Carbon Creek Metallurgical Coal Project:

PROJECT DESCRIPTION EXECUTIVE SUMMARY

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1. Introduction

The proposed Carbon Creek Project involves the development of a metallurgical coal mine with an anticipated average annual production rate of 4.3 million metric tonnes of clean coal once full production is achieved in 2020. The mine has a life of 20 years with a total of 78.4 Mt of clean coal produced. The Project is located in northeastern BC, approximately 40 km west of Hudson's Hope, south of Williston Reservoir, and 50 km north-northwest of Highway 97.

Metallurgical coal is less abundant than thermal coal and is used to produce coke, which is an integral component of the steel manufacturing process. World demand for high-quality metallurgical coal continues to grow to support industrialization in China, India, and many other countries. British Columbia is ideally positioned to satisfy this demand owing to the existence of high-quality coal deposits, an efficient transportation infrastructure for bulk commodity transportation, a skilled workforce and a stable political environment, to develop the province's vast coal resources. Development of the Carbon Creek coal deposits will contribute to expanding and sustaining local communities and will be economically beneficial to the province and the country as a whole.

The information contained in this Project Description is based in part on information provided in the November 2012 Prefeasibility Study. The proposed mine plan and design can be expected to evolve as more scientific and engineering information becomes available and as feedback from Government, First Nations and local communities is received.

Name of Designated project:	Carbon Creek Metallurgical Coal Mine
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1.1 ENVIRONMENTAL ASSESSMENT REGULATORY CONTEXT

The proposed Project requires an Environmental Assessment (EA) under *CEAA 2012*, as it exceeds the production capacity of 3000 t/d of clean coal under the federal *Regulations Designating Physical Activities* for a coal mine (Section 15(d), Schedule (*Section 2 to 4*)).

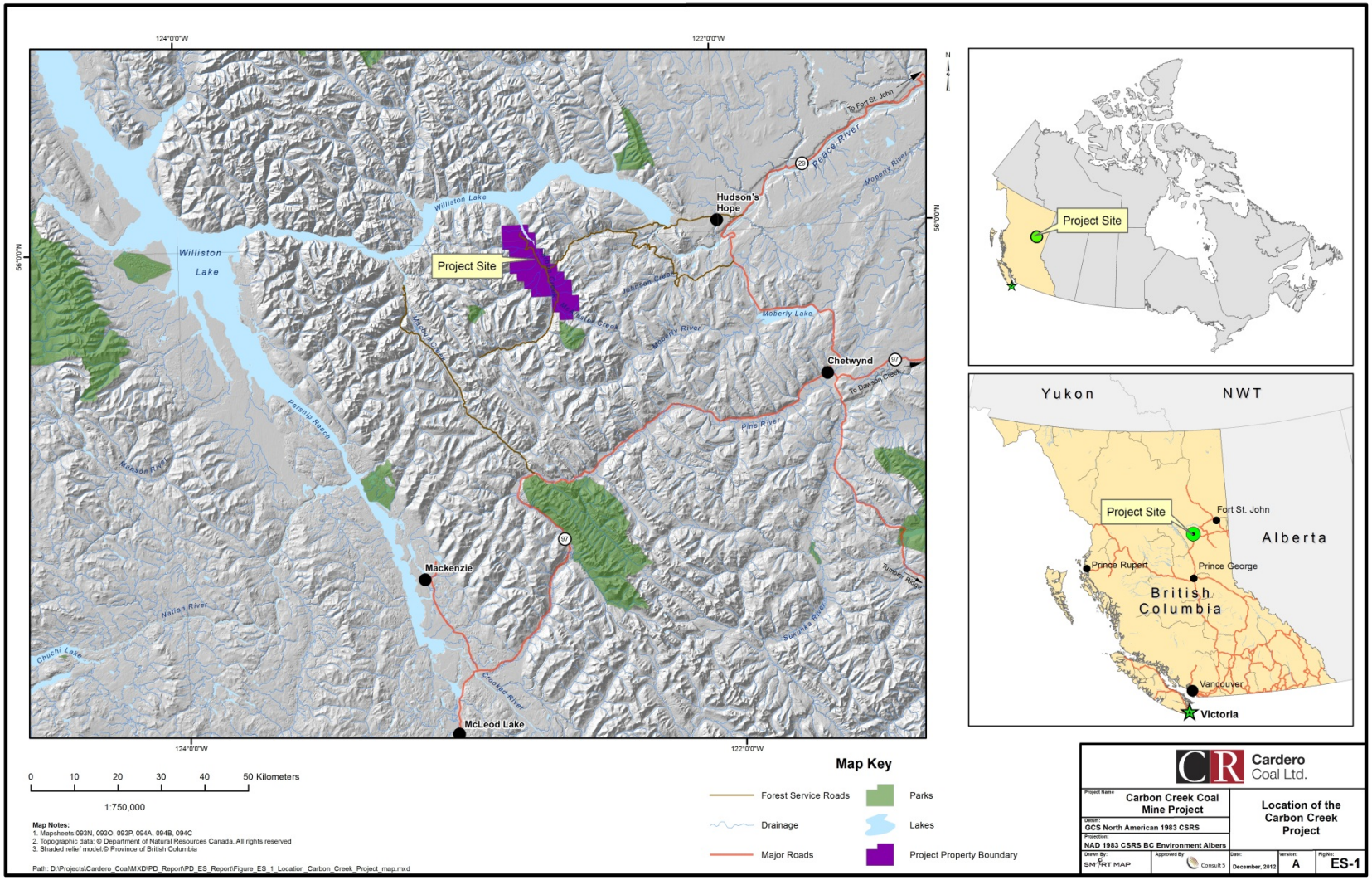
The planned annual production rate of the Project also exceeds thresholds stipulated in the BC *Environmental Assessment Act* Reviewable Projects Regulation for new coal mines. As a result, the Project will also require an EA under the BC *Environmental Assessment Act.*

1.2 PROJECT LOCATION

The Project is located in northeastern BC approximately 40 km west of Hudson's Hope, south of the Williston Reservoir, and 50 km north-northwest of Highway 97 (**Figure ES-1**). The nearest city is Fort St. John, located 110 km east of the Project, connected by Highway 29 to the towns of Hudson's Hope and Chetwynd, 60 km southeast of

the property. The CN Railway line connecting Fort St. John and Tumbler Ridge with Prince George passes 30 km south of the Property. The Property is centered approximately on latitude 55°56'40" N and longitude 122°40'40" E.

Figure ES-1: Location of the Carbon Creek Project



1.3 LAND TENURE

The Project area has been explored by numerous companies under various configurations of licensing and land and mineral tenures over more than 100 years. The Property currently consists of four coal licenses (418174, 418175, 418176, and 418177), ten Coal License Applications, and ten Crown Granted District Lots (CGDL), comprising a contiguous tenure parcel of 17,200 ha. Approximately 14,600 ha of the Property are provincial Crown Lands managed by the Peace River Regional District and the balance of 2,600 ha is Private non-Crown land (CGDL's) managed by the Peace River Partnership (PRP), an Alberta partnership. Cardero Coal has entered into an option, and made all requisite payments, to exercise a coal lease over the coal resources on the CGDL from PRP.

1.4 EXISTING LAND USE

The mine site property, including all components and alternative options assessed, is located in the Peace River Coalfield within the territories of the Tsay Keh Dene (TKD), Takla Lake (TLFN) and Treaty 8 First Nations. The Treaty 8 First Nations affected include: the McLeod Lake Indian Band (MLIB), Saulteau First Nations (SFN), Halfway River First Nation (HRFN), and the West Moberly First Nations (WMFN). The First Nations in the area of the proposed mine use trails on the property for hunting, fishing and berry picking. Caribou hunting is also an established right of the Treaty 8 First Nations in the area. Traditional uses of the proposed mine site currently include: trails, berry picking, fishing and hunting. These activities will possibly be affected by loss of access and will require identification and discussion with the users of the land. The Project mine site facilities are approximately 26 km northwest of the *Twin Sisters* sacred site (also referred to as Beattie Peaks). The designated Project area, although proximal to Aboriginal Reserves and the *Twin Sisters* sacred site, is not anticipated to require access to, or infringe on, these lands. The proposed barge route for the transportation of coal product to market follows Williston Reservoir to Mackenzie and will potentially cross over the TKD statement of intent boundary and will therefore likely require consultation with this group, as well as TLFN.

The Property is located within the 2.9 million ha area covered by the 1999 Dawson Creek Land and Resource Management Plan (LRMP). Current land use activities in the region include: recreation, trapping, mining, energy development exploration, and forestry. Canadian Forest Products Ltd. (CanFor) holds a Tree Farm Licence which covers the non-freehold portions of the Project Area.

There are no federal lands within a 50 km radius of the proposed Project, with the exception of local First Nations' reserve lands. Initial analyses indicate that there are no permanent, seasonal or temporary residences, with the exception of the Project exploration camp, within at least 20 km of the proposed mine site area. The proposed barge load-out will be located approximately five to seven kilometers from the main residential area of Mackenzie in an existing industrialized area serving timber, paper and pulp, and pelletizing industries.

2. Project Information

The information presented in this section is based on the design outlined in the Prefeasibility Study. The mining and coal processing methodologies, as well as the transport systems are described in this section. The following schedule is being used to define how Cardero Coal is proposing to move through the EA process and permitting leading up to construction (**Figure ES-2**).

Figure ES-2: Anticipated Approval Process

Task	2011		2012				2013				2014				2015	
EA Process	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**
Submit Project Description				■												
Finalize AIR							■									
Baseline/Effects Assessment Studies			■	■	■	■	■	■								
Submit Application Report									■							
Consultation	■	■	■	■	■	■	■	■	→	→	→	→	→	→	→	→
EA review (up to 180 days)										■	■	■				
EA decision by Minister													■			
Permitting									■	■	■	■	■			

2.1 COAL RESERVE ESTIMATES

The total coal reserve tonnage for the 20 years life of mine has been estimated as 121 Mt Run of Mine (ROM), subsequently giving 78 Mt of saleable coal (**Table 1**).

Table 1: Project Coal Reserve Estimates

Mining Method	ROM Tonnes (Mt)	Saleable Tonnes (Mt)
Surface	56	38
Highwall	14	7
Underground	52	33
Total	121	78

The accuracy of resource and reserve estimates is, in part, a function of the quality and quantity of available data and of engineering and geological interpretation and judgement (Norwest 2012b). The mine, as described in the Prefeasibility Study document, is expected to have a life of 20 years excluding pre-production evaluation and construction time.

2.2 PROJECT PHASES AND SCHEDULE

Initial Development and Construction phase: Commencement of construction activities will depend on timelines for the review and issuance of an EA Certificate and Mine Permit but are tentatively planned to begin Q3 2014. Initial development and construction is anticipated to continue through to Q3 2015.

Operation phase: First coal production is proposed for Q4 2014. Initially, operations will begin with the surface mine, while underground mine operations will commence in 2016. This will allow time to develop an area to access

the underground mineable coal seams. The mining operation has been financially modelled for 20 years, excluding pre-production development and construction time.

Decommissioning phase: Estimated at two to three years, including all activities relating to the decommissioning of mine-site facilities. Closure of the mine site infrastructure may be carried out in steps as certain project components, such as roads, may be required to carry out the monitoring program and therefore cannot be decommissioned at the same time as most other components. Reclamation schedule will be developed as the mining plan is finalized, but will remain iterative.

Abandonment phase: Refers to conditions that will exist on the site after the site is abandoned and fully reclaimed. The waste rock management facilities will require monitoring following closure of the site. Monitoring will be required until the site has stabilized or as required by regulatory agencies – potential timing unknown.

2.3 MINING METHOD AND COAL PRODUCTION

Exploration activities at Carbon Creek have revealed that the nature of the geology lends itself to employing several different mining methods to maximize the recovery of the resource. The proposed mining methods include underground room and pillar mining with continuous miners (CM), surface contour and area mining using hydraulic excavators and trucks, and highwall mining. After a short ramp-up period, all mining methods will be employed concurrently throughout the proposed 20-year mine life.

Approximately 40% of the current defined reserve will be mined underground (**Table 2**). The mine will be designed to achieve an annual average clean coal production rate of 4.1 million metric tonnes (including ramp up; 2014-2020) as shown in **Table 3**. The wash plant will have a single-stream capability of 1,200 tph with the average clean coal production rates shown in **Table 4**.

Table 2: Carbon Creek Project – Anticipated ROM and clean coal production by area and mining type

Area	Mining Method	ROM Tonnes (Mt)	Clean Tonnes (Mt)
Northern Surface Mine	Area Mining	16.6	11.3
	Contour Mining	4.8	3.3
	Highwall Mining	5.4	2.6
	Total Northern Surface Mine	**26.8**	**17.2**
Central Surface Mine	Area Mining	26.7	18.5
	Contour Mining	7.8	5.4
	Highwall Mining	8.6	4.4
	Total Central Surface Mine	**43.1**	**28.3**
Underground Mines	Room & Pillar Mining	51.5	32.9
	Total Underground Mines	**51.5**	**32.9**
Combined Total		**121.4**	**78.4**

(Mt) – Million tonnes.

Table 3: ROM Coal Production (Mt)

	2014	2015				2016				2017				2018				2019				2020			
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
ROM Production	1.158					3.545				4.596				4.770				5.385				6.654			
Surface area and Contour mining		1.158				2.257				2.271				1.521				1.492				2.595			
Highwall mining						0.900				0.900				0.900				0.900				0.900			
S14 and S15 underground mining						0.388				1.425				2.349				2.993				3.159			

ROM- Run of mine; Mt – Million tonnes.

Table 4: Clean Coal Production

Clean Tonnes (Mt)	2015	2016	2017	2018	2019	Remaining LOM Avg
Surface Operation	0.786	1.641	1.616	0.994	0.970	2.168
Highwall Miner Operation	--	0.476	0.476	0.503	0.504	0.334
Underground Mine Operation	--	0.287	1.054	1.475	1.767	1.890
Total	0.786	2.404	3.146	2.972	3.241	4.392

2.3.1 Overburden Management and Progressive Reclamation

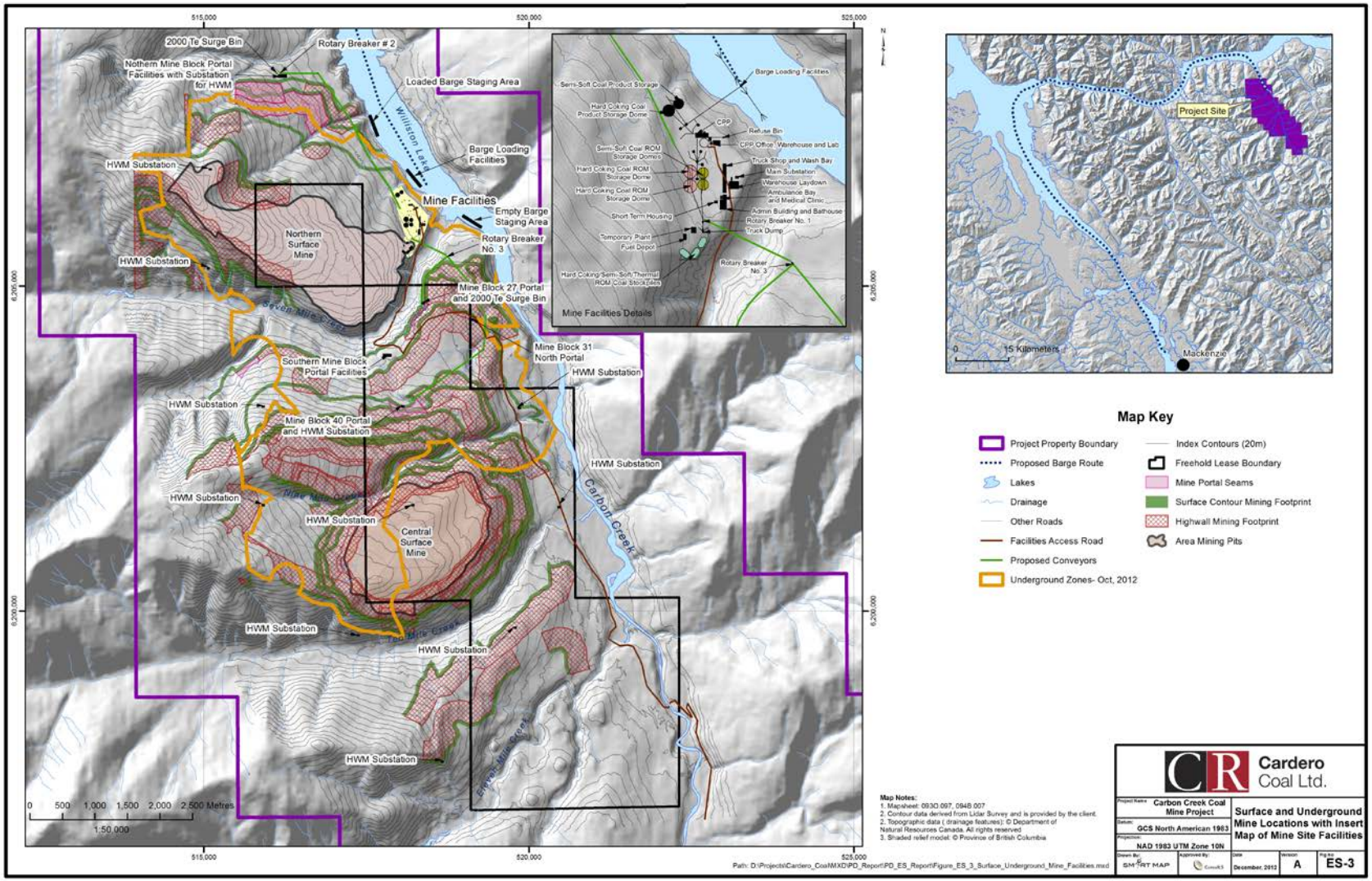
Vegetation removal will precede mining, with selected trees being harvested for local use or for sale to the wood and paper industry where possible, and pine beetle-damaged trees being bucked and scattered. Subsequent to vegetation removal, topsoil will first be salvaged and stockpiled for later use in progressive reclamation. After the topsoil is removed, overburden will be removed to expose the area that will be strip mined. Overburden from the initial cut will be moved by conventional truck-and-shovel methods to an undisturbed area directly down-dip of the open cut. The overburden from each subsequent cut will be used to backfill the previously-mined open strip once sufficient pit room is created. This approach will allow progressive reclamation to occur. The sequential back-filling of open strips will form bench-like topographic features with nearly level tops and sloping faces. These faces will be designed and constructed to reduce the potential for erosion. Since the backfilling will follow the mining progression up-slope, the reclamation will occur in sequence and result in a final shape generally similar to the existing topography. Completed areas having steep slopes will be graded to a more gentle topography, blending with the natural topography of the area. Topsoil will be placed over the returned overburden and re-vegetated to minimize erosion and reduce the footprint of operations.

2.3.2 Surface Mining

Surface mined coal will be produced from two areas, specifically, the Northern Surface Mine Area (located north of Seven Mile Creek), and the Central Surface Mine Area (located between Nine Mile and Ten Mile Creeks) (Figure ES-3). It is expected that in Year 1 of operation, mined coal will be produced from both surface mine areas. In several areas of the property, the coal seams dip gently and approximately parallel to ridges and are at depths which afford favourable strip ratios for complete seam removal.

Northern Surface Mine: ROM production from the Northern Surface Mine, including highwall mining, ranges from 1.1 Mtpa to 1.8 Mtpa and averages 1.4 Mtpa over the mine life with a ROM strip ratio average of 12:1. One highwall mining unit will operate, producing approximately 450,000 tonnes per year. ROM coal is expected to be transported to the processing facility using trucks or conveyors. Clean coal production is expected to be hard

Figure ES-3: Surface and Underground Mine Locations with Insert Map of Mine Site Facilities



coking coal except for a small amount of thermal coal produced from the oxidized zone along the outcrop lines. Clean coal production ranges from 0.6 to 1.3 Mtpa and averages 0.9 Mtpa over the mine life.

Central Surface Mine: ROM production from the Central Surface Mine, including highwall mining, ranges from 1.4 Mtpa to 3.8 Mtpa and averages 2.3 Mtpa over the mine life with a ROM strip ratio average 7:1. One highwall mining unit will operate, producing approximately 450,000 tonnes per year. ROM coal is expected to be transported to the processing facility using trucks or conveyors. Clean coal production is expected to be semi-soft coking coal except for a small amount of thermal coal produced from the oxidized zone along the crop lines. Clean coal production ranges from 0.8 to 3.0 Mtpa and averages 1.5 Mtpa over the mine life.

2.3.3 Underground Mining

Underground mining will be based primarily on the room-and-pillar method using CM units. The CM units will continuously cut and extract coal from the coal face and load it into cars or conveyors, without the need for drills or explosives. The general plan is to mine the reserve in a clock-wise direction, removing the thickest and most gently-dipping coal first. Roof support will be required, with rock bolts acting as the main support, supplemented by timber where necessary. Bleed holes will be left around the perimeter of the mined area to vent gas liberated by mining.

Production from the underground mine operations will be from five separate seams with a minimum thickness of 1.2 m. Underground mining commences in the northern region of the property with Seam 15 in 2016 and expands to Seam 14 in 2018 with separate portals for each seam. Underground mining operations ramp up from one CM to six CM units between 2016 and 2019. As mining reserves in Seam 15 and Seam 14 are depleted, CM units will be relocated south to the three sets of portals for Seams 27, 31 and 40 in the central region of the property, in approximately Year 11 of mining starting with Mine Block 31.

2.3.4 ROM Handling

Prior to coal processing, a system of rotary breakers will size and de-stone the coal. Discard material will be transferred to a storage area at the side of the breaker and hauled to an appropriate waste stockpile at the mine. Three breakers are proposed for the site, one as part of the main processing facility, a second to the north of the site for ROM coming from the portals from mine blocks 14 and 15 and a third to the south of the mine site facilities area for ROM coming from mine blocks 27, 31 and 40 (Figure ES-3). Product from the north and south rotary breakers facilities will be transported back to the ROM coal stockpiles at the main processing facility via approximately seven kilometers of fully enclosed overland conveyors or via trucks. A wind fence will be placed along the south, southeast and east sides of the stockpile area to protect the stockpiles from the prevailing wind at the site.

At the coal processing facility, ROM from the stockpiles will be loaded into the truck dump hopper using a front-end loader. The truck dump will consist of a 300 tonne receiving hopper equipped with a 300 mm X 300 mm grizzly, an apron feeder to pull the material from the hopper and the support structure. The apron feeder will transfer the material to a conveyor that will deliver the material for primary sizing. The Coal Processing Plant (CPP) is designed to process one type of coal at a time, so extra space will be allocated at the truck dump for stockpiling each type of ROM coal.

From the truck dump, ROM coal will then be led through another rotary breaker to size the material and separate the less desirable size material via openings in screen plates. Discard material will be transferred to a storage area

at the side of the breaker and hauled to an appropriate waste stockpile at the mine. Rotary breaker product will be collected on a conveyor and transferred for storage into one of three ROM coal domes– hard coking coal, semi-soft coal and thermal coal. Storage domes will each have a 90,000 tonne capacity; this capacity will allow the CPP to operate somewhat independently of the mine. This allows mining activity to continue uninterrupted even if the CPP plant is undergoing scheduled maintenance and the CPP to continue operation if there is a short break in mining production.

2.3.5 Coal Processing

Start-up Phase Temporary CPP: Initially, during the start of operations in late 2014 and early 2015, a small temporary CPP located immediately west of the truck dump area will be used to support the first coal production. The temporary CPP would be erected at grade on a concrete slab. The modular unit is shipped complete with pre-assembled control room and electrics compliant with the requirements of British Columbia. A sprung steel-and-fabric enclosure will be used to protect the plant during the winter.

The temporary CPP would consist of a "push up" feeder-breaker coupled to a feed conveyor. The feed conveyor would deliver coal at a rate of up to 400 tonnes per hour (tph) to a multi-slope double deck vibrating screen as part of a dry-screening operation. The oversize, approximately 1500 mm x 10 mm, would report to a media drum module. The heavy media drum would separate the low ash, coarse product coal from the high ash reject material. The oversize clean coal would then pass through a crusher to produce a 50 mm product. The clean product would be conveyed to a clean coal stockpile, while the dry minus 10 mm raw undersize coal and rejects would be conveyed to separate ground-based stockpiles. The CPP will feature a small thickener and filter press to recover any fines that will be transferred to the rejects area. Depending on product specifications, the raw fines and clean coals would be blended as needed to produce saleable product.

The candidate seams for treatment in the temporary CPP would likely be thermal coals, oxidized crop coals and coking seams that are amenable to mining with minimal dilution. Washing the thermal and oxidized crop coals through this facility may result in improved economics of the larger CPP and allow the latter to be scaled down and designed to reduce operational complexities.

Operational Phase CPP: The operational phase CPP will be a single-module operation rated at a nominal 1200 tph or 7.2 Mtpa of raw feed at a 68% effective utilization. The CPP will have parallel, size-specific circuits:

- A heavy media bath circuit that will wash the 150 mm x 10 mm stream, followed by crushing to reduce the top size to 50 mm;
- A large-diameter heavy media cyclone circuit to wash the 10 mm x 1 mm stream;
- Reflux classifier circuit for the 1 mm x 0.25 mm; and,
- Two-stage froth flotation circuits for the minus 0.25 mm streams.

Each sub-product stream will employ mechanical dewatering centrifuges. Pressure filtration will be used on the < 45 micron material. All wastewaters will be recycled back into the CPP. Total product moisture values for each stream are projected to be below 8% by weight. The proposed CPP process avoids the need for a thermal dryer and this will reduce power consumption and emissions. Dust emissions in the crusher area will be minimized through the use of dust collectors and mist sprays, where required. Enclosures will be heated and vented according to regulations.

Following beneficiation in the CPP, it is proposed that the respective clean coal products will be fed into hard coking, semi-soft and thermal coal storage domes of approximately 80 Kt, 50 Kt and 2 Kt respectively, prior to loading onto barges. The covered product storage domes will keep coal dry and minimize coal dust liberation.

CPP Coarse Coal Rejects: It is anticipated that coarse coal rejects (CCR) from the CPP will be conveyed to a 300 tonne rejects bin located alongside the CPP building. En route to the rejects bin, fine dewatered reject material in the form of a paste will be loaded on top of the coarse reject material. The order of loading of the reject material will assist in keeping the conveyor belt clean and increase the efficiency of the transfer to the rejects bin and eventually to haul trucks. The combined waste material will be dried and made into a paste that will be spread in landfill cells in previously-minded areas. Reject material will be loaded into 90 tonne capacity end-dump haul trucks, the same trucks used to transport the ROM material to the truck dump. For efficiency, after hauling ROM material the trucks are utilized to back-haul the reject material to a designated disposal site. Clarified water from the process will be pumped back to the plant to be reused as process water.

2.3.6 Coal Transportation

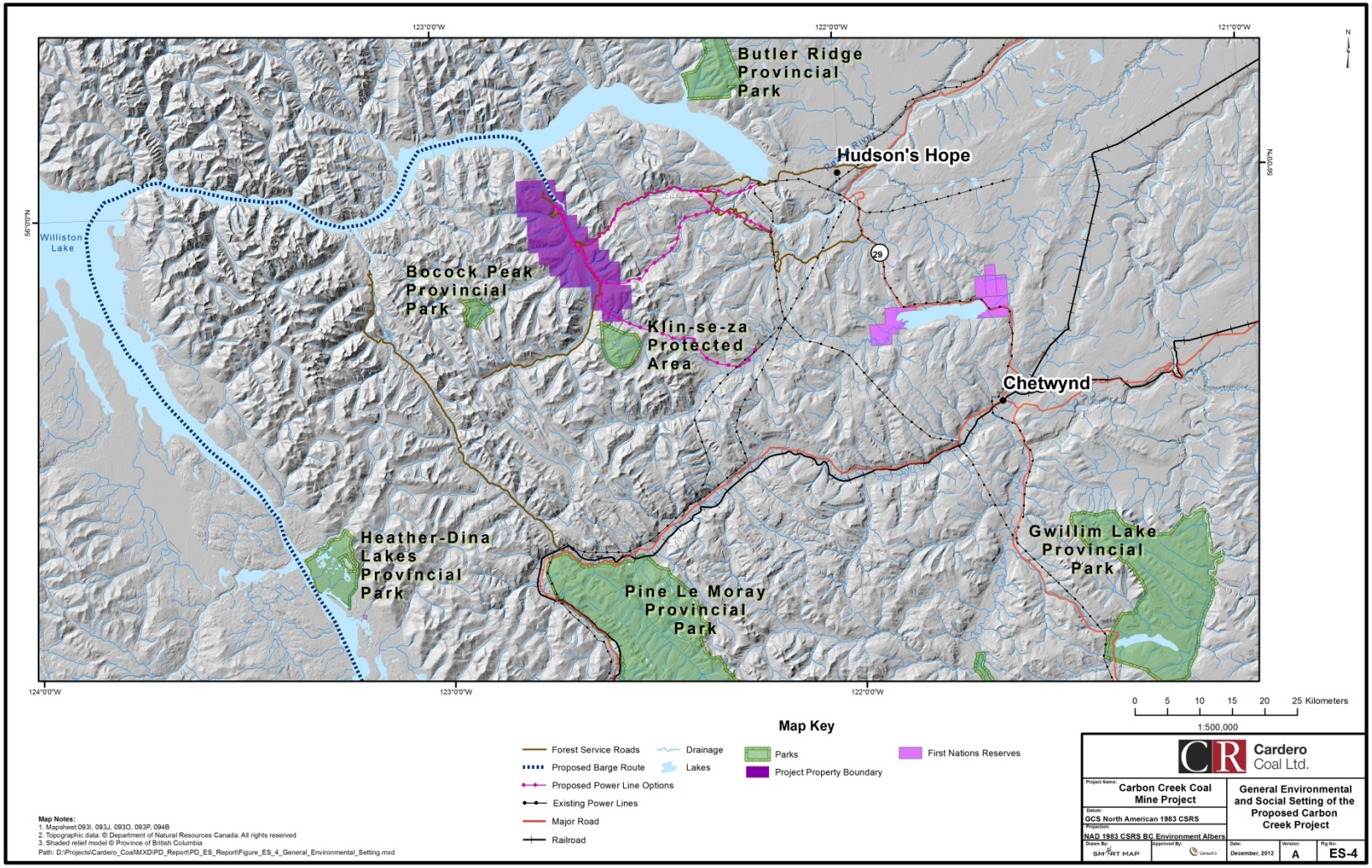
Loading Facilities: From the storage domes, coal will be fed into material draw-down hoppers, then into two reclaim tunnels and fed onto a central collection conveyor that will send the clean coal product to the barge load-out conveyor located in Carbon Inlet. Two reclaim tunnels will be required for each of the hard coking coal and the semi-soft coal products. Dozer or front-end loader access entries will be installed in the domes for occasions when it is necessary to clean out the remaining material.

Barge Transport: The transportation route currently proposed involves loading the washed coal product directly onto barges near the mouth of Seven Mile Creek on Carbon Inlet and transporting the coal approximately 175 km west and then south along Williston Reservoir to an off-loading facility at Mackenzie (**Figure ES-**). This would likely involve construction of product storage silos and a barge loading facility on Carbon Inlet near the proposed mine site and evaluation and potential development of the current facilities available at Mackenzie. Once at Mackenzie the product could be loaded onto CN Railway units for transport to Ridley Terminals at Prince Rupert for onward shipment to market. The barge is anticipated to complete a round-trip every 36 hours throughout the year once full production is achieved.

Unloading Facilities: Currently, there are two potential sites in close proximity to each other, being investigated as possible locations for the coal load-out at Mackenzie. Both sites are located within the district of Mackenzie along the Williston Reservoir in a predominantly industrialized area, approximately 5-7 km from the main residential area of Mackenzie. Both of the sites are on inactive industrial land.

Rail Transport to Ports: Clean coal product will be transferred from the incoming barges via a conveyor system into a hopper, which will dispense the coal into waiting rail cars for transport by CN Railway. Loaded coal trucks will be covered or have a latex sprayed over the coal to minimize dust generation and coal loss during transport. Although it is proposed that product logistics will be controlled from the plant site to ensure that clean coal is fed directly onto trains at Mackenzie, Cardero Coal is considering the construction of a storage dome at the terminal.

Figure ES-4: General Environmental and Social Setting of the Proposed Carbon Creek Project



2.4 LIQUID WASTE MANAGEMENT

The mine will produce wastewater from surface and underground mining operations, the mine processing plant and from office and change room facilities. The sewage water will be treated in a sewage treatment plant with treated water discharged or reused as appropriate.

2.4.1 Surface Water Drainage Control

The surface water drainage control program is designed to minimize erosion, control sedimentation, and minimize degradation of surface water quality. The surface drainage control plan will consist of a series of ditches, diversions and ponds designed to control water flow from active surface and underground mine areas, external waste storage areas and in-pit waste fills, as well as controlling groundwater in-flow from mine pits. The surface water drainage control is based on:

- Excluding naturally-occurring run-off water (unaffected by the mining operation) from mine areas, which can be released directly, thus reducing the volume of surface water that needs to be stored after contact with active mine areas; and,
- Containing run-off from disturbed areas and moving water into sumps and sedimentation control ponds for clarification, prior to its release once it has met permitted guidelines.

2.4.2 Groundwater

Groundwater will be encountered in both surface mining areas and underground mines. In the surface mine areas, both surface water and groundwater will be collected using a series of ditches and in-pit sumps for water storage. Using diversion ditches and/or pumps, water will be removed from the active pit area and sent to sediment control structures. These sedimentation structures will be designed to clarify the mine run-off and remove sediment so that it has the potential to be discharged back into the adjacent streams. Water discharged from the site will need to meet all applicable permitting requirements prior to release.

2.4.3 Mine Waste Drainage Management

Temporary and permanent mine waste rock stockpiles will be constructed in the active mine areas:

- **Temporary waste** storage areas external to the pits are needed to ensure that sufficient in-pit space is created prior to backfilling. The stockpile is moved once adequate space in the pit is available. Drainage from the temporary waste storage areas will be managed by a combination of collection ditches, silt fences, straw bale dikes or berms with sumps used to control runoff.
- **Permanent waste** stockpiles will be created in the surface pit footprints. Run-off from these permanent fills will be controlled by the use of collection ditches that will transfer the water to sedimentation control structures.

In areas where stockpiles may be affected by groundwater seeps or springs, a layer of coarse, non-acid generating (NAG) rock will be placed within the seep area. This material will be placed such that it does not affect the structural stability of the waste storage area over the seep area. All stockpiles will be contoured to minimise infiltration. In preparation for final reclamation, pit-waste stockpiles are expected to compare quite closely with

the original landforms but it may be necessary to maintain a ditch below the stockpile toe to collect run-off water. Once land is re-vegetated, drainage diversions and treatment are anticipated to be unnecessary.

2.4.4 Pit Drainage Water Management

Surface Mines: It is proposed that water discharge from the active mining area will be controlled using ditches and sumps leading discharges to sedimentation control structures. If the water cannot drain directly out of the mine, a sump, pump and ditch system will be used. Water will be ditched so that it flows into a sump and from the sump the water will be pumped to a collection ditch or directly to the sedimentation control facility.

Underground Mines: Water generated in underground mines will be ditched and drained to the portal if the grade of the mine permits, or to a sump where a pump will be used to discharge the water out of the mine. Water from the underground mines will be sent to a sedimentation control structure where it will be treated and released back to the natural drainage system.

Sedimentation Ponds: All sedimentation ponds, settling ponds, ditches, diversions or other drainage structures will be engineered and constructed according to best management practices and applicable regulatory guidelines. Water release will only be implemented when regulatory compliance is achieved.

2.5 GAS MANAGEMENT

The Project may contain coal strata with quantities of coal bed gas (CBG). Such coal strata will typically occur at depths in which hydrostatic pressures have confined gas preventing it from naturally diffusing out of the coal into the surrounding rock and to the surface. CBG primarily comprises methane (CH_4), but does not contain sour gas. It is unknown at this time what quantity or quality of CBG may exist. CBG will be the subject of further study in the mine planning and design for underground operations, primarily for safety reasons. Gas desorption testing undertaken in September 2012 suggests that minimal volume of gas (primarily CH_4) are contained in the coal seams.

2.6 MINE RECLAMATION AND CLOSURE

The final reclamation and closure plan will address the reclamation of all disturbed areas; removal of all structures not required for on-going reclamation monitoring and maintenance and conform with final land use objectives. The mine closure plans will be updated annually to reflect the on-going site activities.

The typical mine closure plan would include the following items:

- Schedule and budget for reclamation and mine closure activities;
- Description of pre-mining land use and post-closure land use objectives;
- Assessment of infrastructure requirements post-mine closure;
- Schedule for removal of all unnecessary buildings, coal processing plant, conveyors, coal stockpile areas and other associated mine infrastructure;
- Plans for final reclamation of all remaining un-reclaimed surface mine areas and underground mine portals;
- Definition of final acceptance criteria to indicate when reclamation and closure is complete and acceptable;

- Plans for the replacement of topsoil/subsoil on final reclamation areas;
- Construction of any required final erosional control structures;
- Selection of plant species, soil amendments, seeding methods and mulching for final reclamation; and,
- Plans for site monitoring and maintenance after final land reclamation is complete.

2.7 POST-CLOSURE

During the post-mine closure, the following activities are anticipated:

- Mine site surface water and groundwater monitoring (quantity and quality) to ensure permit compliance;
- Confirmation that erosion control, seeding and re-vegetation are successful;
- Regular assessment and maintenance of remaining infrastructure; and,
- Final infrastructure removal. Only the infrastructure required for post-mine closure activities will remain.

2.8 GENERAL MINE SITE FACILITIES

The proposed mine site plan includes: coal storage facilities, a CPP, product storage domes, site support facilities, and preliminary waste rock management facilities. The site support facilities planned include: an electrical sub-station, mine office, change house, warehouse, supply yard, coal loading area, and fresh and used water treatment and handling facilities. The inset in Figure ES-3 illustrates the main features discussed in this section.

2.8.1 Road Access Network

A substantial network of roads and trails was built in the Project Area during exploration and development programs prior to 1981 and by CanFor for forestry activities. A reliable connection to the Provincial highway system will be required, and is currently proposed to follow the Johnson Creek FSR route. Roads in the area of the Project are in various states of service, some having been partially decommissioned. Some former road and trail routes may also need to be re-established to support further Project evaluation and construction.

All stream crossings by Project-related linear infrastructure such as roads, transmission line rights-of-way, conveyor, etc. will be fully documented to record their status including whether they are fish-bearing or not. It is envisaged that new crossings required over fish-bearing streams will be constructed as clear-span structures to avoid fish habitat effects and changes to navigability, if deemed navigable by Transport Canada. All haul and access roads will be crowned properly and ditches will be provided to control the run-off from the road. Culverts or bridges will be used to divert water flow under the road. Temporary roads use for mine development, exploration or other miscellaneous mine activities will be ditched with culverts or water-barred to divert water off the roadways. All temporary roads not required will be re-contoured and re-vegetated to control erosion.

2.8.2 Transmission Corridor

The proposed transmission corridor is generally parallel to the Johnson Creek FSR, the main access route from Hudson's Hope to the plant site, and lies in more favourable terrain than other potentially-available options. Positioning the transmission line near, and parallel to, the access road is desirable as it reduces construction and maintenance costs and results in less habitat disturbance as there is only one corridor cutting across the landscape.

The power distribution center at the BC Hydro W.A.C. Bennett Dam is the G.W. Shrum generating station. This is approximately 35 km east of the proposed mine site and is the proposed tie-in point for a new transmission line to supply the Project. Cardero Coal may have to construct a new substation close to the G.W. Shrum generating station in the event that the existing system does not have the capacity to fulfil the Project's needs. It is anticipated that distribution to the plant and several mine sub-stations will be achieved by a combination of single- and double-pole and line options at appropriate transmission voltages.

BC Hydro and Knight Piesold recently conducted field reconnaissance surveys of a number of possible power transmission corridors from the W.A.C. Bennett Dam and Dokie sub-stations to the proposed site in the Carbon Creek Valley. Three power line corridors are under investigation and the best option will be selected through an alternatives analysis:

- **Gaylard Creek Corridor:** Running generally parallel to the proposed route being considered for the access road to the plant site. Shorter and lies in more favourable terrain. There are two different connection points demarcated currently being considered for this route.
- **Gething Creek Corridor:** Runs along McAllister Creek before turning north east up Gething Creek. Longest of the three proposed routes at 47 km.
- **McAllister Creek Corridor:** Running to the south all along McAllister Creek. Investigations stopped due to its proximity to the sacred First Nations' site of *Twin Sisters*

2.8.3 Water Supply

Water will be required at the site for the CPP, dust suppression, wash-down and fire protection systems and separate system will be developed for the potable water supply. A hierarchy of water for use in the mining operation will be established, with an emphasis placed on using mine-affected water for industrial activities prior to using unaffected water.

The hierarchy of use will be:

- Collected surface water run-off from mine areas, waste dumps and other mine facilities;
- Constructed surface water impoundments;
- Nearby lakes;
- On-site water wells; and,
- Other water storage facilities.

It is anticipated that water to be utilised for coal processing, equipment washing, and domestic uses will be sourced from Williston Reservoir, rather than depleting groundwater resources. In addition, the current CPP design incorporates re-use and recycling of water from the processing plant with maximum use being made of water captured from run-off drains and recycled water from the plant. All water supply sources will be evaluated for quality, volume, and environmentally-related effects of withdrawal.

3. Federal and Provincial Involvement

Mining projects in BC are subject to regulation under federal and provincial legislation to protect workers and the environment.

3.1 FEDERAL

The designated Project is not taking place in a region that has been the subject of a regional environmental study.

There is no proposed or anticipated financial support that federal authorities are, or may be, providing to the designated Project. No federal lands will be used for the purpose of carrying out the designated project and with the exception of federal First Nations' reserve land, there are no federal lands within 50 km of the proposed Project. Furthermore, no federal lands are expected to be affected by the proposed Carbon Creek mine operations directly, indirectly or through cumulative effects.

It is anticipated that the following federal *Acts* or *Regulations* may apply for the design and operation of the Carbon Creek Coal Project:

- *Canadian Environmental Assessment Act*;
- *Fisheries Act*;
- *Migratory Birds Convention Act*;
- *Species at Risk Act*;
- *Navigable Waters Protection Act*;
- *Explosives Act*;
- *Canada Transportation Act*;
- *Radio Communications Act*; and,
- *Canada Shipping Act*.

3.2 PROVINCIAL

Below is a list of the anticipated provincial *Acts* and *Regulations* which may apply for the design and operation of the Carbon Creek Coal Project:

- *British Columbia Environmental Assessment Act;*
- *Mines Act;*
- *Coal Act;*
- *Environmental Management Act;*
- *Water Act;*
- *Drinking Water Protection Act and Regulations;*
- *Forest Act;*
- *Land Act;*
- *Public Health Act;*
- *Transportation Act;*
- *Motor Vehicles Act;*

- *Heritage Conservation Act;*
- *Wildlife Act; and,*
- *Wildfire Act.*

4. Environmental Context

4.1 GENERAL ENVIRONMENTAL SETTING

The regional topography of the Project Area occurs as a belt of hills and low mountains. The highest elevation on the Property is slightly over 1,600 m above sea level (masl). The moderately to steeply sloping ground descends to an elevation of about 680 masl on the shores of Williston Reservoir. Most of the project area is below the tree line and is densely forested with spruce and pine. Black bears and grizzly bears are present in the area, in addition to moose, caribou, stone sheep, mountain goats, and deer. The creeks are populated with various species including Arctic grayling and various trout species.

Carbon Creek flows from south to north across the Property, and enters Williston Reservoir at Carbon Inlet, located to the north of the Property. Carbon Creek is fed by a number of west- to east-flowing creeks, the most prominent being Seven Mile Creek, Nine Mile Creek, Ten Mile Creek, and Eleven Mile Creek. These tributaries are named according to their approximate distance from Peace River, which is now covered by Williston Reservoir. McAllister Creek is a major east- to west-flowing tributary of Carbon Creek and joins the river in the southeastern portion of the Property (Figure 4). Utah Mines Ltd conducted several environmental baseline studies throughout the 70s and 80s at the proposed mine site and some of that data and information has been used to inform and guide the recent program of environmental baseline studies and monitoring currently being conducted as part of this EA process.

4.2 CLIMATE

Climate in the Project Area is influenced by the moist, unstable, and mild maritime Pacific air mass during the non-freezing months and by the dry, stable, and subject to extreme temperatures continental Arctic air mass during the winter months. These two air systems typically create short, warm summers and long, cold winters. The main meteorological parameters are described as follows:

- **Temperature:** Average daily summer July temperatures are typically around 15°C while average daily winter January temperatures are typically around -10°C based on data from Environment Canada meteorology stations Pine Pass Mt. Lemoray (ID 1186A71) and Mackenzie Airport (ID 1184790).
- **Precipitation:** Annual precipitation at the site is expected to be in the range of 655 to 791 mm. Precipitation typically falls as snow from November through March and as rain from June through September, while precipitation in other months consists of a mixture of rain and snow.
- **Wind:** Winds generally blow along a north-south axis near the centre of the Property, along Carbon Creek, with variations dependent on local topography.

4.3 HYDROLOGY

The Property is centred about the locally-named Carbon Creek, one of the ten major sub-basins that drain into British Columbia's Williston Reservoir. Carbon Creek is a third-ordered basin, with a drainage area of approximately 740 km^2. It flows north into Williston Reservoir and features several sediment deposition zones along its main channel. Within the Property, several smaller, steep gradient sub-basins drain from east and west into Carbon Creek and are locally referenced as Five Mile to Eleven Mile Creeks.

Since 1998, Water Survey of Canada has operated a hydrometric station at the mouth of Carbon Creek (Station No. 07EF004). Over the period of record, the hydrograph-based results indicate that extended low-flow periods occur during the colder winter months, from December to early April. The seasonally-high peak discharges typically occur between the first of May and the end of June of each water year. This type of stream flow pattern is indicative of snowmelt-dominated water discharge regimes. Mean annual runoff from Carbon Creek has ranged from 290 mm to 780 mm over the eleven years of available data and is approximately 540 mm.

4.4 HYDROGEOLOGY

Slug tests carried out as part of the groundwater studies in the mid-1970s and early 1980s by Utah Mines Ltd. identified two types of material: poorly–permeable bedrock (Case 1) and aquifer materials (Case 2), represented by sands and gravels and fractured bedrock zones. The current hydrogeological program, being conducted as part of environmental baseline studies will confirm the validity of these findings and further describe site groundwater conditions.

4.5 WATER QUALITY AND AQUATIC RESOURCES

Preliminary baseline data from current 2011/2012 aquatic studies relating to categorization of some of the main waterways likely affected by the Project are presented in Table 5.

Table 5: Main Waterways' Width, Depth and Gradient, 2011.

Stream	Zone	Northing	Easting	Avg. Channel Width (m)	Avg. Wetted Width (m)	Avg. Gradient (m)	Avg. Bankfull Depth (m)	Avg. Residual Pool Depth (m)
7 Mile Creek	10U	6204887	513359	13.2	7.9	5.0	0.9	0.4
9 Mile Creek	10U	6202890	519821	7.7	3.8	10.5	1.7	0.4
10 Mile Creek	10U	6201361	520566	12.3	5.2	2.2	1.8	0.4
11 Mile Creek	10U	6197005	519457	19.1	14.7	2.0	0.7	0.5
McAllister Creek	10U	6191537	524132	17.2	13.5	1.3	0.6	0.6
Unnamed Tributary	10U	6193867	524840	9.4	3.5	2.5	0.6	0.5
Carbon Creek*	10U	6199882	521546	53	-	0.5	-	-

**Data sourced from Fisheries Inventory Data Queries, B.C. Ministry of Environment.*

The only existing use of waterways in the vicinity of the Project Area is subsistence/recreational fishing, predominantly carried out by First Nations. Detailed information regarding these activities is not currently available; however, this information is being collected as part of on-going baseline studies: Traditional Use/Knowledge Studies in support of the EA.

Surface water quality surveys were conducted during the period 1971 to 1976 for the Utah Stage I EIA. The historical surface water quality data for Carbon Creek and its tributaries indicates that pH was generally alkaline, ranging from 7.0 to 8.6. Suspended solids data were naturally variable over a year, peaking at 115 mg/L, corresponding with a fall rain event in October, although most measurements were below 30 mg/L. The nutrient concentration in streams was low and they are therefore considered to be oligotrophic. Total metals concentrations were generally considered low, as most were often close to or below the available method detection limits of analytical

procedures employed at that time, as well as being below domestic and aquatic life water quality guideline values of the day (Environment Canada 1979; Environmental Protection Service 1977). Selenium concentrations were not reported, however, current baseline and modelling studies are being conducted to determine the Project's potential for selenium effects on valued ecosystem components.

4.6 METAL LEACHING AND ACID ROCK DRAINAGE

The coals occurring within the Property occur in the upper to middle sections of the Gething Formation, consisting of abundant, but relatively thin, coal seams. The percentage of sulphur in these seams reportedly ranges from 0.57% to 1.88%, average 0.94% S. A limited amount of historical metal leaching/acid rock drainage (ML/ARD) testing was conducted for the Carbon Creek coal deposit in the Utah Mines Ltd. Stage II EIA. Five 'acid production potential tests' (i.e., BC Research acid production potential test procedure) were completed on composite samples of mudstone (0.95% S), sandstone (0.14% S), siltstone (0.26% S), roof-and-floor composite (0.18% S), and coal composite (0.59% S). The coal composite sample was classified as potentially weakly acid generating and the other samples as non-acid producing.

4.7 FISHERIES AND FISH HABITAT

Information obtained from previous studies conducted in the vicinity of the Project Area between 1970 and 2000 indicate the existence of the following resident fish populations in Carbon Creek and its tributaries throughout this time:

- Rainbow trout (*Oncorhynchus mykiss*);
- Bull trout (*Salvelinus confluentus*);
- Kokanee (*O. nerka*);
- Dolly Varden (*Salvelinus malma*);
- Sculpin (general) (*Cottus* spp.);
- Slimy sculpin (*Cottus cognatus*);
- Arctic grayling (*Thymallus arcticus*);
- Longnose suckers (*Catostomus catostomus*); and
- Mountain whitefish (*Prosopium williamsoni*).

Williston Reservoir, to the north of the Project Area, provides habitat for:

- Bull trout;
- Rainbow trout;
- Kokanee;
- Lake trout (*S. namaycush*);
- Mountain whitefish; and,
- Lake white fish (*Coregonus clupeaformis)*.

Effects on fish populations will be driven by water quality management at the site from features such as the location of effluent discharges and the effectiveness of water collection and discharge management structures.

The Carbon Creek watershed and tributary creeks within the Project Lands are currently thought to support populations of rainbow trout, bull trout, kokanee and Arctic grayling. The presence or absence of a fisheries'

trigger, as decided by Fisheries and Ocean Canada (DFO), will determine the requirement for a fish habitat compensation plan.

Provincial and federal fisheries agencies are anticipated to have specific interest in understanding the potential for selenium redistribution and accumulation in the aquatic environment resulting from mining and waste rock management. The presence of waste rock dumps may also potentially affect water flow to the streams on the site. The repercussions of these changes on fish and fish habitats in the area will be investigated.

The baseline program and results generated from the effects assessment will form the basis for an aquatic effects monitoring program (AEMP) or Environmental Effects Monitoring (EEM) program, that will help determine any potential effects to Valued Components (VCs) in the aquatic environment and identify clear mitigation measures. The AEMP/EEM will be designed to monitor potential effects resulting from development activities during all phases of the Project.

4.8 WILDLIFE

The region encompassing the Project Lands is known to be home to many terrestrial wildlife species including:

- Grizzly bears;
- Black bears;
- Northern caribou;
- Mountain goats;
- Moose;
- Elk;
- Stone sheep;
- Avian species (e.g., birds of prey, migratory songbirds, and waterfowl); and,
- Amphibian species (e.g., western toad).

Based on historical studies, ecological databases, and other observations, these wildlife groups are anticipated to occur within the regional area surrounding the Project Lands and are undergoing more detailed study during the environmental baseline monitoring currently being conducted.

A substantial amount of historical work on wildlife has already been conducted in or near the Project Lands and the region in the late 1970s and early 1980s for the Utah Mines Ltd. Stage II EIA. This relatively high-level baseline assessment yielded limited quantitative information on wildlife populations in the area, but identified the presence of mountain goat and northern caribou as important wildlife species requiring consideration. It also suggested that moose were present in much of the area, although winter habitat use was restricted and had been influenced by the earlier flooding of the Peace River for hydro-electric development. It was also suggested that mule deer may spend summers in the Carbon Creek area, while marten were abundant throughout the area and grizzly bears were also present.

Of note was the substantial number of harlequin duck breeding sites documented along both Eleven Mile and Carbon Creeks. In addition to harlequin ducks, migratory species such as Canada geese and common mergansers have also been observed in the lower section of Carbon Creek. The BC blue-listed Canada Warbler (SARA; Threatened status) has also been detected in the region.

The Provincial government has designated certain areas within the region as important for wildlife, including an approved ungulate winter range (UWR) for caribou, big horned sheep and mountain goat (UWR u-9-002) and approved Wildlife Habitat Areas (WHAs) for northern mountain caribou (WHAs 9-050 and 9-051). UWRs and WHAs are protected and managed under the *Forest and Range Practices Act* (2002).

UWR u-9-002 covers an extensive area in the region, predominantly located south of the Carbon Creek and McAllister Creek confluence. UWR u-9-002, Unit No. SPC-037, noted as high elevation mountain goat winter range across Mounts Cowper, Wrigley and Rochfort, is the only unit of UWR u-9-002 that overlaps with an area subject to the Project's Coal License Applications (i.e., specifically application 416898) and Coal Licenses (i.e., 418174, 418175, 418176, and 418177). Cardero have already officially established this area as a 'no-go zone' following consultation with interested First Nations and the Province's Mineral Titles Office.

WHAs 9-050 and 9-051 identify high elevation caribou calving and rutting habitats surrounding Mount McAllister and Mount Monteith. These two WHAs overlap the eastern portions of the areas subject to Coal License Applications 416892 and 416891, and extend southeast of the areas subject to these Coal License Applications. These Coal License areas are not resource targets of the current Project and are not intended to be impacted by any planned project components or infrastructure.

4.9 ECOSYSTEMS AND VEGETATION

The Project Lands are set in the Sub-Boreal Spruce wet cool (SBSwk) and Engelmann Spruce-Subalpine Fir moist very cold (ESSFmv) Biogeoclimatic Ecosystem Classification (BEC) subzones. Terrestrial ecosystems and vegetation were mapped in 1981 to 1982 within the area of Utah's proposed mine site and along the haul road and transmission line (Utah 1982b), indicating that the climax vegetation of the Subalpine Zone was coniferous forest dominated by subalpine fir (*Abies lasioscarpa*) and hybrid Englemann with white spruce (*Picea engelmannii X glauca*) which concurs with the ESSFmv BEC classification for the area. However, this mapping will require updating as the terrestrial ecosystems and vegetation have changed over the last 30 years due to extensive logging and the pine beetle epidemic that has occurred in the area.

Drawing on historical studies in the project area, wetlands were also addressed in the 1982 Utah Mines Ltd. Stage II EIA report. The information was collected before formal wetland classification structures were developed by Environment Canada in 1991. In the Utah Mines Stage II EIA, the term "meadow" is used to describe boreal and sub-alpine complexes of grassland, sedge, and low shrub plant communities occurring as intermittent openings, or in saturated, high-water level areas (bogs), in forests, and along valley floors. Wetlands exist predominantly in the Project Area along the lower, shallower slopes and valley floor along Carbon Creek. Wetland distribution in accordance with current classification standards and wetland function will be addressed as this is central to the environmental assessments of wetlands.

4.10 TERRAIN AND SOILS

A review of existing information, aerial photography, and on-site inspections of the proposed Project Area, as identified in the Utah Stage I and II EIAs, indicate that the area was previously glaciated. This has resulted in a range of landforms and glacial deposits occurring in the Project Area. The till of Carbon Creek Valley is generally silt- and clay-textured and consists of a heterogeneous mixture of debris ranging from clay- to boulder-sized materials and is very compact.

Soils mapped in the Project Area were classified as: Brunisols, Luvisols, Regosols, Podzols, and Organic.

Mudslides and mudflows are common on the higher, steeper, and wetter road cuts and clearly involve the poorly-consolidated upper several metres of till. Several slides have occurred on the steep north slope of Seven Mile Valley where it is undercut by Seven Mile Creek.

The soils in the Project Area outlined in the Utah Stage I and II EIAs were assessed for topsoil suitability and salvage depth. The soils were rated as good to poor. The average salvage depth was between 75 and 115 cm. Many of the soils in the Project Area were rated as fair for suitability for reclamation.

4.11 POTENTIAL ENVIRONMNETAL EFFECTS

Although discipline specialists contracted by Cardero Coal are still in the process of collecting baseline data and analysis has not been completed, it is apparent that some environmental components may potentially be affected by the proposed mine development. These potential effects include:

- **Water quality may potentially decline in local creeks:** The water quality in creeks, especially those with small catchments (low receiving water volume), within the proposed mine development may be affected by the proposed mine activities.
- **Water quality in fish-bearing creeks**: Some local creeks with healthy fish population are currently heavily utilized for recreational fishing. The combination of continued aggressive fishing techniques and potential declining water quality from mine activities might make these recreational fishing spot less desirable.
- **Stream flow in project area streams potentially declines**: Mine dewatering activities may affect stream flow as it is anticipated that some of the base flow in the streams is derived from groundwater systems.
- **Stream flow phasing**: The presence of waste rock dumps can potentially reduce water flow to the streams on the site, spreading peaks out over a longer period and therefore reducing the peak flow events. The effects of this on the fish and fish habitats will be investigated, though a more stable flow would be beneficial to fish if the water quality is maintained.
- **Potential selenium bioaccumulation in fish and birds:** Selenium occurs in coal deposits within the Northeast BC coalfield; its potential effects are currently being modelled.
- **Sedimentation zones in Carbon Creek may affect barging in low water conditions:** A bathymetric study is being conducted on the barging points to determine if the sediment zones will affect all year round barging activity.
- **Potential impact on wildlife migration across the Williston Reservoir:** Due to the barging activities for the proposed mine with round trips every 36 hours, it is anticipated that the reservoir will retain an ice-free, open channel through which the barge moves. If wildlife is currently using the Reservoir as a corridor in winter months, this may no longer be possible in the future with the open channel.
- **The presence of the species at risk in the area and potential habitat loss:** Although studies are underway to confirm this, species at risk (e.g., the Western Toad; Special Concern) have been identified as potentially having habitat in the general area of the proposed mine development.
- **Potential for rare plants in proposed mine area:** Although none have been found to date, the potential for encountering rare plants on the mine site exists. The plants and the area in which they could be found would require suitable management measures.

- **Loss of Habitat:** The proposed mine has a surface footprint and there will inevitably be some habitat loss. By maximizing underground operations, the mine footprint is being managed, but cannot be eliminated. Progressive reclamation is to be implemented during the mine life, in order to minimize the overall impact of surface disturbance.
- **Potential deleterious effects on air quality:** Various coal mining activities, such as conveyance, loading and unloading of material, have the potential to generate fugitive coal dust which can affect ambient particulate matter (PM) concentrations. There is also potential for emissions of nitrogen oxides (NO_x), sulphur oxides (SO_x), carbon monoxide (CO) and greenhouse gases (GHG) from mine related activities. Best available technology and management practices will be incorporated into the Project design to minimize potential effects.

4.12 MITIGATION MEASURES

As part of the EA process, Cardero Coal is developing management plans that will give effect to mitigation measures for the potential effects from the proposed mining operation. These plans are being developed in consultation with specialists and First Nations.

5. Social Context

5.1 ENGAGEMENT AND CONSULTATION FIRST NATIONS GROUPS

Cardero Coal has engaged with First Nations (FN) groups in the area prior to the commencement of the 2010 exploration program. This engagement program commenced with potentially-affected FNs in the vicinity of the Carbon Creek property in July of 2010. Engagement activities with these groups have included:

- Introductory letters and meetings regarding exploration plans and programs;
- Site Visits requested by First Nations;
- Draft and final Project Description documents;
- E-mail and telephone updates;
- Attendance at, and support of, various community events; and
- General relationship-building.

To date, the majority of the engagement program has involved Saulteau First Nations, West Moberly First Nations and the McLeod Lake Indian Band. More recently, this engagement has been extended to include Halfway River First Nations, Takla Lake and Tsay Keh Dene due to changes in the proposed product transportation route to barging.

Key issues and interests expressed during the initial engagement activities include:

- Proximity to the *Twin Sisters* sacred site;
- Loss and deterioration of wildlife habitat;
- Potential impacts on water quality;
- Potential effects on traditional land use and culture;
- Potential impacts on Aboriginal and Treaty Rights;
- Employment and benefits;
- Air quality deterioration (coal dust); and
- Worker safety.

Cardero Coal continues to engage with all interested FNs to more fully understand the exact nature of interests and concerns, and the potential for Project-related impacts on their communities. Cardero Coal has implemented a comprehensive consultation program to provide all interested parties with the opportunity to learn about the Project, identify issues, and provide input, with the goal of positively enhancing Project planning and development. This will continue to include: meetings and working sessions with FN band leadership and community, public open houses, and information sessions. Consultations will be supported by a variety of information materials and mechanisms to encourage feedback, thereby providing the opportunity to be fully informed about the Project and to have convenient and accessible means to provide input.

5.2 PUBLIC AND OTHER GROUPS

Consultation with various federal, provincial, regional and municipal government departments has been initiated and has continued throughout the recent exploration and Project planning programs on an on-going basis. The

objective of the initial engagement was to introduce the company and provide a general overview and relevant environmental and socio-economic considerations related to the Project to stakeholders ranging from EA regulators to local communities. Cardero Coal also provided information on ongoing consultation opportunities that will occur throughout the EA process.

Cardero Coal wishes to gain a comprehensive understanding of, and involvement in, issues related to: the local economy, land rights, infrastructure, community health care, housing availability, and taxation issues. Key comments gained from consultation activities to date include: the need for a full-time doctor in Hudson's Hope, availability of training and employment opportunities, potential for localised economic prosperity, enhancement of community recreational opportunities, and responsible environmental management of the project and surrounding area.

Engagement and consultation with Federal, Provincial, and municipal governments, the public, and other interested stakeholders are being conducted on an ongoing basis throughout all stages of Project planning, regulatory review, and construction, to provide all interested parties with opportunities to learn about the Project, identify issues, and provide input with the goal of positively enhancing Project planning and development. This will include:

- Meetings and working sessions;
- Public open houses; and,
- Information sessions.

Consultation will be supported by a variety of information materials and mechanisms including posters for open houses, newsletters, and information sheets to encourage feedback, thereby, providing all with the opportunity to be fully informed about the Project and to have convenient and accessible means to provide input.

5.3 POTENTIAL EFFECTS TO FIRST NATIONS LAND USE AND RESOURCES

Although specialists contracted by Cardero Coal are still in the process of collecting baseline environmental data, traditional use studies are being developed and prepared and consultation is on-going, it is apparent that there may be some social components potentially affected by the proposed mine development. These potential effects include:

- **Potential lack of appropriate training** to fully get involved in employment at the mine;
- **Potential influx of "outside" workers** which brings with it factors that could result in disruption of the social fabric of First Nations. Typically this is seen as an increase in the availability of drugs and alcohol in the areas surrounding mine sites.
- **Potential loss of water quality and subsequently aquatic biota** and their habitat which could affect First Nations' treaty rights, including fishing.
- **Potential loss of wildlife and plant habitat** could affect the local First Nations' treaty rights, including hunting and also gathering traditionally-important medicinal plants.
- **Potential loss of access to the mine site** and some of the streams used by First Nations and others for the purposes of trail-walking, berry collection, hunting and fishing. With a mine development some of these areas may temporarily be lost until after mine closure and access to some of the areas may be restricted

during operations for safety reasons. There may also be a loss of some of the resources during operations.

- **Archaeological and paleontological resources** may potentially be uncovered or lost during operations. Efforts are currently underway to determine the potential zones for encountering these resources. Management plans will be developed in consultation with the specialists and the First Nations to ensure ways forward can be found that would be acceptable to all parties.
- **The number of projects in the area is steadily growing** and this is likely to result in disruption to First Nations Communities and also their resources. The cumulative effects will need to be determined in consultation with the First Nations Groups.

5.4 CURRENT OVERVIEW OF EFFECTS STATUS

Based on the incomplete information of on-going environmental baseline studies and the need for further analysis and modelling, the proposed Cardero Coal Carbon Creek Metallurgical coal project does not appear, at this stage, to have any effects that cannot be mitigated. Furthermore, the on-going consultation with First Nations has resulted in alternative designs being developed to avoid sensitive areas (e.g., *Twin Sisters*). Where these concerns have been identified, Cardero Coal has responded by seeking alternatives that avoid those areas and which include suggestions from First Nations Groups about what would be more acceptable.