Mine 14 Project

Impact Agency of Canada – Designation Request

Aseniwuche Winewak Nation of Canada

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TABLE OF CONTENTS

List of Tables

List of Figures

List of Appendices

1.0 PROJECT INTRODUCTION

Summit Coal Inc. ("Summit") is the current holder of approvals under the Alberta *Coal Conservation Act* (Mine Permit No. C 2009-6) and Alberta *Coal Conservation Rules* (Mine Licence No. C 2011-9) for the Mine 14 Project (the "Project"). Mine 14 is an underground coal mine that will produce approximately 900,000 to 1,000,000 clean metric tonnes (CMT) per year. The Project represents a high-quality, low volatile, bituminous metallurgical coal resource that will be utilized in the steelmaking industry. This Project represents the responsible development of a known resource that will benefit the local community, stakeholders and Indigenous communities. The duration of the Project will be approximately 9 years.

The Project is located in west central Alberta (Figure 1-1), approximately 4.0 km north of the Hamlet of Grande Cache, directly east of the Smoky River and north and east of Provincial Highway 40 (Figure 1-2). The Project consists of an access road and a mine portal area (Figure 1-3). The Mine Portal Site (Figure 1-4) is generally surrounded by public Crown land that is used for a variety of activities that include public and private recreation, trapping, coal, forestry, and other resource activities.

All lands required for the Project are provincial Crown lands and are subject to numerous approval requirements. Summit has already received the Mine Permit and Mine Licence from the Alberta Energy Regulator ("AER") but is still seeking an *Environmental Protection and Enhancement Act* ("EPEA") Approval, *Water Act* Approval and *Water Act* Licence, which are discussed below. The Mine Permit and Mine Licence are attached in Appendix 1.

Mine Permit No. C2009-6 (Figure 1-2) was received on December 2, 2009. This permit relates to the development of an underground coal mine. Lands involved in this permit include the access road, mine portal location, and underground working area. The mine is designated as Mine No 1814/14 Mine. Mine Licence No. C2011-9 was received on April 20, 2011. This licence authorizes the development of an underground coal mine.

Summit had submitted applications for the outstanding EPEA and *Water Act* approvals but, at the AER's request, it is now resubmitting them with updated information. Summit had previously received public lands approvals for the access road (LOC 131361) and the mine portal area (MSL 131303), which expired in 2021 but for which are being reapplied for.

Summit is in the process of attaining the remaining approvals that are required for the Project. In June 2022, Summit widely distributed a newsletter announcing the company's plans for Mine 14. The June 2022 newsletter is attached at Appendix 2.

2.0 PERMITS AND APPROVALS

The initial application for the Project was completed in 2007. The Project has been the subject of rigorous review, and has received numerous approvals. The Mine Permit and Licence are presented in Table 2-1. The permit and approval regulatory decisions are presented in Table 2-2. The authorizations for the Project are presented in Table 2-3. These are described in this section.

2.1 Mine Permit and Mine Licence

Applications were submitted to the AER (formerly known as the Energy Resources Conservation Board) for the Mine Permit and Mine Licence. The Mine Permit was found to be in the public interest and approved. The Mine Licence was also approved and provided detailed operating approvals for the Project.

The locations of both the Mine Permit (C 2009-6) and Mine Licence (C 2011-9) are provided in Table 2-1 and shown on Figure 2-1. The Mine Permit and Mine Licence are attached at Appendix 1.

Table 2-1 Mine Permit and Licence Locations	
Mine Permit	**Location**
C. 2009-6	LSD 12, 13, Sec 03, 057, 08, W6M
	LSD 9,10,11,15,16, Sec 04, 057, 08, W6M
	LSD 3,4,6,11,10,15,16, Sec 10, 057, 08, W6M
	LSD 3,4,5,6,7,10,11,12,13,14,15, Sec 14, 057, 08, W6M
	LSD 1,10,11,13,14,15,16, Sec 15, 057, 08, W6M
	LSD 16, Sec 16, 057, 08, W6M
	LSD 1,8,9,10,15, 16Sec 21, 057, 08, W6M
	LSD 1,2,3,4,5,7,12, Sec 22, 057, 08, W6M
	LSD 2,3,4, Sec 23, 057, 08, W6M
	LSD 2,3,7,8, Sec 28, 057, 08, W6M
Mine Licence	**Location**
C. 2011-9	LSD 5,6,10,11,12,13,14,15, Sec 14, 057, 08, W6M
	LSD 10,11,13,14,15,16, Sec 15, 057, 08, W6M
	LSD 1,8,9,10,15, 16Sec 21, 057, 08, W6M
	LSD 1,2,3,4,5,7,12, Sec 22, 057, 08, W6M
	LSD 3,4, Sec 23, 057, 08, W6M
	LSD 2,3,7,8, Sec 28, 057, 08, W6M

2.2 EPEA and the *Water Act*

The AER has reviewed applications that Summit submitted under EPEA and the *Water Act*. As part of the review process, the AER has provided numerous information requests, to which Summit has responded. Draft EPEA and *Water Act* approvals were issued for the Project.

Summit is currently preparing an updated Project application which includes updates to the baseline data and previously performed environmental assessment of the Project. Summit plans to submit the updated Project application to the AER by December 2022.

2.3 Public Lands Act

Summit applied, and received approval, for a Licence of Occupation for the main access road (LOC 131361) (Figure 1-3). Summit also applied, and received approval, for a Mineral Surface Lease for the Mine Portal area (MSL 131303) (Figure 1-3). Both of these approvals expired in 2021, but Summit is in the process of reapplying for them.

2.4 Financial Security

Financial security for the Project has been provided in the amount of $2,150,000 and will be revised on an annual basis once operations commence.

2.5 Alberta Transportation Roadside Permit

Summit applied, and received approval, for Roadside Development permits (Permit No. 1476-3345 and No. 1476-3545). These permits have expired, but Summit is currently reapplying for them.

2.6 The Municipal District of Greenview ("MD Greenview") Development Permit

MD Greenview has required Summit to apply for development permits. Summit has prepared its application for the development permits and will submit them to MD Greenview following the receipt of the MSL and LOC dispositions.

2.7 Historical Resources Act Clearance

Summit applied, and received approval, under the *Historical Resources Act* for clearance to construct the Project's mine access and mine portal. The clearance is attached at Appendix 4.

2.8 Government of Canada Approvals

The Canadian Environmental Assessment Agency ("CEAA") issued a letter determining that Summit did not require any federal approvals for the Project and referred the Project to the DFO. Transport Canada, Environment Canada, Health Canada, Indian and Northern Affairs Canada, and Natural Resources Canada (as they were then known) were notified of the Project and indicated that they did not have responsibility over the Project. CEAA's letter is attached in Appendix 5.

2.9 Department of Fisheries and Oceans ("DFO") Canada

DFO reviewed the Project and issued a Letter of Advice (File No. 07-HCAA-CA1-00689) on May 5, 2009, concluding that the Project is not likely to result in impacts to fish and fish habitat. The Project remains essentially the same today as it was at the time of the DFO's conclusion. The DFO's Letter of Advice is attached in Appendix 6.

2.10 Status of Permits and Approvals

A list of the permits and approvals required for the Project is provided in Table 2-2. The Mine Permit and Mine Licence are attached at Appendix 1.

Table 2-2 Permits and Approvals Required for the Project		
Approval	**Issued**	**Status**
Mine Permit C2009-6	December 2, 2009	In good standing; No Expiry
Mine License C2011-9	April 20, 2011	In good standing; No Expiry
CPP C2013-3	Unknown	Expires on April 30, 2023 unless operator satisfies the AER by no later than January 30, 2023.
Draft EPEA Approval No.234735-00-00	N/A	Updated Project Application to be submitted to the AER by December 2022.
Draft *Water Act* Approval No. 241239-00-00	N/A	Updated Project Application to be submitted to the AER by December 2022.
Draft *Water Act* License No. 24507-00-00	N/A	Updated Project Application to be submitted to the AER by December 2022.
Mine Financial Security Program (MFSP)	N/A	Currently no security is held under the MFSP for the Summit Coal No. 14 Mine. Based on the information provided to the AER in 2019, the AER informed Summit via a letter to provide the outstanding security deposit of $2,150,000 under the MFSP, for the AER to make a decision on the EPEA application.
MSL 131303	July 12, 2013	Expired June 2020, currently being reapplied for
LOC 11155 (Carconte Creek Exploration)	September 28, 2011	Expires September 27, 2036
LOC 131361 (Main Access Road)	July 12, 2013	Expired June 2020, currently being reapplied for
Mine 14 Coal Leases (1312050624; 1312050625)	May 2, 2012; May 3, 2012	Expires May 2, 2027
Mine 14 Coal Leases (1319090196; 1319090197; 1319090198)	September 26, 2019	Expires September 25, 2034
Alberta Transportation Roadside Development Permit No. 1476-3545	May 14, 2013	Expired May 14, 2014, currently being reapplied for
MD Greenview Development Permit	N/A	Not Started
MD Greenview Land Use Redesignation	N/A	Not Started
Canadian Impact Assessment Agency	N/A	EIA was not required

Table 2-2 Permits and Approvals Required for the Project		
Approval	**Issued**	**Status**
Historical Resource Act Clearance 2007-212	August 31, 2007	Granted on August 31, 2007 associated to Permit 2007-212 (access road, plant site, mine portal)
Historical Resource Act Clearance	October 7, 2010	Granted October 7, 2010 associated to Permit BOHACH 2006-17A (Carconte Creek Exploration)

An overall list of the required authorizations and their associated details is provided in Table 2-3.

Table 2-3 Authorizations for the Project				
Regulatory Agency	**Applicable Act / Authorization**	**Approval No. & Name**	**Date of Issuance**	**Expiry Date**
AER	Mine Permit	C 2009-6	December 2, 2009	n/a
	Mine Licence	C 2011-9	April 20, 2011	n/a
Government of Alberta Energy	Mine Coal Lease	1312050624; 1312050625	May 2, 2012; May 3, 2012	May 2, 2027
	Mine Coal Lease	1319090196; 1319090197; 1319090198	September 26, 2019	September 25, 2034
	Mine Coal Lease	1312050632	May 3, 2012	May 2, 2027
AB Sustainable Resource Development	License of Occupation Application	LOC 11155 (Carconte Creek Exploration)	September 28, 2011	Expires September 27, 2036
Government of Alberta	License of Occupation Application	LOC 131361 (Main access road)	July 12, 2013	Expired June 2020
Government of Alberta	Mineral Surface Lease	MSL 131303	July 12, 2013	Expired June 2020
Government of Alberta Transportation & Civil Eng.	Roadside Development Application Approval	No. 1476-3545	August 24, 2012	Expired November 1, 2013
Government of Alberta Transportation & Civil Eng.	Roadside Development Application Approval	No. 1476-3545	May 14, 2013	Expired May 14, 2014
Foothills Forest Products	Timber Salvage Committal	LOC 131361	May 26, 2014	Unknown
Alberta Tourism, Parks, Recreation & Culture	Historical Resource Act Clearance	Research Permit 2007-212	August 31, 2007	Unknown
Government of Alberta Historic Resources Management	Historical Resource Act Clearance	Permit BOHACH 2006-17A	October 7, 2010	Unknown

3.0 PROJECT DESCRIPTION

In 2006, Summit began the process of obtaining approvals to commence underground mining activities at Mine 14. The Project was put on hold for a period of time because coal commodity prices were not favourable for development, but under the current economic climate, coal commodity prices have become favourable. This has prompted Summit to resume seeking the remaining approvals required for the Project.

The Project is an underground room-and-pillar operation with the potential to produce about 1,300,000 raw metric tonnes per year (RMT) (approximately 900,000 – 1,000,000 clean metric tonnes (CMT) or 2,740 tonnes per day). The No. 10 Seam will be mined first, followed by the No. 4 Seam. The raw coal from Mine 14 will be transported to the approved Coal Processing Plant ("CPP") located off-site at the Milner Generating Station.

The approved project components for Mine 14 include:

- Surface portal and facilities (no external waste rock dumps will be created);
- Underground mine (room and pillar method);
- Access road; and
- Water management and drainage control features (i.e., ditches, sedimentation pond, mine water pond, treated wastewater pond).

3.1 Surface Portal and Facilities

The underground mine will require two portal benches with one portal bench per seam (Figure 1-4). Project components near the mine portal (collectively, the "Mine Portal Site") include: portal structures (i.e., mine fans, mine utilities, portal conveyor); site facilities (i.e., administrative offices, maintenance shop); coal handling facilities (i.e., conveyors, screening station, coal storage shed and loading out silo); and site drainage (i.e., ditches, ponds).

Highway 40, located south of the Mine Portal Site, will provide site access for employees and materials. The total surface disturbance of the Mine Portal Site and the access road will be approximately 100.3 ha. Figure 1-3 shows the proposed Mine Portal Site layout.

Electrical power and telephone service will be delivered via overhead lines. Mine entries, or openings in the coal seams required for ventilation, will be established at the Mine Portal Site along the outcrop. The Mine Portal Site will be fenced to prohibit unauthorized access.

Explosives will be required during the construction of the mine. Explosives will be used to fragment rocks for the Mine Portal Site, mine access road cuts, and mine entries development.

During this period, construction and management of the explosives supply and storage will be contracted out to contractors. During normal mine operations, the mine development will progress within the coal seams. The explosives will only be used for underground mine development, such as the construction of overcasts. It is estimated that an explosive will be used about once per month, and that an average of 50 kg of explosives will be used each time. The explosive storage magazine will be located on the southwest corner of the Mine Portal Site and is proposed to store no more than 50 kg of explosives.

3.2 Underground mine (room and pillar method)

The No. 10 Seam will be mined first, followed by the No. 4 Seam (Figure 3-1). The product is a high-quality, low volatile, bituminous metallurgical coal that will be used for steelmaking.

Coal extraction will be accomplished using continuous miners loading onto shuttle cars while the roof and side supports are created by roof bolting machines. The coal will be transported and unloaded onto a central belt conveyor by the shuttle cars.

The complement of equipment has been sized and configured to match the mining conditions, and to comply with Canadian mining regulations.

The mine plans for both seams are based on the room and pillar method with secondary pillar extraction. It is assumed that two continuous miners will be set up to feed a single feeder/breaker and belt conveyor. The equipment will consist of two continuous miners, three shuttle cars, two crawler mounted roof bolters, two diesel scoops, a feeder/breaker, and the ancillary support equipment. Mobile roof supports will be used during pillaring operations.

The mining conditions that are critical to the selection of equipment are: seam height; seam dip; and roof and floor conditions. Regulatory requirements are a non-mining condition critical factor. The seam height averages 3.4 m. This requires the use of a mid- to high-seam continuous miners.

Mid-sized electric shuttle cars with heavy-duty wheel units will be selected. The cars would be equipped with alternating current (AC) variable frequency drives, which should improve performance in the steeply dipping and potentially wet floor conditions while offering regenerative braking. The shuttle cars will need to be furnished with heavy-duty frames and suspensions, and feature crab steering capabilities.

The proposed roof bolters are mid-sized, walk-through design machines with crawler drives for mobility and materials handling systems. To improve safety and productivity during pillaring operations, four 800- tonne mobile roof supports have been included in the Project . The

proposed feeder/breaker is a heavy-duty, mid-sized machine with a variable throughput capacity of up to approximately 1200 tonnes per hour.

The proposed scoops are flameproof, diesel driven, rubber tired, LHD style vehicles, which meet international standards for coal mine operations. If Canadian certified scoops are not available when the mine initiates operation, battery-powered equipment with multiple sets of batteries will be used. Other required underground diesel equipment includes personnel carriers and a utility forklift.

Underground equipment will also include: section power centres; a rock duster including an outside 150-tonne storage bin; pumps; and communications and mine monitoring equipment. The Project will be equipped with the best available technology that is economically achievable.

Major surface equipment will include a Caterpillar IT28 sized forklift, and medium duty four-wheel drive trucks for administrative and surface use.

3.3 Coal Transportation and Mine Access

Summit will transport coal from the Mine Portal Site to the approved CPP located at the Milner Generating Station via the Proposed Access Road and Highway 40 (Figure 1-2). The distance is 6.5 km from the portal site to Highway 40, and another 20 km to the CPP.

Summit had obtained an Alberta Transportation Development Permit to access Highway 40. The permit has since expired, but Summit is currently reapplying for the permit.

Once the raw coal reaches the surface by way of a belt conveyor, it will be processed through a rotary breaker. The waste rock (0.5-3%) will be hauled back to underground workings, which means there will be no external waste rock dumps needed for the Project. The under-sized material will be sent to the coal storage shed through a secondary belt conveyor. Coal will be trucked via highway trucks (approximately 96 trips per day or 4 per hour) to the approved CPP at the Milner Power Generating Station for processing. The CPP is a fully approved facility. Milner Power Inc. is the holder of Alberta *Coal Conservation Act* Coal Processing Plant Approval No. C 2013-3 and EPEA Approval No. 9814-03-00 for that facility.

3.4 Water Management

This section describes the site drainage evaluation and management of runoff on the Mine Portal Site. Measures for conveyance of runoff along the access road and at creek crossings are also discussed, along with the proposed management of wastewater and water treatment is also discussed. The proposed access road and mine portal area do not affect fish-bearing creeks (Figure 3-3). The following drainage characteristics have been taken into consideration:

- The Mine Portal Site is located within the drainage area of Carconte Creek, a tributary to Grande Cache Lake. Clean water runoff from the upstream watershed is diverted around the active site while on-site measures control site drainage.
- The access road crosses numerous small streams that are tributaries to Carconte Creek, Allan Creek and Two Cabin Creek. Roadside ditches and culverts are used for conveyance and erosion protection measures are proposed to mitigate potential impacts from sediment and erosion.

Specifics on the water management design are attached in Appendix 7.

3.4.1 Hydrologic Analysis

A hydrologic analysis as part of the supporting studies was completed to comply with regulatory requirements. The goal of this analysis is to provide an estimate of flow discharge at any location, including the portal site and drainage areas at each of the stream crossings of the coal haul route. This analysis was used to determine pond and culvert sizing during significant flow events (i.e., 1:100 year return flows).

3.4.2 Water Balance Analysis

As part of the Water Management Plan, there are three main ponds needed to manage water at the portal location. There are also clean water diversions, ditches and culverts required to ensure collection and conveyance of surface runoff (Figures 3-2 and 3-4). The three ponds include:

- Stormwater Pond (Figure 3-4): The purpose of this pond is to capture all surface runoff from the mine portal area to be stored for use in the mine. If excess volumes occur, they may occasionally be released into the Carconte Creek drainage following sampling and lab analysis to ensure water quality meets the *Water Act* and EPEA guidelines.
- Mine Water Pond (Figure 3-4): The purpose of this pond is to contain groundwater pumped out of the underground mine areas for use in the mine, with discharge to occur only during significant precipitation events (i.e., >1:10 year) following sampling and lab analysis to ensure water quality meets the *Water Act* and EPEA guidelines.
- Wastewater Pond (Figure 3-4): The purpose of this pond is to store wastewater from the on-site water treatment plant, with the water being mostly re-used in the mine, with discharge to occur only during significant precipitation events (i.e., >1:10 year) following sampling and lab analysis to ensure water quality meets the *Water Act* and EPEA guidelines.

The operation of the Project requires a water supply for the underground mining activities, dust control and fire suppression. Potential sources of this water include capturing runoff for re-use, captured groundwater, treated wastewater, and hauling water from the Hamlet of Grande Cache.

With the construction and management of these ponds, there is an opportunity to harness runoff for on-site uses. A water balance analysis was completed, which found that the Project will use approximately 150 m^3 of water per day. It is anticipated this water will be reliably supplied from the on-site water management structures.

3.4.3 Stormwater Management Plan

Concepts

The drainage plan for the Project has four fundamental objectives:

1. Minimize impacts on existing drainage courses with respect to water quantity and quality;
2. Comply with the regulatory requirements for industrial runoff management at the Mine Portal Site;
3. Comply with the regulatory requirements for watercourse crossings; and
4. Optimize collection and storage of rain and snowmelt at the portal site for on-site water demand requirements.

By meeting these four objectives, the drainage strategy will adhere to the various overarching policies and legislation. The surface water management features, overland flow patterns, and discharge points are shown on Figure 3-2.

Access Road

There are nine mapped locations where the proposed access road crosses natural drainage courses were identified. The natural drainage courses at the access road crossings have very high longitudinal slopes, ranging between 10% and 20%.

Culverts are proposed at the road crossings and the initial sizing was completed using the detailed data from the hydrology assessment. The proposed culverts will meet the Alberta Infrastructure and Transportation Design Guidelines.

Portal Site

The drainage strategy for the portal site consists of:

- Construction of drainage berm/ditch systems to intercept flows from external areas and divert clean flows to bypass the portal site;
- Construction of internal drainage ditches and road swales to convey stormwater runoff towards the sedimentation pond;
- Construction of a sedimentation pond to store stormwater and settle suspended particles;
- Construction of a mine water pond to store groundwater from the underground mine. This pond will be used to complete the storage requirement to capture part of the water demand at the mine;
- Use of the proposed treated wastewater pond to complete water demand at the portal site. The proposed reuse of this water is exclusively for toilet flushing.

The proposed level of design for the internal and external drainage channels is the 1:100 year event. The actual capacity of the sediment pond is designed to fully contain the 24-hour; 1:10 year design storm and to safely handle runoff from more extreme events via controlled discharges to natural system and internal water reuse.

A schematic of the proposed stormwater pond, mine water pond operation and treated wastewater pond is shown in Figure 3-4.

Channels for External Areas

Berm/ditch systems (Figure 3-2) are proposed to prevent clean water flow from external/undisturbed areas from entering the portal site. The selected design flows are those associated with a 1:100 year flood event.

The first set of berm/ditch system at the north boundary of the portal site runs from west to east (Figure 3-2) and intercepts flows from a catchment area of about 15.4 ha. The second system runs from north to south on the west boundary of the portal site and drains an external area of approximately 27.1 ha.

The proposed typical ditch has, at a minimum, a triangular cross section with 2:1 side slopes and a total depth of 0.50 m.

Internal Drainage – Roadside Ditches and Other Drainage Ditches within the Portal Area

Summit will use roadside ditches as the main conveyance system to drain the portal area and convey stormwater to the proposed stormwater pond. Culverts are proposed to cross internal roads.

In addition to roadside ditches, swales along the top of the cuts or fill embankments will be placed to prevent water draining onto steep slopes and causing stability issues.

The proposed typical swales and roadside ditches have the same geometry as the channels for external areas, i.e., a triangular cross section with 2:1 side slopes and a total height between 0.5 and 0.75 m.

Stormwater Pond, Mine Water Pond and Wastewater Pond

One pond is proposed to store stormwater and settle suspended particles. Stored water is to be re-used within the portal site according to operational water demand of the mine site. Release of water into the natural drainage courses may be required after rainfall events depending on the water levels at the ponds. Controlled release will occur only when meeting water quality requirements as specified by the site Approval.

One mine water pond is proposed to store groundwater from the underground mine and to complete the required storage to meet the water demands at the portal site.

To store and reuse treated wastewater, a wastewater pond is proposed.

The total storage capacity of the three proposed ponds is approximately 30,000 m^3. According to the water balance analysis, maintaining this amount should be adequate to prevent make-up of water to meet the demand of water during mine operation.

A control structure will be installed to maintain the stormwater pond at the design normal water level (Figure 3-4) and to control water transfer to the mine water pond. The storage between the normal water level and spill elevation on the sedimentation pond is designed to contain the entire 1:10 year storm event. The control structure will have a sluice gate to hold water between normal water level and spill elevation after rain events for one day while water quality analyses are conducted. Due the water demand at the mine site, the water level at the ponds is expected to be lower than normal water level at the beginning of most of rainfall events.

3.4.4 Monitoring

Stormwater

Summit will implement a program for monitoring discharge from the stormwater pond to ensure that it meets water quality standards before discharge, as per the EPEA and *Water Act* Approvals. All site water that will be released into the adjacent environment will be tested prior to release. Tests will be conducted at downstream sampling locations, to ensure compliance with the EPEA and *Water Act* Approval conditions. Sampling locations are shown on Figure 3-2.

Discharges from the stormwater pond will occur in response to rainfall events. Controlled releases are designed for storm events with return periods lower than 10 years and for a portion of the volume of more extreme events. Since water can be reused, the water elevation is likely to be lower than normal water level for most storm events. The total annual release is estimated to average approximately 80 mm/year (800 m^3/ha/year). The average annual precipitation is approximately 540 mm (5,400 m^3/ha/year) and total runoff is approximately 160 mm (1,600 m^3/ha/year). Uncontrolled releases will be through emergency spillways. The maximum expected daily average flow is 350 L/s through the spillway.

Clean surface runoff will be intercepted and directed around the disturbed area by a series of runoff diversion channels. Runoff that comes into contact with the disturbed area will be collected in a series of runoff collection channels and diverted to the stormwater pond. Water retention time in the pond will be sufficient to allow total suspended solids ("TSS") to settle before the water discharges into local drainages.

Wastewater

Treated wastewater will be discharged into a vegetated swale at very low rates for infiltration. The average daily released volume is expected to be approximately 30 m^3 during summer months. The average release rate of treated wastewater into a vegetated swale during summer months and dry days will be less than 0.5 L/s. A wastewater treatment plant will treat the wastewater from bathrooms and restrooms. Expected main components from the effluent of the wastewater treatment plant include biological oxygen demand (BOD) and TSS, whose concentrations are expected to be below 10 mg/L. These are the parameters that are typically sampled if discharge occurs. Wastewater will be treated and stored during winter months and discharged into a vegetated swale during summer months.

Mine Water

Mine water will not be released into the natural drainage courses. A mine water pond is proposed to store mine water. This pond will be used as an extension of the storage capacity of the sedimentation pond. Stored water could be used for dust control and fire protection.

3.4.5 Selenium

External rock dumps, which are most often the sources of selenium and other metals normally associated with open pit or surface mining, are not planned for the Project. The Project will not involve open pit or surface mining. Selenium is not expected to be generated by the Project due to its underground nature. All waste rock material (0.5-3%) from the underground workings will be disposed of underground. There will be no opportunity for waste rock to weather and leach selenium into the environment.

3.4.6 Summary

The proposed Water Management Plan meets the applicable regulatory requirements. The drainage system comprising localized swales, roadside ditches, culverts and sedimentation ponds can be implemented to meet stormwater quantity and quality objectives, including:

- The entire volume generated by a 10-year, 24-hour storm event can be contained within the proposed stormwater pond. The outlet system comprising a gated manhole will allow for controlled releases and water quality sampling and analysis, based on the *Water Act* and EPEA Approvals, prior to releasing captured runoff into natural drainage courses, if required.
- Runoff captured in the ponds can be used for the water requirements at the mine site. The vast majority of the water consumption for mine operations (99% on average) can be provided by reusing collected stormwater runoff and groundwater from the mine collected at the mine and stored at the stormwater ponds, assuming that 31,500 m^3 per year of groundwater can be collected at the ponds.
- On average, make up water requirements to cover water demand at the mine site are approximately 570 m^3 per year. Annual values can vary between zero for wet years and 760 m^3 for the dry years.
- With the increase in water demand for internal reuse, the risk of uncontrolled spills into natural watercourse during the mine's life span is reduced to near zero.
- The retention time at the sediment ponds allows for the removal of most particles greater than 5 microns in size.

The ponds also provide storage for mine operation including dust control, mine water and fire protection.

4.0 INDIGENOUS AND STAKEHOLDER CONSULTATION

Summit is fully engaged in securing and obtaining the remaining required approvals. In June 2022, a newsletter was widely distributed announcing the company's plans for Mine 14. The June 2022 newsletter is attached at Appendix 2.

This section provides a summary of past and current consultation activities.

4.1 Proposed Project Timelines and Consultation

Construction of the mine and related infrastructure will commence immediately upon receiving all the necessary regulator approvals. Final detailed planning of the mine is in progress and will continue, concurrent with the permitting process. Table 4-1 outlines the current Project schedule which is subject to change based on regulatory review and procurement of necessary equipment

Table 4-1 Project Schedule – Updated

Activity	Dates
Public and Indigenous Consultation	2005 to 2007, 2011 to 2013, beginning once again in 2022 and ongoing throughout the regulatory application processes and life of the Project.
Detailed Engineering	2010 to 2013; 2021 to present
Construction/Procurement	Q3 2023 to Q1 2024
Commissioning	Q1 2024
First Coal	Q1 2024
Operations	2024 to 2033 (subject to change based on coal demand)

First production from the mine is projected to begin in Q1 2024 and will be completed in 2033. Facility decommissioning and site reclamation will commence immediately after mine closure and is anticipated to take 2-3 years to complete. Environmental monitoring and maintenance will continue until a final reclamation bond is released by the AER.

4.2 Previous Stakeholder Engagement

Summit (via Milner) has engaged Indigenous communities and public stakeholders regarding the Project since April 2005. Summit designed an initial consultation plan and obtained additional consultation design input from the stakeholders, resulting in a customized consolation that fit the interests and lives of stakeholders in the area.

Table 4-2 outlines the previous Project consultation that has been completed.

Table 4-2 Project Consultation Completed

Year	Date(s)	Individual(s), Groups or Organizations Engaged
2005	June 13–15	AWN, Métis Local 1994, Town admin, HR Milner GeneratingStation employees
	June 23	Various Stakeholder Presentations
	July 13–15	Various Stakeholder Presentations
	December 14–15	AWN Elders, Council
2006	February 15–16	Presentations
	April 25–26	Various Meetings and Open House #1
	July 13	Stakeholder Meeting
	November 14–16	Town Council presentation
2007	January 23–24	Plant, Town Council
	February 26–27	Socio-Economic Impact Assessment interviews
	March 6–7	Various Meetings, Council
	March 21	Various Meetings
	March 27–29	Various Meetings, AWN
	April 17–20	Various Meetings and Open House #2
	May 1–2	HR Milner Generating Station
2011	June 1, 2011	Open House #1
	December 1, 2011	Open House #2
2022	March 3, 2022	Project re-introduction meeting – Mountain Métis
	March 4, 2022	Project re-introduction meeting - Municipal District of Greenview
	April 19, 2022	Project reintroduction presentation – Municipal District of Greenview Committee of the Whole
	April 20, 2022	Project re-introduction meeting - Aseniwuche Winewak First Nation
	April 20, 2022	Project update meeting – Mountain Métis
	August 24, 2022	Meeting with property owners on road LOC (UBar Ranch and GC Saddle Club
	Summer 2022	Mountain Metis requested and was provided approved funds for a Traditional Land Use (TLU) study. The field work was completed in summer 2022. The TLU was completed and a report finalized in late summer 2022. A confidential copy was provided to Valory and selected member of the MEMS project team.
	Spring/Summer 2022	Horse Lake First Nation – Communication with HLFN has been largely through Edwards Lands. The Community was identified by the Aboriginal Consultation Office ("ACO") as requiring consultation on the project.

Table 4-2 Project Consultation Completed		
Year	**Date(s)**	**Individual(s), Groups or Organizations Engaged**
		The Community indicated wanting to undertake a site visit. The project approved funding for the site visit and it was completed late August 2022.

Summit recognizes that Participant Involvement and consultation is an ongoing element of the Project. Consultation will continue throughout all phases of the development of the Project, including operations and reclamation.

Summit will continue to conduct regular community consultation events and meetings with stakeholders to manage relationships and lines of communication. This includes ongoing consultation with Indigenous communities, the local and provincial government, the public, industry, area trappers, and others. Summit plans to hold an open house prior to starting construction and will continue to be transparent and available to all stakeholders and Indigenous communities in the Project area. Plans to hold an open house in the fall of 2022 were communicated to stakeholders through a newsletter distributed in June 2022.

Communication will be maintained through various channels, including a Project website that will be developed closer to the beginning of approved activities and construction, and through newsletters and notices in local newspapers. Summit is also considering opening a community office in Grande Cache as means of being more visible and available to stakeholders throughout the life of the Project.

4.3 Indigenous Consultation

Consultation with Indigenous communities located near the Project commenced in the spring of 2005 and continue today.

All Indigenous groups identified through initial research and consultation undertaken by the ACO have been engaged. Summit will contact the ACO during its updated Project application process to ensure that all local Indigenous groups that have identified during the pre-assessment review process are actively engaged. The Indigenous engagement process will include both the EPEA application process, and the public lands disposition process.

The Indigenous groups that have been identified and engaged are shown in Table 4-3.

Table 4-3 Indigenous Communities Contacted 2007-2012, 2022	
Métis Nation of Alberta Local #1994	Community of Victor Lake/Mtn Louie (not affiliated with AWN)

Aseniwuche Winewak Nation of Canada (AWN)	Upper Athabasca Métis Elders Council (UAMEC) and Mountain Louie
Indigenous Communities Contacted 2022	
Métis Nation of Alberta Local #1994	Horse Lake First Nation
AWN	East Prairie Métis Settlement

Concerns that have been identified by Indigenous groups generally involve environmental matters (i.e., noise, dust, water, and air contamination), location issues (i.e., traffic), and access to and use of areas surrounding the Project. Additional issues of importance to local Indigenous groups relate to wildlife, especially any pressures that may result from additional hunting due to increased access to areas surrounding the Project.

Not all individual communities within a represented group have been engaged, and for those communities, their issues and concerns have been assumed to be similar to the represented Indigenous group that has been engaged.

Dialogue and engagement will continue as individual communities or members respond to Summit's open invitations to participate in the Participant Involvement process. Through their sharing of specific issues and concerns, their individual responses are addressed and, where feasible and practicable, resolved.

Specific engagement activity is detailed in the following sections.

Consultation Process (2007 and 2012)

Early in the process, Summit recognized that a customized and highly flexible approach to consultation was warranted, including because of the geographical dispersion of Indigenous communities surrounding Grande Cache. Summit specifically tailored consultation processes to those potentially affected by this Project.

Summit's consultation strategy with Indigenous communities to date has also been guided by several different processes and guidelines. Summit's efforts were guided by Federal and Provincial guidelines and regulatory directives (i.e., then existing Aboriginal Affairs and Northern Development Guidelines and AER Directive 56), as well as best practices and a "good neighbour" approach that erred on the side of inclusion in the engagement processes, even if there was no regulatory requirement to do so. Summit also drew on Indigenous communities' own consultation and engagement guidelines (i.e., AWN's "Living in Two Worlds" (2007)). As part of its efforts to indicate its commitment to Indigenous communities, Summit also developed an Indigenous policy to guide conduct and protocols for Indigenous consultation.

Consultation Phases (2007 and 2012)

Summit has consistently advised all Indigenous communities that its intention to consult and engage spans the planning, construction, and operation phases. Now, during the period of the Project's final applications review, Summit continues to provide Project development information and incorporate new Indigenous concerns into design considerations and operational requirements, such as in developing its Emergency Response Plan.

Summit discussed the Project with the AWN and the Métis Nation Local #1994 ("Mountain Métis"), the two Indigenous groups nearest to the Grande Cache area.

Agreements (2007 and 2012)

Summit (via Milner) entered into various agreements with both the AWN and the Mountain Métis. Initially those agreements were Memoranda of Understanding (MOU) that laid out the positions of the parties and a willingness to engage in good faith discussions to negotiate other agreements (e.g., Impact Benefit Agreements or IBAs), opportunities (e.g., contracting, supplying and employment) that the proponent can provide. These MOUs laid the foundation for other engagement and agreements in the regulatory process and the life of the Project. A MOU was signed September 16, 2009 with AWN and another was signed September 18, 2008 with the Mountain Métis.

Additional agreements were also signed, including an agreement with Aseniwuche Environmental Corporation ("AEC") signed on March 10, 2010 for AEC to provide Baseline Environmental Monitoring services. An Impact Benefit Agreement with AWN was drafted in 2013.

Confirmation and updates (as required) to all agreements will be part of the upcoming engagement activities that Summit will be completing with the identified Indigenous communities. Draft agreements are presented in Table 4-4. Formal agreements and letters of support for the Project are presented in Table 4-5.

Table 4-4 Draft Agreements

Date	Nation	Agreement or Project Document
2013	Aseniwuche Winewak Nation	Impact Benefit Agreement

Table 4-5 Formal Agreements and Related Project Documents		
Date	**Nation or Organization**	**Agreement or Project Document**
September 16, 2008	Aseniwuche Winewak Nation	Memorandum of Understanding
September 18, 2008	Mountain Métis Local #1994	Memorandum of Understanding
March 10, 2011	Aseniwuche Environmental Corporation	Contract for Environmental Services
April 24, 2009	Mountain Métis Local #1994	Letter of Support
September 10, 2009	Aseniwuche Winewak Nation	Letter of Support

4.4 Regional Stakeholder Consultation

Summit applied the following key principles as its basis for participant involvement and consultation:

- Project introduction to any represented Indigenous community or designate in Grande Cache, including initial assessment of potentially adversely affected groups or communities;
- Provision of plain language information describing the scope and location of the Project, and clear identification of potential design options and their short- and long-term adverse effects;
- Meetings and dialogue to discuss ideas, comments and concerns of the potentially adversely affected groups or communities;
- Discussions of strategies to avoid or mitigate potential adverse effects on traditional uses by affected groups or communities;

At the time, Summit consulted with numerous governments, local authorities, and local industry stakeholder prior to filing the 2007 EPEA and *Water Act* applications. Table 4-6 provides a summary of these conversations.

Table 4-6 Government, Local Authority and Local Industry Consultation (previously completed for 2007 and 2012)		
Organization	**Date**	**Summary of Conversation**
Alberta Environment	Various	Timing for submittal of EPEA reclamation bond
Alberta Sustainable Resource Development (ASRD)	Various	Construction schedule
Alberta Infrastructure & Transportation	Various	Construction Timing & Intersection design

Energy Resources Conservation Board	Various	Increase in haul traffic
Grande Cache Coal Ltd.	January 5, 2012	Discussed increased coal production and coal beneficiation facility.

Summit held two open houses for the 2012 coal licence amendment (which was approved) on June 1, 2011 and December 1, 2011. The open houses were intended to engage the community and to listen, learn, and answer questions about the proposed project from the local communities. The first event was held at the Grande Cache Métis Community Hall, with a total of 18 participants attending, including representatives from the Mountain Métis. The second event took place at the Grande Cache Tourism Interpretive Centre, with 30 participants attending, including representatives from the Hamlet of Grande Cache, industry, AWN and the Mountain Métis.

4.5 **Renewed Stakeholder and Indigenous Engagement**

In March 2022, Summit re-engaged the AWN and the Mountain Métis Association as well as MD Greenview. Project leaders were unable to meet with the AWN in March, but held a meeting with them on April 20, 2022.

The meeting with the Mountain Métis on March 3, 2022 was an opportunity to re-introduce the Project, introduce new Project leadership, and provide a status update. Initial comments from the Mountain Métis provided a historical background and structure of the community and indicated the need for an updated Traditional Land Use ("TLU") Study, which was funded and completed in July 2022. The confidential results were provided to Summit. Other issues raised at the meeting were an interest in jobs for Mountain Métis and the desire to negotiate an IBA. The re-opening of discussions between the parties was positive and both sides indicated a willingness to work together.

The meeting with MD Greenview at the Council Meeting on April 19, 2022 was similar to that with the Mountain Métis, in that it was an opportunity to re-introduce the Project and meet local representatives of the municipal district. The meeting indicated changes in Project ownership, and the status of permitting and other regulatory applications. MD Greenview suggested that the Project should communicate to stakeholders as soon as possible. Other concerns raised during the meeting with MD Greenview related to the Carconte Creek watershed, the limited amount of housing in the area, and whether traffic from the haul road would interfere with the Grande Cache Landfill.

Summit will continue to engage with all Indigenous and public parties that are in proximity or may have a direct interest in the Project. It is Summit's intention to engage fully, transparently and collaboratively to identify stakeholder and Indigenous community concerns, address and

resolve them as much as feasibly possible, and to ensure that stakeholders and Indigenous communities have a voice in the engagement process.

In 2022, the ACO identified Horse Lake First Nation ("HLFN") as another community that Summit must consult with. Representatives of HLFN indicated to Summit that they wanted to understand the Project's effects on the area and requested a site visit. Summit approved the request and provided funding to HLFN to undertake a site visit. The site visit was completed in late August 2022.

The revised public and stakeholder engagement plan for the Project retains the values identified in the original 2007 EPEA and *Water Act* application, as well as Summit's commitment to participant involvement. It will guide the details, values and conduct of Summit personnel and any contractors participating in engagement. The main components of the revised Public and Stakeholder Engagement Plan are:

- Identify all Indigenous communities and public stakeholders and/or their representatives;
- Notify and inform all Indigenous communities and public stakeholders of the Project, providing Project information through various channels, ensuring that all events are accessible to all stakeholder and are advertised locally well in advance;
- Consult and engage openly and transparently with all stakeholders, providing accurate and updated Project information, attending all set meetings with the personnel best suited to the subject matter of the meeting, and working with stakeholders to identify opportunities to provide more information;
- Resolve issues and concerns by ensuring that stakeholders are aware of all meetings, open houses or other events or channels where feedback can be provided to Summit, ensuring that all feedback is responded to in a timely manner, ensuring that all information is accurate, ensuring that all reasonable efforts to resolve any issue or concern is made known to stakeholders;
- Prepare and file applications and audit materials, ensuring that all stakeholders are aware of all regulatory applications being made regarding the Project, providing access to any publicly disclosed materials; and
- Track and document, ensuring that all meeting minutes, emails, phone calls and event details are documented and stored for any reporting requirements or issue resolution. This will include tracking any regulatory or other commitments made to Indigenous communities and other public stakeholders.

Summit presented to MD Greenview's full Council Meeting on April 19, 2022. To ensure that the public has every opportunity to participate on the Project, all public meetings and open

houses will be publicized well in advance. They will be held when the maximum number of interested people may attend (i.e., after normal working hours) and in locations that are easily accessible. Additional options to communicate with the Project and provide feedback will be explored and established, including the possibility of opening a community office in Grande Cache. An inaugural newsletter was published in June 2022 and sent to key stakeholders and Indigenous communities providing an update on the regulatory process and providing a basic overview of the project, including figures showing the location and a proposed schematic of the Mine Portal Site.

Summit recognizes that its commitment to being a responsible operator in the area will also require additional efforts to ensure that local suppliers, contractors, and job seekers are supported and prioritized, as well as community development. Summit will develop a Local Content and Employment Plan, which will provide clear processes to support local businesses and job seekers for opportunities on the Project. A Community Investment Plan will also be developed to support local initiatives and events that are important to the community.

5.0 ENVIRONMENTAL INFORMATION

Detailed environmental studies have been completed since Project planning began in 2005. The results of these studies formed the basis of the applications that were approved through the issuance of the Mine Permit and Mine Licence. More recently, the EPEA and *Water Act* approvals have subject to review and numerous information requests from the AER, to which Summit has responded. Summit intends to submit updated baselines conditions and assessments to the AER in an updated Project application. These activities are currently being completed under the guidance of the AER's rigorous approval application process. Summit is currently preparing an updated Project application with plans to submit to the AER by December 2022.

The Project area is located in sub-alpine and Montane Natural Subregions of the Rocky Mountain Natural Physiographic Region. The Rocky Mountain Natural Region is characterized by rugged topography and strong elevation gradient, with the widest range in elevation (825 m to 3,600 m) of any natural region in Alberta. This strong elevation gradient results in rapid changes in aspect, slope, substrate, and climate.

The Project area itself is characterized by subalpine coniferous forest with minor streams, steep, rocky slopes, and few level areas. Elevation ranges from 1,400m to 2,000m (Figure 1-2).

The Mine Portal Site and coal lease areas are rocky and undulating. The nearest waterbody to the Mine Portal Site is Carconte Creek, located just east of the Mine Portal Site (Figure 1-2). Carconte Creek is a dry stream for a good portion of the year.

The permanent, major water bodies that are closest to the Mine Portal Site are the Smoky River to the west, the Muskeg River to the northeast, Grand Cache Lake to the southeast, and Victor Lake to the south (Figure 1-2).

According to MD Greenview Land Use Bylaw 18-800, the Project area and adjacent lands are classified as Crown Lands, the purpose of which is to provide for a variety of land uses. This includes natural resource extraction and natural resource processing.

The Project area is essentially undeveloped except a non-Project-related communications facility on the south peak of Grande Mountain, with a low-capacity power line running from Grande Cache to that facility. Several exploration roads and reclaimed drill sites are scattered across the Project area. There are no industrial structures, tailings ponds, or similar facilities near the proposed Project area. There are no unusual natural features near the proposed Project, either.

The following sections Discuss the environmental components that are of concern to the Impact Assessment Agency of Canada ("IAAC"). These include:

- fish and fish habitat;
- species at risk;
- migratory birds;
- changes to the environment on federal lands;
- changes to the environment in a province other than the one where the project is taking place; and
- changes to the environment outside of Canada, and environmental effects arising from federally regulated projects.

5.1 Fish and Fish Habitat

Several drainages exist and will be crossed by the access road (Figure 3-3). Most of these are ephemeral in nature and rarely have any water in them, but do have flow as they move further downstream. Water from the drainages reports to Two Cabin Creek, Allen Creek, Carconte Creek and a small tributary to the Smoky River. All crossings will be constructed following the Code of Practice for Watercourse Crossings. Descriptions of these crossings are provided in Appendix 8 based on field sampling that was completed in August 2022, and are discussed in more detail in this section.

There are also some drainages within the mine portal area that report to Carconte Creek. These are also dry for most of the year and do not contain fish or fish habitat. Water from the mine portal disturbance will be captured and managed as part of the water management program.

Details and descriptions of the watercourse crossings and the drainages they report to are provided in this section.

5.1.1 Tributaries to Two Cabin Creek

The Proposed Access Road crosses a number of unnamed tributaries to Two Cabin Creek (Figure 3-3), which include:

- Crossing 1;
- Crossing 3; and
- Crossing 4.

Under the Code of Practice for Watercourse Crossings (AENV 2000), Two Cabin Creek and its unnamed tributaries are designated as Class C with a Restricted Activity Period (RAP) of August 1 to July 15, which means that construction can occur between July 16 and July 31.

Appendix 9 and the following section summarizes the existing fish community in the mainstem of Two Cabin Creek and the fish habitat for the two unnamed tributaries associated with the Proposed Access Road.

Fish Community

There are no Fish and Wildlife Management Information System ("FWMIS") reports of fish presence in this tributary or within the mainstem of Two Cabin Creek or the unnamed tributaries to Two Cabin Creek (ASRD 2006a). In addition, there were no reports of fish presence in any of these watercourses during a literature search.

Fish Habitat

At the time of the environmental assessment that Summit undertook in October 2006 (the "October 2006 assessment"), the unnamed tributary to Two Cabin Creek was characterized as a poorly defined ephemeral draw that likely only conveys water during the spring freshet or during heavy precipitation events.

There was some evidence of a defined channel and flowing water at the proposed crossing 1 near the Highway 40. This is to be expected with most of the drainages as they get further downstream and closer to Highway 40. There was a small open channel with small flow at Crossing 4 as well. Crossing 3 was dry.

In summary, the unnamed tributaries to Two Cabin Creek are not sensitive to construction and operation activities as they relate to the development of an access road. These unnamed tributaries were not considered sensitive because of their poorly defined channels and low flows, except during the spring freshet or heavy precipitation events. There are numerous barriers to fish movement and these channels do not provide suitable fish habitat.

Using best management practices and construction techniques, impacts to Two Cabin Creek can be minimized. All crossing designs will meet Alberta Infrastructure and Transportation Design Guidelines and the Code of Practice requirements.

5.1.2 Tributary to the Smoky River

The Proposed Access Road crosses an unnamed tributary of the Smoky River (Figure 3-3), Crossing 2.

Under the Code of Practice for Watercourse Crossings (AENV 2000), the Smoky River and its unnamed tributaries are designated as Class C with a RAP of August 1 to July 15, which means that construction can occur between July 16 and July 31.

The following section summarizes the existing fish and fish habitat in the tributary to the Smoky River associated with the Proposed Access Road.

Fish Community

There are no FWMIS reports of fish presence in this tributary to the Smoky River (ASRD 2006a). In addition, there were no reports of fish presence in this tributary to the Smoky River from the literature search. The nearest fish species or fish habitat occurs in the mainstem of the Smoky River, located 3 km downstream from the crossing.

At the time of the assessment, the associated unnamed tributary to the Smoky River was not sampled for fish presence or fish absence because of an absence of flowing water in the channel.

Fish Habitat

At the time of the October 2006 assessment, this unnamed tributary to the Smoky River was characterized as a poorly defined ephemeral draw that likely only conveys water during the spring freshet or during heavy precipitation events. This was confirmed again in August 2022.

Crossing 2 is on an existing high-grade road that leads to the Hamlet of Grande Cache waste transfer station. There was no evidence of a defined channel at the proposed crossing site; however, there is a vegetated drainage ditch that connects to a 1000 mm diameter corrugated steel culvert under the high-grade road. The entire area was dominated by vegetation (e.g., grasses and shrubs).

In summary, this tributary to the Smoky River would not be sensitive to construction and operation activities as they relate to the development of an access road. This tributary was not considered sensitive as it was poorly defined and surface water flows are only likely to occur during the spring freshet or heavy precipitation events. Therefore, this channel does not provide suitable fish habitat.

Using best management practices and construction techniques, impacts to Two Cabin Creek can be minimized. All crossing designs will meet Alberta Infrastructure and Transportation Design Guidelines and the Code of Practice requirements.

5.1.3 Tributary to the Allen Creek

The Proposed Access Road crosses a number of unnamed tributaries to Allen Creek (Figure 3-3), which include:

- Crossing 5;
- Crossing 6;
- Crossing 7; and
- Crossing 8.

Under the Code of Practice for Watercourse Crossings (AENV 2000), Allen Creek and its unnamed tributaries are designated as Class C with a RAP of August 1 to July 15, which means that construction can occur between July 16 and July 31.

The proposed watercourse crossings associated with this area of the Proposed Access Road were not assessed at the respective crossing sites because of poor access. There were no cleared cut lines, all-terrain vehicle ("ATV") or hiking trails in this area of Grande Mountain. In addition, the entire area is densely forested, preventing helicopter access. To determine the suitability of these watercourses, two more easily accessible sites downstream of the Proposed Access Road were assessed (Figure 3-3). The site evaluated for Crossings 5, 6 and 7 were several hundred metres downstream of the access road and did have defined channels with open water flowing. A drone was used to evaluate the upstream reaches of the stream, but it was difficult to determine if there was a defined channel or open water flowing. Crossing 8 was assessed at the crossing and it was dry without a defined channel, which is at a similar location upslope, as Crossing 5, 6, and 7.

Fish Community

There were no historical reports of fish presence in the tributaries or the mainstem of Allen Creek in the Alberta Fisheries Information System ("FWMIS database") (ASRD 2006a).

At the time of the assessment, the representative sites were not sampled for the presence or absence of fish because of a lack of flowing water in the channels. There are substantial elevation changes which would prevent fish movement.

Fish Habitat

The headwaters of Allen Creek originate at an elevation of 1,585 m above sea level on the southeast side of Grande Mountain and connect with Grande Cache Lake at 1,120 m asl. The stream gradient associated with the headwater crossing is 40 to 60 m/km (40 to 60 percent).

At the time of the October 2006 assessment, there was no flowing water at sample Site 1; however, there was some evidence of groundwater seepage throughout the assessed reach. The bankfull widths ranged from 0.2 to 5 m and both the left-downstream-bank and the right-downstream-bank were about 2 m in height. The assessed reach displayed a sinuous channel pattern at an average gradient of 10 m/km (1 percent) and was unconfined throughout. There was little evidence of alluvial scour, and the bottom channel was dominated by grasses and shrubs. There were three culverts within the assessed reach: a 0.6 m and a 1 m diameter corrugated steel culvert located under Highway 40. There was also a 0.6 m diameter corrugated steel culvert under an ATV trail that crossed the channel about 5 m upstream of Highway 40. Neither culvert facilitated fish passage.

Site 2 was located on a section of Allen Creek that had a more defined channel. The assessed reach displayed an irregular meander pattern, at an average gradient of 40 m/km (4 percent) and was frequently confined by steep (45 degree) approach slopes next to the channel. At the time of the October 2006 assessment, there was no flowing water in the channel; however, there were several areas of shallow (<15 mm) standing water pools, and most of the channel bottom was wet throughout. The average bankfull width was 1.3 m and the bankfull depths ranged from 0.3 to 0.6 m. Channel substrate was predominantly fines and organics with occasional cobbles in the shallow pools.

In summary, the assessed sites did not have any fisheries potential (*e.g.*, no fish presence, or suitable habitat for spawning, rearing, or over-wintering). Therefore, it is unlikely that the headwater tributaries of Allen Creek associated with the Proposed Access Road crossing sites would provide suitable fish habitat or be sensitive to construction and operations.

Using best management practices and construction techniques, impacts to Two Cabin Creek can be minimized. All crossing designs will meet Alberta Infrastructure and Transportation Design Guidelines and the Code of Practice requirements.

5.1.4 *Tributary to the Carconte Creek*

The Proposed Access Road crosses an unnamed tributary of Carconte Creek (Figure 3-3), Crossing 9.

Under the Code of Practice for Watercourse Crossings (AENV 2000), Carconte Creek and its unnamed tributaries are designated as Class C with a RAP of August 1 to July 15, which means that construction can occur between July 16 and July 31.

Mining developments such as the mine portal, various infrastructure (e.g., conveyor belts, storage containers, and water retention ponds) located on the Mine Portal Site, and a part of the Proposed Access Road will be near headwater tributaries of Carconte Creek.

Two locations on the mainstem of Carconte Creek were sampled to determine the presence or absence of fish species. A 300 m reach about 4 km downstream of the Mine Portal Site near Highway 40 (Site C-1) and a 200 m reach of a headwater tributary to Carconte Creek (Site C-2) were assessed.

The following section provides a description of the existing habitat conditions of the tributaries to Carconte Creek associated with the Proposed Access Road, as well as the results of the fish presence or absence surveys done on the mainstem of Carconte Creek.

Fish Community

There were no historical reports of fish presence in the tributaries or the mainstem of Carconte Creek in the FWMIS database (ASRD 2006a).

At the time of the October 2006 assessment, the associated unnamed tributaries to Carconte Creek were not sampled for the presence or absence of fish because of an absence of flowing water in the channels.

The mainstem of Carconte Creek was sampled in October 2006 for a total of 500 m and was electrofished for 1850 seconds. One brook trout (Salvelinus fontinalis) was captured about 200 m upstream of Highway 40 (about 3.8 km downstream of the Mine Portal Site). The brook trout had a fork length of 230 mm and weighed 186 g. Three minnow traps were set in the creek for 24 hours; no fish or aquatic invertebrates were captured. Fish were not captured in the upper reach of Carconte Creek (C-2) and are likely limited to the lower reaches of Carconte Creek because of an impassable fall (more than 2 m high) about 1.5 km upstream of Highway 40.

Fish Habitat

At the time of the October 2006 assessment, both of the unnamed tributaries to Carconte Creek were characterized as a poorly defined ephemeral draw that likely only conveyed water during the spring freshet or during heavy precipitation events.

At Crossing 9, most of the assessed reach (about 200 m) was characterized as a poorly defined channel with no evidence of flowing water. There was some evidence of an ephemeral draw near the proposed crossing site; however, there was no evidence of alluvial scour or defined banks, and the channel was dominated by grasses and shrubs. The crossing point is about 2.3 km from the mainstem of Carconte Creek. The stream gradient from the crossing site to the Carconte Creek is about 400 m/km (40 percent).

In summary, these headwater tributaries to Carconte Creek would not be sensitive to construction and operations as they relate to the development of an access road and other mine developments activities. This tributary was not considered sensitive because of the poorly defined channel that likely only experiences ephemeral flows during the spring freshet or heavy precipitation events and steep gradients. Therefore, this channel does not provide suitable fish habitat.

Using best management practices and construction techniques, impacts to Two Cabin Creek can be minimized. All crossing designs will meet Alberta Infrastructure and Transportation Design Guidelines and the Code of Practice requirements.

5.2 **Migratory Birds and Species at Risk**

In 2007, Summit submitted an application to address then-existing regulatory requirements under Alberta's EPEA and *Coal Conservation Act* (JWA 2007a). However, to meet current regulatory requirements (e.g., Alberta's *Wildlife Act*, EPEA, the federal *Migratory Birds Convention Act, 1994* ("MBCA"), and the *Species at Risk Act* ("SARA")), additional information is required to update the 2007 wildlife assessment (JWA 2007a) and the 2012 wildlife mitigation and monitoring plan ("WMMP") proposal (Stantec 2013a). One of the key regulatory issues with respect to wildlife is related to the potential occurrence of species at risk or of concern (e.g., western toad, little brown myotis, grizzly bear, migratory birds, etc.) in the vicinity of the Project, and the effects the Project may have on these wildlife species.

The following sections provide an overview of existing information relating to wildlife species at risk and migratory birds and assessment conclusions based on the wildlife assessment completed in 2007 (JWA 2007a). An update summarizing proposed mitigation measures and baseline field studies to address identified information gaps is also provided.

5.2.1 Wildlife Habitat and Wildlife Occurrence

Wildlife Habitat and Sensitive Wildlife Zones

The Project footprint, which will be comprised of a 52.5 ha portal area along with a 6.5 km (47.8 ha) haul road/access corridor, occurs within Alberta's Subalpine and Montane Natural Subregions. Wildlife habitat in the vicinity of the Project footprint is characterized by various coniferous, deciduous, and mixed-wood forests in different stages of succession, along with various wetland types, subalpine meadows, and cliffs/bluffs (JWA 2007a). Drier south and southwest facing slopes in the subalpine zone typically support lodgepole pine forests with understories of false azalea, Canada buffaloberry, low bilberry, white-flowered rhododendron, hairy wild rye, pine grass, feathermoss, and various forbs (Natural Regions Committee 2006, cited in JWA 2007a). In contrast, wetter and cooler sites of the subalpine zone are typically characterized by Engelmann spruce, alder, and willow along riparian zones and grasslands on drier, south-facing slopes (Natural Regions Committee 2006, cited in JWA 2007a). Meanwhile, the montane zone is characterized by closed lodgepole pine forests with understorey species such as bearberry, Canada buffaloberry, hairy wild rye, June grass, and various forb species (Natural Regions Committee 2006, cited in JWA 2007a). Wetter sites are vegetated by balsam poplar and various willow species along creeks and rivers. Closed aspen forests are typically found on warmer, drier sites in the montane subregion (Natural Regions Committee 2006, cited in JWA 2007a).

The Project footprint is also located in the north-central portion of the core access management area of the grizzly bear recovery plan zone within Alberta's Grande Cache Bear Management Area ("BMA") 2 (AEP 2020). Grizzly bears are protected under the provincial *Wildlife Act* – where they are categorized as "Threatened" – and the federal SARA – where they are categorized as "Special Concern"(Schedule 1 species). Approximately one-third (9,918 km2 or 31%) of the 31,942 km^2 BMA 2 recovery zone, which includes both core and secondary access management areas, has a federal (Jasper National Park) or provincial protected area designation that limits motorized vehicle access to designated roads or trails (AEP 2020). Recovery zones were established by the Government of Alberta to inform access planning and development, and to manage the recovery of grizzly bears (AEP 2020). The six-year (2010-2015) population estimate for BMA 2 is estimated to be 353 individuals for a density of 11.1 bears/1,000 km,^{2} including national parks (AEP 2020).

Wildlife Species of Concern

Currently, 45 wildlife species of concern representing 2 amphibians, 2 reptiles, 31 birds, and 10 mammals could potentially occur within and around the Project footprint (Table 5-1), based on

species accounts, range maps, field observations, and other available literature and databases. All 45 of the at-risk wildlife have provincial status designations, while 12 are federally listed.

Of the 45 provincially listed species, 33 species are classified as "Sensitive" in Alberta (AEP 2017), which indicates that although these species are not currently at risk of extinction or extirpation, they may require protection to prevent them from becoming "At Risk" (GoA 2011a). Eight other species are designated as "May Be At Risk" or are "At Risk" or "Threatened" in Alberta (Table 5-1). In addition, three wildlife species have an "Undetermined" status, indicating that there is insufficient information, knowledge, or data available to reliably evaluate their general status. One species is classified as "Secure" in the province (Table 5-1).

At the federal level, 7 of the 45 wildlife species are of "Special Concern", 3 are "Threatened", and 2 are "Endangered" (Table 5-1). The 11 of the 12 federally listed species that could occur within and around the Project footprint also have Schedule 1 designations, indicating that these species benefit from all the legal protection afforded, and that mandatory recovery planning is required under the SARA. Six additional wildlife species were also assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) but were determined to be "Not At Risk" in Canada (Table 5-1).

Table 5-1 Wildlife Species of Concern That Could Potentially Occur in the Vicinity of the Project Footprint

Common Name	Provincial Status	Federal Status[1]	General Habitat Preferences[2]
Amphibians and Reptiles:			
Western Toad	Sensitive	Special Concern/ Schedule 1	Breeds in the shallows of lakes, ponds, marshes, ditches, and other similar waterbodies.
Long-toed Salamander	Sensitive	Not At Risk	Under rocks, rotting logs, debris; near ponds, lakes, streams.
Terrestrial Garter Snake	Sensitive	-	Broad habitat preferences including marshes, fields, forests.
Common Garter Snake	Sensitive	-	Broad habitat preferences including forests, farms, or near water.
Birds:			
American Kestrel	Sensitive	-	Uses a wide variety of open and semi-open habitats. Nests in tree cavities and nest boxes.
Bald Eagle	Sensitive	Not At Risk	Nests in large stick nests along lakes/large rivers feeding on water birds, fish, and small mammals.
Bank Swallow	Sensitive	Threatened/ Schedule 1	Nests in cliffs/vertical riverbanks with friable soils. Sometimes breeds in man-made habitats such as sand and gravel quarries.

Table 5-1 Wildlife Species of Concern That Could Potentially Occur in the Vicinity of the Project Footprint

Common Name	Provincial Status	Federal Status[1]	General Habitat Preferences[2]
Barn Swallow	May Be At Risk	Special Concern/ Schedule 1	Open areas such as agricultural fields, open urban areas, along highways. Nests on buildings.
Barred Owl	Sensitive	-	Mature/old mixedwood forests, with large trees containing large cavities for nesting. Often near riparian areas.
Black-backed Woodpecker	Sensitive	-	Mature coniferous forests, standing dead trees, and disturbed areas.
Black-throated Green Warbler	Sensitive	-	Found in mixedwood/mature coniferous forests nesting on the horizontal branches of conifers.
Brown Creeper	Sensitive	-	Closed canopy, mature and old-growth coniferous/mixed coniferous-deciduous forests.
Cassin's Vireo	Undetermined	-	Nest in coniferous trees and prefers coniferous dominated mixedwood forests with dense understories.
Clark's Nutcracker	Sensitive	-	Mature coniferous and mixed-coniferous forest with large pines.
Common Nighthawk	Sensitive	Special Concern/ Schedule 1	Ground-nesting species that breeds in open habitats with little vegetation like forest clearings, logged areas, and burned over areas
Common Yellowthroat	Sensitive	-	Prefers alder and willow areas bordering streams and marshes.
Eastern Kingbird	Sensitive	-	Breeds in fields with scattered shrubs/trees, often in trees that overhang wetlands, rivers, or lakes.
Eastern Phoebe	Sensitive	-	Occurs in a variety of woodland habitats. Frequently builds nests on man-made structures such as culverts, bridges, and buildings.
Evening Grosbeak	Secure	Special Concern/ Schedule 1	Breeds in coniferous and deciduous forests feeding on buds and berries in winter and insects in summer.
Golden Eagle	Sensitive	Not At Risk	Grasslands, open areas, rivers, mountainous areas, bogs. Nests on cliff edges and tall trees.
Great Gray Owl	Sensitive	-	Forest clearings/meadows/roadsides and nesting near bogs in abandoned hawk and raven nests.
Harlequin Duck	Sensitive	-	Clear, rocky streams and rivers with fast, powerful currents.
Lesser Scaup	Sensitive	-	Shallow water habitats with tall, dense herbaceous vegetation near forest cover.
Northern Goshawk	Sensitive	Not At Risk	Breeds in mature deciduous, mixedwood, and coniferous forests.
Northern Pygmy Owl	Sensitive	-	Mature and old-growth forest, open forest. Forages in open areas.

Table 5-1 Wildlife Species of Concern That Could Potentially Occur in the Vicinity of the Project Footprint

Common Name	Provincial Status	Federal Status[1]	General Habitat Preferences[2]
Olive-sided Flycatcher	May Be At Risk	Threatened/ Schedule 1	Open coniferous forests and forest edges. Often found in recently burned areas.
Pileated Woodpecker	Sensitive	-	Cavity nester that prefers mature coniferous and mixedwood forests with dead and dying trees.
Rusty Blackbird	Sensitive	Special Concern/ Schedule 1	Nests in shrubs or small trees near water like ponds, roadsides, wet meadows, and shoreline shrubs.
Sandhill Crane	Sensitive	-	Breeds in open wetlands or wet meadows surrounded by shrubs or trees.
Sharp-tailed Grouse	Sensitive	-	Prefers shrub and aspen stands and edges of forest clearings near grain fields
Sora	Sensitive	-	Shallow wetlands with dense emergent vegetation.
Trumpeter Swan	Special Concern	Not At Risk	Open fields, grasslands, and agricultural areas. Nests in shallow lakes and marshes.
Western Tanager	Sensitive	-	Nests on a conifer branch in mature coniferous, aspen or mixedwood forests.
Western Wood Pewee	May Be At Risk	-	Prefers open forests and riparian zones.
Yellow-bellied Flycatcher	Undetermined	-	Found in shady coniferous and mixedwood forests, bogs, and fens. Nests in low shrubs.
Mammals:			
Canada Lynx	Sensitive	Not At Risk	Coniferous forest with downed woody debris and dense understory.
Fisher	Sensitive	-	Dense mature and old-growth coniferous forest. Generally, avoids logged and burned areas.
Grizzly Bear	At Risk/ Threatened	Special Concern/ Schedule 1	Open slopes, alpine meadows, cut blocks, burns, riparian areas, mature forest, and disturbed sites.
Hoary Bat	Sensitive	-	Roosts in trees and forages high in clearings or over water.
Little Brown Myotis	May Be At Risk	Endangered/ Schedule 1	Roosts in tree hollows or structures such as sheds or attics. Frequently forages over water.
Long-legged Myotis	Undetermined	-	Similar in appearance to little brown myotis and may roost in mixed groups. Known to roost under slabs of rock along cliff faces and may roost in trees.
Northern Myotis	May Be At Risk	Endangered/ Schedule 1	Forested areas close to waterbodies.
Silver-haired Bat	Sensitive	-	Trees, crevices, and buildings and access to water are used for roosting and foraging.
Wolverine	May Be At Risk	Special Concern/ Schedule 1	Large areas of remote wilderness in the foothills and mountains. Avoids human development.

Table 5-1 Wildlife Species of Concern That Could Potentially Occur in the Vicinity of the Project Footprint			
Common Name	**Provincial Status**	**Federal Status[1]**	**General Habitat Preferences[2]**
Woodland Caribou	At Risk/Threatened	Threatened/ Schedule 1	Prefer mature and old-growth lodgepole pine or mixed pine/spruce/fir forests in winter and more open areas associated with alpine, subalpine, forests and treed/open peatland habitats.

1 FWMIS (2022), AEP (2022). 2 COSEWIC/SARA status (COSEWIC 2022). 3 Fisher and Acorn (1998), Pattie and Fisher (1999), Russell and Bauer (2000).

5.2.2 Migratory Birds

The federal MBCA recognizes the following groups of birds: waterfowl, cranes, rails, coots, shorebirds, doves, insectivorous birds (excluding blackbirds), grebes, bitterns, herons, gulls, terns, seabirds, and loons. Of the 31 at risk bird species with the potential to occur within and around the Project footprint (Table 5-2), 22 species are migratory and would be protected under the MBCA. Similarly, of the 33 bird species detected during field surveys involving breeding bird counts and incidental observations (JWA 2007a) conducted in the vicinity of Project footprint, 28 species were migratory birds and would also be protected under the federal MBCA.

Table 5-2 Breeding Birds Detected During in the Project Assessment Area, June 2005[1]			
Common Name	**Scientific Name**	**Dominant Habitat Type**	**No. ofBirds**
Rufous hummingbird	*Selasphorus rufus*	Aspen Forest	1
Hairy woodpecker	*Picoides villosus*	Conifer Forest	1
Northern flicker	*Colaptes auratus*	Mixedwood – deciduous dominant	1
Yellow-bellied flycatcher	*Empidonax flaviventris*	Mixedwood	2
Warbling vireo	*Vireo gilvus*	Mixedwood – deciduous dominant	7
American crow	*Corvus brachyrhynchos*	Mixedwood	1
Gray jay	*Perisoreus Canadensis*	Spruce / Pine	3
Black-capped chickadee	*Poecile atricapilla*	All Types	11
Chestnut-backed chickadee	*Poecile rufescens*	Deciduous Mixedwood	2
Red-breasted nuthatch	*Sitta Canadensis*	Mixedwood – deciduous dominant	6
Golden-crowned kinglet	*Regulus satrapa*	Deciduous Forest	1
Ruby-crowned kinglet	*Regulus calendula*	Mixedwood	2
American robin	*Turdus migratorius*	Mixedwood – deciduous dominant	8
Varied thrush	*Ixoreus naevius*	Mixedwood – deciduous dominant	4
Swainson's thrush	*Catharus ustulatus*	All Types	17

Table 5-2 Breeding Birds Detected During in the Project Assessment Area, June 2005[1]

Common Name	Scientific Name	Dominant Habitat Type	No. ofBirds
Hermit thrush	*Catharus guttatus*	Mixedwood – spruce dominant	9
Veery	*Catharus fuscescens*	Mixedwood	2
Yellow-rumped warbler	*Dendroica coronata*	Mixedwood – conifer dominant	10
MacGillivray's warbler	*Oporomis tolmiei*	Mixedwood – deciduous dominant	4
American redstart	*Setophaga ruticilla*	Conifer Forest	2
Black-and-white warbler	*Mniotilta varia*	Mixedwood	10
Palm Warbler	*Dendroica palmarum*	Black Spruce / Willow	1
Wilson's Warbler	*Wilsonia pusilla*	Mixedwood – conifer dominant	11
Tennessee Warbler	*Vermivora peregrine*	All Types	15
Orange-crowned Warbler	*Vermivora celata*	Mixedwood	6
Chipping sparrow	*Spizella passerine*	Conifer Forest	11
White-throated sparrow	*Zonotrichia albicolllis*	All Types	9
Dark-eyed junco	*Junco hyemalis*	All except spruce dominant	33
Pine siskin	*Carduelis pinus*	Black Spruce / Willow	1

[1] Source: JWA 2007.

5.2.3 2007 Wildlife Assessment Summary

The 2007 wildlife assessment completed for the Project was based on habitat suitability mapping and a breeding bird survey conducted in June 2005 (JWA 2007a). Habitat suitability maps were developed for five key indicator species including: Rocky Mountain elk; moose; mountain goat; marten; and the provincially and federally "Threatened" grizzly bear. Habitats within and around the Project footprint contain "relatively abundant sources of moderate to high suitability spring feeding habitat for grizzly bears as well as moderate suitability summer berry feeding habitat. Higher quality summer berry feeding habitat is present but less abundant" (JWA 2007a). In addition, a number of migratory and resident breeding birds were documented and/or have the potential to occur within and around the Project footprint. While Project effects relating to construction, operations, and closure and reclamation may adversely affect wildlife and wildlife habitat, the geographic extent and magnitude of effects on wildlife were expected be limited (JWA 2007a). **With the implementation of recommended mitigation measures, the wildlife mitigation and monitoring plan, and environmental management plans, residual effects to wildlife and wildlife habitat were predicted to not be significant (JWA 2007a).**

Baseline Wildlife Surveys and Assessment Update

The wildlife study area will include the Project footprint, plus a 500 m buffer zone to document potential effects on wildlife extending beyond the Project footprint, corresponding with the soils and vegetation study areas. All recommended surveys are season specific and reflect the protocols for collecting wildlife data as outlined in Alberta's *Sensitive Species Inventory Guidelines*, many of which are dependent on narrow timing windows (Table 5-3).

In late August 2022, the wildlife camera trapping program was initiated, and involved deploying 15 Reconyx Professional Ultrafire wildlife cameras in and around the portal area and along the haul road/access corridor. Data collected during the baseline wildlife surveys will be used to update the 2007 wildlife assessment (effects assessment/mitigation measures) (JWA 2007a) and the 2012 WMMP (Stantec 2013a), particularly with respect to addressing temporal and spatial information gaps for the Project footprint.

Table 5-3 Recommended Wildlife Surveys

Survey and Purpose	Timing	Survey Type [1]	Target Species
Wildlife Camera Trapping (species diversity/habitat use)	Late Aug. 2022 – Late Oct. 2023	Deployment of 15 cameras in selected habitats within and adjacent to the Project (3 camera checks).	Grizzly Bear (Alberta: Threatened; Canada: Special Concern); Mountain Goat (Alberta: Secure); Little Brown Myotis (Alberta: May Be At Risk; Canada: Threatened); Northern Myotis (Alberta: May Be At Risk; Canada: Threatened).
Nocturnal Owl Survey (species diversity/ habitat use) [2].	***March 1 – April 30, 2023***	***Nocturnal owl call-playback survey (1).***	***Barred owl (Alberta: Sensitive); Northern Pygmy-owl (Alberta: Sensitive), Other sensitive owls.***
Amphibian Survey (species diversity/ habitat use).	Late Apr. - mid-June 2023	Nocturnal amphibian call count surveys (3)	Western Toad (Alberta: Sensitive; Canada: 'Special Concern'.
Breeding Songbird Survey (species diversity/habitat use)	Early Jun. – Early Jul. 2023	Point count surveys (2).	Sensitive neotropical migrant songbirds (*e.g.*, least flycatcher, Western wood-pewee); breeding waterbirds (*e.g.*, green-winged teal, American bittern).
Bat Survey (species diversity/habitat use).	Late May – Aug. 2023	Nocturnal acoustic recording surveys (2).	Northern myotis (Alberta: Threatened; COSEWIC: Threatened); Little brown myotis (Alberta: Threatened; COSEWIC: Threatened).
Incidental Wildlife Observations.	Late Aug. 22 – Oct. 2023	Recorded during all field surveys.	All wildlife species including their sign (e.g., nests, dens, tracks, scat, mineral licks and other important habitat features, etc.).

[1] Number in parentheses indicate required number of surveys based on Alberta's Sensitive Species Inventory Guidelines (2013).
[2] Bold and italicized text indicates that wildlife research permits will be required.

The update of the wildlife assessment report will follow current practice in Alberta and will be focussed on updating previous work. The wildlife assessment is designed to ensure that all potential effects of the proposed Project relating to construction, operation and maintenance

activities are identified and assessed in accordance with applicable provincial and federal acts, regulations, and guidelines. The final results will be comprehensive and detailed enough to meet the requirements for the necessary regulatory approvals.

5.2.4 Recommended Mitigation Measures

In addition to the recommended environmental management plans (JWA 2007b) and conservation and reclamation plan (Stantec 2013b), the following mitigation measures will be implemented to further avoid or minimize the impacts of the Project's development on wildlife species at risk and migratory birds:

- Mine planning processes will be used to minimize the overall disturbance Project footprint by avoiding important breeding habitats, nesting and denning sites, and movement corridors to the extent possible.
- Vegetation clearing activities will be scheduled to occur outside the active breeding period from March 1 (e.g., early nesting owls) to August 31 to minimize sensory disturbances and mortality risks during the sensitive nesting period and avoid disrupting nesting migratory and resident songbirds and raptors (e.g. early nesting owls), in accordance with Alberta's *Wildlife Act* and Canada's MBCA and SARA (e.g. ECCC 2021a). Avoidance guidelines developed by ECCC (2021b) will be followed to avoid or reduce the risk of disrupting or destroying migratory birds, nests, and eggs.
- If vegetation clearing must occur within the restricted activity period, pre-disturbance wildlife sweeps will be conducted to determine the occurrence of any important wildlife habitat features, such as migratory bird nests, mineral licks, active dens, and active raptor nest sites that could indicate the presence of at-risk wildlife. The pre-disturbance wildlife sweeps will follow current protocols for wildlife (GoA 2020) in Alberta and will be conducted by qualified biologists. If any sensitive habitat features are encountered, a buffer following the recommended setback distances as outlined by the GoA (2021) and by ECCC (2018b) will be implemented. If required, further species-specific mitigation measures will be discussed with Alberta Environment and Parks ("AEP") biologists, including a review of any relevant provincial and federal recovery strategies. Any required Wildlife Research Permits will also be obtained prior to initiation of the pre-disturbance surveys. Results of the pre-disturbance wildlife sweeps will be submitted to the AEP for review and comment and then submitted to Alberta's FWMIS.
- To avoid vehicle and wildlife collisions, construction personnel will follow posted speed limits in and around the Project footprint and local roads/highways.
- A bear safety and site management plan will be developed and implemented.

- Policies on feeding wildlife and proper disposal of food items will be developed and strictly enforced, to avoid attracting wildlife species to the construction area and reduce the probability of human and wildlife interactions. Food will always be kept inside vehicles or on person, and garbage and litter will be carried out of the work area and disposed of properly (Alberta's BearSmart Program, GoA 2011b).
- Construction workers will be instructed to not feed wildlife, which is also considered a wildlife hazard. Policies will be established that limit the opportunity for nuisance wildlife to become habituated to human feeding. The likelihood of the need to remove nuisance wildlife is increased with the greater interaction between construction workers and wildlife (Alberta's BearSmart Program, GoA 2011b).
- All employees and contractors will undergo wildlife awareness training, which will include information on the importance of reducing Project-related sensory disturbance on wildlife and how this can be achieved.
- The use of ATVs and off-highway vehicles by mine personnel and contractors will be prohibited. This will avoid sensory disturbances and wildlife-human conflict. Pets will be prohibited from worksites to avoid harassing wildlife. Firearm restrictions by all mine personnel and contractors will be enforced.
- Access of non-mine personnel to areas around the Project footprint will be restricted to the extent possible (i.e., use of gates, signage, etc.).
- Existing hydrological flows will be maintained to the extent possible.

5.2.5 Wildlife Summary and Conclusions

Potentially suitable habitats for a variety of at-risk wildlife and migratory birds are present within and around the Project, which will be confirmed with the completion of additional baseline wildlife surveys that are currently underway. The extent to which these species will be affected by Project development will primarily reflect the extent of anthropogenic disturbance (e.g., habitat loss, sensory disturbance, movements, and mortality risk), and the presence of suitable habitats. For example, amphibian species, such as the western toad, are likely to occur in suitable wetland habitats that are intersected by the Project footprint. This includes semi-permanent and permanent waterbodies that are used for breeding, and adjacent upland sites for overwintering. Similarly, species with larger home ranges, such as the bald eagle, golden eagle, and grizzly bear, are more likely to pass over or move through or around the Project footprint to other adjacent habitats. While there is potential for some at risk wildlife with smaller home ranges to occur in the vicinity of the Project footprint (e.g., olive-sided flycatcher, several species of bats, etc.), individuals displaced by Project development will likely use other similar adjacent habitats at the local level. Wildlife movements at the local level are also not expected to be

meaningfully affected by Project development because of the relatively small size of the Project footprint (100.3 ha aboveground portal and haul road/access corridor), and the presence of large areas of relatively undisturbed habitats adjacent to the Project footprint at the landscape level.

5.3 Potential Adverse Changes to the Environment on Federal Lands, Lands outside Alberta or Canada

During the Indigenous Engagement for the Project, a number of geographic locations and their proximity to the Project were referenced. These locations are shown on Figure 5-1 and include:

- Wash plant/Milner/CST facilities = 10 km
- Kakwa Provincial Park = 80 km
- Kawa Wildland Park = 40 km
- Mount Robson Park (BC) = 100 km
- Willmore Park =10 km
- Jasper National Park = 50 km (closest federal lands)
- Rock Lake = 75 km
- Solomon Creek Wildland = 85 km
- BC border = 60 km (closest lands outside Alberta)
- Vista/Coalspur Mine (Hinton) = 120 km
- Hinton = 115 km
- Canada – USA Border = 530 km
- A la Peche Caribou zone = 12 km to closest boundary
- Little Smoky Caribou Zone = 50 km to closest boundary
- Grande Cache area COOPs/Enterprises (Grande Cache
    - Wanyandie Flats = 19.4 km
    - Wanyandie Flats (West Cooperative) = 9.5 km
    - Susa Creek = 7 km
    - Joachim (Enterprise) = 5.3 km
    - Kamisak (Enterprise) = 3.2 km

- Victor Lake (Cooperative) = 5.3 km
- Muskeg See Pee = 27.2 km

The nearest federal lands are the northern boundary of Jasper National Park, which is 50 km south. The BC-Alberta boundary is 60 km west. The Canada-USA border is 530 km south. Project impacts will be mitigated at the local level and will not have adverse changes to the environment in these areas.

5.4 Cumulative Effects

Project effects will be controlled at the local level and are not expected to contribute to cumulative effects in the region. The EPEA and *Water Act* approvals required for the Project will contain monitoring requirements to measure any potential cumulative effects of the Project. Other projects in the area would have similar approval conditions that require cumulative effectives monitoring.

5.5 Greenhouse Gas Emissions Including Loss of Carbon Sequestration

Summit will voluntarily opt-in to the Government of Alberta's Technology Innovation and Emissions Reduction ("TIER") program and will be financially incentivized to reduce emissions. The TIER regulation has been granted program equivalency by the federal government pursuant to the federal *Greenhouse Gas Pollution Pricing Act.*

Summit plans to explore ways to reduce methane emissions from the underground activities during planning studies.

5.6 Potential Adverse Impacts Resulting from any Change to the Environment, on Indigenous Peoples or Changes to Their Health, Social or Economic Conditions.

Summit previously consulted with the various Indigenous groups and resolved concerns that had been raised. Agreements were also established with groups. Summit has re-engaged with them. At this time, Summit believes the Project will not have any adverse impacts on Indigenous peoples, based on approval conditions and other mitigations.

6.0 REFERENCES

Alberta Environment and Parks (AEP). 2015. Species at Risk: A Guide to Endangered and Threatened Species and Species of Special Concern in Alberta. Version 2. Available Online at: http://aep.alberta.ca/fish-wildlife/species-at-risk/species-at-risk-publications-web-resources/ documents/SpeciesAtRiskGuide-Jan-2015.pdf.

Alberta Environment and Parks (AEP). 2017. Alberta Wild Species General Status Listing – 2015. Government of Alberta (Updated March 1, 2017). Available Online: Alberta wild species general status listing 2015 - Open Government.

Alberta Environment and Parks (AEP). 2020. Alberta Grizzly Bear Recovery Plan. Alberta Species at Risk Recovery Plan No.37. Edmonton, Alberta, Canada. Available Online: https://open.alberta.ca/publications/9781460147917.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2022. Canadian Species at Risk. Environment Canada. Ottawa, Ontario, Canada. Available Online: http://www.cosewic. gc.ca/eng/sct5/index_e.cfm.

Environment and Climate Change Canada (ECCC). 2021a. General nest periods for migratory birds. Available Online: https://www.canada.ca/en/environment-climate-change/services/avoidingharm-migratory-birds/guidelines.html. Accessed September 23, 2021.

Environment and Climate Change Canada (ECCC). 2021b. Migratory birds: Buffer zone and setback distances. Available Online: https://www.canada.ca/en/environment-climatechange/services/avoiding-harm-migratory-birds/technical-information-riskfactors. html#_03_1_1. Accessed September 29, 2021.

Fish and Wildlife Management Information System (FWMIS). 2022. Fish and wildlife information management information system data. Available Online: http://aep.alberta.ca/fish-wildlife/fwmis/access-fwmis-data.aspx.

Fisher, C., and J. Acorn. 1998. Birds of Alberta – Field Guide. Lone Pine Publishing, Edmonton, Alberta, Canada.

Government of Alberta (GoA). 2011a. General status of Alberta wildlife species – Definitions of general status. Available Online: http://aep.alberta.ca/fish-wildlife/species-at-risk/albertas-species-at-risk-strategy/general-status-of-alberta-wild-species/documents/DefinitionsStatusCategories-Mar2011.pdf.

Government of Alberta (GoA). 2011b. Alberta BearSmart Program Manual: Enhancing the Opportunities for Humans and Bears to Co-exist in Alberta. Available Online: Alberta BearSmart program manual : enhancing the opportunities for humans and bears to co-exist in Alberta - Open Government.

Government of Alberta (GoA). 2013. Alberta Government Sensitive Species Inventory Guidelines. April 18, 2013. Edmonton, Alberta, Canada. Available Online: Sensitive species inventory guidelines | Alberta.ca.

Government of Alberta (GoA). 2021. Master Schedule of Standards and Conditions. April, 2021. Available Online: Master Schedule of Standards and Conditions (alberta.ca).

Jacques Whitford Axyx (JWA). 2007a. Mine #14 Project. Section 6: Environmental and Socio-economic Information. Subsection 6.6 Wildlife. Prepared for Summit Coal Inc. by Jacques Whitford Axys, Calgary, Alberta. Canada.

Jacques Whitford Axyx (JWA). 2007b. Mine #14 Project. Section 8: Environmental Management Plans. Prepared for Summit Coal Inc. by Jacques Whitford Axys, Calgary, Alberta. Canada.

Natural Regions Committee. 2006. Natural Regions and Subregions of Alberta. Compiled by D.J. Downing and W.W. Pettapiece. Government of Alberta. Pub. No. T/852. Available online at: http://www.albertaparks.ca/media/2942026/nrsrcomplete_may_06.pdf.

Pattie, D.L. and C. Fisher. 1999. Mammals of Alberta – Field Guide. Lone Pine Publishing, Edmonton, Alberta, Canada.

Russell, A.P. and A.M. Bauer. 2000. The Amphibians and Reptiles of Alberta: A Field Guide and Primer of Boreal Herpetology. University of Calgary Press, Calgary, Alberta, Canada.

Species at Risk Act (SARA). 2002. *Species at Risk Act*. Available Online: Species at Risk Act (justice.gc.ca).

Stantec Consulting Ltd. (Stantec). 2013a. Summit Coal #14 Wildlife Mitigation and Monitoring Program Proposal for Mine 14 EPEA Approval 234735-00-00. Prepared for Summit Coal Inc. by Stantec Consulting Ltd. Calgary, Alberta, Canada.

Stantec Consulting Ltd. (Stantec). 2013b. Summit Coal #14 Mine Conservation and Reclamation Plan (Revised). Prepared for Summit Coal Inc. by Stantec Consulting Ltd. Calgary, Alberta, Canada.

FIGURES

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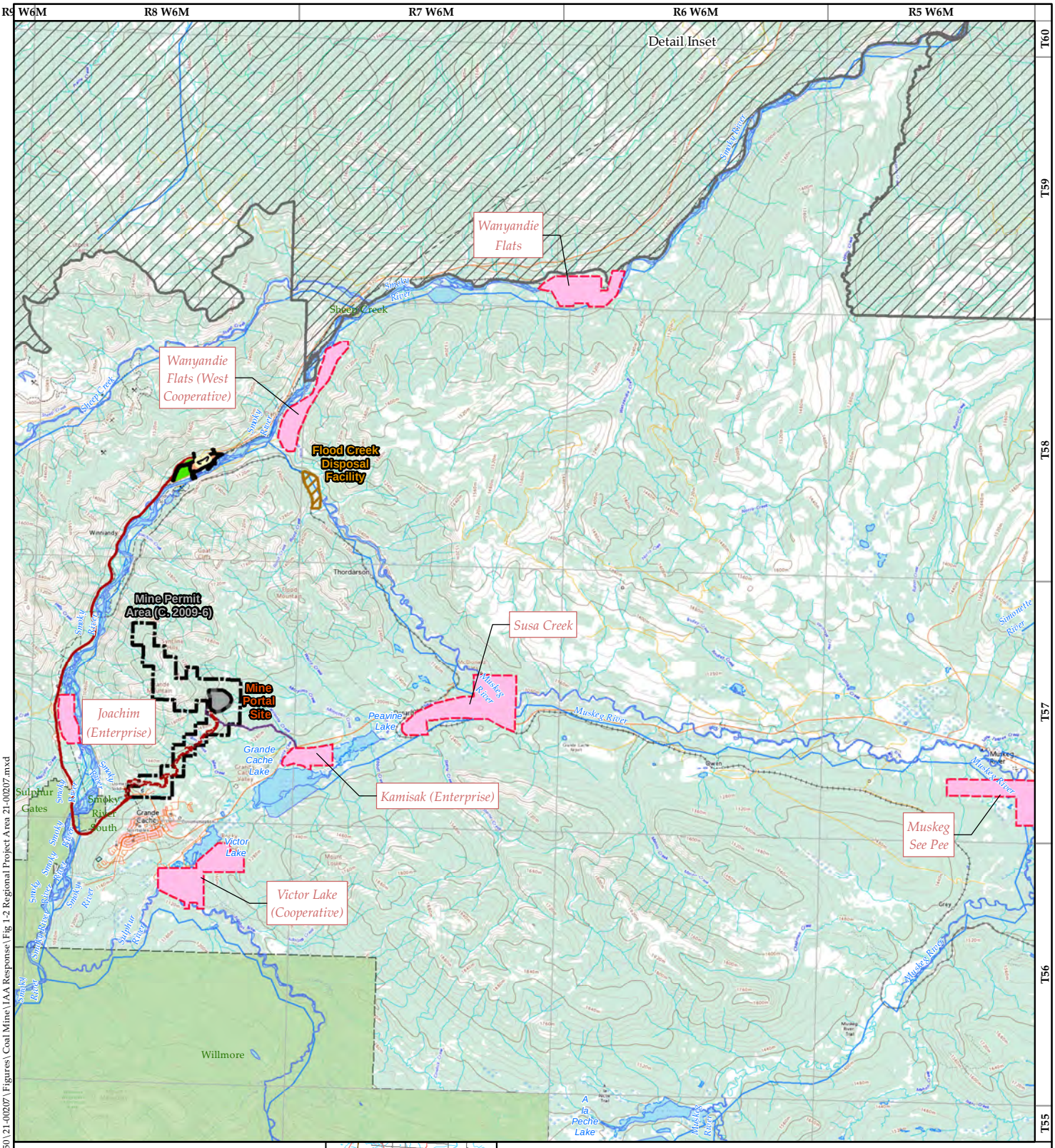
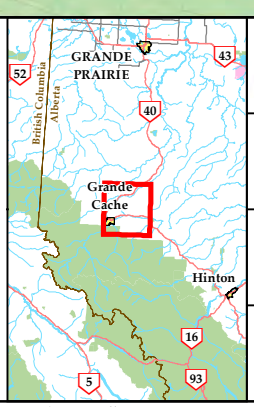


LEGEND

- Watercourse
- Coal Haul Route
- Coal Wash Plant Footprint
- Milner Property Boundary (Approximate)
- CST Coal Plant Area
- Mine Portal Area (MSL 131303)
- Access Road (LOC 131361)
- Exploration Trail (LOC 111555)
- Mine Permit Area (C. 2009-6)
- Aboriginal Enterprise / CO-OP Zone
- Waterbody
- Wilmore Wilderness Park
- Flood Creek Disposal Facility
- Weyerhaeuser FMA



SUMMIT COAL INC. - MINE 14 PROJECT
IMPACT ASSESSMENT AGENCY OF CANADA

REGIONAL PROJECT AREA

AltaLIS, 2022; MEMS, 2022; NRCAN - Toporama, 2022

Coordinate System: NAD 1983 UTM Zone 11N

0 4 8
Kilometers

MILLENNIUM EMS Solutions Ltd.

PROJECT: 21-00207
DRAWN BY: EPITTMAN
CHECKED BY: DM
DATE: SEPTEMBER 6, 2022

FIGURE
1-2

Document Path: K:\Active Projects 2021\AP 21-00201 to 21-00250\21-00207\Figures\Coal Mine\IAA Response\Fig 1-2 Regional Project Area 21-00207.mxd

R8 W6M

T57

MSL 131303

LOC 131361

1319090197

1312050625

1319090196

Allan Creek

Two Cabin Creek

Grande Cache

Smoky River South

16 15 14 9 10 11 4 3 2

SUMMIT COAL INC. - MINE 14 PROJECT
IMPACT ASSESSMENT AGENCY OF CANADA

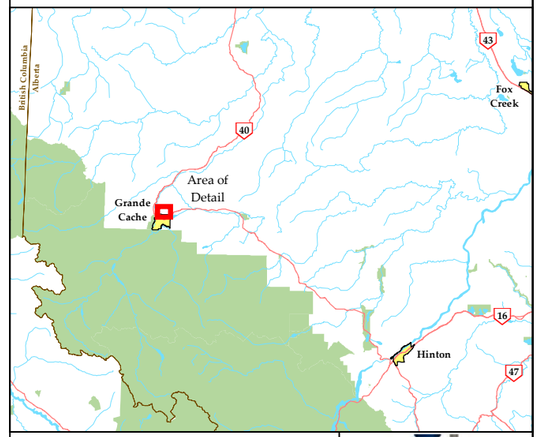
MINE 14 ACCESS ROAD AND MINE PORTAL AREA

LEGEND

- Secondary Road
- Gravel Road
- Trail/Winter/Unimproved
- Water Course (AltaLIS, 2020)
- Park/Protected Area

Mine 14

- Mine Portal Area (MSL 131303)
- Access Road (LOC 131361)
- Mine Permit Area (C. 2009-6)
- Mine License Area (C. 2011-9)
- Coal Lease - Summit Coal Inc.



0 400 800

Meters

Coordinate System: NAD 1983 UTM Zone 11N

AEP, 20120; AltaLIS, 2020; GeoBase, 2017;
MEMS, 2021; Stantec, 2013;
ESRI, 2021 (Image Date: 2019)

MILLENNIUM EMS Solutions Ltd.

PROJECT: 21-00207

DRAWN BY: EPITTMAN

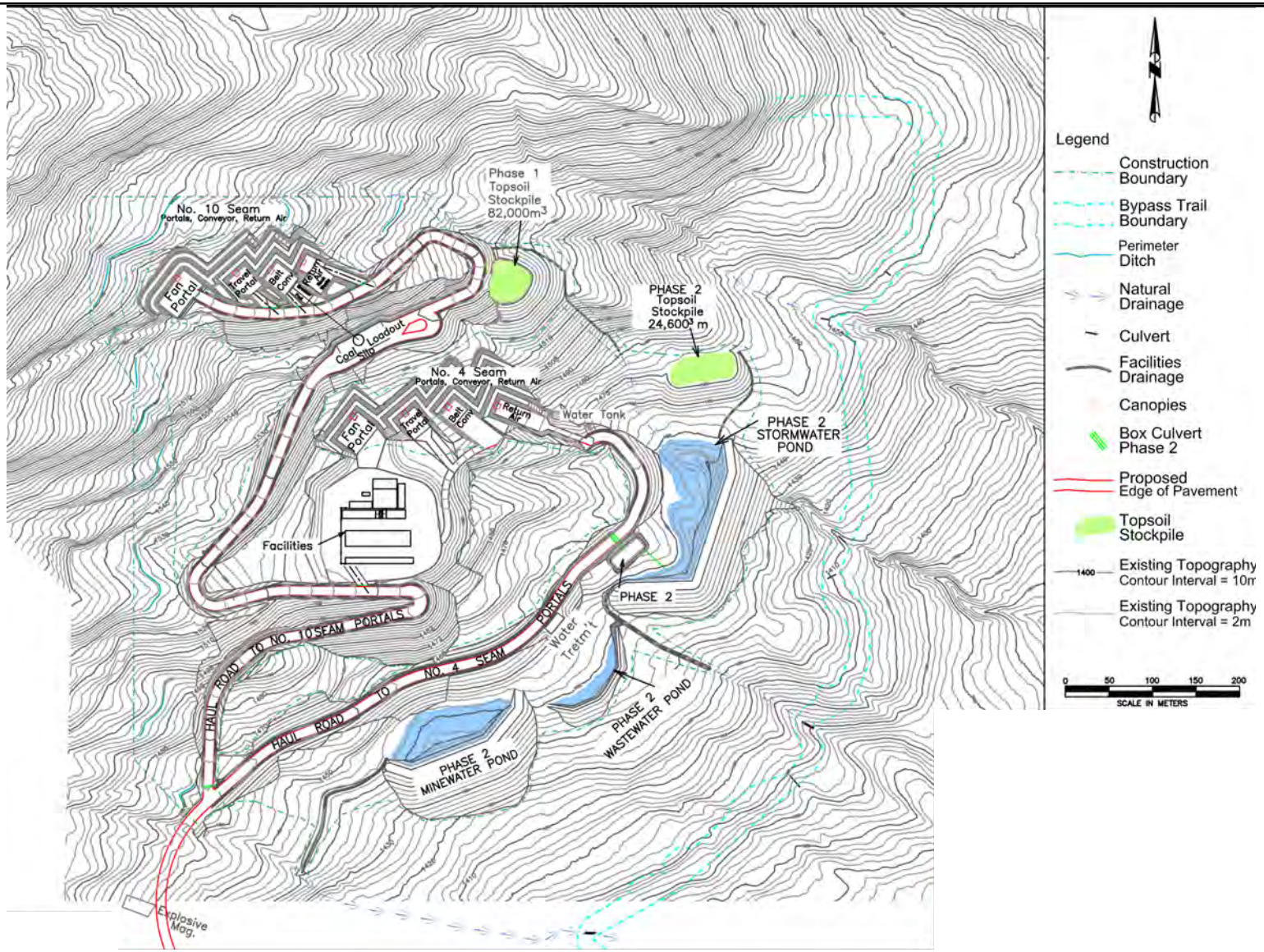
CHECKED BY: DM

DATE: SEPTEMBER 6, 2022

FIGURE

1-3

Document Path: K:\Active Projects 2021\AP 21-00201 to 21-00250\21-00207\Figures\Coal Mine\IAA Response\Fig 1-3 Mine 14 Access Road and Mine Portal Area 21-00207.mxd



LEGEND

SUMMIT COAL INC. - MINE 14 PROJECT
IMPACT ASSESSMENT AGENCY OF CANADA

MILLENNIUM EMS Solutions Ltd.

MINE PORTAL SITE LAYOUT

MEMS, 2022; Milner Power Inc., 2012; Marston, 2012

PROJECT: 21-00207
DRAWN BY: EPITTMAN
CHECKED BY: DM
DATE: SEPTEMBER 6, 2022

FIGURE
1-4

Document Path: K:\Active Projects 2021\AP 21-00201 to 21-00250\21-00207\Figures\Coal Mine\IAA Response\Fig 1-4 Mine Portal Site Layout 21-00207.mxd

R8 W6M

R7 W6M

T58

T57

Document Path: K:\Active Projects 2021\AP21-00201 to 21-00250\21-00207\Figures\Coal Mine\AA Response\Fig 2-1 Mine Permit and Licence Boundaries 21-00207.mxd

SUMMIT COAL INC. - MINE 14 PROJECT
IMPACT ASSESSMENT AGENCY OF CANADA

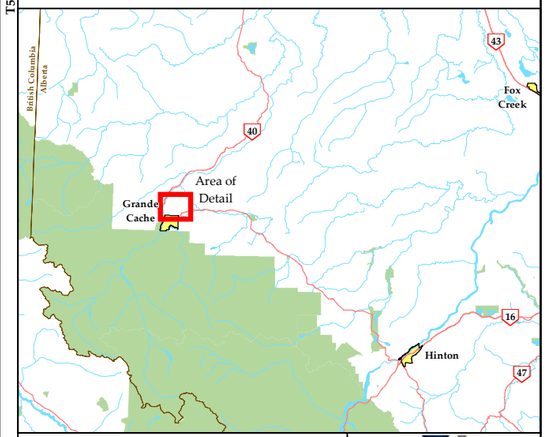
MINE PERMIT AND LICENCE BOUNDARIES

LEGEND

- Railway
- Secondary Road
- Gravel Road
- Trail/Winter/Unimproved
- Index Contour (50m Interval)
- Water Course
- Water Body
- Park/Protected Area
- County/MD Boundary

Mine 14

- Mine Portal Area (MSL 131303)
- Access Road (LOC 131361)
- Exploration Trail (LOC 111555)
- Mine Permit Area (C. 2009-6)
- Mine License Area (C. 2011-9)
- Coal Lease - Summit Coal Inc.



0 1 2

Kilometers

Coordinate System: NAD 1983 UTM Zone 11N

AEP, 2020; AltaLIS, 2022; GeoBase, 2017;
MEMS, 2022; Stantec, 2013;
ESRI, 2022 (Image Date: 2019)

MILLENNIUM EMS Solutions Ltd.

PROJECT: 21-00207

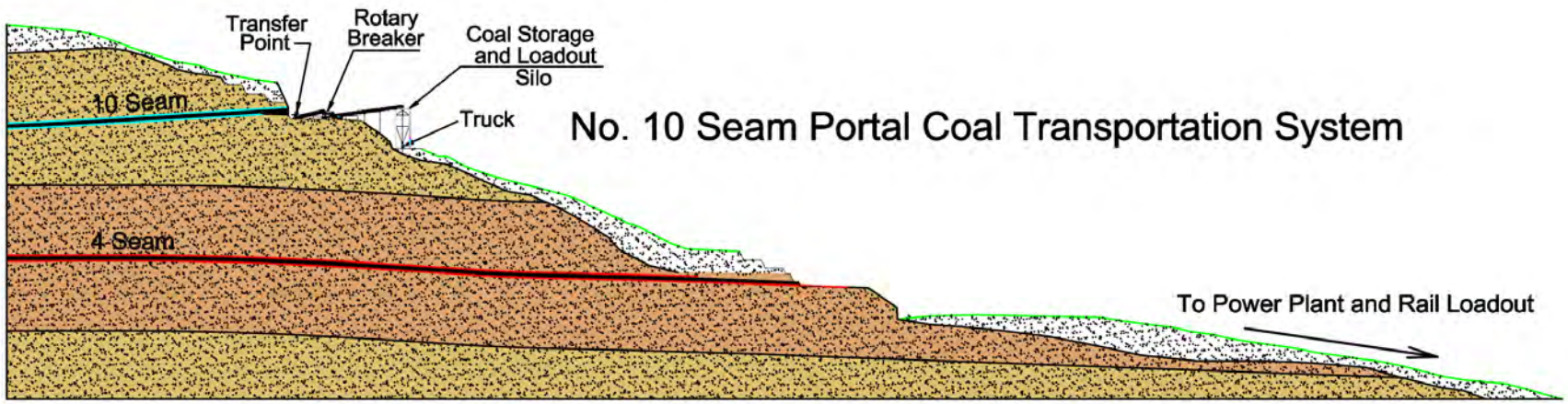
DRAWN BY: EPITTMAN

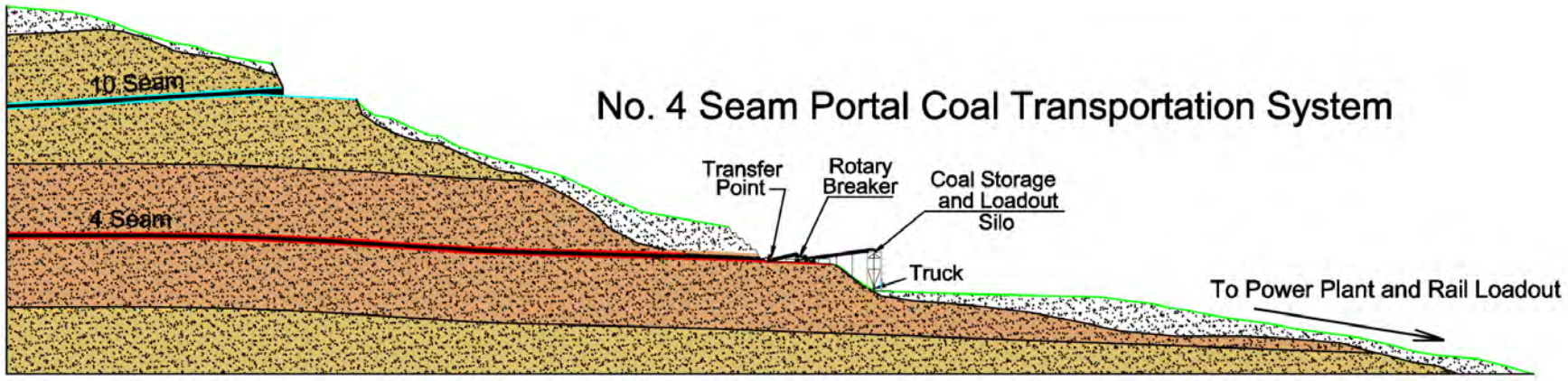
CHECKED BY: DM

DATE: SEPTEMBER 6, 2022

FIGURE

2-1





LEGEND

- UNCONSOLIDATED
- UNDIFFERENTIATED SEDIMENTARY FORMATION
- UNDIFFERENTIATED SEDIMENTARY FORMATION
- NO. 4 AND NO. 10 SEAM

SUMMIT Coal Inc

SUMMIT COAL INC. - MINE 14 PROJECT
IMPACT ASSESSMENT AGENCY OF CANADA

MILLENNIUM EMS Solutions Ltd.

CROSS-SECTIONS OF MINE 14
NO. 4 AND 10 COAL SEAMS AND INFRASTRUCTURE

MEMS, 2022; Milner Power Inc., 2012; Marston, 2012

PROJECT: 21-00207
DRAWN BY: EPITTMAN
CHECKED BY: DM
DATE: SEPTEMBER 6, 2022

FIGURE
3-1

Document Path: K:\Active Projects 2021\AP 21-00201 to 21-00250\21-00207\Figures\Coal Mine\IAA Response\Fig 3-1 Cross-Sections of Mine 14 No4_10 Coal Seams and Infrastructure 21-00207.mxd

R8 W6M

T57

Clean Water Bi-pass Around Mine Portal Area

Surface Runoff Capture for Stormwater Pond

Stormwater Pond

Discharge for Stormwater Pond

Emergency Discharge for Wastewater Pond

Wastewater Pond

Minewater Pond

Emergency Discharge for Minewater Pond

POTABLE WATER TREATMENT PLANT

WATER TOWER

WASTEWATER TREATMENT PLANT

PUMP STATION

POND 4 STORMWATER

POND 5

POND 6

POND 7 MINE WATER

CONTROL STRUCTURE

CONTROL STRUCTURE

SAMPLING POINT STORMWATER

TREATED WASTEWATER

SAMPLING POINT TREATED WASTEWATER

VEGETATED SWALE FOR RELEASE OF TREATED WASTEWATER

SAMPLING POINT MINE WATER

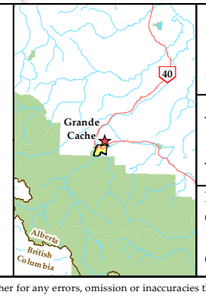
SAMPLING POINT UPSTREAM OF MINE DRAINAGE

CARCONTE CREEK

SAMPLING POINT DOWNSTREAM OF MINE DRAINAGE

LEGEND

- SAMPLING POINT
- DRAINAGE COURSES



SUMMIT Coal Inc

SUMMIT COAL INC. - MINE 14 PROJECT
IMPACT ASSESSMENT AGENCY OF CANADA

WATER MANAGEMENT STRUCTURES AND WQ MONITORING PROGRAM

MEMS, 2022; Westhoff Engineering Resources, Inc., 2007;
CAD File: 10718L02

Coordinate System: NAD 1983 UTM Zone 11N

Scale 1:2,500

MILLENNIUM EMS Solutions Ltd.

PROJECT:	21-00207
DRAWN BY:	EPITTMAN
CHECKED BY:	DM
DATE:	SEPTEMBER 6, 2022

FIGURE

3-2

Document Path: K:\Active Projects 2021\AP 21-00201 to 21-00250\21-00207\Figures\Coal Mine\IAA Response\Fig 3-2 Water Management Structures and WQ Monitoring Program 21-00207.mxd

R8 W6M

T57

T56

Crossing 9 - Carconte Creek
• Flowing water (Yes/No): No
• Channel width (m): no defined channel
• Notes: Valley is 20 m wide from top of slope to top of slope well vegetated banks, slightly moist channel 1.5 m wide.

Seep - Two Cabin Creek
• Flowing water (Yes/No): Yes
• Channel width (m): 8 m wide x 20 m long, then narrows to 0.3 m wide with flowing water.
• Notes: Seep disappears for 10 meters as it flows under a large tree and then reappears.

Spring - Two Cabin Creek
• Flowing water (Yes/No): Yes
• Channel width (m): 2 m wide and runs north for 7 m with clear, flowing water.
• Notes: No inlet to spring; upslope is also wet and dominated by horsetail and alder.

Crossing 8 - Allen Creek
• Flowing water (Yes/No): No
• Channel width (m): 0.5
• Notes: well vegetated banks, slightly moist channel 0.5 m wide.

Crossing 7 - Allen Creek
• Flowing water (Yes/No): Yes
• Channel width (m): 1-2
• Notes: Creek at Alan Creek assessment point is 2 m wide x 0.01 m deep, with running water. North slope is 65% shear rock face, while south slope is 36 degrees. Less than 1 m wide channel at AQ03. Multiple small waterfalls along the creek.

Crossing 2 - Unnamede Tributary to Smokey River
• Flowing water (Yes/No): No
• Channel width (m): no defined channel
• Notes: U-shaped valley app. 20 m wide (from top to top), well grassed valley sides, blocked culvert under the road, lots of garbage downstream of existing water crossing

Crossing 4 - Two Cabin Creek
• Flowing water (Yes/No): Yes
• Channel width (m): 0.5
• Notes: well vegetated banks (sedges, willow).

Crossing 5 & 6 - Allen Creek
• Flowing water (Yes/No): Yes
• Channel width (m): 1-1.5
• Notes: well vegetated banks, multiple channels upstream of AQ02

Crossing 3 - Two Cabin Creek
• Flowing water (Yes/No): No
• Channel width (m): no defined channel
• Notes: U-shaped valley app. 10 m wide (from top to top), well vegetated, no culvert at the trail, cut wood at the bottom of valley. Trees growing at the bottom of the valley.

Crossing 1 - Two Cabin Creek
• Flowing water (Yes/No): Yes
• Channel width (m): 4-5
• Notes: defined channel 4-5 m width, up to 2 m deep, hanging culvert under highway, well vegetated banks, V-shaped valley app. 40 m wide (from top to top), fallen trees across the channel.

Crossing 9
Crossing 8
Seep
Crossing 5 & 6
Crossing 7
Spring
Crossing 2
Crossing 3
Crossing 4
Crossing 1

Carconte Creek
Allen Creek
Smoky River
Two Cabin Creek
Mitchin Creek
Victor Lake
Grande Cache Lake
97 Street
106 Street
105 Avenue
104 Avenue

SUMMIT COAL INC. - MINE 14 PROJECT
IMPACT ASSESSMENT AGENCY OF CANADA

DRAINAGE CROSSINGS - WITH SITE PHOTOS

LEGEND

- Drainage Crossing
- Secondary Road
- Gravel Road
- Trail/Winter/Unimproved
- Water Course
- Water Body

Mine 14

- Mine Permit Area (C. 2009-6)
- Mine Portal Area (MSL 131303)
- Access Road (LOC 131361)

Grande Cache

0 500 1,000
Metres

Coordinate System: NAD 1983 UTM Zone 11N

AltaLIS, 2021; MEMS, 2022;
Valory Resources, 2022 (LiDAR Date: 2022)

PROJECT:	21-00207
DRAWN BY:	EPITTMAN
CHECKED BY:	DM
DATE:	SEPTEMBER 6, 2022

FIGURE
3-3

Document Path: K:\Active Projects 2021\AP 21-00201 to 21-00250\21-00207\Figures\Coal Mine\IAA Response\Fig 3-3 Drainage Crossings with Site Photos 21-00207.mxd

R8 W6M

T57

Coal Storage

Water Tank

Topsoil Stockpile 24,600 m³

UNDISTURBED GROUND

Surface Run-off Capture to Stormwater Pond

STORMWATER POND

10m WIDE MAINTENACE BERM

PROPOSED CONTROL STRUCTURE CS03

PROPOSED INLET

ST 300 HDPE

PROPOSED OUTFALL

Water Tretm't

MINEWATER POND

PROPOSED DRAINAGE DITCH

EMERGENCY SPILLWAY

PROPOSED CONTROL STRUCTURE CS01

10m WIDE MAINTENANCE ROAD

Minewater Pond Emergency Spillway

ST. 200 HDPE

PROPOSED CONTROL STRUCTURE CS02

WASTEWATER POND

3m WIDE MAINTENANCE ROAD

Wastewater Pond Emergency Spillway

Stormwater Pond Spillway

PROPOSED SPILLWAY DRAINAGE DITCH

Stormwater Pond Surface Discharge

Document Path: K:\Active Projects 2021\AP 21-00201 to 21-00250\21-00207\Figures\Coal Mine\IAA Response\Fig 3-4 Overland Drainage Flows and Spill Direction 21-00207.mxd

Disclaimer: This figure was derived from multiple data sources and while we make every effort to assure its accuracy, Millennium EMS Solutions Ltd. disclaims any representation or warranty and assumes no liability either for any errors, omission or inaccuracies that may occur.

SUMMIT Coal Inc

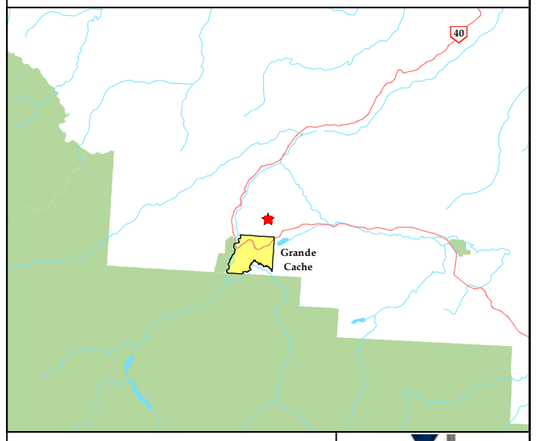
SUMMIT COAL INC. - MINE 14 PROJECT
IMPACT ASSESSMENT AGENCY OF CANADA

OVERLAND DRAINAGE FLOWS AND SPILL DIRECTION

LEGEND

- DYKE/POND CONSTRUCTION BOUNDARY
- PROPOSED PORTAL SITE PERIMETER FENCE
- 1480 EXISTING GROUND CONTOURS @ 10.0m INTERVALS
- EXISTING GROUND CONTOURS @ 2.0m INTERVALS
- 1480 PROPOSED DYKE CONTOURS @ 10.0m INTERVALS
- PROPOSED DYKE CONTOURS @ 2.0m INTERVALS
- SPILL DIRECTION
- OVERLAND DRAINAGE FLOW

NOTES:
1. DRAWING UNITS, DIMENSIONS AND ELEVATIONS ARE IN METERS, AND DECIMALS THEREOF. ALL PIPE SIZES ARE IN MILLIMETERS, UNLESS NOTED OTHERWISE.
2. GRID COORDINATE SYSTEM: UTM, NAD83, ZONE 11.



SCALE 1:1,000

MILLENNIUM EMS Solutions Ltd.

Coordinate System: NAD 1983 UTM Zone 11N

MEMS, 2022;
Westhoff Engineering Resources, Inc., 2011;
CAD File: 11127ST01

PROJECT:	21-00207
DRAWN BY:	EPITTMAN
CHECKED BY:	DM
DATE:	SEPTEMBER 6, 2022

FIGURE

3-4

SUMMIT Coal Inc

SUMMIT COAL INC. - MINE 14 PROJECT
IMPACT ASSESSMENT AGENCY OF CANADA

AREAS OF INTEREST - DISTANCE FROM MINE PORTAL

LEGEND

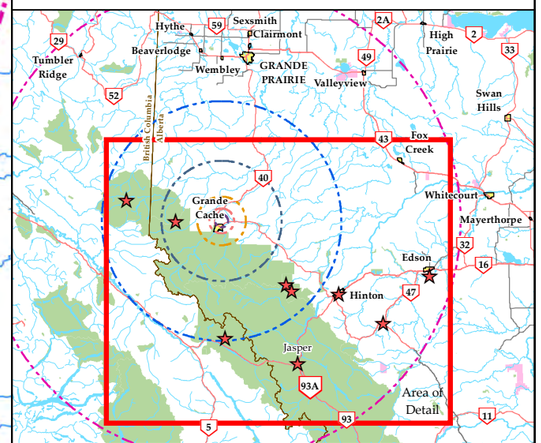
- Area of Interest
- Primary Highway
- Secondary Highway
- Watercourse
- Waterbody
- Park/Protected Area
- Aboriginal Enterprise / CO-OP Zone
- Caribou Range
- Wash Plant / Milner / CST Facilities

Mine 14

- Mine Portal Area (MSL 131303)
- Access Road (LOC 131361)
- Exploration Trail (LOC 111555)

Area of Interest Search Radius

- 5 km
- 10 km
- 20 km
- 50 km
- 100 km
- 200 km



0 20 40

Kilometers

MILLENNIUM EMS Solutions Ltd.

PROJECT: 21-00207	
DRAWN BY: EPITTMAN	
CHECKED BY: DM	
DATE: SEPTEMBER 6, 2022	

Coordinate System: NAD 1983 UTM Zone 11N

AEP, 20120; AltaLIS, 2020; GeoBase, 2017; MEMS, 2021; Stantec, 2013; ESRI, 2021 (Image Date: 2019)

FIGURE 5-1

Document Path: K:\Active Projects 2021\AP 21-00201 to 21-00250\21-00207\Figures\Coal Mine\AA Response\Fig 5-1 AOI Distances 21-00207.mxd

APPENDIX 1: EXISTING APPROVALS

ERCB Energy Resources Conservation Board

COAL MINE
Permit No. C 2009-6

MADE at the City of Calgary, in the Province of Alberta, on 2nd day of December 2009.	<Original signed by> ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of an underground coal mine site of Milner Power Inc. in the **Grande Cache Area.**

WHEREAS the Energy Resources Conservation Board is prepared to grant Application No. 1521988 by Milner Power Inc., registered on August 13, 2007, to develop an underground coal mine site in the Grande Cache area; and

WHEREAS the Lieutenant Governor in Council, by Order in Council Number O.C. 582/2009 dated November 25, 2009, hereto attached as Appendix B, has authorized the granting of this approval.

The Energy Resources Conservation Board (ERCB), pursuant to the Coal Conservation Act, being chapter C-17 of the Revised Statutes of Alberta, 2000, hereby grants to Milner Power Inc. (hereinafter called "the Permittee") a PERMIT to develop an underground coal mine in the Grande Cache area, subject to the provisions of the Act and regulations and orders pursuant thereto and to the following terms and conditions:

1) The mine site shall be known as the Milner Mine Site and be designated as **Mine No. 1814.**

2) The permit shall apply to 860 hectares, more or less, in Township 57, Ranges 8, West of the 6th Meridian, as shown in Appendix A hereto attached.

3) Subject to other provisions of this permit all mining and related operations shall be in accordance with the submissions of the Permittee to the ERCB, registered as

   a) Application No. 1521988 on August 13, 2007.

4) The Permittee shall advise the ERCB of any technical modifications to the development plan and obtain ERCB approval prior to effecting such modifications.

5) Each mining area and external discard site within the permit area shall be individually licensed by the ERCB prior to the commencement of any mining activity.

6) The Permittee shall, as soon as practicable, advise the ERCB and provide a preliminary assessment of any incident or accident affecting, or having the potential for affecting, safety or the environment and being attributable to design features or operational methods which are subject to the approval of the ERCB.

7) The Permittee shall carry out its operations to the satisfaction of the ERCB, and in a manner that

   a) will result in the mining of all practical and economic coal within the permit area,

   b) will not preclude or render more difficult the recovery of other coal recoverable by practical and reasonable operations, and

   c) will facilitate land reclamation.

8) Prior to the Licence for the proposed No. 14 Mine being issued, the ERCB requires the Permittee to provide the ERCB, security as per Application No. 1521988 in respect to abandonment of the mine. Such security may be provided in the form of an irrevocable Letter of Credit.

9) (1) Attached hereto as Appendix B, and made part of this permit, is the order of the Lieutenant Governor in Council authorizing the granting of this permit.

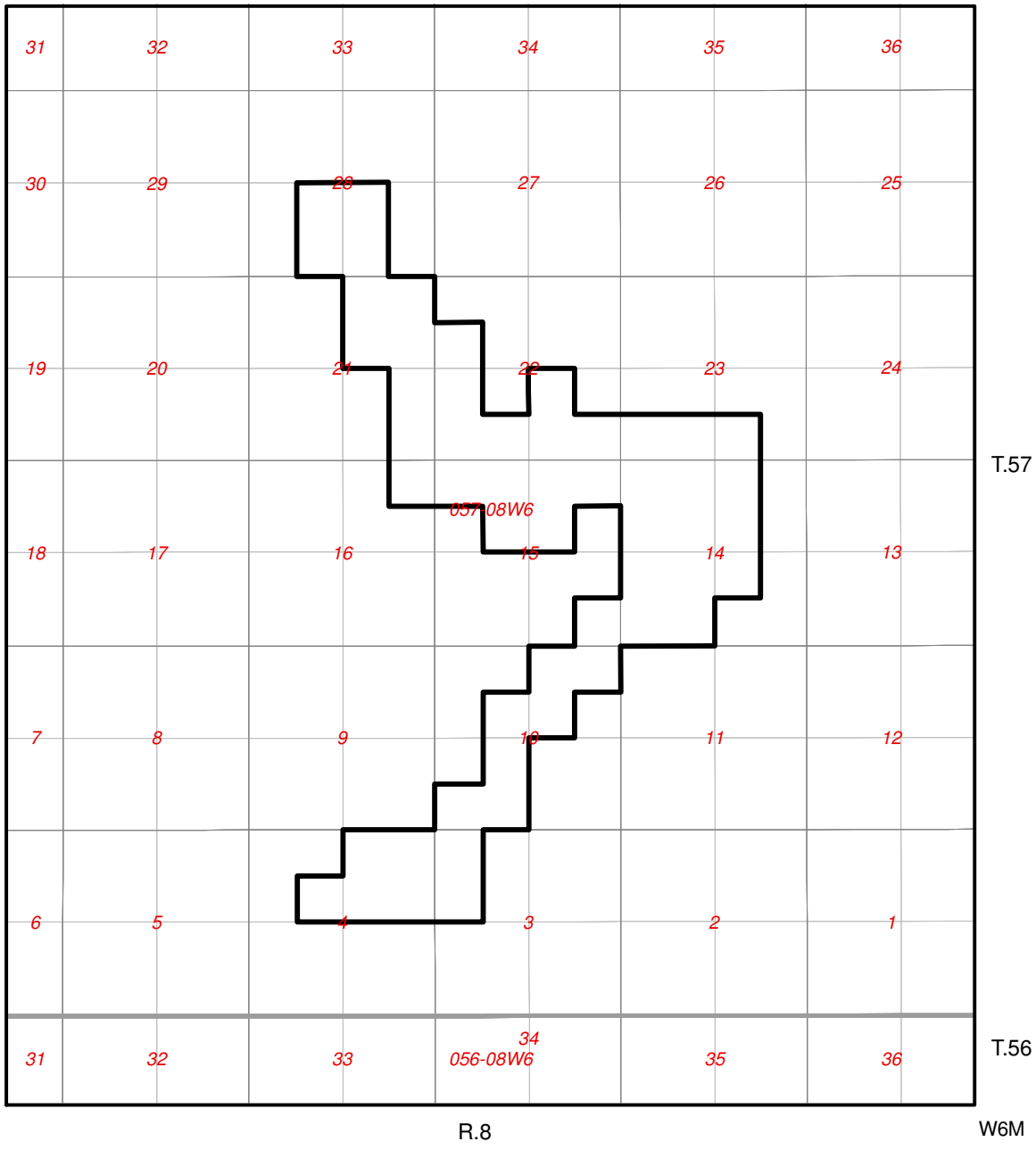
   (2) This permit amendment is subject to the terms and conditions, if any, prescribed by the order of the Lieutenant Governor in Council set out in Appendix B.

10) The ERCB may,

   a) cancel or suspend this permit, in whole or in part, for failure of the Permittee to comply with any provision of the Act, the regulations, or the terms and conditions set out herein, or

   b) amend this permit or make such other order as it deems appropriate under the circumstances.

END OF DOCUMENT



GRANDE CACHE AREA
APPENDIX A TO PERMIT NO. C 2009-6

Area(s) of Change

Added

Deleted

Appendix B
to
Permit No. 2009-6

O.C. 582/2009

NOV 25 2009

Province of Alberta
Order in Council

ORDER IN COUNCIL

Approved and ordered:

<Original signed by>

Lieutenant Governor

The Lieutenant Governor in Council authorizes the Energy Resources Conservation Board to grant Permit No. C 2009-6 to Milner Power Inc. in the form attached.

<Original signed by>

CHAIR

Alberta

For Information only

Recommended by: Minister of Energy

Authority: Coal Conservation Act (section 10)

ERCB Energy Resources Conservation Board

COAL MINE
Permit No. C 2009-6A

MADE at the City of Calgary, in the Province of Alberta, on 31st day of January 2013.	<Original signed by> ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of an underground coal mine site of Summit Coal Inc., in the **Grande Cache Area.**

WHEREAS Milner Power Inc. is the holder of Permit No. C 2009-6 authorizing development of an underground coal mine site in the Grande Cache area; and

WHEREAS Milner Power Inc. has transferred its assets and liabilities to Summit Coal Inc.;

WHEREAS the Energy Resources Conservation Board (hereinafter called "the Board") is prepared to grant Application No. 1751703 by Summit Coal Inc., registered on January 17, 2013, to transfer the holder of Permit No. C 2009-6 for Mine No. 1814, subject to the terms and conditions herein contained.

The Board, pursuant to the Coal Conservation Act, being chapter C-17 of the Revised Statutes of Alberta, 2000, hereby orders as follows:

1) Permit No. C 2009-6 is amended.

2) The name "MILNER Power Inc." is struck out whenever it appears and the name "Summit Coal Inc." is substituted.

END OF DOCUMENT

ERCB Energy Resources Conservation Board

COAL MINE
Licence No. C 2011-9

MADE at the City of Calgary, in the Province of Alberta, on 20th day of April 2011.	<Original signed by> ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of an underground coal mine of Milner Power Inc. in the **Grande Cache Area.**

WHEREAS Milner Power Inc. is the holder of Permit C 2009-6 authorizing development of an underground coal mine site in the Grande Cache Area ; and

WHEREAS the Energy Resources Conservation Board is prepared to grant Application No. 1628550 by Milner Power Inc., registered on October 28, 2009, to operate an underground coal mine within the permit area, subject to the terms and conditions herein contained.

THEREFORE the Energy Resources Conservation Board (hereinafter called "the Board"), pursuant to the Coal Conservation Act, being chapter C-17 of the Revised Statutes of Alberta, 2000, hereby grants to Milner Power Inc. (hereinafter called "the Licencee") a LICENCE to operate an underground coal mine in the Grande Cache area, subject to the provisions of the Act and regulations and orders pursuant thereto and to the following terms and conditions:

1) The mine site shall be designated as **Mine No. 1814/14 Mine.**

2) The licence shall apply to 725 hectares, more or less, in Township 57, Ranges 8, West of the 6th Meridian, as shown in Appendix A hereto attached.

3) Subject to other provisions of this licence all mining and related operations shall be in accordance with the submissions of the Licensee to the Board, registered as Application No. 1628550 on October 28, 2009.

4) The Licensee shall advise the Board of any technical modifications to the mining plan and obtain Board approval prior to effecting such modifications.

5) The Licensee shall obtain written approval from the Board prior to depillaring any mining area which does not reach the mining limits proposed by the Application No. 1628550.

6) The Licensee shall, as soon as practicable, advise the Board and provide a preliminary assessment of any incident or accident affecting, or having the potential for affecting, safety or the environment and being attributable to design features or operational methods which are subject to the approval of the Board.

7) The Licensee shall submit to the Board for approval, at least 4 months prior to construction, a report detailing the overall design of the portal area including additional geotechnical investigation, field work, laboratory work and analyses to confirm and/or finalize strength parameters and stability assumptions.

8) The Licensee shall submit to the Board for approval, at least 4 months prior to construction, a report detailing the overall design for the haulroad including additional geotechnical investigation, field work, laboratory work and analyses to confirm and/or finalize strength parameters and stability assumptions..

9) The Licensee shall monitor the performance of the portal pad , highwall and roof control programs and shall submit, on a quarterly basis or such other frequency the Board may stipulate, a report which:

   a) provides, and analyses, the results of the monitoring programs, and

   b) describes the effectiveness of these programs and the need for additional measures necessary to ensure the safety and efficiency of the operations.

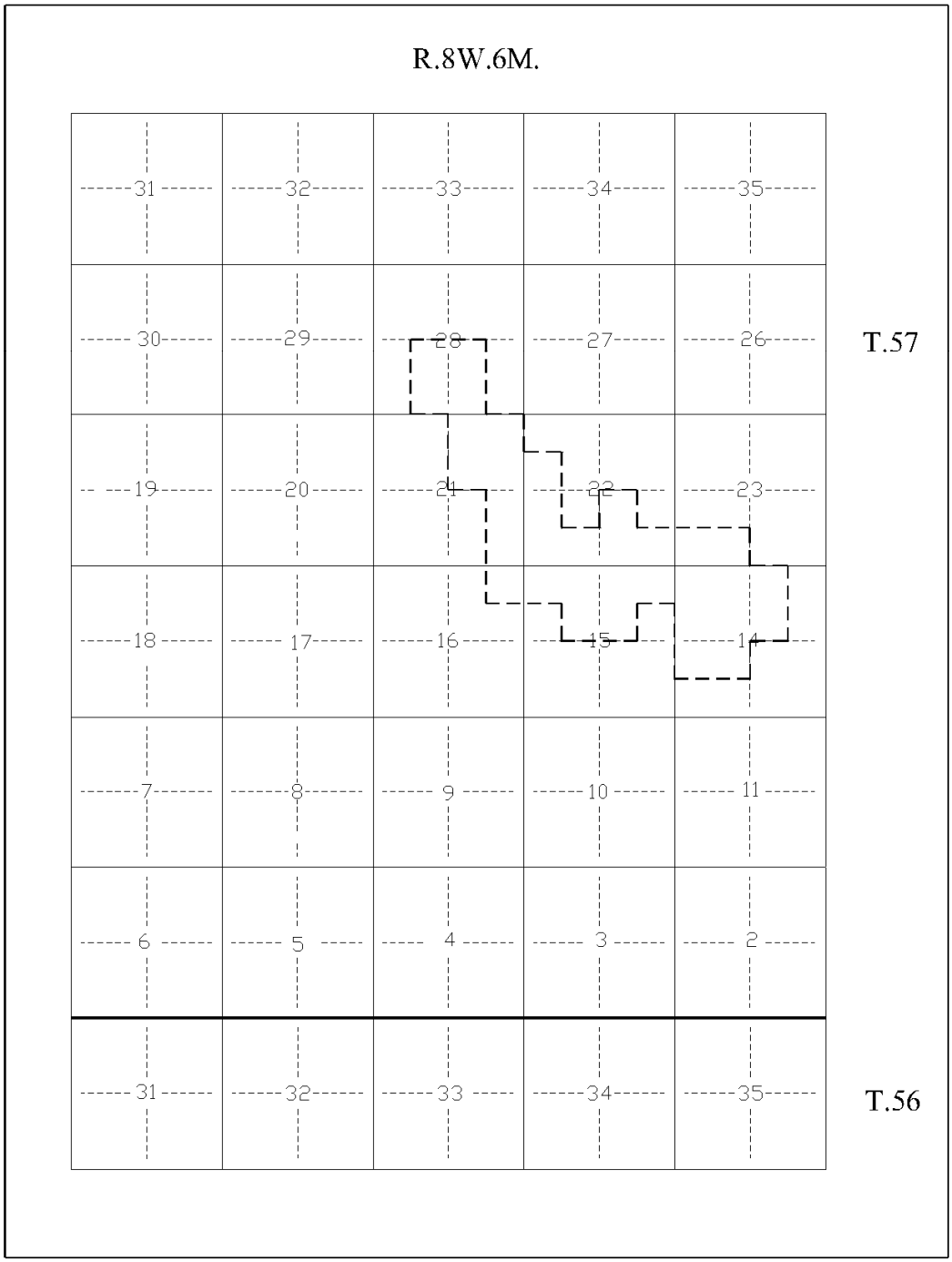
10) Unless otherwise approved by the Board, the Licensee shall seal and abandon all entrances to the underground mine within 6 months of the completion of mining operations.

11) The Board may:

   a) cancel or suspend this licence, in whole or in part, for failure of the Licensee to comply with any provision of the Act, the regulations, order of the Board, or the terms and conditions set out in this licence; or

   b) amend this licence or make such other order as it thinks appropriate under the circumstances.

END OF DOCUMENT



MILNER POWER INC.

GRANDE CACHE AREA

AREA OF CHANGE

LEGEND

APPENDIX A TO LICENCE NO. C 2011-9

——— LICENCE BOUNDARY, MINE NO. 1814

COAL MINE
Licence No. C 2011-9B

MADE at the City of Calgary, in the Province of Alberta, on 22nd day of July 2013.	<Original signed by> ALBERTA ENERGY REGULATOR

IN THE MATTER of an underground coal mine of Summit Coal Inc., in the **Grande Cache Area.**

WHEREAS Summit Coal Inc. is the holder of Permit No. C 2009-6 authorizing development of a coal mine site in the Grande Cache area;

WHEREAS Summit Coal Inc. is the holder of Licence No. C 2011-9 to operate an underground coal mine within the permit area;

WHEREAS the Alberta Energy Regulator (hereinafter called "the Regulator") is prepared to grant Application No. 1736517 by Summit Coal Inc., registered on August 20, 2012, for Mine No. 1814, subject to the terms and conditions herein contained.

The Regulator, pursuant to the *Coal Conservation Act*, being chapter C-17 of the Revised Statutes of Alberta, 2000, hereby orders as follows:

1) Licence No. C 2011-9 is amended.

2) Clause 3 and 5 are struck out and substituted with:

> 3. Subject to other provisions of this licence, all mining and related operations shall be in accordance with the submissions of the Licensee to the Regulator, registered as
>
> a) Application No. 1628550 on October 28, 2009;
> b) Application No. 1751704 on January 17, 2013; and
> c) Application No. 1736517 on August 20, 2012.
>
> 5. The Licensee shall obtain written approval from the Regulator prior to depillaring any mining area which does not reach the mining limits proposed by the Application No. 1736517.

3) Clause 12 is added as follows:

> 12. The Licensee shall submit to the Regulator for approval, at least three months prior to construction, a geotechnical report detailing the design of the Phase 2 topsoil stockpile.

END OF DOCUMENT

COAL MINE
Licence No. C 2011-9C

MADE at the City of Calgary, in the Province of Alberta, on 8th day of May 2014.	Rod Godwaldt ALBERTA ENERGY REGULATOR

IN THE MATTER of an underground coal mine of **Summit Coal Inc**., in the **Grande Cache Area.**

WHEREAS Summit Coal Inc. is the holder of Permit No. C 2009-6 authorizing development of a coal mine site in the Grande Cache area;

WHEREAS Summit Coal Inc. is the holder of Licence No. C 2011-9 to operate an underground coal mine within the permit area;

WHEREAS the Alberta Energy Regulator (AER) is correcting a typographical error incorporated in Licence No. C 2011-9 relating to the applicant's Licence to operate an underground coal mine in the Grande Cache area for Mine No. 1814.

The AER, pursuant to the *Coal Conservation Act*, being chapter C-17 of the Revised Statutes of Alberta, 2000, hereby orders as follows:

1) Licence No. C 2011-9 is amended.

2) Clause 2 is struck out and substituted with:

    2. The licence shall apply to 540 hectares, more or less, in Township 57, Range 8, West of the 6th Meridian, as shown in Appendix A.

END OF DOCUMENT

APPENDIX 2: 2022 NEWSLETTER

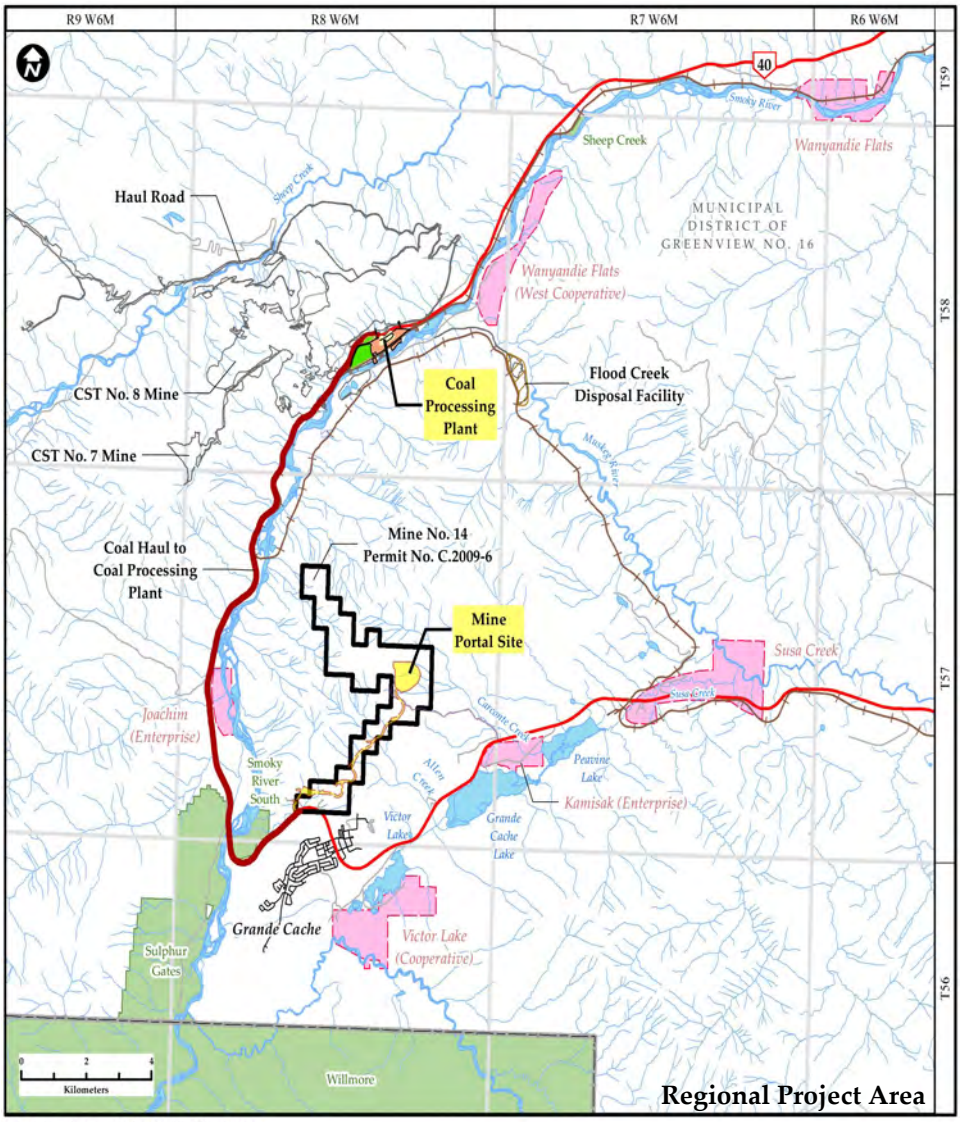
Summit Coal Inc. Mine 14

Newsletter 1—Summer 2022

June 2022

Summit Coal Inc. (Summit) is excited to finalize the approvals for the Mine 14 Project. The mine is designated as Mine No. 1814 but more commonly referred to as Mine 14. Summit has recently resumed the regulatory processes to complete final outstanding approvals for the project. This includes applications with the Alberta Energy Regulator (AER), and the Aboriginal Consultation Office (ACO).

Summit is committed to ensuring that stakeholders can access information on the project through various channels. The project is in its early stages and these channels are being developed, including plans for an email address where stakeholders can request information and provide feedback.



Coordinate System: NAD 1983 UTM Zone 11N

The Mine 14 Project has already secured Mine Permit C2009-6 which was received in 2009. This permit relates to the development of an underground coal mine. Lands included in this permit include the access road, mine portal location and underground working area. Mine Licence No. C2011-9 was received on April 20, 2011. This licence authorizes the development of an underground coal mine. These approvals are still active.

Approvals for the access road (Licence of Occupation (LOC)), the mine portal area (Mineral Surface Lease (MSL)) and transportation were granted but have now lapsed. Summit is currently in the process of reapplying for those approvals.

On March 4, 2022 the Minister of Energy announced that Summit Coal's Mine 14 was one of four coal mining projects that was granted an exemption from a Ministerial Order blocking new coal exploration projects in Alberta. This is due to Mine 14 having advanced and secured a majority of the necessary regulatory applications and permits.

On April 15, 2022 Summit submitted a Project Update Application with the AER. The Project Update included information pertaining to the *Environmental Protection and Enhancement Act* (EPEA) and *Water Act* approvals being sought for Summit's Mine 14 Project.

Summit Coal Inc. Mine 14

Newsletter 1—Summer 2022

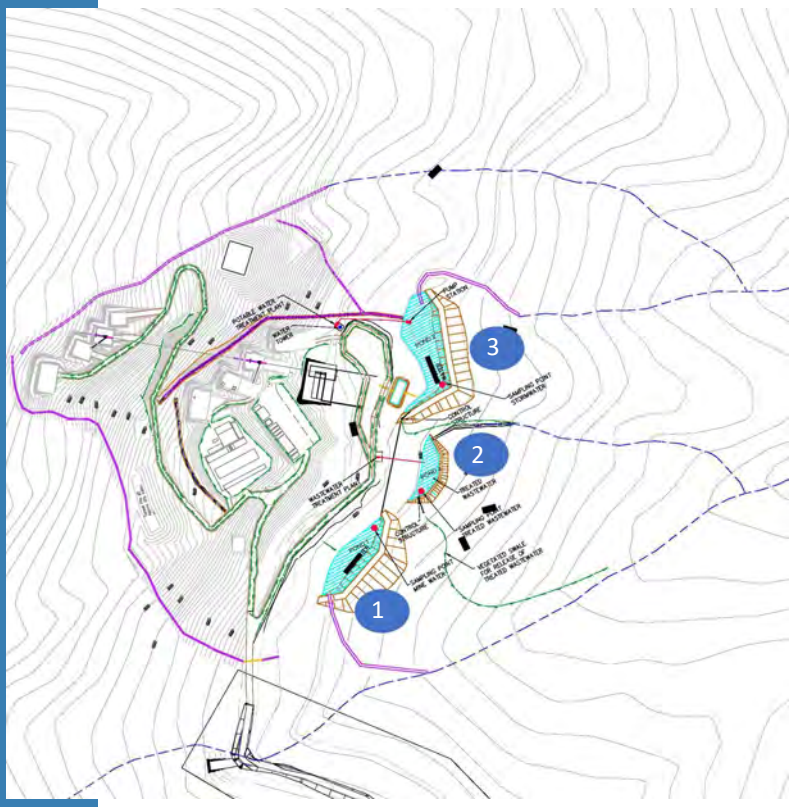
June 2022

The Project Update contains information that was provided in the original 2007 Mine Permit Application, the 2012 Mine Licence Amendment Application and information provided to regulators through multiple rounds of Supplemental Information Requests (SIRs).

Conceptual Drawing of Mine No. 14 Portal Development

Mine 14 is a proposed underground metallurgical coal mine that is located approximately 3.2 km northeast of the hamlet of Grande Cache, Alberta. The proposed production for Mine 14 is 1.3 million raw metric tonnes (RMT) per year. Production levels may vary from year to year but are not planned to exceed this level.

The surface activities include the mine portal area, approximately 52.5 ha, and the access road, approximately 47.8 ha. The current mine permit boundary area is 870.4 ha which is the area where most of the underground mining will occur and also includes the access road and mine portal areas. There are no changes contemplated to the originally applied project components or the total footprint.



Mine No. 14 Portal Layout and Surface Water Management

The surface infrastructure at the mine portal site including topsoil stockpiles, surface water management features as well as the access road are displayed on the portal development drawings. The project has a Water Management Plan which aims to meet four fundamental objectives:

- Minimize impacts on existing drainage courses with respect to water quantity and water quality;
- Comply with the regulatory requirements for industrial runoff management at the portal site;
- Comply with the regulatory requirements for watercourse crossings; and
- Optimize collection and storage of rain and snowmelt at the portal site for on-site water demand requirements.

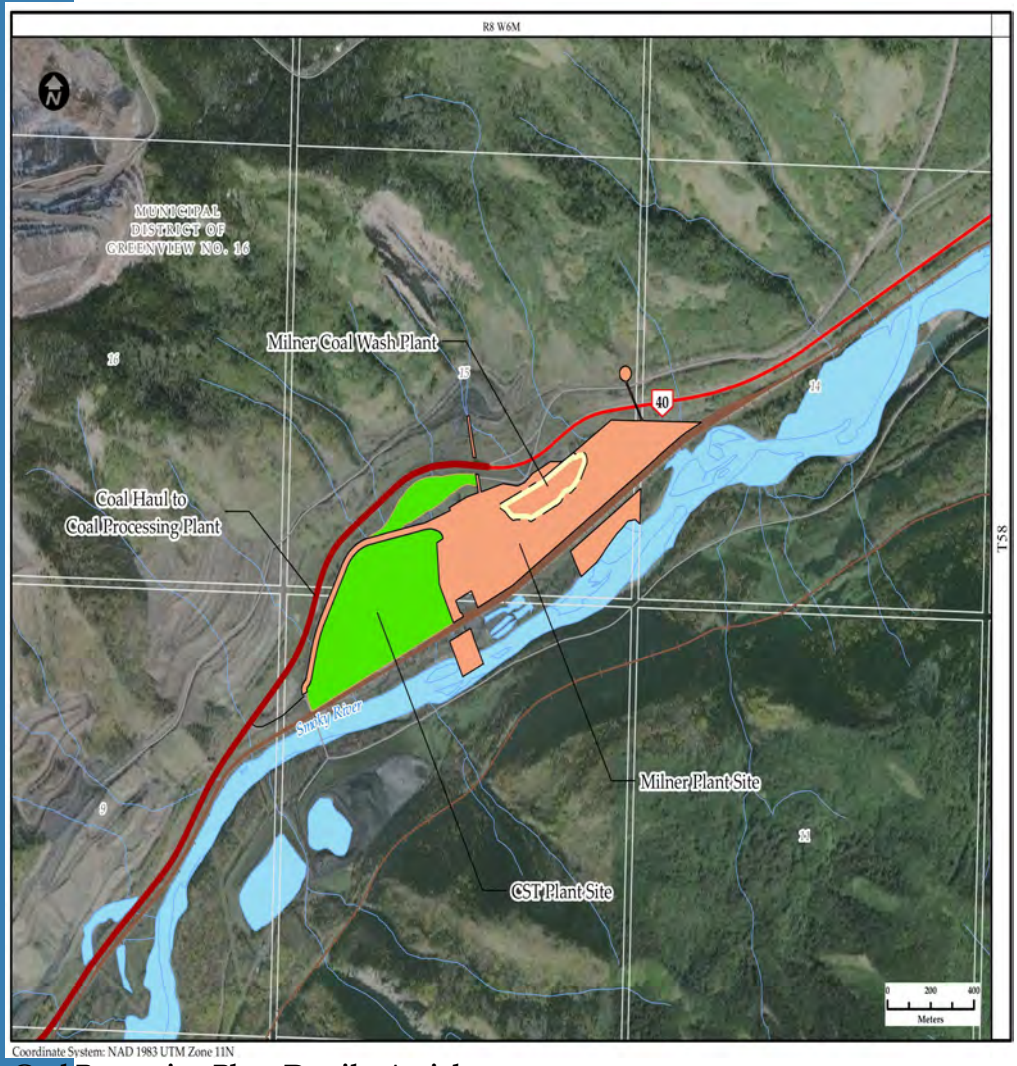
The three numerical circles on the drawings display the location of the water management ponds at the mine portal site from two vantage points.

Summit Coal Inc. Mine 14

Newsletter 1—Summer 2022

June 2022

Coal from Mine 14 will be processed at the Coal Processing Plant (CPP) to be built at the H.R. Milner Generating Station approximately 20 km north of Mine 14. The CPP is approved but is not yet built and will be constructed within the existing disturbance footprint of the H.R. Milner Generating Station, which will encompass approximately 4.9 ha. The CPP was approved under the *Coal Conservation Act* with Approval No. C 2013-3. No modifications to the H.R. Milner Generating Station are required.



Coal Processing Plant Detail – Aerial

Summit will provide opportunities for stakeholders to meet project leaders and personnel through scheduled meetings, open houses, site visits and other local events throughout the life of the project. Summit has started to reengage local Indigenous communities, public stakeholders and the MD of Greenview Municipal Council to introduce project leadership and explain details of the project.

Summit is committed to being a responsible operator and good neighbor in the Grande Cache area and is looking forward to achieving the approvals and permits required to move forward with the Mine 14 Project. For more information about the project, please contact Gaelle Eizlini, Indigenous and Stakeholder Engagement Lead at geizlini@mems.ca.

STAY TUNED FOR AN UPCOMING FALL 2022 OPEN HOUSE

Summit is preparing an Open House in Grande Cache for Fall 2022. The final date, time and venue will be publicized well in advance to ensure that Indigenous communities, local residents, regulators and interested stakeholders will be able to attend.

APPENDIX 3: NO EIA DETERMINATION

Alberta Energy Regulator

Calgary Head Office
Suite 1000, 250 – 5 Street SW
Calgary, Alberta T2P 0R4
Canada

www.aer.ca

September 06, 2022

By email only

Shaun McNamara, Director, Environment and Safety
Summit Coal Inc.
1800, 715-5th Avenue S.W.
Calgary, AB T2P 2X6

Email: smcnamara@maximpowercorp.com

Environmental Impact Assessment Report Not Required

Dear Mr. McNamara:

Further to your correspondence of May 4, 2022, please be advised that pursuant to section 44 of the *Environmental Protection and Enhancement Act (EPEA)*, the Alberta Energy Regulator (AER) has considered the application of the environmental assessment process to Summit Coal Inc. (Summit Coal)'s proposed Mine 14 Underground Coal Mine project. This activity is not a mandatory activity for the purposes of environmental assessment.

The AER has reviewed the information and the project summary table provided by Summit Coal dated May 4, 2022. The AER has also considered the December 15, 2006 decision by Alberta Environment and Parks (AEP) to not require a screening report or an environmental impact assessment report. The AER hereby acknowledges this decision.

Please note that the AER reserves the right to review this decision should different or new information become available. Summit Coal should also note that section 47 of *EPEA* gives the Minister responsible for *EPEA* the authority to order the preparation of an environmental impact assessment report under appropriate circumstances, notwithstanding the Director's decision to not require an environmental impact assessment report.

Summit Coal should be advised that although an environmental impact assessment report is not required for this project, the AER has other regulatory requirements. For more information about these requirements, please go to www.aer.ca.

It remains Summit Coal's responsibility to

- contact the Aboriginal Consultation Office. Summit Coal should note that the Government of Alberta's Indigenous consultation policies and guidelines may apply to this project.
- contact Alberta Culture and Status of Women to discuss the requirements under the *Historical Resources Act*
- contact the Impact Assessment Agency of Canada (IAAC) to discuss potential federal impact assessment requirements under the *Impact Assessment Act, 2019*.

If you have any questions or need further information about the environmental assessment process, please e-mail AEREnvironmental.Assessment@aer.ca.

Sincerely,
<Original signed by>

Rushang Joshi
Manager, Coal Mining
Regulatory Applications
(Designated Director under *EPEA*)

RJ/ca

cc: Rushang Joshi, Alberta Energy Regulator
Doug Koroluk, Alberta Energy Regulator
Ken Bullis, Alberta Energy Regulator
Corey MacGarva, Alberta Energy Regulator
Melanie Daneluk, Alberta Environment and Parks
Mike Maximchuk, Alberta Indigenous Relations
George Chalut, Alberta Culture and Status of Women
Jennifer Dallaire, Impact Assessment Agency of Canada

APPENDIX 4: HRA CLEARANCE

Government of Alberta
Culture and Community Spirit

Historic Resources Management
Old St. Stephen's College
8820 – 112 Street
Edmonton, Alberta T6G 2P8
Canada
Telephone: 780-431-2300
www.culture.alberta.ca/hrm

October 7, 2010

Project File: 4560-50

Mr. Tony Knutson
Manager, Coal Supply
Maxim Power Corp.
1210, 715 – 5th Avenue SW
Calgary, Alberta
T2P 2X6

Dear Mr. Knutson:

SUBJECT: MILNER POWER INC.
MILNER POWER MINE #14 – CARCONTE CREEK DIVERSION TRAIL
HISTORICAL RESOURCES IMPACT ASSESSMENT – PALAEONTOLOGY
FINAL REPORT, PALAEONTOLOGICAL RESEARCH PERMIT BOHACH 2006-17A

Staff of the Royal Tyrrell Museum of Palaeontology have reviewed a copy of a final report submitted by FMA Heritage Inc. presenting the results of the Historic Resources Impact Assessment that they conducted for the captioned project. Based on the information provided in this report staff of the Royal Tyrrell Museum have indicated that construction of this project can proceed. However, a post-construction impact assessment of areas of trail construction through Gates Formation strata is recommended.

***HISTORICAL RESOURCES ACT* REQUIREMENTS/CLEARANCE**

Based on the information provided in this report Milner Power Inc. is granted *Historical Resources Act* clearance to proceed with the development of this project. However, a post-construction impact assessment of areas of trail construction through Gates Formation strata is required as outlined in the attached Schedule D.

In addition, pursuant to Section 31 of the *Historical Resources Act,* should any additional archaeological resources, palaeontological resources, Aboriginal traditional use sites and/or historic period sites be encountered during any activities associated with land surface disturbance operations, the Historic Resources Management Branch must be contacted immediately. It may then be necessary to issue further instructions regarding the documentation of these resources.

Should you require additional information or have any questions concerning the above, please contact Barry Newton (Land Use Planner, Land Use Planning Section, Historic Resources Management Branch, Alberta Culture and Community Spirit, 8820 - 112 Street, Edmonton, Alberta, T6G 2P8); telephone 780-431-2330, fax 780-422-3106 or e-mail barry.newton@gov.ab.ca.

...cont.

Alberta

Freedom To Create. Spirit To Achieve.

On behalf of Alberta Culture and Community Spirit, I would like to thank you and officials of Milner Power Inc. for your cooperation in our endeavour to conserve Alberta's past.

Sincerely,

<Original signed by>

David Link, PhD
Executive Director

Attachment

cc: Lisa Bohach, FMA Heritage Inc.
Dan Spivak, RTMP (3948-83E-14-4)

SCHEDULE "D"
***HISTORICAL RESOURCES ACT* REQUIREMENTS**
MILNER POWER INC.
MILNER POWER MINE #14 – CARCONTE CREEK DIVERSION TRAIL
(PROJECT FILE: 4560-50)

1. HISTORIC RESOURCES POST-IMPACT ASSESSMENT - PALAEONTOLOGICAL RESOURCES

Pursuant to Section 37(2) of the *Historical Resources Act*, an Historic Resources Post-Impact Assessment (HRIA) and any work resulting from this assessment is to be conducted on behalf of Milner Power Inc. by a palaeontological consultant qualified to hold a Permit to Excavate Palaeontological Resources (Mitigative) within the Province of Alberta.

Timing: The HRIA shall consist of the conduct of a post-construction impact assessment.

Coverage: The post-construction impact assessment is required for all areas of trail construction through Gates Formation strata.

Additional measures: Depending upon the results of the post-construction impact assessment, additional salvage, protection or preservative measures may be required.

2. FINAL REPORT

A copy of the final report for palaeontological resources and any Interim reports are to be submitted directly to Dan Spivak, Royal Tyrrell Museum of Palaeontology Box 7500, Drumheller, Alberta, T0J 0Y0.

APPENDIX 5: CEAA RESPONSE

Canadian Environmental Assessment Agency
Agence canadienne d'évaluation environnementale

10237–104th Street Northwest
Revillon Building, Suite 100
Edmonton, Alberta
T5J 1B1

10237, 104e rue Nord-Ouest
Édifice Revillon, bureau 100
Edmonton (Alberta)
T5J 1B1

Phone: (780) 422-7708 | Fax: (780) 422-6202
E-mail: Susan.Tiege@ceaa-acee.gc.ca

March 14, 2007 AP06-019

Tony Knutson
Manager Coal Supply #14 Mine
MAXIM Power Corp
1210, 715 – 5th Avenue S.W
Calgary, Alberta
T2P 2X6

Dear: Mr. T. Knutson;

RE: Maxim Power Corporation – Milner Power #14 Mine Project Federal Referral Response

I am writing with respect to the conclusion of the federal referral process under the Federal Coordination Regulations of the *Canadian Environmental Assessment Act,* (the Act). Under this process, the Canadian Environmental Assessment Agency (the Agency), provided copies of the disc titled "Proposed Mine #14 Mine Project ABC50645" which contained the Project Description to federal authorities for review. The project was referred on February 9, 2007.

Fisheries and Oceans Canada (DFO) identified that they have a responsibility under section 5 of the Act to assess the environmental effects of the proposed project. DFO will be a responsible authority under the Act for this project and will also be the Federal Environmental Assessment Coordinator (FEAC) as per section 12.4 of the Act.

Transport Canada (TC), Environment Canada (EC), Health Canada (HC), Indian and Northern Affairs Canada (INAC), and Natural Resources Canada (NRCan) all indicated that they do not have a responsibility under section 5 of the Act. EC, HC, and NRCan indicated that their departments could provide expert advice to a responsible authority, if requested under section 12(3) of the Act.

For further information on DFO's environmental assessment needs for this project, please contact Sherry Nugent at

Fisheries and Oceans Canada
4253 – 97 Street
Edmonton, Alberta T6E 5Y7
(780) 495 8473
Nugents@dfo-mpo.gc.ca

…/2

If you have any questions please do not hesitate to contact the undersigned by telephone at (780) 422 7708 or by electronic mail at susan.tiege@ceaa-acee.gc.ca.

Yours truly,
<Original signed by>

Susan Tiege
Senior Program Officer
Canadian Environmental Assessment Agency

cc: Sherry Nugent – Fisheries and Oceans Canada
Tak Nakamura and Tannis Zuk – Health Canada
Heather Rock - Environment Canada
Jackie Barker - Transport Canada
Bob Martin - Indian and Northern Affairs Canada

APPENDIX 6: DFO LETTER OF ADVICE (FILE NO. 07-HCAA-CA1-00689)

Fisheries and Oceans Canada | Pêches et Océans Canada

4253 - 97 Street
Edmonton, Alberta
T6E 5Y7

Your file *Votre référence*

May 5, 2009

Our file *Notre référence*
07-HCAA-CA1-00689

Tony Knutson
Maxim Power Corporation
Suite 1210
715 - 5 Avenue SW
Calgary, Alberta
T2P 2X6

Dear Mr. Knutson:

Subject: Proposal not likely to result in impacts to fish and fish habitat provided that additional mitigation measures are applied.

Fisheries and Oceans Canada - Fish Habitat Management Program (DFO) received your proposal to construct an under ground coal mine on Grande Mountain, and the associated access road with 16 culverts crossing tributaries to Carconte Creek, Allen Creek, Two Cabin Creek, the Smoky River, and crossing Two Cabin Creek, and the stormwater, mine water and wastewater management ponds for the mine, on February 16, 2007. Please refer to the file number and title below:

DFO File No.: **07-HCAA-CA1-00689**
Title: **16 Culvert Crossings on Various Tributaries and Two Cabin Creek, Milner Power #14 Mine Project, AB**

Your proposal has been reviewed to determine whether it is likely to result in impacts to fish and fish habitat which are prohibited by the habitat protection provisions of the *Fisheries Act* or those prohibitions of the *Species at Risk Act* that apply to aquatic species.*

Our review consisted of:

- Supplemental information request response titled "Response to Questions on the Milner #14 Mine Project Application," submitted by James D Howell of Stantec Consulting Ltd. (formerly Jacques Whitford AXYS Ltd.), on December 3, 2007.
- Report titled "#14 Mine Project – Application to the Alberta Energy and Utilities Board – Milner Power Inc.," submitted by James D Howell of Stantec Consulting Ltd. (formerly Jacques Whitford AXYS Ltd.), on September 28, 2007.
- Drainage Plan Maps submitted by Juver Garcia of Westhoff Engineering Resources Inc., on May4, 2007.

*Those sections most relevant to the review of development proposals include 20, 22, 32 and 35 of the *Fisheries Act* and sections 32, 33 and 58 of the *Species at Risk Act*. For more information please visit www.dfo-mpo.gc.ca.

- Email correspondence between Scott Stoklosar of Jacques Whitford AXYS Ltd. (now Stantec Consulting Ltd.), and Sherry Nugent of Fisheries & Oceans Canada, on March 30, 2007, identifying the watercourses as ephemeral drainages in the extreme headwaters of the above listed watercourses, and how these watercourses did not contain any fish habitat in the upper Grande Mountain area.
- Report titled "Proposed #14 Mine Project ABC50645 – Project Description Document for CEAA – Milner Power Inc.," submitted by Milner Power Inc., in February 2007.

We understand that you propose to:

- Construct an underground coal mine on Grande Mountain, with a portal to access the underground mine located in 57-8-W6M.
- Construct an access road to the underground mine, with two culvert crossings on an unnamed tributary to the Smoky River, two culvert crossings on an unnamed tributary to Two Cabin Creek, six culvert crossings on six tributaries to Allen Creek, one culvert crossing an unnamed tributary to Carconte Creek and 5 culvert crossings on another tributary to Carconte Creek..
- Construct a settlement pond, which will collect runoff for use in mining operations, a mine water pond to collect water used in mining operations and will not be discharged to the surrounding environment, and a treated wastewater pond, which will discharge into a vegetated swale after meeting all guidelines. All water discharged from the mine area will be tested and treated as required. All water leaving the mine site must meet CCME guidelines and any Provincial guidelines. Water discharged from the mine site will not result in the deposit of any deleterious substances in any watercourse or waterbody.

To reduce potential impacts to fish and fish habitat we are recommending the following mitigation measures be included into your plans:

1. There will be no realignment of any watercourse or changes to its hydraulic characteristics.

2. All culverts will be installed in dry conditions, and will be appropriately sized to handle all potential flood events without causing erosion of the bed or banks and subsequent sediment transport. The inlets and outlets of all culverts will be appropriately armoured to prevent erosion.

3. Disturbance of the right-of-way approach to any watercourse related to the project and associated activities should be kept to a minimum, and immediately stabilized and reclaimed to pre-construction conditions. All exposed areas in the vicinity of all watercourses will be covered with coco-matting or equivalent material, and stabilized to prevent any erosion or sediment transport until complete re-vegetation of all disturbed/exposed areas is achieved.

4. Ditches associated with the road will be re-vegetated, and will incorporate erosion suppression structures such as check dams, ditch blocks, or an equivalent structure to reduce water velocity and prevent erosion and sediment transport. Ditches with the potential to drain into any watercourse connected to fish bearing waters will incorporate materials such as coco-matting or an equivalent along the slopes and all exposed areas of the ditches to prevent erosion and sediment transport until complete re-vegetation of all exposed areas is achieved. Water conveyed through the ditches will be directed away from all watercourses into a

.../3

containment structure or well vegetated area to prevent the entry of any and all deleterious substances into any watercourse or waterbody.

5. Install and maintain effective sediment and erosion control measures until complete re-vegetation of all disturbed areas is achieved. All sediment and erosion control measures will be inspected weekly during non-frozen conditions and after all major precipitation events to ensure that they are functioning properly and are maintained and/or upgraded as required until complete re-vegetation of all disturbed areas is achieved. Any runoff generated during construction or operation of the project will be directed away from all watercourses and contained to prevent any deleterious substances from entering any watercourse or waterbody.

6. The deposit of deleterious substances into waters frequented by fish is prohibited under the *Fisheries Act*. Appropriate precautions will therefore be taken to prevent deleterious substances (e.g. gasoline, sediment, oil, wet concrete, dirt, etc.) from entering any watercourse or waterbody. To this end, equipment operating near the water will be free of external fluid leaks, grease, oil and mud. The cleaning, fuelling, and servicing of equipment will be conducted in an area from which spills or wash water will not enter any watercourse. An emergency spill kit will be available on site at all times, with an appropriate spill response plan in place prior to beginning any works.

7. On site construction monitoring will be implemented to ensure adherence to the specified mitigation measures in this Letter of Advice and in the Report titled "#14 Mine Project – Application to the Alberta Energy and Utilities Board – Milner Power Inc.," including the application of Best Management Practices.

Provided that the additional mitigation measures described above are incorporated into your plans, DFO has concluded that your proposal is not likely to result in impacts to fish and fish habitat.

You will not need to obtain a formal approval from DFO in order to proceed with your proposal. A copy of this letter should be kept on site while the work is in progress.

If the plans have changed or if the description of your proposal is incomplete you should contact this office to determine if the advice in this letter still applies.

Please be advised that any impacts to fish and fish habitat which result from a failure to implement this proposal as described or incorporate the additional mitigation measures included in this letter could lead to corrective action such as enforcement.

If you have any questions please contact the undersigned at (780) 495-8468, by fax at (780) 495-8606, or by email at Michael.Hunka@dfo-mpo.gc.ca.

Yours sincerely,

<Original signed by>

Michael Hunka
Fish Habitat Biologist
Fisheries & Oceans Canada, Edmonton Offfice

Cc: Shane Petry (A/Senior Habitat Biologist)
James D Howell (Stantec Consulting Ltd.)

APPENDIX 7: SUMMARY OF WATER MANAGEMENT PLAN

Mine 14

Water Management Plan Summary

Based on:
Westhoff Engineering Resources, Inc.
Water Management Plan for # 14 Mine
Third Update August 2013 Report

June 2022

TABLE OF CONTENTS

List of Tables

List of Figures

1. PROJECT INTRODUCTION

The purpose of preparing this Water Management Plan Summary document is to provide a brief and concise summary of the detailed hydrologic analysis that was completed for the Summit Coal Inc. (Summit) Mine 14 project, creating a plain language document.

Mine 14 is a proposed underground metallurgical coal mine that is located northeast of the hamlet of Grande Cache, Alberta, directly east of the Smoky River and north and east of Provincial Highway 40 (Figure 1).

Summit's Mine 14 project has already obtained a Mine Permit and Mine Licence which relates to the development of an underground coal mine. The surface activities include the mine portal area, approximately 52.5 ha, and the access road, approximately 47.8 ha. The current mine permit boundary area is 870.4 ha (Figure 1) which is the area where most of the underground mining will occur and also includes the access road and mine portal areas.

Project components at the portal site include portal structures, administrative offices, roads and parking areas, maintenance shop, coal handling facilities (conveyors, screening station, coal stockpile, etc.) and site drainage (ditches and ponds) (Figure 2). The access road is required not only to provide access to the mine but to transport the coal to the H.R. Milner Generation Station. This access road connects the portal site to Highway 40 near Grande Cache.

This summary document describes the site drainage evaluation and management of runoff on-site. Measures for conveyance of runoff along the access road and at creek crossings are also discussed. The proposed management of wastewater and water treatment is also discussed. The proposed works are not affecting fish-bearing creeks and the following regional drainage characteristics have been taken into consideration:

- The portal site is located within the drainage area of Carconte Creek, a tributary to Grande Cache Lake. Clean water runoff from the upstream watershed is diverted around the active site while on-site measures control site drainage.
- The access road crosses numerous small streams that are tributaries to Carconte Creek, Allan Creek and Two Cabin Creek. Roadside ditches and culverts are used for conveyance and erosion protection measures are proposed to mitigate potential impacts from sediment and erosion.

2. HYDROLOGIC ANALYSIS

A hydrologic analysis as part of the supporting studies was completed to comply with regulatory requirements. The goal of this analysis is to provide estimation of flow discharge at any location including the portal site and drainage areas at each of the stream crossings of the coal haul route. This analysis was used to determine pond and culvert sizing during significant flow events (i.e. 1:100 year return flows).

3. WATER BALANCE ANALYSIS

As part of the Water Management Plan there are three main ponds needed to manage water at the portal location. There are also clean water diversions, ditches and culverts required to ensure collection and conveyance of surface runoff (Figures 3 and 4). The three ponds include:

- Stormwater Pond (Figure 4) – purpose is to capture all surface runoff from the mine portal area to be stored for use in the mine, or if excess volumes occur, will occasionally be released into the Carconte Creek drainage.
- Mine Water Pond (Figure 3) – purpose is to contain groundwater pumped out of the underground mine areas for use in the mine, with discharge to occur only during significant precipitation events (i.e. >1:10 year).
- Wastewater Pond (Figure 3) – purpose is to store wastewater from the on-site water treatment plant, with the water being mostly re-used on the mine, with discharge to occur only during significant precipitation events (i.e. >1:10 year).

The operation of the Mine 14 requires a water supply for the underground mining activities, dust control and fire suppression. Potential sources for this water include capturing runoff for re-use, captured groundwater, treated wastewater and hauling water from the Town of Grande Cache.

With the construction and management of these ponds, there is an opportunity to harness runoff for on-site uses. A water balance analysis was completed and the project will use approximately 150 m^3/day of water. It is anticipated this water will be reliably supplied from the on-site water management structures.

4. STORMWATER MANAGEMENT PLAN

4.1. Concepts

The drainage plan for Mine 14 has four fundamental objectives:

1. Minimize impacts on existing drainage courses with respect to water quantity and quality;
2. Comply with the regulatory requirements for industrial runoff management at the portal site;
3. Comply with the regulatory requirements for watercourse crossings;
4. Optimize collection and storage of rain and snowmelt at the portal site for on-site water demand requirements.

By meeting these four objectives, the drainage strategy will also meet the spirit of the various overarching policies and acts. The surface water management features and overland flow patterns along with discharge points are shown on Figure 5.

4.2. Access Road

Drainage generated by the road will be collected on drainage ditches. The ditches are 0.75 m deep with 2:1 slopes and 1:1 slopes. The latest slope is to be constructed on the roadside of a safety berm, where required. Depending on local conditions, this slope may need to be flattened to a more stable slope.

Ten locations where the proposed access road crosses natural drainage courses were identified. The natural drainage courses at the access road crossings have very high longitudinal slopes, ranging between 10% and 20%.

Culverts are proposed at the road crossings and the initial sizing was completed using the detailed data from the hydrology assessment. The proposed culverts will meet the Alberta Infrastructure and Transportation Design Guidelines.

4.3. Portal Site

The drainage strategy for the portal site consists of:

1. Construction of drainage berm/ditches systems intercepting flows from external areas and diverting clean flows to bypass the portal site.
2. Construction of internal drainage ditches and road swales conveying stormwater runoff towards the sedimentation pond.
3. Construction of sedimentation pond to store stormwater and settle suspended particles.
4. Construction of mine water pond to store groundwater from the underground mine. This pond will be used to complete the storage requirement to capture part of the water demand at the mine.
5. Use of the proposed treated wastewater pond to complete water demand at the portal site. The proposed water reuse for this water is exclusively toilet flushing for washrooms.

The proposed level of design for the internal and external drainage channels is the 1:100 year event. The actual capacity of the sediment pond is designed to fully contain the 24 hr; 1:10 year design storm and to safely handle runoff from more extreme events via controlled discharges to natural system and internal water reuse.

A schematic of the proposed stormwater pond, mine water pond operation and treated wastewater pond are shown on Figure 6.

Channels for External Areas

Berm/ditch systems (Figure 2) are proposed to prevent clean water flow from external/undisturbed areas from entering onto the portal site. The selected design flows are those associated to the 1:100 year flood event.

The first set of berm/ditch system at the north boundary of the portal site runs from west to east (Figure 2) and intercepts flows from a catchment area of about 15.4 ha. The second system runs from north to south on the west boundary of the portal site and drains an external area of approximately 27.1 ha.

The proposed typical ditch has as a minimum a triangular cross section with side slopes at 2H:1V and a total depth of 0.50 m.

Internal Drainage – Roadside Ditches and Other Drainage Ditches within the Portal Area

Summit will use roadside ditches as the main conveyance system to drain the portal area and convey stormwater to the proposed stormwater pond. Culverts are proposed to cross internal roads.

In addition to roadside ditches, swales along the top of the cuts or fill embankments are placed to prevent water draining onto steep slopes and cause stability issues.

The proposed typical swales and roadside ditches have the same geometry as the channels for external areas, i.e., triangular cross section with 2:1 side slopes, total height between 0.5 and 0.75 m.

Stormwater Pond, Mine Water Pond and Wastewater Pond

One pond is proposed to store stormwater and settle suspended particles. Stored water is to be re-used within the portal site according to operational water demand of the mine site. Release of water into the natural drainage courses may be required after rainfall events depending on the water levels at the ponds. Controlled release will occur only when meeting water quality requirements as specified by the site Approval.

One mine water pond is proposed to store groundwater from the underground mine and to complete the required storage to meet the water demands at the portal site.

To store and reuse treated wastewater, a wastewater pond is proposed.

The total storage capacity of the three proposed ponds is approximately 30,000 m^3. According to the water balance analysis, maintaining this amount should be adequate to prevent make-up of water to meet the demand of water during mine operation.

A control structure will be installed to maintain the stormwater pond at the design normal water level (Figure 4) and to control water transfer to the mine water pond. The storage between the normal water level and spill elevation on the sedimentation pond is designed to contain the entire 1:10 year storm event. The control structure will have a sluice gate to hold water between normal water level and spill elevation after rain events for one day while water quality analyses are conducted. Due the water demand at the mine site, the water level at the ponds is expected to be lower than normal water level at the beginning of most of the rainfall events.

Table 1 shows the main characteristics of the ponds.

Table 1 Ponds Characteristics

	Pond 1 Mine Water Pond	Pond 2 Stormwater Pond	Pond 3 Wastewater Pond
Drainage Area	1.01 ha	31.88 ha	0.92 ha
Bottom Elevation	1438.00 m	1444.00 m	1438.00 m
Normal Water Level (NWL)	1438.50 m	1445.00 m	1438.00 m
Spill Elevation	1443.00 m	1449.00 m	1439.00 m
Crest Dam Elevation	1444.00 m	1450.00 m	1439.50 m
Total Volume at NWL	484 m^3	361 m^3	65 m^3
Total Volume at Spill Elevation	14322 m^3	14164 m^3	1512 m^3
Volume between NWL and Spill Elevation	13858 m^3	13803 m^3	1447 m^3

5. MONITORING

5.1. Stormwater

Summit will implement a program for monitoring discharge from the stormwater pond to ensure that it meets water quality standards before discharge as per the Approval. All site water that will be released to the adjacent environment will be tested prior to release as well as downstream sampling locations, as required based on the Approval, to ensure compliance with Approval conditions. Sampling locations are shown on Figure 2.

Discharges from the stormwater pond will occur in response to rainfall events. Controlled releases are designed for storm events with return periods lower than 10 years and for a portion of the volume of more extreme events. Since water can be reused, the water elevation is likely to be lower than normal water level for the majority of storm events. The total annual release is estimated to be on average about 80 mm/year (800 m^3/ha/year). The average annual precipitation is about 540 mm (5,400 m^3/ha/year) and total runoff is about 160 mm

(1,600 m^3/ha/year). Uncontrolled releases will be through emergency spillways. The maximum expected daily average flow is 350 L/s through the spillway.

Clean surface runoff will be intercepted and directed around the disturbed area by a series of runoff diversion channels. Runoff that comes into contact with the disturbed area will be collected in a series of runoff collection channels and diverted to the stormwater pond. Water retention time in the pond will be sufficient to allow total suspended solids (TSS) to settle before the water discharges into local drainages.

5.2. Wastewater

Treated wastewater will be discharged into a vegetated swale at very low rates for infiltration. The average daily released volume is expected to be about 30 m^3 during summer months. The average release rate of treated wastewater into a vegetated swale during summer months and dry days is less than 0.5 L/s. A wastewater treatment plant will treat the wastewater from bathrooms and restrooms. Expected main components from the effluent of the wastewater treatment plant include biological oxygen demand (BOD) and TSS, whose concentration are expected to be below 10 mg/L. These are the parameters that are typically sampled if discharge occurs. Wastewater will be treated and stored during winter months and discharge on a vegetated swale during summer months.

5.3. Mine Water

Mine water will not be released into the natural drainage courses. A mine water pond is proposed to store mine water. This pond will be used as an extension of the storage capacity of the sedimentation pond. Stored water could be used for dust control and fire protection.

6. CONCLUSIONS

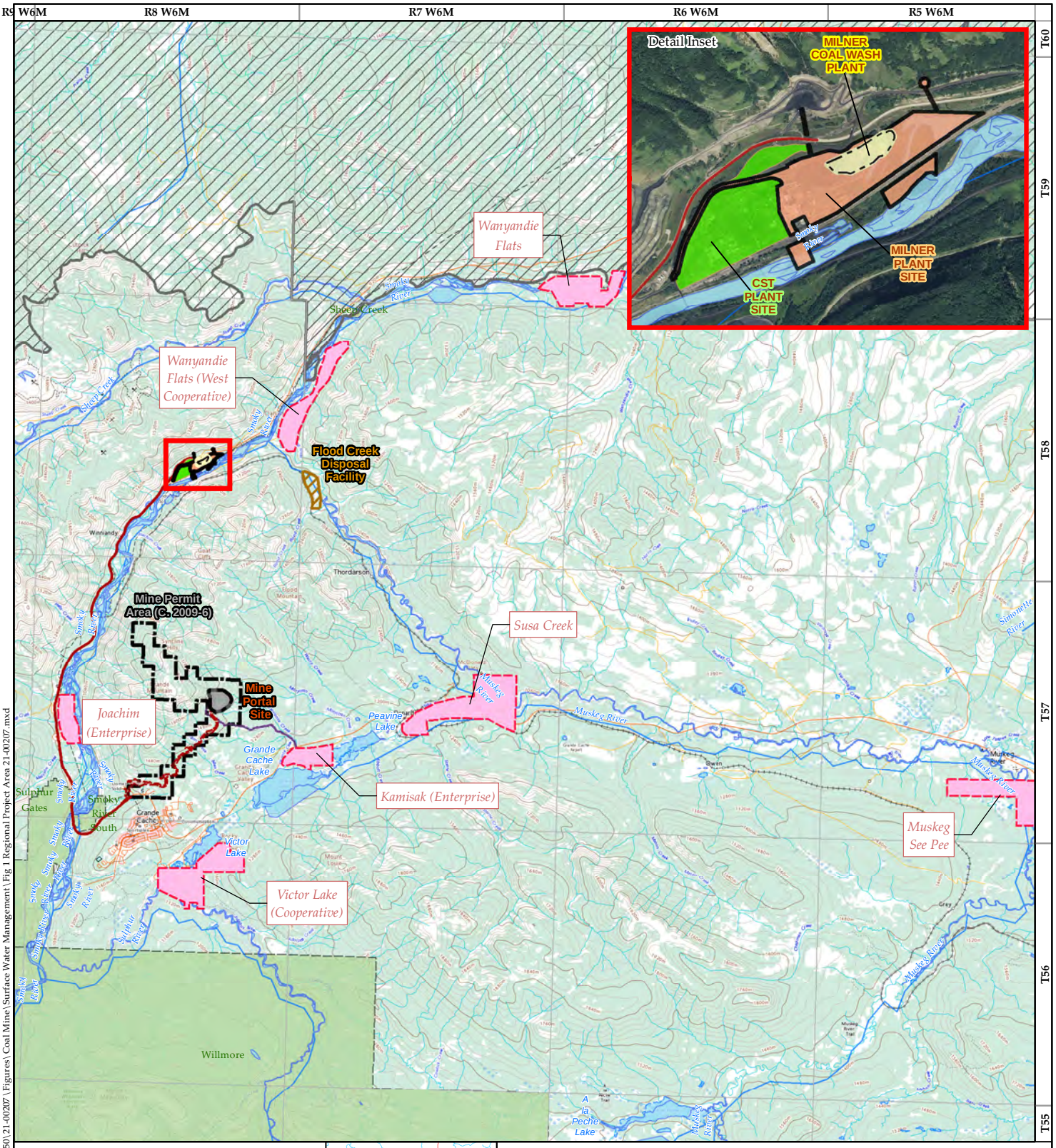
The proposed Water Management Plan meets the regulatory requirements. The drainage system comprising of localized swales, roadside ditches, culverts and sedimentation ponds can be implemented to meet stormwater quantity and quality objectives, including:

- The entire volume generated by a 10-year, 24-hour storm event is contained within the proposed stormwater pond. The outlet system comprising a gated manhole allows for controlled releases and water quality sampling and analysis prior to releasing captured runoff into natural drainage courses, if required.

- Runoff captured in the ponds can be used for the water requirements at the mine site. The vast majority of the water consumption for mine operations (99% on average) can be provided by reusing collected stormwater runoff and groundwater from the mine collected at the mine and stored at the stormwater ponds, assuming that 31,500 m^3 per year of groundwater can be collected at the ponds.
- On average, make up water requirements to cover water demand at the mine site are approximately 570 m^3 per year. Annual values can vary between zero for wet years to 760 m^3 for the dry years.
- With the increase in water demand for internal reuse, the risk of uncontrolled spills into natural watercourse during the mine's life span is reduced to near zero.
- The retention time at the sediment ponds allows for the removal of the majority of particles greater than 5 microns.

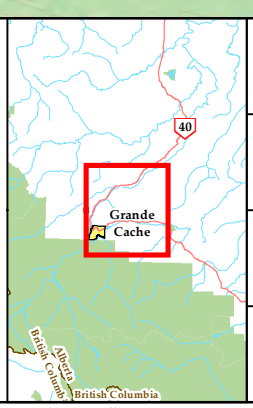
The ponds also provide storage for mine operation including dust control, mine water and fire protection.

FIGURES



LEGEND

- Watercourse
- Coal Haul Route
- Coal Wash Plant Footprint
- Milner Property Boundary (Approximate)
- CST Coal Plant Area
- Mine Portal Area (MSL 131303)
- Access Road (LOC 131361)
- Exploration Trail (LOC 111555)
- Mine Permit Area (C. 2009-6)
- Aboriginal Enterprise / CO-OP Zone
- Waterbody
- Wilmore Wilderness Park
- Flood Creek Disposal Facility
- Weyerhaeuser FMA



SUMMIT COAL INC.
SURFACE WATER MANAGEMENT SUMMARY

REGIONAL PROJECT AREA

AltaLIS, 2022; MEMS, 2022; NRCAN - Toporama, 2022

Coordinate System: NAD 1983 UTM Zone 11N

0 4 8
Kilometers

MILLENNIUM EMS Solutions Ltd.

PROJECT: 21-00207
DRAWN BY: EPITTMAN
CHECKED BY: DM
DATE: JUNE 9, 2022

FIGURE 1

Document Path: K:\Active Projects 2021\AP 21-00201 to 21-00250\21-00207\Figures\Coal Mine\Surface Water Management\Fig 1 Regional Project Area 21-00207.mxd

R8 W6M

T57

Clean Water Bi-pass Around Mine Portal Area

Surface Runoff Capture for Stormwater Pond

Stormwater Pond

Discharge for Stormwater Pond

Emergency Discharge for Wastewater Pond

Wastewater Pond

Minewater Pond

Emergency Discharge for Minewater Pond

POTABLE WATER TREATMENT PLANT

WATER TOWER

PUMP STATION

POND 4 STORMWATER

SAMPLING POINT STORMWATER

CONTROL STRUCTURE

POND 3 WASTEWATER

TREATED WASTEWATER

WASTEWATER TREATMENT PLANT

SAMPLING POINT TREATED WASTEWATER

CONTROL STRUCTURE

POND 7 MINE WATER

SAMPLING POINT MINE WATER

VEGETATED SWALE FOR RELEASE OF TREATED WASTEWATER

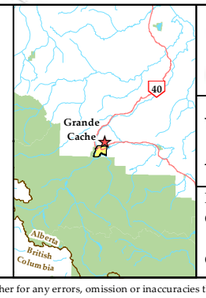
SAMPLING POINT UPSTREAM OF MINE DRAINAGE

CARCONTE CREEK

SAMPLING POINT DOWNSTREAM OF MINE DRAINAGE

LEGEND

- SAMPLING POINT
- DRAINAGE COURSES



SUMMIT Coal Inc

SUMMIT COAL INC.
SURFACE WATER MANAGEMENT SUMMARY

WATER MANAGEMENT STRUCTURES AND WQ MONITORING PROGRAM

MEMS, 2022; Westhoff Engineering Resources, Inc., 2007;
CAD File: 10718L02

Coordinate System: NAD 1983 UTM Zone 11N

Scale 1:2,500

MILLENNIUM EMS Solutions Ltd.

PROJECT:	21-00207
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CHECKED BY:	DM
DATE:	JUNE 9, 2022
FIGURE	2

Document Path: K:\Active Projects 2021\AP 21-00201 to 21-00250\21-00207\Figures\Coal Mine\Surface Water Management\Fig 2 Water Management Structures and WQ Monitoring Program 21-00207.mxd

R8 W6M

T57

SILO & #10 SEAM ACCESS ROAD – LEFT & RIGHT SIDE PROP. 'V' DITCH 0.5m DEEP

DITCH – TYPE 1 L= 147m S=1.0%

CULVERT# 4

11.0m WIDE SILO & #10 SEAM ACCESS ROAD

#4 SEAM ACCESS ROAD – LEFT SIDE PROPOSED 0.5m W x 0.75m DP. DITCH FROM STA. 0+035 TO 0+500

#4 SEAM ACCESS ROAD – RIGHT SIDE PROPOSED 0.6 DEEP 'V' DITCH FROM STA. -0+020 TO 0+500

UNDISTURBED GROUND

DITCH – TYPE 1 L= 87m S=1.0%

TWIN CULVERTS #5

DITCH – TYPE 1 L= 39m S=1.0%

#4 SEAM ACCESS ROAD

MINEWATER POND

Minewater Pond Emergency Overflow Spillway

MINEWATER POND SPILLWAY CHANNEL START INV. EL. 1443.000

MINEWATER POND SPILLWAY CHANNEL END INV. EL. 1441.250

3 CULVERTS #6

40m x 20m x 2m DP SETTLING POND

Stormwater Pond Spillway

STORMWATER POND SPILLWAY CHANNEL START INV. EL. 1449.000

WASTEWATER POND SPILLWAY CHANNEL START INV. EL. 1439.000

WASTEWATER POND

SPILLWAY CHANNEL END INV. EL. 1422.553

Wastewater Pond Emergency Overflow Spillway

Stormwater Pond Surface Discharge

BY-PASS TRAIL (REFER TO DWG. No. TP02)

Portal site - Culvert Data Summarized

PHASE 2 - CULVERT INSTALLATION

Culvert #	Pipe Specification	Length (m)	Slope %	U/S Invert Elevation (m)	D/S Invert Elevation (m)
1	1x400x68x13 CMP	25.00	12.32	1580.643	1577.563
2	1x400x68x13 CMP	15.00	11.85	1576.106	1574.328
3	1x400x68x13 CMP	16.00	7.01	1568.574	1567.452
4	1x400x68x13 CMP	16.00	7.90	1501.231	1499.968
5	2x400x68x13 CMP	16.00	7.67	1465.335	1464.119
6	3x600x68x13 CMP	22.00	0.27	1455.331	1455.271

Notes:
Pipe Specification: a x **b** x c x d **CMP**
a: number of pipes, b: size (mm), c: pitch of corrugation (mm), d: depth of corrugation (mm)
CMP: Corrugated Metal Pipe

LEGEND

- CONSTRUCTION/PHASE BOUNDARY
- PROPOSED ROADSIDE DITCHES
- NATURAL OVERLAND DRAINAGE FLOW
- PROPOSED PERIMETER DITCH/BERM
- CULVERTS
- 1480 MAJOR CONTOURS @ 10.0m INTERVALS
- MINOR CONTOURS @ 2.0m INTERVALS

NOTES:

1. CONSTRUCTION TO BE CARRIED OUT WITHIN THE PHASE 1 BOUNDARY ONLY; PHASE 2 SHALL BE CONSTRUCTED AT A LATER DATE.
2. CULVERT LOCATIONS SHOWN FOR REFERENCE ONLY. (I.E. TO BE INSTALLED AT A LATER DATE)
3. DRAWING UNITS, DIMENSIONS AND ELEVATIONS ARE IN METERS, AND DECIMALS THEREOF. ALL PIPE SIZES ARE IN MILLIMETERS, UNLESS NOTED OTHERWISE.
4. GRID COORDINATE SYSTEM: UTM, NAD83, ZONE 11.
5. REFER TO DWG. No. DT02 FOR PERIMETER DITCH TYPES AND SECTIONS.

SUMMIT Coal Inc

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SURFACE WATER MANAGEMENT SUMMARY

MILLENNIUM EMS Solutions Ltd.

WATER MANAGEMENT PLAN - SOUTH PORTION

MEMS, 2022; Westhoff Engineering Resources, Inc., 2011;
CAD File: 11127SM02

Coordinate System: NAD 1983 UTM Zone 11N

SCALE 1:1,000

PROJECT: 21-00207
DRAWN BY: EPITTMAN
CHECKED BY: DM
DATE: JUNE 9, 2022

FIGURE
3

Document Path: K:\Active Projects 2021\AP 21-00201 to 21-00250\21-00207\Figures\Coal Mine\Surface Water Management\Fig 3 Water Management Plan - South Portion 21-00207.mxd

Portal site - Culvert Data Summarized					
PHASE 2 - CULVERT INSTALLATION					
Culvert #	Pipe Specification	Length (m)	Slope %	U/S Invert Elevation (m)	D/S Invert Elevation (m)
1	1x400x68x13 CMP	25.00	12.32	1580.643	1577.563
2	1x400x68x13 CMP	15.00	11.85	1576.106	1574.328
3	1x400x68x13 CMP	16.00	7.01	1568.574	1567.452
4	1x400x68x13 CMP	16.00	7.90	1501.231	1499.968
S	2x400x68x13 CMP	16.00	7.67	1465.335	1464.119
6	3x600x68x13 CMP	22.00	0.27	1455.331	1455.271

Notes:
Pipe Specification: a x b x c x d CMP
a: number of pipes, b: size (mm), c: pitch of corrugation (mm), d: depth of corrugation (mm)
CMP: Corrugatec Metal Pipe

Clean Water Bi-pass Portal Area

Surface Run-off Collection to Stormwater Pond

DITCH – TYPE 1 L=112m S=1.0%
DITCH – TYPE 1 L=27m S=1.0%
DITCH – TYPE 1 L=50m S=1.0%
DITCH – TYPE 1 L=62m S=1.0%
DITCH – TYPE 1 L=23m S=1.0%
DITCH – TYPE 1 L=37m S=1.0%
DITCH – TYPE 1 L=47m S=1.0%
DITCH – TYPE 2 L=58m S=1.0%
DITCH – TYPE 1 L= 147m S=1.0%

LEFT & RIGHT SIDE PROP. 'V' DITCH 0.5m DEEP
RIGHT & LEFT SIDE PROP. 'V' DITCH 0.5m DEEP
LEFT SIDE PROP. 'V' DITCH 0.5m DEEP
SILO BY-PASS ROAD – RIGHT SIDE PROPOSED 'V' DITCH 0.5m DEEP
SILO & #10 SEAM ACCESS ROAD – LEFT & RIGHT SIDE PROP. 'V' DITCH 0.5m DEEP
#4 SEAM ACCESS ROAD – RIGHT & LEFT SIDE PROPOSED 'V' DITCH 0.5m DEEP FROM STA. 0+500 TO 0+650

TOE OF SLOPE PROTECTION DRAINAGE DITCH/BERM REFER TO DWG. No. DT02 FOR DETAILS

PROP. SILO LOCATION
7.0m WIDE BY-PASS ROAD
SILO BY-PASS ROAD
SEAM #10 ACCESS ROAD
#4 SEAM ACCESS ROAD
3 CULVERTS #6
CULVERT #1
CULVERT #2
CULVERT #3
CULVERT# 4
Sta

No. 10 Seam Fan Portal
No. 10 Seam Return Air Portal
No. 10 Seam Belt Conv.
Rock Waste
Breaker Pond
No. 4 Seam Fan Portal
No. 4 Seam Tower Portal
No. 4 Seam Belt Conv.
No. 4 Seam Return Air

Topsoil Stockpile 82,000m³
Topsoil Stockpile 24,600 m³
Coal Storage
Water Tank
STORMWATER POND
40m x 20m x 2m DP SETTLING POND

UNDISTURBED GROUND

A DT02
B DT02
C DT02

0+676.60

LEGEND

- PROPOSED ROADSIDE DITCHES
- NATURAL OVERLAND DRAINAGE FLOW
- PROPOSED PERIMETER DITCH/BERM
- CULVERTS
- 1480 MAJOR CONTOURS @ 10.0m INTERVALS
- MINOR CONTOURS @ 2.0m INTERVALS

NOTES:

1. CONSTRUCTION TO BE CARRIED OUT WITHIN THE PHASE 1 BOUNDARY ONLY; PHASE 2 SHALL BE CONSTRUCTED AT A LATER DATE.
2. CULVERT LOCATIONS SHOWN FOR REFERENCE ONLY. (I.E. TO BE INSTALLED AT A LATER DATE)
3. DRAWING UNITS, DIMENSIONS AND ELEVATIONS ARE IN METERS, AND DECIMALS THEREOF. ALL PIPE SIZES ARE IN MILLIMETERS, UNLESS NOTED OTHERWISE.
4. GRID COORDINATE SYSTEM: UTM, NAD83, ZONE 11.
5. REFER TO DWG. No. DT02 FOR PERIMETER DITCH TYPES AND SECTIONS.

SUMMIT Coal Inc

SUMMIT COAL INC.
SURFACE WATER MANAGEMENT SUMMARY

MILLENNIUM EMS Solutions Ltd.

WATER MANAGEMENT PLAN - NORTH PORTION

MEMS, 2022; Westhoff Engineering Resources, Inc., 2011;
CAD File: 11127SM02

Coordinate System: NAD 1983 UTM Zone 11N

SCALE 1:1,000

PROJECT: 21-00207
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FIGURE 4

R8 W6M

T57

Coal Storage

Water Tank

Topsoil Stockpile m³ 24,600

UNDISTURBED GROUND

Surface Run-off Capture to Stormwater Pond

STORMWATER POND

PROPOSED CONTROL STRUCTURE CS03

PROPOSED INLET

ST 300 HDPE

PROPOSED OUTFALL

10m WIDE MAINTENACE BERM

Stormwater Pond Spillway

MINEWATER POND

PROPOSED DRAINAGE DITCH

EMERGENCY SPILLWAY

PROPOSED CONTROL STRUCTURE CS01

10m WIDE MAINTENANCE ROAD

Minewater Pond Emergency Spillway

Water Tretm't

WASTEWATER POND

PROPOSED CONTROL STRUCTURE CS02

ST. 200 HDPE

3m WIDE MAINTENANCE ROAD

Wastewater Pond Emergency Spillway

PROPOSED SPILLWAY DRAINAGE DITCH

Stormwater Pond Surface Discharge

Document Path: K:\Active Projects 2021\AP21-00201 to 21-00250\21-00207\Figures\Coal Mine\Surface Water Management\Fig 5 Overland Drainage Flows and Spill Direction 21-00207.mxd

Disclaimer: This figure was derived from multiple data sources and while we make every effort to assure its accuracy, Millennium EMS Solutions Ltd. disclaims any representation or warranty and assumes no liability either for any errors, omission or inaccuracies that may occur.

SUMMIT Coal Inc

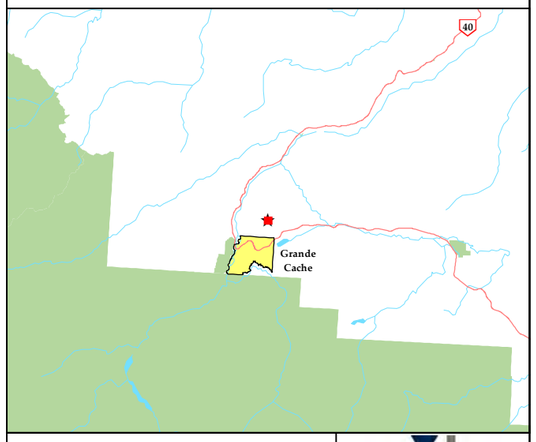
SUMMIT COAL INC.
SURFACE WATER MANAGEMENT SUMMARY

OVERLAND DRAINAGE FLOWS AND SPILL DIRECTION

LEGEND

- DYKE/POND CONSTRUCTION BOUNDARY
- PROPOSED PORTAL SITE PERIMETER FENCE
- 1480 EXISTING GROUND CONTOURS @ 10.0m INTERVALS
- EXISTING GROUND CONTOURS @ 2.0m INTERVALS
- 1480 PROPOSED DYKE CONTOURS @ 10.0m INTERVALS
- PROPOSED DYKE CONTOURS @ 2.0m INTERVALS
- SPILL DIRECTION
- OVERLAND DRAINAGE FLOW

NOTES:
1. DRAWING UNITS, DIMENSIONS AND ELEVATIONS ARE IN METERS, AND DECIMALS THEREOF. ALL PIPE SIZES ARE IN MILLIMETERS, UNLESS NOTED OTHERWISE.
2. GRID COORDINATE SYSTEM: UTM, NAD83, ZONE 11.



SCALE 1:1,000

MILLENNIUM EMS Solutions Ltd.

Coordinate System: NAD 1983 UTM Zone 11N

MEMS, 2022;
Westhoff Engineering Resources, Inc., 2011;
CAD File: 11127ST01

PROJECT:	21-00207
DRAWN BY:	EPITTMAN
CHECKED BY:	DM
DATE:	JUNE 9, 2022

FIGURE

5

Mine Cutting Water Supply
Net Precipitation
Catchment Runoff
Potable Water Supply
SWP Overflow
Treatment Plant and Pumpstation
Net Precipitation
Dust Control Supply
Catchment Runoff
Pump Treated Water to SWP
Mine Drainage
Controlled Release to MWP by Gravity
Control Structure
SWP
MWP
SWP Overflow
MWP Overflow to Natural Water Course
Non-portable Water Supply
Treated Waste Water Inflow
Catchment Runoff
Net Precipitation
Controlled Release to Natural Water Course
TWP Overflow to Natural Water Course
92m^3/day
TWP
NATURAL WATER COURSE

LEGEND

SUMMIT COAL INC.
SURFACE WATER MANAGEMENT SUMMARY

SCHEMATIC OF PONDS OPERATION

MEMS, 2022; Westhoff Engineering Resources, Inc., 2013;

Coordinate System: NAD 1983 UTM Zone 11N

PROJECT: 21-00207
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FIGURE
6

Document Path: K:\Active Projects 2021\AP 21-00201 to 21-00250\21-00207\Figures\Coal Mine\Surface Water Management\Fig 6 Schematic of Ponds Operation 21-00207.mxd

APPENDIX 8: STREAM/DRAINAGE CROSSING EVALUATION FOR THE MINE ACCESS ROAD

Mine 14 Project

Stream/Drainage Crossing Evaluation for the Mine Access Road

Prepared by:
Summit Coal Inc.

September 2022

TABLE OF CONTENTS

List of Figures

1.0 INTRODUCTION

Summit Coal In. (Summit) conducted an on-site inspection of the potential stream/drainage crossings along the proposed access road from Highway 40 to the mine portal. This document provides a brief description and photographs taken at each of the nine locations. Inspections were made as close the locations as access would permit. The locations are shown on Figure 1.

2.0 CROSSING 1 – TWO CABIN CREEK

Crossing Type: Tree clearing around site is likely required, construction of the highway approaches may require extending the existing culvert under the highway.

Representative site(s): AQ21

Channel Features:

- Flowing water (Yes/No): Yes
- Channel width (m): 4-5
- Notes: defined channel 4-5 m width, up to 2 m deep, hanging culvert under highway, well vegetated banks, V-shaped valley app. 40 m wide (from top to top), fallen trees across the channel.

Watercourse Pictures:

Picture 1: Culvert under the highway facing left bank.

Picture 2: Culvert under the highway facing downstream

Picture 3. Creek facing downstream. Banks are well vegetated.

3.0 CROSSING 2 – UNNAMED TRIBUTARY TO SMOKY RIVER

Crossing Type: Tree clearing around site is likely required, culvert may be required along MD portion of the road to the dump, small portion of the drainage directed along the ditch-line of the main access road.

Representative site(s): AQ01

Channel Features:

- Flowing water (Yes/No): No
- Channel width (m): no defined channel
- Notes: U-shaped valley app. 20 m wide (from top to top), well grassed valley sides, blocked culvert under the road, lots of garbage downstream of existing water crossing

Watercourse Pictures:

Picture 1: 30 m south of blocked culvert under the road facing upstream

Picture 2: 50 m upstream of existing road crossing facing downstream

Picture 3. 5 m downstream of existing road crossings facing downstream. No water, lots of garbage.

Picture 4: 10 m downstream of existing road crossings facing upstream. No water, lots of garbage.

Picture 5: Blocked culvert under existing road.

Picture 6: 50 m upstream of existing road crossing. Bottom of the valley.

4.0 CROSSING 3 – REPORTS TO TWO CABIN CREEK

Crossing Type: Tree clearing around site is likely required, culverted crossing of access road is required.

Representative site(s): AQ04, A04

Channel Features:

- Flowing water (Yes/No): No
- Channel width (m): no defined channel
- Notes: U-shaped valley app. 10 m wide (from top to top), well vegetated, no culvert at the trail, cut wood at the bottom of valley. Trees growing at the bottom of the valley.

Watercourse Pictures:

Picture 1: Watercourse at assessment point AQ04 facing downstream

Picture 2: 5 m upstream of AQ04 facing upstream

Picture 3. Trail crossings facing downstream. No water, no culvert.

Picture 4: Valley bottom at AQ04. No water, cut wood.

Picture 5: Valley bottom at A04. No water found.

Picture 6: Watercourse at assessment point A04.

Picture 7: Watercourse valley at assessment point A04.

5.0 CROSSING 4 – REPORTS TO TWO CABIN CREEK

Crossing Type: Tree clearing around site is likely required, culverted crossing of access road is required.

Representative site(s): AQ20

Channel Features:

- Flowing water (Yes/No): Yes
- Channel width (m): 0.5
- Notes: well vegetated banks (sedges, willow).

Watercourse Pictures:

Picture 1: Watercourse at assessment point AQ20 facing right bank

Picture 2: Watercourse at assessment point AQ20 facing upstream

Picture 3. Watercourse at assessment point AQ20 facing downstream.

Picture 4: Watercourse at assessment point AQ20 facing left bank.

6.0 CROSSING 5 AND 6 – REPORTS TO ALLEN CREEK

Crossing Type: Tree clearing around site is likely required, culverted crossing of access road is required. The two actual crossings are located quite a distance upstream of this location.

Representative site(s): AQ02

Channel Features:

- Flowing water (Yes/No): Yes
- Channel width (m): 1-1.5
- Notes: well vegetated banks, multiple channels upstream of AQ002

Watercourse Pictures:

Picture 1: Watercourse at assessment point AQ02 facing downstream

Picture 2: Watercourse at assessment point AQ02 facing upstream

Picture 3. Watercourse at assessment point AQ02. Trail crossing facing left bank.

Picture 4: Watercourse at assessment point AQ02 facing downstream at height of 3 m.

Picture 5: Watercourse from height of app. 35 m (drone picture).

Picture 6: Drone Photo of Watercourse further upstream where it crosses proposed access road

7.0 CROSSING 7 – ALLEN CREEK

Crossing Type: Tree clearing around site is likely required, culverted crossing of access road is required. The actual crossing is located quite a distance upstream of this location, actual characteristics of the crossing are likely similar to Crossing 8, which was dry.

Representative site(s): AQ03, Allen Creek

Channel Features:

- Flowing water (Yes/No): Yes
- Channel width (m): 1-2
- Notes: Creek at Alan Creek assessment point is 2 m wide x 0.01 m deep, with running water. North slope is 65% shear rock face, while south slope is 36 degrees. Less than 1 m wide channel at AQ03. Multiple small waterfalls along the creek.

Watercourse Pictures:

Picture 1: Watercourse at assessment point Allen Creek facing left bank

Picture 2: Watercourse channel at assessment point Allen Creek facing left bank

Picture 3: Watercourse valley at assessment point Allen Creek facing downstream.

Picture 4: App. 1m high waterfall at assessment point AQ03 facing upstream

Picture 5: Watercourse at assessment point AQ03 facing downstream

8.0 CROSSING 8 – ALLEN CREEK

Crossing Type: Tree clearing around site is likely required, culverted crossing of access road is required.

Representative site(s): AQ10

Channel Features:

- Flowing water (Yes/No): No
- Channel width (m): 0.5
- Notes: well vegetated banks, slightly moist channel 0.5 m wide.

Watercourse Pictures:

Picture 1: Watercourse at assessment point AQ10 facing downstream. No flowing water.

Picture 2: Watercourse at assessment point AQ10 facing upstream

Picture 3: Trail crossing at assessment point AQ10 facing left bank

Picture 4: Watercourse at assessment point AQ10 facing downstream

9.0 CROSSING 9 – TRIBUTARY TO CARCONTE CREEK

Crossing Type: Tree clearing around site is likely required, culverted crossing of access road is required.

Representative site(s): Wildlife Camera 12

Channel Features:

- Flowing water (Yes/No): No
- Channel width (m): no defined channel
- Notes: Valley is 20 m wide from top of slope to top of slope well vegetated banks, slightly moist channel 1.5 m wide.

Watercourse Pictures:

Picture 1: Watercourse at assessment point 9 facing downstream. No flowing water.

Picture 2: Watercourse at assessment point 9 facing upstream

10.0 SPRING – LOCATED NEAR CROSSING #3, REPORTS TO TWO CABIN CREEK

Crossing Type: Tree clearing around site is likely required, culverted crossing of access road is required. Flows report to Two Cabin Creek.

Representative site(s): Spring

Channel Features:

- lowing water (Yes/No): yes
- Channel width (m): 2 m wide and runs north for 7 m with clear, flowing water. Notes: No inlet to spring; upslope is also wet and dominated by horsetail and alder
- Watercourse Pictures:

Picture 1: Looking down at spring origin.

Picture 2: Looking downstream from spring

Picture 3: Looking northwest upslope of spring area

Picture 4: Looking north adjacent to spring area

Picture 5: Looking south towards spring showing channel flowing downstream from the spring

11.0 SEEP – REPORTS TO TWO CABIN CREEK

Representative site(s): Seep located just east of proposed access road

Channel Features:

- Flowing water (Yes/No): yes
- Channel width (m): 8 m wide x 20 m long, then narrows to 0.3 m wide with flowing water.. Notes: Seep disappears for 10 meters as it flows under a large tree and then reappears.
- Watercourse Pictures:

Picture 1: Showing origin of seep area where water has ponded on a bench on a lower to mid-slope position.

Picture 2: Looking upstream at seep.

Picture 3: Showing where seep disappears underneath tree

Picture 4: Looking upstream showing where seep re-appears from tree.

FIGURES

R8 W6M

T57

T56

Crossing 9 - Carconte Creek
• Flowing water (Yes/No): No
• Channel width (m): no defined channel
• Notes: Valley is 20 m wide from top of slope to top of slope well vegetated banks, slightly moist channel 1.5 m wide.

Seep - Two Cabin Creek
• Flowing water (Yes/No): Yes
• Channel width (m): 8 m wide x 20 m long, then narrows to 0.3 m wide with flowing water.
• Notes: Seep disappears for 10 meters as it flows under a large tree and then reappears.

Spring - Two Cabin Creek
• Flowing water (Yes/No): Yes
• Channel width (m): 2 m wide and runs north for 7 m with clear, flowing water.
• Notes: No inlet to spring; upslope is also wet and dominated by horsetail and alder.

Crossing 8 - Allen Creek
• Flowing water (Yes/No): No
• Channel width (m): 0.5
• Notes: well vegetated banks, slightly moist channel 0.5 m wide.

Crossing 2 - Unnamede Tributary to Smokey River
• Flowing water (Yes/No): No
• Channel width (m): no defined channel
• Notes: U-shaped valley app. 20 m wide (from top to top), well grassed valley sides, blocked culvert under the road, lots of garbage downstream of existing water crossing

Crossing 1 - Two Cabin Creek
• Flowing water (Yes/No): Yes
• Channel width (m): 4-5
• Notes: defined channel 4-5 m width, up to 2 m deep, hanging culvert under highway, well vegetated banks, V-shaped valley app. 40 m wide (from top to top), fallen trees across the channel.

Crossing 3 - Two Cabin Creek
• Flowing water (Yes/No): No
• Channel width (m): no defined channel
• Notes: U-shaped valley app. 10 m wide (from top to top), well vegetated, no culvert at the trail, cut wood at the bottom of valley. Trees growing at the bottom of the valley.

Crossing 4 - Two Cabin Creek
• Flowing water (Yes/No): Yes
• Channel width (m): 0.5
• Notes: well vegetated banks (sedges, willow).

Crossing 5 & 6 - Allen Creek
• Flowing water (Yes/No): Yes
• Channel width (m): 1-1.5
• Notes: well vegetated banks, multiple channels upstream of AQ02

Crossing 7 - Allen Creek
• Flowing water (Yes/No): Yes
• Channel width (m): 1-2
• Notes: Creek at Alan Creek assessment point is 2 m wide x 0.01 m deep, with running water. North slope is 65% shear rock face, while south slope is 36 degrees. Less than 1 m wide channel at AQ03. Multiple small waterfalls along the creek.

Crossing 9
Crossing 8
Seep
Spring
Crossing 2
Crossing 3
Crossing 4
Crossing 1
Crossing 5 & 6
Crossing 7

Carconte Creek
Allen Creek
Smoky River
Two Cabin Creek
Victor Lake
Grande Cache Lake
97 Street
106 Street
105 Avenue
104 Avenue

SUMMIT COAL INC. - MINE 14 PROJECT
IMPACT ASSESSMENT AGENCY OF CANADA

DRAINAGE CROSSINGS - WITH SITE PHOTOS

LEGEND

- Drainage Crossing
- Secondary Road
- Gravel Road
- Trail/Winter/Unimproved
- Water Course
- Water Body

Mine 14

- Mine Permit Area (C. 2009-6)
- Mine Portal Area (MSL 131303)
- Access Road (LOC 131361)

Grande Cache

0 500 1,000
Metres

Coordinate System: NAD 1983 UTM Zone 11N

AltaLIS, 2021; MEMS, 2022;
Valory Resources, 2022 (LiDAR Date: 2022)

MILLENNIUM EMS Solutions Ltd.

PROJECT: 21-00207
DRAWN BY: EPITTMAN
CHECKED BY: DM
DATE: SEPTEMBER 6, 2022

FIGURE
1

Document Path: K:\Active Projects 2021\AP 21-00201 to 21-00250\21-00207\Figures\Coal Mine\1AA Response\Fig 3-3 Drainage Crossings with Site Photos 21-00207.mxd