



August 25, 2018
Authorization Number: 107517

Tracking Number: 371604

REGISTERED MAIL

Teck Coal Limited
3300-550 Burrard ST
Vancouver, BC V6C 0B3

Dear Permittee:

Enclosed is Amended Permit 107517 issued under the provisions of the *Environmental Management Act*. Your attention is respectfully directed to the terms and conditions outlined in the permit. An annual fee will be determined according to the Permit Fees Regulation.

This permit does not authorize entry upon, crossing over, or use for any purpose of private or Crown lands or works, unless and except as authorized by the owner of such lands or works. The responsibility for obtaining such authority rests with the permittee. This permit is issued pursuant to the provisions of the *Environmental Management Act* to ensure compliance with Section 120(3) of that statute, which makes it an offence to discharge waste, from a prescribed industry or activity, without proper authorization. It is also the responsibility of the permittee to ensure that all activities conducted under this authorization are carried out with regard to the rights of third parties, and comply with other applicable legislation that may be in force.

This decision may be appealed to the Environmental Appeal Board in accordance with Part 8 of the *Environmental Management Act*. An appeal must be delivered within 30 days from the date that notice of this decision is given. For further information, please contact the Environmental Appeal Board at (250) 387-3464.

Administration of this permit will be carried out by staff from the Environmental Protection Division's Regional Operations Branch. Plans, data and reports pertinent to the permit are to be submitted by email or electronic transfer to the Director, designated Officer, or as further instructed.

Yours truly,

A handwritten signature in black ink, appearing to read "Douglas Hill". The signature is written in a cursive style with some loops and flourishes.

Douglas J. Hill, P.Eng.
for Director, *Environmental Management Act*

Enclosure



MINISTRY OF ENVIRONMENT AND CLIMATE CHANGE STRATEGY

PERMIT

107517

Under the Provisions of the Environmental Management Act

Teck Coal Limited

3300-550 Burrard ST
Vancouver, BC V6C 0B3

is authorized to discharge effluent to the land and water from five coal mine sites located within the Elk Valley near Elkford and Sparwood, British Columbia, subject to the terms and conditions listed below. Contravention of any of these conditions is a violation of the Environmental Management Act and may lead to prosecution.

The terms and conditions included in this permit are intended to supplement the commitments and processes contained in the Elk Valley Area Based Management Plan approved November 18, 2014. Should any conflict exist between this permit and the Elk Valley Area Based Management Plan, the permit requirements take precedence.

1. DEFINITIONS AND GLOSSARY

Unless otherwise defined, all terms used in this permit are defined as in the Elk Valley Area Based Management Plan (ABMP), approved November 18, 2014. The ABMP is also referred to as the Elk Valley Water Quality Plan.

ABMP: Elk Valley Area Based Management Plan or the Elk Valley Water Quality Plan or EVWQP.

AMP: Adaptive Management Plan

AWTF: Active Water Treatment Facility

BCWQG FWAL: British Columbia Water Quality Guideline for Fresh Water Aquatic Life

CMO: Coal Mountain Operations as described in the latest approved Mines Act Permit C-84

Compliance Point: an effluent monitoring location specified in the permit at which discharge limits apply

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Constituents of Interest: an element or ionic compound that may pose a threat to ecological or human health when present at sufficient concentrations including selenium (Se), cadmium (Cd), nitrate (NO₃) and sulphate (SO₄).

Designated Area: a portion of southeastern British Columbia that contains the Elk Valley Watershed and the portion of Koochanusa Reservoir within Canada, and is geographically defined by Ministerial Order M113 (references to the Elk Valley are references to the Designated Area)

Elk Valley Area Based Management Plan: Teck Coal Limited was required under Section 89 of the Environmental Management Act, to prepare an Area Based Management Plan. The Elk Valley Water Quality Plan (EVWQP) was approved by the BC Minister of Environment on November 18, 2014.

EMC: Environmental Monitoring Committee

ENV: Ministry of Environment and Climate Change Strategy

EVO: Elkview Operations as described in the latest approved Mines Act Permit C-2

FRO: Fording River Operations as described in the latest approved Mines Act Permit C-3

GHO: Greenhills Operations as described in the latest approved Mines Act Permit C-137

LAEMP: Local Aquatic Effects Monitoring Program

LCO: Line Creek Operations as described in the latest approved Mines Act Permit C-129

Order (the): Ministerial Order number M113, which was the directive issued by the B.C. Minister of Environment in April 2013 requiring Teck Coal Limited to develop the Elk Valley Area Based Management Plan.

Order station: a monitoring location specified by the Order to monitor water quality in the Designated Area, at which site performance objectives apply

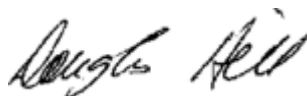
RAEMP: Regional Aquatic Effects Monitoring Program

Regulatory Document: any document submitted to the Director as required by this permit

SPO: Site Performance Objective

WLC: West Line Creek

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for Director, *Environmental Management Act*

2. AUTHORIZED DISCHARGES (COMPLIANCE POINTS)

The compliance points in this Section correspond to locations where all or most of the point and non-point discharges from a mine site or portions of a mine site are expected to accumulate. These accumulated discharges are subject to the limits.

For Sections 2.1 to 2.5, the limits are expressed as monthly average concentrations as well as specified daily maximums. The monthly average concentration is defined as the average of all samples collected in a calendar month at the sample location. For months where only one result is collected, that result shall be compared to both the monthly average and daily maximum limits.

2.1. FORDING RIVER OPERATIONS - FORDING RIVER COMPLIANCE POINT

This section applies to effluent from Teck Coal Limited mine operations (Fording River Operations and the Greenhills Operations into the Fording River watershed) upstream of FRO Compliance Point (EMS E300071). The FRO Compliance Point (EMS E300071) is located approximately 525 m downstream of Cataract Creek as shown in Appendix 1.

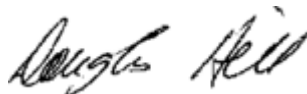
2.1.1. The characteristics of the effluent at the compliance point must not exceed the following monthly average limits:

MONTHLY AVERAGE			
PARAMTERS	Immediately	By Dec. 31, 2019	By Dec. 31, 2023
Total selenium ($\mu\text{g/L}$)	130	90	61
Nitrate as N (mg/L)	27	19	13
Sulphate (mg/L)	580	620	650

2.1.2. The characteristic of the effluent at the compliance point must not exceed the following daily maximums:

DAILY MAXIMUM			
PARAMETERS	Immediately	By Dec. 31, 2019	By Dec. 31, 2023
Total selenium ($\mu\text{g/L}$)	155	106	71
Nitrate as N (mg/L)	32.5	23	15

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- 2.1.3. The authorized works include tailings impoundments, sedimentation and infiltration ponds, diversions, ditches, pipelines and pumping, sewage treatment plants, and related appurtenances.

2.2. GREENHILLS OPERATIONS – FORDING RIVER COMPLIANCE POINT

This section applies to effluent from Teck Coal Limited mine operations (Fording River Operations, Greenhill Operations and Line Creek Operations) upstream of GHO Fording River Compliance Point (EMS 0200378). The GHO Fording River Compliance Point (EMS 0200378) is located 205 m downstream of Greenhills Creek as shown in Appendix 1.

- 2.2.1. The characteristics of the effluent at the compliance point must not exceed the following monthly average limits:

MONTHLY AVERAGE			
PARAMETERS	Immediately	By Dec. 31, 2019	By Dec. 31, 2023
Total selenium (µg/L)	80	63	57
Nitrate as N (mg/L)	20	14	11

- 2.2.2. The characteristics of the effluent at the compliance point must not exceed the following daily maximums:

DAILY MAXIMUM			
PARAMETERS	Immediately	By Dec. 31, 2019	By Dec. 31, 2023
Total selenium (µg/L)	100	78	62
Nitrate as N (mg/L)	29	17	15

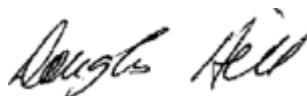
- 2.2.3. The authorized works include tailings impoundments, sedimentation and infiltration ponds, diversions, sewage treatment plants, and related appurtenances.

2.3. GREENHILLS OPERATIONS – ELK RIVER COMPLIANCE POINT

This section applies to effluent from Teck Coal Limited mine operations (Greenhills Operations into the Elk River watershed) upstream of GHO Elk River Compliance Point (EMS 300090). The GHO Elk River Compliance Point (EMS 300090) is located 220 m downstream of Thompson Creek as shown in Appendix 1.

- 2.3.1. The characteristics of the effluent at the compliance point must not exceed the following monthly average limits:

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MONTHLY AVERAGE		
PARAMETERS	Immediately	By Dec. 31, 2027
Total selenium ($\mu\text{g/L}$)	15	8
Nitrate as N (mg/L)	3	3

2.3.2. The authorized works include tailings impoundments, sedimentation and infiltration ponds, diversions, sewage treatment plants and related appurtenances.

2.4. **LINE CREEK OPERATIONS – LINE CREEK COMPLIANCE POINT**

This section applies to effluent from Teck Coal Limited mine operations (Line Creek Operations into the Line Creek Watershed) above LCO Compliance Point (EMS E297110). The LCO Compliance Point (EMS E297110) is located approximately 1500 m downstream of the West Line Creek Active Water Treatment Facility (WLC AWTF) outfall as shown in Appendix 1

2.4.1. The characteristics of the effluent at the compliance point must not exceed the following monthly average limits:

MONTHLY AVERAGE			
PARAMETERS	Immediately	By Dec. 31, 2015	By Dec. 31, 2033
Total selenium ($\mu\text{g/L}$)	80	50	29
Nitrate as N (mg/L)	14	7	3

2.4.2. The characteristics of the effluent at the compliance point must not exceed the following daily maximums:

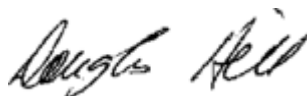
DAILY MAXIMUM			
PARAMETERS	Immediately	By Dec. 31, 2015	By Dec. 31, 2033
Total selenium ($\mu\text{g/L}$)	95	58	33
Nitrate as N (mg/L)	20	9	4

2.4.3. The authorized works include tailings impoundments, sedimentation and infiltration ponds, diversions, sewage treatment plants, and related appurtenances.

2.5. **ELKVIEW OPERATIONS – HARMER CREEK COMPLIANCE POINT**

This section applies to effluent from Teck Coal Limited mine operations (Elkview Operations into the Harmer Creek watershed) above EVO Harmer Compliance Point (EMS E102682). The EVO Harmer Compliance Point (EMS E102682) is located at the Harmer Spillway as shown in Appendix 1.

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2.5.1. The characteristics of the effluent at the compliance point must not exceed the following monthly average limits:

MONTHLY AVERAGE			
PARAMETERS	Immediately	By Dec. 31, 2017	By Dec. 31, 2021
Total selenium (µg/L)	45	57 (interim) ¹	Requires Development ¹
Nitrate as N (mg/L)	4	16	8
Sulphate (mg/L)	300	380	450

¹ The limits for total selenium are determined following the process outlined in Section 2.7.1. Establishment of the limits requires written approval by the Director.

2.5.2. The authorized works include sedimentation and infiltration ponds, tailings impoundments, diversions, sewage treatment plants, and related appurtenances.

2.6. ELKVIEW OPERATIONS – MICHEL CREEK COMPLIANCE POINT

This section applies to effluent from Teck Coal mine operations (Elkview Operations into the Michel Creek watershed) above EVO Michel Creek Compliance Point (EMS E300091). The EVO Michel Creek Compliance Point (EMS E300091) is located at the Highway 3 bridge over Michel Creek as shown in Appendix 1.

2.6.1. The characteristics of the effluent at the compliance point must not exceed the following monthly average limits:

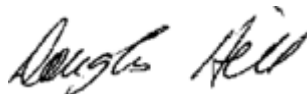
MONTHLY AVERAGE			
PARAMETERS	Immediately	By Dec. 31, 2021	By Dec. 31, 2025
Total selenium (µg/L)	28	20	19
Nitrate as N (mg/L)	6	6	6

2.6.2. The authorized works include sedimentation and infiltration ponds, tailings impoundments, diversions, sewage treatment plants, and related appurtenances.

2.7. COAL MOUNTAIN OPERATIONS (CMO)

This section applies to effluent from Teck Coal Limited mine operations (Coal Mountain Operations) above CMO Compliance Point (EMS E258937). The CMO Compliance Point (EMS E258937) is located 50 m upstream of Andy Goode Creek as shown in Appendix 1.

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2.7.1. The characteristics of the effluent at the compliance point must not exceed the following monthly average limits:

PARAMETERS	Immediately
Total selenium (µg/L)	19
Nitrate as N (mg/L)	5
Sulphate (mg/L)	500

2.7.2. The authorized works include sedimentation and infiltration ponds, diversions, sewage treatment plant, and related appurtenances.

2.8. WEST LINE CREEK ACTIVE WATER TREATMENT FACILITY

This section applies to the discharge of effluent from the West Line Creek Active Water Treatment Facility (WLC AWTF) Phase 1 to Line Creek. The site reference number for this discharge is E291569 as shown in Appendix 1.

2.8.1. The maximum authorized rate of discharge is 8,300 cubic meters per day.

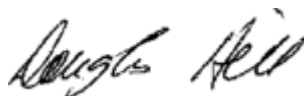
2.8.2. The characteristics of the discharge at the treated effluent outlet of the WLC AWTF must not exceed:

PARAMETER	LIMIT
Ammonia	1.0 mg/L
Biological Oxygen Demand	25 mg/L
pH Range	6.5-8.5
Nitrate	3.0 mg/L
Total Phosphorus	0.3 mg/L
Total Selenium	0.02 mg/L, Monthly Average
Total Suspended Solids	10.0 mg/L

2.8.3. The authorized works are West Line Creek intake structure and pipeline, active water treatment plant, the advanced oxidation process facility, combined Line Creek intake and outfall structure and pipeline, leachate influent from biosolids residual management facility, buffer pond, buffer pond overflow spillway and wet pond, and groundwater diversion, and related appurtenances.

2.8.4. The location of the facilities from which the discharge originates and the location of the point of discharge is District Lot 6772, District Lot 4588, Kootenay Land District.

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2.9. RE-EVALUATION OF LIMITS

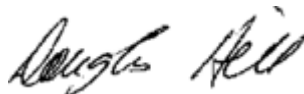
2.9.1. EVO Harmer Compliance Point Selenium Evaluation

The interim limit for selenium of 57 ug/L effective December 31, 2017 is confirmed.

A proposed timeframe and long term limit for total selenium must be re-submitted for consideration and approval by the Director no later than December 31, 2018. The re-submission must include a proposed monthly average total selenium at the EVO Harmer Compliance Point (EMS E102682) appropriate to meet the intentions of the approved Elk Valley Water Quality Plan, and must consider and address the following:

- 1) The comments provided by the EMC in the input table dated June 12, 2015 and the Ktunaxa Nation Council (KNC) in their letter dated January 25, 2016;
- 2) Information derived from the Tributary Evaluation Program;
- 3) The results from updated water quality modelling due October 31, 2017 as per section 10.9;
- 4) An assessment of means to exclude fish from sediment ponds in general and the Harmer Dry Creek Sediment Ponds in particular. Methodology for exclusion should be evaluated by the Elk Valley Fish and Fish Habitat Committee; and
- 5) Clarification regarding how Teck has modified the BRE mine plan to reduce selenium loadings at the Harmer compliance point.

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for Director, *Environmental Management Act*

3. SITE PERFORMANCE OBJECTIVES

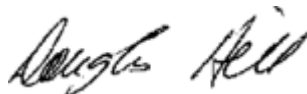
3.1. SITE PERFORMANCE OBJECTIVES FOR ORDER STATIONS

The following Site Performance Objectives (SPOs) are established at the Order Stations. It is expected that SPOs will be maintained during all timeframes shown in the tables or immediately maintained if no date is indicated.

Site performance objectives are expressed as monthly average concentrations. The monthly average concentration is defined as the average of the samples collected in a month.

ORDER STATION {Teck ID} (EMS number)	ORDER DESCRIPTION (Teck location description)	PARAMETER	UNIT	IMMEDIATELY	By DEC 31, 2019	By DEC 31, 2023	By DEC 31, 2025	By DEC 31, 2028
FR4 {GH_FR1} (0200378)	Fording River Downstream of Greenhills Creek	Total Selenium	µg/L	-	63	57	-	-
		Nitrate as N ²	mg/L	20	14	11	-	-
		Sulphate	mg/L	429	-	-	-	-
		Dissolved Cadmium ¹	µg/L	0.39	-	-	-	-
FR5 {LC_LC5} (200028)	Fording River at the Mouth (Fording River downstream of Line Creek)	Total Selenium	µg/L	-	51	40	-	-
		Nitrate as N ²	mg/L	18	10	-	-	-
		Sulphate	mg/L	429	-	-	-	-
		Dissolved Cadmium ¹	µg/L	0.39	-	-	-	-
ER1 {GH_ER1} (206661)	Elk River downstream of Greenhills Operations (Upstream of Boivin Creek)	Total Selenium	µg/L	19	-	-	-	-
		Nitrate as N	mg/L	3	-	-	-	-
		Sulphate	mg/L	309	-	-	-	-
		Dissolved Cadmium ¹	µg/L	0.24	-	-	-	-
ER2 {EV_ER4} (200027)	Elk River from Fording to Michel Creek (upstream of Grave Creek)	Total Selenium	µg/L	23	-	19	-	-
		Nitrate as N	mg/L	-	4	-	3.5	3
		Sulphate	mg/L	429	-	-	-	-
		Dissolved Cadmium ¹	µg/L	0.24	-	-	-	-
ER3 {EV_ER1} (200393)	Elk River downstream of Michel Creek	Total Selenium	µg/L	19	-	-	-	-
		Nitrate as N	mg/L	-	3	-	-	-
		Sulphate	mg/L	429	-	-	-	-
		Dissolved Cadmium ¹	µg/L	0.24	-	-	-	-

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ER4 {RG_ELKORES} (E294312)	Elk River at Elko	Total Selenium	µg/L	19	-	-	-	-
		Nitrate as N	mg/L	-	3	-	-	-
		Sulphate	mg/L	429	-	-	-	-
		Dissolved Cadmium ¹	µg/L	0.24	-	-	-	-
LK2 {RG_DSELK} (E300230)	Koocanusa Reservoir south of the Elk River	Total Selenium	µg/L	2	-	-	-	-
		Nitrate as N	mg/L	3	-	-	-	-
		Sulphate	mg/L	308	-	-	-	-
		Dissolved Cadmium ¹	µg/L	0.19	-	-	-	-

¹ Cadmium SPOs are hardness dependent based on the following formula:
 $Cd \text{ (in } \mu\text{g/L)} = 10^{0.83\log_{10}(\text{hardness})-2.53}$ where hardness is in mg/L of CaCO₃

² Nitrate SPOs for FR4 {GH_FR1} as of 2023 and FR5 {LC_LC5} as of 2019 are hardness dependent based on the following formula:

Level 1 benchmark for the Fording River N as mg/L = $10^{1.0003\log_{10}(\text{hardness})-1.52}$ where hardness is in mg/L of CaCO₃

For the purposes of calculating the targets above, hardness is based on the following concentrations:

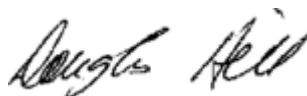
FR4{GH_FR1}, FR5{LC_LC5}, and ER1{GH_ER1} – 360 mg/L
 ER2{EV_ER4}, ER3{EV_ER1}, and ER4{RG_ELKORES} – 200 mg/L
 LK2{RG_DSELK} – 150 mg/L

3.2. **TRIGGERS FOR REASSESSMENT OF LIMITS**

3.2.1. In the event that a site performance objective listed in Section 3.1 is exceeded without an exceedance of limits in Section 2, the Permittee must:

- 1) Immediately notify the Director of the exceedance;
- 2) Re-sample within 7 days of receiving data to confirm results;
- 3) If the results are still above the SPO, the Permittee must reassess discharge sources and determine appropriate limits for the compliance points detailed in Section 2, or new compliance points based on reassessment of discharge sources; and
- 4) Provide to the Director an explanation of the temporary exceedance or an application for an amendment of this permit with new or revised Section 2 limits within 3 months.
- 5) Director may specify additional monitoring in the event of a continued exceedance.

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3.2.2. After 3 years of data collection the Permittee must undertake trend analysis at each of the site performance objective locations and submit the trend analysis with the next annual report. The first annual report is due in 2018. The Permittee must use the trend analysis to predict expected concentrations for the next 3 year period. If after consideration of planned mitigation measure any of the site performance objective locations are expected to exceed the maximum concentrations listed in Section 3.1, the Permittee must:

- 1) Immediately notify the Director of the potential future exceedance;
- 2) Reassess discharge sources and determine appropriate limits for the compliance points detailed in Section 2, or new compliance points based on reassessment of discharge sources; and
- 3) Provide to the Director an application for an amendment of this permit with new or revised Section 2 limits within 3 months.

3.3. SITE PERFORMANCE OBJECTIVES FOR COMPLIANCE POINTS

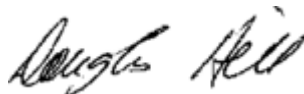
The following Site Performance Objectives (SPOs) are established at the Compliance Points (see Table 1 section 9.1.1.1 for location descriptions) for sites where permit limits have not been specified in Section 2. It is expected that the SPOs will be maintained during all time frames.

COMPLIANCE POINT	SITE PERFORMANCE OBJECTIVE	
GHO Fording River, GHO Elk River, LCO, EVO Michel Creek	Sulphate: BCWQG FWAL ¹ (hardness dependent)	
	WATER HARDNESS ² (mg/L)	SULPHATE GUIDELINE (mg/L)
	Very Soft (0-30)	128
	Soft to moderately soft (31-75)	218
	Moderately soft/hard to hard (76-180)	309
	Very hard (181-250)	429
	In addition, the following water quality benchmark as developed for the ABMP will be applied:	
Very hard (>250)	429	
All Compliance Points	Cadmium: Cd (in µg/L) = 10 ^{0.83(log[hardness])-2.53} where hardness is in mg/L of CaCO ₃	

¹BC Water Quality Guideline for Freshwater Aquatic Life

²Hardness is in mg/L CaCO₃

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Site performance objectives are expressed as monthly average concentrations. The monthly average concentration is defined as the average of the samples collected in a month.

3.4. SITE PERFORMANCE OBJECTIVES FOR WLC AWTF

Additional requirements for WLC AWTF are detailed in Section 4.

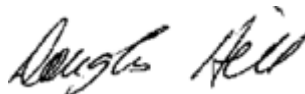
- 3.4.1. The following Site Performance Objectives are established for Line Creek immediately downstream of the confluence with South Line Creek. The site reference number where the Site Performance objectives apply is E297110 as shown in Appendix 1.

PARAMETER	OBJECTIVE	METHOD/NOTES
Total Phosphorus	$\leq 20\mu\text{g/L}$	Growing season average calculated from measurements collected every two weeks between June 15 and September 30 annually.

- 3.4.2. Periphyton chlorophyll-a sampling must be completed for this location in 2017 and reported in the Line Creek Operations Local Aquatic Effects Monitoring Report.
- 3.4.3. The Permittee must prepare a Data Summary Report verifying the attainment of the Site Performance Objectives for WLC AWTF. The report must be submitted annually to the Director by January 31st of each year based on data collected in the previous year. The first report is due January 31, 2016.

In the event that any of the Site Performance Objectives specified above are exceeded, the Permittee must review the discharge concentration limit for total phosphorus in Section 2.6.1.2 and submit an application to amend the limit such that the Site Performance Objectives in this Section is met. The amendment application must be submitted along with a plan that clearly identifies proposed works, management actions, and timelines for implementation. The Plan must be submitted to the Director for approval by May 31st of the year following the exceedance of the Site Performance Objective(s).

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4. ACTIVE WATER TREATMENT FACILITY ADDITIONAL REQUIREMENTS

4.1. COMMISSIONING

For the purpose of this permit, commissioning means bringing the Active Water Treatment Facility (AWTF) works into operation. Subsequent to initiating operation of AWTF works, the commissioning phase includes provision of reasonable time for undertaking operational refinement or adjustment of works to optimize efficiency and/or effluent quality. In this regard, a maximum of 120 days is considered a reasonable time provision to commission the AWTF. During commissioning of the AWTF, the discharge is required to be non-acutely toxic as per Section 7.2. During the time that commissioning is underway, periodic reporting on the status of commissioning must be provided to the satisfaction of the Director.

4.2. OPERATIONAL PLAN

An Operational Plan for each AWTF and the associated authorized works in Section 2 must be prepared by a qualified professional and submitted to the Director and implemented prior to commencement of the discharge from the AWTF. The Operational Plan must include but is not necessarily limited to:

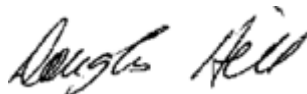
a) Standard Operating Procedures:

- The facility operator's manual, with provision for its continual improvement;
- A comprehensive planned maintenance program which includes an inventory of facility components and authorized replacement parts, and a detailed description of inspection, repair and replacement frequency for facility components; and
- Documentation to verify that the facility is operated at all times within specifications and in a manner to ensure compliance with this authorization and other applicable legislation.

b) Emergency Response and Contingency Plan:

- Describe all built-in redundancy features of the facility;
- Identify actions to be taken if effluent quality fails to meet the requirements of this permit;
- Outline measures to prevent emergency conditions from occurring;
- Describe measures to mitigate any health or environmental impacts, if emergencies occur;
- Make specific reference to the Spill Reporting Regulation; and,

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- Provide specific instructions for staff in the event of an emergency including contact information for local authorities (fire, police, public health), Emergency Management BC, and the Director.

c) Commissioning Plan:

- Operational procedures required to commission and to start-up following a shut-down of the water treatment facility, including any additional monitoring and reporting required to demonstrate that no adverse environmental impacts result from commissioning.

The Operational Plan must be reviewed and updated following the first year of facility operations and as needed thereafter to assess its appropriateness for the authorized works, discharges and conditions. Results of the initial review must be provided to the Director in the performance review report prepared under Section 4.3 of this permit. Changes in procedures may be required by the Director on the basis of this or later assessments, the operational records for the treatment facility and/or the results of discharge and receiving environment monitoring under Section 9.

4.3. PERFORMANCE REVIEW REPORT

Within 12 months of finalizing the commissioning phase of the active water treatment facility, the Permittee must submit a monitoring and operational performance report, prepared by a qualified professional to the Director. The report must document the results of performance monitoring and system optimization over the first year of operations at the facility and recommend any necessary system improvements and schedule for implementation.

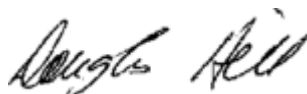
4.4. EVO Water Quantity Data Assessment

The Permittee must assess the adequacy of the existing EVO surface and groundwater monitoring programs to support modelling evaluation and project design of the Elkview Phase I AWTF to meet downstream SPOs and Compliance Limits. The assessment should include consideration of the monitoring programs ability to:

- Quantify the magnitude and temporal distribution of total runoff from the watersheds upstream of the proposed AWTF intake locations;
- Quantify the magnitude and temporal distribution of surface flow in the reach between the intakes and potential discharge locations; and
- Define the proportion of total runoff conveyed at surface and through the subsurface at the intake locations at a monthly resolution.

If warranted, the assessment must also include recommendations and an implementation schedule for additional monitoring to address identified shortcomings in the existing programs.

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An assessment report must be prepared by a qualified professional and be provided to the Director by October 31, 2017.

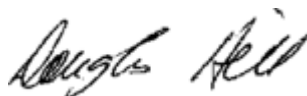
5. TRIBUTARY EVALUATION AND MANAGEMENT

The Permittee must develop and implement a phased study design for a Tributary Evaluation Program, and develop and implement a Tributary Management Plan. The Tributary Evaluation Program and the Tributary Management Plan must include all tributaries affected or potentially influenced by the Permittee's current operations and future development plans in Management Units 1, 2, 3, and 4, as defined in the Elk Valley Water Quality Plan.

The Tributary Evaluation Program is intended to evaluate the ecological value of tributaries to the Elk and Fording Rivers to support identification of tributaries that play a significant role in supporting the health of the ecosystem as a whole. The Tributary Evaluation Program must include the following elements:

- Inventory of tributaries to the Elk and Fording Rivers that are located in Management Units 1, 2, 3, and 4 that are affected or potentially influenced by the Permittee's current and future development plans;
- Maps of Management Units 1, 2, 3, and 4 showing the locations of the tributaries of the Elk and Fording Rivers, and identifying the tributaries that are affected or potentially influenced by the Permittee's current and future development plans;
- Collation of existing and readily available data and information on each tributary, including surface-water chemistry, surface-water toxicity, sediment chemistry, sediment-toxicity, calcification, flow, habitat value ranking, benthic invertebrate community structure, and habitat use by fish and/or sensitive aquatic dependent wildlife (i.e., water birds);
- Evaluation of historical (i.e. conditions relevant to the 1980 timeframe, where available) and current habitat value, based on surface-water quality, sediment quality, extent of calcification, flow, amount of habitat available, habitat types, physical features, connectivity to fish habitat, status of riparian habitat, and habitat use by fish and sensitive aquatic dependent wildlife species;
- Evaluation of the potential for rehabilitation of aquatic and riparian habitat and potential for improvement of water quality conditions; and
- Prioritization of each tributary for ongoing protection and/or restoration based on the evaluation of current ecological value, potential for rehabilitation, and potential to contribute to the objectives of the EVWQP.

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The purpose of this evaluation is to provide context for the development of specific management objectives for tributaries included in the Tributary Management Plan. As the Tributary Evaluation Program will also provide essential information for assessing the potential effects of planned mine expansions and new projects, the components of the program that relate to the upper Fording River and the Michel Creek watershed should be completed on a priority basis as part of the phased study design.

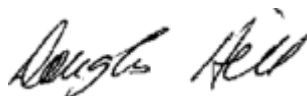
Following the evaluation of the tributaries, the Permittee must develop and implement a Tributary Management Plan. The Tributary Management Plan is intended to incorporate protection and rehabilitation goals for tributaries that will support achieving the area-based objectives of the Elk Valley Water Quality Plan. In development of the Tributary Management Plan, those tributaries that are not impacted by mining activities, that provide relatively high habitat value, and/or support ongoing habitat use by fish and sensitive aquatic dependent wildlife (i.e. directly or indirectly through food production) shall be identified as the highest priority tributaries for permanent protection. Those tributaries that have been impacted by mining, provide or have the potential to provide relatively high habitat value, and/or support or could support habitat use by fish and sensitive aquatic dependent wildlife shall be identified as the highest priority tributaries for restoration/rehabilitation. The Tributary Management Plan will consider the Permittee's future mine development plans. The scope of the Tributary Management Plan excludes tributaries that have been permanently removed or severely altered (e.g., covered by waste spoils or other mine infrastructure or dewatered) by mining activities within the Permittee's current mine permit boundaries. Loss of habitat for such tributaries is governed by requirements under the Federal *Fisheries Act* and the provincial mitigation policy.

The Tributary Evaluation Program and Tributary Management Plan will complement the Elk Valley Water Quality Plan and clearly detail any proposed management of water quality conditions, flows and ecological values within the tributaries affected or influenced by the Permittee's current operations and planned developments in Management Units 1, 2, 3, and 4, as defined in the Elk Valley Water Quality Plan.

The following development and implementation timelines apply:

- 1) A Phased Study Design for the Tributary Evaluation Program, including a listing of all tributaries to be evaluated, must be submitted to the EMC by May 1, 2015.
- 2) The Phased Study Design for the Tributary Evaluation Program must be submitted for acceptance to the Director by May 31, 2015.
- 3) The Terms of Reference for the Tributary Management Plan must be submitted to the EMC by March 31, 2016.

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- 4) Data collected during the Tributary Evaluation Program for current ecological value of tributaries within Management Units 1, 2, 3 and 4 must be compiled into a written report and submitted to the EMC by March 31, 2016.
- 5) Analysis and interpretation of Tributary Evaluation Program data, assessment of potential for rehabilitation and/or mitigation, and prioritization of tributaries for potential future habitat rehabilitation must be compiled into a written interim report and submitted to the EMC by August 31, 2016.
- 6) Interim Tributary Management Plan report must be submitted to the EMC by July 31, 2017.
- 7) The Tributary Management Plan shall be submitted for acceptance to the Director by December 31, 2017. Thereafter, the Plan shall be updated annually and submitted to the Director by December 31. The annual update shall, at a minimum, incorporate any changes to the Permittee's current and future development plans.
- 8) The Tributary Management Plan must be implemented by March 1, 2018.

6. CALCITE MANAGEMENT

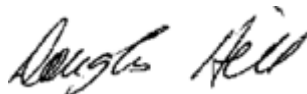
6.1. SITE PERFORMANCE OBJECTIVES – CALCITE

The Permittee must manage calcite levels in streams in Management Units 1,2, 3, and 4 for streams that are fish bearing, provide fish habitat or flow directly into fish bearing streams and are not scheduled by an Environmental Assessment Certificate or Mines Act Permit to be buried. These streams must meet the following Site Performance Objectives:

- 1) By December 31, 2024 $CIConc \leq 0.50$
- 2) By December 31, 2029 $CItotal \leq 0.50$

Where: $CItotal$: Calcite Index (total) = $CIConc + CIPres$
 $CIConc$: Calcite Concretion = $\frac{\text{Sum of pebble concretion scores}}{\text{Number of pebbles counted}}$
 $CIPres$: Calcite Presence = $\frac{\text{Number of pebbles with calcite}}{\text{Number of pebbles counted}}$

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6.2. COMMITMENTS FROM ABMP - CALCITE

6.2.1. IMPLEMENTATION

The Permittee must notify the Director in writing of the selected priority stream for calcite treatment by March 31, 2016. The Permittee must then implement calcite treatment in a minimum of one priority stream by October 31, 2017. Priority streams for calcite management currently include Greenhills Creek (GHO), Corbin Creek (CMO), Dry Creek (EVO) and Erickson Creek (EVO).

6.2.2. SCHEDULE FOR REVISIONS TO CALCITE MANAGEMENT PLAN

The Permittee must update and submit the Calcite Management Plan, as outlined in Chapter 7 of the Elk Valley Water Quality Plan, by July 31 and every three years thereafter. The next Calcite Management Plan must be submitted to the Director by July 31, 2016.

6.3. CALCITE TREATMENT PROJECT

6.3.1. OPERATIONAL PLANS

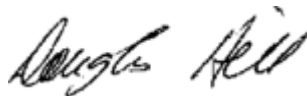
The following operational plans must be prepared by a qualified professional, submitted to the Director, and implemented prior to commencement of antiscalant addition for calcite treatment in Lower Greenhills Creek:

- i. Greenhills Creek Antiscalant Addition System Commissioning Plan;
- ii. Greenhills Creek Calcite Management Plan;
- iii. Antiscalant Management Plan; and
- iv. Antiscalant Addition System Operating and Maintenance Manual.

6.3.2. EFFLUENT QUALITY

Effluent from the antiscalant treatment module must be non-acutely toxic, have an antiscalant concentration of 150 mg/L or less, and result in an in-stream concentration of 5 mg/L or less. Only the antiscalant identified in the Teck application "Greenhills Operations Lower Greenhills Creek Calcite Management Project" dated June 15, 2017 may be used for this project. Notification of any deviation from the identified antiscalant must be provided to the Director, Environmental Protection, and KNC prior to implementation.

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6.3.3. COMMISSIONING REPORT

A commissioning report must be submitted to the Director within 60 days of commissioning completion. If the commissioning report deadline corresponds with the annual report deadline, one report may be submitted to meet both requirements. The commissioning report must include, but is not limited to:

- i. Operating times;
- ii. Treated water volumes and stream flow;
- iii. Antiscalant consumption and dosing details; and
- iv. Monitoring data.

6.3.4. ANNUAL REPORT

An annual report must be submitted to the Director by March 15 for each year following the data collection calendar year. The first report is due March 15, 2018. The report must include, but is not limited to:

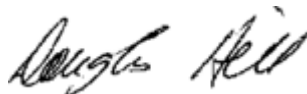
- i. Operating times
- ii. Treated water volumes and streamflow;
- iii. Antiscalant consumption and dosing details;
- iv. Monitoring data;
- v. Interpretation and analysis of monitoring data; and
- vi. An updated schedule for application and implementation of calcite treatment in Upper Greenhills Creek.

6.3.5. MONITORING

The Permittee must implement monitoring programs as described in the approved monitoring programs “Greenhills Creek Aquatic Effects Assessment and Monitoring Program” and “Greenhills Creek Antiscalant Addition System Operational Monitoring Plan”.

The Permittee must submit to the Director any changes to the monitoring program prior to implementation. The Director may make or request changes to the monitoring program at any time by specifying such in writing to the Permittee.

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The Permittee must monitor water quality at GH_GH5 for an initial period of 6 months during project commissioning and operations. Sampling must occur monthly and include field parameters, conventional parameters, nutrients, major ions, and total and dissolved metals. The Permittee must provide an analysis and interpretation of results to KNC and the Director, Environmental Protection, within 8 months of the project start date and include a recommendation for monitoring at this location.

Monitoring at this location must continue until a request for an alternative monitoring schedule is made by Teck and approved by the Director, Environmental Protection. The request must include a report on engagement with KNC.

7. GENERAL REQUIREMENTS

7.1. MAINTENANCE OF WORKS AND EMERGENCY PROCEDURES

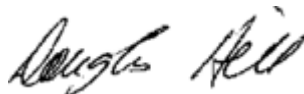
The Permittee must inspect the authorized works regularly and maintain them in good working order. In the event of a condition or emergency which prevents effective operation of the authorized works, leads to unauthorized discharge, or results in a permit exceedance, the Permittee must:

- 1) Comply with all applicable statutory requirements, including the Spill Reporting Regulation;
- 2) Immediately contact the Director or an Officer designated by the Director by e-mail and/or telephone;
- 3) Take immediate appropriate remedial action for the prevention or mitigation of pollution; and
- 4) Submit written documentation of any malfunction or emergency condition. The report must include all the corrective and preventative actions that will be taken, a schedule of implementation of actions and the date the findings as to the cause of the incident will be reported to the Director. This information must be submitted with the next quarterly report required in Section 10 unless otherwise required by the Director.

During an emergency event, the Director may suspend conditions under this permit where the emergency event will prevent compliance with a requirement of this permit.

During and/or after the emergency event or condition, the Permittee must conduct appropriate sampling and analysis of discharges, which may be more stringent than the monitoring requirements of this permit and/or applicable statutory requirements. As the results of such sampling become available, the Permittee must provide the results to the Director or a designated

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Officer. The Director may require additional monitoring or reporting at any time by specifying such in writing to the Permittee.

The Director may specify contingency actions to be implemented to protect human health and the environment while authorized works and/or standard operating procedures are being restored.

7.2. EFFLUENT NON-TOXICITY

The effluent must not cause greater than 50% mortality in 96 hr Rainbow Trout (*Oncorhynchus mykiss*) single concentration toxicity tests (EPS 1/RM/13 2nd edition, December 2000) or greater than 50% mortality in 48 hr *Daphnia magna* single concentration toxicity tests (EPS 1/RM/14 2nd edition, December 2000).

7.3. CONTROLLED BYPASSES

Bypass of the authorized works is prohibited unless the prior approval of the Director is obtained and confirmed in writing. The Director may specify conditions to address the bypass.

7.4. PROCESS MODIFICATIONS

The Permittee must notify the Director in writing, prior to implementing changes to any process that may adversely affect the quality and/or quantity of the discharge. Notwithstanding notification under this Section, permitted levels must not be exceeded.

7.5. NEW WORKS

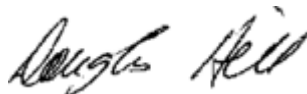
The Director may require upgrading of the treatment works and disposal facilities based on monitoring results, and/or any other pertinent information. Plans and specifications for new pollution treatment works and upgrades to existing works must be submitted to the Director as an amendment application. All new works must be approved before a discharge from the works commences.

7.6. QUALIFIED PROFESSIONAL

A qualified professional is defined as follows:

"Qualified Professional" means an applied scientist or technologist specializing in an applied science or technology applicable to the duty or function, including, but not limited to agrology, biology, chemistry, engineering, geology or hydrogeology and who:

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- i. is registered with the appropriate professional organization, is acting under that organization's code of ethics and is subject to disciplinary action by that organization, and
- ii. through suitable education, experience, accreditation and/or knowledge, may be reasonably relied on to provide advice within their area of expertise.

All documents submitted to the Director by a Qualified Professional must be signed by the author(s).

7.7. ENVIRONMENTAL EMERGENCY RESPONSE PLAN

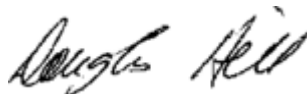
The Permittee must maintain an Environmental Emergency Response Plan which includes effective procedures for responding to all probable environmental emergencies associated with the Teck Coal operations and mine site areas, including the suspension of discharge of effluent(s) where appropriate, if required. The Permittee must keep this plan up to date and provide the Director with any updates to this plan within 30 days of adoption of the plan update.

The Director may require periodic review of the response plan, and/or a report on any emergency event associated with the mine operation or occurring at the mine site.

7.7.1. The Emergency Response Plan shall at a minimum include:

- a) Identification of Environmental Aspects as defined by the ISO 14001 Environmental Management System Standards that pose a risk to the environment or public safety;
- b) An evaluation of the identified environmental aspects including a fate and effects assessment where applicable;
- c) Maps identifying areas of high environmental sensitivity around the mine sites including along the transportation corridors, and areas downstream of water-crossings where spilled materials can reasonably be anticipated to impact;
- d) Site specific spill response tactics, including the required training and resources to implement those tactics for each of the identified materials or risks during an emergency event;
- e) Requirements and procedures for spill reporting and/or emergency notification to various levels of government, including the KNC; and
- f) Procedure for establishing formal interagency communication for the duration of the emergency and clean-up as necessary.

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- 7.7.2. The Permittee must maintain an Environmental Emergency Response Plan and ensure:
- a) Adequate equipment caches are available at each operation, at a minimum, to enable timely and effective response to the identified highly sensitive areas and implementation of the plan;
 - b) Identify, train and have available a sufficient number of emergency responders to effectively and efficiently respond and implement the identified emergency response tactics;
 - c) Conduct regularly scheduled emergency response drills and exercises to test and refine the plan; and
 - d) Participate in efforts to harmonize spill response kits and plans with other industrial operators and municipalities.

7.8. PUBLIC NOTIFICATION REGARDING POTABLE WATER USE IN ELK VALLEY

The permittee must provide annual notification to all current water users (specifically surface and shallow groundwater users along the Fording and Elk Rivers) downstream of the Teck Operations, where impacts from mining are causing exceedances of the British Columbia Drinking Water Quality Guidelines. The notification must:

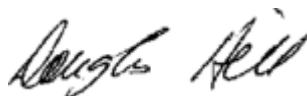
- a) Advise current water users in the Elk Valley of the risks for drinking water sources to exceed drinking water guidelines
- b) Remind all water users to have their source water sources tested to identify if treatment is required prior to drinking;
- c) Have the same information accessible and maintained on the Internet; and
- d) Annually by March 31, submit a written report to the Director describing compliance with the requirements of this section for the previous year. The first annual report is due March 31, 2016.

A draft of the notification shall be submitted to Interior Health (email: hbe@interiorhealth.ca) and to the Director 30 days prior to distribution. This notification requirement shall continue until such time as water quality in the affected areas improves such that BC Drinking Water Quality Guidelines are achieved.

8. ABMP COMMITMENTS

The following section identifies specific commitments made by the Permittee in the Elk Valley Area Based Management Plan.

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The Permittee must aggressively pursue all viable approaches for reducing contaminant loadings to the environment and implement in a timely manner. Treatment approaches include passive and active water treatment.

8.1. TREATMENT

8.1.1. ACTIVE WATER TREATMENT FACILITIES

The Permittee must design, construct and operate the following active water treatment facilities (AWTF), by the date shown. The Permittee must employ best achievable technology in the development of these treatment facilities. Phosphorus treatment must be included if necessary to ensure BC Water Quality Guidelines for chlorophyll-a for freshwater aquatic life in streams is met.

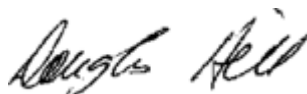
TREATMENT FACILITY	TREATMENT SCOPE	APPROXIMATE CAPACITY OF AWTF	OPERATIONAL DATE
Fording River South	Cataract, Swift, Kilmarnock Creeks	20,000 m ³ /day	December 31, 2018
Elkview Phase I	Bodie, Gate, Erickson Creeks	30,000 m ³ /day	December 31, 2020
Fording River North	Clode Creek, North Spoil, Swift Pit	15,000 m ³ /day	December 31, 2022
Elkview Phase II	Erickson	20,000 m ³ /day	December 31, 2024
Greenhills	GHO West Spoil (Thompson, Leask, Wolfram), Greenhills Creek	7,500 m ³ /day	December 31, 2026
Fording River North Phase II	Swift Pit Discharge	15,000 m ³ /day	December 31, 2030

Notwithstanding the above requirements to construct and operate active water treatment facilities, the Permittee must ensure that all necessary active water treatment works or alternative water quality mitigation works are designed, constructed and operated in sufficient time and at sufficient capacity to meet targets and timeframes for water quality consistent with the ABMP.

8.1.2. MANAGEMENT PLAN FOR ACTIVE WATER TREATMENT WASTES

- i. The Permittee must submit to the Director by June 30, 2015, a work plan for the development of a Water Treatment Waste Management Plan. The work plan must outline the scope of work that will be undertaken to develop the Water Treatment Waste Management Plan.

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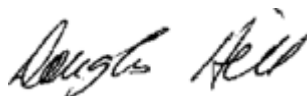
- ii. The Water Treatment Waste Management Plan must include details regarding geochemical stability of treatment wastes, volumes of wastes that will be produced over the life of water treatment at Teck Coal Limited operations in the Elk Valley, physical storage requirements, waste disposal strategies and locations, leachate management strategies, preliminary costs and monitoring requirements, measures to reduce waste volumes in the long-term, strategies for reclamation and closures of waste management facilities, and potential environmental effects related to these materials.
- iii. The initial Water Treatment Waste Management Plan must be submitted to the Director by October 31, 2016. This plan must be updated periodically based on review of treatment plant waste characterization programs, operational monitoring data and as new water treatment methods are incorporated into the Permit. Revisions of this plan must be submitted to the Director.
- iv. The outcomes from the Water Treatment Waste Management Plan must inform detailed design information requirements for future permitting of waste disposal associated with individual water treatment plants.

8.2. RESEARCH AND TECHNOLOGY DEVELOPMENT

8.2.1. RESEARCH ACTIVITIES

- i. The Permittee shall conduct a research and technology development program aimed at:
 - a) Identifying, evaluating, and verifying measures to minimize the release of selenium, nitrate, sulphate, cadmium, calcite, and any other Constituents of Interest designated by the Director; and
 - b) Developing mitigation strategies to improve the management of water quality and calcite within the Designated Area.
- ii. Research and technology development activities shall specifically include research to identify, evaluate, and validate measures to reduce the reliance on long term active water treatment.
- iii. Research areas shall include, but not be limited to, the following topics:
 - a) geochemical release mechanisms, release rates and relationships between factors that influence contaminant release;
 - b) saturated and unsaturated flow mechanisms in waste piles;
 - c) mine waste rock management and dump design alternatives;

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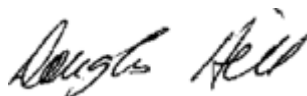
- d) cover systems including soil and vegetative covers, complex soil covers and geomembranes;
 - e) water capture, diversion and conveyance systems;
 - f) active and semi-passive water treatment, including partially saturated waste rock fills;
 - g) water treatment residuals management;
 - h) treatment strategies for phosphorus reduction;
 - i) treatment strategies for sulphate and cadmium reduction, if needed in the future;
 - j) nitrate reduction through treatment and improved blasting practices; and,
 - k) predictive tools and treatment/management technologies for calcite formation.
- v. All on-site field trials for mitigation strategies and on-site piloting work for water treatment shall be discussed with the Director to determine whether they will require permit amendments before proceeding.

8.2.2. REPORTING

The Permittee must submit an annual Research and Technology Development Progress Report by March 31st of each year that contains:

- i. A detailed rationalization of the overall research program including reasons why specific research areas are/are not being investigated in a given year;
- ii. Detailed information on research objectives, study designs, data collected, results and interpretation, and plans for future research and technology development;
- iii. An evaluation of the technologies relative to their potential for implementation at specific locations within the Designated Area;
- iv. A timeframe for implementation of technologies at pilot and at full-scales and for integration into the Adaptive Management Plan; and,
- v. Portions of the report that contain proprietary information must be marked “Confidential – Proprietary.” Release of information is subject to the Freedom and Information Privacy Act.

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9. MONITORING REQUIREMENTS

The Director may alter the monitoring and reporting requirements in this permit as needed. The need for changes to the programs will be based on results submitted as well as any other information obtained by ENV in connection with the discharges.

9.1. DISCHARGE AND RECEIVING ENVIRONMENT MONITORING PROGRAMS

The Permittee must sample the parameters at the sampling sites at the specific frequencies as defined in Appendix 2 Tables 9 through 24. The discharge and receiving environment water sampling sites are located approximately as shown in Appendix 1.

9.1.1. SAMPLING SITES

Discharge and receiving environment sample collection locations are described and numerically identified in Tables 1 through 8.

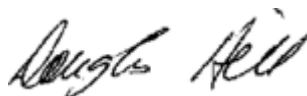
Table 1: COMPLIANCE POINTS SAMPLING LOCATIONS (APPENDIX 1C)

EMS #	TECK IDENTIFIER	SITE	SITE DESCRIPTION
E300071	FR_FRCP1	FRO	Fording River, approximately 525m downstream of Cataract Creek
0200378	GH_FR1	GHO	Fording River, approximately 205 m downstream of Greenhills Creek
E300090	GH_ERC	GHO	Elk River, approximately 220m downstream of Thompson Creek
E297110	LC_LCDSSLCC	LCO	Line Creek immediately downstream of South Line Creek Confluence (approximately 1500 m downstream of the WLC WTP outfall)
E102682	EV_HC1	EVO	Harmer Spillway
E300091	EV_MC2	EVO	Michel Creek at Highway 3 Bridge
E258937	CM_MC2	CMO	Michel Creek, approximately 50m upstream of Andy Goode Creek
E291569	WL_BFWB_OUT_SP21	LCO	WLC WTP Outfall (Effluent)

TABLE 2: ORDER STATIONS SAMPLING LOCATIONS (APPENDIX 1D AND 1E)

EMS #	ORDER STATION (TECK IDENTIFIER)	SITE DESCRIPTION
0200378	FR4 (GH_FR1)	Fording River Downstream of Greenhills Creek
0200028	FR5 (LC_LC5)	Fording River downstream of Line Creek
E206661	ER1 (GH_ER1)	Elk River upstream of Boivin Creek
0200027	ER2 (EV_ER4)	Elk River upstream of Grave Creek (from Fording River to Michel Creek)
0200393	ER3 (EV_ER1)	Elk River Downstream of Michel Creek
E294312	ER4 (RG_ELKORES)	Elk River at Elko Reservoir
E300230	LK2 (RG_DSELK)	Koocanusa Reservoir south of the Elk River

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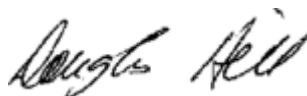
TABLE 3: FORDING RIVER OPERATION DISCHARGE, RECEIVING ENVIRONMENT, AND OTHER SAMPLE LOCATIONS (APPENDIX 1F)

<i>EMS #</i>	<i>TECK IDENTIFIER</i>	<i>SITE DESCRIPTION</i>
E102475	FR_TP1	Tailings Slurry to North Tailings Pond
E206660	FR_TP3	Tailings Slurry to South Tailings Pond
E102476	FR_NL1	North Loop Settling Pond Decant to the Fording River
E102478	FR_MS1	Maintenance and Services Settling Pond Decant
E102480	FR_EC1	Eagle Settling Pond Decant
E102481	FR_CC1	Clode Settling Pond Decant
E208394	FR_SKP1	South Kilmarnock Settling Pond Decant - Phase 1
E208395	FR_SKP2	South Kilmarnock Settling Pond Decant- Phase 2
E216781	FR_HP1	Henretta Pit Effluent into diversion culvert
E217403	FR_3PIT	Swift Pit Effluent to Fording River
E261897	FR_SP1	Smith Ponds Decant
0200384	GH_CC1	Cataract Creek Sed. Pond Decant
E221329	GH_SC1	Swift Creek Sed. Pond Decant
E105061	GH_SC2	Swift Creek Sed. Pond Bypass
E304835	FR_LP1	Liverpool Sed. Pond Decant
E304750	FR_PP1	Post Sed. Pond Decant
0200252	FR_KC1	Kilmarnock Cr. D/S of Rock Drain
E306924	FR_LMP1	Lake Mountain Sediment Pond Decant
0200201	FR_FR2	Fording river upstream of Kilmarnock Creek
0200251	FR_FR1	Fording River downstream of Henretta
E216777	FR_UFR1	Fording River upstream of Henretta
E216778	FR_HC1	Henretta Cr. U/S of Fording River
E300096	FR_HC3	Henretta Creek upstream of McQuarrie Creek
E300097	FR_FRRD	Fording River near Fording River Road

TABLE 4: GREENHILLS OPERATION DISCHARGE AND RECEIVING ENVIRONMENT SAMPLE LOCATIONS (APPENDIX 1G)

<i>EMS #</i>	<i>TECK IDENTIFIER</i>	<i>SITE DESCRIPTION</i>
E287438	GH_TPS	Tailings Pond Water
E102709	GH_GH1	Greenhills Creek Sed. Pond Decant
E309911	GH_GH2	Greenhills Creek downstream of Sed. Pond Decant
E207436	GH_TC2	Thompson Creek Sed. Pond Decant
0200385	GH_PC1	Porter Creek Sed. Pond Decant
E257795	GH_WC1	Wolfram Creek Sed. Pond Decant
E257796	GH_LC1	Leask Creek Sed. Pond Decant
E207437	GH_RLP	Rail Loop Sed. Pond Decant

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0200388	GH_MC1	Mickelson Creek at LRP Road
E287433	GH_WADE	Wade Creek at LRP Road
E305855		Wolf Creek Sed. Pond Decant
E305854		Willow Creek Sed. Pond Decant
0200389	GH_ER2	Elk River upstream of Greenhills Operation
E102714		Thompson Creek at LRP Road
E287432	GH_COUGAR	Cougar Creek at LRP Road
E287437	GH_BR_F	Branch F at LRP Road
E305875	GH_NNC	No Name Creek
E305876	GH_ER1A	Elk River Side Channel D/S Wolfram Creek
E305877		Elk River D/S of Thompson Creek
E305878		Elk River Side Channel U/S Wolfram Creek
E309912		Discharge from Antiscalant Module to Lower Greenhills Creek

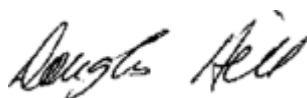
TABLE 5: LINE CREEK OPERATION DISCHARGE AND RECEIVING ENVIRONMENT SAMPLE LOCATIONS (APPENDIX 1H)

<i>EMS #</i>	<i>TECK IDENTIFIER</i>	<i>SITE DESCRIPTION</i>
E221268	LC_LC9	No Name Cr. Pond Decant
E216144	LC_LC7	MSA North Ponds Effluent to Line Creek
E219411	LC_LC8	Contingency Treatment System Effluent to Line Creek
E293371	WL_WLCI_SP01	WLC WTP West Line Creek (Influent)
E293370	WL_LCI_SP02	WLC WTP Line Creek (Influent)
E304613	LC_LC7DSTF	MSA North Ponds Effluent to Line Creek Alternate
200044	LC_LC4	Line Creek u/s of Process Plant (~5,550 m d/s of WLC WTP outfall)
200337	LC_LC3	Line Creek d/s of West Line Creek (~200 m d/s of WLC WTP Outfall)
200335	LC_LC2	Line Creek upstream of Rock Drain
E293369	LC_LCUSWLC	Line Creek u/s of West Line Creek, below rock drain (~ 140 m u/s of WLC WTP outfall)
E216142	LC_LC1	Line Creek upstream MSA North Pit
E282149	LC_SLC	South Line Creek West Side of Main Rock Drain
E261958	LC_WLC	West Line Creek
E223240	LC_LC12	North Horseshoe Creek Near Mouth

TABLE 6: ELKVIEW OPERATION DISCHARGE, RECEIVING ENVIRONMENT AND OTHER SAMPLE LOCATIONS (APPENDIX 1I)

<i>EMS #</i>	<i>TECK IDENTIFIER</i>	<i>SITE DESCRIPTION</i>
E296310	EV_GH1	GEHO Line Valve At Plant (West Fork Tailings Effluent)
0200097	EV_EC1	Erickson Creek at Mouth
E296311	EV_SP1	South Pit Creek Sed. Pond Decant
E208057	EV_MG1	Milligan Creek Sed. Pond Decant
E206231	EV_GT1	Gate Creek Sed. Pond Decant

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E102685	EV_BC1	Bodie Creek Sed. Pond Decant
E102679	EV_OC1	Otto Creek 70 m upstream of the Elk River
E208043	EV_GC2	Goddard Creek Sed. Pond Decant
E258135	EV_LC1	Lindsay Creek Infiltration Pond
E298590	EV_DC1	Dry Creek Sed. Pond Decant
E102681	EV_SM1	6 Mile Creek Sed. Pond Decant
E302170	EV_AQ6	Aqueduct Control Structure to Aqueduct Creek
0200203	EV_MC3	Michel Creek upstream of Erickson Creek
0200111	EV_ER2	Elk River upstream of Michel Creek
E298592	EV_BLM2	Balmer Creek at CFI Road
E298591	EV_FC1	Fennelon Creek at CFI Road
E298594	EV_SPR2	Spring Creek at Mouth
E298593	EV_TC1	Thresher Creek at Milligan Road

TABLE 7: COAL MOUNTAIN OPERATION DISCHARGE AND RECEIVING ENVIRONMENT SAMPLE LOCATIONS (APPENDIX 1J)

<i>EMS #</i>	<i>TECK IDENTIFIER</i>	<i>SITE DESCRIPTION</i>
E102488	CM_SPD	Decant Discharge from Main Interceptor Sedimentation Ponds to Corbin Creek
E206438	CM_CCPD	Decant Discharge from Corbin Sedimentation Pond to Corbin Creek
E298733	CM_PC2	Pengelly Channel to Corbin Creek
E298734	CM_SOW	Sowchuck Sump
E258175	CM_MC1	Michel Creek upstream of Operations
E200209	CM_CC1	Corbin Creek near Confluence with Michel Creek

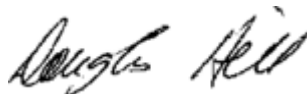
TABLE 8: KOOCANUSA RESERVOIR RECEIVING ENVIRONMENT SAMPLE LOCATIONS (APPENDIX 1E)

<i>EMS #</i>	<i>TECK IDENTIFIER</i>	<i>SITE DESCRIPTION</i>
E300095	RG_KERRRD	Koocanusa Reservoir downstream of Kikkoman Creek
E300092	RG_GRASMERE	Koocanusa Reservoir west of Grasmere
E300093	RG_USGOLD	Koocanusa Reservoir upstream of Gold Creek
E300094	RG_BORDER	Koocanusa Reservoir upstream of the Canada/US border

9.1.2. SAMPLING AND ANALYTICAL PROCEDURES

The following sections apply to the monitoring required as per Section 9 of this permit.

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9.1.2.1. SAMPLING PROCEDURES & LAB ANALYSES

Sampling is to be carried out in accordance with the procedures described in the most recent edition of the "British Columbia Field Sampling Manual for Continuous Monitoring Plus the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples," or by suitable alternative procedures as authorized by the Director.

A copy of the manual may be viewed online at:

http://www.env.gov.bc.ca/epd/wamr/labsys/field_man_03.html

Analyses are to be carried out in accordance with procedures described in the most recent edition of the "British Columbia Laboratory Methods Manual for the Analysis of Water, Wastewater, Sediment, Biological Materials and Discrete Ambient Air," or by suitable alternative procedures as authorized by the Director.

A copy of the manual may be viewed online at:

http://www.env.gov.bc.ca/epd/wamr/labsys/lab_meth_manual.html

Copies of the above manual(s) may be purchased from the Queen's Printer Publications Centre, P. O. Box 9452, Stn. Prov. Gov't. Victoria, British Columbia, V8W 9V7 (1-800-663-6105 or (250) 387-6409).

Copies of the manuals are also available at all Environmental Protection offices.

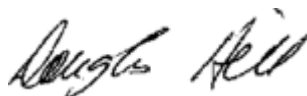
9.1.2.1.1. Minimum Detection Limit

Minimum analytical detection limits for each parameter required by this permit must be suitable for comparison with the applicable standards listed in the most recent Approved and Working Water Quality Guidelines prepared by ENV or other applicable limits acceptable to the Director.

9.1.2.1.2. Quality Assurance/Quality Control (QA/QC) Program

The Permittee must implement a Quality Assurance and Quality Control plan in accordance with the Environmental Data Quality Assurance Regulation and guidance provided in the "British Columbia Field Sampling Manual for Continuous Monitoring and the Collection of Air, Air-Emissions, Water, Wastewater, Soil, Sediment, and Biological Samples", and "British Columbia Laboratory Methods Manual for the Analysis of Water, Wastewater, Sediment,

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Biological Materials and Discrete Ambient Air.” All data analyses required to be submitted by this permit must be conducted by an analytical laboratory(ies) registered under the inter-laboratory comparison program as identified in the Environmental Data Quality Assurance Regulation unless otherwise instructed by the Director.

9.1.2.2. FLOW MONITORING

9.1.2.2.1. *Flow Calculation*

Flow calculation methods for receiving streams or creeks where flow measurements are not taken must be based on a regional hydrological evaluation and recommendations made by a qualified professional. Appropriate current and historical stream gauging data should be utilized. Methods must be updated at a frequency and in a manner recommended by a qualified professional and acceptable to the Director.

For the purposes of permit fee calculation, mean annual flows for the previous calendar year will be used.

9.1.2.2.2. *Flow Measurement*

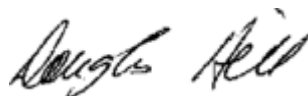
Flow monitoring programs must be designed and implemented, and flow measurements conducted, with the intent of achieving acceptable data quality standards as defined in the approved Regional Flow Monitoring Plan. In order to appropriately determine data quality, flow measurement must be conducted in accordance with the Manual of British Columbia Hydrometric Standards (RISC, 2009), or by suitable alternative procedures as authorized by the Director. The "British Columbia Field Sampling Manual for Continuous Monitoring Plus the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples" may also be used in conjunction with the Hydrometric Standards to provide more detailed guidance on monitoring of flow using rated structures, or as a reference for alternative monitoring methods.

9.1.2.2.3. *Metadata Summary*

The Permittee must compile flow monitoring station metadata for all mine sites and Elk Valley monitoring locations, including:

- i. Station lat/long, elevation, basin area and median basin elevation;
- ii. Measurement method;

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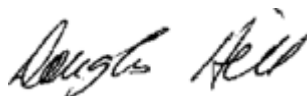
- iii. Measurement frequency;
- iv. Rating curve established, and stability of rating curve;
- v. Identify where benchmarks and staff gauge are installed;
- vi. Identify where flow is measured and where it is calculated (by summing/subtracting/scaling other gauged flows);
- vii. Identify where data is collected to meet a permit condition;
- viii. Identify qualitatively where station information is considered representative of “mine affected” or “natural” catchments;
- ix. Targeted RISC data grade as defined in the approved Regional Flow Monitoring Plan;
- x. identify the percent contribution of mean annual flow to nearest downstream order station listed;
- xi. identify qualitatively where station information likely representative of total watershed yield, and if not, list the known issues affecting the ability of the station to represent total watershed yield;
- xii. a general site description of each hydrometric monitoring station including a photo(s) of the station; and,
- xiii. The metadata summary and information identified above must be submitted to the Director by coinciding with the Water Quality Model requirements under section 10.9.

9.1.2.2.4. Regional Flow Monitoring Plan

The Permittee must develop a Regional Flow Monitoring Plan. The intent of the Regional Flow Monitoring Plan is to review the permittee’s flow monitoring network in the Elk Valley (including receiving environment and discharge locations) to define the appropriate temporal and spatial frequency of flow monitoring locations. The plan should include:

- i. Definition of the assessment criteria and associated data requirements for the different types of flow monitoring locations
- ii. An assessment of each existing flow monitoring location, identification of stations not meeting the assessment criteria; and identification of locations where additional flow monitoring is needed; and,

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- iii. A plan with timelines to implement or modify flow monitoring locations based on results of the assessment, including definition of the appropriate measurement methods and acceptable data quality standard for each type of flow monitoring location.

The Regional Flow Monitoring Plan must be submitted to the Director for approval by December 31, 2016.

9.1.2.3. TEMPORARY MODIFIED SAMPLING SCHEDULE FOR THE LCO MSX SHORT DUMP PROJECT

- i. Site E304613 shall be temporarily used to collect water samples only when access to E216144 is restricted due to safety concerns with the progression of the MSX Short Dump.
- ii. At least twice per year during the duration of the MSX Short Dump Project, paired samples shall be taken from the site E304613 and E216144 when safe access is available to E216144. The results should be compared in the Annual Report.
- iii. During the duration of the MSX Short Dump Project, water samples do not have to be collected when access to 0200335 is restricted due to safety concerns with the progression of the MSX Short Dump. In the event regular scheduled sampling times cannot be met every effort must be made to obtain the number of samples normally required for a 6 month period. Missed samples and non-routine sampling times shall be itemized in the Quarterly Report.

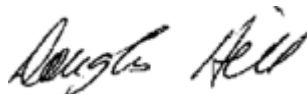
9.2. GROUNDWATER MONITORING PROGRAM

9.2.1. ELK VALLEY GROUNDWATER MONITORING

The Permittee must develop and implement a comprehensive groundwater monitoring program for Management Units 1, 2, 3 and 4, as defined in the Elk Valley Water Quality Plan, prepared by a qualified professional and incorporating data from the site-specific groundwater monitoring programs at each mine site described in Section 9.2.2.

Groundwater and groundwater systems include water within bedrock as well as the surficial materials overlying bedrock. This program must be conducted to the satisfaction of the Director and must include the following:

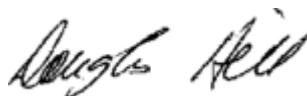
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- i. Evaluate the regional effects of the Permittee's operations on groundwater in management units 1, 2, 3 and 4, and assess potential surface water to groundwater interaction effects related to the Permittee's operations in all management units compared to all applicable standards.
- ii. Complete a regional groundwater synthesis report that must integrate all available groundwater information collected by the Permittee. The report must include information collected as part of operational investigations carried out for diverse purposes (e.g. as part of permitting applications, water supply assessments, geotechnical investigations, etc).
- iii. Establish and maintain a groundwater monitoring network as part of the ongoing monitoring and reporting of groundwater in the Elk Valley with multi-level wells, and sentry wells.
- iv. Identify limitations and data gaps and conduct additional studies necessary to refine the hydrogeological conceptual model, determine the location and extent of mine-affected groundwater discharge to surface waters and to evaluate management and mitigation options.
- v. Clearly summarize findings and recommendations in an Executive Summary
- vi. Conduct ongoing monitoring, evaluation, and reporting of groundwater in the Elk Valley. Monitoring and assessment must include relevant aquifer characteristics (e.g. hydraulic conductivity, storage properties, transmissivity, etc.), and a description of regional groundwater flow patterns (directions and velocities) and recharge areas, fate, groundwater interactions with surface waters, the effects of groundwater withdrawals on the SW/GW interactions, and the mobility of mine related constituents. Sampling is to occur at a frequency determined in the approved groundwater monitoring plan.- Monitoring data to be provided with maps and tables.
- vii. A schedule for updating the conceptual site model for on-going investigations and reporting for each source area operation, for installation or closure of monitoring wells, and for ongoing groundwater monitoring and reporting.
 - 1) The Terms of Reference for the monitoring program must be submitted for review to the EMC and the Director by January 31, 2015.

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- 2) The regional groundwater synthesis report, data gaps assessment and recommendations for monitoring and/or additional supporting studies must be submitted for review to the EMC and the Director by April 30, 2015.
- 3) Based on the recommendations from the regional groundwater assessment, monitoring and/or supporting study programs must be submitted to the Director for approval by July 31, 2015.
- 4) Monitoring activities must commence in 2015.
- 5) The Permittee may be required to develop and implement a Groundwater Management Plan to manage impacts from the mine sites to groundwater should the groundwater monitoring programs identify groundwater quality issues.

9.2.2. SITE SPECIFIC GROUNDWATER MONITORING

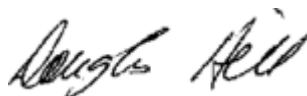
The Permittee must develop and implement a comprehensive groundwater monitoring program at each mine site, prepared by a qualified professional. This program must include the following:

- i. Characterization of the groundwater system, aquifer characteristics (e.g., hydraulic conductivity and storativity), water quality and connectivity to the surface water system;
- ii. Characterization of seasonal variability in the groundwater system (quality and quantity); and
- iii. Provision of a site specific conceptual model and the information necessary to support the development and verification of water quality predictions for the mine site. The site specific conceptual model shall be provided with the groundwater monitoring plan update on October 31, 2018, and updated with subsequent revisions to the monitoring plan.
- iv. Site specific, numerical groundwater models may be required to support permitting activities. Numerical models, where required, must consider all available, relevant monitoring data (e.g. groundwater and surface water monitoring, stream flow, and precipitation data) and be developed by a Qualified Professional to meet the intended modelling purpose.

9.2.2.1. FORDING RIVER OPERATIONS

Groundwater monitoring must be conducted in accordance with a plan approved by the Director. The Permittee must respond within 30 days to comments/requests

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made by the Director on the submission until the Director is satisfied with the submission.

A revised plan must be submitted to the Director for approval October 31, 2018 and every 3 years subsequently.

9.2.2.2. GREENHILLS OPERATIONS

Groundwater monitoring must be conducted in accordance with a plan approved by the Director. The Greenhills Operations Site Wide Groundwater Monitoring program has been submitted to the Director. The Permittee must respond within 30 days to comments/requests made by the Director on the submission until the Director is satisfied with the submission.

A revised plan must be submitted to the Director October 31, 2018 and every 3 years subsequently.

9.2.2.3. LINE CREEK OPERATIONS

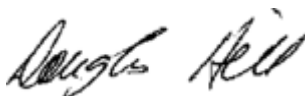
Groundwater monitoring must be conducted in accordance with a plan approved by the Director. The Line Creek Operations Site Wide Groundwater Monitoring program has been submitted to the Director. The Permittee must respond within 30 days to comments/requests made by the Director on the submission until the Director is satisfied with the submission.

A revised plan must be submitted to the Director October 31, 2018 and every 3 years subsequently.

9.2.2.4. ELKVIEW OPERATIONS

- i. The Terms of Reference for the monitoring program must be submitted to the Director by December 31, 2014.
- ii. The monitoring program must be submitted to the Director for approval by March 31, 2015. The Permittee must respond within 30 days to comments/requests made by the Director on the submission until the Director is satisfied with the submission.
- iii. Monitoring activities must commence in 2015.
- iv. A revised plan must be submitted to the Director October 31, 2018 and every 3 years subsequently.

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9.2.2.5. COAL MOUNTAIN OPERATIONS

- i. The Terms of Reference for the monitoring program has been submitted to the Director.
- ii. The Gap Analysis and Recommendations Report for the monitoring program has been submitted to the Director.
- iii. Implement drilling requirements identified in the qualified 3rd party Gap Analysis and Recommendations Report by July 31, 2015.
- iv. Implement the full monitoring program by September 15, 2015.
- v. A revised plan must be submitted to the Director October 31, 2018 and every 3 years subsequently.

9.2.3 SPARWOOD AREA GROUNDWATER SUPPORTING STUDY

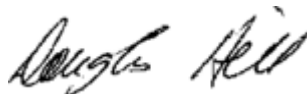
For the purpose of this section, the “Sparwood Area” is defined as the following areas within the District of Sparwood:

- The main downtown area of Sparwood; and
- The area northeast of the confluence of the Elk River and Michel Creek, bordered by:
 - Elk River to the west,
 - Lagoon D to the north,
 - Michel Creek to the south,
 - Michel Creek Highway 3 bridge to the east.

The boundaries of the “Sparwood Area” are preliminary, and may decrease or expand to include other areas if/as required to investigate Permittee-sourced constituents of interest. The Permittee must develop a Terms of Reference for a groundwater supporting study for the “Sparwood Area”. The Terms of Reference will include:

- 1) Purpose and objectives
- 2) A review, summary and gap analysis of existing information in the “Sparwood Area”
- 3) Description of a conceptual site model outlining current knowledge of the site setting, hydrogeologic properties and groundwater flow regime, Permittee-related potential sources of constituents of interest to groundwater and pathways to known or potential receptors

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- 4) Based on the results from items 1-3 above, provide a description of the approach for an evaluation of the permittee's impact to groundwater in the "Sparwood Area". Components of the evaluation may include:
 - a. Assessment of the adequacy of the permittee's monitoring well network, and monitoring program for continued monitoring to meet proposed purpose and objectives.
 - b. Assessment of groundwater quality thresholds that would trigger potential management/mitigation strategies to reduce the permittee's impact to groundwater in the "Sparwood Area".
 - c. A review of management/mitigation strategies to reduce the permittee's impacts to groundwater in the "Sparwood Area".
- 5) A schedule for reporting to ENV

This program must be prepared by a Qualified Professional and must be conducted to the satisfaction of the Director.

The Terms of Reference for the groundwater supporting study must be submitted by April 30, 2017 for approval by the Director.

9.3. LOCAL AQUATIC EFFECTS MONITORING PROGRAM (LAEMP)

The Permittee may be required to develop with input from the EMC and implement a Local Aquatic Effects Monitoring program (LAEMP) to determine the effects of a mining effluent discharge(s) on the receiving environment.

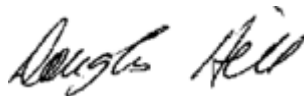
9.3.1. LINE CREEK OPERATIONS

The Permittee must develop and implement a Local Aquatic Effects Monitoring program to determine the effects of the Line Creek discharge on the receiving environment. An annual study design for the program must be prepared in consultation with the EMC and submitted to the Director for approval by May 1 each year. Any changes to the approved study design must be reported in the annual LAEMP report.

9.3.2. FORDING RIVER OPERATIONS

The Permittee must complete to the satisfaction of ENV a study design for a LAEMP which will focus on the upper Fording River for 2016-2018 by June 1, 2016. The study design must be reviewed by the EMC and be designed to an appropriate temporal scale to capture short term, local effects to the immediate receiving

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environment. Any changes to the approved study design must be reported in the annual LAEMP report.

9.3.3. COAL MOUNTAIN OPERATIONS

The Permittee must complete to the satisfaction of ENV, a study design for a LAEMP by February 29, 2019. The study design must be reviewed by the EMC and be designed to assess the magnitude and extent of influence from CMO on water quality, calcite and benthic invertebrate communities downstream of CMO and to assess what factors are contributing to the observed effects. Any changes to the approved study design must be reported in the annual LAEMP report.

9.3.4. GREENHILLS OPERATIONS

The Permittee must complete to the satisfaction of ENV a study design for a LAEMP which will focus on the upper Elk River and the Elk River side channel and tributaries located on the west side of Greenhills Operation between EMS sites 0200389 and E3000090 for 2017-2020 by June 1, 2017. The study design must be reviewed by the EMC and be designed to an appropriate temporal scale to capture short term, local effects to the immediate receiving environment. Any changes to the approved study design must be reported in the annual LAEMP report.

9.4. REGIONAL AQUATIC EFFECTS MONITORING PROGRAM (RAEMP)

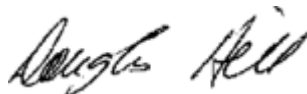
The Permittee must implement the Regional Aquatic Effect Monitoring Program as per the November 14, 2014 approval or the latest Director approved program. A final Study Design for each subsequent three-year cycle must be submitted to the Director by February 28 in the first year of each three-year cycle.

9.5. CALCITE MONITORING

9.5.1. CALCITE MONITORING PROGRAM

- i. The Permittee shall continue to conduct annual calcite monitoring following the methods in the approved monitoring program.
- ii. The Permittee shall submit, for Director's approval, changes to the monitoring program by April 15 of the data collection year.

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9.5.2. SEASONAL CALCITE SUPPORTING STUDY – 2015/2016

The Permittee must have a Qualified Professional develop a monitoring program to assess seasonality of calcite formation and potential dissolution. The program must, at minimum, include multiple locations and assess seasonal variation in the rate of calcite formation or dissolution, water quality, and presence and density of algae, and the presence and density of benthic invertebrates.

- i. An Initial Study Design for the program must be submitted to the Environmental Monitoring Committee for input prior to submission to the Director for acceptance by March 1, 2015.
- ii. Monitoring results and interpretation for the 2015 program must be compiled into a written report with a study design for the 2016 program and submitted to the satisfaction of the Director by March 31, 2016.
- iii. Monitoring results and interpretation of the 2016 program must be compiled into a written report and submitted to the satisfaction of the Director by March 31, 2017.

9.6. KOOCANUSA RESERVOIR WORKING GROUP

A Kooconusa Reservoir Monitoring and Research Working Group (Working Group) will be established under the BC & Montana government to government Memorandum of Understanding. The Permittee must participate fully in the Kooconusa Reservoir Monitoring and Research Working Group.

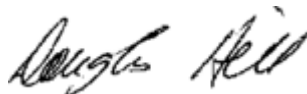
The Permittee is required to contribute to the costs of the Kooconusa Reservoir Monitoring and Research Program as operated by the Kooconusa Reservoir Research and Monitoring Working Group.

9.7. KOOCANUSA RESERVOIR BURBOT BASELINE STUDY 2015

The Permittee shall undertake a sampling program in Kooconusa Reservoir to evaluate the potential for selenium related effects in Burbot. The Permittee shall make reasonable efforts to collaborate with Ktunaxa Nation representatives to identify suitable fishing locations in Kooconusa Reservoir, to develop a sampling plan, and to implement the program.

The sampling must be initiated in February 2015 and include the following:

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- 1) Sampling will occur at representative locations within Koochanusa Reservoir and should consider areas upstream of Elk River, near the mouth of the Elk River, and near of the mouth of Gold Creek.
- 2) All fish captured during the sampling program will be identified and enumerated with results captured on field sheets and sexually mature burbot measured and sampled in the field as follows:
 - a) Field examination of condition of each fish for external deformities, erosions, lesions, or tumors with condition recorded on field sheets
 - b) Muscle tissue will be sampled from each fish
 - c) Collection of eggs from up to 10 ripe female burbot from the three sampling locations where available.
- 3) Tissue and eggs will be analysed for metals using a high-resolution inductively coupled plasma mass spectrometry.
- 4) Results will be reported on a dry weight basis along with the moisture content.

Results of the sampling program shall be submitted to the Director by July 31, 2015.

The Permittee will evaluate the human health risk with respect to Ktunaxa consumers specific to the burbot tissue data.

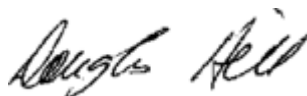
9.8. CHRONIC TOXICITY TESTING PROGRAM

The Permittee must develop and implement a toxicity testing program for receiving environments affected by coal mining operations. The purpose of the program is to evaluate chronic toxicity at the compliance points and other locations throughout the Elk Valley.

The toxicity testing program must include, at a minimum, the following elements:

- i. Once every three years beginning in 2015, bioassays must be conducted to evaluate the survival and development (incidence of deformities) of targeted aquatic species using gametes obtained from species utilizing habitats in the Fording River, their tributaries, and associated lentic habitats, and the Koochanusa Reservoir. The concentrations of selenium in the eggs of each female spawned must be measured;
- ii. Quarterly or semi-annual surface-water chronic toxicity testing using a suite of toxicity tests:

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The following toxicity test must be conducted during each semi-annual (spring and fall) sampling event:

- 30-day early life-stage test with the rainbow trout (*Oncorhynchus mykiss*; EPS1/RM/28) using <24-hour post-fertilization eggs; endpoints: survival, hatching, growth, deformity, behaviour;

The following toxicity tests must be conducted during each quarterly sampling event at all compliance points:

- 7-day water-only test with the cladoceran, *Ceriodaphnia dubia* (EPS1/RM/21); endpoints: survival, reproduction;
- 72-hour test with the alga, *Pseudokirchneriella subcapitata* (EPS1/RM/25); endpoints: growth inhibition;

The following toxicity tests must be conducted during each quarterly sampling event at compliance points in the Fording River (specifically FRO and GHO Fording) and Michel Creek (CMO):

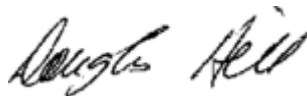
- 28-day water-only test with amphipod, *Hyaella Azteca* (adapted from USEPA 2000); endpoints: survival, growth; and
 - 30-day early life-stage test with the fathead minnow, *Pimephales promelas* (USEPA 1996) using <24-hour post-fertilization eggs; endpoints: survival, hatching, growth, deformity.
- iii. Toxicity testing methods must be consistent with Environment Canada's, U.S. Environmental Protection Agency's, or ASTM's approved biological test methods;
 - iv. A Quality Assurance/Quality Control component; and
 - v. A proposed schedule of dates that coincide with water quality sampling and that target predicted worst-case times such as low flow, during flocculant use, or when discharge quality is expected to be reduced.

The suite of toxicity tests will be reviewed on an annual basis by the EMC and recommendations provided to the Director for consideration.

9.8.1. **SULPHATE TOXICITY AT HIGH HARDNESS CONCENTRATIONS**

The Permittee must develop with input from the EMC, and implement a toxicity testing program specifically to assess sulphate toxicity at high hardness concentrations. Results will be used to support finalization of long term sulphate site performance objectives.

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The following toxicity test shall be conducted as a component of the Sulphate toxicity testing program.

- 30-day early life-stage test with the fathead minnow, *Pimephales promelas* (USEPA 1996) using <24-hour post-fertilization eggs; endpoints: survival, hatching, growth, deformity.
- Other sensitive species (amphibian, trout, water flea, etc.) shall be included.

Monitoring results and interpretation must be compiled into a written report and submitted to the satisfaction of the Director by December 31, 2017.

9.8.2. **SUBLETHAL TOXICITY STUDY**

The Permittee must develop with input from the EMC, and implement a sublethal toxicity study to confirm that surface waters meeting the Site Performance Objectives for the order stations are not toxic to sensitive aquatic receptors. The Permittee must submit the study design to the Director by April 30, 2015.

9.9. **HUMAN HEALTH RISK ASSESSMENT**

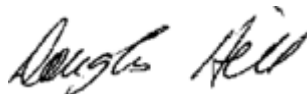
The Permittee must conduct a Human Health Risk Assessment (HHRA), in consultation with the EMC to examine the potential effects of mine-related parameters of concern including selenium, mercury cadmium, chromium, copper, manganese, nickel, vanadium and zinc for the designated area. The Permittee is responsible for developing the HHRA design and addressing any concerns raised by the Interior Health Authority.

A draft terms of reference and a work plan for the HHRA must be discussed at the EMC. A final terms of reference and work plan for the HHRA shall be submitted by May 31, 2015 and be of a quality acceptable to the Director.

The Human Health Risk Assessment must follow the BC Contaminated Sites Regulation approved methodologies and levels of acceptable risk for Human Health Risk Assessment. The Permittee must provide the results of the HHRA by March 31, 2016 to the EMC. The Permittee must provide the results of the HHRA to the Director by March 31, 2016. The risk assessment must be to the satisfaction of the Director.

The assessment must determine the exposure pathways and potential human health risks from selenium and other mine-related parameters of concern which may be present in vegetation, fish and wildlife that are potentially used for food or medicinal sources, or present in currently known

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potable water sources. The assessment must take into consideration First Nations consumption patterns and risk sensitivities.

The study must incorporate information available from a variety of sources such as: traditional use studies, consultation records, consumption surveys, and baseline and monitoring data for mine-related parameters of concern.

Wherever possible, the assessment must incorporate data obtained from established monitoring programs. If required for the assessment, additional sampling programs must be implemented to ensure data gaps are addressed.

The conclusions and findings of the Human Health Risk Assessment shall be risk ranked and prioritized and include recommended risk management controls and other mitigation actions to address human health risks identified in the human health risk assessment for inclusion in the adaptive management plan for the area.

9.10. SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

The Permittee shall re-evaluate the Screening Level Ecological Risk Assessment. The Screening Level Ecological Risk Assessment re-evaluation must address the following points:

- some contaminants of potential concern exceeded the criteria for negligible risk,
- there was an incorrect use of tissue concentrations as indicators of toxicity, and
- multiple food type dietary exposure was not incorporated.

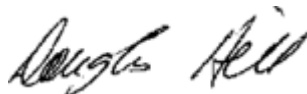
The re-evaluation must be conducted by an approved Contaminated Sites Approved Professional (CSAP) or follow the BC Contaminated Sites Regulation approved methodologies. If the re-evaluation is not conducted by an approved CSAP, the re-evaluation must be submitted to the Director for review and acceptance. The re-evaluation shall be submitted by July 31, 2015.

In the event that this re-evaluation determines changes to the monitoring requirements, this information shall be shared with the EMC and a report with recommendations provided to the Director regarding the outcome of the re-evaluation.

9.11. DETAILED ECOLOGICAL RISK ASSESSMENT

A Detailed Ecological Risk Assessment may be required.

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10. REPORTING REQUIREMENTS

10.1. SUBMISSION RESULTS

All results of monitoring and calculations required in this permit must be submitted to ENV, Environmental Protection (ENVSECoal@gov.bc.ca) in a format acceptable to the Director.

All data lab sheets are to be kept on site and are to be provided to ENV upon request in an electronic format.

10.2. DISCHARGE AND RECEIVING ENVIRONMENT MONITORING DATA

10.2.1. NON-COMPLIANCE NOTIFICATION

The Permittee must immediately notify the Director or designate by e-mail (EnvironmentalCompliance@gov.bc.ca) of any non-compliance with the requirements of this permit by the Permittee and take appropriate remedial action to remedy any effects of such non-compliance.

The Permittee must provide the Director with written confirmation of all such non-compliance events, including available test results within 24 hours of the original notification unless otherwise directed by the Director.

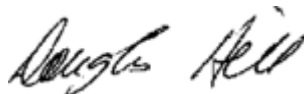
10.2.2. NON-COMPLIANCE REPORTING

If the Permittee fails to comply with any of the requirements of this authorization, the Permittee must, within 30 days of such non-compliance, submit to the Director a written report that is satisfactory to the Director and includes, but is not necessarily limited to, the following:

- a) all relevant test results obtained by the Permittee related to the noncompliance,
- b) an explanation of the most probable cause(s) of the noncompliance, and
- c) a description of remedial action planned and/or taken by the Permittee to prevent similar noncompliance(s) in the future.

The Permittee must submit all non-compliance reporting required to be submitted under this section by email to (EnvironmentalCompliance@gov.bc.ca).

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10.2.3. MONITORING AND REPORTING FOLLOWING TOXICITY NON-COMPLIANCE

In addition to Section 10.2.1, for any acute toxicity test failure in the effluent, the Permittee must:

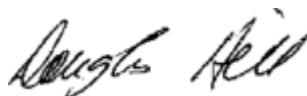
- i. Immediately conduct a confirmatory test on the effluent using multiple concentrations (i.e. 96 hr LC₅₀ for Rainbow Trout or 48 hr LC₅₀ for *Daphnia magna*, as appropriate). The Director may require a Toxicity Identification Evaluation (TIE) to be initiated to determine the cause of the effluent toxicity.
- ii. Immediately take corrective action,
- iii. Forward all test results including raw laboratory data sheets to the Director as soon as they are available. As soon as possible, submit a full report indicating the cause and effects of the incident, which identifies all actions taken by the Permittee to correct, restore and prevent a similar event from occurring in the future. This report must be submitted with the next quarterly report or as otherwise instructed by the Director.

10.2.4. QUARTERLY REPORTING

The Permittee must submit the results of the discharge and receiving environment water sampling program (Section 9) directly into the ENV EMS database using the appropriate EMS site identification numbers within 30 days of the end of the quarter in which the samples were collected. Flow data is to be submitted annually. The Permittee must also submit a written quarterly report to the Director or designate, due within 30 days of the end of the quarter in which the samples were taken. The quarterly report must include:

- i. Effluent water quality results used to calculate monthly averages for the limits in Section 2, if applicable;
- ii. Effluent water quality results exceeding limits and targets or other criteria, such as daily maximums or as specified by the Director;
- iii. Identification of all missing data and all QA/QC issues;
- iv. All toxicity test results and raw laboratory data sheets for all mortality results;
- v. All reportable spills or other incidents related to water quality, occurring in the quarter;

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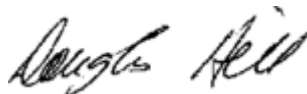
- vi. Explanation of the most probable cause(s) of any non-compliances;
- vii. All measures taken to reduce or eliminate non-compliances;
- viii. All other reports or documentation as specified by this permit to be submitted quarterly; and
- ix. Any additional sampling results for the compliance points identified in Section 2 obtained for any reason, whether compliance, maintenance, or operational purposes. All test data must be reported within 30 days of the end of the quarter in which sampling occurred. These additional results may be reported in summary form. Further information on the testing event may be requested in writing by the Director.
 - Any data collected at the compliance points in Section 2 for research oriented activities that do not meet the analytical requirements in Section 9.1.2.1 of the Permit must be submitted separate from Quarterly Reports in a project report at the completion of the applicable study.

10.2.5. ANNUAL REPORTING

The Permittee must prepare on an annual basis a report or series of reports summarizing activities, incidents, and discharge/receiving environment monitoring results. The report(s) must include but is not limited to:

- i. A map of monitoring locations with EMS and Permittee descriptors;
- ii. A summary of non-compliances with the permit conditions for the previous calendar year and all emergency conditions identified under Section 7.1. This must include interpretation of significance, and the status of corrective actions and/or ongoing investigations;
- iii. A summary of measured parameters including all collected monitoring data for the reporting year suitably tabulated (ie, excel spreadsheets), appropriate graphs and comparison of results to limits, Approved and Working Water Quality Guidelines, Site Performance Objectives, or other criteria and benchmarks as specified by the Director;
- iv. A discussion of Selenium, Sulphate, Nitrate, and Cadmium at significant source sites and key receiving environment sites, including an analysis of dormant versus active waste rock dumps; and
- v. All acute toxicity test-specific reports from the laboratory and an interpreted summary and discussion of results, including recommendations and all subsequent actions;

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- vi. All acute toxicity test lab reports must include data and/or observations for hardness, alkalinity, pH, temperature, and formation of precipitate either in the vessel or on the organism.
- vii. A summary of all QA/QC issues during the year.
- viii. The following hydrology information:
 - a. A description of measurement methods, field procedures or data calculation that deviate from the information provided in the Metadata Summary.
 - b. A summary table of the discharge measurements recorded during the year. The summary must include staff gauge measurements, calculated flow values from a stage-discharge rating curve, and manual flow measurements.
 - c. A hydrograph(s) at a scale appropriate for visually comparing flow values between stations.
 - d. A data quality grade for each monitoring station using the Manual of British Columbia Hydrometric Standards (RISC, 2009) methodology, and comparison of the grade to target grades as listed in the Regional Flow Monitoring Program.
 - e. In conjunction with the submission of the annual report, final non-continuous flow data will be uploaded to the ENV EMS database while final continuous flow data records and associated rating curves will be provided in Excel format.

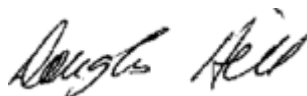
The Annual Report must be submitted to the Director by March 31 of each year following the data collection calendar year.

10.3. TOXICITY REPORTING

All acute toxicity test lab reports must include data and/or observations for pH, temperature, and formation of precipitate either in the vessel or on the organism. Lab reports for the 48 hour *Daphnia magna* single concentration toxicity test must also include data and/or observations for hardness and alkalinity.

The Permittee must prepare on an annual basis a report summarizing all acute and chronic toxicity data from the laboratory and an interpreted summary and discussion of results, including recommendations and subsequent actions. The report is to be submitted to the Director by April 30 of each year following the data collection calendar year.

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10.4. GROUNDWATER

The Permittee must prepare on an annual basis a report or series of reports summarizing groundwater activities and monitoring results for the Site Specific Groundwater Monitoring Programs by March 31.

Regional groundwater monitoring results and interpretation must be compiled into a written report and submitted on an annual basis for each calendar year to the Director by May 16 of the following year. The Annual Report must include summaries of the site specific groundwater reports.

The report(s) must include, but is not limited to:

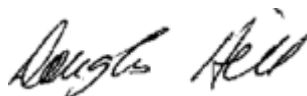
- i. A map of monitoring locations with EMS and Permittee descriptors;
- ii. Cross sections showing well installation details, stratigraphy, groundwater elevations, and flow. Cross sections should be in the direction of groundwater flow and perpendicular to groundwater flow.
- iii. Drawings showing locations and water quality data of groundwater sampling points.
- iv. A summary of background information on that year's program, including discussion of program modifications relative to previous years;
- v. A summary of measured parameters, including appropriate graphs and comparison of results to, Approved and Working Water Quality Guidelines, or other criteria and benchmarks as specified by the Director;
- vi. If applicable, a summary of exceedances of screening benchmarks;
- vii. Evaluation and discussion of spatial patterns and temporal trends;
- viii. A summary of all QA/QC issues during the year; and
- ix. Recommendations for further study or measures to be taken.

10.5. LAEMP

The LAEMP Annual Reports must be reported on in accordance with generally accepted standards of good scientific practice in a written report and submitted to the Director of each year following the data collection calendar year on the following dates:

- LCO LAEMP: April 30
- GHO LAEMP: May 31

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- FRO LAEMP: May 31
- CMO LAEMP: June 30 (The first report is due June 30, 2020)

10.6. RAEMP

The RAEMP report for the first approved cycle under the ABMP must be submitted to the Director by September 30, 2017 and by November 30 of the final year of each subsequent three year monitoring cycle.

The Permittee shall submit a report that contains a detailed rationalization of the overall RAEMP including reasons why specific monitoring areas are/are not being monitored in a given year. The report may include a discussion and analysis of the results of the previous cycle of monitoring of the following components:

- 1) Water quality
- 2) Sediment quality and calcite
- 3) Water and sediment toxicity testing
- 4) Periphyton productivity and community structure
- 5) Benthic invertebrate community structure and tissue contaminants
- 6) Fish population metrics and tissue contaminants
- 7) Amphibian and bird egg tissue contaminants
- 8) QA/QC

Each report will also discuss cumulative effects by providing an integrated interpretation of conditions in the Elk River Watershed.

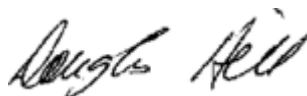
Each report will, on a three year cycle, verify and calibrate the selenium bioaccumulation model using the most recent three years of water quality, aquatic effects and other data from any special studies undertaken.

10.7. CALCITE

A Calcite Monitoring Annual Report must to be submitted to the Director by April 15 of each year following the data collection calendar year. The report must include the following, at minimum:

- i. A map of monitoring locations;

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- ii. A summary of background information on that year's program, including discussion of program modifications relative to previous years;
- iii. Results of stream selection reassessment – highlight streams added/removed;
- iv. Summary of where sampling followed the methodology in the monitoring plan document, and details where sampling deviated from the approved methodology;
- v. Statement of results for the period over which sampling was conducted;
- vi. Reference to the raw data, provided as appendices;
- vii. General discussion of observations, including summary tables of sites with increasing and decreasing deposition indices;
- viii. Interpretation of location, extent, and any other observations;
- ix. A summary of any QA/QC issues during the year; and
- x. Recommendations for sites to add, sites to remove, modifications to methodology, monitoring frequency adjustments.

In addition, for the 2015 and 2016 reports (2014 and 2015 sampling years), the Permittee must provide a document investigating the statistical power of the calcite monitoring program when reviewing monitoring results.

10.8. KOOCANUSA RESERVOIR

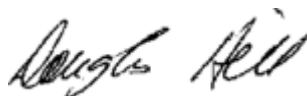
The Permittee must prepare on an annual basis a report summarizing activities and monitoring results. The report must be submitted to the Kooacanusa Reservoir Monitoring and Research Working Group (Kooacanusa Reservoir Working Group) and the EMC by June 30 of each year.

10.9. WATER QUALITY MODELLING

The Permittee must update the water quality model and complete a water quality prediction report for each mine site and the Designated Area as a whole to be submitted to the Director by October 31, 2017.

This report must be updated every 3 years or more frequently as required, based on changes to the mine plan, when observed water quality and water quantity are regularly and significantly different from predicted values, or as otherwise required by the Director in writing. The report must include data collected from the monitoring programs described in Section 9 as well as any other special studies undertaken to investigate water quality in the Designated Area.

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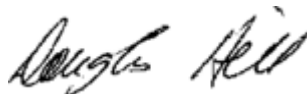
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On a three year cycle, verify and, failing verification, calibrate the Elk Valley Water Quality Planning Model using the most recent three years of water quality data and regional flow data from appropriate (e.g. Environment Canada regional) hydrometric data stations.

The report must provide:

- i. Current and projected (through the next twenty years) bank cubic meters of waste rock at the mine, detailed by affected drainage.
- ii. Hydrology modelling information, detailed by affected drainage.
 - Identify the specific hydrology information used in the modeling work
 - An evaluation of the relative data accuracy/precision and overall confidence in the data used. The evaluation should consider any relative bias that a station may introduce (e.g. a stations' ability to represent total watershed yield). Documentation must clearly provide a rationale for why specific data was selected for use in the model.
- iii. Current and predicted concentrations of Order constituents, and other constituents of interest (COIs) as required, in the surface water of affected drainages through the life of the mine based on current model, which incorporates waste rock volumes and local hydrology, compared to BC Water Quality Guidelines or water quality targets for selenium, nitrate, sulphate and cadmium.
- iv. A description of the calibration and validation of the flow model and water quality.
- v. A sensitivity analysis for variation in flows and potential errors in measured input data.
- vi. Water quality and water quantity model output in electronic format.
- vii. A monitoring plan for continued evaluation of ii), iii) and iv) as the mine progresses.
- viii. Refined hydrology, hydrogeology and geochemical source term information (including refinements for cadmium source terms), together with any site specific water balance models and hydrogeology studies;
- ix. Changes to the mine plan; and
- x. Information and outcomes from research and technology development studies that have been incorporated into the model.

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10.9.1. EVALUATION OF WATER QUALITY MODELLING FOR TRIBUTARIES (LCO)

- a) The Permittee shall assess the conservatism and uncertainty associated with the scaling approach used to predict tributary concentrations in the EVWQP by independent comparison with predictions obtained from project specific model outputs and provide recommendation for evaluating future water quality in tributaries in the Elk River watershed.
- b) A report presenting the comparison and analysis of water quality modelling methods, as well as a list of tributaries where the scaling method was/or was not applied in the EVWQP shall be provided to the Director by February 28, 2015.

10.10. ENVIRONMENTAL IMPACT ASSESSMENT - CHANGES TO MINE PLANS

Where changes to a mine plan requires amendment of the Mines Act Permit for a site, the Permittee shall provide the Director with a project description detailing the changes and results of water quality modelling that assesses the effects on water quality at the applicable order stations/compliance points. The Director may require an environmental impact assessment to be completed to evaluate the effects of the changes on the environment.

10.10.1. FRO MINE PLAN

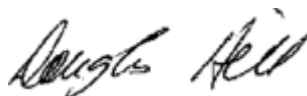
If FRO's mine plan changes such that FRO's total waste rock volume exceeds the maximum volume assessed in the Swift Environmental Assessment Certificate application and the North Spoil Re-handle screening-level assessment an environmental effects assessment be conducted.

11. ADAPTIVE MANAGEMENT

The Permittee must develop and implement a detailed adaptive management plan (AMP) to support implementation of the ABMP, to achieve water quality targets including calcite targets, ensure that human health and the environment are protected, and where necessary, restored, and to facilitate continuous improvement of water quality in the Elk Valley. The adaptive management cycle consists of six stages, as summarized below. Elements of the AMP required for this permit have been included in the ABMP, but other key components remain outstanding, as described below. The Permittee must prepare and implement an AMP to the satisfaction of the Director. The AMP must fulfill the following requirements at a minimum:

- 1) Stage one – Assess and Define the Scope

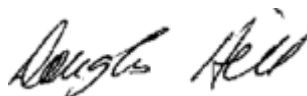
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- a. Section 1.2 of the Elk Valley Area Based Management Plan identifies the following environmental management objectives that apply to the AMP: protection of aquatic ecosystem health; management of bioaccumulation of constituents in the receiving environment (including fish tissue); protection of human health; and protection of groundwater.
 - b. The AMP should support continuous improvement of water quality conditions in the Elk Valley such that human health and ecosystem health are protected in the long-term, without restrictions or limitations on the use of water resources or associated biological resources.
 - c. Identify areas of uncertainty for further analysis and development of hypotheses to support adaptive management. Uncertainties may include effects on aquatic health, actual water quality conditions in space and time, treatment capability and results, R&D project success and implementation, efficacy of passive and semi-passive mitigation methods, etc.
 - d. The conceptual water quality model in Annex D of the ABMP should link management activities to effects to water quality and other components of the aquatic environment.
 - e. Select measurement end points for monitoring and determining what activities and/or actions could be adjusted to influence the measurement endpoints to improve water quality and the aquatic environment to meet the environmental management objectives of the ABMP.
- 2) Stage two – Design of Adaptive Management Plan
- a. Review of existing monitoring programs in relation to uncertainties and alternative hypotheses developed above in 1.b and ensure that the monitoring will provide sufficient information to evaluate which hypothesis is most supported. Clear linkages between the AMP and the RAEMP, supporting studies, other monitoring and water quality modelling must be included.
 - b. Establish early-warning triggers for management action. If not already in place, identify the locations where the indicators will be monitored and develop a monitoring program to assess the status of these indicators.
 - c. An assessment framework for evaluating whether an outcome is acceptable or not must be provided. Monitoring and operational outcomes or indicators must be detailed and what responses will be taken as a result of exceedances of each indicator, as well as the order and timeframe in which the responses will be implemented.

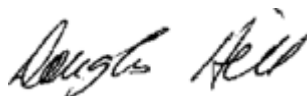
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- d. Develop and test hypotheses associated with alternative mitigation strategies. The intention is to evaluate applying active adaptive management to research and development activities related to non-active water treatment plant technologies and calcite management.
- 3) Stage three – Implement the Adaptive Management Plan
 - a. Implement the AMP as designed.
 - b. Document all deviations to the AMP including rationale and information considered in the decision to deviate.
 - 4) Stage four - Conduct Monitoring
 - a. Implement and follow the various monitoring programs and supporting studies in this permit and within the ABMP. Additional monitoring may be required as per 2.b above.
 - b. Identify how collected information/data will be managed to facilitate evaluation of hypotheses and status of indicators.
 - 5) Stage five – Evaluate the results of monitoring activities
 - a. Describe how the information/data from the monitoring programs and supporting studies will be analyzed/evaluated for the AMP.
 - b. Document exceedances of the indicators and the management responses that were undertaken.
 - c. Identify whether the results were expected, where results deviated from those expected, why the deviations occurred, and what lessons were learned.
 - d. Communicate results to the EMC (Section 12.2).
 - 6) Stage six – Adjust and Revise the Hypotheses and Management Strategies
 - a. Adjust the ABMP implementation plans and actions as required, including knowledge gained from Section 8.2 – Research and Development.
 - b. Communicate changes to ABMP implementation plans and activities to the EMC.

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- c. Reassess expected outcomes, potential impacts, and responses to these outcomes for an adjusted plan. Where plan components are related to impacts on Human Health, the Permittee shall make reasonable efforts to consult with Interior Health (hbe@interiorhealth.ca).
- d. Adjust the AMP as required in consultation with the EMC.

The Permittee must develop and implement an Adaptive Management Plan to ensure that the management goals in the approved ABMP are met. The Permittee shall deliver the following:

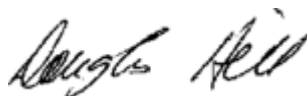
- i. The Permittee must prepare a draft Terms of Reference (TOR) for the Adaptive Management Plan for discussion at the EMC by February 15, 2015.
- ii. The Permittee must submit a final TOR by March 15, 2015 to the Director for review and approval.
- iii. The Permittee must prepare a draft AMP for discussion at the EMC by September 30, 2015.
- iv. The Permittee must submit the final AMP by February 29, 2016 to the Director for review and acceptance.
- v. The Permittee must prepare and submit an annual report documenting the activities undertaken in each stage of the Adaptive Management Plan. The AMP report must be submitted to the Director annually by July 31. The first AMP report is due July 31, 2016.
- vi. The Permittee must update and revise the AMP every three years. The First update report is due July 31, 2019.
- vii. The Permittee shall implement the AMP to the satisfaction of the Director.
- viii. The Permittee shall notify the Director immediately regarding significant deviations from or adjustments to the accepted AMP (e.g., changes in triggers, responses, timeframes and/or study designs).

12. DATA ANALYSIS ACCOUNTABILITY AND TRANSPARENCY

12.1. FIRST NATIONS REPORTING REQUIREMENT

Unless otherwise agreed to by the Ktunaxa Nation Council (KNC) and the Permittee, the Permittee shall provide the KNC with information related to any material changes to the Initial Implementation Plan, Adaptive Management Plan, the Calcite Management Plan and the Research and Technology Development Plan. In addition, the Permittee shall provide the KNC

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with all data, information and/or reports generated during the implementation of these plans in accordance with this permit.

12.2. ENVIRONMENTAL MONITORING COMMITTEE (EMC)

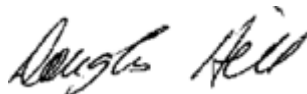
The Permittee must establish an Environmental Monitoring Committee (EMC), consisting of representatives from ENV, the Ministry of Energy and Mines, Environment Canada, the Ktunaxa Nation, Interior Health Authority, and the Permittee. The Committee will review submissions and provide technical advice to the Permittee and Director regarding monitoring submissions in Sections:

- i. 9.2.1 –Regional Groundwater Monitoring Program
- ii. 9.3 – Local Aquatic Effects Monitoring
- iii. 9.4 – Regional Aquatic Effects Monitoring
- iv. 9.5 – Calcite Monitoring
- v. 9.8 – Chronic Toxicity Testing Program
- vi. 9.9 – Human Health Risk Assessment
- vii. 11. – Adaptive Management
- viii. 12.3 – Third Party Audit

The committee will also provide input to the Permittee regarding reports which are required under Sections:

- ix. 2.7 – Re-evaluation of Limits
- x. 5 – Tributary Evaluation and Management
- xi. 9.7 – Koocanusa Reservoir Burbot Baseline Study 2015
- xii. 10.2.4 – Annual Reporting
- xiii. 10.3 – Toxicity Reporting
- xiv. 10.4 – Groundwater
- xv. 10.5 – LAEMP
- xvi. 10.6 – RAEMP
- xvii. 10.7 – Calcite
- xviii. 10.8 – Koocanusa Reservoir
- xix. 10.9 – Water Quality Modelling

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- xx. 11 – Adaptive Management
- xxi. 12.3 – Third Party Audit

The EMC will convene a public meeting once per calendar year for the purpose of informing the public of information reviewed by the committee and any audit results as per Section 12.3.

The EMC will confirm the scope of third party audit in Section 12.3 a minimum of 9 months prior to the audit submission deadline.

12.3. THIRD PARTY AUDIT

Monitoring data for this Permit and its analysis is subject to the review and audit by a third party qualified professional on a three year cycle. The audit must include a review of monitoring data and data analysis for reports submitted under this Permit relevant to at least three components (monitoring endpoints) of Teck’s environmental monitoring programs undertaken as requirements of this Permit for the previous three years and must address at least the following:

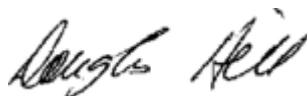
- i. Data quality and completeness;
- ii. Protocols and procedures from the QA/QC plan for the monitoring program; and,
- iii. Standard operating procedures and data handling protocols in place for Teck Coal Limited.

The audit objectives scope, components, and criteria must be selected in consultation with the EMC. Each Third Party Audit Report must be submitted to the EMC and to the Director, by October 31 of each audit year. The next Third Party Audit Report must be submitted to the Director by October 31, 2020. The Third Party Audit Report must report on actions taken to address findings of previous reports.

13. SECURITY

Although financial security under the Environmental Management Act is not required at this time, the Director may require security in the amount and form subject to the conditions the Director specifies.

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APPENDICES 1A-1J: TECK COAL LIMITED OPERATIONS MAPS

APPENDIX 1A – Teck Coal Limited Location Map

APPENDIX 1B – Teck Coal Limited Sampling Locations Overview Map

APPENDIX 1C – Teck Coal Limited Sampling Locations Map – Compliance Points

APPENDIX 1D – Teck Coal Limited Sampling Locations Map – Order Stations

APPENDIX 1E – Teck Coal Limited Sampling Locations Map – Koocanusa Reservoir

**APPENDIX 1F – Teck Coal Limited Sampling Locations Map – Fording River
Operations**

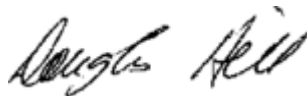
APPENDIX 1G – Teck Coal Limited Sampling Locations Map – Greenhills Operations

**APPENDIX 1H – Teck Coal Limited Sampling Locations Map – Line Creek
Operations**

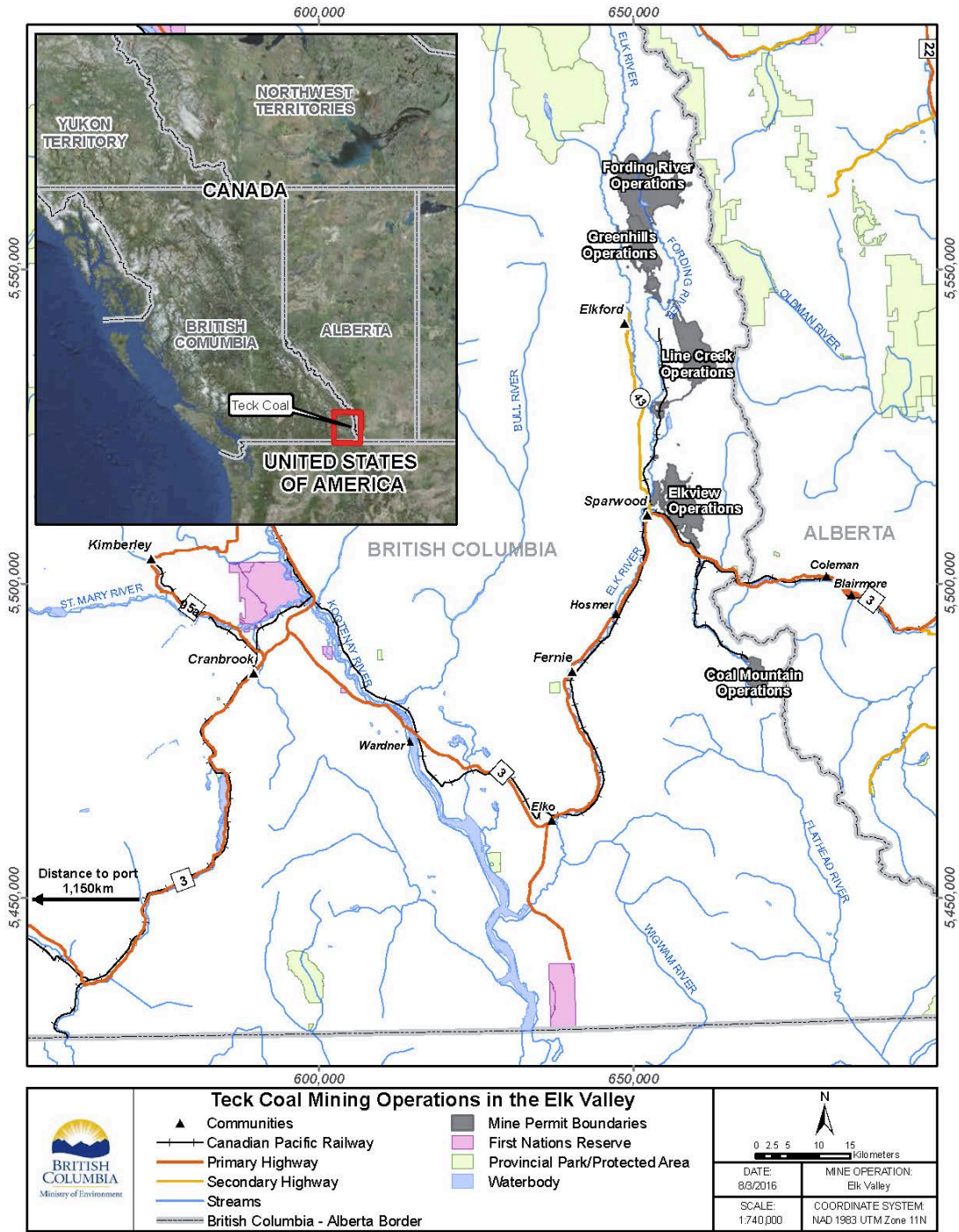
APPENDIX 1I – Teck Coal Limited Sampling Locations Map – Elkview Operations

**APPENDIX 1J – Teck Coal Limited Sampling Locations Map – Coal Mountain
Operations**

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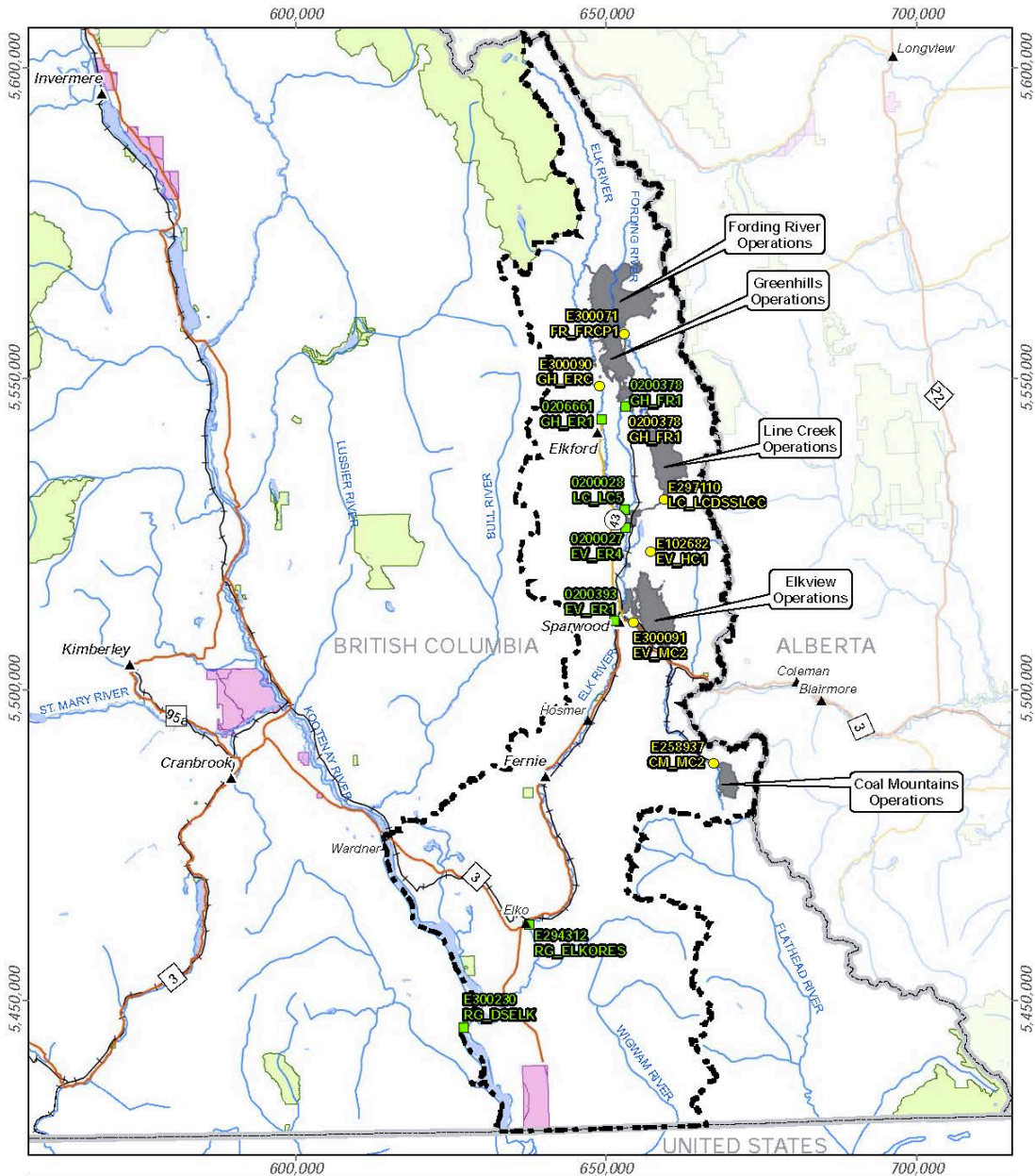


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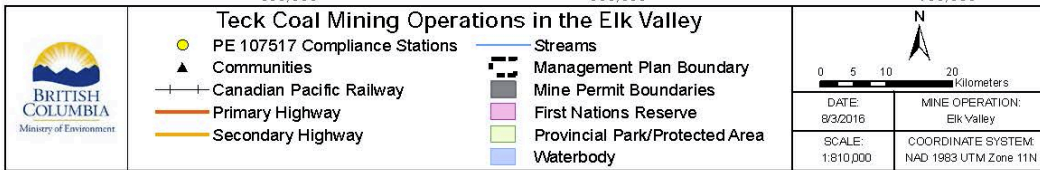
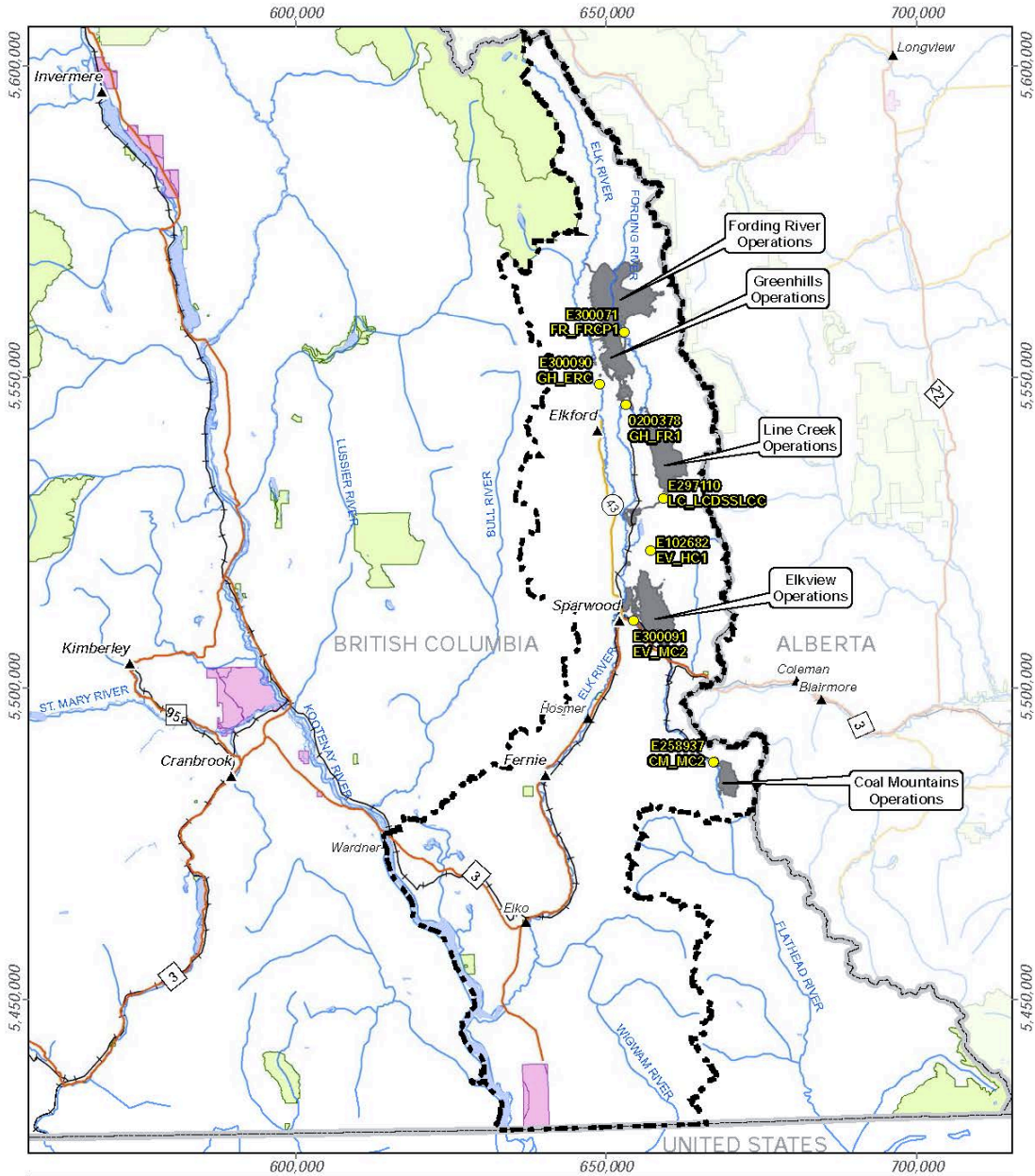


	Teck Coal Limited Sampling Locations in the Elk Valley					
	<ul style="list-style-type: none"> ■ PE 107517 Order Stations ● PE 107517 Compliance Stations ▲ Communities Canadian Pacific Railway Primary Highway Secondary Highway 	<ul style="list-style-type: none"> Streams Management Plan Boundary Mine Permit Boundaries First Nations Reserve Provincial Park/Protected Area Waterbody 		<table border="1"> <tr> <td>DATE: 8/3/2016</td> <td>MINE OPERATION: Elk Valley</td> </tr> <tr> <td>SCALE: 1:810,000</td> <td>COORDINATE SYSTEM: NAD 1983 UTM Zone 11N</td> </tr> </table>	DATE: 8/3/2016	MINE OPERATION: Elk Valley
DATE: 8/3/2016	MINE OPERATION: Elk Valley					
SCALE: 1:810,000	COORDINATE SYSTEM: NAD 1983 UTM Zone 11N					

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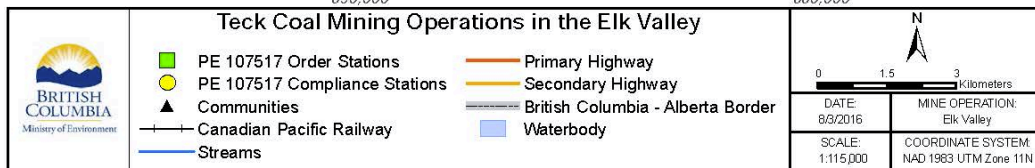
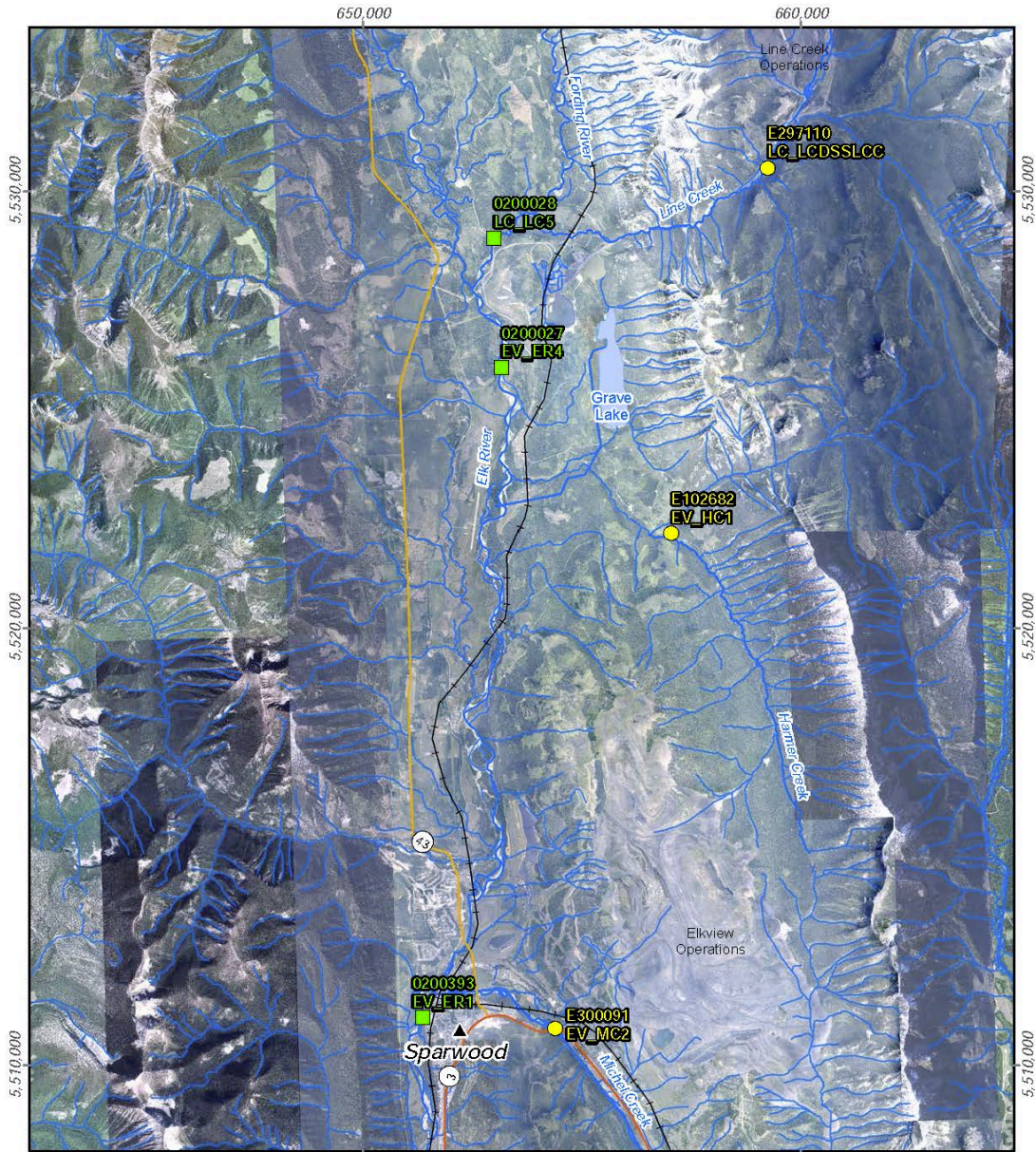


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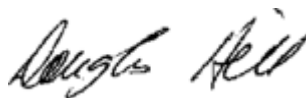
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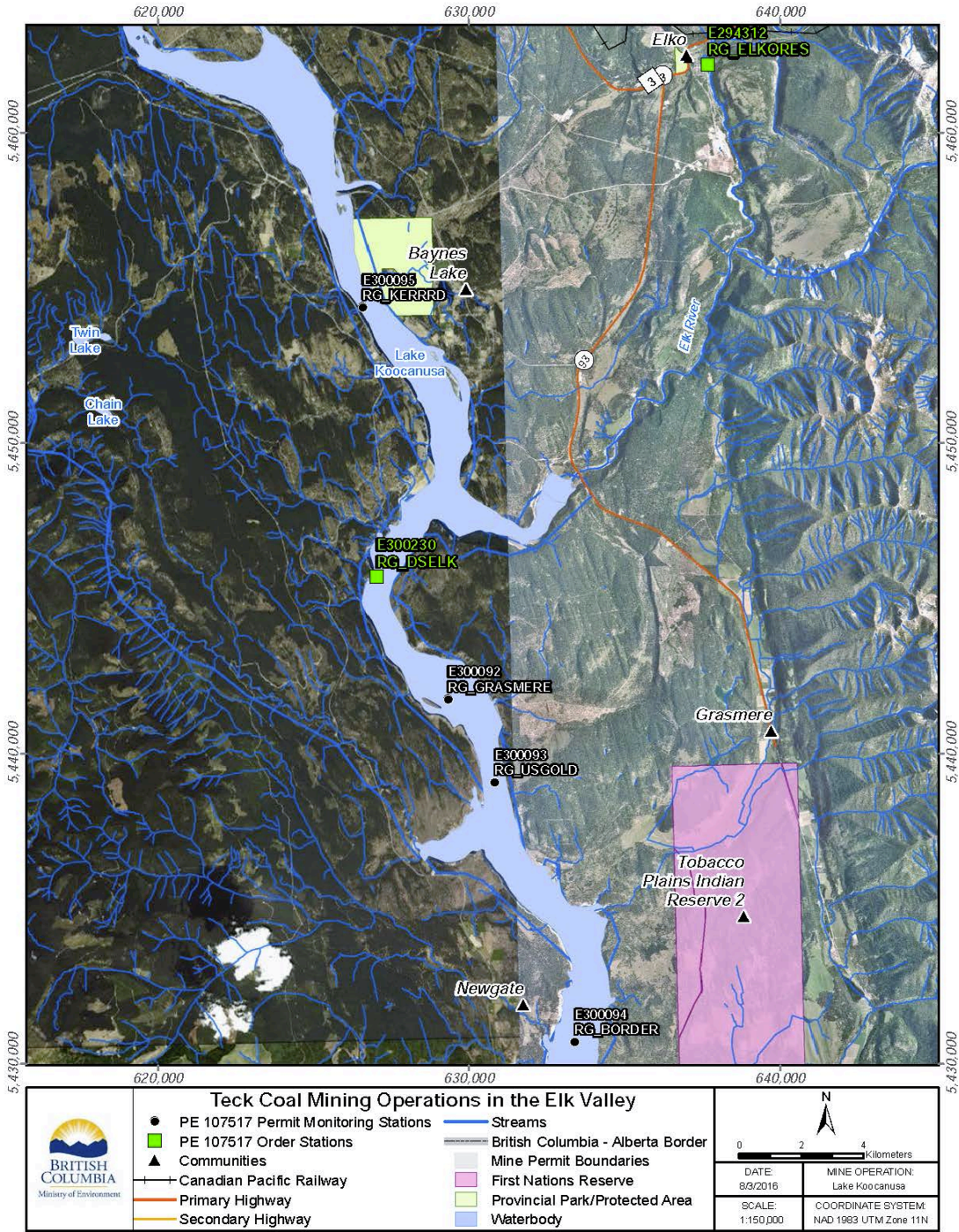
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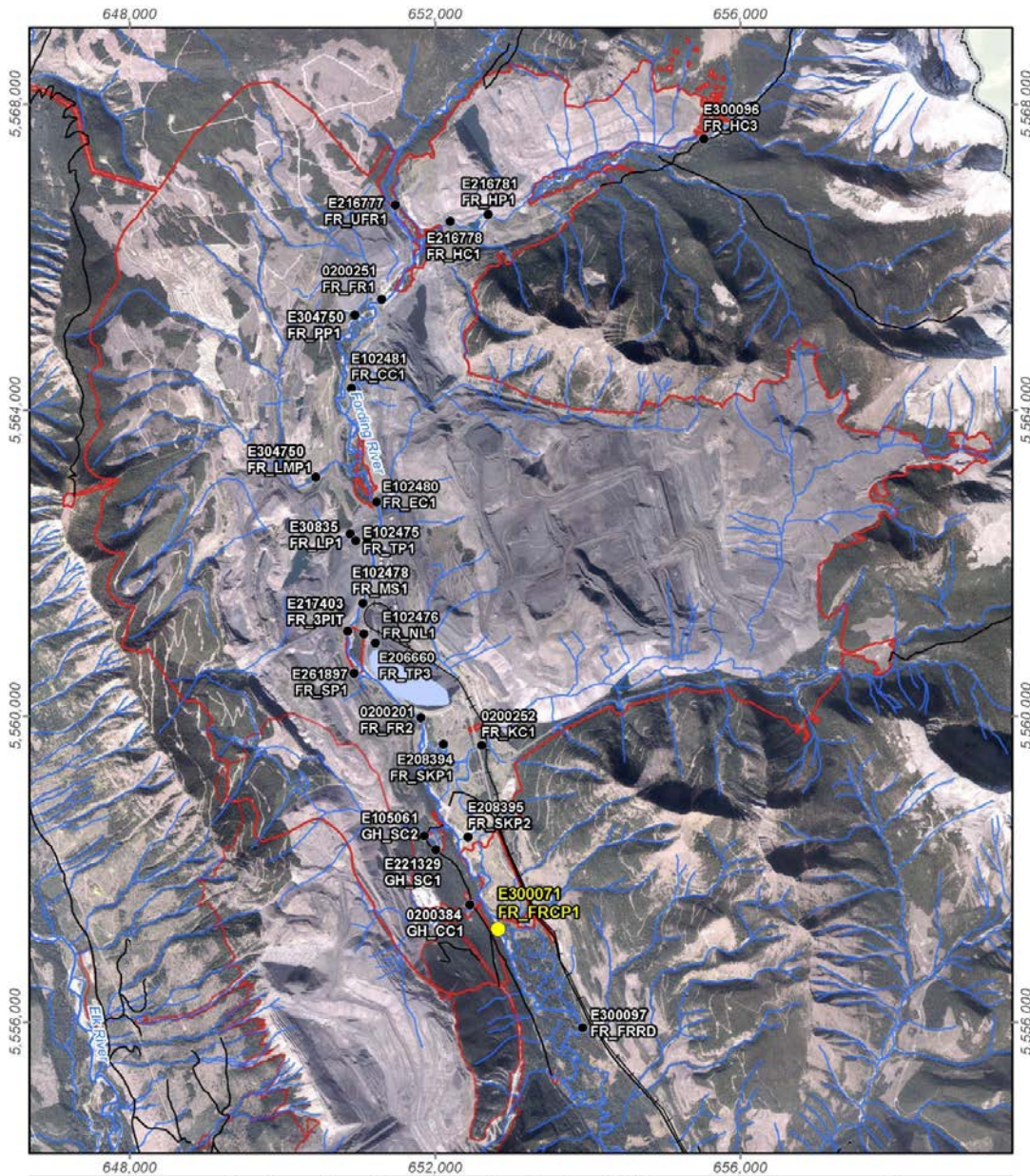


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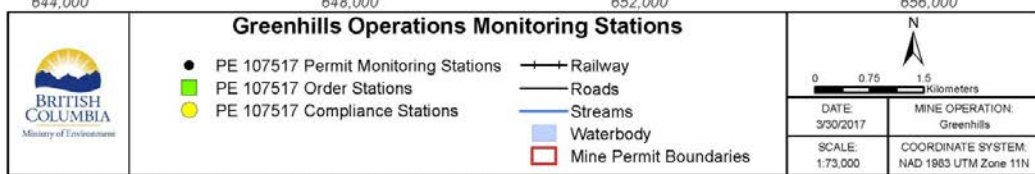
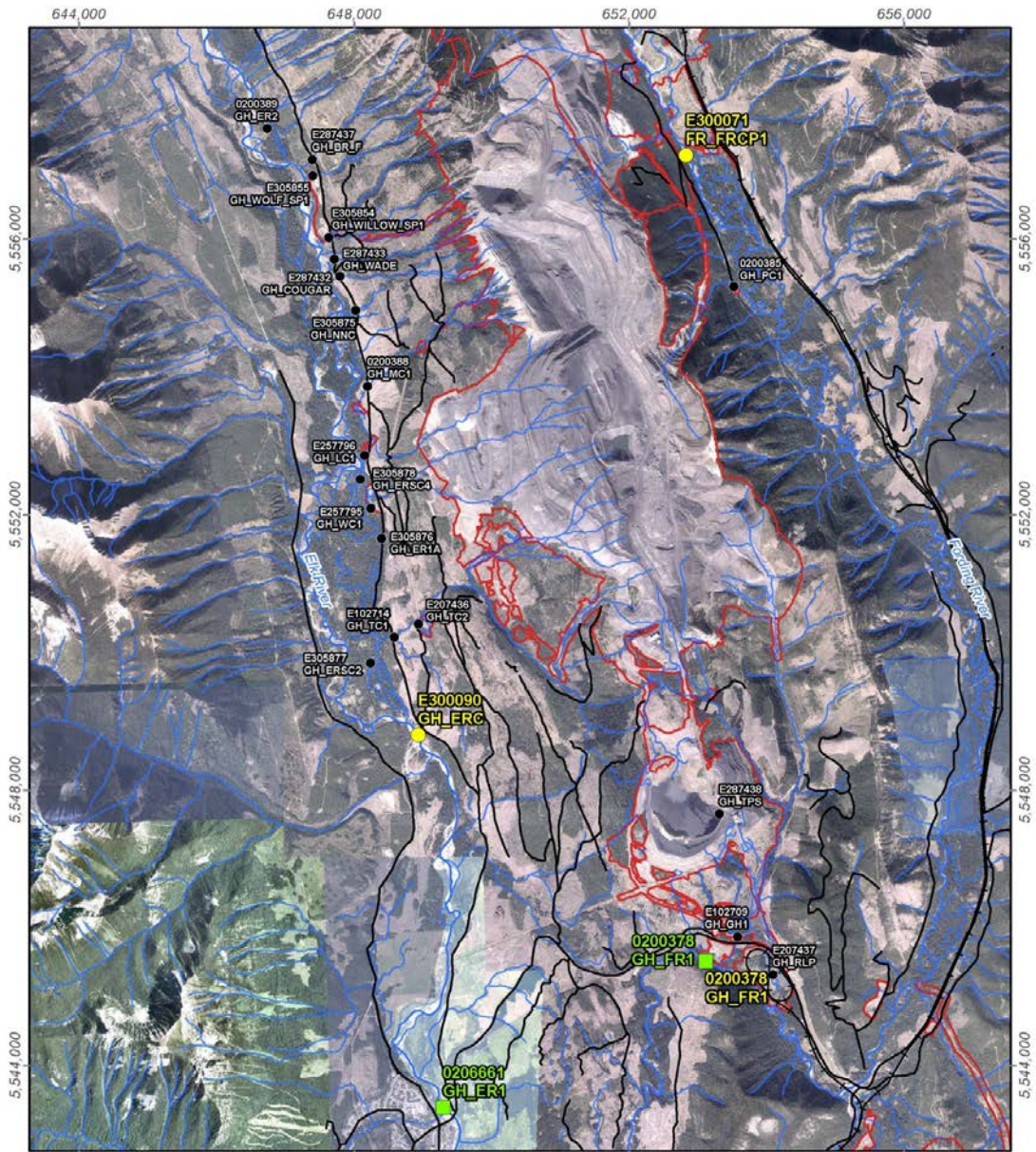


	Fording River Operations Monitoring Stations					
	<ul style="list-style-type: none"> ● PE 107517 Permit Monitoring Stations ■ PE 107517 Order Stations ● PE 107517 Compliance Stations 	<ul style="list-style-type: none"> — Railway — Roads — Streams — Waterbody □ Mine Permit Boundaries 		<table border="1"> <tr> <td>DATE: 3/29/2017</td> <td>MINE OPERATION: Fording River</td> </tr> <tr> <td>SCALE: 1:65,863</td> <td>COORDINATE SYSTEM: NAD 1983 UTM Zone 11N</td> </tr> </table>	DATE: 3/29/2017	MINE OPERATION: Fording River
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 Page 65 of 87 Appendix 1F: Teck Coal Limited Sampling Locations Map - Fording River Operations

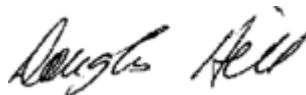
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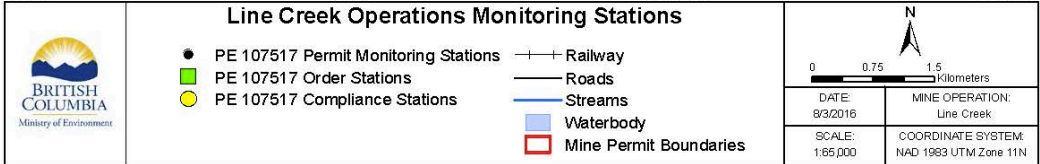
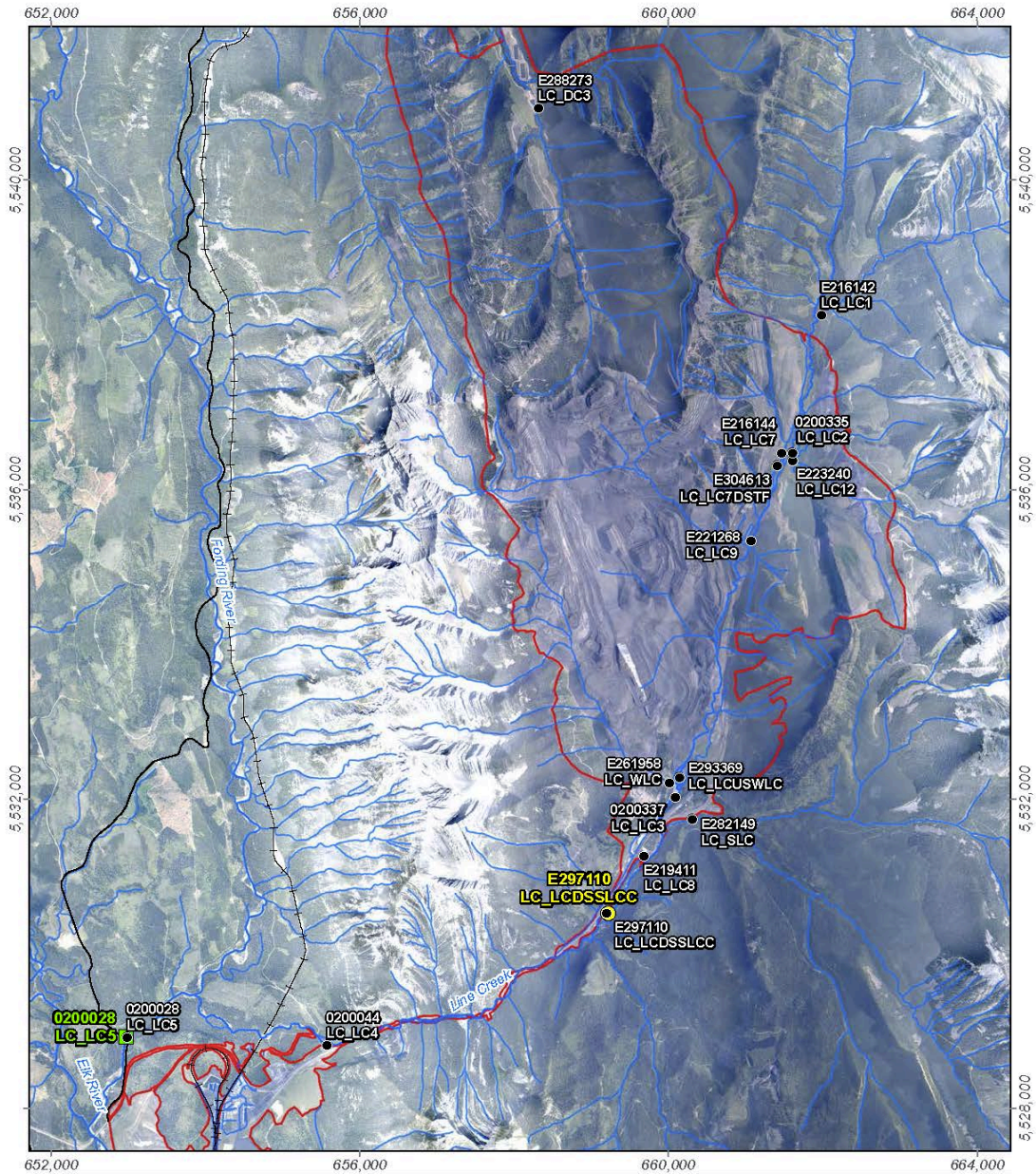


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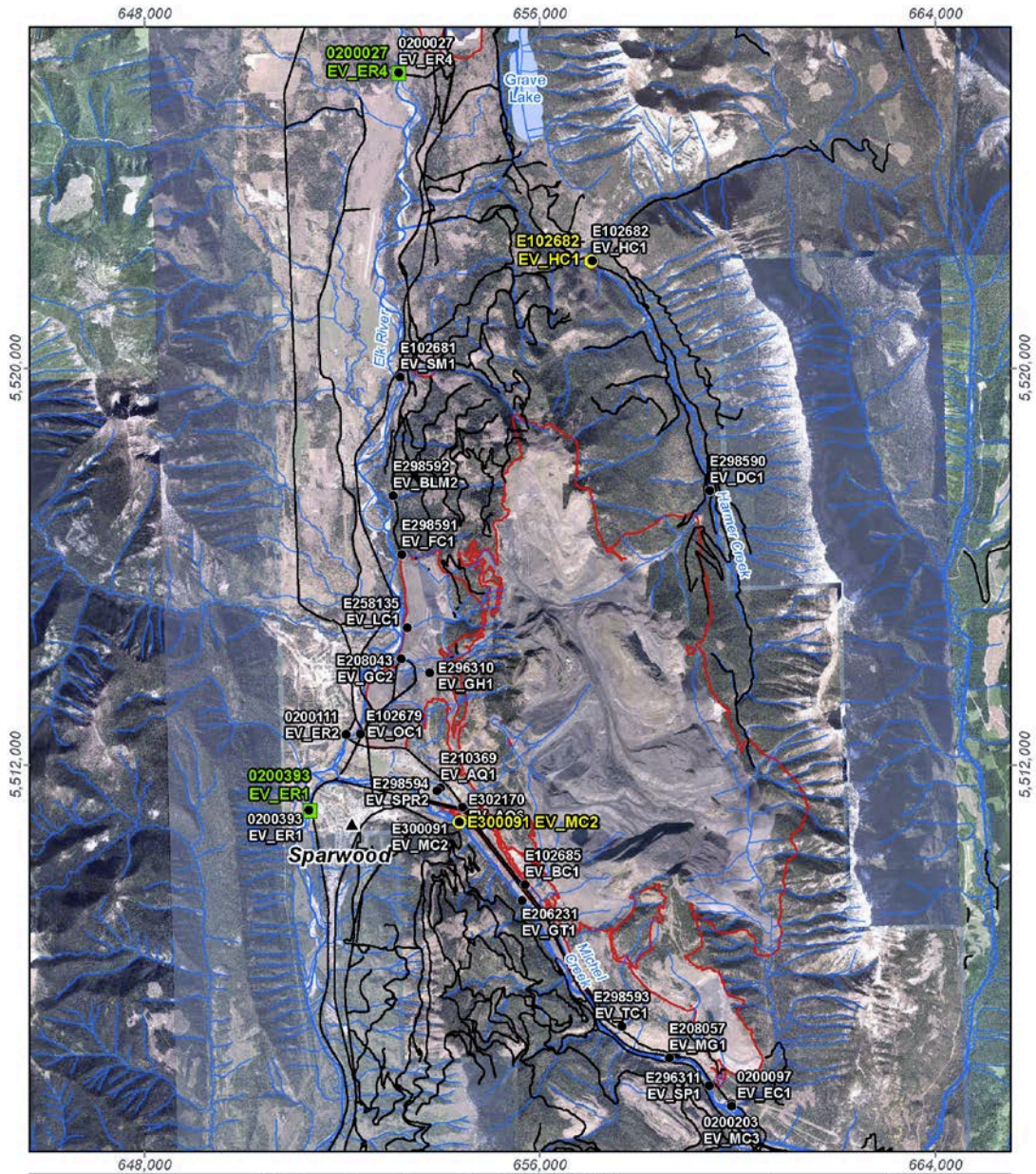
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Appendix 1H: Teck Coal Limited Sampling Locations Map - Line Creek Operations

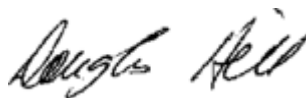
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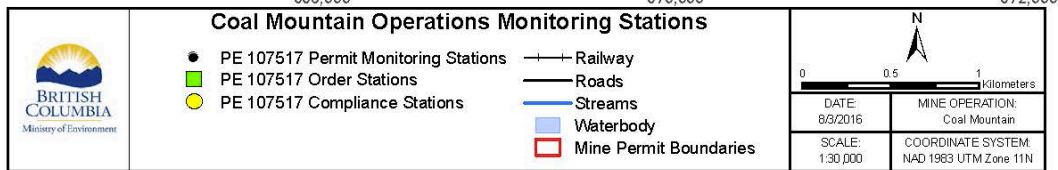
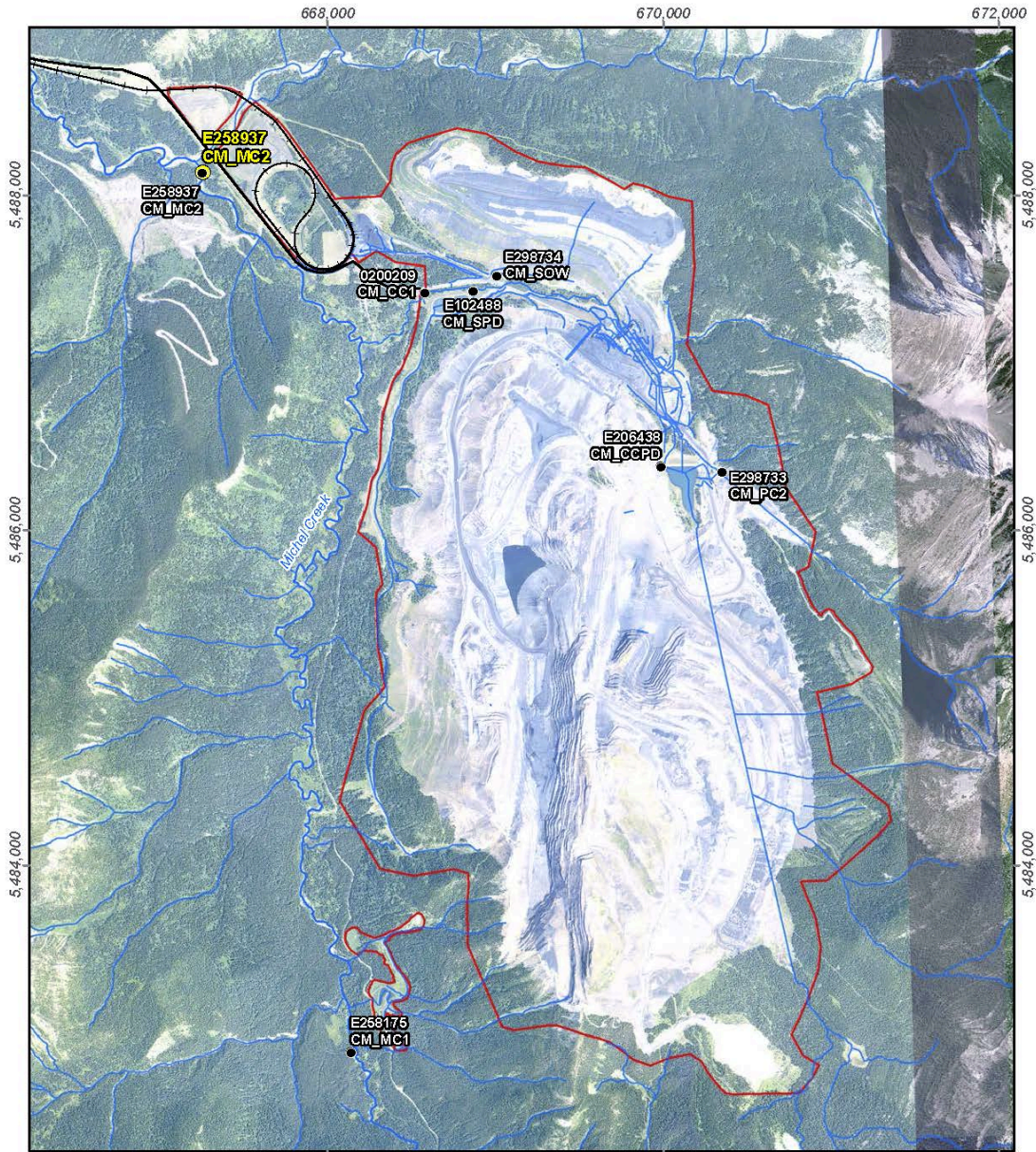
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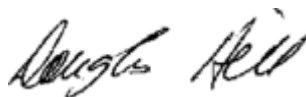


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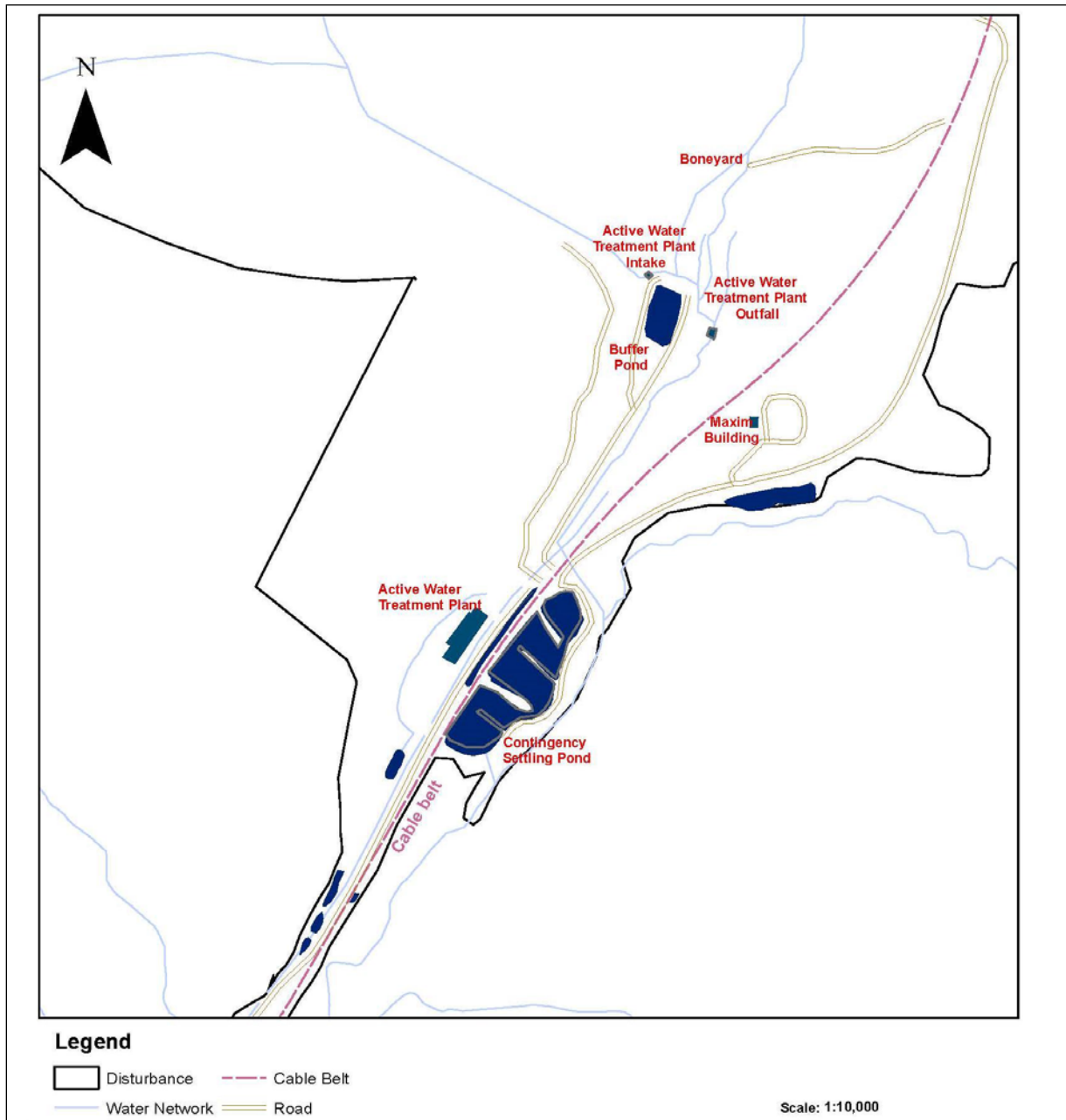
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APPENDIX 1K: TECK COAL LIMITED SITE PLAN - WEST LINE CREEK ACTIVE WATER TREATMENT FACILITY



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APPENDIX 2: SURFACE WATER DISCHARGE AND RECEIVING ENVIRONMENT MONITORING PROGRAM

TABLE 9 - DESIGNATED AREA MONITORING PROGRAM – COMPLIANCE POINTS

	FRO – FORDING RIVER ~525m DOWNSTREAM OF CATARACT CREEK	GHO – FORDING RIVER ~205m DOWNSTREAM OF GREENHILLS CREEK	GHO – ELK RIVER ~220m DOWNSTREAM OF THOMPSON CREEK	LCO – LINE CREEK IMMEDIATELY DOWNSTREAM OF SOUTH LINE CREEK CONFLUENCE	EVO – HARMER SPILLWAY	EVO – MICHEL CREEK AT HWY 3 BRIDGE	CMO – MICHEL CREEK 50m UPSTREAM OF ANDY GOODE CREEK
EMS NUMBER	E300071	0200378	E300090	E297110	E102682	E300091	E258937
PARAMETER							
Field Parameters ^(a)	W/M	W/M	W/M	W/M	W/M	W/M	W/M
Conventional Parameters ^(b)	W/M	W/M	W/M	W/M	W/M	W/M	W/M
Major Ions ^(c)	W/M	W/M	W/M	W/M	W/M	W/M	W/M
Nutrients ^(d)	W/M	W/M	W/M	W/M	W/M	W/M	W/M
Total and Dissolved Metals Scans ^(e)	W/M	W/M	W/M	W/M	W/M	W/M	W/M
BOD	-	-	-	M	-	-	-
Flow ^(f)	C	W/M	W/M	- ³	W/M	C	W/M
Chlorophyll-a	-	-	-	Three times annually, between July 15 & Sept 30 annually	-	-	-
Total Phosphorus	-	-	-	Every two weeks beginning Jun 15 through Sept 30, annually	-	-	-
Bromate	-	-	-	W/M	-	-	-
Hydrogen Peroxide	-	-	-	W/M	-	-	-
7 day <i>Ceriodaphnia dubia</i> chronic toxicity (EPSI/RM/21) water-only endpoints: survival, reproduction	Q	Q	Q	Q	Q	Q	Q
72 Hr <i>Pseudokichneriella subcapitata</i> (EPSI/RM/25) endpoints: growth, inhibition	Q	Q	Q	Q	Q	Q	Q
30-day early life-stage test -rainbow trout (<i>Oncorhynchus mykiss</i> ; EPSI/RM/28) using <24-hour post-fertilization eggs; endpoints: survival, hatching, growth, deformity, behaviour	2 times per year – once in Spring and once in Fall	2 times per year – once in Spring and once in Fall	2 times per year – once in Spring and once in Fall	2 times per year – once in Spring and once in Fall	2 times per year – once in Spring and once in Fall	2 times per year – once in Spring and once in Fall	2 times per year – once in Spring and once in Fall
30-day early life-stage test with the fathead minnow (<i>Pimephales promelas</i> ; USEPA 1996) using <24-hour post-fertilization eggs; endpoints: survival, hatching, growth, deformity	Q	Q	-	-	-	-	Q
28-day water-only test with amphipod, <i>Hyaella Azteca</i> (adapted from USEPA 2000) endpoints: survival, growth	Q	Q	-	-	-	-	Q

- 1) Refer to Table 24, Appendix 2, for abbreviation description.
- 2) Refer to Table 25, Appendix 2, for explanatory notes.
- 3) Flows for LCO compliance point will be determined by calculation using upstream flows.

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TABLE 10 – DESIGNATED AREA MONITORING PROGRAM – ORDER STATIONS

	FR4 GH_FR1 UPPER FORDING RIVER (DOWNSTREAM OF GREENHILLS CREEK)	FR5 LC_LC5 LOWER FORDING RIVER (FORDING RIVER DOWNSTREAM OF LINE CREEK)	ER1 GH_ER1 ELK RIVER UPSTREAM OF BOIVEN CREEK	ER2 EV_ER4 ELK RIVER UPSTREAM OF GRAVE CREEK (FROM FORDING RIVER TO MICHEL CREEK)	ER3 EV_ER1 ELK RIVER DOWNSTREAM MICHEL CREEK	ER4 RG_ELKORES ELK RIVER AT ELKO RESERVOIR	LK2 RG_DSELK LAKE KOOCANUSA SOUTH OF THE ELK RIVER
<i>EMS Number</i>	0200378	0200028	E206661	0200027	0200393	E294912	E300230
PARAMETER							
Field Parameters ^(a)	W/M	W/M	W/M	W/M	W/M	W/M	M
Conventional Parameters ^(b)	W/M	W/M	W/M	W/M	W/M	W/M	M/EH
Major Ions ^(c)	W/M	W/M	W/M	W/M	W/M	W/M	M/EH
Nutrients ^(d)	W/M	W/M	W/M	W/M	W/M	W/M	M/EH
Total and Dissolved Metals Scan ^(e)	W/M	W/M	W/M	W/M	W/M	W/M	M/EH
Flow ^(f)	W/M	W/M	W/M	W/M	W/M	-	-
Secchi depth and chlorophyll-a	-	-	-	-	-	-	M

- 1) Refer to Table 24, Appendix 2, for abbreviation description.
 2) Refer to Table 25, Appendix 2, for explanatory notes.

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TABLE 11 - DESIGNATED AREA MONITORING PROGRAM – KOOCANUSA RESERVOIR RECEIVING ENVIRONMENT STATIONS

	KOOCANUSA RESERVOIR DOWNSTREAM OF KIKKOMAN CREEK	KOOCANUSA RESERVOIR WEST OF GRASMERE	KOOCANUSA RESERVOIR UPSTREAM OF GOLD CREEK	KOOCANUSA RESERVOIR UPSTREAM OF CANADA/US BORDER
<i>EMS Number</i>	<i>E300095</i>	<i>E300092</i>	<i>E300093</i>	<i>E300094</i>
PARAMETER				
Field Parameters ^(a)	M	M	M	M
Conventional Parameters ^(b)	M/EH	M/EH	M/EH	M
Major Ions ^(c)	M/EH	M/EH	M/EH	M
Nutrients ^(d)	M/EH	M/EH	M/EH	M
Total and Dissolved Metals Scan ^(e)	M/EH	M/EH	M/EH	M
Secchi depth and chlorophyll-a	M	M	M	M

Note: sample collection is based upon access; ice on Lake may prevent sample collection, if this is the case, the monitoring report must include a reason in the report

- 1) Refer to Table 24, Appendix 2, for abbreviation description.
- 2) Refer to Table 25, Appendix 2, for explanatory notes.

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TABLE 12 - FORDING RIVER OPERATIONS DISCHARGE MONITORING PROGRAM

	TAILINGS SLURRY TO NORTH TAILINGS POND	TAILINGS SLURRY TO SOUTH TAILINGS POND	NORTH LOOP POND (h)	MAINTENANCE AND SERVICES SED POND	EAGLE POND DECANT (h)	CLODE POND (h)	SOUTH KILMARNOCK SED. POND – PHASE I (h)	SOUTH KILMARNOCK SED. POND – PHASE II (h)	HENRETTA PIT EFFLUENT INTO DIVERSION CULVERTS (j)	SMITH PONDS (h)	SWIFT PIT EFFLUENT TO FORDING RIVER	SWIFT SED PONDS TO SWIFT CREEK	SWIFT SED PONDS BYPASS TO SWIFT CREEK	CATARACT SED PONDS TO CATARACT CREEK	LIVERPOOL SED PONDS TO FORDING RIVER (h)	POST SED PONDS TO FORDING RIVER (h)	LAKE MOUNTAIN SEDIMENT PONDS TO LAKE MOUNTAIN CREEK
EMS NUMBER	E102475	E206660	E102476	E102478	E102480	E102481	E208394	E208395	E216781	E261897	E217403	E221329	E105061	E0200384	E304835	E304750	E306924
PARAMETER																	
Field Parameters (a)	-	-	M	M	M	M	M	M	M	M	M	M	Ma	M	M	M	M
Conventional Parameters (b)	SA	SA	M	M	M	M	M	M	M	M	M	M	Ma	M	M	M	M
Major Ions (c)	SA	SA	M	M	M	M	M	M	M	M	M	M	Ma	M	M	M	M
Nutrients (d)	SA	SA	M	M	M	M	M	M	M	M	M	M	Ma	M	M	M	M
Total and Dissolved Metals Scan (e)	SA	SA	M	M	M	M	M	M	M	M	M	M	Ma	M	M	M	M
96 hour Rainbow Trout single concentration toxicity test (g)	-	-	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	-	Q	Q	-	Q
48 hour <i>Daphnia magna</i> single concentration toxicity test (g)	-	-	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	-	Q	Q	-	Q

- 1) Refer to Table 24, Appendix 2, for abbreviation description.
- 2) Refer to Table 25, Appendix 2, for explanatory notes.

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TABLE 13 – FORDING RIVER OPERATIONS RECEIVING ENVIRONMENT AND OTHER MONITORING PROGRAM

	FORDING RIVER U/S OF KILMARNOCK CREEK	FORDING RIVER D/S OF HENRETTA	FORDING RIVER U/S OF HENRETTA	HENRETTA CREEK AT MOUTH	HENRETTA CREEK UPSTREAM OF MCQUARRIE CREEK	FORDING RIVER NEAR FORDING ROAD	KILMARNOCK AT MOUTH	FR_FRNTP (MAINTENANCE SHOPS NEAR NORTH TAILINGS POND)
<i>EMS Number</i>	<i>0200201</i>	<i>0200251</i>	<i>E216777</i>	<i>E216778</i>	<i>E300096</i>	<i>E300097</i>	<i>0200252</i>	-
PARAMETER								
Field Parameters (a)	W/M	M	M	W/M	M	M	M	-
Conventional Parameters (b)	W/M	M	M	W/M	M	M	M	-
Major Ions (c)	W/M	M	M	W/M	M	M	M	-
Nutrients (d)	W/M	M	M	W/M	M	M	M	-
Total and Dissolved Metals Scan (e)	W/M	M	M	W/M	M	M	M	-
Flow (f)	W/M	C	C	C	M	M	C	C

- 1) Refer to Table 24, Appendix 2, for abbreviation description.
- 2) Refer to Table 25, Appendix 2, for explanatory notes.

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TABLE 14 – GREENHILLS OPERATIONS DISCHARGE MONITORING PROGRAM

	TAILINGS POND WATER	GREENHILLS CREEK SED. POND DECANT	THOMPSON CREEK SED. POND DECANT	PORTER CREEK SED. POND DECANT	WOLFRAM CREEK SED. POND DECANT	LEASK CREEK SED. POND DECANT	RAIL LOOP SED. POND DECANT	MICKELSON CREEK AT LRP ROAD	WADE CREEK AT LRP ROAD	WOLF CREEK SED. POND DECANT	WILLOW CREEK SED. POND DECANT
EMS Number	<i>E287438</i>	<i>E102709</i>	<i>E207436</i>	<i>0200385</i>	<i>E257795</i>	<i>E257796</i>	<i>E207437</i>	<i>0200388</i>	<i>E287433</i>	<i>E305855</i>	<i>E305854</i>
PARAMETER											
Field Parameters ^(a)	-	M	M	M	M	M	M	M	M	M	M
Conventional Parameters ^(b)	SA	M	M	M	M	M	M	M	M	M	M
Major Ions ^(c)	SA	M	M	M	M	M	M	M	M	M	M
Nutrients ^(d)	SA	M	M	M	M	M	M	M	M	M	M
Total and Dissolved Metals Scan ^(e)	SA	M	M	M	M	M	M	M	M	M	M
96 hour Rainbow Trout single concentration toxicity test ^(g)	-	Q	Q	Q	Q	Q	-	-	Q	Q	Q
48 hour <i>Daphnia magna</i> single concentration toxicity test ^(g)	-	Q	Q	Q	Q	Q	-	-	Q	Q	Q
Flow ^(f)	-	C	-	-	-	-	-	-	-	-	-

- 1) Refer to Table 24, Appendix 2, for abbreviation description.
- 2) Refer to Table 25, Appendix 2, for explanatory notes.

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TABLE 15 – GREENHILLS OPERATIONS RECEIVING ENVIRONMENT MONITORING PROGRAM

	ELK RIVER UPSTREAM OF GREENHILLS OPERATIONS	THOMPSON CREEK AT LRP ROAD ³	COUGAR CREEK AT LRP ROAD	BRANCH F AT LRP ROAD	NO NAME CREEK (GH_NNC)	ELK RIVER SIDE CHANNEL D/S WOLFRAM CREEK (GH_ER1A)	ELK RIVER D/S OF THOMPSON CREEK	ELK RIVER SIDE CHANNEL U/S WOLFRAM CREEK	GREENHILLS CREEK D/S OF SED. POND DECANT
EMS Number	0200389	E102714	E287432	E287437	E305875	E305876	E305877	E305878	E309911
PARAMETER									
Field Parameters ^(a)	M	M	M	M	M	M	M	M	M
Conventional Parameters ^(b)	M	M	M	M	M	M	M	M	M
Major Ions ^(c)	M	M	M	M	M	M	M	M	M
Nutrients ^(d)	M	M	M	M	M	M	M	M	M
Total and Dissolved Metals Scan ^(e)	M	M	M	M	M	M	M	M	M
96 hour Rainbow Trout single concentration toxicity test ^(g)	-	Q	-	-	-	-	-	-	Q
48 hour <i>Daphnia magna</i> single concentration toxicity test ^(g)	-	Q	-	-	-	-	-	-	Q
Flow ^(f)	-	-	-	-	-	-	-	-	-

- 1) Refer to Table 24, Appendix 2, for abbreviation description.
- 2) Refer to Table 25, Appendix 2, for explanatory notes.
- 3) The requirement for monitoring at this site will be re-evaluated upon acceptance of the GHO LAEMP study design

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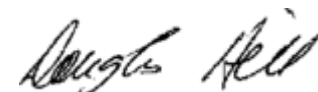
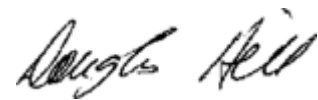

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Table 16 - LINE CREEK OPERATIONS DISCHARGE MONITORING PROGRAM

	NO NAME CREEK POND EFFLUENT TO LINE CREEK	MSA NORTH PONDS EFFLUENT TO LINE CREEK	CONTINGENCY TREATMENT SYSTEM EFFLUENT TO LINE CREEK (r)
<i>EMS Number</i>	<i>E221268</i>	<i>E216144</i>	<i>E219411</i>
PARAMETERS			
Field Parameters ^(a)	M	M	M
Conventional Parameters ^(b)	M	M	M
Major Ions ^(c)	M	M	M
Nutrients ^(d)	M	M	M
Total and Dissolved Metals Scan ^(e)	M	M	M
96 hour Rainbow Trout single concentration toxicity test ^(g)	Q	Q	-
48 hour <i>Daphnia magna</i> single concentration toxicity test ^(g)	Q	Q	-

- 1) Refer to Table 24, Appendix 2, for abbreviation description.
- 2) Refer to Table 25, Appendix 2, for explanatory notes.

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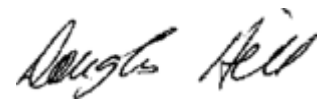
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Table 17 - LINE CREEK OPERATIONS WLC AWTF MONITORING PROGRAM

	WLC AWTF WEST LINE CREEK (Influent)	WLC AWTF LINE CREEK (Influent)	BUFFER POND OUTFALL (Effluent)
EMS NUMBER	E293371	E293370	E291569
PARAMETER			
TSS & Turbidity (field parameters) ³	D	D	D
BOD	-	-	3X/W
Total Selenium	-	-	3X/W
Selenium Speciation (selenate and selenite)	-	-	M
Field Parameters ^(a)	D	D	D
Conventional Parameters ^(b)	M	M	M
Major Ions ^(c)	M	M	M
Nutrients ^(d)	M	M	M
Nitrate (Teck Internal Lab Results for this line only)	W	W	W
Sulphide	-	-	M
Total and Dissolved Metals Scan ^(e)	M	M	M
Bromate	-	-	M
Hydrogen Peroxide	-	-	M
Ozone	-	-	M
Flow ^(f)	C	C	C
96 hour Rainbow Trout single concentration toxicity test ^(g)	-	-	Q*
48 hour <i>Daphnia magna</i> single concentration toxicity test ^(g)	-	-	Q*

- 1) Refer to Table 24, Appendix 2, for abbreviation description.
- 2) Refer to Table 25, Appendix 2, for explanatory notes.
- 3) TSS may be determined as per Permit 5353, Section 2.3

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Table 18 – LINE CREEK OPERATIONS RECEIVING ENVIRONMENT MONITORING PROGRAM

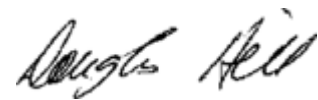
	LINE CREEK UPSTREAM OF PROCESS PLANT	LINE CREEK DOWNSTREAM OF WEST LINE CREEK	LINE CREEK UPSTREAM OF ROCK DRAIN	LINE CREEK UPSTREAM OF WLC BELOW ROCK DRAIN	LINE CREEK UPSTREAM MSA NORTH PIT	SOUTH LINE CREEK	WEST LINE CREEK	NORTH HORSESHOE CREEK NEAR MOUTH
<i>EMS Number</i>	0200044	0200337	0200335	E293369	E216142	E282149	E261958	E223240
PARAMETER								
Field Parameters ^(a)	W/M	W/M	M	M	M	M	M	M
Conventional Parameters ^(b)	W/M	W/M	M	M	M	M	M	M
Major Ions ^(c)	W/M	W/M	M	M	M	M	M	M
Nutrients ^(d)	W/M	W/M	M	M	M	M	M	M
Nitrate	-	-	-	W	-	-	W	-
Total and Dissolved Metals Scan ^(e)	W/M	W/M	M	M	M	M	M	M
BOD	-	W/M	M	M	-	M	-	-
Sulphide	-	W/M	-	-	-	-	-	-
Bromate	W/M	W/M	-	-	-	-	-	-
Hydrogen peroxide	W/M	W/M	-	-	-	-	-	-
Flow ^(f)	C*	C	C	-	-	M	C	-

1) Refer to Table 24, Appendix 2, for abbreviation description.

2) Refer to Table 25, Appendix 2, for explanatory notes.

C* = Water Survey of Canada Station (not operated by Teck)

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Table 19 - ELKVIEW OPERATIONS DISCHARGE MONITORING PROGRAM

	WESTFORK TAILINGS IMPOUNDMENT DISCHARGE TO GROUND	ERICKSON CREEK (@MOUTH) DISCHARGE TO MICHEL CREEK	SOUTH PIT CREEK SEDIMENTATION POND DISCHARGE TO MICHEL CREEK	MILLIGAN CREEK SEDIMENTATION POND DISCHARGE TO MICHEL CREEK	GATE CREEK SEDIMENTATION POND DISCHARGE TO MICHEL CREEK	BODIE CREEK SEDIMENTATION POND DISCHARGE TO MICHEL CREEK	AQUEDUCT CREEK CONTROL STRUCTURE TO AQUEDUCT CREEK
<i>EMS Number</i>	<i>E296310</i>	<i>0200097</i>	<i>E296311</i>	<i>E208057</i>	<i>E206231</i>	<i>E102685</i>	<i>E302170</i>
PARAMETER							
Field Parameters ^(a)	SA	M	M	M	M	M	M
Conventional Parameters ^(b)	SA	M	M	M	M	M	M
Major Ions ^(c)	SA	M	M	M	M	M	M
Nutrients ^(d)	SA	M	M	M	M	M	M
Total and Dissolved Metals Scan ^(e)	SA	M	M	M	M	M	M
96 hour Rainbow Trout single concentration toxicity test ^(g)	-	Q	Q	Q	Q	Q	Q
48 hour <i>Daphnia magna</i> single concentration toxicity test ^(g)	-	Q	Q	Q	Q	Q	Q
Flow ^(f)	W	C	-	-	-	-	-

- 1) Refer to Table 24, Appendix 2, for abbreviation description.
- 2) Refer to Table 25, Appendix 2, for explanatory notes.

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Table 20 - ELKVIEW OPERATIONS DISCHARGE MONITORING PROGRAM (CONTINUED)

	OTTO CREEK (@MOUTH) DISCHARGE TO ELK RIVER	GODDARD CREEK SEDIMENTATION POND DECANT DISCHARGE TO GODDARD MARSH VIA ELK RIVER	LINDSAY CREEK INFILTRATION BASIN DISCHARGE TO GROUND	DRY CREEK SEDIMENTATION POND DECANT TO HARMER CREEK	6 MILE CREEK SEDIMENTATION POND DECANT DISCHARGE TO ELK RIVER
<i>EMS Number</i>	<i>E102679</i>	<i>E208043</i>	<i>E258135</i>	<i>E298590</i>	<i>E102681</i>
PARAMETER					
Field Parameters ^(a)	M	M	M	M	M
Conventional Parameters ^(b)	M	M	M	M	M
Major Ions ^(c)	M	M	M	M	M
Nutrients ^(d)	M	M	M	M	M
Total and Dissolved Metals Scan ^(e)	M	M	M	M	M
96 hour Rainbow Trout single concentration toxicity test ^(g)	Q	Q	Q	Q	Q
48 hour <i>Daphnia magna</i> single concentration toxicity test ^(g)	Q	Q	Q	Q	Q
Flow ^(f)	-	-	-	C	-

- 1) Refer to Table 24, Appendix 2, for abbreviation description.
- 2) Refer to Table 25, Appendix 2, for explanatory notes.

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Table 21 – ELKVIEW OPERATIONS RECEIVING ENVIRONMENT AND OTHER MONITORING PROGRAM

	MICHEL CREEK UPSTREAM OF ERICKSON CREEK	ELK RIVER UPSTREAM OF MICHEL CREEK	BALMER CREEK @ CFI ROAD	FENNELON CREEK @ CFI ROAD	SPRING CREEK @ MOUTH WITH AQUADUCT CREEK	THRESHER CREEK @ MILLIGAN ROAD
EMS Number	0200203	0200111	E298592	E298591	E298594	E298593
PARAMETER						
Field Parameters ^(a)	W/M	M	M	M	M	M
Conventional Parameters ^(b)	W/M	M	M	M	M	M
Major Ions ^(c)	W/M	M	M	M	M	M
Nutrients ^(d)	W/M	M	M	M	M	M
Total and Dissolved Metals Scan ^(e)	W/M	M	M	M	M	M
Flow ^(f)	-	-	M	M	M	M

- 1) Refer to Table 24, Appendix 2, for abbreviation description.
- 2) Refer to Table 25, Appendix 2, for explanatory notes.

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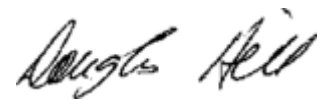
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Table 22– COAL MOUNTAIN OPERATIONS DISCHARGE MONITORING PROGRAM

	DECANT DISCHARGE FROM MAIN INTERCEPTOR SEDIMENTATION PONDS (h)	DECANT DISCHARGE FROM CORBIN SEDIMENTATION POND (h)	PENGELLY CHANNEL DECANT (h)	SOWCHUCK SUMP
<i>EMS Number</i>	<i>E102488</i>	<i>E206438</i>	<i>E298733</i>	<i>E298734</i>
PARAMTER				
Field Parameters (a)	M	M	M	M
Conventional Parameters (b)	M	M	M	M
Major Ions (c)	M	M	M	M
Nutrients (d)	M	M	M	M
Total Metals Scan (e)	M	M	M	M
96 hour Rainbow Trout single concentration toxicity test (g)	Q	Q	Q	-
48 hour LT ₅₀ <i>Daphnia magna</i> single concentration toxicity test (g)	Q	Q	Q	-

- 1) Refer to Table 24, Appendix 2, for abbreviation description.
- 2) Refer to Table 25, Appendix 2, for explanatory notes.

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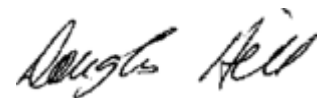
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Table 23 – COAL MOUNTAIN OPERATIONS RECEIVING ENVIRONMENT MONITORING PROGRAM

	MICHEL CREEK UPSTREAM OF OPERATIONS	CORBIN CREEK NEAR CONFLUENCE WITH MICHEL CREEK
<i>EMS Number</i>	<i>E258175</i>	<i>0200209</i>
PARAMETER		
Field Parameters ^(a)	M	W/M
Conventional Parameters ^(b)	M	W/M
Major Ions ^(c)	M	W/M
Nutrients ^(d)	M	W/M
Total Metals Scan ^(e)	M	W/M
Flow ^(f)	M	C

- 1) Refer to Table 24, Appendix 2, for abbreviation description.
- 2) Refer to Table 25, Appendix 2, for explanatory notes.

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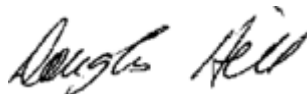
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APPENDIX 3: MONITORING PROGRAM NOTES AND EXPLANATIONS

Table 24 - Abbreviations for Surface Water Monitoring Program

3X/W	Sampling three times per week
C	Continuous Monitoring refer to (f) Table 25
D	Daily frequency
M	Monthly frequency
Ma	Monthly alternative sample location for Swift Creek Sed Pond. Either E221329 or E105061 is sampled, not both.
M/EH	<p>Monthly frequency of one epilimnetic composite of water sampled from three depths (e.g. 1m, 5m,10m) and another hypolimnetic composite of water sampled from three depths (e.g. 20m,32m,45m)</p> <p>Stratification into an epilimnion and hypolimnion will be confirmed wherever a thermocline (defined as a 1°C change over 1 meter depth) is recorded. This temperature differential must be sustained in order to constitute stratification. Where stratified, one composite sample will be formed from three evenly spaced grab samples in the epilimnion and one composite sample similarly from the hypolimnion. Where unstratified, samples will be collected 3 m from the surface, 3 m from the substrate and at the mid-point of the water column. These samples will be averaged to comprise a composite sample.</p>
Q	Quarterly frequency
Q*	Toxicity testing done weekly until one year after commissioning is completed, at which time testing must be done quarterly.
SA	Semi-Annual frequency (twice per year), SA sampling schedules must coincide with the monthly sampling schedule for sampling locations where both sampling frequencies are required.
W/M	Weekly frequency March 15 – July 15, monthly during the rest of the year.
BOD	5-day Biochemical Oxygen Demand
EPH	Extractable Petroleum Hydrocarbons, a combination of HEPH (C19-32) & LEPH (C10-19)
TSS	Total Suspended Solids

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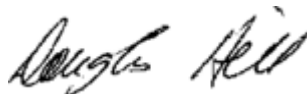


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Table 25- Surface Water Monitoring Program: Explanatory Notes

a	Field Parameters must include water temperature, specific conductance, dissolved oxygen, pH; for Kooocanusa Reservoir locations this includes vertical profiles of dissolved oxygen and temperature
b	Conventional Parameters must include specific conductance, total dissolved solids, total suspended solids, hardness, alkalinity, dissolved organic carbon, total organic carbon, and turbidity.
c	Major Ions must include bromide, fluoride, calcium, chloride, magnesium, potassium, sodium, sulphate.
d	Nutrients must include ammonia, nitrate, nitrite, TKN, orthophosphate, total phosphorus.
e	Dissolved Metals Scan must include aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, chromium, cobalt, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, thallium, tin, titanium, uranium, vanadium, and zinc. Total Metals Scan must include aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, chromium, cobalt, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, thallium, tin, titanium, uranium, vanadium, and zinc.
f	Flow monitoring locations may be changed through approved flow monitoring plan and must follow latest approved plan. Flow measurements must be taken in accordance with Section 9.1.2.2 or in accordance with an approved Flow Monitoring Plan.
g	Acute and chronic toxicity tests must coincide with water quality sampling and-must be implemented in accordance with the toxicity testing program approved by the Director. Teck shall collected samples when ponds are decanting within the permitted sampling frequency
h	If the discharge point is not decanting to the receiving environment, water quality samples must be taken just inside the decant point for all parameters, with the exception of toxicity.
o (LCO)	Water temperature, dissolved oxygen, pH must be continuously monitored.
r (LCO)	To be sampled only when in use.

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 (most recent)



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 for Director, *Environmental Management Act*