Acid Rock Drainage and Metal Leachate Management Plan – Water Quality Annual Report: January 1 to December 31, 2024

Site C Clean Energy Project

March 31, 2025

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Acronyms

ABA	acid base accounting
AFDE	Aecon, Flatiron, Dragados, and EBC
AG	Acid Generating
ARD/ML	acid rock drainage/metal leaching (or leachate)
BCWQG	British Columbia Water Quality Guidelines for Protection of Aquatic Life
CEMP	construction environmental management plan
CVC	conventional vibrated concrete
DOC	diversion outlet cofferdam
DTIP	diversion tunnel inlet portal
DTOP	diversion tunnel outlet portal
EAC	Environmental Assessment Certificate
EOP	end of pipe (in relation to discharge limits)
EPP	environmental protection plan
IDZ	initial dilution zone
IEM	Independent Environmental Monitor
LB	left bank (of the Peace River, when facing downstream)
LBCD	left bank cofferdam
LBDA	left bank draiange adit
LBDT	left bank drainage tunnel
LBEX	left bank excavation
MCW	main civil works
MWTF	mobile water treatment facility
Non-PAG/NPAG	non-potentially acid generating
PAG	potentially acid generating
PMQ	Portage Mountain Quarry
PRHP	Peace River Hydro Partners
RB	right bank (of the Peace River, when facing downstream)
RBDT	right bank drainage tunnel
RCC	roller compacted concrete
RSEM	relocated surplus excavated materials (area)
SBIAR	south bank initial access road
TSS	total suspended solids
QP	Qualified Professional

1. ACID ROCK DRAINAGE AND METAL LEACHATE MANAGEMENT PLAN

1.1 Background and Reporting Requirements

The Acid Rock Drainage and Metal Leachate Monitoring Plan has been developed in accordance with the following regulatory conditions:

- Condition 7 of the Site C Project's Federal Decision Statement, issued to BC Hydro on October 14, 2014 and re-issued November 25, 2014, which requires BC Hydro to:
  - "…develop, in consultation with Environment Canada and Natural Resources Canada, a water quality management plan to address environmental effects to the aquatic environment from the Designated Project, including acid rock drainage and metal leaching."
- Condition 3 of the Site C Project's Environmental Assessment Certificate, (EAC #E14-02), issued to BC Hydro on October 14, 2014, which requires BC Hydro to:
  - "…. develop a water quality monitoring program, [which] must be detailed in the Acid Rock Drainage and Metal Leachate Management Plan."

The Site C Project's Construction Environmental Management Plan (CEMP; Revision 12 dated October 23, 2023), Appendix E – Acid Rock Drainage and Metal Leachate Management Plan (Version 6.1, October 4, 2023) fulfills the requirements of the water quality management plan referenced in the above conditions.

This update satisfies the annual reporting requirements specified by these conditions, covering the reporting period from January 1 to December 31, 2024.

We acknowledge this work is being conducted on the traditional territory of Treaty 8 First Nations of Dunne Zaa, Cree and Tse'khene cultural descent.

2. OVERVIEW OF SITE ACTIVITIES IN 2024

2.1 General Description of Site Activities

Site C construction activities were completed in 2024, with commissioning of the dam completed. In November 2024 the reservoir was filled and the potentially acid generating (PAG) material in the PAG-containing RSEM areas was flooded, which completed the long-term PAG cover management strategy at the site. The implementation of a water cover by flooding the reservoir in 2024 has reduced the risk of ARD/ML from RSEM Area R5A, Approach Channel, RSEM Area R5B and Zone 8 of the Earthfill Dam by permanently saturating the PAG material placed there.

Bedrock material excavation and disposal was tracked throughout 2024, and details of the construction areas and material disposal are summarized in Section 2.5 and detailed in the Appendix A report from Lorax.

A total of 11,190 m^3 PAG bedrock was excavated in 2024 from the Approach Channel and Spillway and was placed in the temporary stockpile in Area 20/21, prior to being relocated to a permanent disposal site approved for PAG material.

The location of construction areas and water management structures relevant to ARD/ML material management are described below and are shown on Figure 1 (dam site) and Figure 2 (off dam site). On the dam site, the areas are categorized per their location on the Right (south) Bank or Left (north) bank of the Peace River, and are listed by excavation site, followed by permanent storage facility. Complete details of the site activities related to ARD/ML, including material excavation, placement, mitigation and monitoring programs should be referenced in the attached appendices.

2.2 Environmental Protection Plans (EPPs)

Each construction area is required to have a BC Hydro approved environmental protection plan (EPP) which describes ARD/ML mitigation and management plans relevant to the site work as per Appendix E of the CEMP. A chance find procedure is included in the EPP document where exposure or disturbance of bedrock is not anticipated as part of the construction activities. As of December 31, 2024 (cumulatively since the start of project construction), 2,169 EPPs (including revisions) have been reviewed by BC Hydro covering all contractors and scopes of work. In the calendar year 2024, 123 of these EPPs (including revisions) were submitted to and reviewed by BC Hydro). Implementation of these plans is the responsibility of site contractors, and is overseen by BC Hydro, the Independent Environmental Monitor (IEM) and ARD/ML Qualified Professionals (QPs).

2.3 ARD/ML Mitigation Hierarchy

The baseline geochemical characterization of bedrock determined that all bedrock units that will be disturbed by dam site construction activities are PAG (KCB, 2015). This report specifies that bedrock should be assumed to be PAG or AG, unless direct sampling and analyses determine otherwise. ARD/ML monitoring is recommended for areas where bedrock is excavated and where these materials are stored.

Mitigation measures implemented to minimize exceedances of discharge limits due to ARD/ML include material management (e.g. excavating or covering bedrock exposure), water management to contain water that may be influenced by ARD/ML, and water treatment to neutralize pH and remove total and dissolved metals.

The primary mitigation strategy for ARD/ML is material management to limit exposure of PAG material and the generation of PAG contact water that may trigger the implementation of additional water management. Weathered material that has been exposed for several months and is becoming acidic is monitored to determine when mitigation is required. PAG bedrock monitoring is discussed in Section 2.4. In addition, material that is placed in RSEM disposal areas is monitored, and weathered material is covered with recently excavated bedrock or overburden. The majority of PAG and AG material will be stored within the future reservoir footprint. This is to slow reaction rates, and ARD/ML to minimal levels once the material is permanently submerged in the reservoir.

The secondary mitigation strategy is water management, including diversion of non-contact runoff from above the project to bypass the construction site, such as Garbage Creek, and retaining as much contact water as possible within the site. Water that must be released is directed to RSEM sediment control ponds or monitored and discharged from the associated rock cut location, from where it is discharged to the Peace River. The construction of two pipelines to facilitate the pumping of R5B Phase 2 Sump water to RSEM R5A Pond A, the RSEM R6 ponds or to the water treatment plant (WTP) greatly improved the water management system at site and decreased the risk of discharging non-compliant water to the Peace River.

The tertiary mitigation strategy is water treatment, wherein contact water not anticipated to meet end of pipe (EOP) discharge limits is conveyed to the WTP which is positioned at RSEM Area R6 and discharges treated effluent through a series of sludge settling cells and ultimately to the RSEM R6W sediment pond. The WTP was operated by PRHP from March 18 to April 6, 2024. Subsequent to April 22, 2024, PRHP relinquished responsibility of WTP operation and maintenance to other parties.

The implementation of various erosion and sediment control measures at site has reduced the frequency of TSS-related exceedance of EOP discharge limits from RSEM Area sediment ponds since the monitoring program was initiated in autumn 2016.

2.4 PAG Bedrock Monitoring

Contractors are each responsible for their respective work areas on the MCW site and have their own QP (ARD/ML) for monitoring, management and mitigation of PAG excavation areas. The primary contractor on the MCW site is Peace River Hydro Partners (PRHP) and their QP (ARD/ML) is Lorax Environmental (Lorax). AFDE is responsible for limited areas on the MCW including L2 and the Powerhouse. Any PAG excavated by AFDE is managed within the PRHP RSEMs and AFDE does manage PAG or PAG contact water within their scope on the MCW site.

ARD/ML monitoring is undertaken in areas where bedrock is exposed or where these materials are stored. Due to the completion of RSEM Areas in 2023 and limited bedrock disturbance by PRHP in 2024, no ARD/ML analyses were completed for PAG bedrock in 2024.

Details of the PAG bedrock monitoring program is presented in Lorax report (Appendix A).

2.4.1 Sediment Monitoring

Section 7.2.4 of the Acid Rock Drainage and Metal Leachate Management Plan (CEMP, Appendix E) addresses the testing and disposal of accumulated sediment from a PAG contact sediment control pond. It states the following:

> *“If the Contractor must remove accumulated sediment from a PAG contact sediment pond, the Contractor shall test the sediment for metals and hydrocarbon to ensure it meets the regulated limits for the site where that accumulated sediment will be deposited.”; and,*

"Prior to decommissioning or infilling of the PAG contact sediment pond, the contractor shall test the sediment for metals and hydrocarbon to ensure it meets the regulated limits."

The accumulated sediment at the bottom of sediment control ponds that may be removed by dredging is referred to as dredgeate. Sediment samples were collected in 2024 from the sediment ponds in Area 11, Area 13, and Area 25 as well as the Phase 3 Crusher settling pond. The geochemical characteristics and hydrocarbon content of the samples were analyzed to ensure the appropriate long-term management plans are implemented for the sludge and dredgeate.

No contamination was identified in sediment samples collected in 2024 from the sediment ponds in Area 11, Area 13, Area 25 and the Phase 3 Crusher settling pond. Based on the results, it was concluded that the sediment accumulated in each area is suitable for permanent disposal in the respective area pond.

Details of the sediment monitoring program and results are presented in Lorax report (Appendix A).

2.5 Dam Site Activities Related to PAG Material Management

Placement of non-potentially acid generating (NPAG) covers on PAG exposures was the primary ARD/ML mitigation strategy to limit the exposure of AG material at site during construction. However, in 2024 only minimal amounts of PAG material was managed by PRHP. Placement of the final NPAG cover on exposed PAG material to minimize potential ARD/ML was conducted at RSEM Area R5B, Earthfill Dam, RSEM Area R5A and RSEM Area L5 prior to 2024. In November 2024 the reservoir was filled and the PAG material in the PAG-containing RSEM areas was flooded, which completed the long-term PAG cover management strategy at the site.

2.5.1 Right Bank PAG Material Management & Excavation

Excavations on the Right Bank in 2024 amounted to a total of 11,190 m^3 of PAG bedrock. This material was produced from excavations on the Approach Channel and Spillway by AFDE. The material excavated on the Right Bank was temporarily placed in Area 20-21. Cumulative volumes of PAG material in the Right Bank RSEMs and stockpiles are summarized in Appendix A.

2.5.2 Left Bank PAG Material Management & Excavations

In 2024, no material was excavated on the Left Bank. Cumulative volumes of PAG material in the Left Bank RSEMs and stockpiles are summarized in Appendix A.

2.5.3 Earthfill Dam

The Earthfill Dam construction reached its final elevation in Q3 2023. The dam was reshaped to its design configuration with placement of the dam cap and rip rap.

In 2024, no material was excavated from the Earthfill Dam. Zone 8 is an area within the upstream side of the Earthfill Dam approved for the placement of PAG material. At the end of 2023, Zone 8 contained 1,984,760 m^3 of PAG bedrock and no material was added in 2024.

2.5.4 Area 20/21 Temporary PAG Stockpile

A temporary stockpile was constructed in 2024 in the Area 21 laydown area to hold PAG material prior to ultimate disposal in an approved location. The stockpile was designed by Tetra Tech, with input from the geotechnical, hydrotechnical and QP-ARD teams for stockpile.

The source of material in the temporary stockpile, as well as the volume and extent of material in the pile varied during the 2024 year. The construction of the Area 21 temporary stockpile pad location was completed at the end of 2023 for the initial purpose of holding PAG material excavations from the Approach Channel excavations. This stockpiled material was moved to the RSEM L5 Garbage Creek area for permanent disposal prior to reservoir flooding. The temporary stockpile received material from the R6 abutment slope excavation in late summer 2024.

Rinse pH tests were conducted on the stockpiled material during the Tetra Tech site audits to evaluate progression of acid generation in the stockpile and inform decision making on relocation of the material.

A water quality sample location was established in January 2024 for the purpose of monitoring run off from the Area 21 Temporary PAG stockpile area. Results are presented in Section 3.2 and detailed in Appendix C.

2.5.5 R6 Abutment Slope

Geotechnical design work was undertaken on the R6 Abutment shale slope, east of the spillway, which resulted in PAG excavation. There was foundation preparation to remove weathered shale bedrock from the existing slope such that the Zone 3 material cover could be placed against fresh and geotechnically sound bedrock. The existing slope was benched back, with the temporary excavations progressed in 10m sections of limited height, and with each section backfilled before the next is excavated on the slope. Tetra Tech was engaged by BC Hydro as the ARD(QP) to review and provide recommendations. The PAG shale removed from the slope was transported to the temporary stockpile in Area 20/21.

2.5.6 Lock Block Wall

The Lock Block wall is a structure located along Bench Zero at the termination of the primary drainage channel on the Left Bank of the Peace River. The purpose of the structure is to collect and dissipate energy and flow of water prior to its entry into the reservoir upstream of the Dam Core.

The structure interfaces with Bench Zero of the LBEx, and there is a space constraint which requires a retaining structure to allow work access. The construction of the structure required excavation in PAG shale rock at the base and along the backwall. The PAG shale rock exposed at the base of the excavation below Elev. 460.00 is mitigated in the long-term by flooding of the reservoir. Shale excavated at elevations ranging from the low water level of the reservoir at EL 460.0 m to maximum El. 464.4 m at the top of shale cut, is exposed to variable water levels,

allowing for wetting and drying cycles and flushing of the bedrock periodically. Permeability of the backfill materials will not prevent oxygen diffusion within the structure and both oxygen and water will be in contact with the shale perpetuating ARD ML processes.

BC Hydro engaged Tetra Tech, as QP(ARD) to provide prescriptions for ARD/ML management and mitigation. Limitations with respect to the design of this Lock Block wall do not allow for reducing either the flow of water through the shale nor the use of low permeability fills to eliminate oxygen. The remaining mitigation techniques include amendments and treatments of the PAG material to either increase available neutralization potential (NP) to act as a buffer and limit acid generation, or to greatly accelerate the acid generation reactions on the exposed PAG surface to burn it out so that the material available to react is controlled and won't occur once the structure is built. The approved construction mitigation of ARD/ML was shotcrete application and lime slurry passivation treatment. Water outflow from the Lock Block wall structure is captured in the overall site water quality program in the Peace River.

2.6 Off Dam Site Activities Related to PAG Material Management

2.6.1 Reservoir Clearing

OLTC16/17 Middle Reservoir Clearing Project – Halfway Frost

The west and east slopes on each side of the creek at Scissor Cut were inspected, assessed, and sampled for rinse pH testing by Tetra Tech during the late April site audit. Tetra Tech identified that the site had employed the possible and previously recommended mitigation of having limestone to buffer acidic drainage prior to discharge to the environment.

The site is now subaqueous under the reservoir filling for permanent mitigation of ARD/ML.

OLTC20a – 4Evergreen Resources

The Eagle Road PAG stockpile was covered and seeded in 2022. Final deactivation of the Eagle Rd PAG cut was completed in August 2023, which included stabilizing the embankment and lining the ditch with limestone to the waterline. Tetra Tech completed a review of the site during the late April site audit and found that the site had employed the possible and previously recommended mitigation for encapsulating PAG and placing limestone to buffer drainage off the Eagle Road exposed shale slope.

The site now subaqueous under the reservoir filling for permanent migration of ARD/ML.

2.6.2 Transmission Line Right of Way

No planned nor incidental PAG excavation or exposures were associated with the 1L364, 5L5 or 5L6 Transmission Line RoWs in 2024.

2.6.3 Highway 29 Realignment

Excavation and mitigation of PAG materials and exposures were largely completed prior to 2023. There were a few minor incidental exposures observed in 2023. No new PAG excavations were encountered in 2024. Refer to previous year's annual reports for details of PAG excavations and ARD/ML management and mitigation on Highway 29.

Exposed PAG from excavations were mitigated by engineered covers, or by temporary covers in accordance with design and the individual segments PAG Management Plans, and in accordance with the CEMP Appendix E, S.5.2.2.

All PAG disposal areas were constructed and monitored in accordance with the CEMP, Appendix E, S.5.2.2.

2.6.4 Portage Mountain Quarry Reclamation

As operations ceased in 2022, no new PAG material was excavated, exposed, or created at Portage Mountain Quarry (PMQ). The Portage Mountain Quarry Reclamation Plan was initiated in 2023 and was completed in 2024.

Water quality sampling continued during reclamation in 2024.

Tetra Tech, as BC Hydro's ARD/ML QP, completed a geological and geochemical characterization report and a Human Health and Ecological Risk Assessment for informing the reclamation plan.

3. OVERVIEW OF WATER QUALITY MONITORING PROGRAMS RELATED TO ACID ROCK DRAINAGE AND METAL LEACHING

The CEMP Appendix E identifies responsibilities specific to BC Hydro and the contractor. In 2024, BC Hydro, as owner, and Peace River Hydro Partners, as MCW contractor, engaged QPs in ARD/ML to assist with implementation of the various water quality monitoring programs identified in Table 1. Additional qualified professionals were engaged by off dam site contractors as warranted. These roles were filled in accordance with CEMP Appendix E, S.6.1.2.

- Lorax Environmental, PRHP's QP for ARD/ML, monitors surface water quality within the construction site, groundwater quality and levels at RSEM Area R5A and R5B (prior to 2020 decommissioning) and observes and tests to assess the geochemical characteristics of bedrock that has been disturbed in the course of construction, such as exposed, excavated and relocated bedrock and RSEM sediment pond dredgate and sludge removal from mobile water treatment facility reactor and settling ponds. In addition to overseeing these water quality monitoring programs, Lorax provided general materials management and professional advice on the topic of ARD/ML
- ASKI Environmental Reclamation and Ecofish Research Ltd., BC Hydro's QP, complete Peace River mixing dynamics and water quality monitoring work undertaken in relation to discharge from PAG-contact RSEM sediment ponds.
- BC Hydro's QP, Tetra Tech Canada Inc., acted in the capacity of auditor of contractor compliance with CEMP Appendix E, while also providing professional advice on the topic of ARD/ML to BC Hydro.

The results of the 2024 ARD/ML water quality program are summarized below. The network of monitoring stations for the Site C project has been adapted as site conditions change, with some stations that were established early in the construction phase no longer in use, and other new stations added. Water quality monitoring is conducted at end of pipe and upgradient station locations. In addition to the surface water quality stations within the construction area, surface

water quality samples at established upstream, far-field downstream and IDZ locations in the Peace River are sampled.

Table 1: Water Quality Monitoring Programs related to the ARD/ML Management Plan (CEMP Appendix E)

	Program Description	CEMP Appendix E Reference	Frequency	Duration	Geographic Extent	Program Responsibility	Monitoring Program Qualified Professional (QP), 2024
Monitoring associated with PAG-contact RSEM Sediment Ponds	**Collected/Contained Water**						
	PAG-contact RSEM Sediment Pond Water Quality Water quality sampling, and installation and operation of data loggers for measurement of pH, turbidity and electrical conductivity from PAG containing RSEM sediment ponds.	7.3.2	Hourly (*in situ* measurements) Daily (water quality sampling)	Ongoing from December 2016	RSEM sediment ponds conveying PAG-contact water	Contractor (Peace River Hydro Partners)	Lorax Environmental
	RSEM Sediment Pond Toxicity Collection of acute toxicity tests (96hr LC50) from water in PAG-contact RSEM sediment ponds	7.2.1, 7.3.1	1) Bi-monthly In event of failure, additional sample 96 hours after first failed sample, additional samples every 96 hours until sample passes. Targeted acute toxicity if pH drops below 6.5 for more than one hour.	Ongoing from November 2016	RSEM sediment ponds conveying PAG-contact water	BC Hydro	ASKI Environmental Reclamation and Ecofish Research Ltd.
	Groundwater						
	Groundwater Monitoring *Install groundwater monitoring wells upgradient and downgradient of RSEM R5A and R5B, and water quality monitoring of groundwater.*	*7.2.5, 7.3.3*	*Quarterly (No longer required as of September 2020 due to river diversion/headpond creation)*	*September 2016 to July 2020 (wells decommissioned September 2020)*	*RSEM R5A and RSEM R5B*	*Contractor (Peace River Hydro Partners)*	Lorax Environmental
	Peace River Surface Water						
	Peace River Mixing Dynamics and Water Quality Monitoring Field verification of modelled river mixing dynamics for the RSEM discharge sites, assessment of appropriateness of Initial Dilution Zone (IDZ) sample sites through discharge plume characterization, and collection of surface water quality samples at established upstream, far-field downstream and IDZ locations in the Peace River.	6.1.1, 7.2.3, 7.3.4	Monthly during RSEM discharge events	Ongoing from December 2016	Peace River at locations upstream and downstream of PAG containing RSEM areas	BC Hydro	ASKI Environmental Reclamation and Ecofish Research Ltd.
Other Monitoring	**Surface Water**						
	Dam Site Road Cut Water Quality Monitoring Water quality monitoring at construction-related road cuts into PAG material.	5.2.1.7	Monthly (except while dry/frozen) for first year of observation, then quarterly thereafter unless otherwise directed by the QP(ARD)	Ongoing from fall 2016	Throughout the dam site (left and right Peace River banks)	BC Hydro & Contractor (Peace River Hydro Partners), in their respective work areas	Tetra Tech Canada Inc. (on behalf of BC Hydro) Lorax Environmental (on behalf of Peace River Hydro Partners)
	Off Dam Site Project Components Water quality monitoring at excavations into PAG material during construction of these project components.	5.2.2	Once prior to initial discharge, then monthly (except while dry/frozen) for first year of observation, then quarterly thereafter	Ongoing from time of exposure until decommissioning	Throughout exposure area, as appropriate	Contractor (various)	Various

3.1 Summary of Implementation Status: Monitoring Programs Associated with PAG-contact RSEM Sediment Ponds

3.1.1 RSEM Sediment Pond Water Management

Water management focuses on segregating possible ARD influenced water (i.e., PAG contact water) from non-PAG contact waters within PAG containing construction areas. Transfers within and between Project area catchments are conducted to improve water management efficiency and to ensure contact waters are routed through an appropriate treatment facility prior to discharge. This is achieved with a network of sumps, ponds, baker tanks, ditches and pipelines, and active water management (i.e., pumps, hoses and water trucks). Water quality monitoring data are used to identify potentially ARD/ML influenced water that requires treatment using the WTP. RSEM sediment control ponds are used to treat suspended sediments (i.e., TSS).

The general water management objectives are to:

- Segregate ARD influenced water that must be treated by the WTP;
- Maximize storage capacity for surges of ARD/ML influenced PAG contact water associated with heavy runoff from rainfall or snowmelt; and,
- Minimize the number of treatment facilities (i.e., sediment control ponds) that require daily management.

The water management system is continuously adapted as earthworks are undertaken, and generally utilizes a series of one or more conveyance and holding structures, including ditches, sumps, and settling ponds. Ultimately, the majority of PAG contact water is diverted to one of five RSEM sediment pond facilities for discharge to the Peace River. Water is transferred to the Water Treatment Plant (WTP) for treatment, as needed. Transfers between catchments are also occasionally undertaken to improve water management efficiency and ensure PAG contact waters are routed through a RSEM sediment control pond.

This maintenance of the water management systems in catchments mitigates risk through 2024, as detailed in Appendix A.

Left Bank Water Management

PRHP maintained control of the LBEX and RSEM L6 catchment areas on the Left Bank. The small RSEM Area L6 catchment, from which contact water is conveyed to the RSEM Area L6 sediment pond. A pump and pipeline to direct water from the LBEX B2 sump to the RSEM L6 sediment pond was decommissioned in January 2024. PRHP handed control of the Left Bank water management to BC Hydro in 2024 Q2.

Right Bank Water Management

Non-contact water upstream of the Substation Laydown, Approach Channel and RSEM Area R5B are diverted in the Right Bank Diversion Ditch to the Moberly River confluence with the Peace River adjacent to RSEM Area R5B.

RSEM Area R6 from which contact water is conveyed to the RSEM R6 sediment control ponds. Water from other catchments above the RSEM area is also transferred to the RSEM R6 ponds. As of April 15, 2024, PRHP was no longer the prime contractor for the RSEM Area R6 ponds.

Area 30 is used to stockpile aggregates from the West Pine Quarry. Runoff from the stockpiled aggregates accumulate in the Area 30 sediment control pond and discharge to the adjacent wetlands through a riprap lined channel.

Area A is a large area to the east of the SBIAR in which NPAG aggregates were being extracted for use at the construction site. Contact water was generally directed to construction water supply or to a side arm of the Peace River.

Water Treatment

The WTP on the Right Bank is used to treat PAG contact water to meet the RSEM EOP discharge limits. It is located in the RSEM Area R6 catchment adjacent to the RBDT facilities. The WTP treatment process and system configuration are described in Appendix A.

The former AK Pond is the WTP Pre-Treatment pond. Water that requires treatment is stored in the WTP Pre-Treatment Pond to supply a steady flow of influent to the WTP. Treated water is routed through the WTP Sludge Pond to settle solids and lower pH prior to discharge of the treated effluent. The clarified and pH adjusted treated effluent is discharged from the Sludge Pond Cell 3 to the RSEM R6 West sediment control pond by gravity flow through a lined discharge channel. A portion of the discharge channel passes through a zinc-plated corrugated steel culvert located under an access road crossing.

The WTP was operated by PRHP from March 18 to April 6. Subsequent to April 22, 2024, PRHP relinquished responsibility of WTP operation and maintenance to other parties.

Process control analytical samples were collected approximately weekly by PRHP at the Pre-Treatment Pond and the Sludge Pond outfall from Cell 3.

Sediment Pond Discharge from PAG-Containing RSEM Catchments

The active PAG-contact sediment ponds on the dam site are presented below with approximate volumes of water discharged during the year. Details of water discharge by month is provided in Appendix A.

No water was discharged from the sediment ponds on the Left Bank in the first four months of 2024. The RSEM L5 sediment control ponds were decommissioned in 2023 and as of April 15, 2024, PRHP was no longer the prime contractor for the RSEM Area L6.

A measured volume of 122,330 m^3 of water was discharged from the Right Bank in the first four months of 2024. All of this was discharged from the RSEM Area R6 West sediment control pond (RSEM R6W). As of April 15, 2024, PRHP was no longer the prime contractor for the RSEM Area R6 ponds.

RSEM R6 West sediment control pond were generally dominated by inflows from AFDE dewatering wells in the RCC Area, with additional flows contributed from the WTP discharge.

Overall, the total discharge from the Right Bank was relatively low (generally less than 20 L/s) in Q1. The discharge was generally greater than 20 L/s) in April.

3.1.2 RSEM Sediment Pond Water Quality

A brief summary of monitoring undertaken at PAG-contact RSEM sediment ponds is provided below; a detailed description is included in Appendix A Lorax report on water quality.

In general, operational PAG-contact RSEM sediment ponds are subject to the following monitoring regime:

- Continuous monitoring of discharge flow from each RSEM sediment control pond discharge pipe;
- Continuous monitoring (15 minute intervals) of pH, turbidity and electrical conductivity using in situ sonde measurements of PAG-contact RSEM sediment control pond water quality, when discharging;
- Daily field measurements and analytical water quality samples collected end of pipe from each PAG containing RSEM sediment control pond;
- Periodic field measurements and analytical samples collected in-pond from each PAG containing RSEM sediment control pond when not discharging; and
- Daily, weekly or periodic field measurements and analytical samples of water quality at upstream sumps and ditches

These monitoring measures are undertaken except when the pond is dry or frozen.

Water quality at stations within the construction site upgradient of RSEM sediment ponds are compared to RSEM EOP limits described in the CEMP Appendix E (Table 1) to inform water management. Water that accumulates at these stations is not discharged directly to the Peace River. Consequently, water quality at these stations that exceeds RSEM EOP limits does not indicate non-compliance with CEMP requirements. It indicates only that water management may be required.

End-of-pipe (EOP) discharge limits from RSEM sediment ponds for pH, TSS, Cd, Co, Cu and Zn are set out in Table 1 in the BC Hydro ARD/ML Management Plan (BC Hydro, 2023a). There were no reported exceedances of EOP discharge limits of RSEM discharges to the Peace River in 2024.

Surface water quality sampling was undertaken at a total of 14 stations in 2024, including 1 station on the Left Bank and 13 stations on the Right Bank. The program was effective in identifying trends and documenting discharge water quality.

Right Bank

RSEM Area R6 Sediment Control Ponds

The RSEM Area R6 East and West sediment control ponds are divided by a berm which isolates the two ponds from each other. The berm was designed to allow the cells to merge in a large (greater than 1-in-10 year 24-hour) storm event. The East and West ponds discharge through separate culverts onto a shared rip rap-protected outfall, which descends the bank to the Peace River. Two stations have been established in each pond: one station within the pond itself and another for sampling discharge from the end of pipe.

Analytical water quality monitoring of RSEM R6 East and West sediment control ponds was conducted throughout 2024, including daily samples at EOP when discharging or occasional in-pond sampling when not discharging and as water levels allowed. The monitoring records indicate that the RSEM R6 West sediment control pond discharged most days in 2024. The East Pond did not discharge in 2024.

The continuous in situ sonde was deployed in-pond in 2024 at both ponds, excluding brief periods when the sonde required maintenance. Field measurements were collected on a daily to weekly basis at the station upstream of the RSEM R6 East pond, when water was flowing in mid-March to mid-April. Analytical water quality data and in situ field pH measurements for RSEM Area R6 East and West ponds are summarized in the sections below.

RSEM Area R6 East Catchment

The 2024 monitoring data indicate the RSEM R6 East sediment control pond water was circum-neutral to slightly alkaline, with sulphate concentrations up to 172 mg/L. The RSEM R6 East sediment control pond did not discharge in 2024.

Monitoring results for RSEM-R6-EP-US-SD, located at the inlet to the RSEM R6 East sediment control pond conveyance ditch, upstream of a road crossing, show slightly acidic conditions (pH 3.6 to 5.3) from March 17 to 19 then circumneutral conditions thereafter. TSS concentrations were variable in the two analytical samples collected, ranging from 703 mg/L to 1,390 mg/L, and corresponds to TSS influenced metal concentrations for total As, Co, Cu, Fe, Mn and Zn. Overall, sulphate levels were moderate (249 to 885 mg/L).

RSEM Area R6 West Catchment

The 2024 monitoring data indicate that the RSEM R6 West sediment control pond water and EOP discharges were circum-neutral to slightly alkaline, with sulphate concentrations up to 70 mg/L

Left Bank

RSEM L6

The RSEM L6 sediment control pond receives runoff water from RSEM Area L6 and discharges through a culvert onto a rip rap protected outfall, which descends the bank to the Peace River. Water quality is monitored at end-of-pipe when discharging, and otherwise at the in-pond station.

The RSEM L6 sediment control pond did not discharge due to low water levels in 2024. Analytical water samples were collected from the in-pond station on March 18, April 5, and April 10. In situ field measurements were collected in parallel with analytical samples in addition to periodic field measurements from the in-pond station.

The pH in all analytical samples and field measurements was circumneutral to alkaline, with moderate sulphate levels. Overall, the concentrations of metals (D-Al, T-As, D-Cd, T-Co, T-Cu, T-Fe, T-Mn, and T-Zn) were low.

3.1.3 RSEM Sediment Pond Toxicity

A summary of toxicity testing undertaken at PAG-contact RSEM sediment ponds in 2024 is provided below; a detailed description is included in Appendix B.

The acute toxicity (Rainbow Trout 96 hour LC50) monitoring program is designed to confirm that water discharged from the PAG contact RSEM ponds is not acutely toxic to aquatic life at the point of discharge into the Peace River. Therefore, prior to discharge into the Peace River, and for the duration of discharge into the Peace River, acute toxicity testing is required for each RSEM pond.

The toxicity testing program for PAG containing RSEM sediment ponds consists of two components: routine bi-monthly monitoring and targeted monitoring as specified in the CEMP. In 2024, acute toxicity of RSEM pond water was monitored for each pond, provided sufficient water was available for sampling. Toxicity samples were not collected if the water level was too low or the pond was frozen to the bottom, in this case, sampling was postponed until sufficient water was available.

The acute toxicity testing is performed by Nautilus Environmental Inc. (Nautilus, in Burnaby or Calgary), and in rare cases by Bureau Veritas Laboratories (in Burnaby) or ALS (in Winnipeg) when Nautilus is having issues with their supply of Rainbow Trout. Sample carboys are delivered to ALS in Fort St. John shortly after sampling (on the same day) and the samples are shipped to Nautilus following standard chain of custody and within acceptable hold times.

Acute toxicity was evaluated using a standard laboratory assay (Rainbow Trout 96-hour LC50 test) performed on water samples collected directly from the pond or from the end of pipe pond outflow. A toxicity test “passes” (i.e., the pond water is not acutely toxic) if the result of the test is >50% survival in undiluted pond water. Considering all RSEM ponds, a total of 17 routine toxicity samples were collected in 2024 and all the tests passed. Eleven samples were collected from the RSEM R6W and RSEM R6E ponds and six samples were collected from the RSEM L6 pond.

RSEM R6

In 2024, RSEM R6 toxicity samples were collected on a bi-monthly sampling schedule starting in January for RSEM R6W and in February for RSEM R6E. RSEM R6E could not be sampled in December 2024 because it was frozen.

RSEM L6

In 2024, toxicity sampling of the RSEM L6 pond was done on a bi-monthly basis from March through November; the pond was frozen/empty in January. Additional sampling of the RSEM L6 pond was performed in December 2024 to account for the transfer of seepage water from the Diversion Tunnel to RSEM L6.

3.1.4 Peace River Mixing Dynamics and Water Quality Monitoring

A summary of Peace River mixing dynamics (IDZ study) and water quality in 2024 is provided below, as reported by Ecofish. A detailed description is included in the Ecofish Annual Report in Appendix B.

Peace River Mixing Dynamics

Mixing in IDZs has been assessed by Ecofish Research Ltd. on behalf of BC Hydro. Water quality monitoring in the Peace River is also undertaken by Ecofish and reported monthly as well as in the annual report.

Prior to the construction of RSEM sediment ponds and any associated discharges, water quality modelling was undertaken by the project to examine the predicted mixing capacity of the Peace River through a 100 m IDZ. Modelling in previous years has demonstrated that the RSEM discharge plume is generally fully mixed with the Peace River 20 m to 40 m downstream of the pond discharge location, but when present at the 100 m IDZ, is detectable at the proposed 10-15 cm depth 1 m from shore. Mixing within the IDZ for each sediment pond discharge occurs with only a portion of the total flow in the Peace River.

Monitoring of RSEM pond discharge plumes within the IDZ is conducted to characterize dilution under a variety of pond discharge and Peace River flows to meet the CEMP requirement to confirm discharge plume dynamics and modeling predictions. IDZ characterization relies on measurements of in situ specific conductivity, as conductivity in the RSEM ponds is reliably higher than the Peace River. In situ specific conductivity measurements are recorded in the Peace River at different depths (typically 15 and 30 cm below the surface), distances from shore, and distances upstream and downstream from pond discharge points.

Water Quality Monitoring

Monthly and 5 in 30-day water quality sampling (five evenly spaced sampling events over 30 days performed twice per year, once during clear flow and once during turbid flow) were conducted during periods of RSEM pond discharge in 2024. Sampling consists of collecting measurements in the field, and collection of water quality samples for laboratory analysis.

The full suite of laboratory parameters as specified in Section 7.3.2 of the ARD/ML Management Plan (CEMP, Appendix E) (physical, anions and nutrients, total metals, and dissolved metals) were sampled monthly when the RSEM ponds were discharging. The same parameters were also sampled for the 5 in 30-day sampling. Monthly sampling was used to also fulfil one or more of the 5 in 30-day sampling requirements. These parameters are consistent with those being measured by PRHP and (West Moberly-DWB Limited Partnership) WM DWB LP in the RSEM ponds.

For the monthly monitoring conducted in 2024, there were no observations of exceedances in the Peace River of the BC WQG (short-term or long-term) for the protection of aquatic life that were attributed to discharge of water from the RSEM ponds. Similar to previous annual monitoring and baseline monitoring (see Appendix B for details), there were natural exceedances in the Peace River of the total iron short-term maximum BC WQG for the

protection of aquatic life. Natural total iron exceedances occurred predominantly during the freshet period in June and were observed at all sample sites except the R6 IDZ site located 100 m downstream of the RSEM R6 discharge point. Exceedances were most often associated with elevated concentrations of suspended solids in the Peace River.

During 5 in 30-day sampling that takes place in the fall under clear water condition, there are normally no exceedances of the long-term BC WQG. However, in October 2024, there was an exceedance of the dissolved zinc long-term average BC WQG for the protection of aquatic life at far-field downstream site on the left bank. There were also exceedances of the dissolved nickel long-term BC WQG at RSEM R6 upstream, RSEM R6 IDZ, and two far-field downstream sites during 5 in 30-day sampling in October 2024. These dissolved nickel and dissolved zinc long-term guideline exceedances are not related to discharge from the RSEM ponds. Rather, they are thought to be related to changes in water quality during and immediately following reservoir filling.

Peace River TSS

The RSEM ponds have EOP limits for total suspended solids (TSS). Continuous turbidity gauges installed on the left and right bank of the Peace River upstream of the confluence with the Moberly River were used from January to August 2024 to inform the project's Main Civil Works contractor, PRHP until April 21, 2024 and WM DWB LP as of April 22, 2024, of the Peace River background TSS. These stations were decommissioned in August 2024 prior to reservoir filling and were replaced with two stations located ~1 km below the Site C dam.

To estimate the background Peace River TSS, Ecofish has developed TSS:turbidity relationships over the course of monitoring which are used to estimate TSS concentrations from the turbidity data logged by the monitoring stations. This relationship between TSS and turbidity is dynamic and depends upon a variety of factors, including snowmelt and precipitation driven changes in the relative contributions of various sediment sources (BC ENV 2024), as well as hydrology related changes in the sediment carrying capacity of the Peace River. As such, a site-specific TSS:turbidity relationship has been developed for the Peace River over a range of flow and turbidity conditions and this relationship is updated regularly with turbidity data recorded by the gauges paired with additional data from laboratory analysed TSS samples to ensure the relationship reflects current conditions. In 2024, TSS sampling was completed on 12 sampling dates.

The TSS:turbidity relationship applied to calculate TSS from turbidity data in 2024 was 0.71:1. A total of 299 samples collected over 69 samples dates between December 15, 2017 to October 6, 2024 were used to develop the updated TSS:turbidity relationship. These data encompassed a wide range of turbidity (1.7 NTU to 2,618 NTU) and TSS (2 mg/L to 1,710 mg/L) observations.

Trends in the Data Related to Reservoir Filling

Site C reservoir filling began on August 25, 2024; the first turbine came into operation on October 28, 2024. There were several parameters that exhibited higher concentrations compared to what is normal under the clear water conditions that were present for the

commencement of reservoir filling. These higher-than-normal concentrations were not observed in the early part of reservoir filling when samples were collected on September 19, 2024. However, they were observed during 5 in 30-day sampling which began on October 3, 2024 and ended on October 31, 2024, and during monthly sampling that took place on November 7 and 8, 2024. Monthly sampling in December took place on December 26, 2024, and these elevated concentrations had generally returned to what is typical for the Peace River under clear flow conditions in the winter.

Despite concentrations of the parameters being elevated above normal, there were no exceedances of short-term BC WQG. In October 2024 during 5 in 30-day sampling, exceedances of the dissolved nickel long-term BC WQG were observed at the RSEM R6 upstream, RSEM R6 IDZ, and two far-field downstream sites; there were no exceedances of this guideline in the corresponding R6 pond data. The dissolved nickel concentrations were high enough from October 3 to November 7/8, 2024 at the left bank far-field downstream site to result in an exceedance of the long-term BC WQG for nickel when the annual average concentration at this site is compared to the long-term BC WQG. Dissolved zinc also exceeded the long-term BC WQG at the left bank far-field downstream site in October 2024.

3.1.5 Groundwater Monitoring

The groundwater monitoring program at RSEM R5A and R5B was initiated in 2016 and completed in 2020 to fulfill the requirements of CEMP Appendix E, S.7.25 and S.7.3.3. Details of the groundwater monitoring are provided in previous years annual reports.

Separate from the above-mentioned program, groundwater seepage water quality and water management are dealt with in various areas of the site, which is detailed by Lorax in Appendix A.

3.2 Summary of Implementation Status: Other Monitoring Programs

3.2.1 Dam Site Road Cut and Other PAG Shale Exposures Water Quality Monitoring

A summary of the 2024 monitoring results for the dam site road cut water quality program is included below, as reported by Tetra Tech. Details of the sampling programs and results are provided in the Tetra Tech annual report in Appendix C.

Two large double lane dam site road cuts referred to as River Road (exposed in 2015) on the Left Bank between Howe Pit and the Peace River, and the South bank Initial Access Road (SBIAR), exposed in early 2017, on the Right Bank between Area A and RSEM R6 have been constructed to allow site vehicle access from the upper terrace to the lower flood plain. Continued exposure of bedrock materials from both of these road cuts requires that routine water quality monitoring be conducted by BC Hydro as required by CEMP Appendix E S.5.2.1.7.

Monitoring locations were added from October 2020 to 2023 at the L2 Powerhouse Area and from 2020 to 2024 at the BC Hydro LBDB to monitor water quality from exposed PAG slopes. The L2 Powerhouse sample location discontinued following March 2023 due to expansion of construction of the powerhouse extended over top of the sample locations. The LBDB location

was discontinued following June 2024 due to inundation of the Peace River during flooding of the reservoir.

Additional monitoring of the RBDT/RBDT-Sump and Area 21-Sump were conducted relatively consistent during 2024. The monitoring program includes locations at the discharge points and at midstream locations as well as locations upstream from the discharge to characterize variation to water chemistry within the catchment due to mixing and inflow of water from multiple sources.

Water quality sampling was conducted at SBIAR, RR, LBDB, RBDT, and Area 21-Sump during 2024 outside of dry or frozen conditions.

A summary of the 2024 monitoring results for the dam site road cut water quality program is included below, see Appendix C for details.

River Road

A total of eleven (11) monitoring locations are established in the River Road catchment near Blind Corner to observe longer term influences from the PAG outcrop at Blind Corner and run-off/seepage from Howe Pit on the water collected in the River Road ditch. ARD-ML management and mitigation along River Road adjacent to the PAG slopes includes a cut-off ditch above the slope, which diverts surface flows into limestone rip-rap lined “Chimney ditches” which then feed into the River Road ditch below the slope. The River Road ditch adjacent to the PAG slope includes a bentonite liner and limestone rip-rap to provide neutralization potential and mitigate against acidic drainage.

In situ field and laboratory results in 2024 within the River Road ditch indicated a neutral to alkaline pH throughout the sampling year. The observation of consistent neutral to alkaline pH drainage conditions at all locations in River Road area in 2024 are indicative of changes in the exposed PAG slope over time. Visual observations show that over time the slope has weathered and developed a partial clay capping surface which may be limiting ARD/ML reactions, and sections of the exposed PAG slope have been observed to have naturally revegetated in localized areas.

Lab water quality measurements during 2024 from a total of one (1) sample collected from RR resulted in one (1) BCAWQG-FST exceedances for total iron. The exceedances are primarily attributed to washing, or flushing, of sediment and secondary mineral precipitate during freshet (or precipitation following a dry period), as water contacted accumulated sediment within the ditch in addition to the exposed shale, colluvium, and overburden cut-banks. It is anticipated that sediment in the ditch will continue to accumulate a small amount of secondary mineral formed by up-gradient ARD-ML processes. These minerals commonly contain an elevated concentration of metals related to ML and mineral precipitation from acid neutralizing reactions.

The source of TSS is primarily from River Road run-off, scouring of sediment deposited within the River Road ditch and washing from the cut-slopes. Seasonally, elevated TSS levels have been noted to occur during spring melt and freshet season, typically April, when water flow can wash elevated precipitates from rock.

South Bank Initial Access Road

Water quality data was collected from three established sampling locations in 2024 that measure water directly from within the SBIAR ditch locations. The ditch samples provide long-term characterization of SBIAR water management and water quality originating from the SBIAR PAG slope at the upstream and downstream location in the east ditch, and the downstream west ditch. The upstream west ditch was not sampled in 2024 due to changes in ditch access.

Alkalinity and pH indicate that the waters in SBIAR have measured inconsistently from below to within the BCAWQG guideline range (pH 6.5 to 9.0), fluctuating from acidic to neutral in 2024, with various occurrences of elevated metals above the BC WQG in some sample events.

Concentrations of total and dissolved iron, total cobalt, total manganese, dissolved cadmium, dissolved copper, dissolved zinc, and pH were measured as exceedances of the BCAWQG-FST in the RBSBIAR-DS location. No samples were collected from the RBSBIAR-US upstream location. No BCAWQG-FST exceedances were measured in the RBSBIAR-EUS and RBSBIAR-EDS locations from sampling in 2024.

In 2024, at the downstream SBIAR locations, total iron (5), dissolved iron (5), total manganese (2), total cobalt (2), dissolved cadmium (2), dissolved copper (1), dissolved zinc (5), and pH (2) were measured BCAWQG-FST exceedances at RBSBIAR-DS were measured in eight sampling events from March to October 2024; total aluminum (6) and total arsenic (2) measured BCAWQG-FST exceedances in the eight sampling events. Sediment washing and ditch cleaning can influence the SBIAR cut-slope. No BCAWQG-FST exceedances were measured at RBSBIAR-EDS in one sampling event in June 2024.

There is an intensive water quality monitoring program in the pond (continuous in situ measurements of pH, conductivity; daily lab analysis for all parameters) conducted prior to discharge by Lorax Ecofish Research Ltd. and others, as well as Peace River receiving environment monitoring conducted by Ecofish and others.

L2 Powerhouse Area

In 2024, due to progress of the dam construction the Powerhouse area included two sampling locations, the RBDT-Sump and R6 Slope. Additionally, material sourced from the R6 Slope (Powerhouse Area) that was stored at the Temporary Area 21 PAG Stockpile was, included a sample location at the Area 21 Sump. These three sampled locations were monitored in 2024, although not included in the CEMP.

Water from the Powerhouse area is conveyed to AFDE RSEM R6 pond as needed or water treatment facility that discharges to the sediment pond. Water from the AFDE RSEM R6 pond is monitored prior to discharge.

Right Bank Drainage Tunnel

During 2024, at the RBDT location, thirteen (13) sampling events occurred. There was a total ten (10) BCAWQG-FST (freshwater short-term) guideline exceedances measured, including for pH > 9.0 (5), ammonia (1), and total iron (4). Parameters measured above the BCAWQG-FLT

(freshwater long-term) guideline for total aluminum (12), total arsenic (5), total silver (2), dissolved copper (5), chloride (5), ammonia (5), and nitrite (1) were noted.

At RBDT, the pH measures consistently alkaline and exceeded the upper limit of pH > 9.0 from the BCAWQG-FST guideline (pH 6.5-9.0) during five of the total twelve months. The pH values measured within the BCAWQG-FST guidelines from January to July 2024, followed by a pH range >9.0 exceeding the guidelines from August to December 2024. Four exceedances were measured above the BCAWQG-FST guideline (1000 µg/L) for total iron in March, April, May and July 2024. One BCAWQG-FST exceedance was measured for ammonia on September 25 (777 µg/L), and other months ranged from 26.8 to 438 µg/L.

R6 Slope

On May 26, 2024, BC Hydro personnel completed six rinse pH tests with shale material from the R6 Slope. The rinse pH values range from 3.22 to 3.64, with an average rinse pH of 3.46.

During the October 2, 2024 site audit, Tetra Tech personnel completed five rinse pH tests on shale material sourced from R6 Slope that was stockpiled at Area 21 Temp PAG Stockpile. The rinse pH values range from 3.67 to 6.76, with an average rinse pH of 5.42. Four rinse pH values measure below the acceptable BCAWQG-FST guidelines (pH 6.5-9.0), and one rinse pH value measures slightly within the acceptable guidelines.

Area 21 Temporary PAG Stockpile Sump

In the seven (7) sampling events at the Area 21-Sump location from April to October 2024 there were no BCAWQG-FST exceedances measured.

At Area 21-Sump, the pH measures consistently neutral to alkaline with a range of pH 7.71 to 8.05, and average pH 7.92.

BC Hydro Left Bank Debris Boom

Water quality sampling commenced at the BC Hydro LBDB area in accordance with the CEMP Appendix E in October 2020 and continued sampling through to July 21, 2024. The LBP Pond was sampled five times from March to July 2024 before the area was inundated from the Peace River to the approximate 460m flooded elevation. The remainder of LBDB sampling locations were observed with frozen or no flow conditions and not sampled in 2024.

In 2024, during the five sample events from March to July 2024 at LBP Pond, a total of three BCAWQG-FST exceedances were measured including total iron (2) and dissolved zinc (1). The LBP Pond is not a discharge station and most commonly no flow is observed in or out of the pond.

At LBP Pond, pH values have remained neutral to alkaline with pH values at or above 7.92. Total alkalinity values vary with an overall increasing trend through the year, which is a similar trend noted in previous years. Acidity values vary from below detection limit <2 mg/L to 7.9 mg/L in 2024, which is within range of previous years.

Left Bank Excavation

The pipeline that was installed from the LBEX Bench 2 sump to the RSEM L6 Pond and the pipeline was decommissioned in January 2024. No water quality testing was undertaken at the LBEX sample stations in 2024.

3.2.2 Right Bank Areas

Area 30 / Septimus Hill

Area 30 is located southeast of the dam construction area and includes the rail loadout facility located on Septimus Hill that receives and stockpiles limestone aggregate from the West Pine Quarry. The sediment pond or discharge was monitored on at least a monthly frequency in January through June during ice free periods and samples submitted to the analytical laboratory. Occasional discharge was reported in January, March, May and June.

Field measurements collected at the Area 30 sediment control pond (in-pond and at EOP) show circumneutral conditions, with field pH and field conductivity ranging from pH 6.8 to 8.3 and 880 to 3,130 µS/cm. Sediment pond water quality showed a maximum TSS of 12 mg/L. Analytical results for sediment pond discharge met the short-term BC WQGs for all parameters.

Monitoring of the Septimus Beaver Pond was performed on May 2nd at four spatially distributed locations. Parameters which showed concentrations above the short-term BC WQGs were observed for total Fe at two locations and dissolved Fe at one location. Parameters were below applicable long-term BC WQGs. Overall, Se concentrations show a range of <0.00010 mg/L to 0.00020 mg/L in Septimus Beaver Pond samples, below the long-term BC WQG (0.002 mg/L).

Area A

Area A is located south-east of the dam construction area, and east of the SBIAR ditch. Within this area, NPAG overburden and aggregate are excavated and transported to the Phase 2 Crusher to produce aggregate that is temporarily stockpiled for use at the construction site. Phase 2 Crusher water is directed to settling ponds in Area A to settle TSS, and clarified water is recycled within the crusher circuit.

In 2024, analytical samples were collected in March and June from the Area A North Ditch, while field measurements were taken when sufficient water was present. All field measurements at this location show circumneutral to slightly alkaline pH values. TSS was relatively low in the March and June samples (26 and 22 mg/L, respectively). The total Fe concentration in the June 16 sample was above the short-term BC WQG. All other analytical results show parameter concentrations below the short-term BC WQGs.

Water Treatment Plant (WTP)

The WTP on the Right Bank is used to treat PAG contact water to meet the RSEM EOP discharge limits. It is located in the RSEM Area R6 catchment adjacent to the RBDT facilities. Water directed to the WTP accumulated in the Pre-Treatment Pond. Process control analytical samples were collected approximately weekly by PRHP at the Pre-Treatment Pond and the Sludge Pond outfall from Cell 3.

3.2.3 Off Dam Site Water Quality Monitoring

Water quality monitoring at off-dam site exposures included the Scissor Cut and Portage Mountain quarry, was completed in 2024.

An in-situ water quality measurement in the creek at the toe of the Scissor cut slope was recorded in April 2024 and noted neutral pH conditions with a value of pH 8.1. Water quality sampling was completed by Ecofish on 17 April 2024 at the Scissor Cut location.

Water quality monitoring at Portage Mountain Quarry was completed during the completion of reclamation work in the quarry. Results are detailed under separate cover as part of the reclamation summary reporting.

4. SITE AUDITS

BC Hydro has engaged Tetra Tech as QP (ARD), in accordance with the CEMP Appendix E S. 6.1.2, to inspect and monitor various construction areas with potential for ARD/ML since June 2016. The site audit includes observations of ARD-ML materials management at various construction areas, Relocated Surplus Excavation material (RSEM) facilities and designated water discharge points.

The site audit locations focused on areas of stored or exposed shale rock, condition and functioning of implemented mitigation and management including limestone riprap and water management structures, and the surface water receptors potentially influenced by PAG materials. While visiting these locations, observations were made based on visual inspection and detailed investigations were not conducted, however, some in-situ measurements or confirmatory rock samples were collected during some audits.

A summary of each of the site audits was reported to BC Hydro during the year. Site audits completed during 2024 for the project were conducted as follows:

- April 29 - May 1, 2024: Lara Reggin, P.Geo. and Erica Massey, P.Geo., from Tetra Tech, completed a site audit at the Main Civil Works areas, including LBEX, LBDB, SBIAR, RR and Area 21 Temp Stockpile on April 29, off-site and Highway 29 locations on April 30, and RBDT, AK Pond and R6 Ponds on May 1.
- While visiting these locations, observations were made based on visual inspection, sample collections for rinse pH tests, and in situ water quality tests to verify the local ambient site conditions. Five (5) in situ water measurements, thirty (30) rock samples from exposed shale on the MCW site, and five (5) rock samples were collected from the South Reservoir locations for field rinse pH analysis.

  Site areas visited during the audit:

  - Left Bank: MCW River Road, Left Bank Debris Boom, and RSEM L6.
  - Right Bank: RSEM R5A, RSEM R5B, Approach Channel, SBIAR, RBDT portal, Dam Core, Area A, 21, 25, Powerhouse Area, Spillway basin, and Moberly River PAG slope.

- Off-site and Highway 29: Key-in Fill, Eagle Rd Km 13.5, Scissor Cut, and Halfway River Boat Launch.

- October 1-3, 2024. Erica Massey, P.Geo., from Tetra Tech, completed a site audit at the MCW dam site. The site audit locations focused on areas of stored or exposed shale rock (PAG), condition and functioning of implemented mitigation and management, including limestone riprap and water management structures, and the surface water receptors potentially influenced by PAG materials. No in situ rinse pH values or samples were collected. Site areas visited during the audit:
  - Left Bank: River Road, North Bank Road, P5 Stockpiles, Bench Zero, Lock Block Wall, LBEx.
  - Right Bank: SBIAR, Area 21 Temporary PAG Storage, Area 20/21 Material stockpiles.

Appendix A

Appendix B

Appendix C