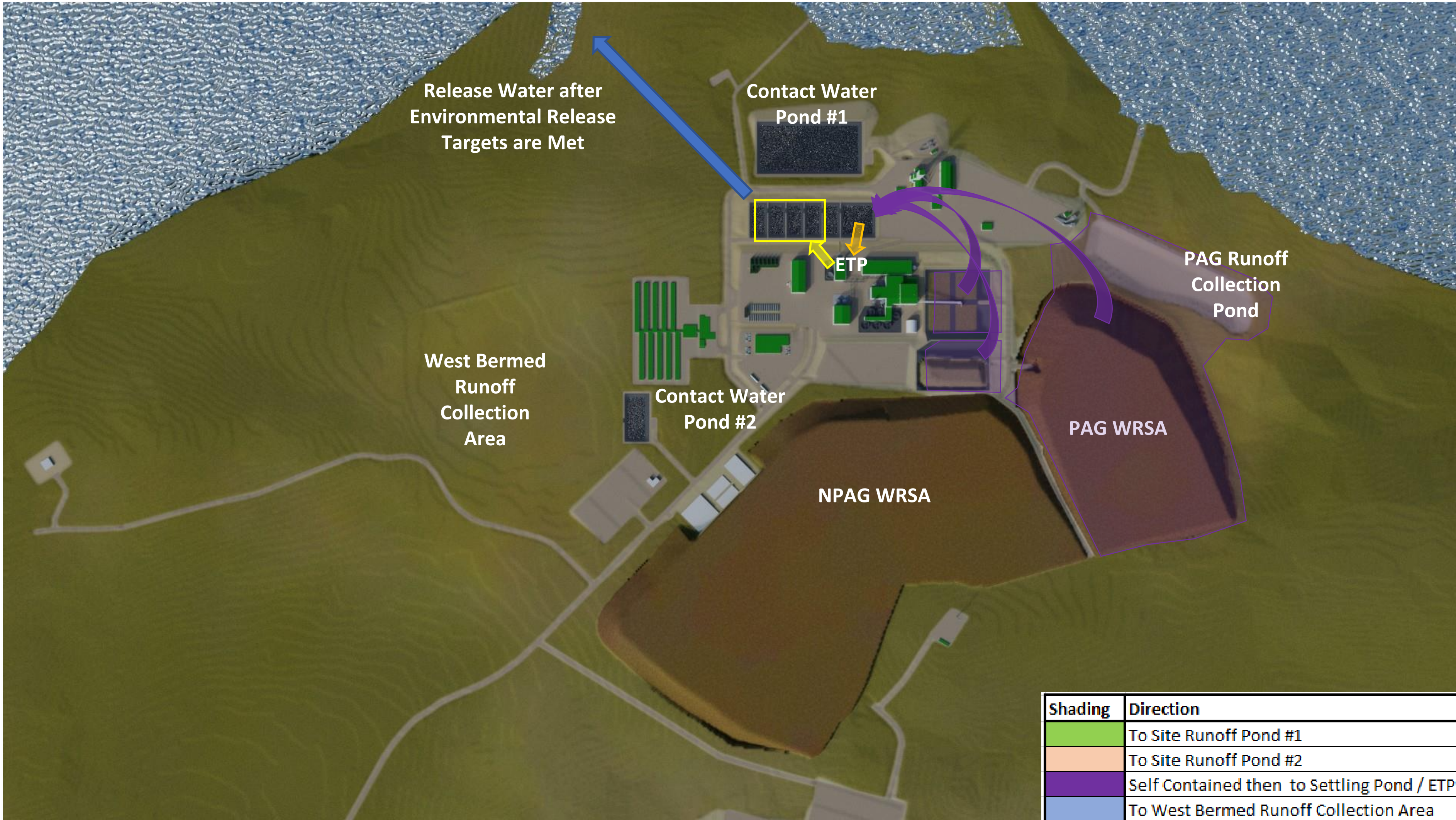
SAVED: 01-Mar-21 2:17 PM PLOTTED: 01-Mar-21 2:18 PM USER: POZNIAK, BRIAN E.

Figure 2: Surface Water Management: Non-Contact Water Diversion (Simplified Diagram)



ETP = effluent treatment plant; PAG = potentially acid generating; NPAG = non-potentially acid generating; WRSA = waste rock storage area.

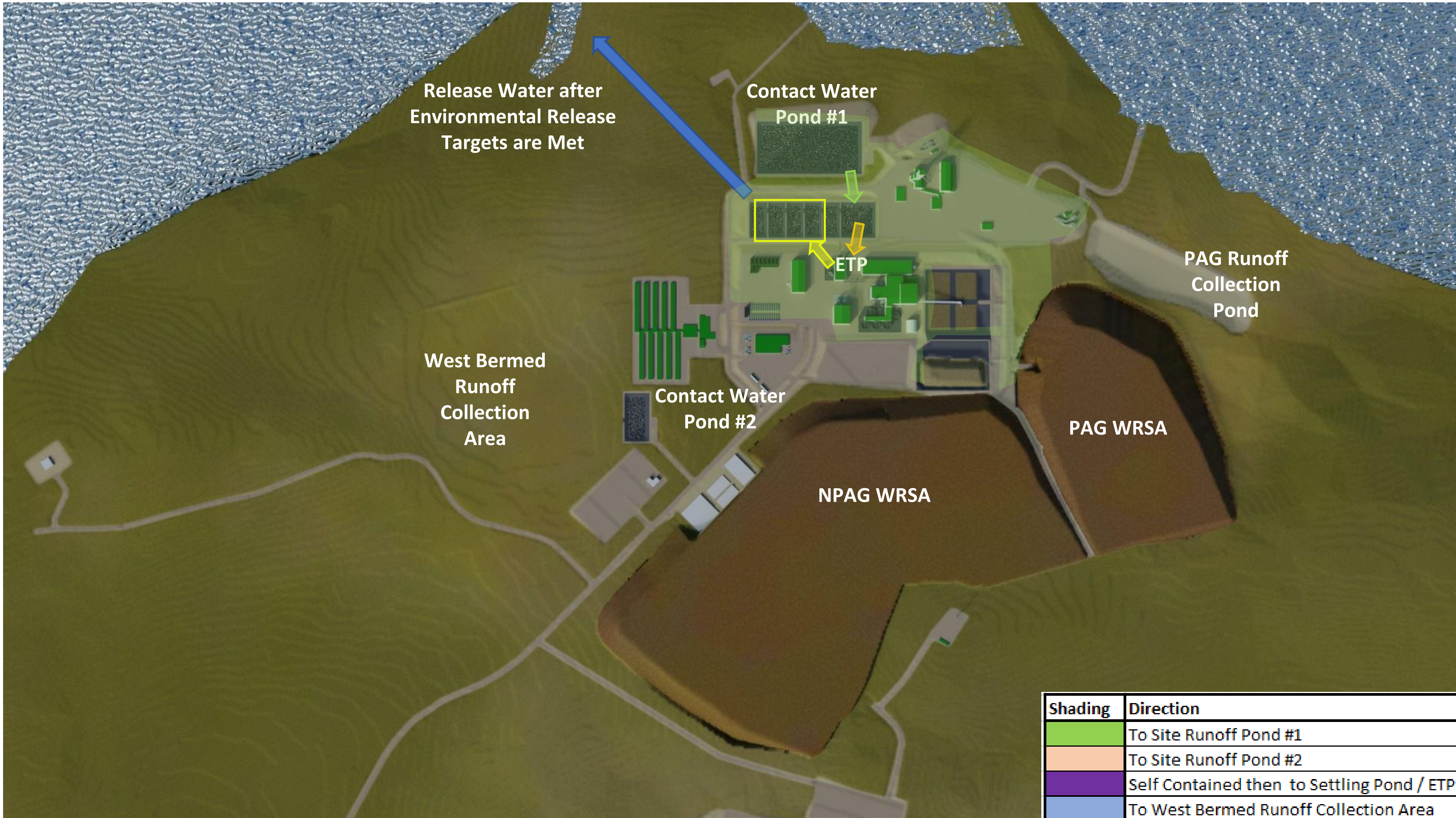
Figure 3: **Surface Water Management: Self-Contained Contact Water (Simplified Diagram)**



Shading	Direction
	To Site Runoff Pond #1
	To Site Runoff Pond #2
	Self Contained then to Settling Pond / ETP
	To West Bermed Runoff Collection Area

ETP = effluent treatment plant; PAG = potentially acid generating; NPAG = non-potentially acid generating; WRSA = waste rock storage area.

Figure 4: Surface Water Management: Contact Water Pond #1 Drainage (Simplified Diagram)



ETP = effluent treatment plant; PAG = potentially acid generating; NPAG = non-potentially acid generating; WRSA = waste rock storage area.

Figure 5: Surface Water Management: Contact Water Pond #2 / West Bermed Runoff Collection Area Drainage (Simplified Diagram)

Shading	Direction
(green)	To Site Runoff Pond #1
(peach)	To Site Runoff Pond #2
(purple)	Self Contained then to Settling Pond / ETP
(blue)	To West Bermed Runoff Collection Area

ETP = effluent treatment plant; PAG = potentially acid generating; NPAG = non-potentially acid generating; WRSA = waste rock storage area.

Attachment IR 46-2

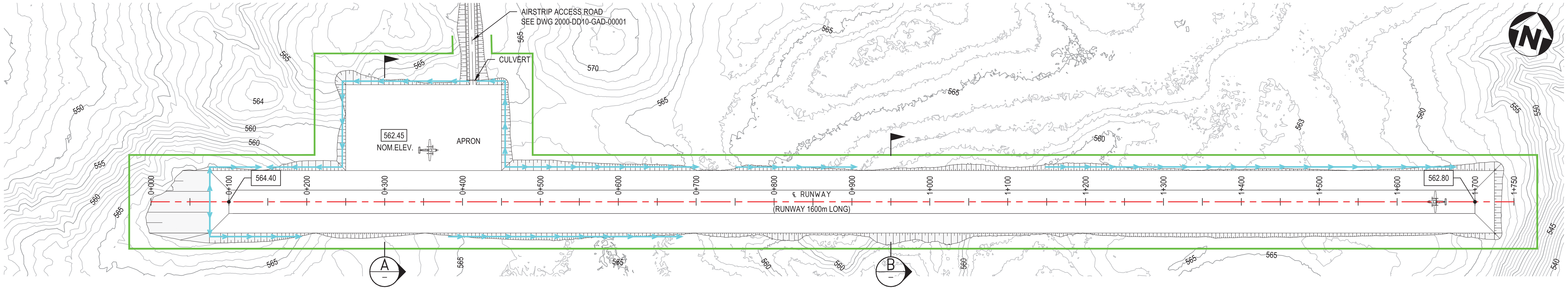
Table 1: Pond/Storage

Input Variable \ Ponds	Site Runoff Pond #1	Monitoring Pond #1	Monitoring Pond #2	Monitoring Pond #3	Monitoring Pond #4	Contingency Pond	Settling Pond	PAG Runoff Collection Area	West Bermed Runoff Collection Area	Site Runoff Pond #2	Special Waste Collection Sump	Ore Stockpile Collection Sump
Element ID	**P/S00**	**P/S01**	**P/S02**	**P/S03**	**P/S04**	**P/S05**	**P/S06**	**P/S07**	**P/S08**	**P/S09**	**P/S10**	**P/S11**
Climate data	Ref0	Ref0	Ref0	Ref0	Ref0	Ref0	Ref0	Ref0	Ref0	Ref0	N/A	N/A
Pond area (m^2)	28,800; Ref6	3,106; Ref6	3,106; Ref6	3,106; Ref6	3,106; Ref6	3,106; Ref6	5,940; Ref6	48,464; Ref6	153,440; Ref6	6,160; Ref6	2,174[f]	1,673[f]
Evaporation	Ref8	Ref8	Ref8	Ref8	Ref8	Ref8	Ref8	Ref8	Ref8	Ref8	N/A	N/A
Design Storm	PMP	PMP	PMP	PMP	PMP	PMP	PMP	PMP	PMP	100 yr 24hr	PMP	PMP
Minimum Storage (m^3)[i]	13,000	500[c]	500[c]	500[c]	500[c]	500[c]	1,600[c]	16,000	29,000	3,000	1,000	1,000
Operating Storage (m^3)[j]	13,000	N/A	N/A	N/A	N/A	N/A	N/A	16,000	0	3,000	1,000	1,000
Flood Storage (m^3)	131,690; Ref1	1,860 Ref1	1,860 Ref1	1,860 Ref1	1,860 Ref1	1,860 Ref1	3,855 Ref1	156,545; Ref1	286,854; Ref1	29,057; Ref1	8,184; Ref1	10,635; Ref1
Maximum Storage (Minimum Storage + Operating Storage + Flood Storage)	164,690	5,000; Ref9	5,000; Ref9	5,000; Ref9	5,000; Ref9	5,000; Ref9	16,000; Ref9	188,545	315,854	35,057	11,184	12,635
Initial Conditions (Water Level)	FSL	FSL	FSL	FSL	FSL	FSL	FSL	FSL	FSL	FSL	FSL	FSL
Liner Presence/Absence (P = Present; A = Absent)	P; Ref3	P; Ref3	P; Ref3	P; Ref3	P; Ref3	P; Ref3	P; Ref3	P; Ref3	A; Ref3	P; Ref3	P; Ref3	P; Ref3
Seepage rates	0	0	0	0	0	0	0	0	0[a]	0	0	0
Stage-Storage-Area Relationship	Estimated[g]	Estimated[g]	Estimated[g]	Estimated[g]	Estimated[g]	Estimated[g]	Estimated[g]	Estimated[g]	Estimated[g]	Estimated[g]	Estimated[g]	Estimated[g]
Simulated Volume Reporting during PMP by site model	164,000	1,520	1,520	1,520	1,520	1,520	12,900	150,000	140,000	170,000	8,840	10,900
Notes for PMP	- Pumping to Settling Pond	- Exchange between monitoring ponds possible during extreme event. - Simulated volume is direct precipitation on pond	- Exchange between monitoring ponds possible during extreme event. - Simulated volume is direct precipitation on pond	- Exchange between monitoring ponds possible during extreme event. - Simulated volume is direct precipitation on pond	- Exchange between monitoring ponds possible during extreme event. - Simulated volume is direct precipitation on pond	- Simulated volume is direct precipitation on pond	- Overflow Weir to Contingency Pond - Simulated volume of PMP is the peak daily inflow	- Initial self containment, followed by pumping to Settling Pond	- Detention of water to settle out suspended solids	- Excess storage to West Bermed Runoff Collection Area	- Initial self containment, followed by pumping to Settling Pond	- Initial self containment, followed by pumping to Settling Pond

FSL = Full supply level; PMP = probable maxium preciption.

Notes:

a) Seepage from the West Bermed Runoff Collection Area will report to Patterson Lake along the same flow path. Seepage from West Bermed Runoff Collection Area is a component of West Surface Runoff Discharge (Q01).
b) Patterson Lake simulated in the Regional Hydrology Model.
c) minimum pond storage maintained at approximately 10% of required flood storage to support water quality calculations.
d) Sump size assumed to be 10 m3 in the absence of sizing data
e) Sewage lagoon assumed to be 1,000 in leiu of documented value.
f) Area of collection sumps estimated as 10%
g) Stage-storage-area relationships estimated as an inverted tapezoidal prism fit to storage and area at full supply level.
h) Stage-storage- area relationship estimated as cylindrical tank.
i) Minimum storage estimated as approximately 10% of flood storage. Minimum storage maintained at all times to accommodate WQ calculation.
j) Operating storage estimated as approximately 10% of flood storage.



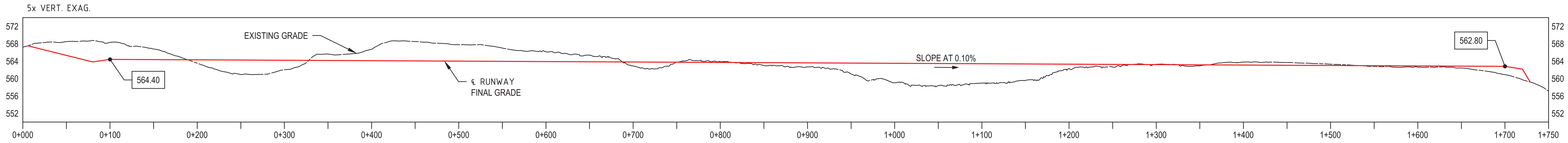
PLAN - AIRSTRIP
1:3000

NOTES:

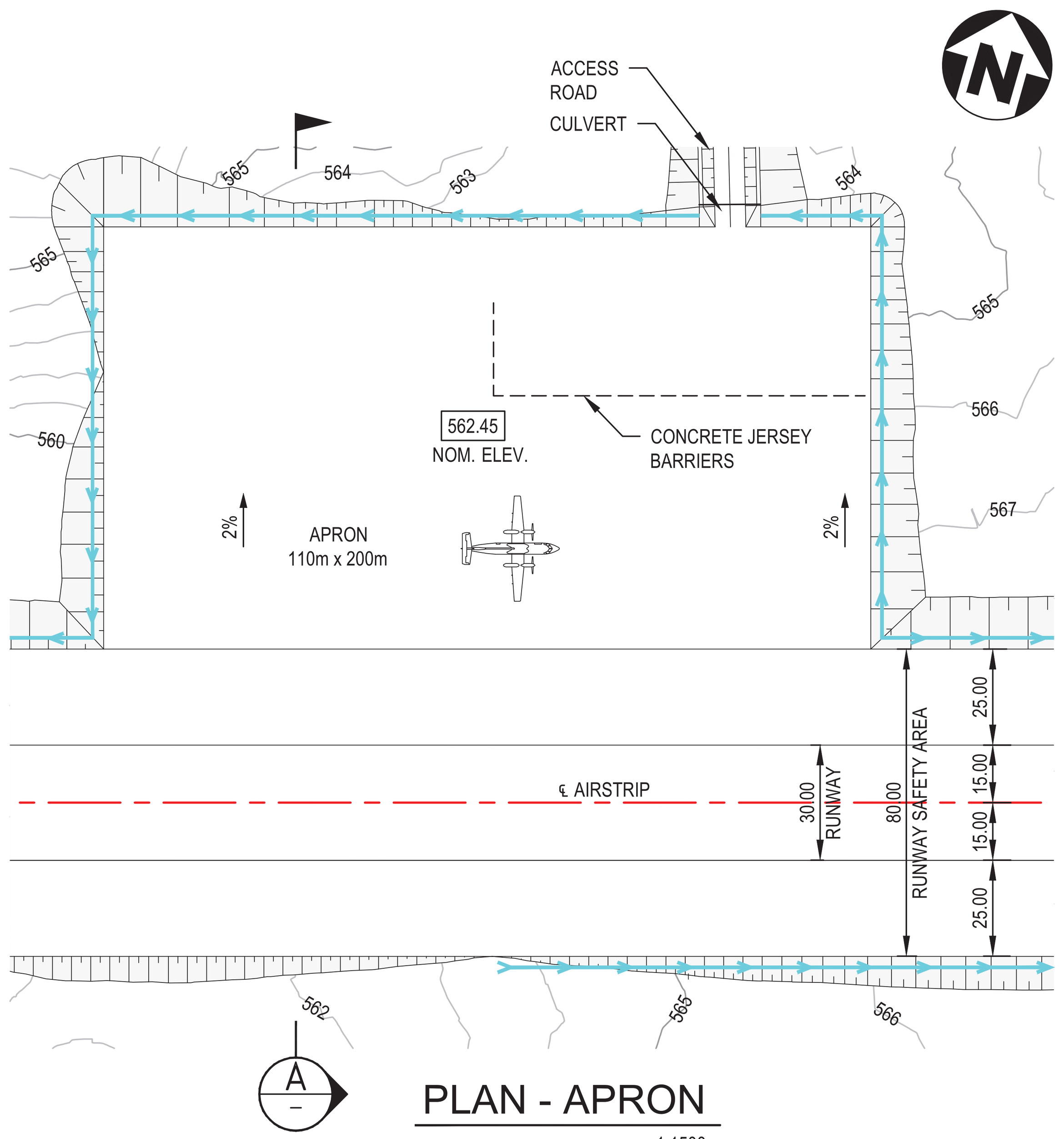
1. ALL UNITS ARE METRIC WITH DIMENSIONS IN METERS, UNLESS NOTED OTHERWISE. COORDINATES ARE UTM ZONE 12N NAD 83 (CSRS98) GROUND GRID.
2. CONTOUR INTERVALS ARE 1.0m.
3. RUNWAY AND AIRSTRIP DESIGNED FOR BOMBARDIER DASH 8 Q300 AND ATR 42-320.

LEGEND:

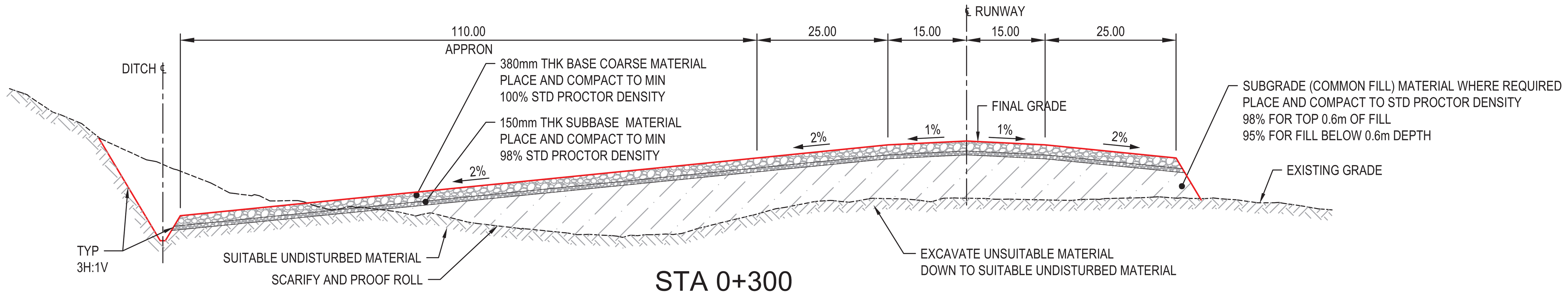
- 528.50 — FINISHED GRADE ELEVATION
- % — SLOPE INDICATOR
- CLEARING AND GRUBBING EXTENTS
- DITCH



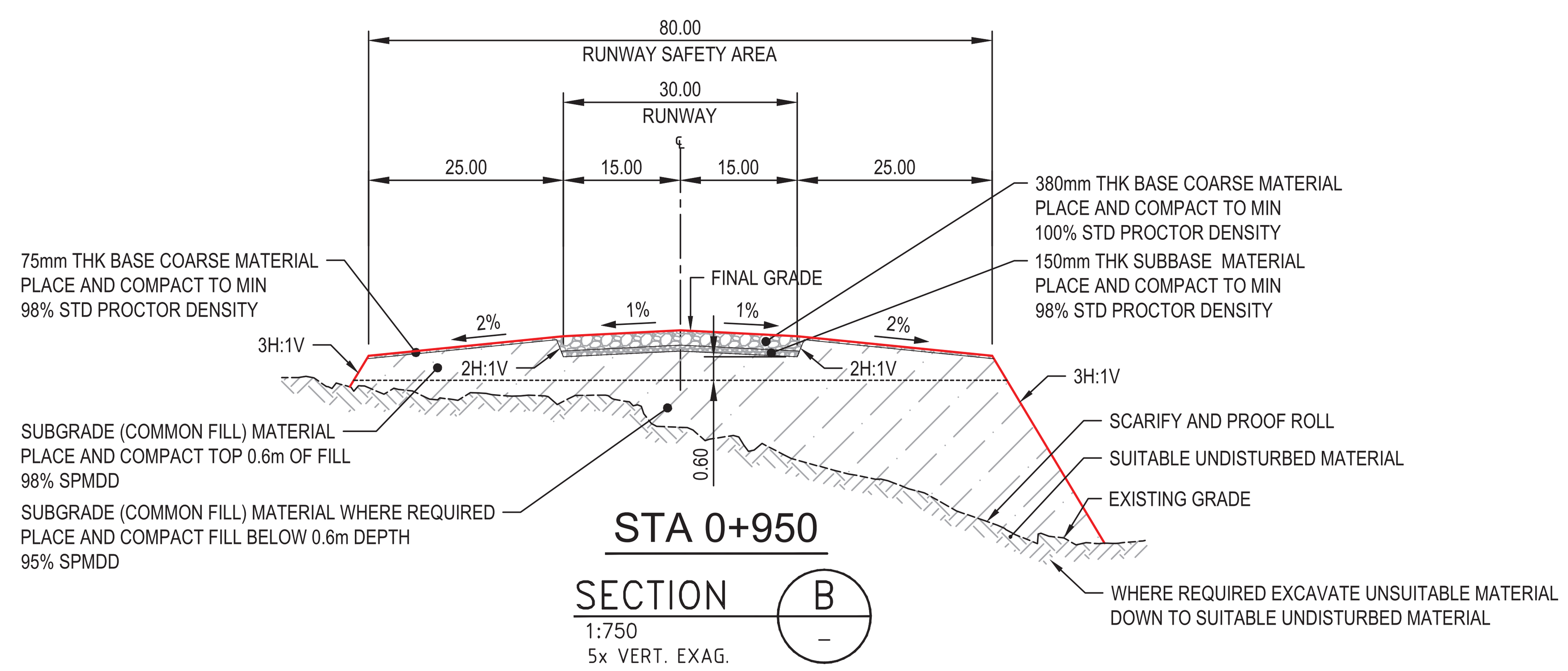
PROFILE
H 1:3000 V 1:600



PLAN - APRON
1:1500



STA 0+300
SECTION A
1:750
5x VERT. EXAG.



STA 0+950
SECTION B
1:750
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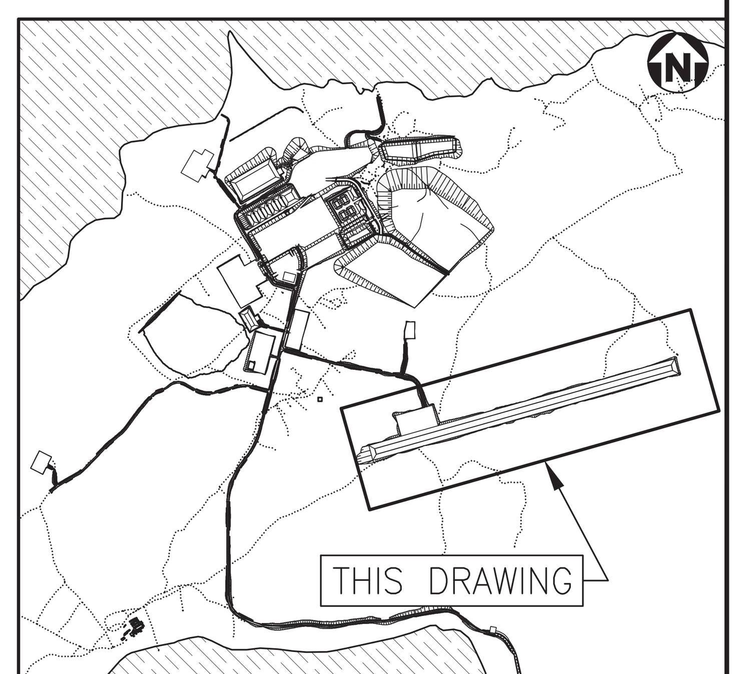
NOT TO BE USED FOR CONSTRUCTION

1:1500

1:3000

KEY PLAN



REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN BY	DES BY	DWG CHK	DES CHK	ENG MGR	PM
E	16DEC20	ISSUED FOR DESIGN	CJE	BEP				
D	27NOV20	ISSUED FOR APPROVAL	DBZ	BEP	BEP	CLC	ABB	PO
C	30OCT19	ISSUED FOR DESIGN	CJE	BEP	BEP	CLC	ABB	PO
B	18OCT19	ISSUED FOR APPROVAL	CJE	BEP	BEP	CLC	ABB	PO
A	23SEP19	ISSUED FOR REVIEW	CJE	BEP	BEP	CLC	ABB	PO

REF	NUMBER	TITLE
01	2000-DD10-GAD-00001	OVERALL AREA PLAN

REFERENCES

STAMP/SEAL

PROFESSIONAL ENGINEER
C.L. CHIN
MEMBER 05812
2020 12 21
YR. MN. DAY
SASKATCHEWAN

ASSOCIATION OF PROFESSIONAL ENGINEERS & GEOSCIENTISTS OF SASKATCHEWAN
CERTIFICATE OF AUTHORIZATION
Wood Canada Limited
NUMBER C0577
PERMISSION TO CONSULT HELD BY:

DISCIPLINE	Sk. Reg. No.	SIGNATURE
CIVIL	05812	C.L. CHIN

APPROVED FOR FEASIBILITY STUDY

R. WEYMARK 08DEC20 — CLIENT PROJECT MGR | DEPARTMENT MGR | PROJECT MGR

PROJECT PHASE: ROOK I FEASIBILITY STUDY

PROJECT NO.: 246061

SCALE: 1:500

	BY	DDMMMYY
DES	B.E. POZNIAK	04SEP19
DRN	C. ENGEL	04SEP19
CHK		17DEC20
APP		17DEC20

NexGen Energy Ltd.

SUBJECT: CIVIL
SURFACE INFRASTRUCTURE
AIRSTRIP AND APRON
PLAN, PROFILE AND SECTIONS

CONSULTANT LOGO: wood.

AREA: 2700
AREA DESCRIPTION: AIRSTRIP, APRON AND AIRPORT FACILITIES

DRAWING NO.: Figure 1
REV: E

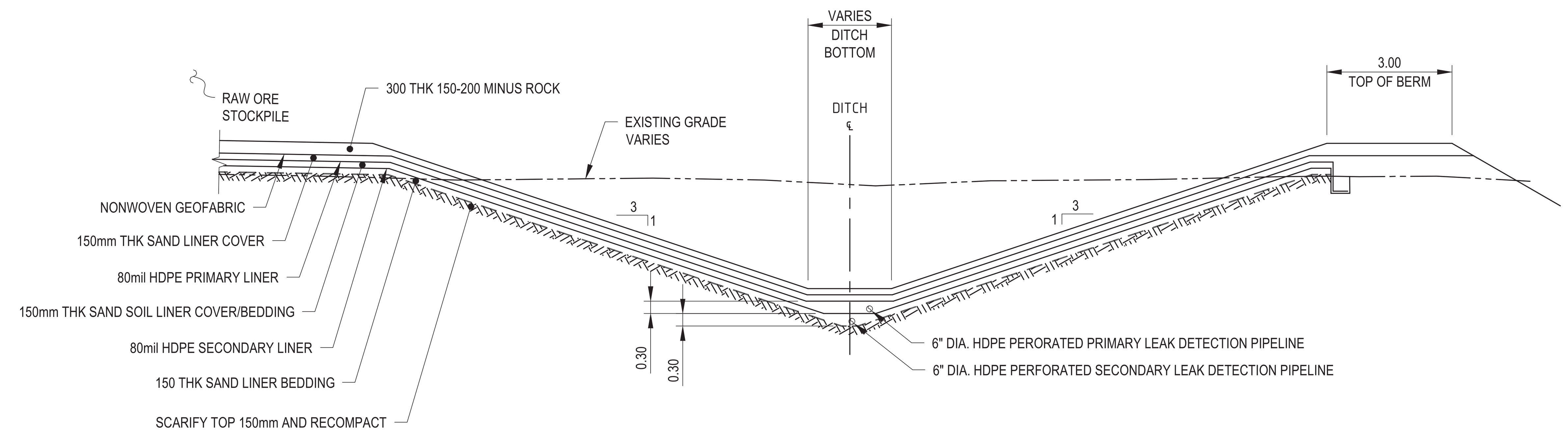
CAD FILE: P:\CAD\CIVIL\2700-DD10-GAD-00001.DWG

SAVED: 16-Dec-20 10:20 AM PLOTTED: 16-Dec-20 10:20 AM USER: POZNIAK, BRIAN E.

ISO A1-594x841

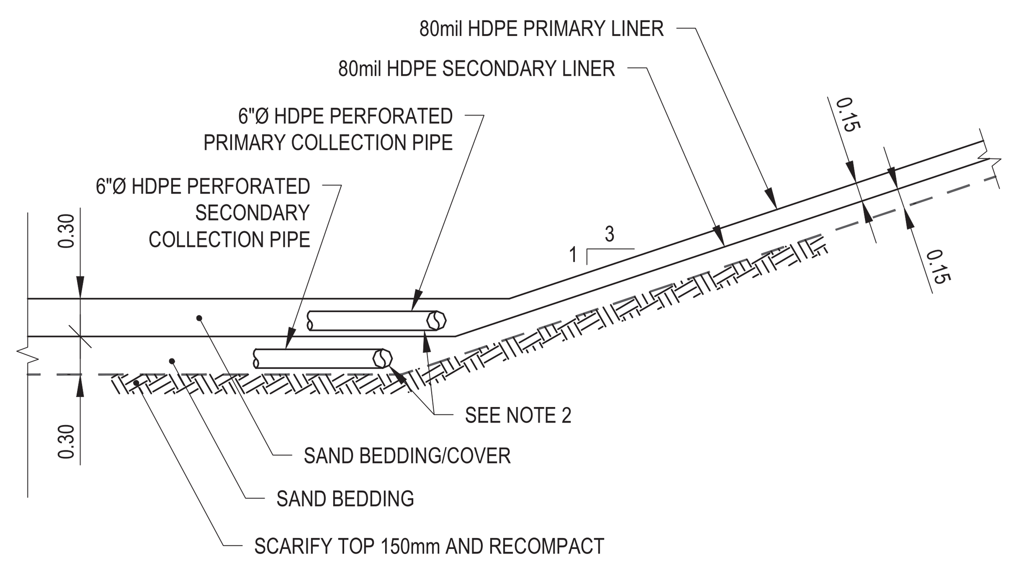
NOTES:

1. ALL UNITS ARE METRIC WITH DIMENSIONS IN METERS, UNLESS NOTED OTHERWISE. COORDINATES ARE UTM ZONE 12N NAD 83 (CSRS98) GROUND GRID.
2. PERFORATED LEAK DETECTION PIPING CONNECTED TO MONITORING WELLS VIA 6"Ø HDPE NON-PERFORATED PIPELINES. SEE DWG 2100-DD10-GAD-00004 FOR LEAK DETECTION PIPING LAYOUT.



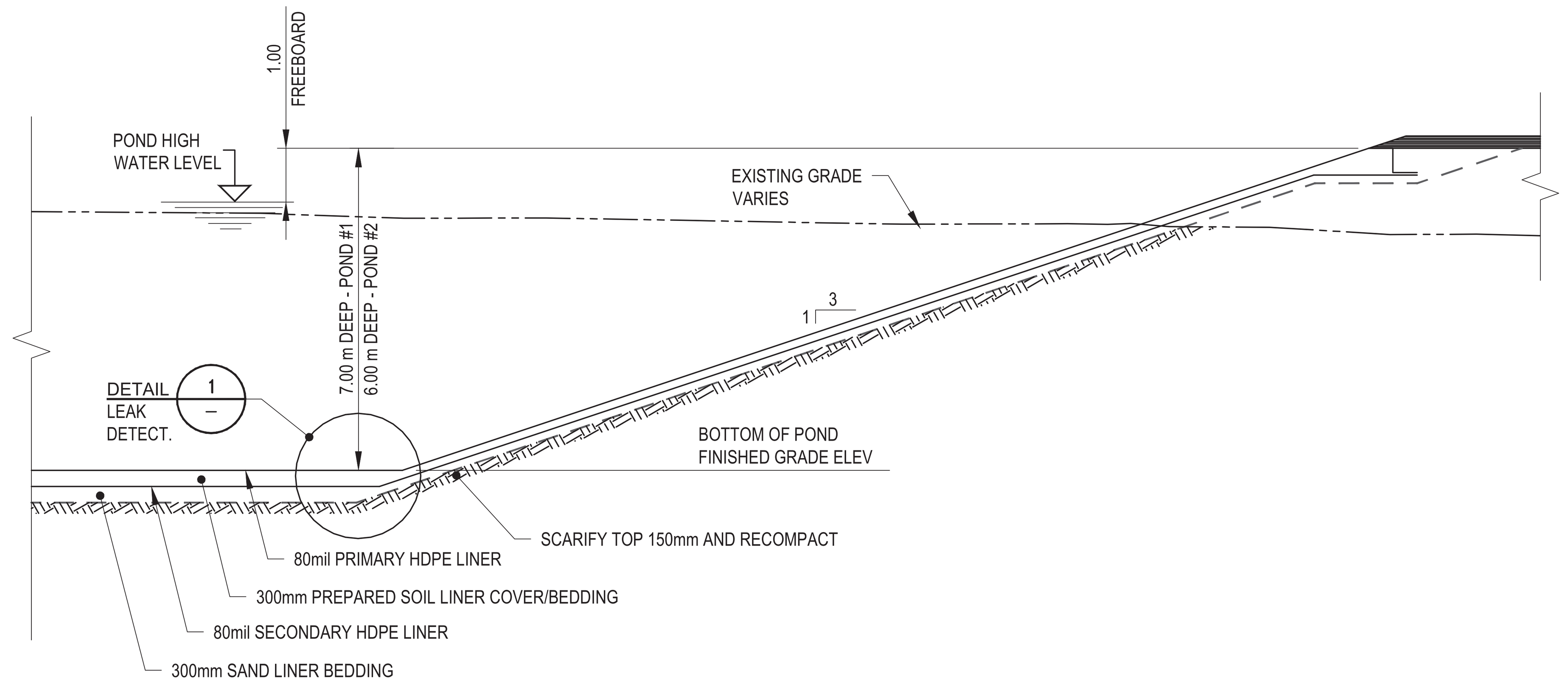
TYPICAL RAW ORE STOCKPILE
PAD AND DITCH

SECTION A
SCALE 1:100



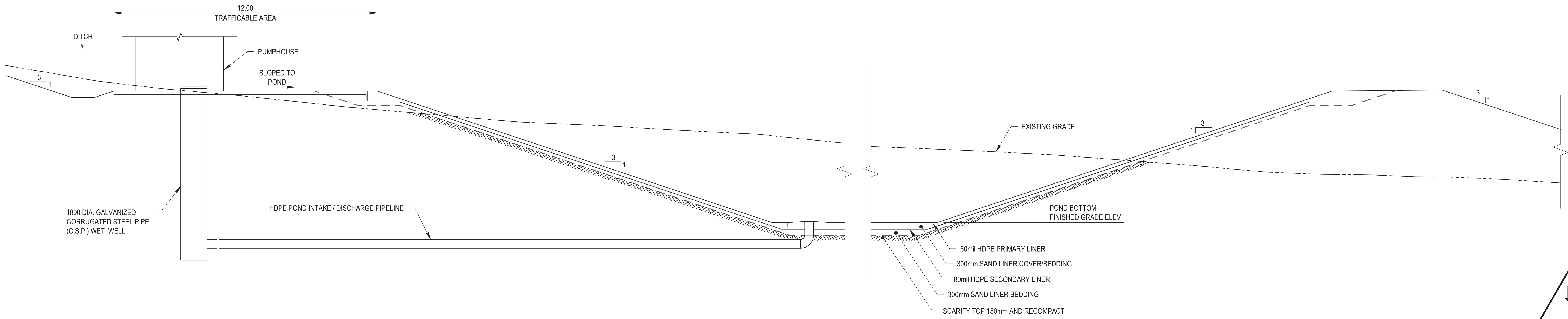
LEAK DETECTION DOUBLE LINER

DETAIL 1
SCALE 1:50



SITE RUNOFF CONTAINMENT POND

SECTION B
SCALE 1:100



MONITORING PONDS

SECTION C
SCALE 1:100

NOT TO BE USED FOR CONSTRUCTION

REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN BY	DES BY	DWG CHK	DES CHK	ENG MGR	PM
E	14DEC20	ISSUED FOR DESIGN	CJE	BEP				
D	27NOV20	ISSUED FOR APPROVAL	DBZ	BEP	BEP	CLC	ABB	PO
C	30OCT19	ISSUED FOR DESIGN	SH	BEP	BEP	CLC	ABB	PO
B	09OCT19	ISSUED FOR APPROVAL	SH	BEP	BEP	CLC	ABB	PO
A	26SEP19	ISSUED FOR REVIEW	SH	BEP	BEP	CLC	ABB	PO

REF	NUMBER	TITLE
04	5300-DD10-GAD-00002	GENERAL SITE PIPING LAYOUT
03	5300-DD10-GAD-00001	PROCESS PONDS PIPING AND GENERAL ARRANGEMENT
02	2000-DD10-GAD-00002	GENERAL SITE PLAN
01	2000-DD10-GAD-00001	OVERALL AREA PLAN

REFERENCES

STAMP/SEAL: PROFESSIONAL ENGINEER, C.L. CHIN, MEMBER 05812, 2020 12 21 (YR. MN. DAY), SASKATCHEWAN

ASSOCIATION OF PROFESSIONAL ENGINEERS & GEOSCIENTISTS OF SASKATCHEWAN
CERTIFICATE OF AUTHORIZATION
Wood Canada Limited
NUMBER C0577
PERMISSION TO CONSULT HELD BY:

DISCIPLINE	Sk. Reg. No.	SIGNATURE
CIVIL	05812	C.L. CHIN

APPROVED FOR FEASIBILITY STUDY

R. WEYMARK 08DEC20		
CLIENT PROJECT MGR	DEPARTMENT MGR	PROJECT MGR

PROJECT PHASE: ROOK I FEASIBILITY STUDY

PROJECT NO.: 246061

SCALE: AS SHOWN

	BY	DDMMMYY
DES	B.E. POZNIAK	11SEP19
DRN	S. HOPE	11SEP19
CHK		17DEC20
APP		17DEC20

NexGen Energy Ltd.

SUBJECT: CIVIL
SURFACE INFRASTRUCTURE
TYPICAL DETAILS
SITE RUNOFF POND & ORE STORAGE PAD

CONSULTANT LOGO: wood.

AREA: 2500
AREA DESCRIPTION: SITE WATER MANAGEMENT

DRAWING NO.: Figure 2
REV: E

SAVED: 10-Dec-20 1:50 PM PLOTTED: 14-Dec-20 9:15 AM USER: ENGEL, CHRISTOPHER J

CAD FILE: C:\USERS\SEAN.HOPE\DOWNLOADS\NEXGEN\2100-DD10-SDD-00001.DWG

ISO A1-594x841

Attachment IR 49-1

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3150 – 1021 West Hastings Street
Vancouver, BC V6E 0C3

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Saskatoon, SK S7K 1P4

Attachment IR 49-1

1 Introduction

Attachment IR 49-1 has been developed to support part 1 and part 2 of NexGen's response to IR 49; this IR from Environment and Climate Change Canada requests:

1. Provide a schematic demonstrating flow through the ETP [effluent treatment plant] including flow rates, capacity of system tanks and clarifiers, locations, and average and maximum treatment capacity of the ETP.
2. Provide a more in-depth overview of the treatment processes within the proposed ETP and how the ETP is designed to remove the chemical and radiological constituents from effluent, including the expected efficiency of treatment.

As noted in NexGen's main response to IR 49, the reviewer's request for detailed information on the ETP is outside the scope of the Project Terms of Reference (Draft EIS Appendix 1A [Concordance Tables for the Terms of Reference and Generic Guidelines for Preparation of an Environmental Impact Statement], Table 1A-2) and the CNSC Generic Guidelines for the preparation of an EIS (CNSC 2021a). With this in mind, the following information is intended to assist in the reviewer's understanding of the Project, though NexGen notes that design details may change through the ongoing ETP design development, a process which involves additional engagement between NexGen and the CNSC as part of federal licensing activities.

2 Effluent Treatment Plant

During Operations, the ETP would receive and treat water from surface drainage facilities in addition to designated streams from the process plant. After treatment, effluent could be recycled for use in the process plant or underground and would be suitable for release to the environment as treated effluent.

Information provided on effluent treatment during the Operations Phase will be refined through subsequent phases of engineering design in a manner consistent with all applicable regulatory requirements including, but not limited to, the draft REGDOC-2.9.*2, Controlling Releases to the Environment* (CNSC 2021b).

As shown in Figure 2-1, the ETP would be located on the mill terrace, west of the solvent extraction building and south of the settling and monitoring ponds. The ETP would be a 36 m by 30 m, pre-engineered building that would house the reactor tanks and reagent tanks. The clarifiers, treated water tank, and lime silo would be located outside of the building on self-contained pads. The ETP would consist of the equipment listed in Table 2-1 and shown in Figure 2-2 and Figure 2-3.

Figure 2-1: Effluent Treatment Plant Location on Mill Terrace

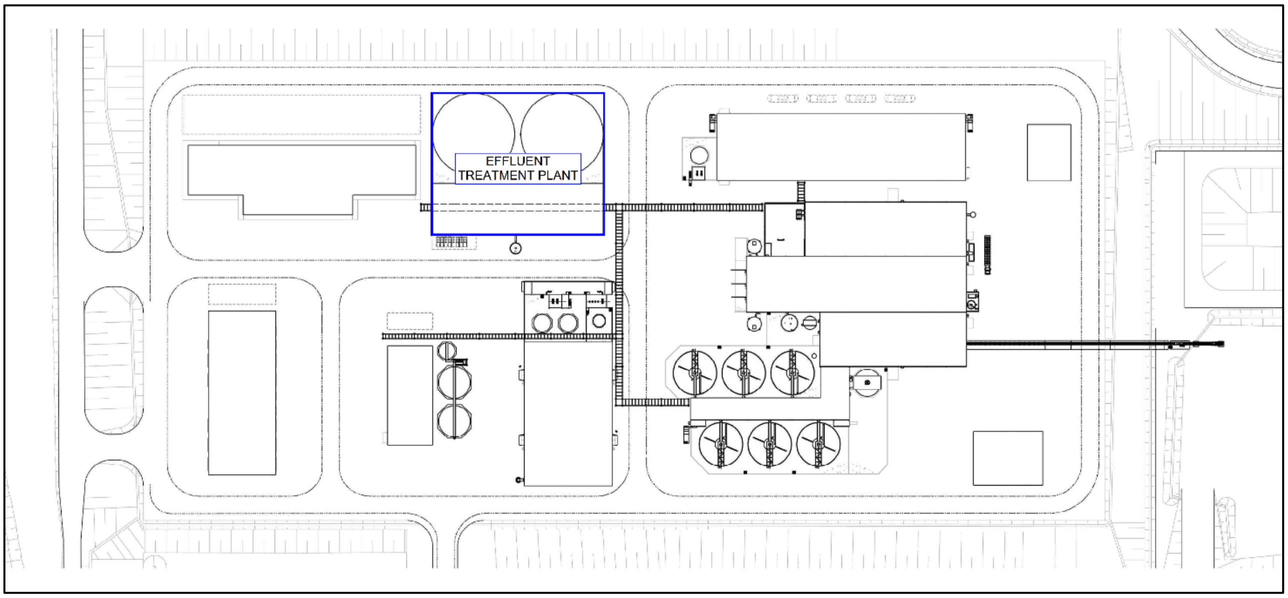
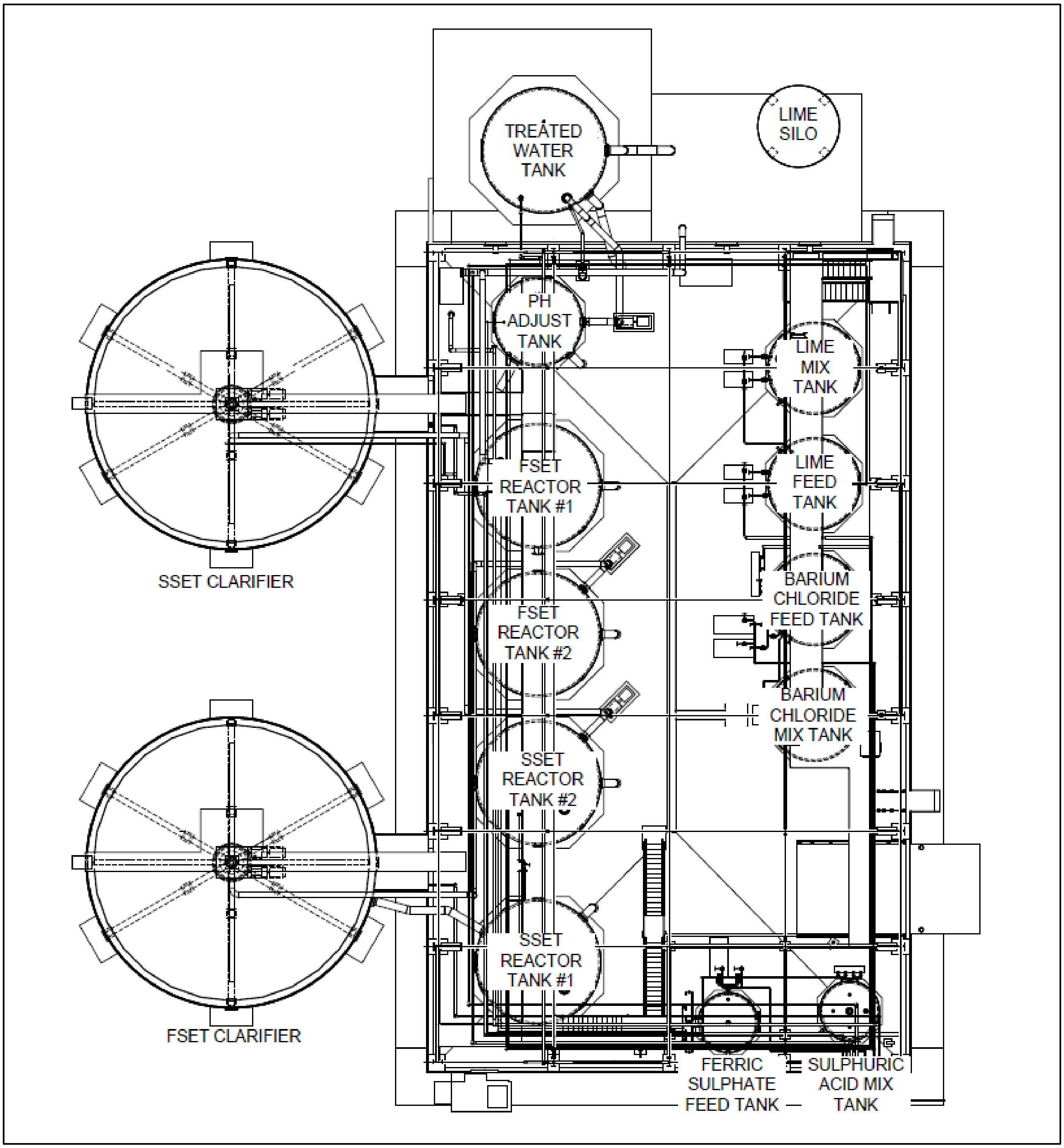


Table 2-1: Effluent Treatment Plant Equipment

Equipment	Description	Design Capacity Volume (m^3)
First-Stage Effluent Treatment Reactor Tank (2)	Agitator inside the reactor tank mixes lime slurry, ferric sulphate, and barium chloride with ETP feed streams at low pH (i.e., 4.5) stage.	300 (each)
First-Stage Effluent Treatment Clarifier	Liquid-solids separation of first-stage ETP precipitate (i.e., clarifier underflow stream) and clarifier overflow stream.	1,900
Second-Stage Effluent Treatment Reactor Tank (2)	Agitator inside the reactor tank mixes lime slurry, ferric sulphate, and barium chloride with first-stage clarifier overflow stream at high pH (i.e., 10.5) stage.	300 (each)
Second-Stage Effluent Treatment Clarifier	Liquid-solids separation of second-stage ETP precipitate (i.e., clarifier underflow stream) and clarifier overflow stream.	1,900
pH Adjustment Tank	Agitator inside the pH adjustment tank mixes diluted acid with second-stage clarifier overflow stream at neutral pH (i.e., 7) stage.	102

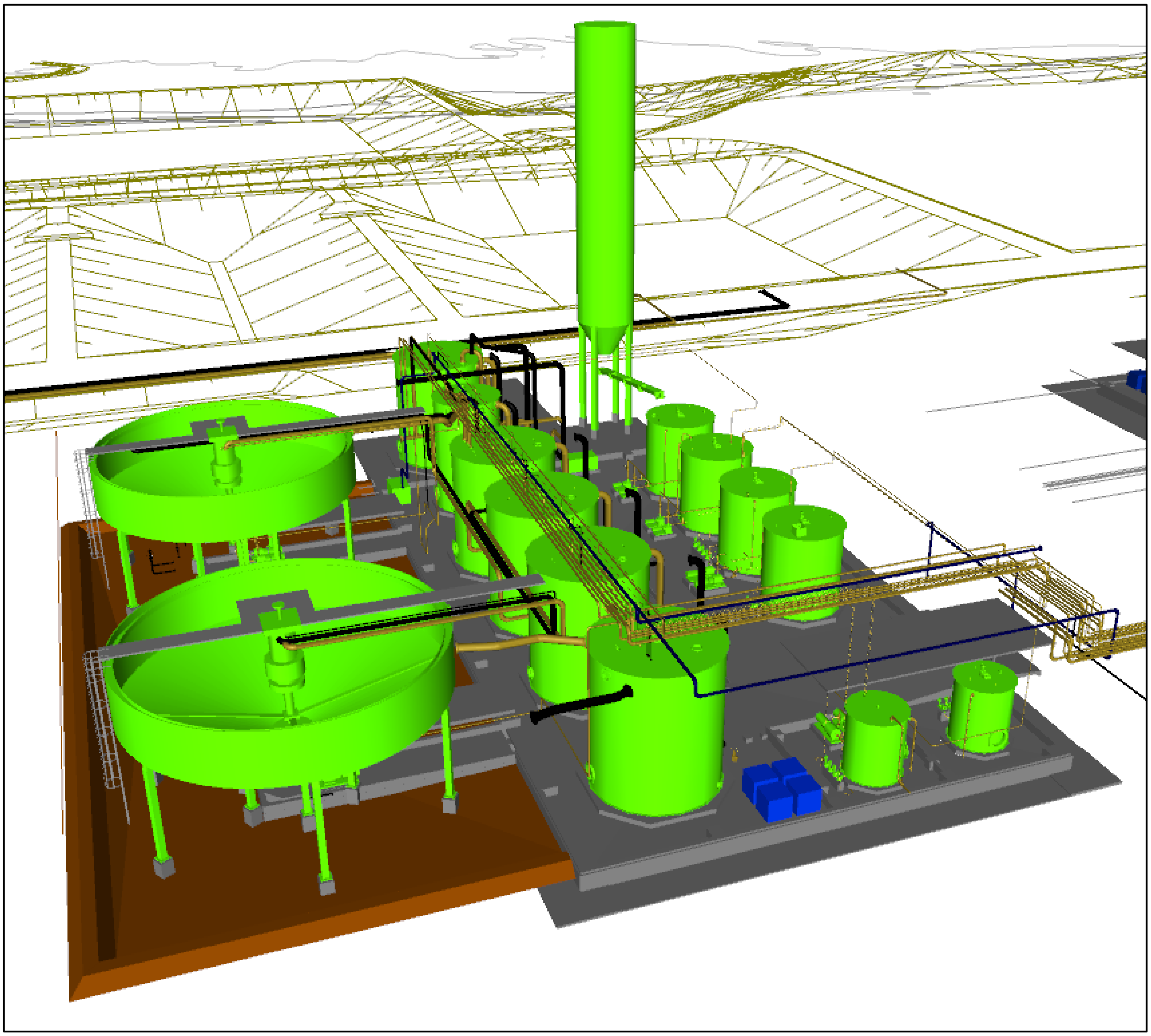
m^3 = cubic metres; ETP = effluent treatment plant.

Figure 2-2: Effluent Treatment Plant General Arrangement



FSET = first-stage effluent treatment; SSET = second-stage effluent treatment.

Figure 2-3: Effluent Treatment Plant (3D Model)



2.1 Design Basis

The effluent treatment design basis includes the criteria, methodology, and technical documents developed to define the effluent treatment process and inform the overall design. The objective of the ETP is to provide a reliable process to treat water to meet the required discharge criteria, prevent pollution, and keep releases to the environment as low as reasonably achievable (ALARA).

Where possible, the volume of water requiring treatment will be optimized by maximizing the reuse of the ETP feed streams, recycling treated water to the underground mine and process plant, and minimizing fresh water consumption.

The effluent treatment design is based on two-stage chemical precipitation. The design inflow parameters are shown in Table 2-2.

Table 2-2: Effluent Treatment Plant Design Criteria

Criteria	Value (m^3/h)	
	Nominal	Design
First-stage effluent treatment feed flow	275	400
Second-stage effluent treatment feed flow	275	400
Treated water tank capacity	275	400
Treated water recycled to process (including paste plant)	10	10
Treated water recycled to underground mine	21	21

m^3/h = cubic metres per hour.

The settling pond, contact water pond #1, and the raffinate and clarifier barren strip tanks in the process plant would provide surge capacity that would allow the ETP to be fed at a constant flow rate as often as possible, with a mix of the feed streams. The ETP is designed for a flow of 600 cubic metres per hour (m^3/h), while the estimated feed flow is 424.5 m^3/h. Therefore, the estimated feed flow would be approximately 71% of the design hydraulic capacity of the treatment system. Pilot tests completed to predict ETP performance indicate that the removal efficiency would be greater than 99.6% for most constituents of potential concern (COPCs) within Project influent and greater than 97% for all COPCs within Project influent.

2.2 First-Stage Effluent Treatment

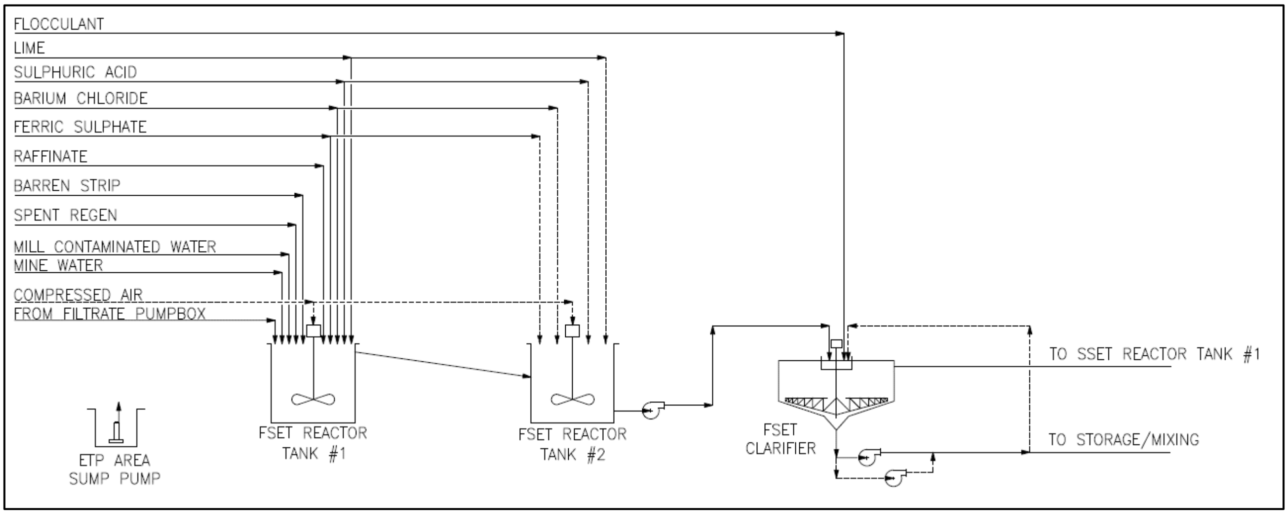
First-stage effluent treatment is designed to begin the removal of metals such as iron, arsenic, molybdenum, and selenium. Although these constituents are the primary metals of concern, most of the existing metals would also begin precipitating during this stage.

Table 2-3 lists the feed streams that would be fed to the ETP. Figure 2-4 shows the process flows for first-stage effluent treatment.

Table 2-3: First-Stage Effluent Treatment Feed Streams

Stream	Source
Raffinate	Liquid-Solids Separation – Raffinate Tank
Spent Regen	Solvent Extraction – Regen Mixer Settler
Barren Strip	Precipitation – Clarified Barren Strip Tank
Mine Water	Settling Pond via the Underground Workings
Process Water	Process Plant General – Various
Contact Water	Settling Pond

Figure 2-4: First-Stage Effluent Treatment Process Flows



ETP = effluent treatment plant; FSET = first-stage effluent treatment; SSET = second-stage effluent treatment.

The feed water would report to the first of two first-stage effluent treatment reactor tanks. Much of the ore processing water would be acidic; even when combined with slightly basic mine water, the pH would normally be lower than the target operating pH of 4.5. Lime slurry would be added to this reactor tank to maintain the pH at 4.5. The free acid would react with the lime, forming a gypsum precipitate.

The raffinate from the liquid-solids separation circuit (Table 2-3) would normally have significant levels of ferric iron. If raffinate is not present or is in low supply, ferric sulphate could be added to confirm an adequate ratio of ferric iron to arsenic and molybdenum (i.e., approximately 4:1 ratio).

Much of the arsenic, molybdenum, and selenium would be precipitated in first-stage effluent treatment, with the hydroxide added by the lime to form metal hydroxides. These elements can co-precipitate with precipitates or be adsorbed onto surfaces of precipitate of iron compounds, such as ferrihydrite and ferric and manganese hydroxides.

Barium chloride would be added in the first-stage effluent treatment reactors. Barium would react with available sulphate from the first-stage water treatment to form barium sulphate (BaSO). The radium in the effluent would act similarly to barium and most of the radium would be co-precipitated with the barium sulphate in first-stage effluent treatment.

The two reactor tanks would have a total residence time of 1hour at the design flow of 400 m^3/h and 1.6 hours at nominal flow. All reagents would be able to be added into either the first or second reactor tank, as prescribed.

Elements precipitated in the first-stage effluent treatment reactor tanks would feed with the water into the first-stage effluent treatment clarifier. The clarifier would settle the precipitates and provide a clarified stream that would flow to the second-stage effluent treatment reactors.

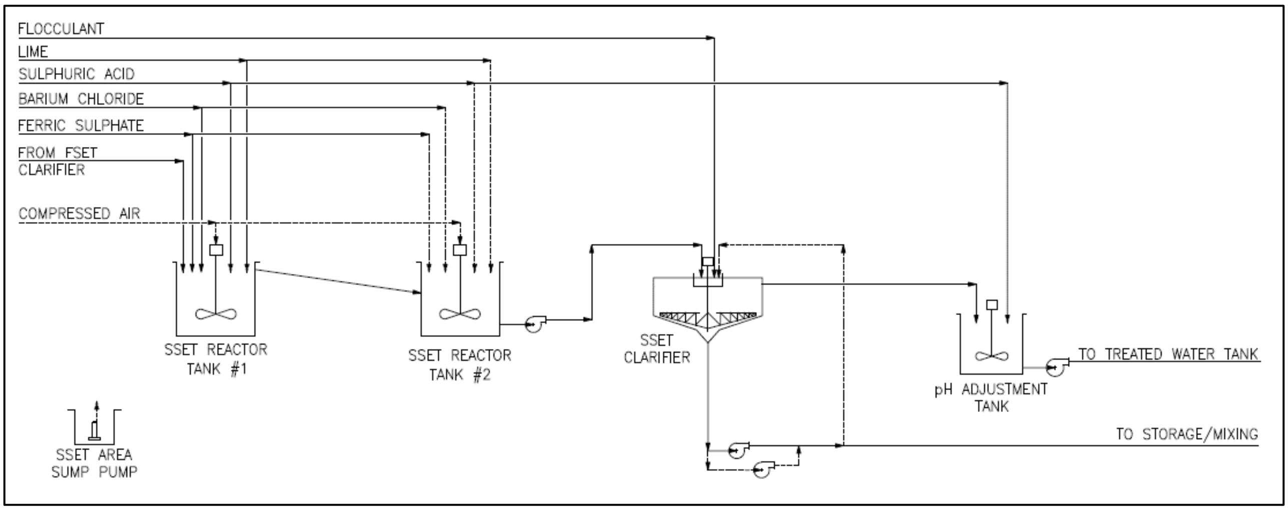
The solids in the underflow stream would be removed from the first-stage effluent treatment clarifier and report to the first-stage effluent treatment precipitate storage tank. The underflow slurry from this tank would contain ETP precipitates and would be pumped to the tailings mix tank, where this slurry would be mixed with the tailings streams and neutralized.

2.3 Second-Stage Effluent Treatment

Second-stage effluent treatment is designed to continue the removal of constituents that would be started in the first-stage effluent treatment as well as precipitate metals that only precipitate at a higher pH.

Figure 2-5 shows the process flows for second-stage effluent treatment.

Figure 2-5: Second-Stage Effluent Treatment Process Flows



FSET = first-stage effluent treatment; SSET = second-stage effluent treatment.

In the two second-stage effluent treatment reactor tanks, lime would be added to increase the pH to 10.5. As the pH is increased, the remaining iron, arsenic, molybdenum, and selenium would be precipitated, as well as other constituents that may be present. Additional ferric sulphate and barium chloride would be used to precipitate more metals and radium-226. Sulphuric acid would be available for pH control or if additional sulphate is required.

All reagents would be able to be added into either of the two second-stage effluent treatment reactor tanks. Similar as with first-stage effluent treatment, the total residence time in the reactors would be a minimum of 1 hour at the design flow rate. Precipitated solids would be removed from the second-stage effluent treatment precipitate storage tank as underflow slurry that would be pumped to the tailings mix tank, where this slurry would be mixed with the tailings streams and neutralized.

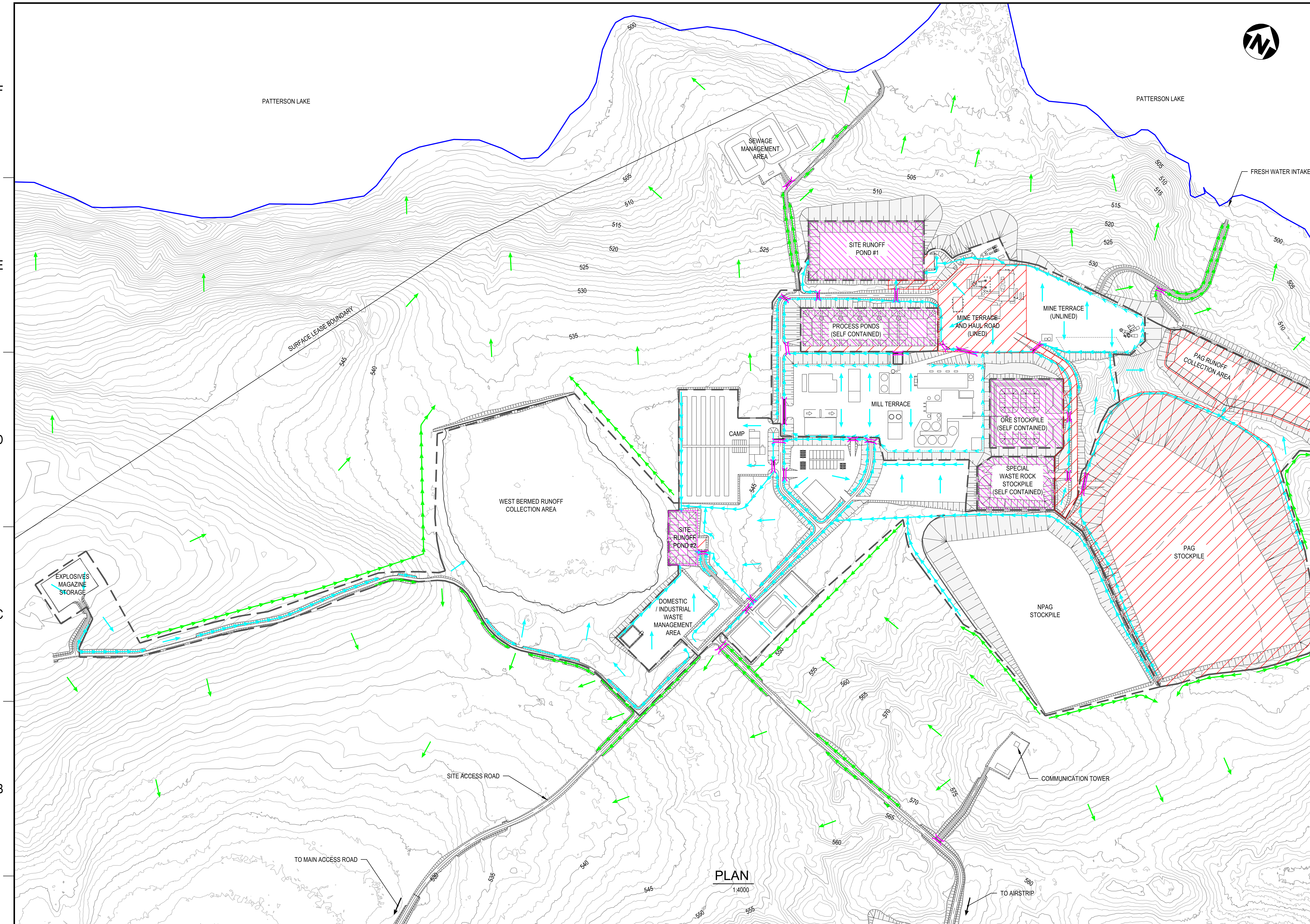
The second-stage effluent treatment clarifier would overflow into the pH adjustment tank. Diluted sulphuric acid would be added to adjust the effluent pH to 6.5 before the effluent is pumped to the treated water tank.

3 References

CNSC (Canadian Nuclear Safety Commission). 2021a. Generic Guidelines for the Preparation of an Environmental Impact Statement – Pursuant to the *Canadian Environmental Assessment Act, 2012*. Available at http://cnsc.gc.ca/eng/resources/environmental-protection/ceaa-2012-generic-eis-guidelines.cfm

CNSC. 2021b. REGDOC-2.9.2, Environmental Protection, Controlling Releases to the Environment. DRAFT. March 2021. Available at https://www.nuclearsafety.gc.ca/eng/pdfs/regulatory-documents/regdoc2-9-2/REGDOC-2_9_2_Controlling_Releases_to_the_Environment.pdf

Attachment IR 46/73-1



PLAN
1:4000

NOTES:

1. ALL UNITS ARE IN METRIC. COORDINATES AND DIMENSIONS ARE IN METERS, UNLESS NOTED OTHERWISE AND REFER TO THE UTM ZONE 12N NAD 83 (CSRS98) GROUND GRID.
2. CONTOUR INTERVALS ARE 1.0m.

LEGEND:

- DRAINAGE CATCHMENT AREA
- DITCH - RUNOFF COLLECTION
- SWALE - RUNOFF COLLECTION
- RUNOFF COLLECTION - FLOW DIRECTION
- DITCH - RUNOFF DIVERSION
- UNDISTURBED RUNOFF - FLOW DIRECTION
- CULVERT
- SINGLE HDPE LINER
- DOUBLE HDPE LINER WITH LEAK DETECTION

REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN BY	DES BY	DWG CHK	DES CHK	ENG MGR	PM
F	01MAR21	ISSUED FOR DESIGN	CJE	BEP				
E	16DEC20	ISSUED FOR DESIGN	CJE	BEP	BEP	CLC	ABB	PO
D	27NOV20	ISSUED FOR APPROVAL	CJE	BEP	BEP	CLC	ABB	PO
C	30OCT19	ISSUED FOR DESIGN	BJS	BEP	BEP	CLC	ABB	PO
B	18OCT19	ISSUED FOR APPROVAL	BJS	BEP	BEP	CLC	ABB	PO
A	19SEP19	ISSUED FOR REVIEW	BJS	BEP	BEP	CJE	ABB	PO

ISO A1-594x841

REFERENCES

REF	NUMBER	TITLE
01	2000-DD10-GAD-00001	OVERALL AREA PLAN

STAMP/SEAL

ASSOCIATION OF PROFESSIONAL ENGINEERS & GEOSCIENTISTS OF SASKATCHEWAN
CERTIFICATE OF AUTHORIZATION
Wood Canada Limited
NUMBER C0577
PERMISSION TO CONSULT HELD BY:
DISCIPLINE Sk. Reg. No. SIGNATURE

APPROVED FOR FEASIBILITY STUDY

R. WEYMARK 08DEC20	B.E. POZNIAK	P. O'HARA
CLIENT PROJECT MGR	DEPARTMENT MGR	PROJECT MGR

PROJECT PHASE: ROOK I FEASIBILITY STUDY

PROJECT NO.: 246061

SCALE: 1:4000

	BY	DDMMMYY
DES	B.E. POZNIAK	16SEP19
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CHK	C.L. CHIN	17DEC20
APP	A.B. BOEHM	17DEC20

NexGen Energy Ltd.

SUBJECT: CIVIL SURFACE INFRASTRUCTURE GENERAL SITE DRAINAGE PLAN

CONSULTANT LOGO: wood.

AREA: 2500
AREA DESCRIPTION: SITE WATER MANAGEMENT

DRAWING NO.: Figure 1
REV: F

CAD FILE: P:\CAD\CIV\2100-DD10-GAD-00003.DWG

SAVED: 01-Mar-21 2:17 PM PLOTTED: 01-Mar-21 2:18 PM USER: POZNIAK, BRIAN E.

Attachment IR 72-1

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Attachment IR 72-1

1 Introduction

NexGen Energy Ltd. (NexGen) is proposing to develop a new uranium mining and milling operation in northwestern Saskatchewan, called the Rook I Project (Project). The proposed Project is subject to both provincial and federal Environmental Assessment (EA) processes, would be licensed as a nuclear facility by the Canadian Nuclear Safety Commission (CNSC), and would be subject to various provincial and federal permits and approvals.

NexGen submitted a Draft Environmental Impact Statement (EIS) to the Saskatchewan Ministry of Environment (ENV) and Canadian Nuclear Safety Commission (CNSC) in 2022. Through the technical review of the Draft EIS, NexGen received information requests (IRs) from the Federal-Indigenous Review Team (FIRT), which is led by the CNSC.

Attachment IR 72-1 provides supporting information for NexGen's response to IR 72 (Table 1), which pertains to the consideration of an accidental release of uranium concentrate to the Clearwater River at the bridge along the existing access road (Draft EIS Section 21.6.3 [Bounding Scenario 1: Traffic Accident (Uranium Concentrate and Radioactivity)]). The accidents and malfunctions assessment for the Project is summarized in Draft EIS Section 21.6.3.3 (Assessment of Potential Effects) and detailed in Draft EIS Technical Support Document (TSD) VIII (Accidents and Malfunctions Report).

In support of NexGen's response to IR 72, Section 2 of this attachment provides information specific to Bounding Scenario 1: Traffic Accident (Uranium Concentrate and Radioactivity) (Draft EIS TSD VIII, Section 6.0). This information includes a summary of supporting information that has been updated since drafting of the original accidents and malfunctions assessment provided in Draft EIS TSD VIII. The proposed updates that will be included in the revised EIS are provided in Section 3.

Table 1: Federal Indigenous Review Team Information Request 72

Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement
Section 9.3.2.2 TSD VIII, Section 6.2 Section 7.4 Annex IV.3 Figure 13 Figure C4 Annex IV.2, Table 9	**Context:** In Section 6.2 of the Accidents and Malfunctions report, the width of the Clearwater River at the crossing is 6 m with an average depth of 30 cm and an assumed water velocity of 1 m/s for a flow rate of 1.8 m^3/s. These dimensions and rates do not match the channel widths of the Clearwater River presented in Annex IV.3 Geomorphology Characterization Report. According to Figure 13, Transect #4 is right at the bridge crossing, and field measurements at Transect #4 are presented in Figure C4. The stream width was ~12 m and the average depth ~40 cm in late September/early October 2018. According to measurements reported in table 9 of Annex IV.2 Hydrometric Monitoring Characterization Report, discharge at hydrometric station CR-WC-MS-03, adjacent to Transect #4, on 29 September 2018 was 0.983 m^3/s, which is low for open water at this station. In Section 7.4, potential effects of a diesel spill from the bridge over the Clearwater River are discussed with calculations using the river width, depth and flow ~1.5 km downstream from the spill site, between Forrest and Beet Lakes. In this case a channel width of 100-400 m, a depth of less than 2 m, water velocity of 1 cm/s and flow rate of 2.3 m^3/s are used. These dimensions are close to those found in Section 9.3.2.2 of the Environmental Impact Statement, where the Clearwater River between Forrest and Beet lakes is described as being more like a water body with width ranging from 100 m to 600 m. **Rationale:** Of the six bounding scenarios considered in the Accidents and Malfunctions, two are traffic accidents at the bridge over the Clearwater River on the Project access road, with release of contaminants in the river (uranium concentrate and diesel). The parameters of the river are not the same in both scenarios even though the spill location is the same. Since the stream width is a parameter used in calculating the uranium dissolution rate and long term release rates, doubling its width to match the measured value would increase the potential effects. For the diesel spill scenario, since the stream is narrower and has higher water velocity at the spill location than what was used for calculations, the potential area of impact could be underestimated.	Provide rationale for the accident scenario stream dimensions that differ from the field measurements or revise the calculations with dimensions reported in the Geomorphology Characterization Report and update the assessment of potential effects.

TSD = Technical Support Document.

2 Response to Federal-Indigenous Review Team Information Request 72

The geomorphological data used in the accidents and malfunctions assessment were derived from cross-sections taken from aerial imagery at the assumed release location, which do not necessarily correspond with the identical locations or flow conditions highlighted in Draft EIS Annex IV.3 (Geomorphology Characterization Report). Although the geomorphological data used in the accidents and malfunctions assessment were similar to the data documented in Draft EIS Annex IV.3, the calculations have been revised as per the reviewer's recommendation in the IR.

NexGen notes that during development of the Draft EIS, the analysis in the accidents and malfunctions assessment was completed prior to the finalization of the environmental risk assessment (ERA) (Draft EIS TSD XXI). As a result, the accidents and malfunctions assessment incorporated an earlier iteration of ERA assumptions, which were subsequently updated during Draft EIS development and are reflected in Draft EIS TSD XXI. These ERA assumptions are associated with the Project water balance and the amount of time the subsistence harvester spends harvesting food from different areas. The assumptions associated with the Project water balance are provided in Table 3-3 of the IMPACT Model (Draft EIS TSD XXI, Appendix A). The assumptions associated with the subsistence harvester analysis are provided in Table 2-8 of the IMPACT Model (Draft EIS TSD XXI, Appendix A). In addition to the integration of the geomorphologic inputs presented in Draft EIS Annex IV.3, the outputs from the IMPACT Model (Draft EIS TSD XXI, Appendix A) have been incorporated into the revised calculations made for the accidents and malfunctions assessment in support of responding to IR 72.

Overall, the updated accidents and malfunctions assessment results are similar to those results presented in the Draft EIS. The maximum concentration of uranium-238 in Forrest Lake is predicted to be 27.2 becquerels per litre (Bq/L), in contrast to 29.2 Bq/L shown in Draft EIS Section 21.6.3.3 and Section 6.4 of Draft EIS TSD VIII. The maximum surface water concentration of uranium-238 in Beet Lake is predicted to be 0.16 Bq/L, in contrast to 0.17 Bq/L shown in Section 6.4 of Draft EIS TSD VIII. Table 2 provides the estimated maximum total radiation dose to human receptors following an aquatic release of uranium concentrate for both the initial accidents and malfunctions assessment (Draft EIS TSD VIII, Section 6.4, Table 6-5) and the updated results. Table 3 summarizes the estimated maximum total radiation dose to terrestrial and semi-aquatic receptors at Beet Lake for both the initial accidents and malfunctions assessment (Draft EIS TSD VIII, Section 6.4, Table 6-6) and the updated results.

Table 2: Estimated Maximum Total Radiation Dose to Human Receptors Following an Aquatic Release of Uranium Concentrate (Reference Location Representative of Baseline Exposure)

Receptor	Receptor Location	Total Dose (mSv/yr) – Draft EIS Accidents and Malfunctions Assessment	Total Dose (mSv/yr) – Updated Results
Subsistence harvester	Reference location	2.66×10^{-03}	2.66×10^{-03}
Subsistence harvester one-year-old	Reference location	3.17×10^{-03}	3.17×10^{-03}
Subsistence harvester	Beet Lake	3.39×10^{-03}	3.05×10^{-03}
Subsistence harvester one-year-old	Beet Lake	3.58×10^{-03}	3.39×10^{-03}

mSv/yr = millisieverts per year.

Table 3: Estimated Maximum Total Radiation Dose to Terrestrial and Semi-Aquatic Receptors at Beet Lake Following an Aquatic Release of Uranium Concentrate

Receptor	Total Dose (mGy/d) – Draft EIS Accidents and Malfunctions Assessment	Total Dose (mGy/d) – Updated Results
Beaver (*Castor canadensis*)	2.52×10^{-05}	2.50×10^{-05}
Black bear (*Ursus americanus*)	1.74×10^{-05}	1.74×10^{-05}
Canada goose (*Branta canadensis*)	7.05×10^{-05}	7.05×10^{-05}
Grey wolf (*Canis lupus*)	1.43×10^{-06}	1.42×10^{-06}
Grouse (*Falcipennis canadensis*)	5.01×10^{-04}	5.01×10^{-04}
Little brown myotis (*Myotis lucifugus*)	7.80×10^{-06}	7.33×10^{-06}
Common loon (*Gavia immer*)	5.13×10^{-05}	4.79×10^{-05}
Mallard (*Anas platyrhynchos*)	7.79×10^{-04}	7.32×10^{-04}
Mink (*Neovison vison*)	4.37×10^{-06}	4.11×10^{-06}
Moose (*Alces americanus*)	2.08×10^{-05}	2.08×10^{-05}
Muskrat (*Ondatra zibethicus*)	3.08×10^{-05}	2.90×10^{-05}
Red fox (*Vulpes vulpes*)	1.30×10^{-06}	1.30×10^{-06}
Rusty blackbird (*Euphagus carolinus*)	8.87×10^{-04}	8.45×10^{-04}
Snowshoe hare (*Lepus americanus*)	2.10×10^{-05}	2.11×10^{-05}
Southern red-backed vole (*Myodes gapperi*)	7.66×10^{-06}	7.67×10^{-06}
Woodland caribou (*Rangifer tarandus caribou*)	1.64×10^{-05}	1.60×10^{-05}

mGy/d = milligrays per day.

The original assessment in the Draft EIS concluded that with implementation of environmental design features and mitigation, and in consideration of the assessed probability for Bounding Scenario 1: Traffic Accident (Uranium Concentrate and Radioactivity) (Draft EIS TSD VIII, Section 6.0), the likelihood was assessed as highly unlikely. The consequence was assessed as moderate based on the prediction that estimated radiation doses to ecological and human receptors would be below relevant benchmarks, though some potential for short-term, localized exposure of ecological receptors to elevated radiation levels would exist. The overall risk rating was assessed as low.

The updated assessment summarized above yields the same conclusions as those presented in Draft EIS TSD VIII. Both likelihood and consequence are unchanged, and the scenario continues to have an overall risk rating of low.

3 Updates for the Revised Environmental Impact Statement

The second paragraph of revised EIS Section 21.6.3.3 (Assessment of Potential Effects) will be updated based on the updated accidents and malfunctions results outlined in Section 2 of this attachment as follows (changes in **bold**):

“Uranium concentrations in water were predicted based on an understanding of hydrologic conditions in the Clearwater River at the bridge crossing location and published information on the solubility of uranium in water. Based on this analysis, the hypothetical maximum uranium concentration in water for this scenario was predicted to be **2,184 μg/L** or **27.2 Bq/L** and would occur in the immediate vicinity of the release. Concentrations were predicted to attenuate with distance downstream and time after the release.”

Table 6-5 and Table 6-6 of Section 6.4 in revised EIS TSD VIII (Accidents and Malfunctions Report) will be modified to replace the Draft EIS values with the updated results from the revised calculations in Table 2 and Table 3, respectively.

Attachment IR 93-1

Table 1: Summary of Cobalt TRVs adjusted for Hardness based on Biotic Group and Representative Species

Biotic Group	Representative Species	Common Name	Endpoint	Test Hardness (mg/L)	Toxicity Value (µg/L)	Normalized Toxicity Value (µg/L)
Forage Fish	*Pimephales promelas*	Fathead Minnow	Lowest chronic EC_{20} (survival)	98.4	409	314
Predator Fish	*Oncorhynchus mykiss*	Rainbow Trout	Lowest chronic EC_{20} (biomass)	115.8	2,495	1,791
Benthic Invertebrates	*Hyalella azteca*	Amphipod	Lowest chronic EC_{20} (growth)	125.2	17.6	12.2
Aquatic Plant	*Lemna minor*	Duckweed	Lowest estimated EC_{20} (growth)	54.9	9.8	9.6

TRV = toxicity reference values; mg/L = milligrams per litre; µg/L = micrograms per litre; EC_{20} = 20% effect concentration.

Table 2: Summary of Cobalt Hazard Quotients for Aquatic Receptors with Adjusted TRVs in the Far Future

Ecological Receptor	Location	Far-Future Projection HQ		
		Application Case	Upper Bound	RFD
Benthic Invertebrate	Reference (Broach Lake)	4.75E-02	4.75E-02	4.75E-02
	Patterson Lake North Arm – West Basin	1.16E-01	1.53E-01	1.16E-01
	Patterson Lake South Arm	8.92E-02	1.11E-01	8.92E-02
	Beet Lake	6.96E-02	8.13E-02	6.96E-02
	Lloyd Lake Inlet	4.98E-02	5.10E-02	4.98E-02
Northern Pike (Predator)	Reference (Broach Lake)	3.26E-04	3.26E-04	3.26E-04
	Patterson Lake North Arm – West Basin	7.97E-04	1.05E-03	7.97E-04
	Patterson Lake South Arm	6.12E-04	7.64E-04	6.12E-04
	Beet Lake	4.77E-04	5.57E-04	4.77E-04
	Lloyd Lake Inlet	3.41E-04	3.49E-04	3.41E-04
Lake Whitefish (Forage)	Reference (Broach Lake)	1.85E-03	1.85E-03	1.85E-03
	Patterson Lake North Arm – West Basin	4.54E-03	5.97E-03	4.54E-03
	Patterson Lake South Arm	3.48E-03	4.35E-03	3.48E-03
	Beet Lake	2.72E-03	3.17E-03	2.72E-03
	Lloyd Lake Inlet	1.94E-03	1.99E-03	1.94E-03
Macrophytes	Reference (Broach Lake)	6.07E-02	6.07E-02	6.07E-02
	Patterson Lake North Arm – West Basin	1.49E-01	1.95E-01	1.49E-01
	Patterson Lake South Arm	1.14E-01	1.43E-01	1.14E-01
	Beet Lake	8.90E-02	1.04E-01	8.90E-02
	Lloyd Lake Inlet	6.36E-02	6.52E-02	6.36E-02

TRV = toxicity reference values; HQ = hazard quotient; RFD = reasonably foreseeable development.

Attachment IR 107-1

Assessment	Key Inputs	Key Findings
Water Quality Assessment (Section 10)	RSWQM predictions for COPCs in water after closure and in the far future	Copper and cobalt concentrations in Patterson Lake are predicted to exceed surface water quality thresholds for the protection of aquatic life
Ecological Risk Assessment (TSD XXI)	Estimated ecological health risks to aquatic receptors from exposure to COPCs, including copper and cobalt, expressed in terms of HQs	Limited instances where predicted copper concentrations result in HQ values of greater than 1, indicating the potential for adverse effects and that further assessment is warranted. Cobalt was removed from further consideration because HQ values were less than 1.
Aquatic Health Assessment (Appendix 11A)	Additional assessment of the potential health effects to aquatic life in Patterson Lake from copper exposure	Exposure to copper in Patterson Lake would be unlikely to result in adverse effects on aquatic populations and communities

Fish and Fish Habitat Assessment

Attachment IR 128-1

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Attachment IR 128-1

1 Introduction

NexGen Energy Ltd. (NexGen) is proposing to develop a new uranium mining and milling operation in northwestern Saskatchewan, called the Rook I Project (Project). The proposed Project is subject to both provincial and federal Environmental Assessment (EA) processes, would be licensed as a nuclear facility by the Canadian Nuclear Safety Commission (CNSC), and would be subject to various provincial and federal permits and approvals.

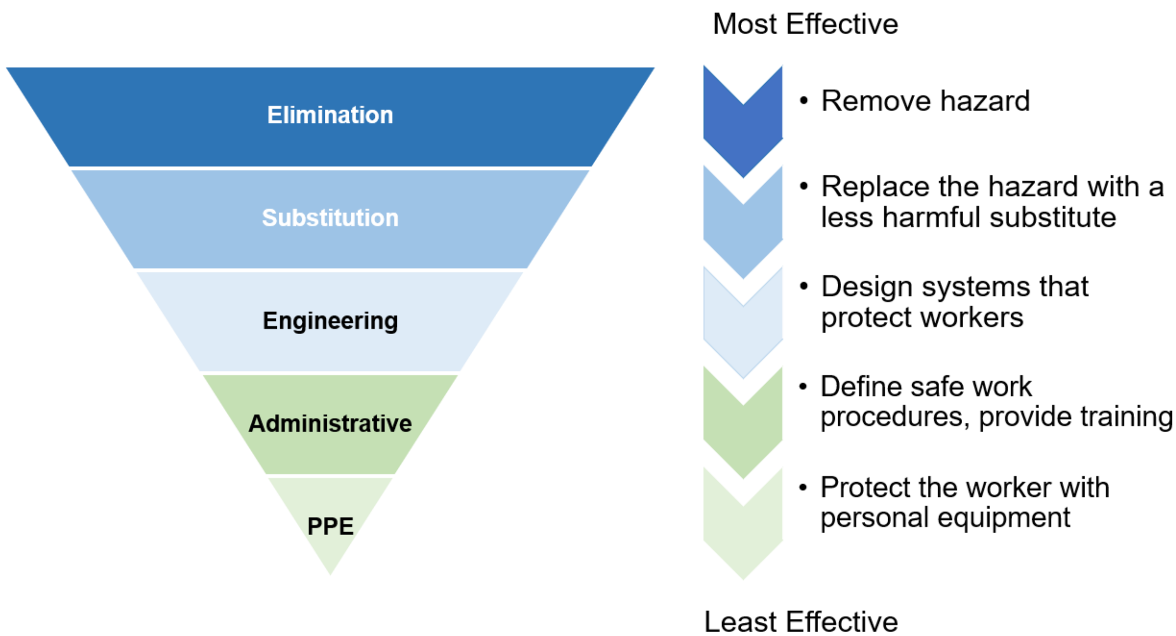
Potential radiological, chemical, physical, and biological hazards associated with Project activities that pose risks to the health and safety of workers have been, and will continue to be, systematically assessed to determine the nature, likelihood, and consequence of the potential risk; identify and implement measures to mitigate associated effects; and keep radiological and non-radiological exposures to workers as low as reasonably achievable (ALARA). Risk assessments performed for the Project specific to worker health and safety are documented in a variety of reports and studies that were used to confirm the design basis for the proposed Project. These assessments have been, and will continue to be, submitted to the CNSC and other federal and provincial regulatory agencies in support of the various Project licensing and permitting phases. The type of assessments performed are appropriate for the topic, apparent level of risk, and complexity of the activity. Examples of studies completed to date include:

- radiological exposure assessment for the underground mine, process plant, and paste processing and delivery systems;
- diesel exhaust and crystalline silica exposure assessments for the underground mine, process plant, and paste processing and delivery systems;
- hazard studies; and
- human factors assessment.

The controls identified during risk assessments are used to eliminate, prevent, or reduce the potential risk of elevated radiation exposure, injury, illness, or disease to workers, and would be implemented with consideration for the hierarchy of controls (Figure 1-1). The controls applied for the Project would be specific to the nature of the risk and would be documented, tracked, and periodically evaluated for effectiveness. Examples of such controls include:

- facility, equipment, and process design;
- safe work practices and training; and
- personal protective equipment (PPE).

Figure 1-1: Hierarchy of Controls



PPE = personal protective equipment.

In addition to these foundational studies, risks to worker health and safety would be managed throughout the lifespan of the Project in accordance with the processes that would be outlined in the Project's Integrated Management System (IMS) Manual and its supporting programs; specifically, the Health and Safety Program and the Radiation Protection Program. These management system documents would also describe the processes required to monitor and characterize workplace hazards, monitor and characterize the effectiveness of mitigations, and continually improve the protection of worker health and safety throughout all Project phases. Where uncertainty associated with potential worker health and safety hazards exists, adaptive management measures may also be proposed. The process for determining when, how, and where to use adaptive management will be described within the IMS Manual in support of licensing and approval steps.

In addition to NexGen's commitment to continually assess and improve its internal processes to maintain protection of worker health and safety, the effectiveness of IMS Manual and its supporting programs would be subject to ongoing oversight from the CNSC and provincial regulatory agencies (e.g., Labour Relations and Workplace Safety) throughout Construction, Operations, and Closure.

The purpose of Attachment IR 128-1 is to present a summary of Project radiological and non-radiological effects to Project workers as well as present the radiological and non-radiological effects that these workers may experience through potential accidents and malfunctions. With respect to non-radiological effects, only effects that could be experienced beyond effects described for the camp worker receptor in Section 15 (Human Health) are discussed. Attachment IR 128-1 also presents a summary of the hazard analysis (HAZAN) study completed for the Project and the proposed approach to human factors engineering.

Further information regarding the assessments of radiological and non-radiological effects to workers is provided in the Project Application for a Licence to Prepare and Construct submitted to the CNSC, with follow-up and additional information to be provided in subsequent licensing and permitting phases.

2 Radiological Exposures

Radiation exposures associated with Project activities would occur in the form of ionizing radiation, which is energy that can damage cells and tissues by detaching electrons from atoms. There are three forms of ionizing radiation that would be present at the Project site (i.e., alpha, beta, and gamma), and each poses different hazards to human health. Alpha and beta radiation take the form of small, charged particles that are potentially hazardous if ingested, inhaled, or introduced via an open wound. Gamma radiation takes the form of an energy wave and can penetrate through skin and protective clothing. Sources of ionizing radiation at the proposed Project and potential exposure pathways are listed in Table 2-1. The potential for radiation exposure is based on multiple factors, including duration of exposure, form of hazard, and distance from the radiation source.

Table 2-1: Rook I Project Ionizing Radiation Sources

Type of Radiation	Exposure Pathway	Sources[(a)]
Gamma	External exposure	Mineralization, nuclear density gauges, aged uranium ore concentrate
Alpha/beta – radon progeny[(b)]	Inhalation	Mine or process water, mineralization
Alpha – radon gas	Inhalation	Mine or process water
Alpha/beta – long-lived radioactive dust	Inhalation, ingestion, wound contamination	Mineralization, uranium ore concentrate

a) Listed sources of radiation are typical of uranium mining and milling facilities and are not meant to be a comprehensive representation of any particular phase of the proposed Project.
b) Radon progeny are decay products produced from radon gas.

The CNSC Radiation Protection Regulations specify that doses to nuclear energy workers are limited to a maximum effective dose of 100 millisieverts (mSv) over a five-year dosimetry period (i.e., effectively an annual average dose limit of 20 millisieverts per year [mSv/yr]) and to a maximum dose of 50 mSv in any one-year dosimetry period. A nuclear energy work is a worker who has a reasonable probability to receive an effective dose of radiation of 1 mSv/year or greater. The term effective dose includes the whole-body dose from credible internal and external exposure to workers, which include external radiation (i.e., gamma); inhalation of radon gas (RnG); inhalation of short-lived radon progeny (RnP); and inhalation of long-lived radioactive dust (LLRD). Although the maximum allowed effective dose is 50 mSv in any one year, in practice, the CNSC expects that the effective dose in any single year should be less than 20 mSv (i.e., 100 mSv over five years). The Radiation Protection Regulations also require licensees to establish internal action levels below the regulatory dose limits that, if reached within specified time frames, may provide an early indication of a loss of control and would trigger specific actions to be taken by the radiation department and workers to maintain control of radiation hazards and keep exposures ALARA.

Where reasonably practicable, controls are used in combination to effectively prevent or reduce the risk to workers, the public, and the environment. These controls would include minimizing time near the source, maximizing distance from the source, and using shielding where practicable. Controls are used, operated, and maintained according to their design, limitations, and require applicable training. Adherence to procedures and training are critical in preserving the effectiveness of controls.

Project radiological exposures to workers would be expected to occur in three work environments: underground workplace, process plant and paste tailings preparation workplace, and the low-level radioactive waste (LLRW) incinerator workplace. Radiological exposures could also potentially occur as a result of accidents and malfunctions. Radiological assessments were completed for these three work environments as well as for potential accidents and malfunctions.

For underground mining and paste tailings placement, protection measures from radiation sources would include, but not be limited to:

- **Gamma radiation:** using engineered protection (e.g., shielding), distance (e.g., possible use of remote mining methods), and managing time spent on various mining activities. For workers in the cabs of heavy equipment, there would be an intrinsic protection (i.e., shielding) provided by the steel of the vehicle itself. Shotcrete would be applied on the underground ceiling (i.e., back) and walls during mine development, as needed, and either crushed waste rock or concrete would be used to cover the development floor (i.e., sills). Waste rock and concrete would have a very low uranium content and provide shielding, with the protection factor increasing with increasing thickness.
- **RnP and RnG:** managing ventilation, managing time spent on various mining activities, and using remote-control mining equipment, as appropriate. The Project would include a push-pull ventilation system for ventilating mining stopes, where fresh air would be pulled into a working stope from a main travel way and a portion of that fresh air would be pushed toward the working face (i.e., the rock surface where the mining development is advancing). Potentially contaminated air would then be pulled from the working stope and exhausted away from any active work area.
- **Long-lived radioactive dust (LLRD):** managing ventilation and applying dust suppression measures (e.g., wet drilling).

For the process plant and paste tailings preparation workplace at surface, protection measures from radiation sources would include, but not be limited to:

- **Gamma radiation:** using engineered protection (e.g., shielding of process vessels), distance (e.g., situating process vessels apart from routine work areas), and managing time spent on various process plant and paste tailings processing and delivery activities.
- **RnP and RnG:** using general area ventilation and source control (e.g., covered process vessels directly vented to the atmosphere).
- **LLRD:** managing ventilation and source control (e.g., capture dust and vent to the atmosphere).

For the LLRW incinerator, protection measures from radiation sources would include, but not be limited to:

- **Gamma radiation:** using engineered protection (e.g., shielding), distance (e.g., situating gamma radiation sources apart from routine work areas), and wearing appropriate PPE.
- **RnP and RnG:** exposure to RnP and RnG would not be anticipated (Section 2.3).
- **LLRD:** managing ventilation and wearing appropriate PPE.

The radiological exposure assessments performed as part of Project planning will be used as a planning tool to demonstrate that engineering designs are safe for workers, to identify possible engineering design optimizations to keep exposures ALARA, and to inform the development of radiation protection processes and monitoring requirements that will be implemented and continually improved throughout the Project lifespan.

To complete the assessment of radiological exposures to Project workers, the concept of similar exposure groups (SEGs) was adopted. A SEG represents a group of workers that would have the same general exposure profile for the occupational health hazard(s) anticipated or being evaluated because of the similarity, frequency, and duration of the tasks that would be performed; the materials and processes that would be utilized; and the similarity of the methods used to perform those tasks.

2.1 Underground Workplace

The purpose of this subsection is to summarize the predicted occupational risks to workers due to radiation exposures during the Operations Phase.

The proposed underground development and associated mining activities would include drilling, blasting, mucking (i.e., using equipment to handle ore and waste), shotcreting, development of the purpose-built underground tailings management facility (UGTMF), ore production, and backfilling mined-out stopes with cemented paste tailings. The current mineral resource model shows an average grade of 3.1% triuranium octoxide (U_3O_8); however, the annual mined grade would change from year to year.

The assessment of potential radiation dose to workers that would work in a variety of underground mining tasks was determined for each worker based on the exposure conditions in their various tasks and the amount of time workers would spend each day, and annually, performing those tasks. Annual doses were determined for the First Year of operations and Steady State operations.

Workers in the various underground development and associated mining activities workplaces may be exposed to four different radiation sources: gamma radiation, RnG, RnP, and LLRD. The mining activities with radiation exposure include:

- work in ore stopes;
- work in waste rock;
- work in the UGTMF;
- placement of paste tailings in the UGTMF (i.e., cemented paste tailings);
- placement of paste tailings in ore stopes (i.e., cemented paste backfill); and
- infrequent work (e.g., remuck maintenance, potential spill of ore or tailings).

The predicted dose estimates account for the implementation of engineered protection measures in the underground work environment; specifically, local push-pull ventilation in ore stopes; shotcrete on walls, floor, and back for shielding gamma radiation; intrinsic gamma radiation shield from equipment cabs for operators when they are inside vehicles; and remote-controlled operation of some equipment (e.g., loaders).

2.1.1 Gamma Radiation

Gamma radiation dose rates depend on the ore grade in the surfaces emitting radiation and the distance of each receptor location from these surfaces. The surfaces considered within the assessment were the back, the sills, the walls, and the working face. These surfaces were considered for each of the ore, special waste, and waste sections of the stope.

The assessment of gamma radiation shows that doses to workers arising from exposures to gamma radiation are expected to range from approximately 0.3 mSv/yr to 9.4 mSv/yr. There would be opportunities to further reduce gamma exposures through increasing intrinsic shielding provided by equipment cabs and using remote-controlled equipment for more operational tasks (e.g., drills, shotcrete application).

2.1.2 Radon Gas and Radon Progeny

Underground workers would be exposed to both RnP and RnG due to emission from surfaces, mucking, and mine water. Annual doses to workers from RnG and RnP would include contributions from work in underground development areas; as examples, in the development of the UGTMF and general underground mine, and occasionally, in ore sections of stopes.

The assessment of RnG and RnP radiation shows that doses to workers arising from exposures to RnG and RnP are expected to range from approximately 0.05 mSv/yr to 0.53 mSv/yr and 0.84 mSv/yr and 1.1 mSv/yr, respectively. There would be opportunities to further reduce RnG exposure through increasing local ventilation, as needed, using forced fans and to further reduce RnP exposure by selecting equipment with enclosed cabs and filtered air supply.

2.1.3 Long-Lived Radioactive Dust

For mine development, ore mining, and other work in waste (e.g., development of the UGTMF), sources of exposure to LLRD would include the following tasks, which were the focus of the assessment:

- drilling;
- blasting;
- mucking (including tramming);
- dumping to ore passes; and
- material handling transfer points (e.g., conveyors, chutes, grizzlies).

To minimize effects to workers associated with the potential exposure to LLRD, wet drilling would be employed and there would be a 1-hour delay after a blast before workers would be allowed to re-enter a mining area that has been blasted.

The predicted doses from LLRD would be quite low, much less than 1 mSv/yr in the First Year. In the following years, exposed workers would likely receive an annual dose of less than 1 mSv from LLRD; however, recognizing variability in dust levels by task and location, an annual LLRD dose of 1 mSv/yr was assumed for all underground work. There are opportunities to further reduce LLRD exposure by selecting equipment with enclosed cabs and a filtered air supply.

2.1.4 Underground Workplace Radiation Exposure Assessment Summary

Table 2-2 shows the predicted doses resulting from worker exposures to gamma radiation, RnG, RnP, and LLRD as well as the total predicted doses from all exposure types for the First Year and Steady State operations.

Table 2-2: Annual Doses for First Year and Steady State Operations Using Remote-Controlled Equipment and Enhanced Shotcrete Options

SEG	Annual Dose (mSv/yr)				
	Total Dose	Gamma	RnG	RnP	LLRD
First Year Operations					
Blaster	**8.1**	5.9	0.32	0.92	1
Bolter Operator	**5.0**	2.9	0.17	0.88	1
Cable Bolter Operator	**4.1**	2.1	0.16	0.88	1

Table 2-2: Annual Doses for First Year and Steady State Operations Using Remote-Controlled Equipment and Enhanced Shotcrete Options

SEG	Annual Dose (mSv/yr)				
	Total Dose	Gamma	RnG	RnP	LLRD
Jumbo Operator	**3.6**	1.6	0.11	0.86	1
Production Driller	**5.3**	3.2	0.23	0.90	1
Raisebore Operator	**10.4**	7.9	0.52	1.00	1
Scoop Operator – Development	**2.6**	0.7	0.08	0.85	1
Scoop Operator – Production	**2.2**	0.3	0.05	0.84	1
Services / Construction Worker	**6.7**	4.1	0.53	1.10	1
Shotcrete Operator	**3.8**	1.7	0.17	0.91	1
Steady State Operations					
Blaster	**9.2**	7.0	0.28	0.91	1
Bolter Operator	**4.7**	2.7	0.13	0.87	1
Cable Bolter Operator	**4.5**	2.5	0.15	0.88	1
Jumbo Operator	**3.5**	1.6	0.09	0.85	1
Production Driller	**5.9**	3.8	0.21	0.90	1
Raisebore Operator	**11.9**	9.4	0.47	1.00	1
Scoop Operator – Development	**2.6**	0.7	0.07	0.84	1
Scoop Operator – Production	**2.2**	0.4	0.05	0.84	1
Services / Construction Worker	**7.2**	4.8	0.40	1.00	1
Shotcrete Operator	**3.7**	1.7	0.13	0.89	1

Note: **Bold** indicates total dose values. Values may not add up due to rounding.
mSv/yr = millisieverts per year; SEG = similar exposure groups; RnG = radon gas; RnP = radon progeny; LLRD = long-lived radioactive dust.

The calculations presented in Table 2-2 demonstrate that the underground workplace environment would be safe for workers. All annual doses are below 10 mSv/yr with the exception of the raisebore operators, who may receive an annual dose of 12 mSv/yr under Steady State operations.

Results of this evaluation are considered suitable for the screening of the exposure of underground workers to radiation hazards and can be used to confirm or modify design assumptions, including the design of ventilation systems and other engineering controls, time management, and radiation work planning to provide worker protection in accordance with the ALARA concept as would be included in the Radiation Protection Program developed for the Project.

2.2 Process Plant and Paste Tailings Preparation Workplace

The purpose of this subsection is to summarize the predicted occupational risks to workers due to radiation exposures in the process plant and paste tailings preparation workplace during the Operations Phase.

The proposed process plant would be designed to produce up to 13.6 million kilograms (Mkg) (30 million pounds [Mlbs]) of U_3O_8 per year with a projected mine life of 24 years (based on current mineral resource estimates). The process plant would be designed with a throughput of up to 1,300 tonnes per day (tpd). The planned head grade for material sent to the process plant would be an average grade of 3.1% U_3O_8. The maximum grade processed in the process plant would be 5.0% U_3O_8.

In addition to the process plant where ore would be processed into U_3O_8, an attached paste preparation area would convert the tailings into cementitious paste, which would be disposed of underground in mined-out stopes or within the purpose-built UGTMF.

The assessment of potential radiation dose to workers in the process plant and paste tailings preparation workplace areas is based on the current design of the process plant and the predictions of quantities and radioactivity levels of the ore and tailings that would be processed and prepared for placement in underground, respectively. This assessment determined whether the proposed design and configuration of the process plant and paste tailings preparation workplace would provide reasonable assurance that radiation doses potentially received by workers would be below the regulatory limits of the CNSC and consistent with NexGen's commitment to keep radiological exposures ALARA. To provide a conservative assessment, it was assumed that basic mitigations would be implemented; however, NexGen notes that additional mitigation measures would be available and explored further as Project design proceeds.

Workers in the process plant and paste tailings preparation workplace may be exposed to three different radiation sources: gamma radiation, RnG and RnP, and LLRD. Similar exposure groups within the process plant and paste tailings preparation workplace would include process operators, maintenance personnel, and metallurgists.

2.2.1 Gamma Radiation

There is potential for workers to be exposed to elevated levels of gamma radiation at several areas in the process plant and paste tailings preparation workplace. The areas expected to have the highest gamma radiation fields are:

- the front end of the process plant, where ore enters the grinding circuit;
- areas proximal to process tanks containing ore slurry, leach residue, and tailings;
- areas where uranium concentrate is stored; and
- paste tailings preparation areas.

The assessment of gamma radiation shows that doses to workers arising from exposures to gamma radiation are expected to range from approximately 6 mSv/yr to 12 mSv/yr. There would be opportunities to further reduce gamma exposures through engineering design optimization (e.g., implementation of additional shielding on high gamma emitting tanks, inclusion of shielding walls between high-gamma-emitting tanks and routinely occupied areas) and consideration of work practices (e.g., consideration of task times, increased use of automation). Since elevated gamma levels would also occur in areas where aged uranium concentrate is stored, storage of uranium concentrate would be away from routinely occupied areas.

2.2.2 Radon and Radon Progeny

The greatest potential for release of radon to the general work areas of the process plant would be at the front end of the processing circuit, where the crushed ore is conveyed to the semi-autogenous grinding (SAG) mill. Once the ore has entered the grinding circuit, indoor tanks and equipment in the process plant and paste tailings preparation workplace that would be potential sources of RnG would be covered and have exhaust hoods, and the fumes would be actively vented to the outside.

The assessment shows that levels of exposure to RnP would be less than 10 mSv/yr through the effective control of radon at source and the design of general ventilation in the process plant and paste tailings preparation workplace. Opportunities for further optimization would include consideration of radon collection efficiency at the entry to the milling and grinding area and ventilation design optimization in the process plant and paste tailings preparation workplace to further minimize worker exposure to air potentially containing radon.

2.2.3 Long-Lived Radioactive Dust

Long-lived radioactive dust is generated in the dry processes such as the front end of the process plant, where crushed ore is conveyed to the SAG mill. Source control would be used at the front end of the processing circuit to capture dust that is generated, with the remaining dust mixing with process plant ventilation systems at surface. Once the ore has entered the grinding circuit, the remainder of the processing would be a wet process with minimal opportunity for dust generation. The exception to this wet process would be the drying, calcining (i.e., reduced, oxidized, or desiccated at high temperatures), and packaging circuit.

Access to the drying, calcining, and packaging areas would be strictly controlled and limited to specially trained personnel fitted with high-efficiency respirators (i.e., appropriate protection level selected based on the exposure risks) and other PPE, as required. Therefore, exposure to uranium concentrate was not assessed further. Where workers would be required to enter these areas, task-specific work and radiation plans would be developed and potential exposures would be closely monitored.

The current assessment shows that exposures to LLRD from the front end of the process plant where ore enters the circuit are expected to result in doses less than 1 mSv/yr. Within the process plant, ore and tailings would be in slurry form with all tanks and vessels exhausted outside of the process plant; therefore, there is expected to be a very low potential for worker exposure to LLRD.

2.2.4 Process Plant and Paste Tailings Preparation Workplace Radiation Exposure Assessment Summary

Table 2-3 presents the dose to each SEG by pathway, as well as the total yearly dose received. All doses predicted would be well below the CNSC yearly dose limit of 50 mSv and below the averaged annual dose limit of 20 mSv. Some of the SEGs are predicted to receive doses above the target dose of 10 mSv/yr.

Table 2-3: Total Dose by Similar Exposure Groups and Pathway

Similar Exposure Group	Dose by Pathway (mSv/yr)			Total Dose (mSv/yr)
	Exterior Gamma	RnP[b]	LLRD[b]	
Process Operator (Grinding Area)	10.73	1.45	<1	**13.18**
Process Operator (Leach Area)	8.36[a]	n/a	n/a	**8.36**
Process Operator (CCD Area)	7.35	n/a	n/a	**7.35**
Process Operator (Residue/Paste Area)	11.96	0.11	n/a	**12.07**
Maintenance	6.63	0.091	Nil (<<1)	**6.7**
Metallurgist	6.15[a]	0.26	Nil (<<1)	**6.4**

Note: **Bold** indicates total dose values.
a) Estimated assuming 10 cm thick reinforced concrete shielding.
b) Dose from 3.1% U_3O_8 feed grade presented for consistency.
< = less than; n/a = not applicable; CCD = counter current decantation; RnP = radon progeny; LLRD = long-lived radioactive dust;
<< = much less than.

Further optimization of radiation protection may be available through ongoing design. As examples, the possible use of additional shielding from reinforced concrete platforms, shielding walls located adjacent to process vessels containing ore or tailings, and increased dust control efficiency at the front end of the process plant would all be expected to reduce the radiological exposure to workers.

Although there is some uncertainty in dose estimates, calculations are considered to provide reasonable estimates of dose and are likely conservative (i.e., likely overestimate the dose to a typical worker in an SEG) as limited mitigations were applied within the assessment and further mitigation opportunities would be available.

Results of this evaluation are considered suitable for the screening of the exposure of process plant and paste tailings preparation workplace workers to radiation hazards and can be used to confirm or modify design assumptions, including the design of ventilation systems and other engineering controls, time management, and radiation work planning to provide worker protection in accordance with the ALARA concept as would be included in the Radiation Protection Program developed for the Project.

2.3 Low-Level Radioactive Waste Incinerator

The purpose of this subsection is to summarize the predicted occupational risks to operators and maintenance staff due to radiation exposures in the LLRW incinerator during the Operations Phase.

Low-level radioactive waste would consist of conventional waste potentially contaminated by contact with radioactive materials and would be generated during the life of the Project. The LLRW would be incinerated in an LLRW incinerator in a dedicated incinerator building. The LLRW incinerator would be batch run, sized to incinerate up to 10 tonnes per batch, and include a wet-dry air pollution control system and continuous emission monitoring system to minimize the emissions of particulate matter, metals, acid gases, nitrogen, carbon monoxide, and organics, and to meet applicable emission requirements. Ash from the LLRW incinerator would be drummed for disposal underground.

The assessment of the potential radiation dose to workers from operating the LLRW incinerator is based on the current design and predictions of the quantities and radioactivity levels of LLRW that would be processed and prepared for placement in underground. This assessment determined whether the proposed design and configuration of the LLRW incinerator would provide reasonable assurance that radiation doses potentially received by workers would be below the regulatory limits of the CNSC and consistent with NexGen's commitment to keep radiological exposures ALARA. To provide a conservative assessment, it was assumed that basic mitigations would be implemented; however, NexGen notes that additional mitigation measures would be available and explored further as Project design proceeds.

Radiological exposures in the LLRW incinerator building area are expected to primarily arise from external gamma radiation and LLRD. Given the proposed ventilation design of the incinerator building and pollution controls during incineration, any radon that escapes would be diluted. Therefore, there would be very little opportunity for material exposure of workers to RnG and RnP.

Similar exposure groups working with the LLRW incinerator would include the incinerator operator and maintenance worker. Periodic maintenance of the LLRW incinerator would be required; however, maintenance tasks are not expected to generate LLRD and would be planned when waste or ash handling was not being performed. Additionally, maintenance inspections are estimated to require a maximum of 30 minutes per week. Therefore, radiological exposure to maintenance workers was not assessed as effects would be much less than (i.e., bounded by) those experienced by an LLRW incinerator operator.

Operation of the LLRW incinerator would not require 24-hour attendance; therefore, it is anticipated that LLRW incinerator operators and maintenance staff would have additional duties that could potentially expose these workers to other radiological hazards. The discussion in this subsection (Section 2.3, Low-Level Radioactive Waste Incinerator) focuses on exposure at the LLRW incinerator only.

2.3.1 Low-Level Radioactive Waste Incinerator Radiological Source Activities

There are multiple activities that would be undertaken as part of operating and maintaining the LLRW incinerator. These tasks and key assumptions are described in Table 2-4.

Table 2-4: Low-Level Radioactive Waste Incinerator Activities and Key Assumptions

Activity	Activity Description and Key Assumptions
Pre-Start Visual Inspection	Inspection of the LLRW incinerator prior to waste loading. The incinerator and associated equipment are expected to contain minimal, if any, LLRW waste or ash, and other sources of gamma radiation would be shielded and located away from where inspections would occur.
Waste Preparation	The receipt, placement, and segregation of LLRW to provide a proper waste mixture for waste charging. The operator would wear suitable PPE to minimize exposure to gamma radiation and LLRD.
Waste Charging	Loading of LLRW into the incinerator using a skid steer loader. The skid steer loader operator would be exposed to gamma radiation and LLRD when moving LLRW to the primary chamber.
Starting the System	Initiating the burn cycle. Potential gamma radiation exposure is considered within the waste preparation and waste charging.
Burn Cycle	Represents the incineration of LLRW. The operator may be exposed to gamma radiation during the first hour of the cycle as they would be in the monitoring area. After the first hour, gamma radiation exposure would be minimal as the operator would be in the LLRW incinerator building office (i.e., at a distance and shielded from gamma radiation sources).
Cooldown Cycle	Automated cooldown following the burn cycle that would not require operator supervision. No radiological exposure would occur during this activity.
Bottom Ash Removal	Represents the removal of larger ash particles that remain in the incinerator chamber following incineration. An operator would manually remove ash into steel drums and would wear suitable PPE to minimize exposure to gamma radiation and LLRD.
Fly Ash Removal	Represents the removal of fine ash particles that would flow into a drum during the incineration process. Once the drum was full, an operator would remove and seal it. The operator would wear suitable PPE to minimize exposure to gamma radiation and LLRD.
Maintenance	Periodic electrical and mechanical inspections and maintenance of the LLRW incinerator would be conducted. Radiological exposure to a maintenance worker would be bounded by the assessment of exposures to an operator.

LLRW = low-level radioactive waste; LLRD = long-lived radioactive dust; PPE = personal protective equipment.

2.3.2 Low-Level Radioactive Waste Incinerator Radiation Exposure Assessment Summary

Following the descriptions and key assumptions provided in Table 2-4, the assessment radiation exposure risks to an operator considered the following LLRW incinerator activities: waste preparation, waste charging, burn cycle, bottom ash removal, and fly ash removal. The total annual incremental radiation dose to an operator for identified tasks is provided in Table 2-5.

Table 2-5 Total Incremental Radiation Dose to an Operator

Parameter	Annual Dose (mSv/yr)	
Task	**Base Case**	**Sensitivity Case**
Waste Preparation	1.37E-02	3.43E-02
Waste Charging	1.10E-02	2.76E-02
Starting the System	Included in Waste Charging	
Burn Cycle	5.53E-03	1.38E-02
Cooldown Cycle	No Exposure	
Bottom Ash Removal	7.37E-02	1.82E-01
Fly Ash Removal	3.34E-03	8.34E-03
Total Annual Dose	**1.07E-01**	**2.66E-01**

mSv/yr = millisieverts per year.

The estimated total annual incremental radiation doses for the base case and sensitivity case are 0.107 mSv/yr and 0.266 mSv/yr, respectively. These annual incremental doses represent approximately 0.5% to 1.3% of the annual dose limit of 20 mSv/yr and would only affect a small number of workers.

2.4 Accidents and Malfunctions

The purpose of this subsection is to summarize the potential Project-related accidents and malfunctions that involve potential worker exposure to radiation and radioactivity during the Operations Phase.

The assessment of accidents and malfunctions included the identification of the reasonably feasible, potential Project-related accidents and malfunctions that involve worker exposure to radiation to estimate the dose received from radiological exposure scenarios that fall outside the range of "typical" day-to-day events.

2.4.1 Hazard Identification

The hazard identification evaluation was used to establish a comprehensive list of potential Project-related accident and malfunction scenarios, screen these scenarios for potential risks, and, based on the initial screening results, select the appropriate high- or moderate-risk scenarios as bounding scenarios. These bounding scenarios were carried forward for more detailed risk assessments. The hazard identification evaluation focused on risks to worker health.

The screening evaluation was applied to all accident and malfunction scenarios by qualitatively evaluating the likelihood (Table 2-6) and consequence (Table 2-7) to determine a risk level (Table 2-8).

Table 2-6: Likelihood Index

Rating	Likelihood	Description
1	Highly unlikely	<1 occurrence in 1,000 years
2	Unlikely	≤1 occurrence in 100 years and >1 occurrence in 1,000 years
3	Likely	≤1 occurrence in 10 years and >1 occurrence in 100 years
4	Very likely	≤1 occurrence in 1 year and >1 occurrence in 10 years
5	Almost certain	>1 occurrence in 1 year

< = less than; ≤ = less than or equal to; > = greater than.

Table 2-7: Consequence Index

Rating	Consequence	Description
1	None	Below IL
2	Negligible	Below AcL but above IL
3	Minor	Below 20 mSv for NEW (0.3 mSv for non-NEW) but above AcL
4	Moderate	Below 50 mSv but above 20 mSv for NEW (below 1 mSv but above 0.3 mSv for non-NEW)
5	Major	Above 50 mSv for NEW (above 1 mSv for non-NEW)

IL = Investigation levels; AcL = Action levels; mSv = millisieverts; NEW = nuclear energy worker.

Table 2-8: Hazard Analysis Risk Matrix

Likelihood		Consequence				
		1	2	3	4	5
		None	Negligible	Minor	Moderate	Major
5	Almost certain	Low	Moderate	Moderate	High	High
4	Very likely	Low	Low	Moderate	High	High
3	Likely	Low	Low	Moderate	Moderate	High
2	Unlikely	Low	Low	Low	Moderate	High
1	Highly unlikely	Low	Low	Low	Moderate	Moderate

A total of 22 potential hazards were identified through the hazard identification process; 12 hazards were characterized as moderate-risk scenarios with the remaining 10 hazards being characterized as low-risk scenarios. No high-risk scenarios were identified.

2.4.2 Bounding Scenarios

A bounding scenario is used to represent an event in which the potential effects of that event are considered to be representative of those associated with other accident and malfunction scenarios; or, alternatively, the potential effects of scenarios that are bounded by another scenario are expected to fit within the envelope of the effects associated with the bounding scenario. From the initial screening process detailed in the hazard identification, five hazard scenarios were selected as bounding scenarios for more detailed risk analysis (Table 2-9).

2.4.3 Accidents and Malfunctions Assessment Summary

The results of the risk assessment of the bounding accident scenarios are summarized in Table 2-9.

The results combine the analysis of both effect likelihood and effect consequence for each bounding scenario to identify an overall risk rating. The predicted dose to workers is also provided. The overall risk ratings indicate that one bounding accident scenario has a moderate risk and four bounding accident scenarios have a low risk.

Table 2-9: Summary of Assessment Results for Bounding Scenarios

No.	Accident or Malfunction Scenario	Location	Likelihood	Predicted Worker Dose	Estimated Effects Consequence	Overall Risk Rating[(a)]
1	Vehicle accident including rollover, collision, resulting in fire and dusting	Access road	Likely	0.70 mSv	Moderate	Moderate risk
2	Process vessel including leach tanks and piping system failure	Mill processing facility	Highly unlikely	0.048 mSv	Negligible	Low risk
3	Solvent extraction fire or explosion	Solvent extraction building	Unlikely	2.17 mSv	Minor	Low risk
4	Failure of tailings / paste pipes and pumps	Paste plant and paste delivery / UGTMF	Likely	0.017 mSv	Negligible	Low risk
5	Ventilation disruption and radon accumulation in the mine	Underground mine	Unlikely	4.92 mSv[(b)]	Negligible	Low risk

a) Based on Table 2-8.
b) Conservative value provided. Values range from 0.000034 mSv to 4.92 mSv.
UGTMF = underground tailings management facility; mSv = millisievert.

The vehicle accident including rollover, collision, resulting in fire and dusting scenario was deemed to be a moderate risk. Given that the risk would be managed to be as low as reasonably practicable (ALARP) by implementation of proper emergency response plans and radiation protection plans, this risk was deemed to be tolerable, and no further mitigation was deemed necessary.

The effectiveness of designs and mitigations would continue to be assessed according to the risk management processes that would be described in the IMS Manual and the Environmental Protection Program developed for the Project, and in accordance with provincial, CNSC, and other regulatory requirements.

The results of this assessment and/or subsequent future assessments as the Project advances would be considered in planning emergency response measures.

3 Non-Radiological Exposures

Non-radiological exposures would include the circumstance or conditions that could cause harm to workers in the form of physical injury, illness, or disease. Following the identification of potential circumstances and conditions that could create exposures to workers, risks to worker health, safety, and the environment are assessed with consideration for a range of factors, including:

- who is affected;
- the potential injury or exposure;
- the severity of the risk exposure; and
- the frequency and duration of exposure to the hazard.

The controls identified during this risk assessment are used to eliminate, prevent, or reduce the risk of injury, illness, or disease to workers. Controls appropriate for the hazard and corresponding level of risk are selected and implemented with consideration for the hierarchy of controls (Figure 1-1). Examples of controls include facilities, equipment, processes, products, safe work practices, and PPE.

Where practicable and advisable, controls would be used in combination to effectively prevent or reduce worker risk. Controls would be used, operated, and maintained in accordance with their design, limitations, and applicable training and documentation.

The potential non-radiological exposures assessed for the proposed Project included worker exposure to crystalline silica dust and diesel fuel emissions.

3.1 Workplace Exposure to Crystalline Silica Dust and Diesel Fuel Emissions

The purpose of this subsection is to summarize the predicted occupational risks to workers due to potential exposures to airborne crystalline silica, diesel engine gaseous emissions, and diesel engine particulate matter (DPM) emissions during the Construction and Operations phases.

Potential exposure to airborne crystalline silica, diesel engine emissions (i.e., nitrogen oxides [NO_X], carbon dioxide [CO_2], carbon monoxide [CO], and sulphur dioxide [SO_2]), and DPM associated with underground development and mining and surface activities (e.g., shaft sinking, processing of paste tailings and ore in the process plant) could present potential risks to workers. The assessment of estimated exposure concentrations from crystalline silica dust, diesel engine emissions, and DPM to workers considered if proposed mining methods, development and production mining rates, and mine and surface process plant ventilation rates would adequately protect workers from the hazards of crystalline silica dust and diesel engine emissions. To evaluate these risks, estimated exposures to crystalline silica dust and diesel engine emissions were developed.

Exposure estimates of workplace concentrations were developed and compared to occupational exposure limits (OELs) adopted by NexGen for the Project to evaluate occupational risks to workers. The OELs adopted for the Project during both Construction and Operations were based on a 12-hour daily work shift, at a minimum of 7 to 14 consecutive days, with an equal number of days of rest afterwards. NexGen will meet all applicable regulatory limits and will aim to meet, based on the concept of ALARA, more stringent OELs to be established for the Project (Table 3-1). This approach imparts an added degree of protection to workers by adopting more stringent OELs.

Table 3-1: 12-hour Occupational Exposure Limits Adopted by NexGen

Contaminant	Units	12-hour Time-Weighted Average
Crystalline silica	mg/m^3	0.024
Carbon dioxide (CO_2)	ppm	2,500
Carbon monoxide (CO)	ppm	12.5
Nitrogen oxides (NO_X)	ppm	25.0
Nitrogen dioxide (NO_2)	ppm	0.134
Sulphur dioxide (SO_2)	ppm	n/a
Diesel particulate matter (DPM)	$\mu g/m^3$	80

mg/m^3 = milligrams per cubic metre; ppm = parts per million; $\mu g/m^3$ = micrograms per cubic metre; n/a = not applicable.

3.1.1 Crystalline Silica Dust

Crystalline silica exposure estimates considered dust generated during drilling, blasting, mucking, and underground conveying; rock breaking associated with shaft sinking; underground lateral development; development of the UGTMF; and ore extraction. Dust generated during the processing of paste tailings and ore in the surface process plant was also considered. Based on proposed operational practices, it was concluded that dust generated from blasting, underground conveying, rock breaking, and wet processing of ore would not result in significant exposure to workers; therefore, these activities did not require detailed exposure estimates. Based on estimated exposures to crystalline silica underground due to drilling and mucking activities and in the surface process plant due to the receipt and handling of ore entering the plant, it is predicted that with current proposed mining methods, development and production mining rates, and mine and surface process plant ventilation rates, workplace concentrations of crystalline silica dust would generally not exceed the established OEL of 0.024 mg/m^3, assuming 12-hour exposures (Table 3-2). A marginal exceedance of the OEL is predicted during shaft development when drilling through approximately 15 m to 25 m of quartz arenite sandstone located in the proposed shaft location. Personal protective equipment or increased ventilation would be implemented, if required, when drilling through this sandstone.

Table 3-2: Estimated Occupational Exposures to Crystalline Silica - Underground

SEG	Work Activity	Estimated 12-hour TWA Workplace Crystalline Silica Dust Concentration[(a)]	
		Construction and Commissioning	Operations
Driller – Shaft Sinking	Shaft Sinking	0.0245 mg/m^3	n/a
Driller – Lateral	Underground lateral mine development (worst case)	0.0041 mg/m^3	0.0040 mg/m^3
Driller – UGTMF	Underground mine production (ore) (worst case)	n/a	0.0025 mg/m^3
Driller – Ore	UGTMF stope development	0.0028 mg/m^3	0.0028 mg/m^3
Material Handler – Shaft Sinking	Shaft Sinking	0.0105 mg/m^3	n/a
Material Handler – Lateral	Underground lateral mine development (worst case)	0.008 mg/m^3	0.008 mg/m^3
Material Handler – UGTMF	UGTMF stope development	0.011 mg/m^3	0.011 mg/m^3
Material Handler – Ore	Underground mine production (ore)	n/a	0.006 mg/m^3

Note: shading indicates exceedance of the occupational exposure level.
a) The 12-hour OEL is 0.024 mg/m^3.
SEG = similar exposure group; TWA = time-weighted average; UGTMF = underground tailings management facility; n/a = not applicable.

3.1.2 Diesel Fuel Emissions

For diesel engine emissions, SEGs selected for further analysis were operators of primary fleet vehicles where diesel power machines/equipment would be used for the majority of the work shift. Other SEGs (e.g., supervisors, maintenance personnel, radiation technicians) would be expected to have lower exposure levels due to a more limited use of diesel-powered equipment and the generally lower engine power ratings for vehicles used by these SEGs. For the equipment selected as part of the Project design, it is predicted that exposures to diesel engine emission gases and DPM would be below the applicable 12-hour OELs for all contaminants assessed for all SEGs other than the material handler – haul truck operator (NO_2) and the shotcrete sprayer (NO_2 and DPM) (Table 3-3). Modelling indicates that DPM emissions would be adequately controlled if the Project was able to utilize a shotcrete sprayer with a Tier 4 engine, incorporate a diesel particulate filter (DPF) on the Tier 3 engine, increase ventilation rates, or reduce work cycle timing.

Table 3-3: 12-hour Time-Weight Average Concentrations for Diesel-Powered Emissions – No Adjustment for Productive Hours

SEG[e]	EPA Tier	NO_2[a] (ppm)	NO[a] (ppm)	CO (ppm)	CO_2 (ppm)	SO_2 (ppm)	DPM[d] ($\mu g/m^3$)
Material Handler – LHD Operator: Lateral Development	3	0.296[b]	2.8	2.8	2,031	0.012	635.8
							95.4 w. DPF
	4[c]	**0.108**	**1.0**	**0.2**	**1,645**	**0.011**	**3.4**
Material Handler – LHD Operator: UGTMF Mining	3	0.339	3.2	3.2	2,326	0.014	728.2
							109.2 w. DPF
	4	**0.123**	**1.2**	**0.2**	**1,855**	**0.012**	**3.9**
Material Handler – LHD Operator: Ore Mining	3	0.103	1.0	1.0	705	0.004	220.7
							33.1 w. DPF
	4	**0.037**	**0.4**	**0.1**	**571**	**0.004**	**1.2**
Material Handler – Haul Truck Operator	**4**	**0.162**	**1.5**	**0.4**	**2,472**	**0.016**	**5.2**
Shotcrete Sprayer	**3**	**0.152**	**1.5**	**1.4**	**1,045**	**0.007**	**481.3**
							72.2 w. DPF
	4	0.092	0.9	0.01	886	0.006	1.8
OEL – 12-hour TWA	n/a	0.134/1.0[f]	25.0	12.5	2,500	n/a	80

Note: shading indicates exceedance of the occupational exposure level.

a) Assumes 15% of NO_x is NO_2 (range 5% to 15%) and 95% of NO_x is NO (range 85% to 95%) (Majewski 2009). As a result, NO_2 + NO emissions exceed NO_x emissions.
b) Yellow shading indicates exceedance of relevant OEL(s).
c) **Bold** numbers indicate the engine tier selected for the Project.
d) w. DPF = Tier 3 engine equipped with a diesel particulate filter with an efficiency of 85%.
e) The diesel engine is conservatively assumed to be operating for all work hours.
f) The most stringent limit recommended by Aura (2023) is 0.134 ppm. The ALARA OEL recommended in this assessment is 1.0 ppm based on *The Mines Regulations, 2018* 8-hour TWA of 2 ppm adjusted for a 12-hour exposure period.

SEG = similar exposure group; EPA = Environmental Protection Agency; NO_2 = nitrogen dioxide; NO = nitric oxide; CO = carbon monoxide; CO_2 = carbon dioxide; SO_2 = sulphur dioxide; DPM = diesel particulate matter; LHD = load-haul-dump; DPF = diesel particulate filter; UGTMF = underground tailings management facility; OEL = occupational exposure level; TWA = time-weighted average; n/a = not applicable.

The scenarios shown in Table 3-3 assume 100% productivity for a 12-hour shift. The more likely scenarios for Construction and Operations (e.g., 12-hour TWA workplace with 9.33 productive hours) predict that the concentrations for LHD and haul truck operators using equipment with Tier 4 engines and a shotcrete worker using equipment with a Tier 3 engine equipped with an aftermarket DPF would be below the applicable 12-hour OELs for all diesel-powered emissions.

3.1.3 Crystalline Silica Dust and Diesel Fuel Emissions Exposure Assessment Summary

The evaluation of workplace exposure to crystalline silica dust and diesel engine emissions, including DPM, considered the proposed Project mining methods, development and production mining rates, and mine and surface process plant ventilation rates.

Based on estimated exposures to crystalline silica underground due to drilling and mucking activities, and in the surface process plant due to the receipt and handling of ore entering the plant, it is predicted that workplace concentrations of crystalline silica would remain below the established OEL of 0.024 mg/m^3, with one exception. A marginal exceedance of the OEL is predicted during shaft development when drilling through approximately 15 m to 25 m of quartz arenite sandstone located in the proposed shaft location. Personal protective equipment or increased ventilation would be used when drilling through this sandstone.

4 Hazard Analysis

A qualitative hazard analysis (HAZAN) study was completed as part of Project engineering to identify, assess, eliminate (if possible), and mitigate hazards that could affect people, the environment, or property during the operation and maintenance of the Project. Where practicable, the HAZAN study identified opportunities to modify operational hazards and/or to reduce the most significant hazards to ALARP.

The results of the HAZAN study will be considered within subsequent phases of Project design, including detailed engineering. In addition, the HAZAN study will be followed up by a comprehensive hazard operability (HAZOP) study, which will be performed during detailed engineering once process and instrumentation drawings are finalized and sufficient engineering informative is available. The HAZOP study will further identify Project design and/or mitigation measures that would be implemented for the Project, where practicable, that would reduce hazards to ALARP.

4.1 Hazard Analysis Study Scope

The HAZAN study included reviewing the processes for the following facilities associated with the Project:

- Process Plant
  - Leaching
  - Solid/liquid separation
  - Paste plant and backfill system
  - Precipitation
  - Ore handling/grinding
  - Solvent extraction
  - Tailings neutralization
  - Product drying
- Acid plant
- Process utilities
- Off-site roads
- Bulk fuel storage
- Communication tower
- Underground mine
  - Shaft sinking infrastructure
  - Mine terrace
  - Mine ventilation
- Dewatering and material handling
- Waste rock storage areas and stockpiles
- Sewage treatment, incinerator, and fresh water buildings
- Mill control room, and emergency response building

4.2 Hazard Analysis Study Results

The HAZAN study identified and assessed 615 hazards; of this total, 21 hazards were ranked as Actionable, 179 hazards as ranked as Monitor (i.e., monitoring during Project activities would be required to determine if further action is necessary), 215 hazards were ranked as Medium, and 60 hazards were ranked as Low (Table 4-1). The other 140 hazards were unranked because of insufficient information, these hazards would be assessed during the HAZOP, or no further action was required (Table 4-1). Where insufficient information was available, further details will be acquired and the hazards will be re-assessed, if required, during future studies (e.g., HAZOP). Where possible, future controls were recommended to reduce the most significant hazards to ALARP.

Table 4-1: Hazard Analysis Results

Consequence Magnitude	Number of Hazards
Actionable	21
Monitor	179
Medium	215
Low	60
Not rated	140
Total	**615**

4.3 Hazard Analysis Next Steps

Project design features and mitigation measures proposed during the HAZAN study will be considered within future Project design phases (e.g., detailed engineering) to reduce the identified hazards to ALARP. Once the Project design has advanced, a HAZOP study will be conducted to identify any additional required Project design features or mitigation measures that would be implemented to reduce potential hazards to ALARP.

5 Human Factors Engineering

Human factors engineering refers to the application of psychological and physiological principles to the engineering and design of products, processes, and systems. The human factors process allows human performance issues and human-related concerns to be addressed early, effectively, and iteratively throughout Project design by facilitating compatibility between users (i.e., applicable workers), the equipment/technology/systems they use, the tasks they execute, and the environment they work in.

The means by which human factors considerations will be integrated into Project activities licensed by the CNSC are documented in the Human Factors Engineering Program Plan (Plan). The Plan provides an overview of how human factors will be integrated to derive Project design.

5.1 Goal of the Human Factors Engineering Program Plan

The goal of the Plan is to outline the methods for integrating human factors in the design and development of Project facilities, equipment, and processes in a manner that:

- enhances measures to protect human health, safety, and the environment;
- optimizes work environments and worker well-being;
- supports Project security; and

- improves Project operability and maintainability.

This Plan provides a consistent, risk-based approach to assessing Project facilities, equipment, and processes to include review and evaluation of user tasks, human-system interfaces, and physical work environments for compatibility with human characteristics, capabilities, and limitations.

5.2 Plan Scope

The Plan serves as a roadmap for integrating human factors into the design of Project facilities, equipment, and processes. The activities described in this Plan are limited to the current and future engineering design phases of the Project. Although the outcomes of this work would provide the basis for the effective integration of human factors considerations throughout the Project lifespan, this Plan does not prescribe or account for human factors assessments performed during Construction, Operations, or Closure.

All areas of the Project (e.g., mine, underground, surface processing, surface facilities) will undergo a preliminary review to determine the final scope (i.e., Project areas) that will be subject to the human factors evaluation. Human factors integration will be informed using a graded, risk-based approach that accounts for the apparent level of risk, safety significance, and complexity of facilities, equipment, or processes.

The outcomes of risk-based human factors assessments, verification, and validation executed throughout the Project would be documented in a Human Factors Engineering Summary Report.

5.3 Human Factors Integration Program Management

Human factors integration will be achieved through:

- accountability for human factors integration through clear roles and responsibilities;
- establishment of human factors culture within the overall Project team (e.g., design authority, responsible designer);
- consistent understanding of human factors concepts within the overall Project team (e.g., design authority, responsible designer);
- alignment of human factors needs with design workflows and stage gates;
- integration of human factors within the design review meetings, constructability reviews, and hazard studies;
- direct access by the human factors experts to the design documents and/or models; and
- direct access by the human factors experts to Project technical experts for technical support.

Human factors integration will be facilitated through development of a human factors working group; this working group will also support:

- stakeholder awareness of the Plan and human factors work activities;
- integration of human factors work activities within the responsible designer's design timeline and schedule;
- stakeholder awareness of the status of the human factors work activities and requirements (e.g., data gathering sessions, access to Project technical experts); and
- identification of risks and proposed mitigation, if applicable.

5.4 Human Factors Work Activities

The human factors work activities that are planned for the Project engineering design phase include:

- operating experience review;
- function analysis;
- task analysis;
- critical task analysis;
- task-based design reviews; and
- human-system interface design.

The human factors work activities are intended to improve Project operability and maintainability as well as optimize Project work environments. A description of these activities is provided in Table 5-1.

Table 5-1: Human Factors Work Activities

Human Factor Work Activity	Description
Operating Experience Review	Uses design, operating, and maintenance experience from other mines and mills and applicable industries to identify and analyze lessons learned that should be considered during Project design.
Function Analysis	Provides an understanding of system functions by identifying and describing primary high-level activities (i.e., functions) that must be performed to satisfy system operational and maintenance requirements and objectives.
Task Analysis	Identifies the actions or cognitive processes a user must perform to achieve a function and details the performance demands on a user and requirements for successful task completion.
Critical Task Analysis	A process for rating task importance and prioritizing those tasks that are critical for safe and successful goal completion for further analysis.
Task-Based Design Reviews	Uses the results of the task analysis to conduct task-based design reviews to verify Project design supports operability and maintainability.
Human-System Interface Design	Review of the systems, equipment, technology, and graphical user interfaces (e.g., software) to maintain both design compliance to applicable human factors / design standards and guidelines support for operations and maintainability.

Human factors experts will select the most appropriate methods and tools to facilitate the human factors work activities based on their extensive experience in integrating human factors in related design projects and domains.

Human factors integration consists of three phases:

- **Development:** development of the Plan and the Human Factors Engineering Validation Plan;
- **Implementation:** human factors integration through the execution of the human factors work activities during the engineering design phases; and
- **Documentation and Traceability:** summary of results for each human factors work activity and traceability of human factors design requirements and recommendations in the Human Factors Considerations Tracking File.

The execution of the human factors work activities has been scheduled based on the overall Project design timelines and would adapt to Project schedule modifications as appropriate.

5.5 Related Activities

Identification of adequate staffing and job design is an important consideration during the design process to confirm that user tasks can be completed safely and efficiently for a range of operating conditions (e.g., routine, abnormal, emergency). Similarly, developing training modules and processes will support safe and efficient task completion, user interaction with human-system interfaces, and user response during abnormal and emergency events.

The results of human factors activities such as the function and task analysis, operating experience review, and validation exercises can be used to support development of staffing, job design (i.e., roles), qualifications, processes, and training. Human factors experts will highlight specific results arising from these analyses that would be considered by the design authority and shared with the relevant groups (e.g., staffing, training, process development).

5.6 Minimum Staff Complement

The Project staff complement would be based on operational effectiveness and planned output. Abnormal events, incidents, or emergencies could result in either modifying activities to align operations to a safe state or unplanned shutdowns of whole or partial operations. The Project staff complement would be adjusted to support these abnormal events, incidents, or emergencies.

5.7 Design Verification

Design verification demonstrates that the Project design conforms to human factors-related requirements, design standards, and guidelines.

5.7.1 Human-System Interface Design

Human-system interface designs will be reviewed and verified against human factors design standards and guidelines for compliance. Components of the design that were found non-compliant to human factors design standards and guidelines would be identified and recommendations for mitigating non-compliance will be developed, documented, and communicated to the responsible designer.

5.7.2 Evaluating Human-System Interfaces Against Tasks

The design of human-system interfaces would be evaluated against operational and maintenance tasks to verify that human-system interfaces provide the required support for safe execution of user tasks. Human-system interface designs that inadequately support user tasks would be identified and design recommendations to support operability and maintainability would be developed, documented, and communicated to the responsible designer.

5.7.3 Human Factors Requirements and Recommendations

Design requirements and recommendations arising from the human factors work activities will be reviewed to verify they have been addressed, resolved, and integrated into Project design. If there are instances where design requirements and recommendations could not be implemented, justification will be provided.

5.7.4 As-Built Verification

An as-built verification checklist will be developed at the end of the Project design engineering. The checklist will be based on the human factors recommendations and implemented during the as-built verification walk through completed during system commissioning.

5.7.5 Design Validation

Design validation is the process of determining the degree to which the design facilitates achievement of the overall goals of Project design.

A Human Factors Engineering Validation Plan will be developed documenting the planning and execution of the validation activities and will be submitted to the CNSC for review and approval. The Human Factors Engineering Validation Plan will document the test plan for executing validation exercises during detailed design and commissioning and will include information such as:

- validation scenario (may be identified from the results of the critical task analysis);
- type of analysis;
- approach and methodology;
- apparatus (e.g., model, simulation);
- participants;
- data collection tools (e.g., questionnaires, workload scales); and
- performance measures (quantitative and qualitative).

Iterative validation activities may be implemented as the design advances and more information (e.g., equipment design, human-system interface, layouts) become available.

6 Summary

Potential radiological, chemical, physical, and biological hazards associated with Project activities that pose risks to the health and safety of workers have been, and will continue to be, systematically assessed to determine the nature, likelihood, and consequence of the potential risk; to identify and implement measures to mitigate associated effects; and to keep radiological and non-radiological exposures to workers ALARA. Risk assessments performed for the Project specific to worker health and safety are documented in a variety of reports and studies that were used to confirm the design basis for the proposed Project. These assessments have been, and will continue to be, submitted to the CNSC and other regulatory agencies in support of the various Project licensing and permitting phases.

7 References

Majewski WA. 2009. MDEC 2009, NO_2 Emissions in Mines. Available at https://mdec.ca/2010/S7P3_majewski.pdf

Radiation Protection Regulations, SOR/2000-203 under the *Nuclear Safety and Control Act*. Last amended 1 January 2021. Available at https://laws-lois.justice.gc.ca/eng/regulations/SOR-2000-203/index.html

The Mines Regulations, 2018. RRS c S-15.1 Reg 8 under The *Saskatchewan Employment Act*. Effective April 6, 2019. Available at https://www.canlii.org/en/sk/laws/regu/rrs-c-s-15.1-reg-8/latest/rrs-c-s-15.1-reg-8.html

Attachment IR 132-1

Table 1: Comparison of Intake Rates for Canadian Standards Association One-Year-Old and Health Canada Infant and Health Canada Toddler

Exposure Pathway	CSA One-Year-Old	Health Canada Infant	Health Canada Toddler
Soil (g/d)	0.06	0.02	0.08
Inhalation (m^3/d)	5.01	2.2	8.3
Water (L/d)	0.27	0.3	0.6
Milk (g/d)	665	664	592

CSA = Canadian Standards Association; g/d = grams per day; m^3/d = cubic metres per day; L/d = litres per day; g/d = grams per day.

Attachment IR 231/264/266/267-1

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Attachment IR 231/264/266/267-1

1 Introduction

NexGen Energy Ltd. (NexGen) is proposing to develop a new uranium mining and milling operation in northwestern Saskatchewan, called the Rook I Project (Project). The proposed Project is subject to both provincial and federal Environmental Assessment (EA) processes, would be licensed as a nuclear facility by the Canadian Nuclear Safety Commission (CNSC), and would be subject to various provincial and federal permits and approvals.

NexGen submitted a Draft Environmental Impact Statement (EIS) to the Saskatchewan Ministry of Environment (ENV) and Canadian Nuclear Safety Commission (CNSC) in 2022, and has received information requests (IRs) from the Federal-Indigenous Review Team (FIRT), which is led by the CNSC. This memorandum provides NexGen's responses and supporting information to IR 231, IR 264, IR 266, and IR 267 in which the CNSC referenced Draft EIS Technical Support Document (TSD) XIV (Groundwater Flow and Solute Transport Modelling Report) and Draft EIS Annex III (Hydrogeology Baseline Report). These four IRs are presented in Table 1.

Table 1: Summary of Information Requests Addressed in this Memorandum

No.	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement
231	TSD XIV, Section 2.3	**Provide Context and Rationale:** Section 2.3.1 states that "the model was constructed based on a rectangular mesh ……, with the northwest portion of the model domain situated along a high and the southeast portion of the model situated along a topographic low (i.e., with drainage to the Clearwater River)". It is not clear how the topographic high/low was determined, considering that the rectangular mesh is not coincident with the surface water watershed (as shown in Figure A-2). Section 2.3.2 indicates that fixed head boundary nodes were specified along the southeast lateral boundary on slices 6 to 39. It is not clear why the southeast boundary was specified as fixed head boundary while all the other three boundary conditions were assumed as no-flow boundary. Additionally, it is not clear why the fixed head was assigned to slice 6 to 39, and what the stratigraphic units of slice 6 to 39 are. Section 2.3.1 described the discretization of the model domain. A figure showing the model mesh would help understand the model domain discretization along the horizontal and vertical direction, and the discretization of each hydro-stratigraphic unit. topographic	1.Provide clarification as to why the northwest and southeast portions are topographic high and low, since they are not coincident with the surface water watershed. 2.Provide a justification of the boundary conditions (i.e., why the southeast portion was specified as fixed head while all the rest were assigned as no-flow boundary conditions?). 3.Show the model domain discretization along the horizontal and vertical directions along with the hydro-stratigraphic units on the same figure to illustrate the discretization of each hydro-stratigraphic unit.

No.	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement
264	Annex III, Section 5.2.2.2, Appendix G	Context: Section 5.2.2.2 indicates that hydraulic conductivities were calculated using the Thiem equation. However, Appendix G shows that some tests were analyzed using the Lugeon unit, some were analyzed using the Theis recovery curve analysis, and some were based on the Thiem equation. For the Thiem equation, radius of influence were assumed instead of measured. It is stated in Section 5.2.2.2 that "These assumptions were: R0=1 m; where Q≤0.1 L/min R0=10 m; where 1.0 L/min≤Q≤0.1 L/min R0=1 m; where Q≤0.1 L/min" Rationale: There are apparent typos in these assumptions, and they impact the understanding of the content. Additionally, justification (i.e., references) should be provided for these assumptions.	Provide all the theories used in the packer test analysis (i.e., Lugeon test analysis, Theim recovery curve analysis, etc.), and ensure text in Section 5.2.2.2 is consistent with Appendix G. Please clarify the assumptions related to the radius of influence, and provide justification for the assumptions.
266	Annex III, Section 6.3.3	Section 6.3.3 describes the fault zone and shear zone derived based on the geological model and geophysical survey data. Figures 28, 20 and 30 illustrate the cross sections of the fault zone. But it is not clear how the fault zone extends in the horizontal direction.	Please illustrate the plan view of the fault zone and shear zone in a figure.
267 (Part 1 of 4)	Annex III, Section 6.5	Figure 31 (Annex III) shows the calibration statistics, but there is no information about the water balance. The model should demonstrate an accurate water balance. The water balance error is the difference between total predicted inflow and total predicted outflow.	Provide the water balance as a model performance measure.

EIS = Environmental Impact Statement; TSD = Technical Support Document.

2 Information Request Responses

2.1 Response to Information Request 231

1. In low relief areas, the regional groundwater flow system does not necessarily reflect local drainage patterns and groundwater flow divides do not necessarily align with surface water catchment boundaries. The northwest and southeast groundwater model boundaries (Draft EIS TSD XIV) are approximately aligned with the inferred regional surface drainage direction for the area of the Project, as inferred from the topography. The northwest model boundary is situated approximately parallel to a topographic high, and the southeast model boundary is situated topographically lower than most of the remainder of the model domain. Drainage out of the model domain towards Clearwater River is inferred to be possible.

2. A no-flow boundary condition was applied to the northwest model boundary as this condition approximately aligns with an area of higher topographic elevation (i.e., assumed local groundwater flow divide). The ground surface in the southeast portion of the model domain is topographically lower, with flow out of the model domain towards Clearwater River (farther to the southeast) considered possible. For this reason, a specified head boundary was assigned along the downstream southeast model boundary on slices (i.e., surfaces that define model layers) 6 through 39 to allow regional outflow of groundwater through the bedrock. In the absence of groundwater elevation data in this area, the specified head boundaries on the southeast model boundary were assigned an elevation of 485 metres above sea level (masl), corresponding to the approximate low point in topography along the periphery of the model (Draft EIS TSD XIV,

Section 2.3.2). The remaining two sides of the model boundary were assumed to be generally parallel to the flow direction and inferred regional surface drainage direction and were assigned as no flow boundaries.

As discussed in Part 1 of this IR response, in low relief areas, the regional groundwater flow system does not necessarily reflect local drainage patterns and groundwater flow divides do not necessarily align with surface water catchment boundaries. Model boundaries were therefore selected to be sufficiently distant from the proposed underground mine to not influence model predictions but not so far as to result in a large model domain that would prevent the detailed refinement of geological faults and shear zones near the underground development associated with the Project. Groundwater flow conditions near the underground mine would be primarily controlled by surface water levels in Patterson Lake, Forrest Lake, and Beet Lake. Predicted drawdown presented in Figure A-19 (Draft EIS TSD XIV, Appendix A) is limited to the area of these lakes and does extend to the model limits, supporting that the model limits are sufficiently distant from the underground to not influence model predictions.

3. Multiple figures are required to illustrate the discretization of each hydrostratigraphic unit along the horizontal and vertical directions within the model domain; these figures are included in Appendix A. The model domain and finite element mesh are presented in Figure 1. Figure 2 to Figure 13 present the three dimensional (3-D) extent of each zone / hydrostratigraphic unit within the model. Figure 14 presents a detailed cross section showing the discretization of the units near the proposed underground mine.

2.2 Response to Information Request 264

Text in Section 5.2.2.2 of revised EIS Annex III (Hydrogeology Baseline Report) will be modified to provide the theories used for the best estimates of hydraulic conductivity presented in Appendix G of Draft EIS Annex III. Specifically, the text will be modified to reflect the following information:

Appendix G presents hydraulic conductivity values estimated from packer testing.

Hydraulic conductivity values from packer test data conducted by BGC were reported to be analyzed utilizing the equation below from Hoek and Bray (1981) using the Lugeon interpretation practice proposed by Houlsby (1976) and revisited by Qionones-Rozo (2010) to select a representative hydraulic conductivity (K) value for each test (BGC 2019).

$$K = \frac{Q * \left(\frac{L\sin(A)}{r}\right)}{2 * \pi * L\sin(A) * dH}$$

Where:

K = hydraulic conductivity (m/s);
Q = rate of injection in (m^3/s);
L = test interval length (m);
dH = head differential (m);
A = angle from horizontal (degrees); and
R = drillhole radius (m).

Tabulated hydraulic conductivity data for drillholes GAR-18-010, GAR-18-013, and GAR-18-015 present hydraulic conductivity analysis carried out internally by NexGen. Estimates of hydraulic conductivity were completed using an excel template, with estimates derived from the Thiem equation (shown below) considered to be the best estimate.

$$T = \frac{Q}{2\pi dH} \times \ln\left(\frac{R_o}{R_w}\right)$$

Where:

T = transmissivity (m^2/s);
Q = rate of injection in (m^3/s);
dH = head differential (m);
Ro = radius of influence (m); and
Rw = radius of drillhole (m).

The radius of influence requires multiple monitoring wells to measure the pressure disturbance with distance from the testing drillhole, and these monitoring wells were not available at the time of testing. The radius of influence assumptions were selected from a literature review, and that the radius of influence will have little effect on the calculated hydraulic conductivity as it is within the log normal function of the equation. The radius of influence is smaller for lower permeability rock and is affected by flow rate, test duration, and the properties of the fractures and pores near to the tested well. Given these factors, the assumptions were:

Ro = 1 m; where Q ≤ 0.1 L/min;

Ro = 10 m; where 0.1 L/m ≤ Q ≤10 L/min; and

Ro = 50 m; where Q ≥ 10 L/min.

Hydraulic conductivity of the testing interval was calculated from the transmissivity results by dividing the calculated transmissivity by the length of the test interval:

$$K = T/b$$

Where:

K = hydraulic conductivity (m/s);
T = transmissivity (m^2/s); and
b = test interval length (m).

2.3 Response to Information Request 266

To support this IR response, Figure 1 to Figure 14 are included in Appendix A. The model domain and finite element mesh are presented in Figure 1. Figure 2 to Figure 13 present the 3-D extent of each hydrostratigraphic unit included within the model domain. This includes the fault zone (Figure 10) and the shear zone (Figure 11). Figure 14 presents a detailed cross section showing the discretization of the units near the proposed underground mine.

2.4 Response to Information Request 267 (Part 1 of 4)

As a check on the stability of the groundwater model (Draft EIS TSD XIV), total predicted inflow and total predicted outflow were compared at the end of the steady-state model simulation for calibration. The mass balance error was low (i.e., -0.001%), as summarized in Table 2 and Table 3, indicating the numerical error is small and does not affect the groundwater model predictions.

Table 2: Steady-State Model Calibration – Mass Balance Error

Total Model Inflow (m^3/day)	Total Model Outflow (m^3/day)	Imbalance (m^3/day)	Imbalance (%)
2.9848×10^5	2.9848×10^5	-2.0969	-0.001

Note: Significant digits presented correspond to model output.

m^3/day = cubic metres per day.

Table 3: Overall Model Water Budget

Component/Boundary	Flow Into Model Domain (m^3/day)	Flow Out of Model Domain (m^3/day)
Recharge from Precipitation	1.8765×10^5	n/a
Specified Head Boundaries – lakes, wetlands, streams	1.1083×10^5	2.8750×10^5
Specified Head Boundaries – southeast model boundary (representing regional outflow of groundwater through bedrock)	1.6161	1.0981×10^4
Imbalance	0.616[(a)]	

a) Imbalance presented in Table 3 and Table 2 are slightly different because of rounding/significant digits in model output. Significant digits match the output in FEFLOW. Overall imbalance is low (0.001%).

m^3/day = cubic metres per day.

3 References

BGC (BCG Engineering Inc.). 2019. Draft Report on Snowbird Project Prefeasibility Study 2017 Site Investigation Report. Dated 26 January 2018.

Hoek, E., and Bray, J.W. 1981. Rock Slope Engineering. The Institution of Mining and Metallurgy, London.

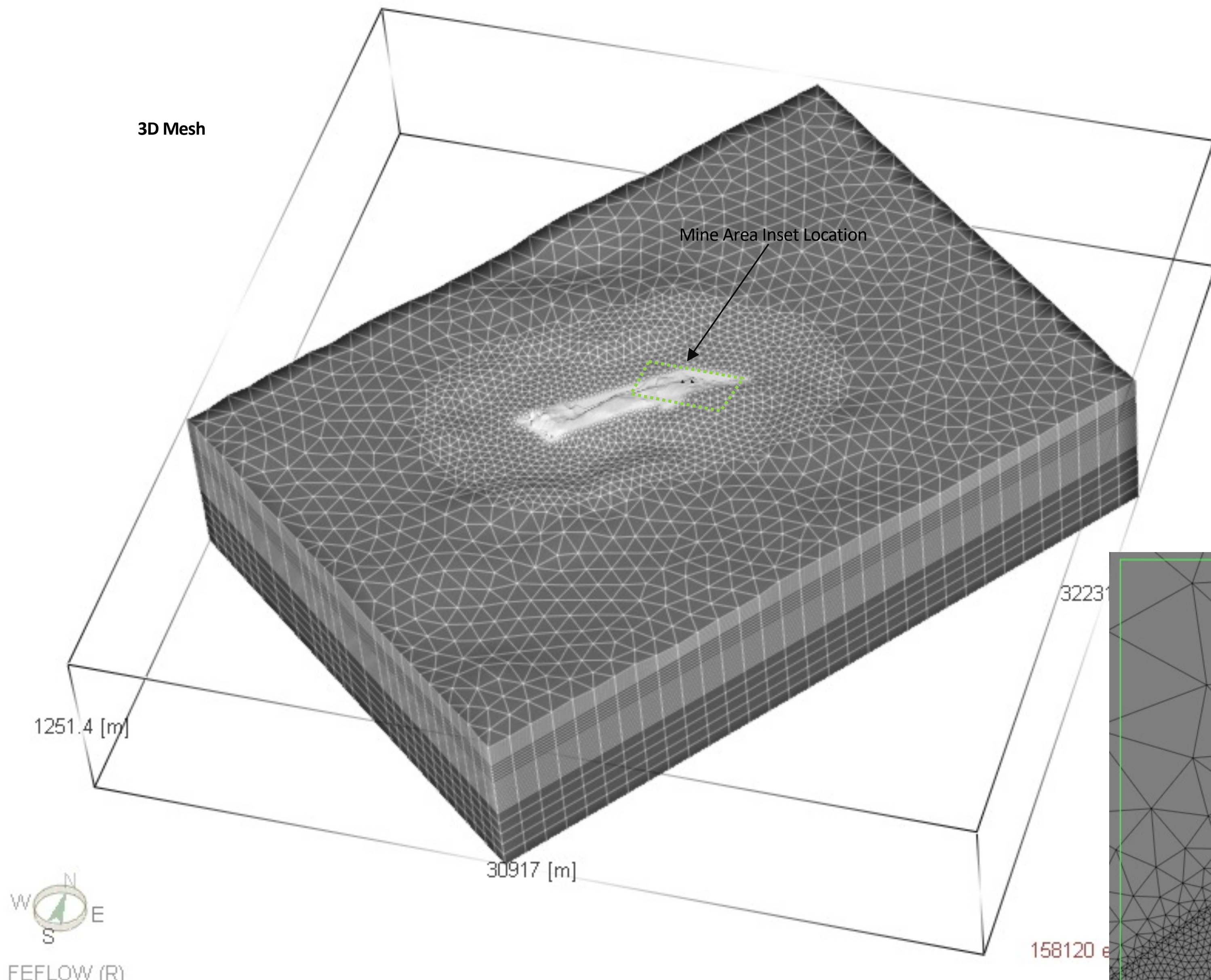
Houlsby, A.C. 1976. Routine interpretation of the Lugeon water-test. Quarterly Journal of Engineering Geology and Hydrogeology, 9:303-313.

Qionones-Rozo, C. 2010. Lugeon test interpretation, revisited. In collaborative management of integrated watersheds. Proceeding of 30th US Society of Dams Annual Conference, 405-414.

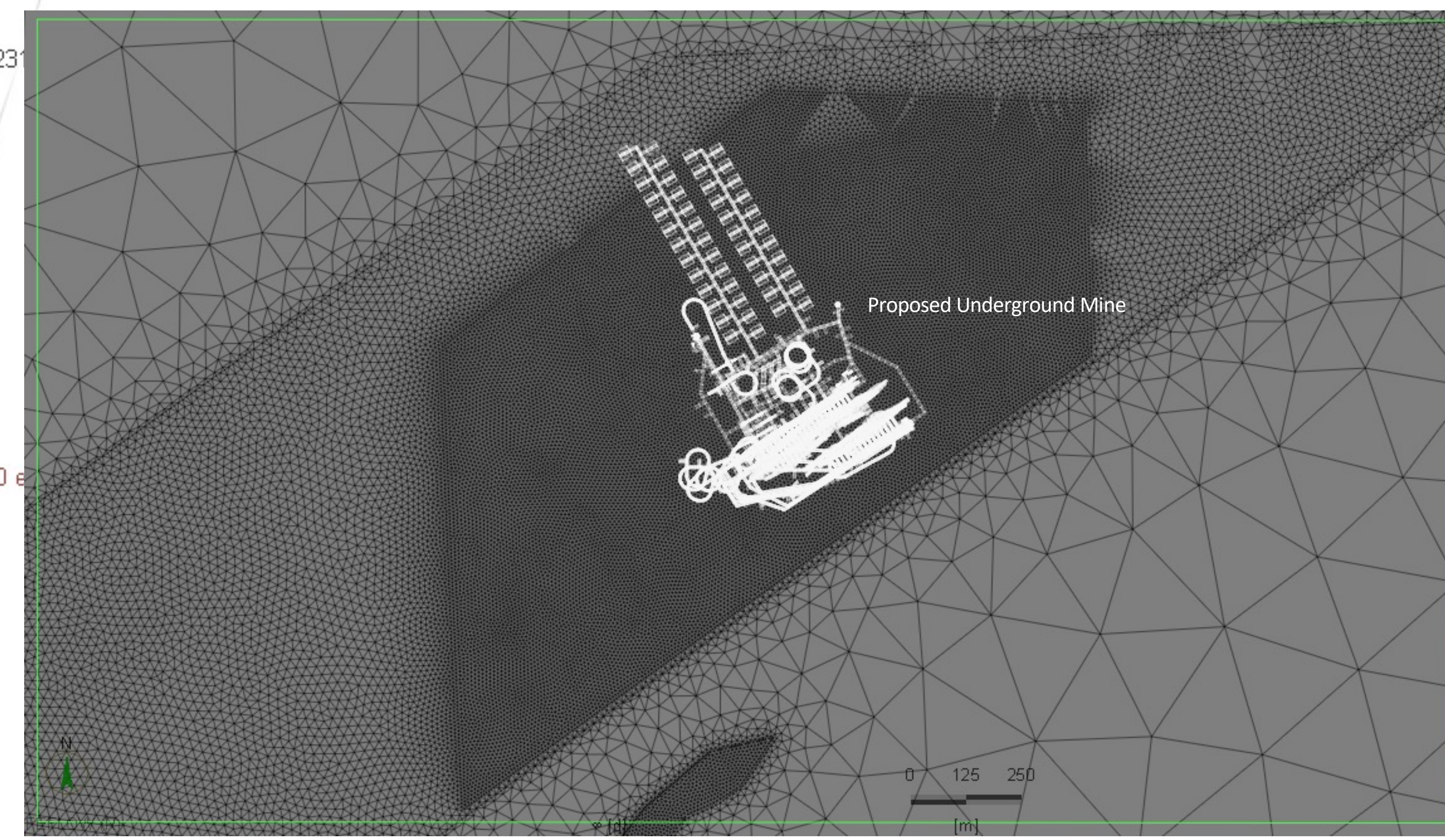
SRK (SRK Consulting [Canada] Inc.). 2019. Rook I Arrow Deposit Pilot Hole Characterization Field Program Final Report. Dated April 2019.

Appendix A Figures

3D Mesh



Mine Area Inset – Looking Down at Top of Model



NOTES

CLIENT

NexGen Energy Ltd.

CONSULTANT

wsp

YYYY-MM-DD	2021-06-28
PREPARED	GI
DESIGN	GI
REVIEW	NB
APPROVED	MT

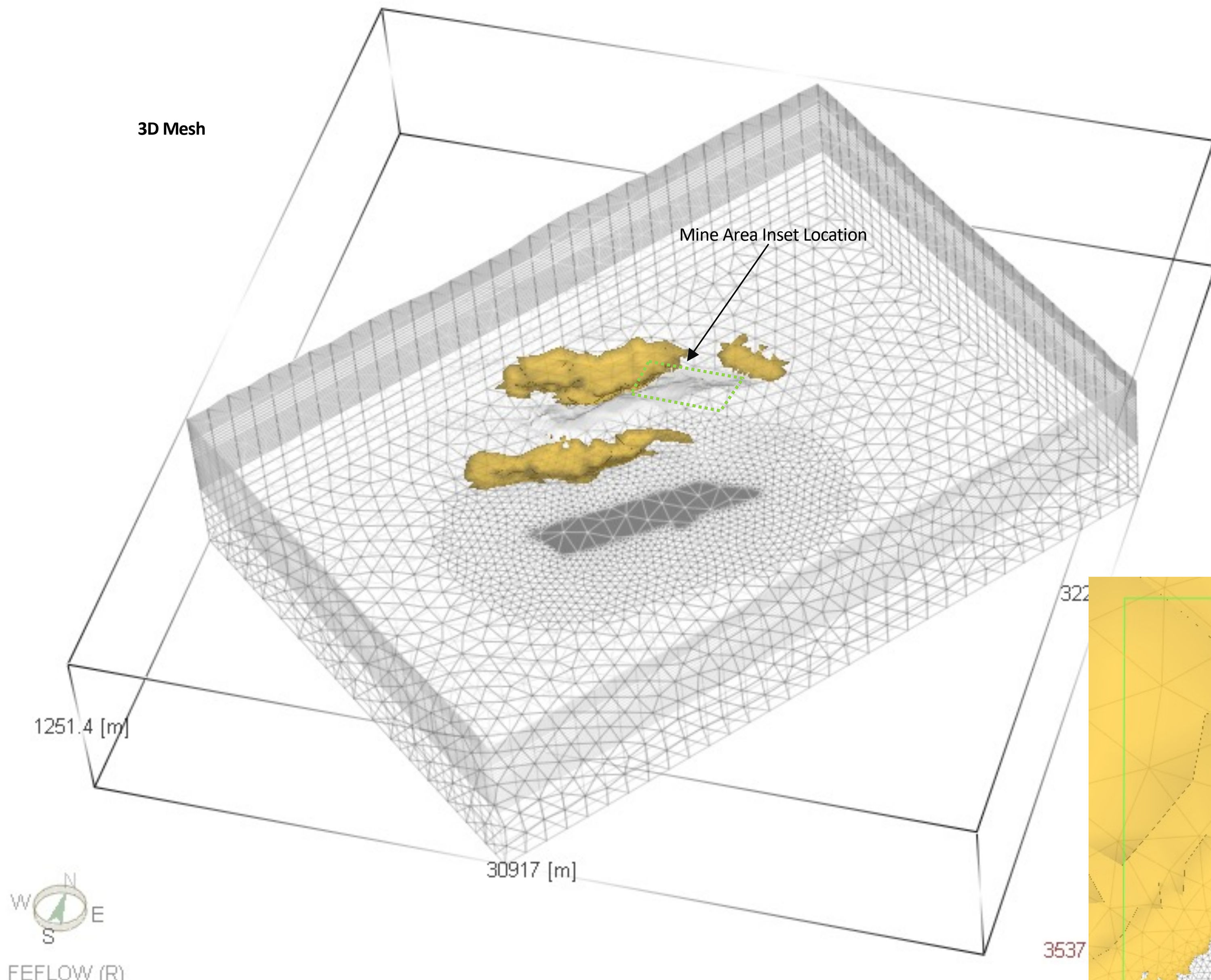
PROJECT

NEXGEN ENERGY LTD.
ROOK I PROJECT

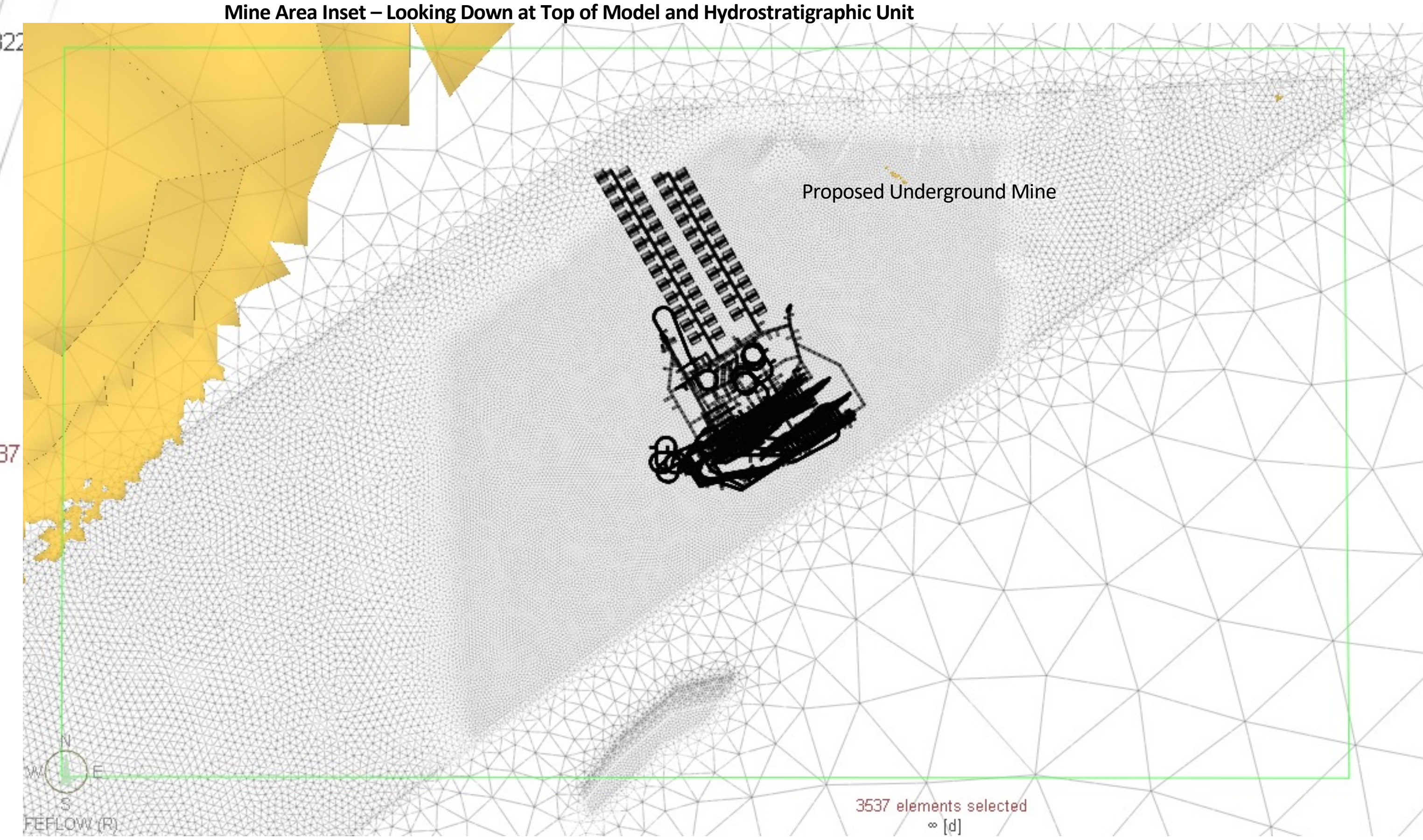
TITLE

MODEL DOMAIN AND FINITE ELEMENT MESH

PROJECT No.	PHASE	Rev.	FIGURE
20144150	3104	B	1



Mine Area Inset – Looking Down at Top of Model and Hydrostratigraphic Unit



LEGEND

- 3D Extent of Lake Unit

NOTES

CLIENT
NexGen Energy Ltd.

CONSULTANT
wsp

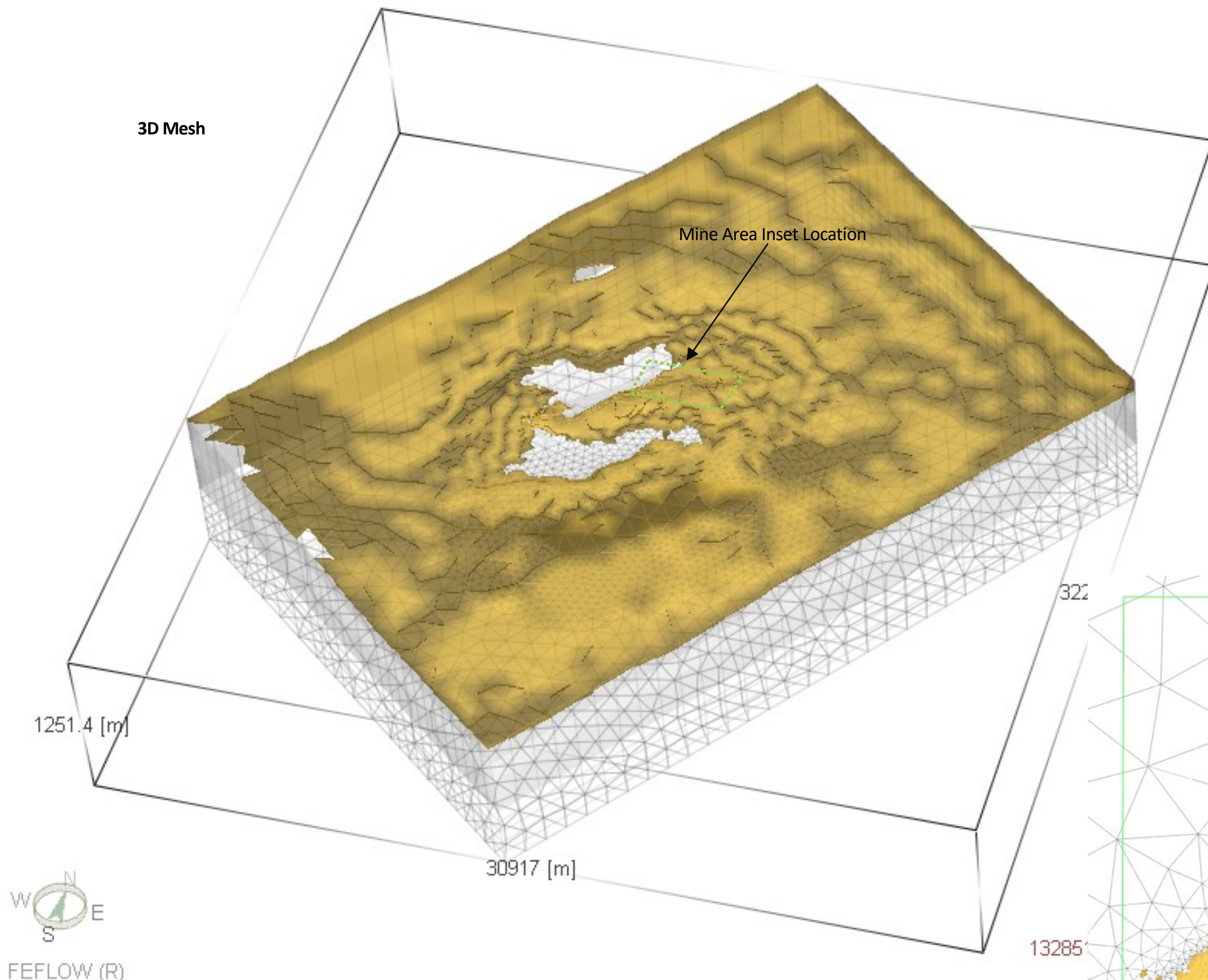
YYYY-MM-DD	2021-06-28
PREPARED	GI
DESIGN	GI
REVIEW	NB
APPROVED	MT

PROJECT
NEXGEN ENERGY LTD.
ROOK I PROJECT

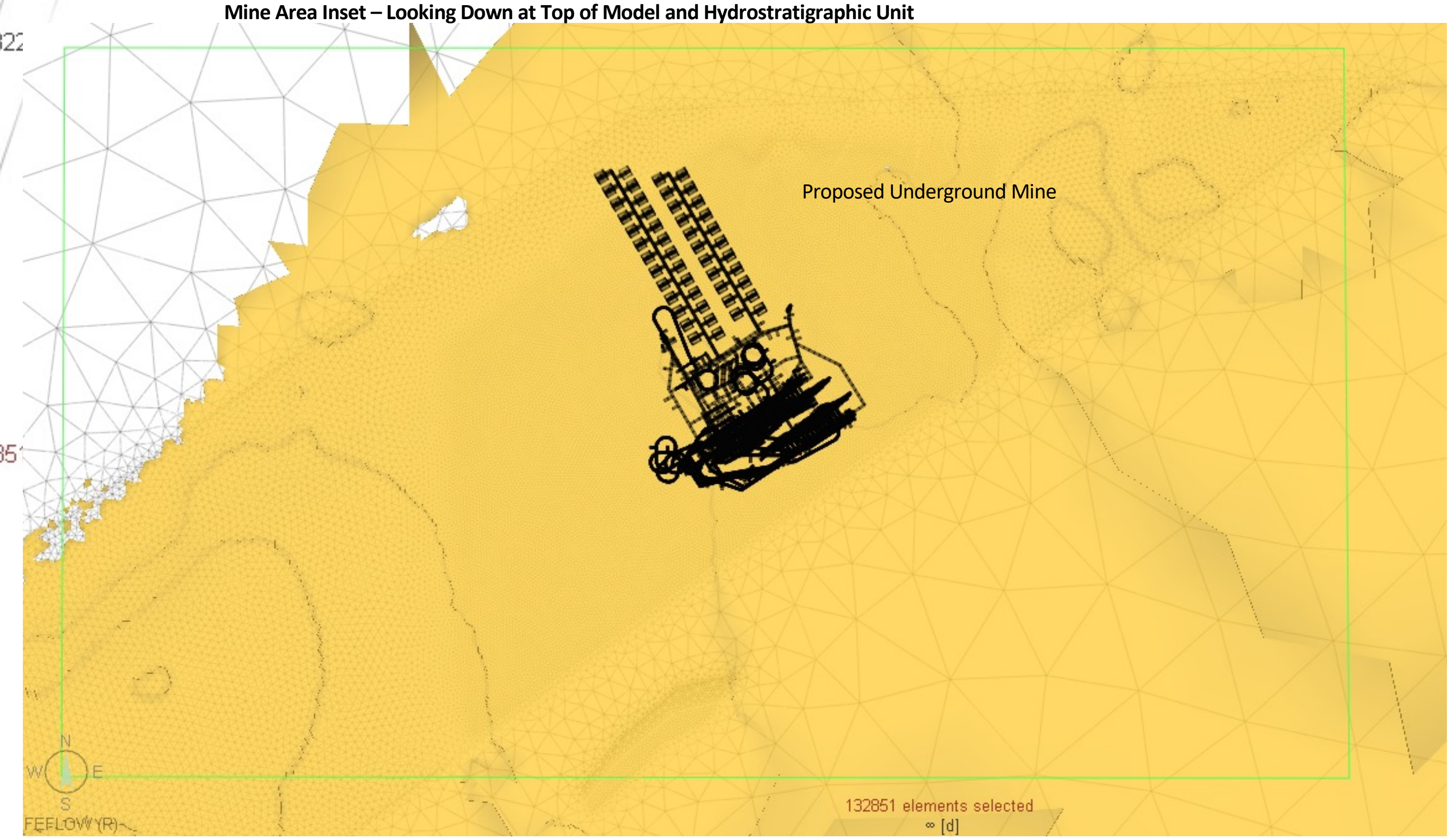
TITLE
LAKE UNIT EXTENTS
FINITE ELEMENT MESH

PROJECT No.	PHASE	Rev.	FIGURE
20144150	3104	B	2

3D Mesh



Mine Area Inset – Looking Down at Top of Model and Hydrostratigraphic Unit



LEGEND

3D Extent of Upper Overburden Unit

NOTES

CLIENT

NexGen Energy Ltd.

CONSULTANT

wsp

YYYY-MM-DD	2021-06-28
PREPARED	GI
DESIGN	GI
REVIEW	NB
APPROVED	MT

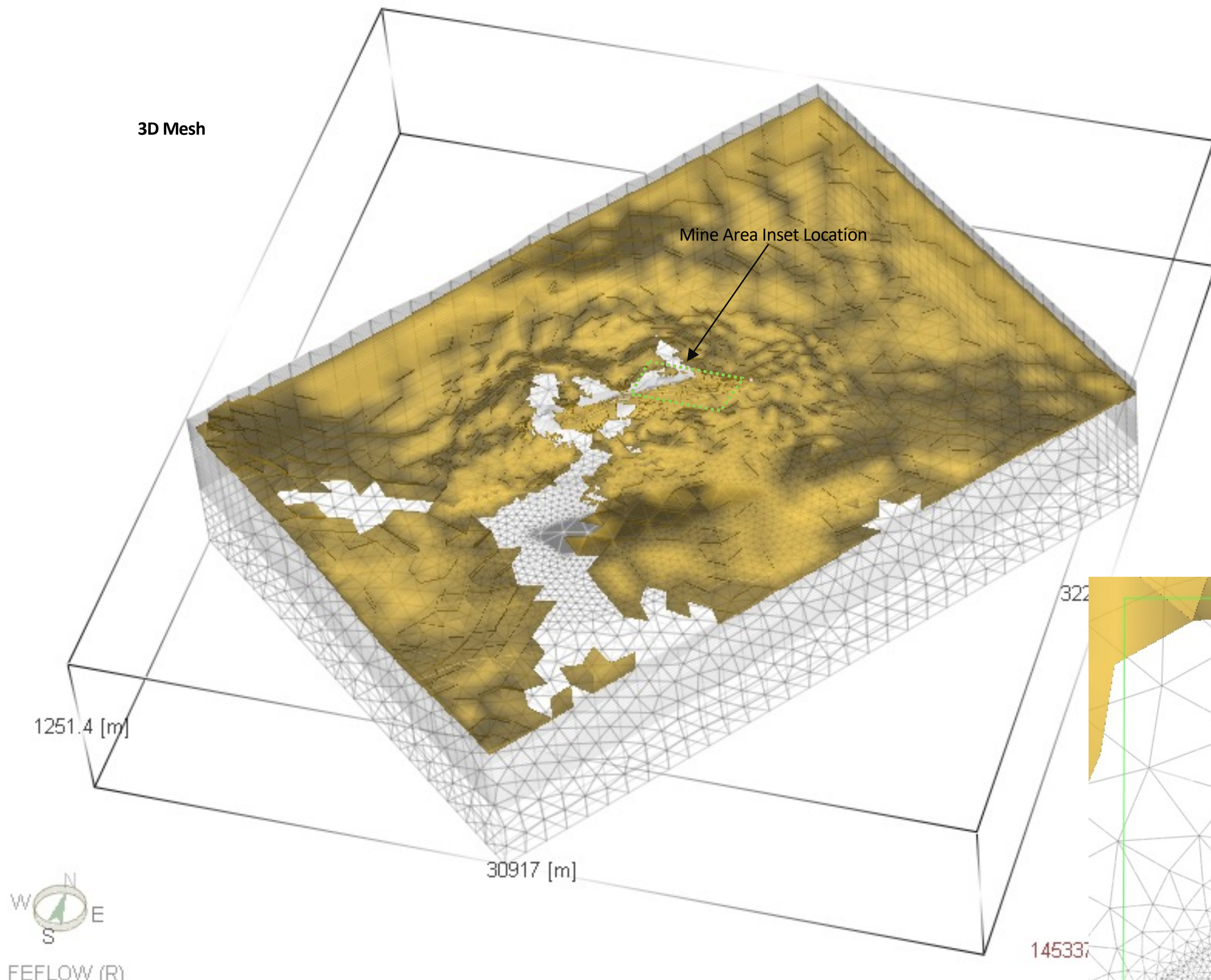
PROJECT

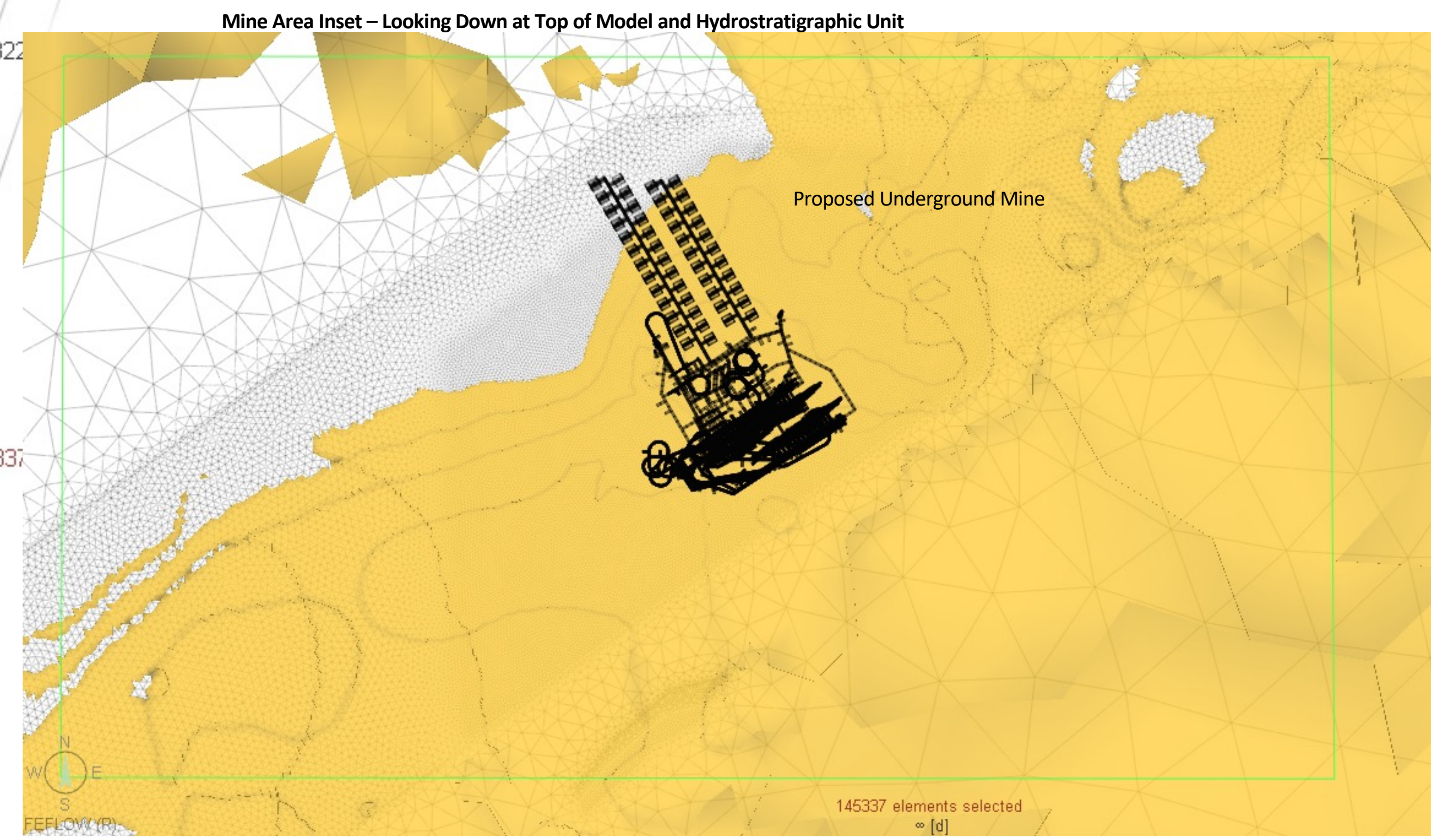
NEXGEN ENERGY LTD.
ROOK I PROJECT

TITLE

UPPER OVERBURDEN EXTENT
FINITE ELEMENT MESH

PROJECT No.	PHASE	Rev.	FIGURE
20144150	3104	B	3





LEGEND

3D Extent of Lower Overburden (Till) Unit

NOTES

CLIENT

NexGen Energy Ltd.

CONSULTANT

wsp

YYYY-MM-DD	2021-06-28
PREPARED	GI
DESIGN	GI
REVIEW	NB
APPROVED	MT

PROJECT

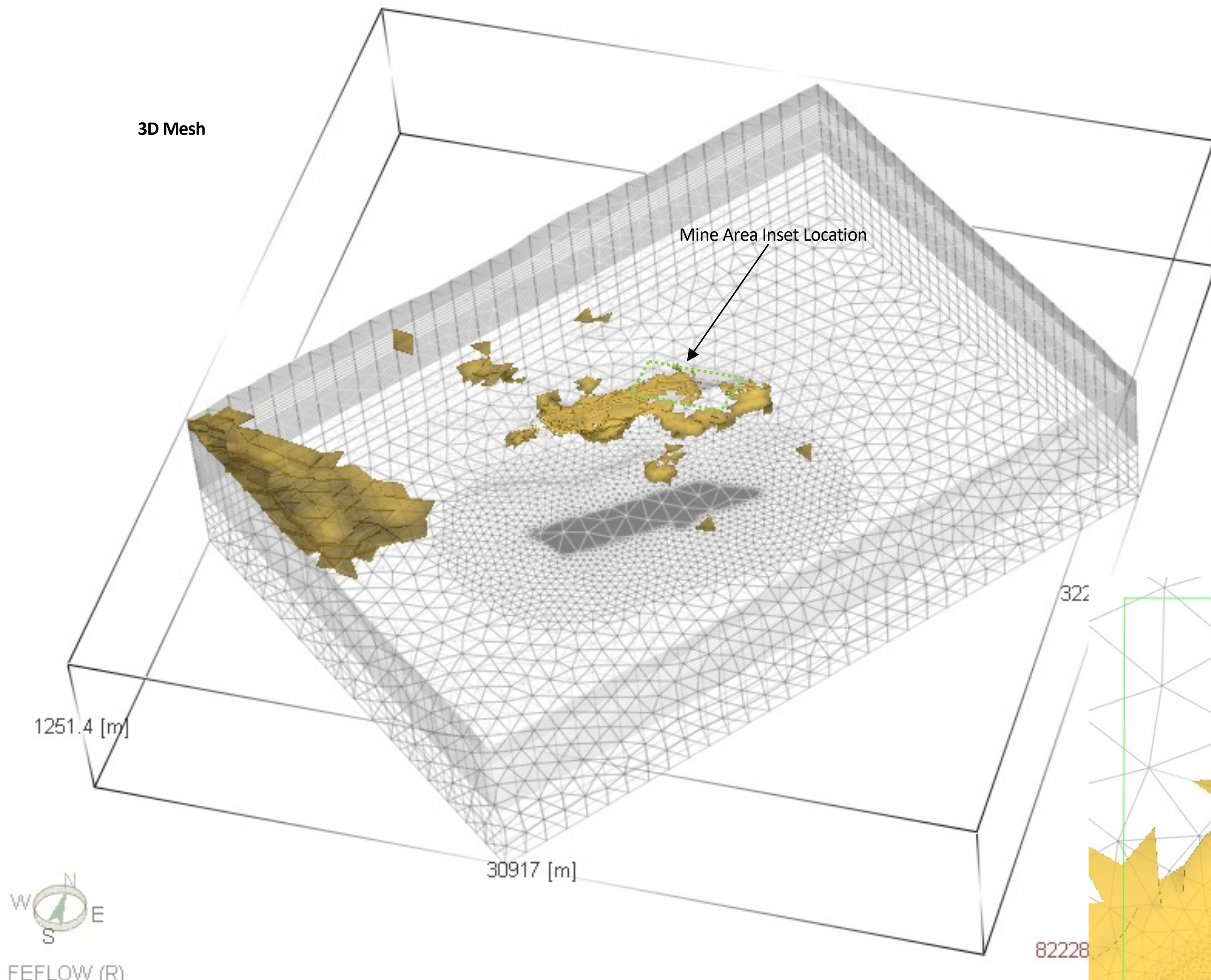
NEXGEN ENERGY LTD.
ROOK I PROJECT

TITLE

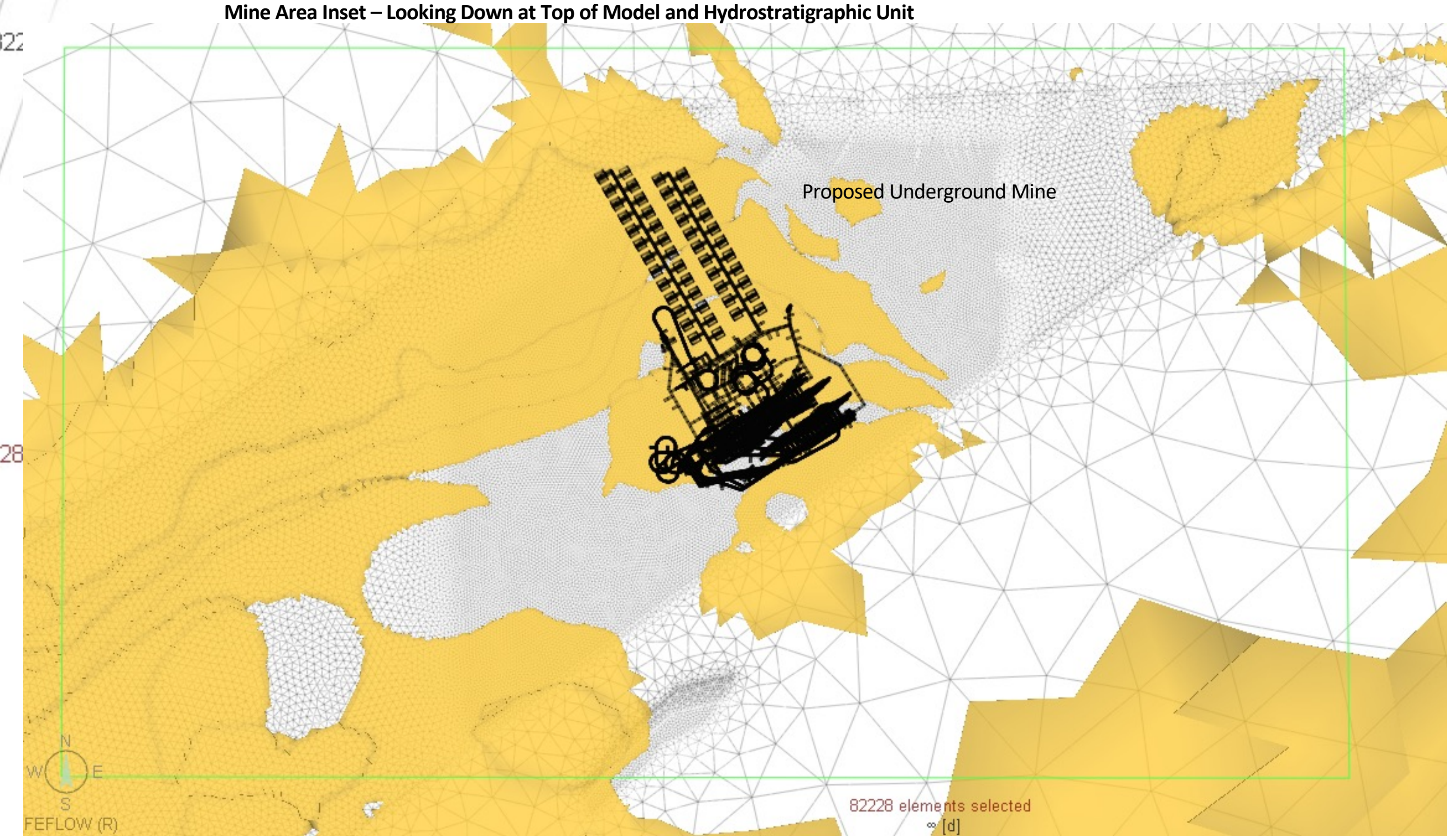
LOWER OVERBURDEN (TILL) EXTENT
FINITE ELEMENT MESH

PROJECT No.	PHASE	Rev.	FIGURE
20144150	3104	B	4

3D Mesh



Mine Area Inset – Looking Down at Top of Model and Hydrostratigraphic Unit



LEGEND

3D Extent of Cretaceous Bedrock Unit

NOTES

CLIENT
NexGen Energy Ltd.

CONSULTANT
wsp

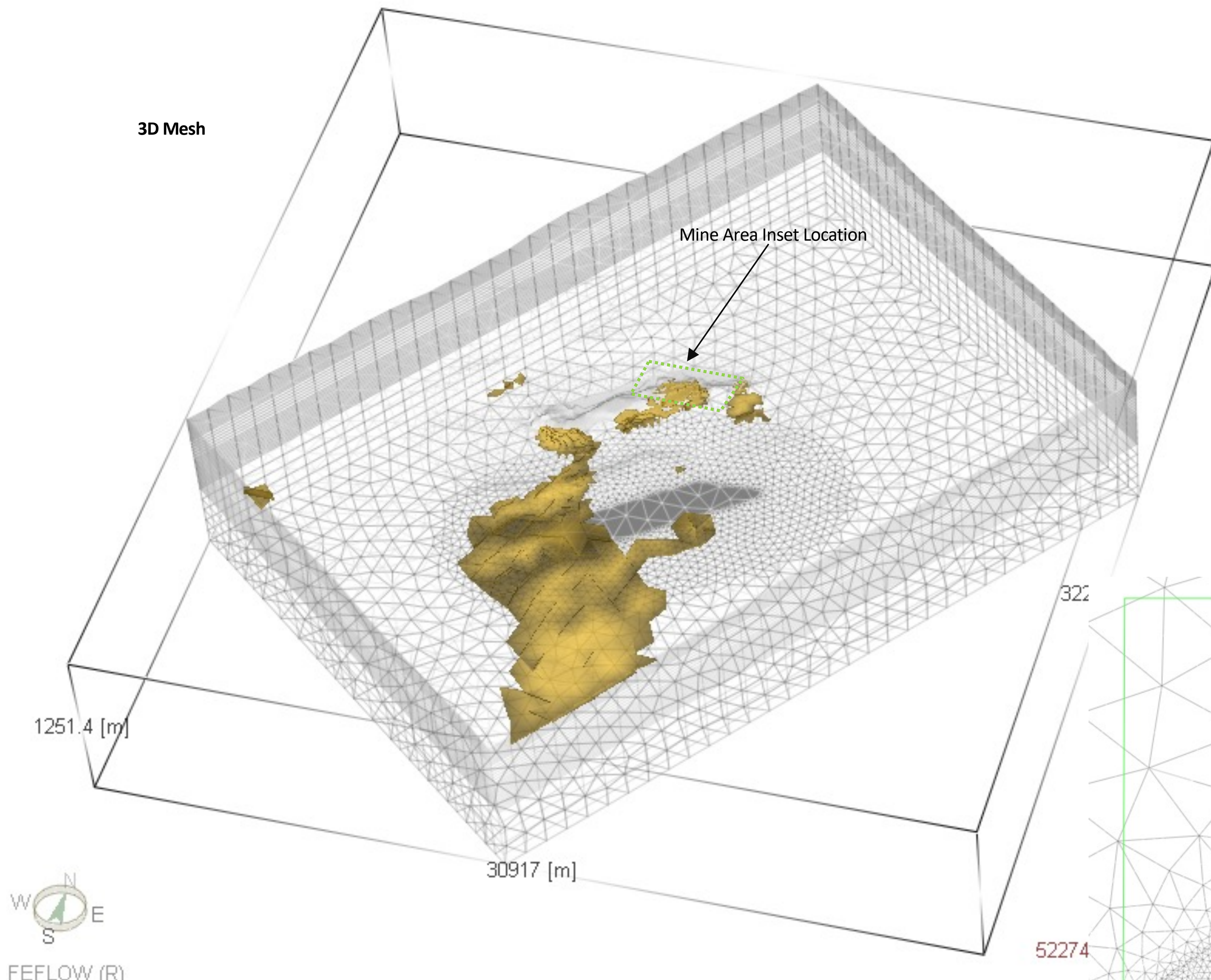
YYYY-MM-DD	2021-06-28
PREPARED	GI
DESIGN	GI
REVIEW	NB
APPROVED	MT

PROJECT
NEXGEN ENERGY LTD.
ROOK I PROJECT

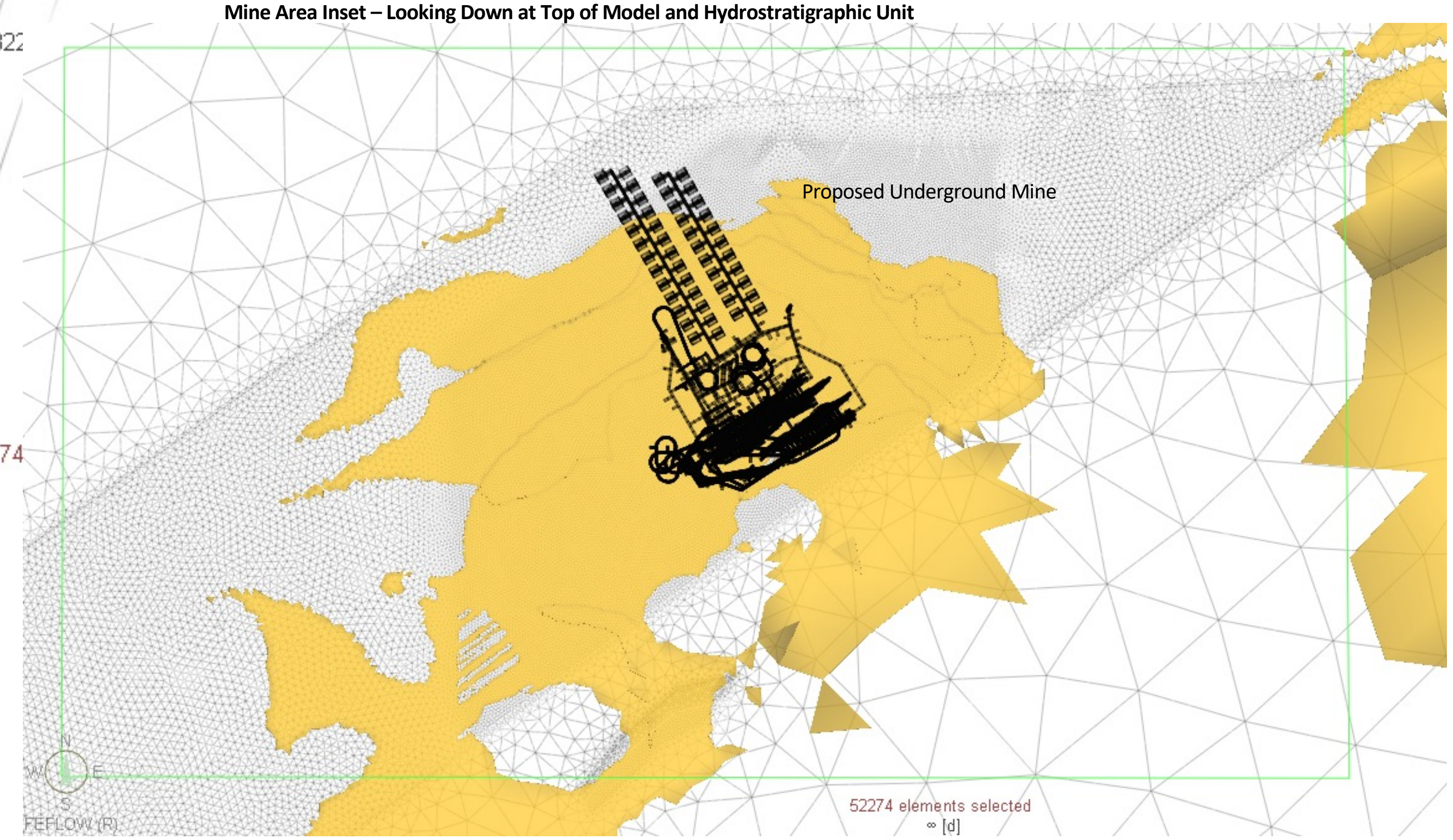
TITLE
CRETACEOUS BEDROCK EXTENT
FINITE ELEMENT MESH

PROJECT No.	PHASE	Rev.	FIGURE
20144150	3104	B	5

3D Mesh



Mine Area Inset – Looking Down at Top of Model and Hydrostratigraphic Unit



LEGEND

3D Extent of Devonian Bedrock Unit

NOTES

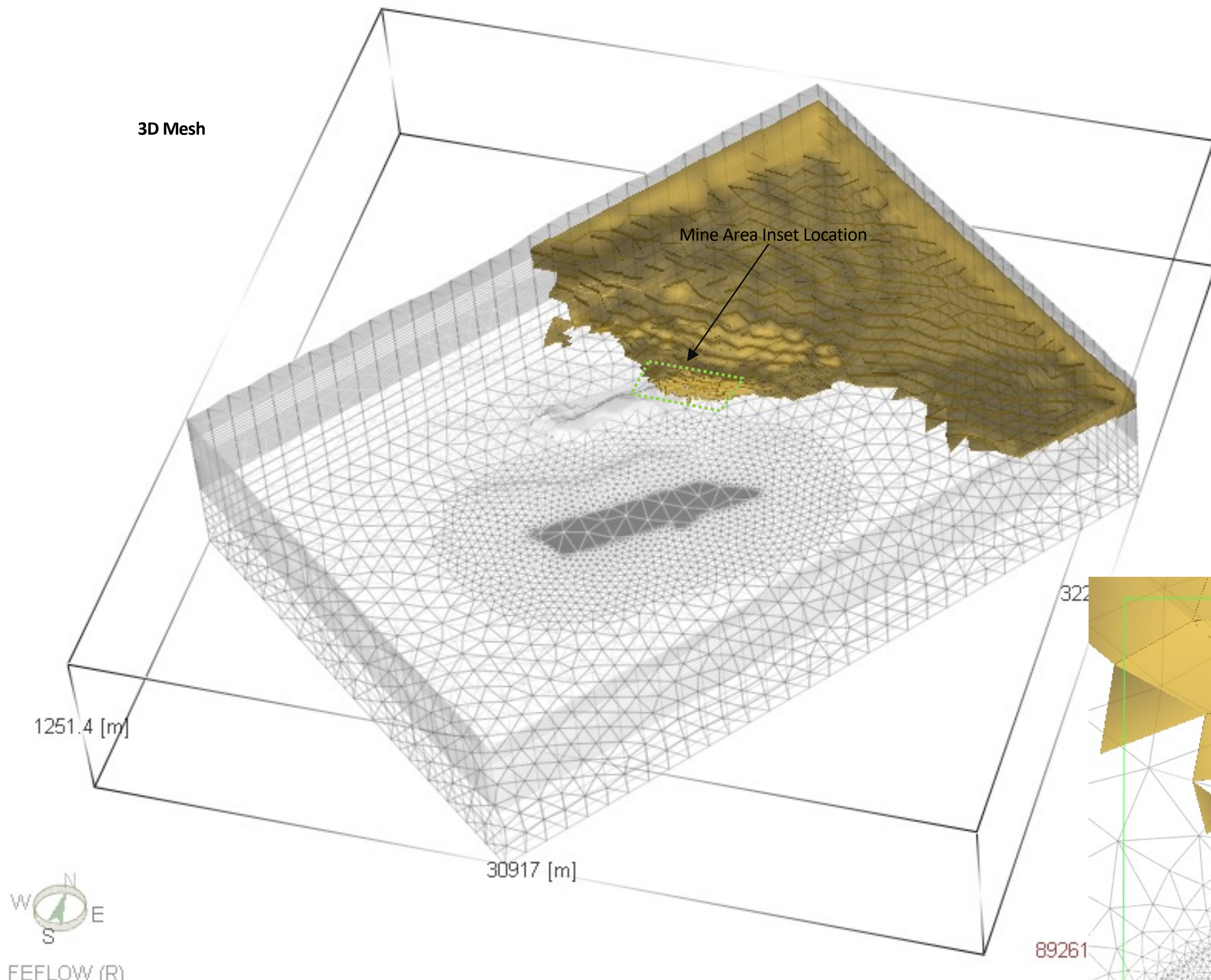
CLIENT	NexGen Energy Ltd.
CONSULTANT	wsp
YYYY-MM-DD	2021-06-28
PREPARED	GI
DESIGN	GI
REVIEW	NB
APPROVED	MT

PROJECT
NEXGEN ENERGY LTD.
ROOK I PROJECT

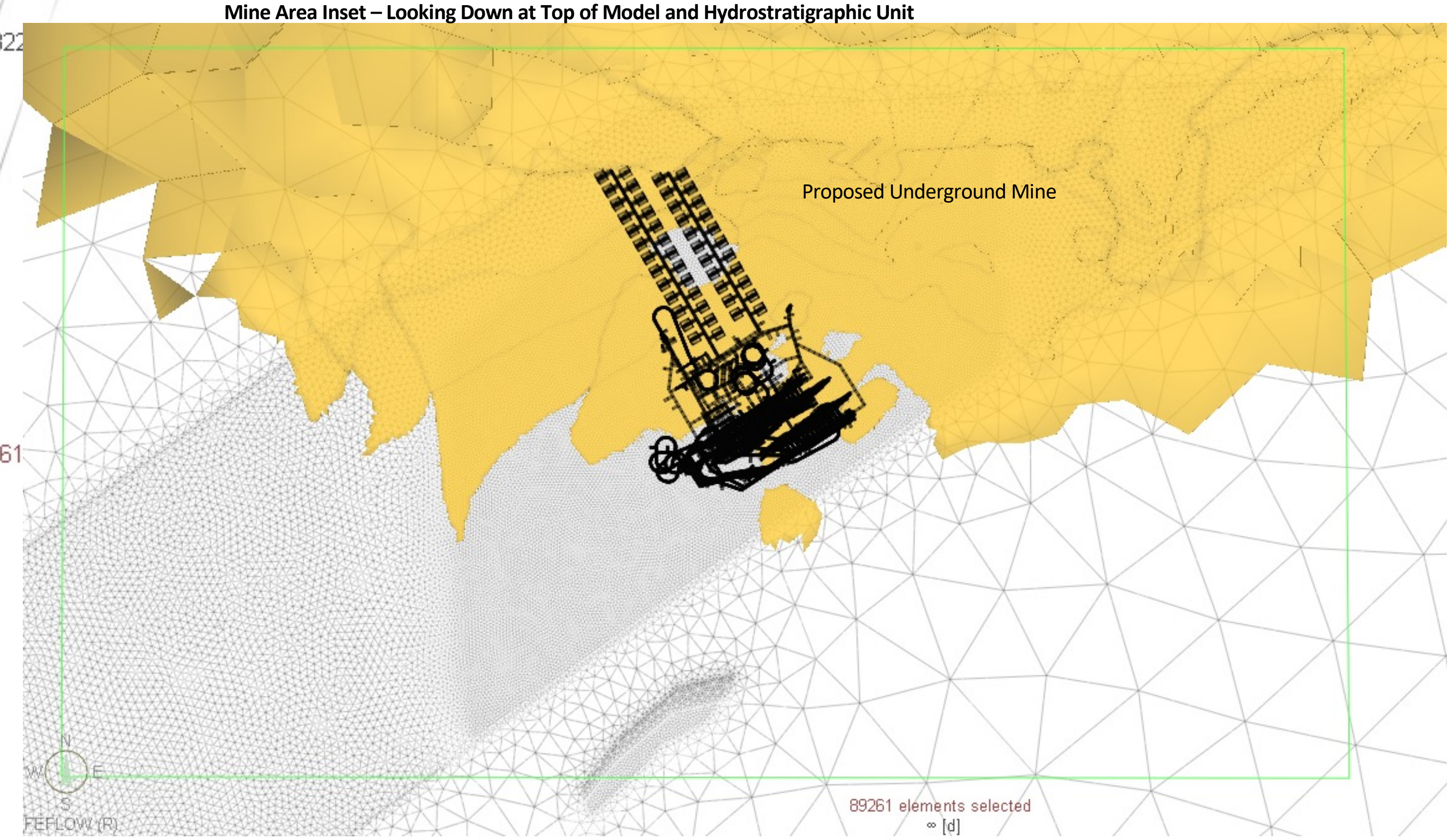
TITLE
DEVONIAN BEDROCK EXTENT
FINITE ELEMENT MESH

PROJECT No.	PHASE	Rev.	FIGURE
20144150	3104	B	6

3D Mesh



Mine Area Inset – Looking Down at Top of Model and Hydrostratigraphic Unit



LEGEND

3D Extent of Sandstone Bedrock Unit

NOTES

CLIENT

NexGen Energy Ltd.

CONSULTANT

wsp

YYYY-MM-DD	2021-06-28
PREPARED	GI
DESIGN	GI
REVIEW	NB
APPROVED	MT

PROJECT

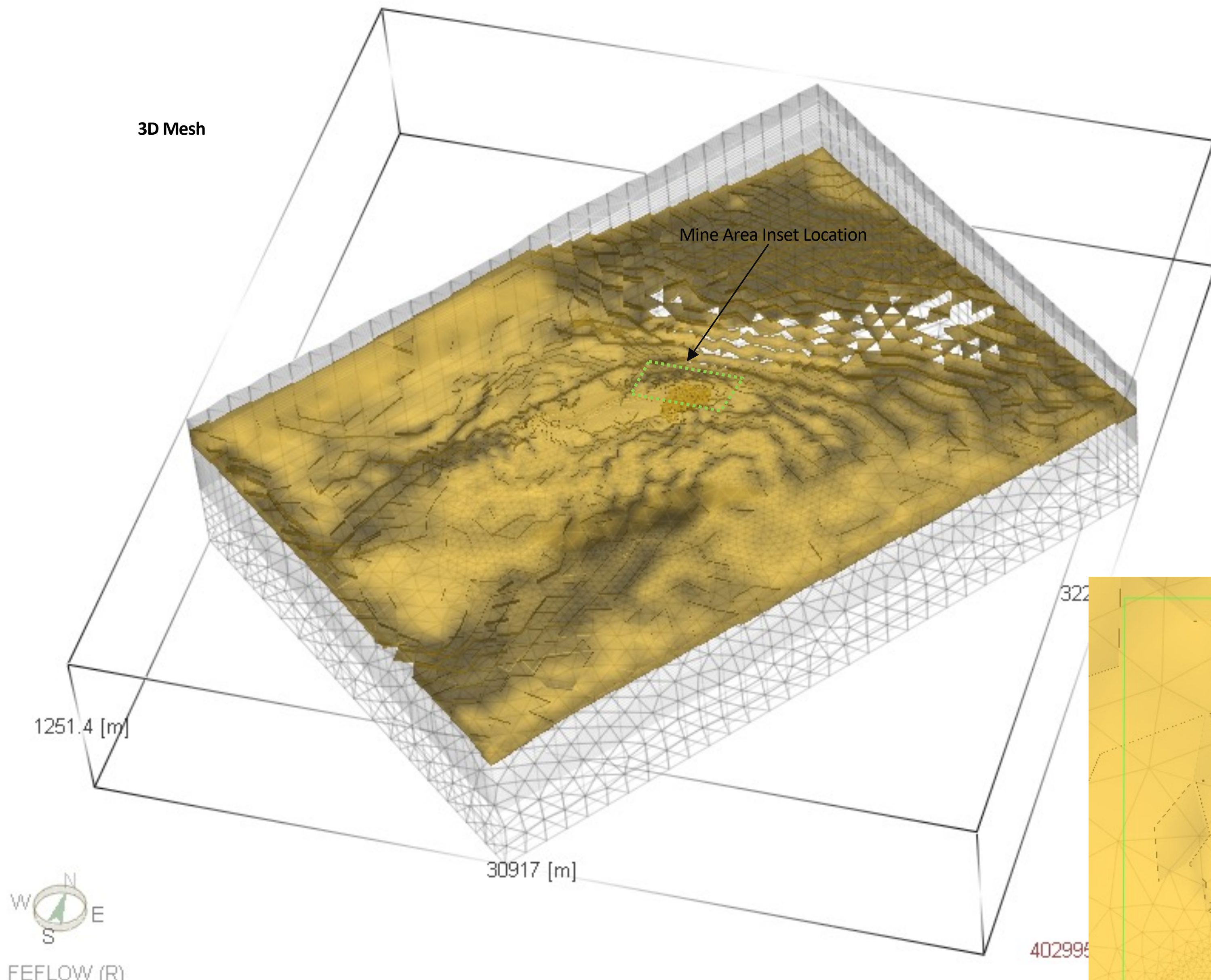
NEXGEN ENERGY LTD.
ROOK I PROJECT

TITLE

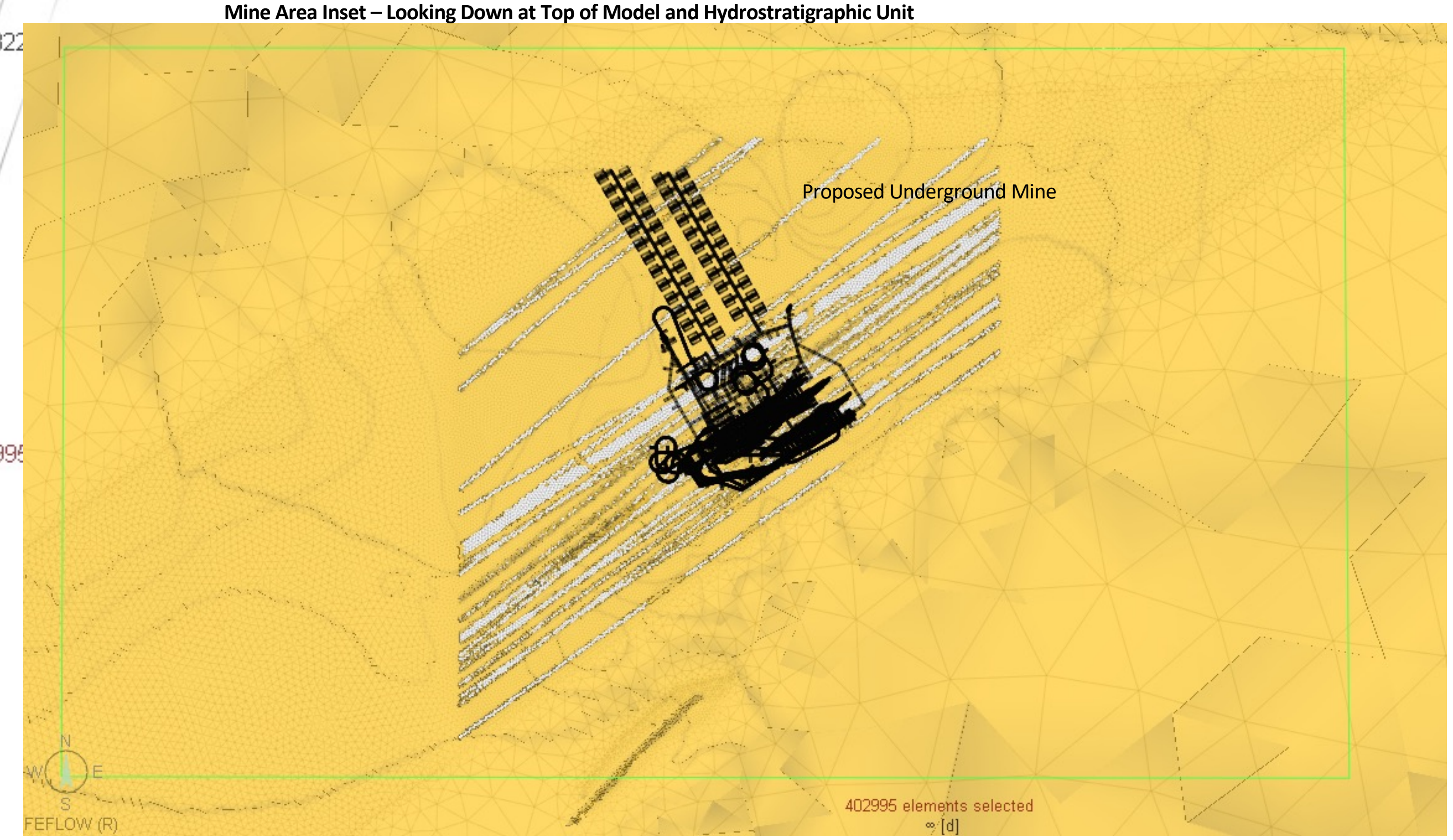
SANDSTONE BEDROCK EXTENT
FINITE ELEMENT MESH

PROJECT No.	PHASE	Rev.	FIGURE
20144150	3104	B	7

3D Mesh



Mine Area Inset – Looking Down at Top of Model and Hydrostratigraphic Unit



LEGEND

3D Extent of Paleoweathered Basement Bedrock Unit

NOTES

CLIENT

NexGen Energy Ltd.

CONSULTANT

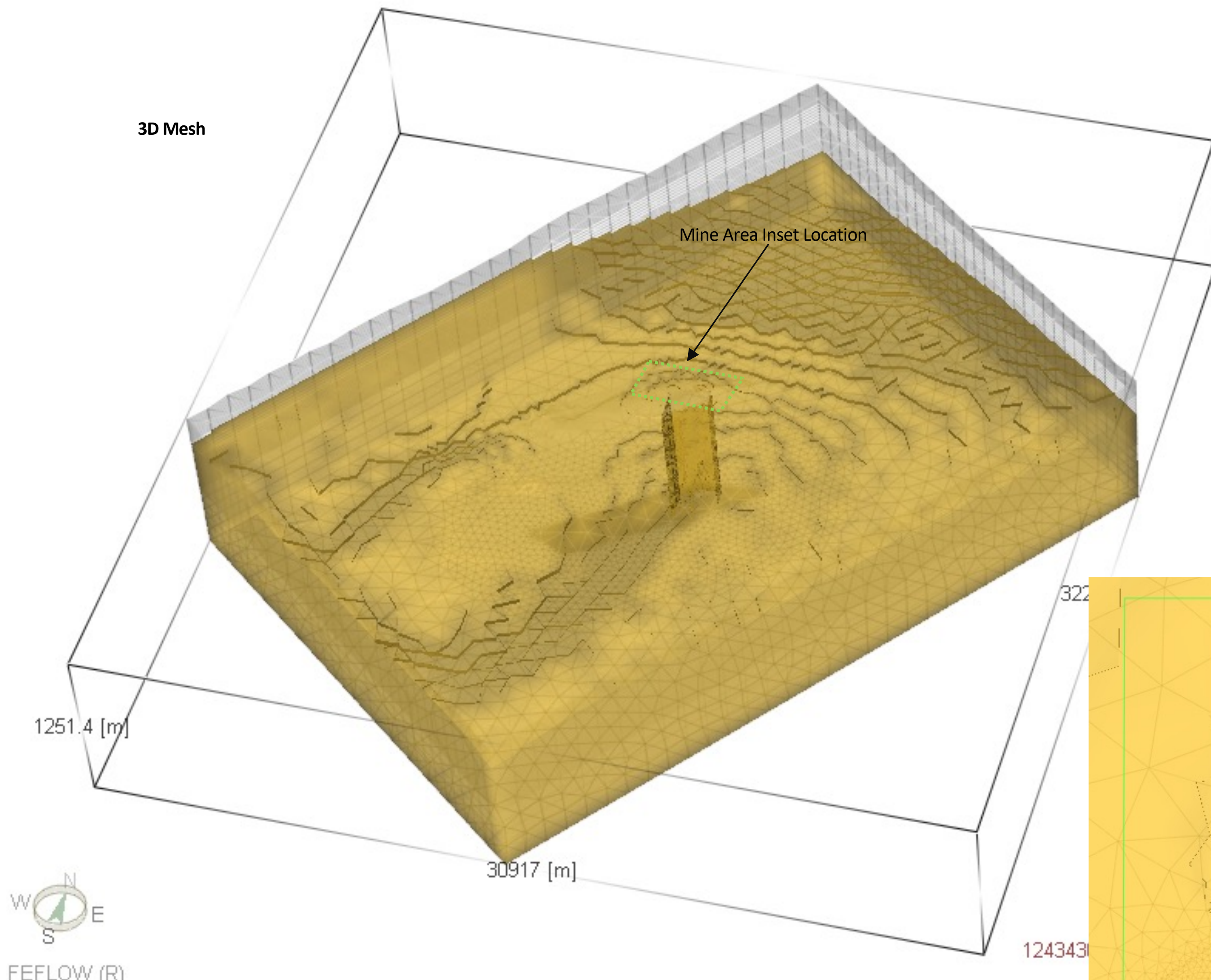
wsp

YYYY-MM-DD	2021-06-28
PREPARED	GI
DESIGN	GI
REVIEW	NB
APPROVED	MT

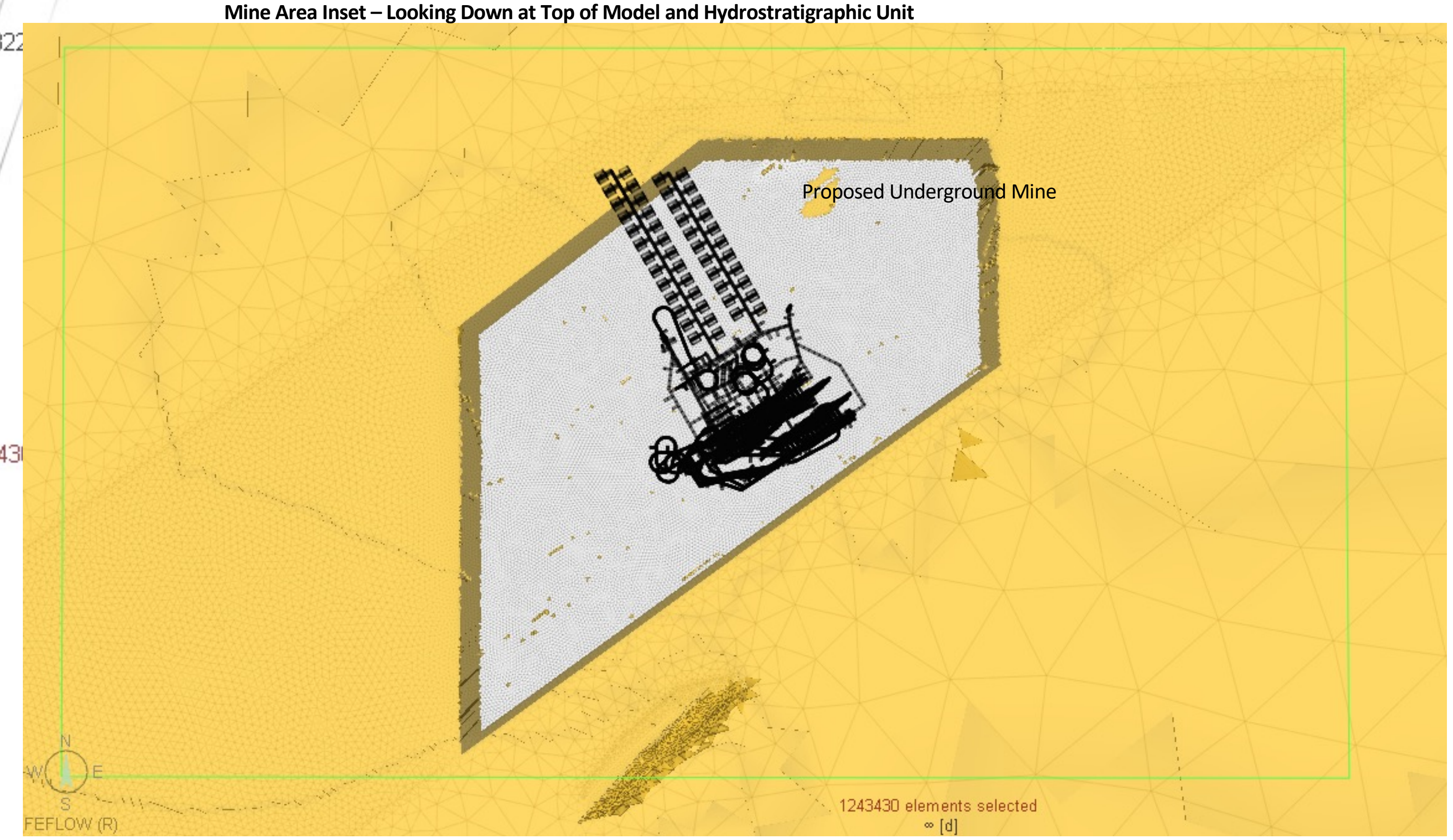
PROJECT
NEXGEN ENERGY LTD.
ROOK I PROJECT

TITLE
PALEOWEATHERED BASEMENT BEDROCK EXTENT
FINITE ELEMENT MESH

PROJECT No.	PHASE	Rev.	FIGURE
20144150	3104	B	8



Mine Area Inset – Looking Down at Top of Model and Hydrostratigraphic Unit



LEGEND

3D Extent of Basement Bedrock Unit

NOTES

CLIENT
NexGen Energy Ltd.

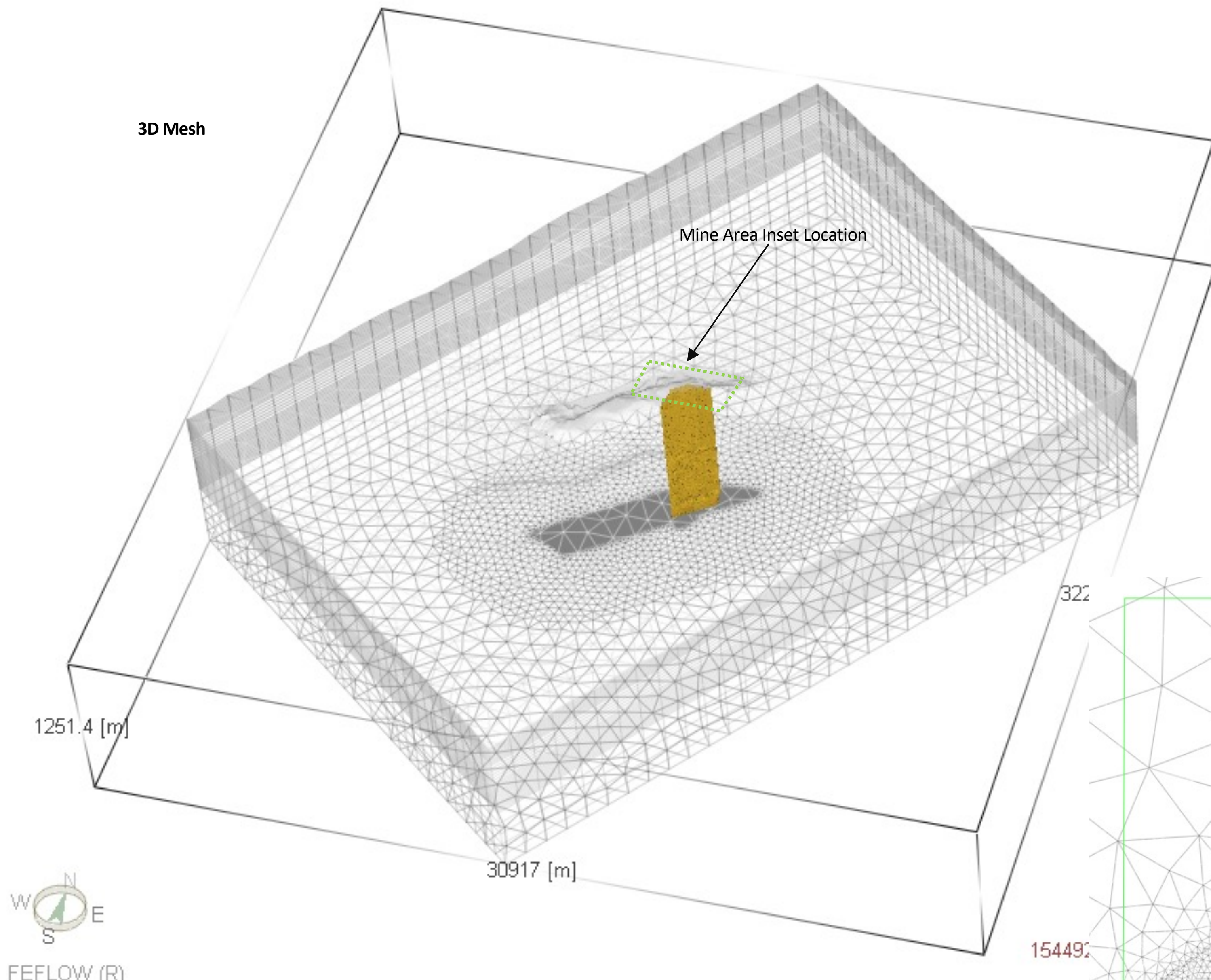
CONSULTANT
wsp

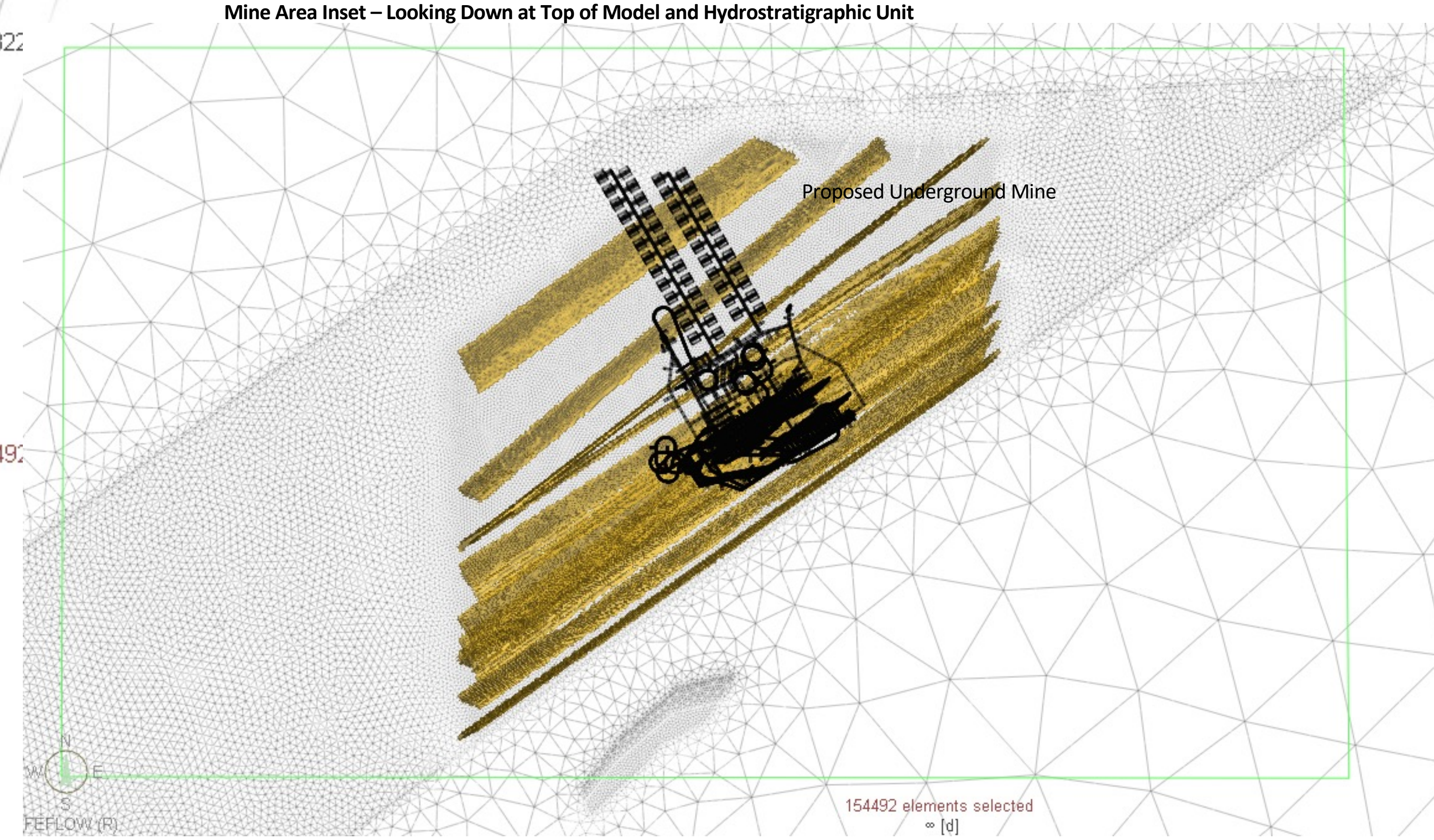
YYYY-MM-DD	2021-06-28
PREPARED	GI
DESIGN	GI
REVIEW	NB
APPROVED	MT

PROJECT
NEXGEN ENERGY LTD.
ROOK I PROJECT

TITLE
BASEMENT BEDROCK EXTENT
FINITE ELEMENT MESH

PROJECT No.	PHASE	Rev.	FIGURE
20144150	3104	B	9





LEGEND

3D Extent of Fault Zone Unit

NOTES

CLIENT
NexGen Energy Ltd.

CONSULTANT
wsp

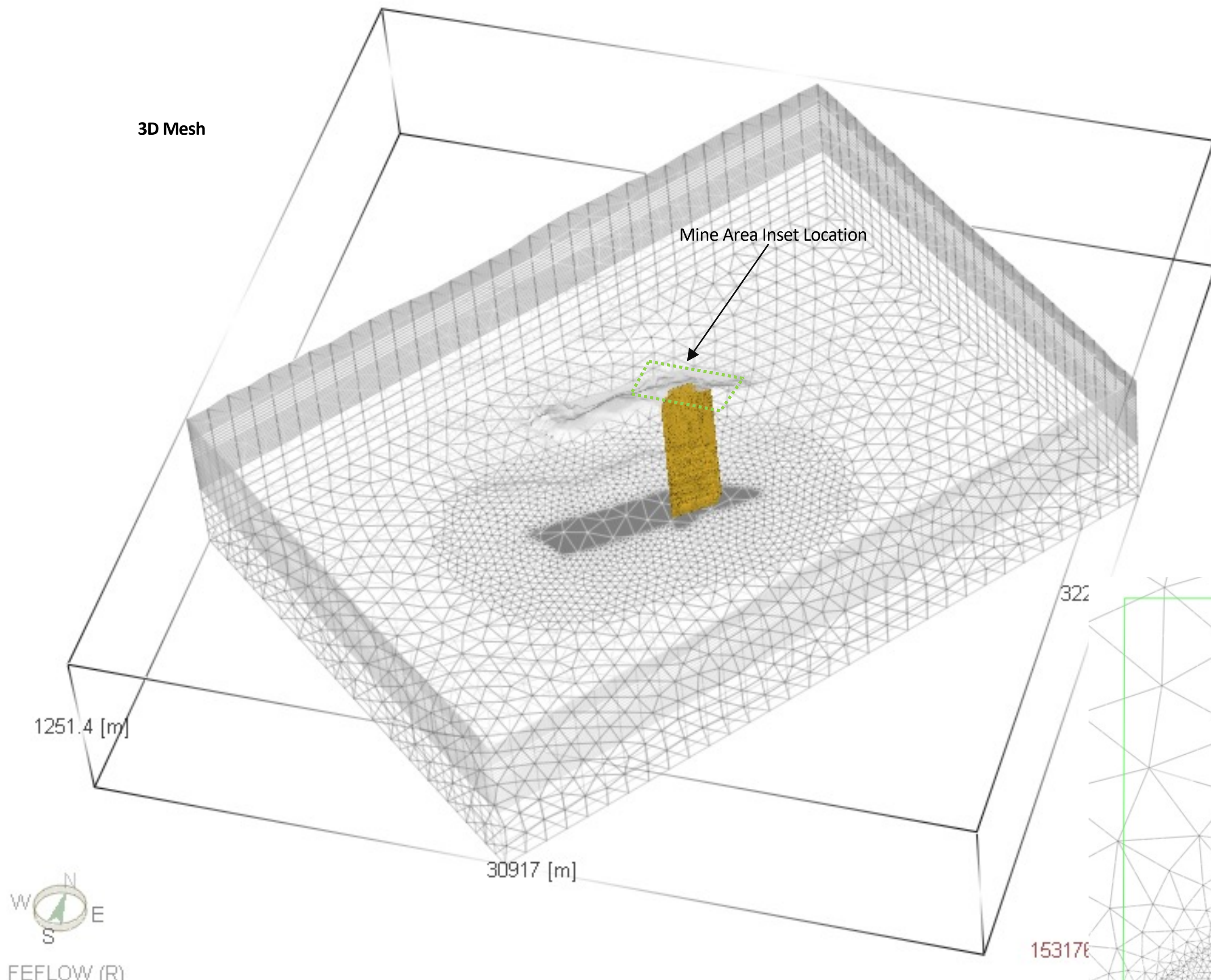
YYYY-MM-DD	2021-06-28
PREPARED	GI
DESIGN	GI
REVIEW	NB
APPROVED	MT

PROJECT
NEXGEN ENERGY LTD.
ROOK I PROJECT

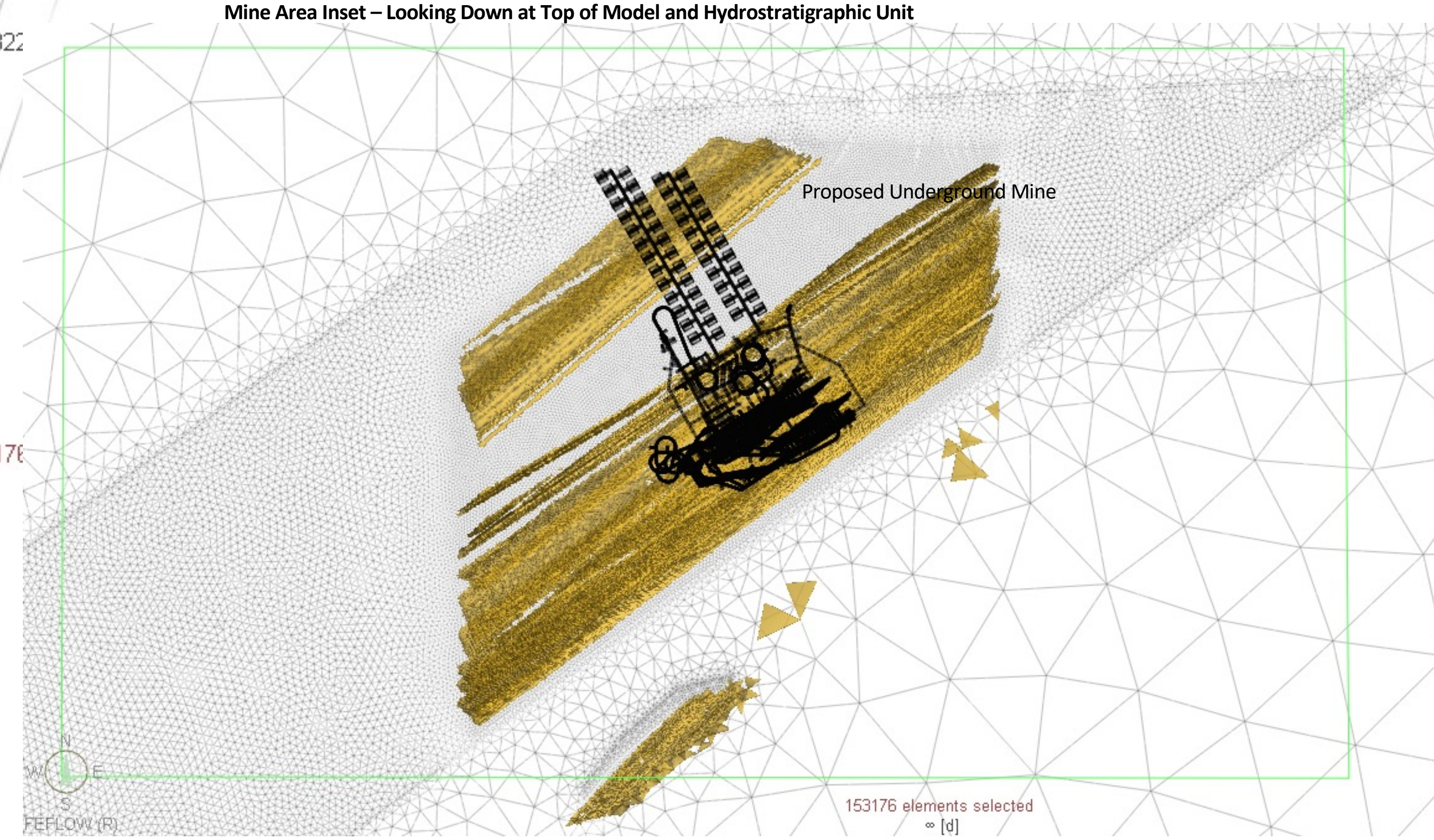
TITLE
FAULT ZONE EXTENTS
FINITE ELEMENT MESH

PROJECT No.	PHASE	Rev.	FIGURE
20144150	3104	B	10

3D Mesh



Mine Area Inset – Looking Down at Top of Model and Hydrostratigraphic Unit



LEGEND

3D Extent of Shear Zone Unit

NOTES

CLIENT

NexGen Energy Ltd.

CONSULTANT

wsp

YYYY-MM-DD	2021-06-28
PREPARED	GI
DESIGN	GI
REVIEW	NB
APPROVED	MT

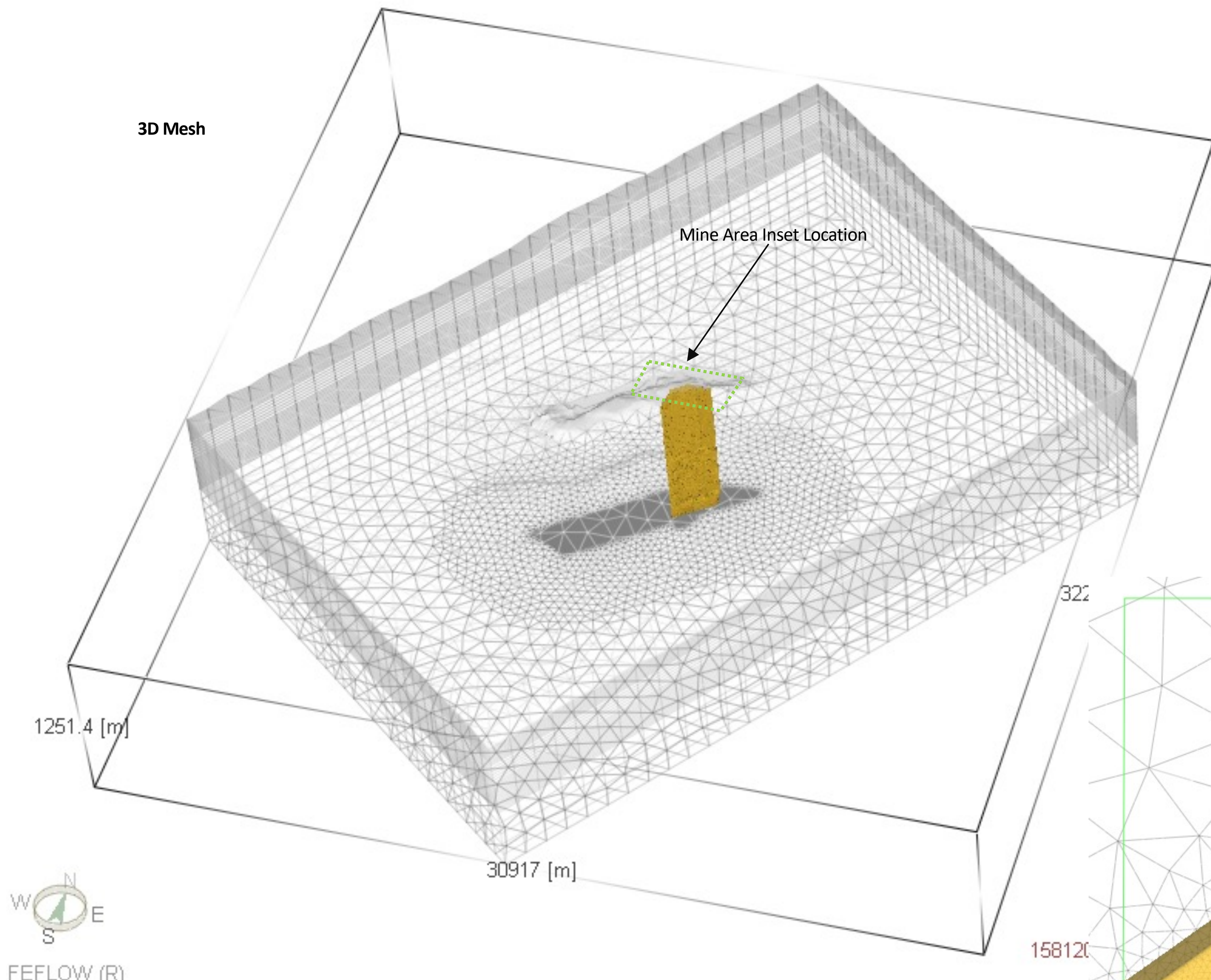
PROJECT

NEXGEN ENERGY LTD.
ROOK I PROJECT

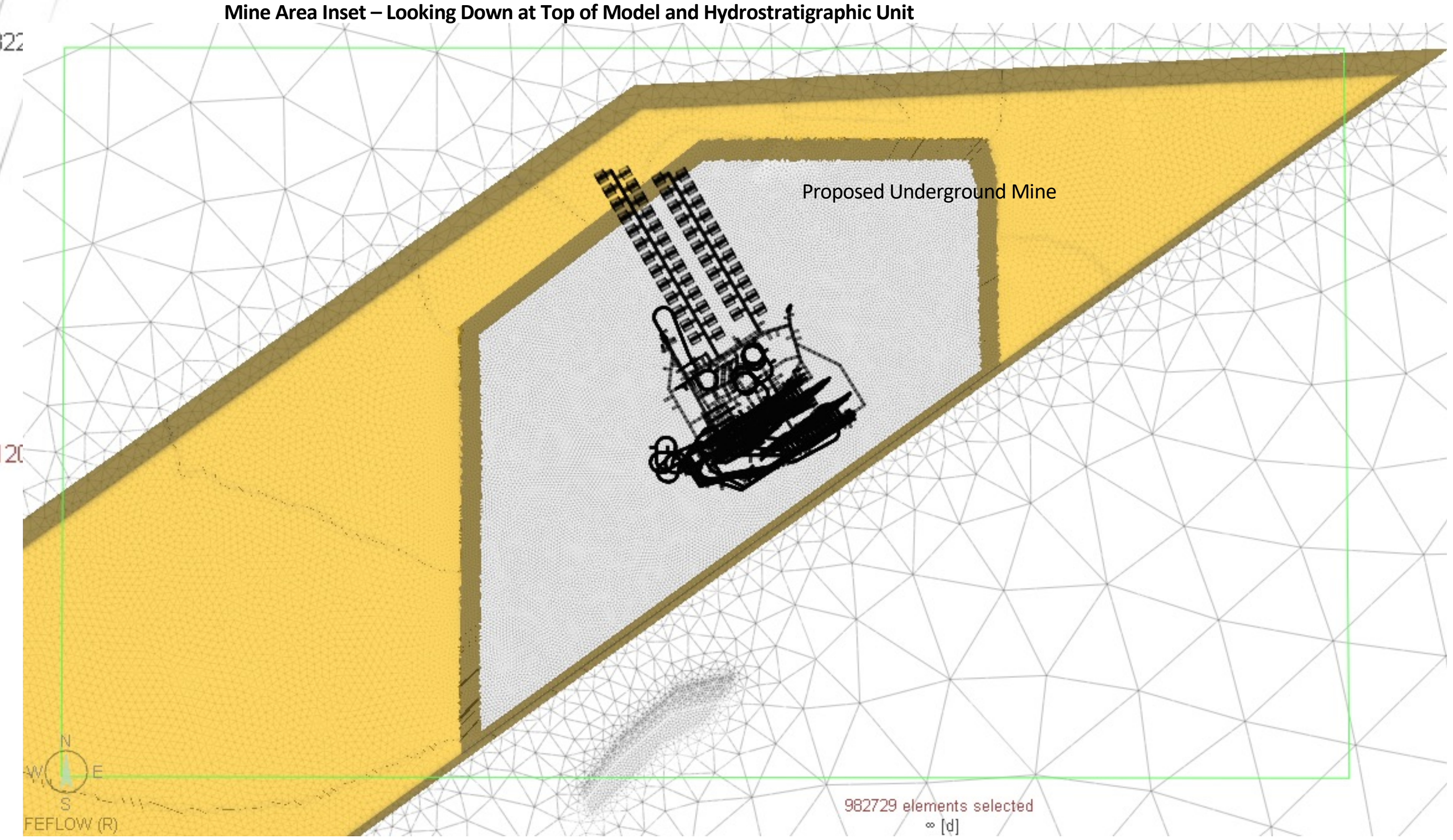
TITLE

SHEAR ZONE EXTENTS
FINITE ELEMENT MESH

PROJECT No.	PHASE	Rev.	FIGURE
20144150	3104	B	11



Mine Area Inset – Looking Down at Top of Model and Hydrostratigraphic Unit



LEGEND

3D Extent of Inferred Fault Zone Extent

NOTES

CLIENT
NexGen Energy Ltd.

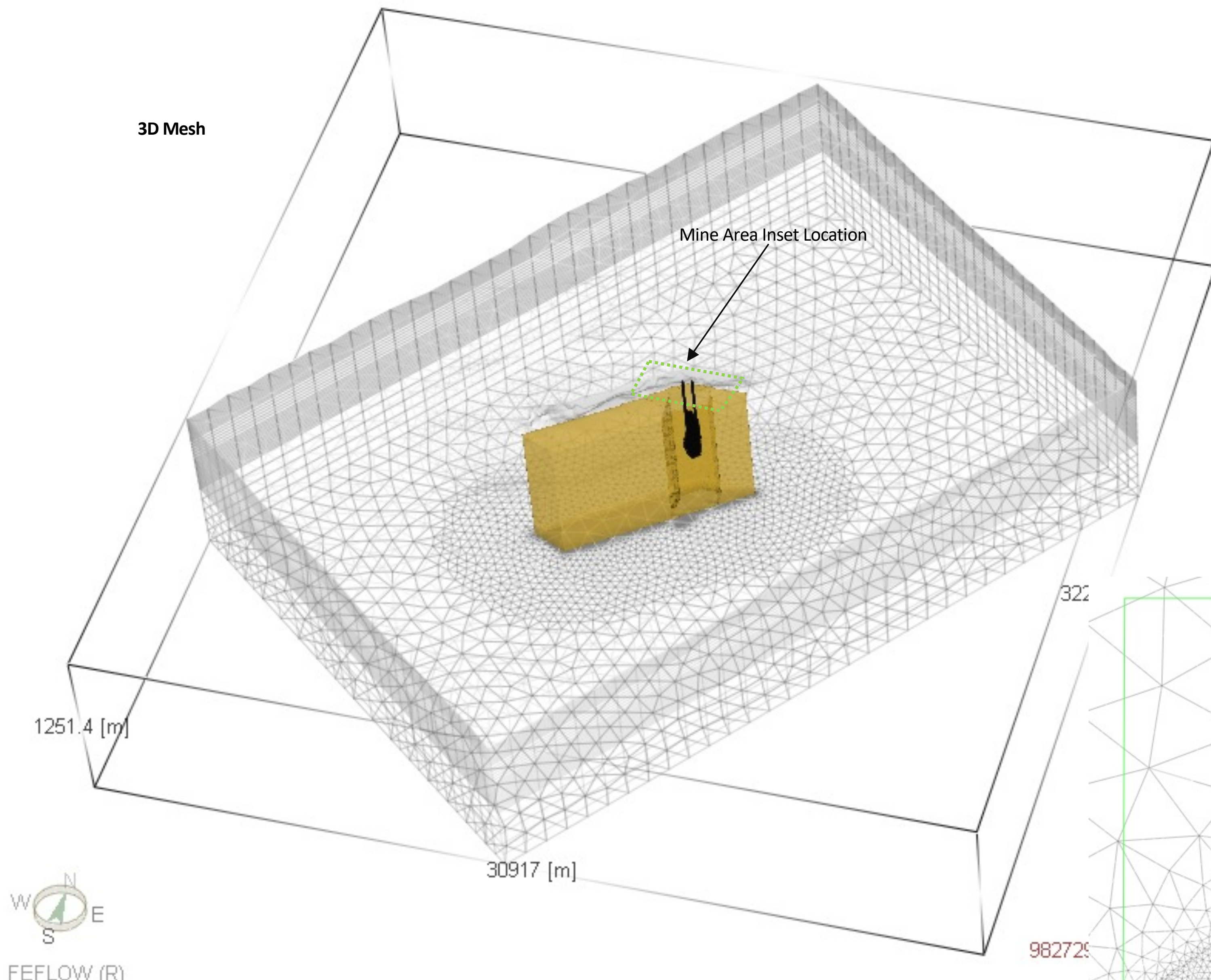
CONSULTANT
wsp

YYYY-MM-DD	2021-06-28
PREPARED	GI
DESIGN	GI
REVIEW	NB
APPROVED	MT

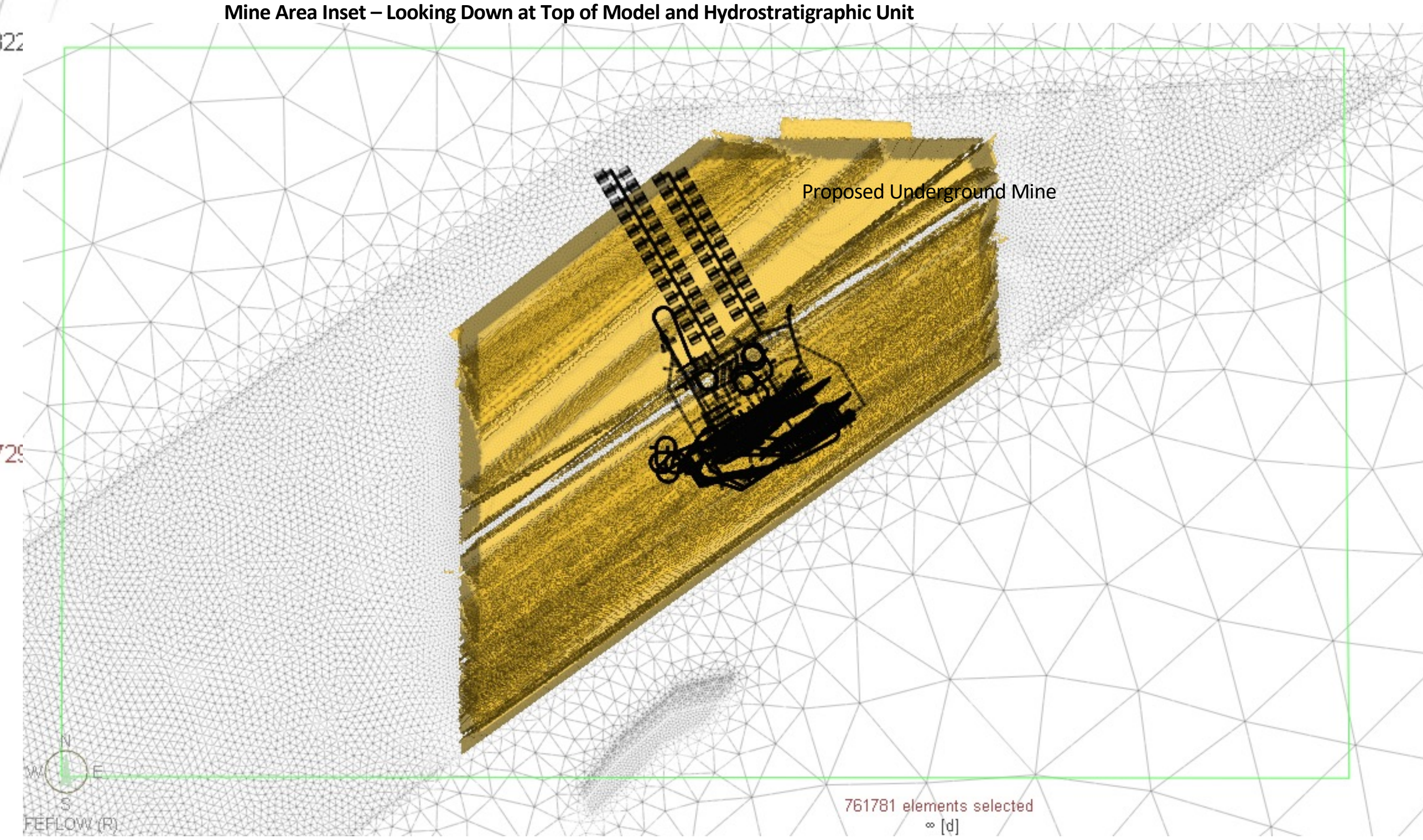
PROJECT
NEXGEN ENERGY LTD.
ROOK I PROJECT

TITLE
INFERRED FAULT ZONE EXTENT
FINITE ELEMENT MESH

PROJECT No.	PHASE	Rev.	FIGURE
20144150	3104	B	12



Mine Area Inset – Looking Down at Top of Model and Hydrostratigraphic Unit



LEGEND

3D Extent of Inner Basement Unit

NOTES

CLIENT
NexGen Energy Ltd.

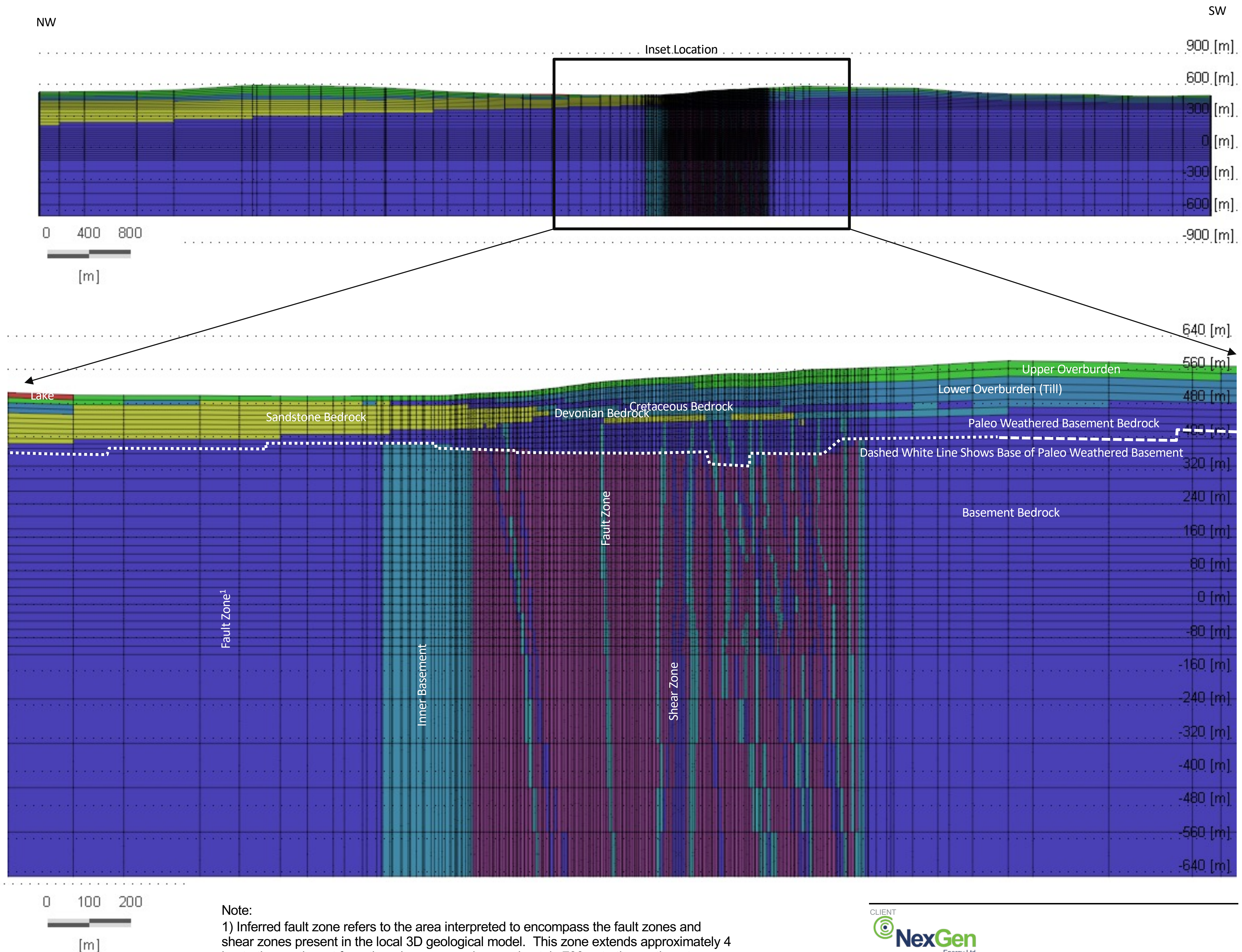
CONSULTANT
wsp

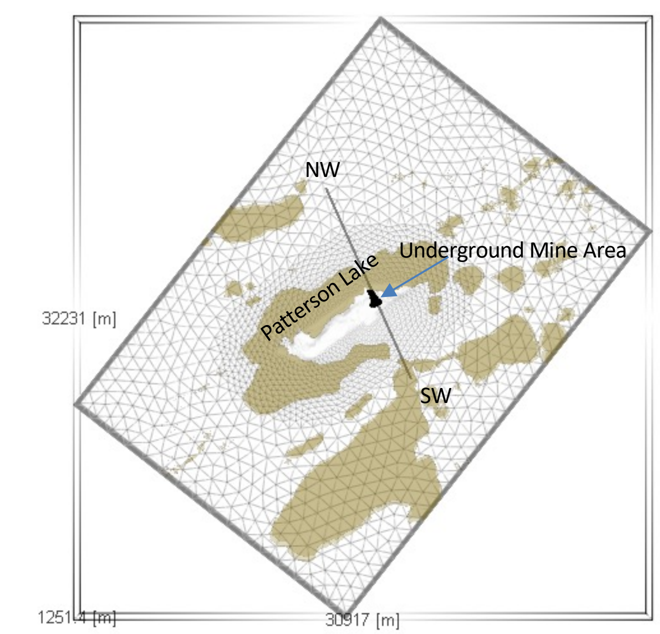
YYYY-MM-DD	2021-06-28
PREPARED	GI
DESIGN	GI
REVIEW	NB
APPROVED	MT

PROJECT
NEXGEN ENERGY LTD.
ROOK I PROJECT

TITLE
INNER BASEMENT EXTENT
FINITE ELEMENT MESH

PROJECT No.	PHASE	Rev.	FIGURE
20144150	3104	B	13





Note:
1) Inferred fault zone refers to the area interpreted to encompass the fault zones and shear zones present in the local 3D geological model. This zone extends approximately 4 km to the southwest from the mine area, and approximately 700 m to the northeast.

CLIENT	NexGen Energy Ltd.
CONSULTANT	wsp
YYYY-MM-DD	2021-06-28
PREPARED	GI
DESIGN	GI
REVIEW	NB
APPROVED	MT

PROJECT
NEXGEN ENERGY LTD.
ROOK I PROJECT

TITLE
HYDROSTRATIGRAPHIC UNITS ALONG NW-SW CROSS-SECTION NEAR PROPOSED UNDERGROUND MINE

PROJECT No.	PHASE	Rev.	FIGURE
20144150	3104	B	14

Attachment IR 233/240/243-1

NexGen Energy Ltd.
Head Office
3150 – 1021 West Hastings Street
Vancouver, BC V6E 0C3

Saskatoon Office
200 – 475 2nd Ave S
Saskatoon, SK S7K 1P4

Attachment IR 233/240/243-1

1 Introduction

NexGen Energy Ltd. (NexGen) is proposing to develop a new uranium mining and milling operation in northwestern Saskatchewan, called the Rook I Project (Project). The proposed Project is subject to both provincial and federal Environmental Assessment (EA) processes, would be licensed as a nuclear facility by the Canadian Nuclear Safety Commission (CNSC), and would be subject to various provincial and federal permits and approvals.

NexGen submitted a Draft Environmental Impact Statement (EIS) to the Saskatchewan Ministry of Environment (ENV) and Canadian Nuclear Safety Commission (CNSC) in 2022. Through the technical review of the Draft EIS, NexGen has received information requests (IRs) from the Federal-Indigenous Review Team (FIRT), which is led by the CNSC. This memorandum provides NexGen's responses to IR 233, IR 240, and IR 243 for which the CNSC posed questions regarding information contained within Draft EIS Technical Support Document (TSD) XIV (Groundwater Flow and Solute Transport Modelling Report) and Draft EIS TSD XVII (Waste Rock and Underground Wall Rock Source Term Predictions Report). These three IRs are presented in Table 1.

Table 1: Summary of Information Requests Addressed in this Memorandum

No.	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and Rationale	Information Requirement
233	TSD XIV, Section 3.3.1	Section 3.3.1 (page 13) indicates that, for the post-closure, infiltration was reduced relative to operation conditions due to the cover-in-place. However, no further information is provided about the reduced infiltration (e.g., the extent that infiltration was reduced due to the cover-in-place).	Please provide additional information on the reduced infiltration, including the infiltration rate assumed due to the cover-in-place, or provide reference (such as other TSD) for the reduced infiltration.
240	TSD XVII, Section 3.2.2, Table 3-4	**Context:** Table 3-4 provides a summary of the infiltration rates, surface area and annual flows rates for each source term. However, no further details how they are obtained, in particular, the net infiltration rate. **Rationale:** Net infiltration will impact on the contaminant leaching and migration and then the loading to the surrounding environment and should be well justified.	Provide further details how net infiltration rates for different source terms are determined. **Suggestions for mitigation and follow-up measures** Monitor the net infiltration rate during operation and reclamation of waste rock stockpiles
243	TSD XVII WR and UG Source Term Report Section 3.2.2 Model inputs & assumptions, Oxygen transport modelling	**Context:** Oxygen transport modelling was completed by Okane to assess oxygen availability for sulfide oxidation in the waste rock stockpile. The Okane (2020) report was heavily relied upon for the development of source terms under different scenarios, in particular, the designs with engineered layers. **Rationale:** The current EIS and TSD XVII have limited to no information on how the engineered layers in the PAG waste rock stockpile are designed. The methodology and simulation results of oxygen transport in waste rock stockpiles are unavailable in the current report.	Provide the referenced Okane (2020) reports: Okane (2020a). Rook I WRSA Options Analysis. Memorandum provided to NexGen Energy Ltd. Okane (2020b). Rook I WRSA – 1-Dimensional Numerical Modelling of WRSA End-Members, Internal Memorandum provided to NexGen Energy Ltd., March 24, 2020.

IR = information request; TSD = Technical Support Document.

2 Information Request Responses

2.1 Additional Background and Context

To understand the potential environmental effects of seepage from the potentially acid generating (PAG) waste rock storage area (WRSA), a series of models were developed to predict the geochemical conditions within the PAG WRSA and to predict the transport of water and constituent mass released from the PAG WRSA. This memorandum provides additional information regarding how the geochemical source term model described in Draft EIS TSD XVII and the groundwater flow and solute transport model described in Draft EIS TSD XIV were linked, including how the information described in Okane (2020a) and Okane (2020b) was applied in the Draft EIS.

A brief overview of each linked model is provided in Section 2.1.2, described in the order of the flow path from the source to receptor. NexGen notes the discussion below focuses on information requested in IR 233, IR 240, and IR 243 and highlights that each of these models simulated processes beyond what is described in this memorandum. It is assumed that readers are familiar with the content described in the Draft EIS reference subsections listed in Table 1.

2.1.1 Waste Rock Storage Area Options

During the early design stage of the Project, various options were evaluated to select WRSA designs. A preliminary options analysis presented in Okane (2020a) was superseded by a formal multiple accounts analysis (MAA) described in Draft EIS Section 4.5.6.4 (Waste Rock) and included as Draft EIS TSD VII (Mine Waste Alternatives Assessment Report). The MAA considered environmental, technical, economic, and social assessment categories to identify the selected alternative of a segregated, lined PAG WRSA with engineered source control, which is referred to as 'Option 2b' in Draft EIS Section 4.5.6.4.1 (Selected Alternative).

2.1.2 Waste Rock Storage Area Seepage, Groundwater Transport, and Source Term Modelling

The engineered layering described in Section 2.4 of Draft EIS TSD XVII was designed to limit oxygen ingress into the WRSA, which in turn would limit the oxidation of waste rock and the associated potential for metal leaching and acid rock drainage. Oxygen ingress was modelled using the one-dimensional (1-D) finite element model GeoStudio as described in Okane (2020b), which is included as Appendix A. As part of this oxygen ingress modelling, net infiltration was simulated under different engineered layering and cover designs. Infiltration was also modelled using two different climate datasets: Cluff Lake Climate and Rook I Simulated Climate. The former (i.e., Cluff Lake Climate) was applied for the purpose of the oxygen ingress modelling because it represented a long-term measured dataset (the latter [i.e., Rook I Simulated Climate] was site-specific, but synthetic). Based on the modelling described in Okane (2020b), the option using engineered source control (referred to as 'Option 1c', which represents the same type of WRSA design as presented in Draft EIS Section 4.5.6.4.1), was carried forward. Under this scenario, the net infiltration through the WRSA was predicted to be 110 millimetres per year (mm/yr) to 130 mm/yr during Operations (i.e., prior to cover placement) and 65 mm/yr to 85 mm/y after Closure (i.e., after cover placement) as shown in Table 4 and Table 5 of Okane (2020b), respectively.

The modelling by Okane (2020b) also evaluated the influence of a geomembrane liner on the drainage characteristics and concluded that due to lateral drainage at the base of the WRSA, the hydrology of a lined versus unlined WRSA would be comparable. Therefore, while Okane (2020b) refers to an unlined WRSA, these results are considered valid for the lined WRSA assumed in both Draft EIS TSD XIV and Draft EIS TSD XVII. As conservative assumptions in the Draft EIS, the solute and mass transport model assumed a 5% loss of seepage through the liner during the Operations Phase and a complete failure of the liner immediately after the Decommissioning and Reclamation (i.e., Closure) Phase.

Infiltration rates were applied in the source term model as described in Section 3.2.2 of Draft EIS TSD XVII. In Draft EIS TSD XVII, the engineered layer option corresponds to 'Source Term 5'. Variations were modeled for Source Term 5 to account for a Base Case and Upper Case during both Operations and Closure. As listed in Table 3-4 of Section 3.2.2 of Draft EIS TSD XVII, the infiltration rates assumed for Operations and Closure were 120 mm/yr and 70 mm/yr, respectively, which is within the range for each period listed in Okane (2020b).

The Operations and Closure values for Source Term 5 were then applied as a source term in the solute transport model developed in GoldSim, along with groundwater fluxes predicted by the groundwater model developed in FEFLOW (as described in Section 3 of Draft EIS TSD XIV). The combination of the groundwater flow model developed in FEFLOW and solute transport model developed in GoldSim was used to assess the migration of groundwater and associated constituent mass originating in the PAG WRSA through the subsurface flow path to Patterson Lake.

2.2 Response to Information Request 233 and 240

As summarized above and detailed in Okane (2020b), 1-D modelling of the PAG WRSA was conducted with and without the assumption of a cover system to represent Operations and Closure conditions, respectively. The model results indicated that the cover system would control net infiltration to 15% to 20% of the total precipitation.

As suggested by CNSC, NexGen confirms that the net infiltration rate would be monitored during operation and reclamation of the WRSAs.

2.3 Response to Information Request 243

In response to this IR, Okane (2020b) is attached as Appendix A to this memorandum.

Given that the Okane (2020a) only provided preliminary information that was superseded by the formal MAA provided in Draft EIS TSD VII (Mine Waste Alternatives Assessment Report) and described in Draft EIS Section 4.5.6.4, this document is considered moot and is not provided.

3 References

Okane. 2020a. Rook I WRSA Options Analysis. Memorandum provided to NexGen Energy Ltd.

Okane. 2020b. Rook I WRSA – 1-Dimensional Numerical Modelling of WRSA End-Members, Internal Memorandum provided to NexGen Energy Ltd., March 24, 2020.

Appendix A Rook I Project Waste Rock Storage Area - 1-Dimensional Numerical Modelling of Waste Rock Storage Area End Members

Saskatoon

112 - 112 Research Drive
Saskatoon, SK S7N 3R3
Canada

T: (306) 955 0702 **F:** (306) 955 1596

www.okc-sk.com

Memorandum

To:	Kristie Bonstrom, NexGen Energy Ltd.
From:	Jared Robertson, Intermediate Geochemist
Cc:	Arthur Lieu, NexGen Energy Ltd.
Our ref:	1219-01-007 Rev3
Date:	March 24, 2020
Re:	**Rook I Project Waste Rock Storage Area - 1-Dimensional Numerical Modelling of Waste Rock Storage Area End Members**

Okane Consultants Ltd. (Okane) are assisting NexGen Energy Ltd. (NexGen) with the development of a waste rock management strategy in support of the environmental assessment process of the Rook I Project (Project) located in northern Saskatchewan, Canada. Okane previously conducted an options analysis[1] to evaluate opportunities for source control in NexGen's waste rock storage areas (WRSAs) to inform on a WRSA design to permanently store potentially acid generating (PAG) and non-potentially acid generating (NPAG) waste rock. Introducing source control into the WRSAs would limit oxygen (O_2) availability for reactive minerals capable of generating acidic seepage containing elevated concentrations of contaminants of potential concern (COPCs).

Numerical models of the identified options were developed with the objective of estimating an envelope of performance for proposed conceptual WRSA design options. The envelope of performance comprises results from a Base Case scenario (i.e., Option 1) and an Engineered (i.e., source control) scenario (i.e., Option 4) and consists of:

[1] Okane Consultants 2020. *Rook I Project Waste Rock Storage Area Options Analysis*. 1219-01-006 Rev1. Submitted February 24, 2020.

- expected annual net infiltration rates into the WRSA during operations and post-closure; and

- expected O_2 availability in the WRSAs post-closure.

Summary

One-dimensional (1D) numerical models of end-member WRSA construction scenarios were developed to evaluate the hydrology of a Base Case and Engineered WRSA and evaluated the influences of the resulting hydrology on O_2 availability.

The Base Case WRSA was assumed to be built by end-dumping to an average overall height of 16.5 m. The Engineered WRSA was simulated as constructed from the bottom up, with a sequence of 5 m lifts of waste rock followed by 0.5 m thick engineered source control layers (i.e., finer-textured material, similar to the silty texture of Project-produced gypsum), each set repeated three times to create a final height of 16.5 m. A 1.25 m cover system consisting of 1.0 m of sandy till on top of a 0.25 m lower-permeability layer was placed on top of both WRSA scenarios. The sensitivity of the models to climate databases and the presence of a liner was also tested. Model results were expected to be representative of both co-mingled (i.e., PAG and NPAG stored together) and segregated (i.e., separate NPAG and PAG) WRSAs.

The outcomes of the modelling program were:

1. Net infiltration of water into each WRSA during facility operation was controlled by the construction method. In the Engineered WRSA, the engineered source control layers behaved as an interim cover system and limited net infiltration to the underlying waste rock compared to bare surface conditions. At closure of the WRSA, net infiltration was controlled by the cover system.

2. The finer-textured properties of the engineered source control layer increased the degree of saturation of these layers, thereby inhibiting the air conductivity of the Engineered WRSA relative to the Base Case.

3. Oxygen transport into the Base Case WRSA occurred by both diffusion and advection. In the Engineered WRSA, the advective O_2 transport was inhibited by the engineered source control layers, causing diffusion to be the dominant O_2 transport mechanism in this scenario.

4. The Base Case WRSA would likely remain fully oxygenated, allowing for unrestricted sulphide oxidation to occur. Conversely, it was estimated that the Engineered WRSA would have a reactive thickness of approximately 3 m due to diffusive transport into the top surface (i.e., plateau) and slopes of the WRSA.

5. Placement of a liner at the base of the WRSA was not expected to influence the WRSA's internal hydrology.

6. Net infiltration into each WRSA was sensitive to the climate database used for the model. In the two climate databases tested, variations of up to 50% in the net infiltration values were modelled.

Numerical Modelling Method

Material Properties

The numerical modelling software GeoStudio was used to build 1D finite element models that simulate hydraulic, air, and thermal processes. A list of material types expected to be placed in the WRSA is presented in Table 1. Material properties were either obtained from Okane's internal database or estimated from known physical properties.

Table 1: Summary of material types used for the numerical models

Material Type	Comment
Waste Rock	Includes PAG and NPAG waste rock (i.e., no gypsum). Material properties were sourced from waste rock from a similar uranium mine in the Athabasca Basin.
Gypsum / Silty Material	Material properties were estimated based on the particle size distribution, specific gravity, and bulk density data provided by NexGen.
Sandy Till	Assumed to be the material at the base of the WRSA and the WRSA cover. Material properties were based on generic properties for sandy till.
Lower Permeability Layer	Assumed to be a lower permeability material placed at the base of the cover system. Material properties were based on generic properties for clay.

NPAG = non-potentially acid generating; PAG = potentially acid generating; WRSA = Waste Rock Storage Area.

Material properties for waste rock were assumed to be the same for PAG and NPAG waste rock. As such, the water balance model results will be the same for co-mingled and segregated WRSAs.

Gypsum was initially assumed to be a finer-textured material with low air conductivity that could be used as an engineered source control layer and was also readily-available at site. However, subsequent evaluation of gypsum as an engineered source control layer suggests there is a potential risk of geochemical and geotechnical instability if gypsum is placed as a discrete layer. Similar performance with respect to decreasing air conductivity could be achieved using a similarly silty-textured material (e.g., from a borrow source or an amended material). The material properties of gypsum were used for the purposes of modelling, but a borrow source with similar texture is expected to behave similarly. As such, all references to the engineered source control layer assume a silty-textured material with properties similar to gypsum.

The following property functions were defined for each material:

- water retention curve (WRC) (i.e., volumetric water content versus matric suction);
- hydraulic conductivity function (i.e., hydraulic conductivity versus matric suction);

- air conductivity function (i.e., air conductivity versus degree of saturation);
- thermal conductivity function (i.e., thermal conductivity versus volumetric water content [VWC]);
- volumetric specific heat function (i.e., volumetric specific heat versus VWC); and
- unfrozen water content function (i.e., unfrozen water content versus temperature).

Figure 1 provides the WRCs, hydraulic conductivity functions, and air conductivity functions for each material, while Figure 2 provides the thermal conductivity, volumetric heat capacity, and unfrozen water content functions. Table 2 provides a summary of other hydraulic and gas properties estimated for each material. The functions for these properties were defined using methods programmed into the GeoStudio software suite.

Table 2: Summary of hydraulic and thermal properties for each material

Material Type	SG	ρ_{dry} (g/cm^3)	Porosity (m^3/m^3)	K_{sat} (m/s)	K_{air} (m/s)	Mineral Thermal Conductivity (kJ/day·m·°C)	Mass Specific Heat (kJ/kg·°C)
Waste Rock	2.65	1.725	0.35	5E-5	3.85E-6	250	0.85
Gypsum	2.50	1.00	0.60	5E-7	3.85E-8	25.9	1.09
Sandy Till	2.65	1.59	0.40	1E-5	7.70E-7	38.9	1.06
Lower Permeability Layer	1.70	1.62	0.40	1E-8	7.70E-10	21.6	0.878

SG = specific gravity; ρ_{dry} = dry density; K_{sat} = saturated hydraulic conductivity; K_{air} = air conductivity through dry material

Air conductivity is dependent on the degree of water saturation in the system. Air conductivity is maximal when pore spaces are completely devoid of water and filled with air. Conversely, air conductivity decreases in a non-linear fashion as the degree of water saturation of the waste rock increases.

An O_2 consumption function was added to the GeoStudio software to simulate oxidation processes by sulphide minerals. An O_2 consumption rate was derived from preliminary results of seven humidity cell tests (HCTs) by SRK Consulting Inc.[2] of core samples from the mine workings. For each HCT, the cumulative sulphate generation rate (kg SO_4/t/s) was calculated starting after the third week to verify stored acidity was flushed from the HCT. Assuming all O_2 consumption and sulphate generation was caused by pyrite oxidation, the sulphate generation rate was converted to O_2 consumption rate through the stoichiometric relationship of pyrite oxidation (0.533 mol sulphate/mol O_2). An average O_2 consumption rate of 1.3E-8 kg O_2/t/s was used for the model.

[2] SRK Consulting (Canada) Inc. 2019. *Rook I Arrow Deposit – Geochemical Characterization. Phase II – HCT results update – Cycle 0-16*. PowerPoint presentation submitted to NexGen Energy Ltd. November 2019.

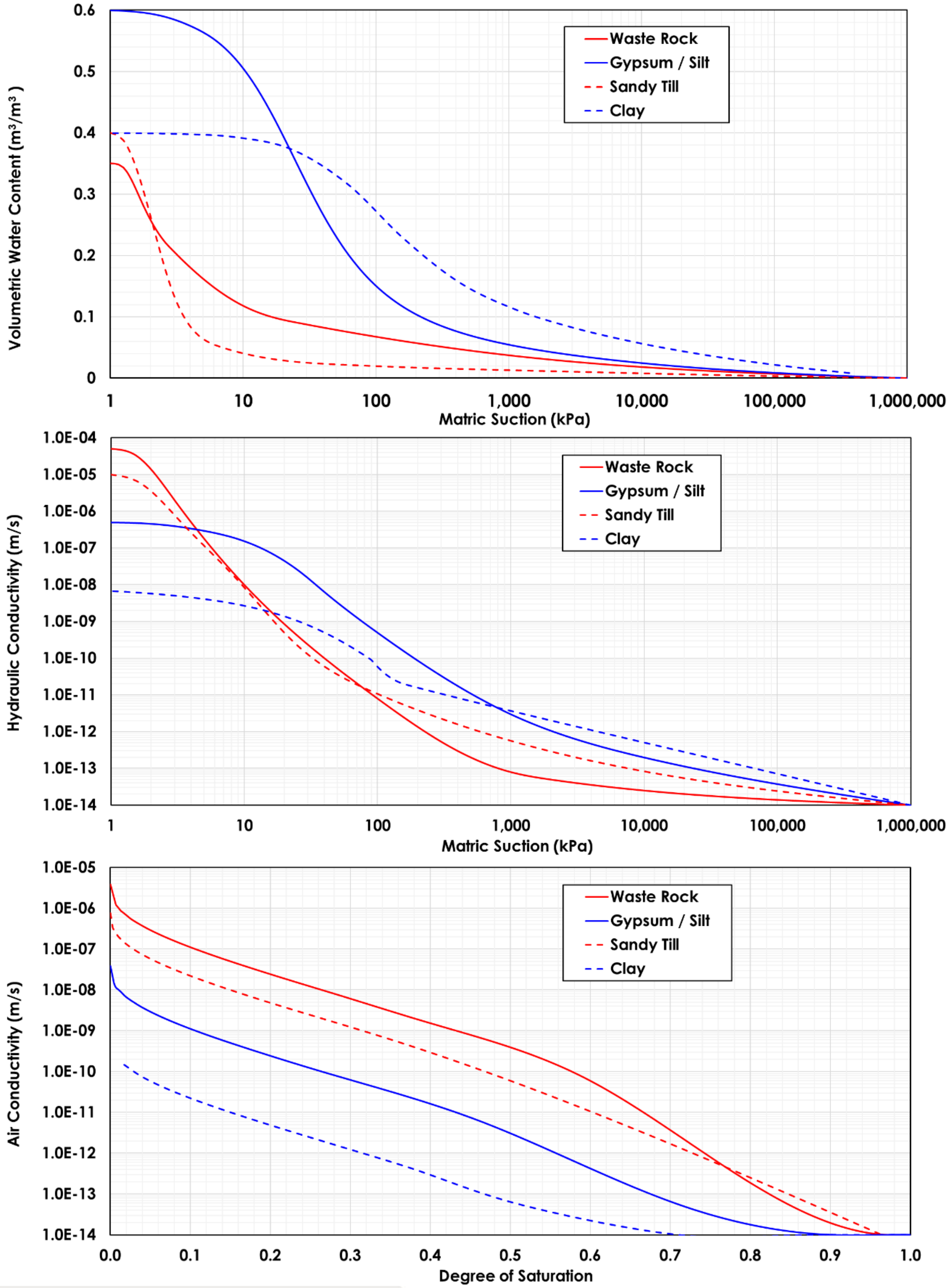


Figure 1: Material property functions of the modelled material types

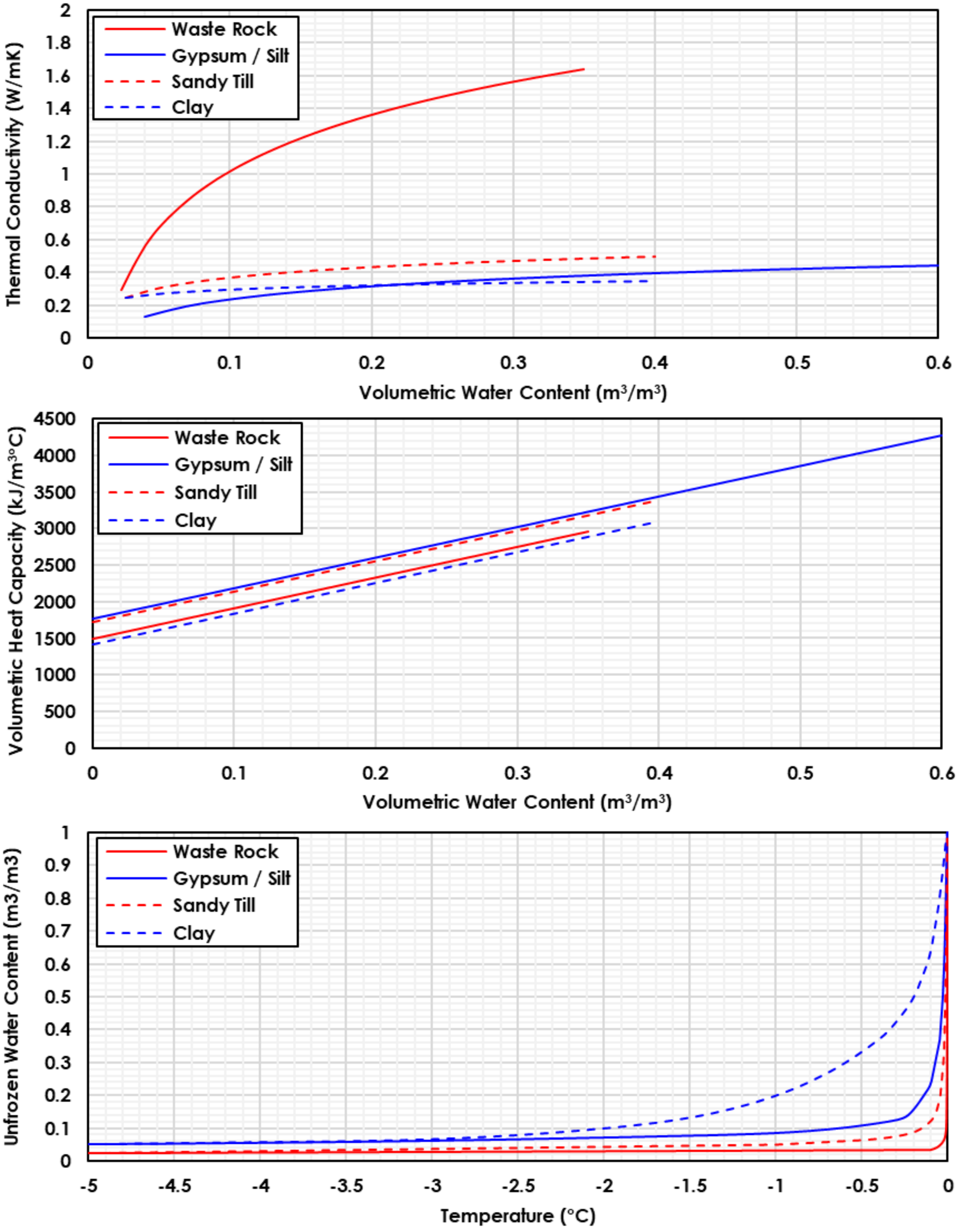


Figure 2: Thermal property functions of the modelled material types

Climate

Cluff Lake, which is located approximately 80 km north of the Project, was chosen as a climate analogue for the Project climate in the absence of site-specific climate data. A climate database was developed using data from the Cluff Lake Environment Canada climate monitoring station that was augmented with climate data collated by Okane from nearby monitoring stations. A second simulated climate database that combined data from multiple nearby sites, referred to as the Rook I ERAI Simulated DB, was utilized for sensitivity purposes. Each climate database contained 40 years of daily climate data.

Model Scenarios

Five conceptual WRSA options were identified in Okane's options analysis[3]. The options that were expected to be end members of performance were the Base Case (i.e., least ability to control O_2) and the bottom-up construction with horizontal, finer-textured layers (i.e., greatest ability to control O_2). These two options were selected for 1D numerical modelling (Table 3). Sensitivity to the presence of a geomembrane liner and climate databases were also tested.

Table 3: Summary of the simulated 1D model scenarios

Option	Description	Construction Method	Climate
1a	Base Case (No Liner)	End-Dump	Cluff Lake
1b	Base Case (Lined)	End-Dump	Cluff Lake
1c	Engineered Source Control (No Liner)	Bottom-up with Horizontal, Finer-Textured Layers	Cluff Lake
1a	Base Case (No Liner)	End-Dump	Rook I ERAI Simulated DB
1c	Engineered Source Control (No Liner)	Bottom-up with Horizontal, Finer-Textured Layers	Rook I ERAI Simulated DB

The 1D models for all five scenarios consisted of the same 16.5 m overall WRSA height and geometry placed on top of a 5 m layer of sandy till representing the underlying ground. The thickness was gradually built up over 24 years in the model to simulate WRSA construction during the Operations Phase of the Project. A cover layer was placed at the end of 24 years and consisted of a 0.25 m lower-permeability layer overlain by a 1 m sandy till layer. The effects of any potential vegetation were not included in the model scenarios. Each model was run for a total of 40 years (i.e., the complete temporal range of the climate database).

The end-dump method assumed PAG, NPAG, and gypsum were completely co-mingled. These models used the waste rock material properties.

The bottom-up method with horizontal engineered source control layers assumed PAG and NPAG were co-mingled and placed in 5 m lifts, overlain by a 0.5 m engineered source

[3] Okane Consultants 2020. *Rook I Project Waste Rock Storage Area Options Analysis*. 1219-01-006 Rev1. Submitted February 24, 2020

control layer. This sequence was repeated to reach a total of three layers. The co-mingled PAG and NPAG used the waste rock material properties. In practice, shorter lifts may result in a different WRC for the waste rock layers. For simplicity, it was assumed that the material properties of waste rock did not change between the Base Case and Engineered models.

Results

Water balance results for each 1D model pre-cover and post-cover construction are provided in Table 4 and Table 5, respectively. These results demonstrate the sensitivity of net infiltration on cover system presence, construction method, climate, and liner presence.

Table 4: Water balance results of the 1D model pre-cover (Year 20 to 24)

Parameter	1a Base Case (Cluff Lake Climate)	1b Base Case (Cluff Lake Climate, Lined)	1c Engineered (Cluff Lake Climate)	1a Base Case (Rook I Simulated Climate)	1c Engineered (Rook I Simulated Climate)
Total PPT (mm)	435	435	435	545	545
PET (mm)	560	560	560	550	550
Rainfall (mm)	325-350	325-350	325-350	410-440	410-440
Snowmelt (mm)	20-45	20-45	20-45	25-55	25-55
Runoff (mm)	0-20	0-20	0-20	0-30	0-30
Ablation (mm)	45-65	45-65	45-65	55-80	55-80
Actual Evaporation (mm)	110-130	110-130	240-260	135-165	300-330
Net Infiltration (mm)	200-220	200-220	110-130	245-275	135-165

PPT = precipitation; PET = potential evapotranspiration.

Prior to placement of the cover system, net infiltration was strongly controlled by the construction method. The presence of source control layers in the Engineered WRSA behaved like an interim cover system and inhibited infiltration rates into the WRSA. The water retention properties of the engineered source control layers decreased the water velocity and allowed for more evaporation to occur. After placement of the cover system, infiltration rates into the Base Case and Engineered WRSAs were equal, suggesting net infiltration rates were controlled by the cover system. The cover system controls net infiltration to 15% to 20% of total precipitation.

Within the waste rock of the Base Case and Engineered WRSAs, the average steady state VWC was 0.11, while the VWC in engineered source control layers in the Engineered WRSAs ranged from 0.43 to 0.45 (PPT = precipitation; PET = potential evapotranspiration.

Table 6). The VWC profiles of each model demonstrate that steady state is reached once the cover is placed (Figure 3). Small fluctuations in the VWC occur due to annual differences in climate.

Conceptually, the finer-textured layers in the Engineered WRSA possess greater water retention capabilities than the waste rock. By increasing the water content of these layers, the air conductivity, and therefore advective O_2 transport, can be limited.

Numerical modelling of advective O_2 transport in 1D cannot capture the processes that control advection in a WRSA. As such, advective potential was only evaluated qualitatively for this initial modelling program.

Table 5: Steady-state water balance results of the 1D model post-cover placement (Year 36 to 40)

Parameter	1a Base Case (Cluff Lake Climate)	1b Base Case (Cluff Lake Climate, Lined)	1c Engineered (Cluff Lake Climate)	1a Base Case (Rook I Simulated Climate)	1c Engineered (Rook I Simulated Climate)
Total PPT (mm)	435	435	435	535	535
PET (mm)	540	540	540	565	565
Rainfall (mm)	330-350	330-350	330-350	400-430	400-430
Snowmelt (mm)	20-45	20-45	20-45	25-55	25-55
Runoff (mm)	0-20	0-20	0-20	0-25	0-25
Ablation (mm)	45-65	45-65	45-65	55-80	55-80
Actual Evaporation (mm)	285-305	285-305	285-305	350-375	350-375
Net Infiltration (mm)	65-85	65-85	65-85	80-105	80-105
Net Percolation (mm)	65-85	65-85	65-85	80-105	80-105

PPT = precipitation; PET = potential evapotranspiration.

Table 6: Hydraulic and air properties of materials in the Base Case and Engineered WRSAs pre- and post-cover

Option	Material Type	Volumetric Water Content	Degree of Saturation	Hydraulic Conductivity (m/s)	Air Conductivity (m/s)
1a Base Case – Pre-Cover	Waste Rock	0.11	0.31	3E-09	5E-09
1a Base Case – Post-Cover	Waste Rock	0.11	0.31	3E-09	5E-09
1c Engineered – Pre-Cover	Waste Rock	0.11	0.31	3E-09	5E-09
	Engineered Source Control Layer	0.43	0.72	5E-08	5E-14
1c Engineered – Post-Cover	Waste Rock	0.11	0.31	3E-09	5E-09
	Engineered Source Control Layer	0.45	0.75	9E-08	3E-14

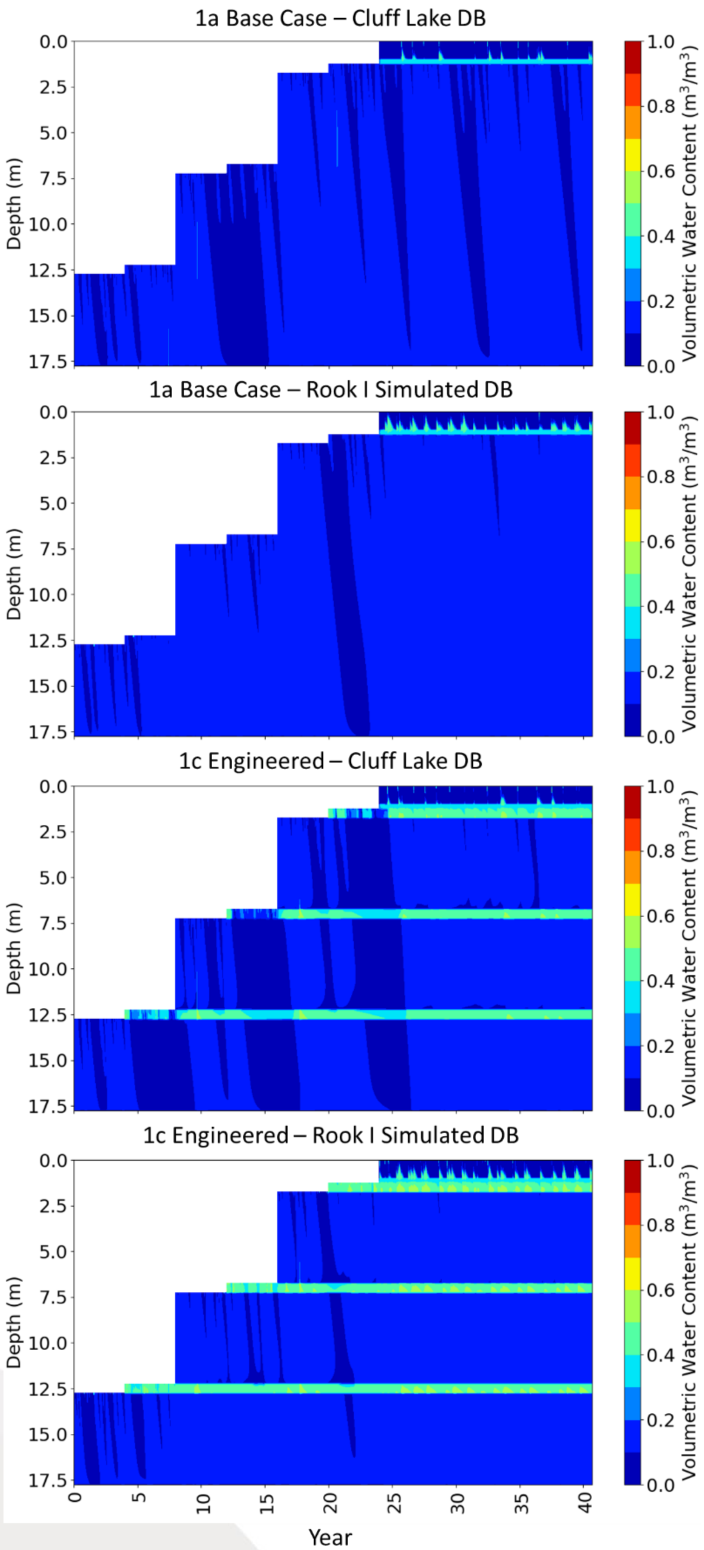


Figure 3: **Volumetric water content profiles in the 1D models from Year 0 to Year 40**

In the Base Case, the low degree of saturation controlled the air conductivity to 5E-9 m/s (PPT = precipitation; PET = potential evapotranspiration.

Table 6). In the Engineered WRSA, the air conductivities were controlled to approximately 3E-14 and 5E-14 m/s. The air conductivities of the engineered source control layers were five orders of magnitude less than in waste rock and suggests air would be strongly inhibited by these source control layers.

Potential advective O_2 flux ($J_{adv,O2}$) can be estimated from Equation 1:

$$J_{adv,O2} = \frac{k_a}{g}\frac{\Delta P}{\Delta y}x_{O2} \qquad (Equation\ 1)$$

where:

- k_a = air conductivity;
- g = gravitational acceleration;
- $\Delta P / \Delta y$ = a pressure gradient; and
- x_{O2} = mass fraction of O_2 in air (i.e., 0.2314).

By applying a relatively large (and arbitrary) pressure gradient of 100 Pa/m, advective O_2 flux potential through the Base Case waste rock was 1.2E-8 kg/m^2/s. Conversely, advective O_2 flux potential through the engineered source control layer was 1.2E-14 kg/m^2/s under the same pressure gradient.

Diffusive O_2 transfer into the top of the WRSA was estimated in the 1D model to be approximately 1.3E-8 kg/m^2/s. This diffusive flux is approximately equal to the advective flux potential in the Base Case, suggesting both diffusion and advection would supply O_2 throughout the WRSA. In the case of the Engineered WRSA, the diffusive flux is much greater than the advective flux as a result of the engineered source control layers reducing advective transport pathways. As such, O_2 transport into the Engineered WRSA is estimated to be diffusion limited.

Diffusion of O_2 into both the Base Case and Engineered WRSAs would occur through the plateau and slopes of the WRSA. The Base Case is anticipated to remain fully oxygenated due to the influences of advection. Oxygen concentrations in the Engineered WRSA are anticipated to be controlled by diffusion only.

Because O_2 is consumed by sulphide minerals in the waste rock, a point exists were O_2 consumption is greater than the diffusive supply. Using the HCT O_2 consumption rate of 1.3E-8 kg O_2/t/s, the O_2 consumption rate exceeds the diffusive flux after 0.6 m. Because the HCT rate is an accelerated rate, a layer of conservatism can be applied by scaling the rate back by half an order of magnitude to 2.6E-9 kg O_2/t/s to approximate the influence of temperature on reaction rate. The scaled O_2 consumption rate moves the point where O_2 consumption is greater than diffusive supply down to 3.0 m.

Influence of a Geomembrane Liner

A geomembrane liner would influence the drainage characteristics of the WRSA and, depending on the material properties, could cause a perched water table to develop in the lower regions of the WRSA.

The Base Case model using the Cluff Lake climate database was compared to a similar model run with the presence of a liner at the base of the WRSA. Within the 1D model, a small, perched water table (approximately 20 cm deep) formed at the base of the WRSA (Figure 4). However, the 1D model does not simulate lateral drainage, and it is likely there would be sufficient lateral drainage capacity in the constructed WRSA to prevent a substantial perched water table from forming. In addition, the hydrology above the perched water table and the overall water balance remained essentially unchanged.

Because it is likely there would be enough lateral drainage to prevent the formation of a substantial perched water table, it is assumed the hydrology of a lined versus unlined WRSA would be comparable (with exception of toe seepage rather than seepage to ground).

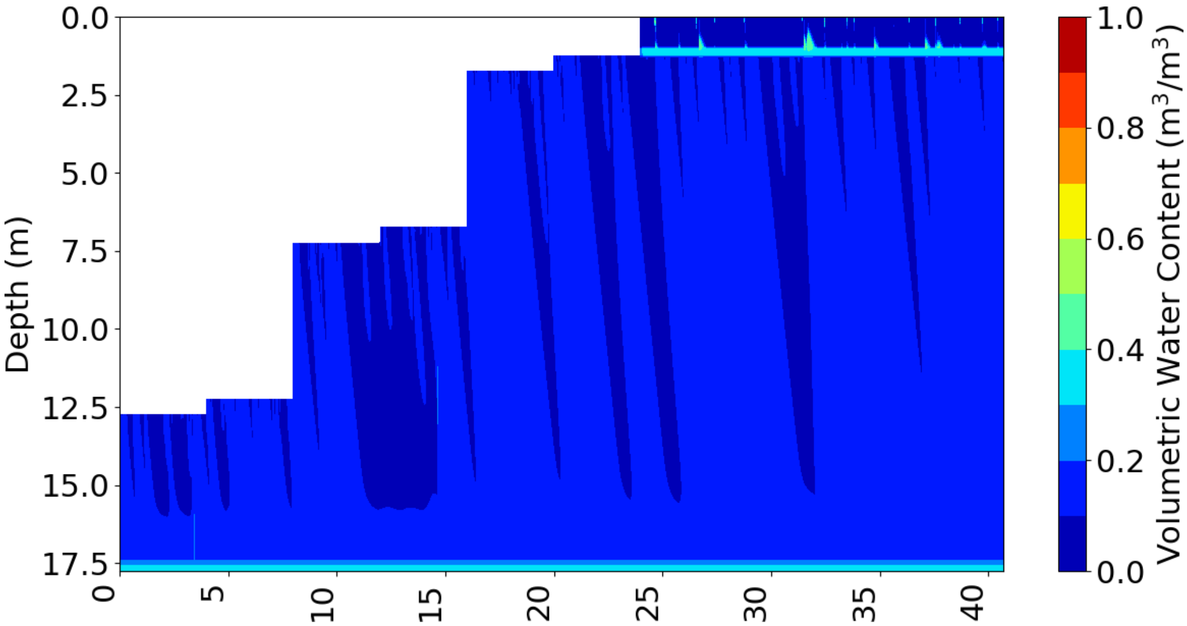


Figure 4: Volumetric water content profile of option 1b (Base Case lined), using the Cluff Lake climate database

Climate Database Sensitivity

The Rook I Simulated DB contained notable differences from the Cluff Lake climate database. These differences were:

- the average air temperature was considerably warmer in the Rook I Simulated DB, likely due to the average minimum temperature being approximately 6°C warmer; and

- precipitation occurred every day in the Rook I Simulated DB.

The potential evapotranspiration (PET) in both climate databases were similar, while the total precipitation in the Rook I Simulated DB database ranged from 100 mm to 110 mm greater than the Cluff Lake database (Table 4 and Table 5). Actual evaporation was also greater in the Rook I Simulated DB, although the increase was not as large as the increase in total precipitation.

For the Base Case WRSA, net infiltration rates increased 45 mm to 55 mm for the Rook I Simulated DB scenarios pre-cover. Post-cover, net infiltration rates increased 15 mm to 20 mm. For the Engineered WRSA, net infiltration increased 20 mm to 35 mm for the Rook I Simulated DB scenarios pre-cover. Post-cover, net infiltration rates increased 15 mm to 20 mm. These results demonstrate that estimated net infiltration rates, and therefore COPC loading, would be sensitive to the climate database used. Oxygen control likely would not be sensitive to this difference in net infiltration as indicated by the similar volumetric water content values in the engineered source control layers in both climate database scenarios (Figure 3).

Closure

We trust information provided in this memorandum is satisfactory for your requirements. Please do not hesitate to contact me at 306-713-1695 or jrobertson@okc-sk.com should you have any questions or comments.