



Klohn Crippen Berger

Teck Highland Valley Copper Partnership

2022 Annual Facility Performance Report

7-Day Pond Tailings Storage Facility



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Teck Highland Valley Copper Partnership
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Mr. Bryan Bale, P.Eng.
Chief Engineer, Tailings

Dear Mr. Bale:

2022 Annual Facility Performance Report
7-Day Pond Tailings Storage Facility

We are pleased to submit the final 7-Day Pond Tailings Storage Facility 2022 Annual Facility Performance Report. The review period for this document is from October 2021 through September 2022.

Yours truly,

KLOHN CRIPPEN BERGER LTD.



Pablo Urrutia, P.Eng.
Engineer of Record, Representative
Senior Geotechnical Engineer, Associate

PU/AC:cd

Teck Highland Valley Copper Partnership

2022 Annual Facility Performance Report

7-Day Pond Tailings Storage Facility

EXECUTIVE SUMMARY

Klohn Crippen Berger Ltd. (KCB) was engaged by Teck Highland Valley Copper Partnership (HVC) to complete the 2022 Annual Facility Performance Report (AFPR) of the 7-Day Pond Tailings Storage Facility (TSF). The review period of this AFPR is from October 2021 through September 2022.

The 7-Day Pond TSF is 180 m north of the Highland Mill, and is used to store tailings and water from the Highland Mill during upset conditions.

The 7-Day Pond TSF Structures

The 7-Day Pond TSF is contained by the East Berm and pit waste rock dumps, which also act as access routes around the perimeter of the facility. The East Berm is about 200 m long, has a maximum height of 6 m, and a minimum crest width of 8 m. The existing 7-Day Pond impoundment area is about 7 hectares.

Immediately downstream of the East Berm there are two vegetated areas of approximately 17,000 m² combined (referred to herein as “the treed areas”), which are fully contained by access road fills. The 7-Day Pond TSF and treed areas are the low points of the surrounding catchment; therefore, the 7-Day Pond TSF does not have a failure mode that could endanger permanent population downstream of the facility.

During the review period the key roles, according to the definitions in the Health, Safety and Reclamation Code for Mines in B.C. (HSRC¹), were filled as follows:

- Mr. Bryan Bale, P.Eng. (HVC Chief Engineer - Tailings) acted in the role of TSF Qualified Person; and
- Mr. Pablo Urrutia, P.Eng. was the Engineer of Record, as a representative of KCB.

Activity and Operation during the Review Period

During the review period, the 7-Day Pond TSF was maintained within the design basis and conditions assumed for the approved design.

Approximately 13,000 m³ of tailings were discharged into the facility during the review period, resulting in a remaining storage capacity of about 119,500 m³. This exceeds the facility’s minimum required storage capacity to store the inflow design flood (IDF) (92,100 m³).

Surveillance Program

The OMS Manual and the Emergency Preparedness and Response Plan (EPRP²) were reviewed during the review period and are current and suitable for the facility. The 7-Day Pond TSF surveillance program, described in the OMS Manual, is appropriate for this facility.

¹ EMLCI. 2021b. “Health, Safety and Reclamation Code for Mines in British Columbia, Revised.” February.

² EPRP = Dam Emergency Plan (DEP).

During the review period, surveillance activities were completed as prescribed in the OMS Manual.

7-Day Pond TSF Performance

The facility performance during the review period was consistent with historic performance; no issues of dam safety concern or unacceptable performance were identified. KCB made the following key observations regarding the performance of the 7-Day Pond TSF during the review period:

- Existing design and management controls are in place and are performing as intended based on measured performance.
- No observations that would indicate unacceptable dam behaviour were recorded during visual inspections by the HVC dam inspector, the EoR's AFPR site visit, or others working in the area.
- HVC operated the 7-Day Pond TSF with a minimal pond by using the fixed pumping system installed in 2020, and additional support from a diesel pump, when needed.
- The minimum freeboard measured at the 7-Day Pond TSF during the review period was 1.5 m, which is greater than the target minimum freeboard adopted by HVC for the facility (i.e., 0.5 m).

Design Basis and Failure Mode Reviews

A review by HVC and KCB concluded there had been no significant change to conditions (e.g., infrastructure, land use) downstream of the 7-Day Pond TSF during the review period.

HVC and KCB reviewed the current IDF and earthquake design ground motion (EDGM) for the 7-Day Pond TSF to confirm they meet or exceed the equivalent requirements under the HSRC.

Potential failure modes for the 7-Day Pond TSF were also reviewed by HVC and KCB during the review period based on available information and existing controls. The review concluded that potential failure modes are being managed appropriately.

At the request of HVC, the AFPR does not include any reference to a consequence classification for the 7-Day Pond TSF. Consequence classification is not part of HVC's tailings management governance and stewardship because there are components of that system that do not align with HVC's safety culture. HVC's internal governance has been developed to meet or exceed requirements under the HSRC.

Recommendations

There were no outstanding recommendations related to facility performance at the start of the review period and no new dam safety recommendations were identified during the 2022 AFPR.

The last dam safety review (DSR) for the facility was completed in 2018; all recommendation from the 2018 DSR have been addressed. The next DSR is scheduled for 2023 to meet the requirements of the HSRC.

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CLARIFICATIONS REGARDING THIS REPORT

This report is an instrument of service of Klohn Crippen Berger (KCB). The report has been prepared for the use of Teck Highland Valley Copper Partnership (Client) for the specific application to the 2022 Dam Safety Support Project, and may be published or disclosed by the Client to the BC Ministry of Energy, Mines, and Low Carbon Innovation.

KCB has prepared this report in a manner consistent with the level of care, skill and diligence ordinarily provided by members of the same profession for projects of a similar nature at the time and place the services were rendered; however, the use of this report will be at the user's sole risk absolutely and in all respects, and KCB makes no warranty, express or implied. This report may not be relied upon by any person other than the Client or BC Ministry of Energy, Mines, and Low Carbon Innovation without KCB's written consent.

Use of or reliance upon this instrument of service by the Client is subject to the following conditions:

1. The report is to be read in full, with sections or parts of the report relied upon in the context of the whole report.
2. The Executive Summary is a selection of key elements of the report. It does not include details needed for the proper application of the findings and recommendations in the report.
3. The observations, findings and conclusions in this report are based on observed factual data and conditions that existed at the time of the work and should not be relied upon to precisely represent conditions at any other time.
4. The report is based on information provided to KCB by the Client or by other parties on behalf of the client (Client-supplied information). KCB has not verified the correctness or accuracy of such information and makes no representations regarding its correctness or accuracy. KCB shall not be responsible to the Client for the consequences of any error or omission contained in Client-supplied information.
5. KCB should be consulted regarding the interpretation or application of the findings and recommendations in the report.

1 INTRODUCTION

Klohn Crippen Berger Ltd. (KCB) was engaged by Teck Highland Valley Copper Partnership (HVC) to complete the 2022 Annual Facility Performance Report (AFPR) of the 7-Day Pond Tailings Storage Facility (TSF) on the Highland Valley Copper mine site (HVC Mine Site). The review period for the 2022 AFPR is between October 2021 through September 2022.

During the review period, Mr. Bryan Bale, P.Eng. (HVC Chief Engineer - Tailings) acted in the role of TSF Qualified Person (QP) and Mr. Pablo Urrutia, P.Eng. was the Engineer of Record (EoR), as a representative of KCB. These roles are consistent with the definition in the Health, Safety and Reclamation Code (HSRC) (EMLCI 2021b).

The AFPR scope of work consisted of:

- site visit to observe the physical conditions of the various containment facilities;
- review of surveillance data for the review period, provided by HVC;
- review of climate and water balance data for the site;
- review of the Operations, Maintenance and Surveillance (OMS) Manual and Emergency Preparedness and Response Plan (EPRP) to confirm they are appropriate for the existing facility; and
- review of construction activities completed at the site during the review period, if any.

The AFPR site visit to the 7-Day Pond TSF was completed by KCB representatives Mr. Pablo Urrutia, P.Eng., Ms. Cheryl Torres, Civil Consultant and Mr. Andrew Côté, EIT on July 26, 2022. During the site visit, the weather was sunny and clear.

The 7-Day Pond TSF is operated under the general British Columbia Ministry of Energy, Mines and Petroleum Resources (EMPR) geotechnical permit M11 for the mine (Mine ref. 0300010 HVC). The 7-Day Pond TSF, referred to as the Emergency Tailings Pond, is also permitted under the British Columbia Ministry of Environment (MOE) effluent permit PE-376 to receive upset condition discharges from the Highland Mill.

2 FACILITY DESCRIPTION

The HVC Mine Site is located near Logan Lake, approximately 45 km south of Kamloops, in the British Columbia Interior. The 7-Day Pond TSF is approximately 1 km southeast of the Valley Pit, adjacent to the Highland Mill, as shown on Figure 1.

The facility is used to store tailings and water discharged from the Highland Mill during upset conditions, as well as runoff from the Mill catchment area. The Mill Operations Department controls the discharge of tailings, as well as contributing sources of water, which include overflow from the thickeners, Sewage Treatment Plant (STP) effluent, and other pumped flows/surface runoff, as needed.

The pond is contained by the East Berm and by the pit waste rock dumps. The facility's maximum flood storage containment level is El. 1261.5 m. Road surfacing fill raises the facility-perimeter's low point to El. 1261.8 m, but this is not considered in flood storage estimates. Refer to Figure 2 for a layout of the facility.

Typical geometry and dimensions of the East Berm are summarized in Table 2.1. Based on the June 2022 survey, provided by HVC, the facility has capacity to store up to about 34,000 m³ of water and/or tailings in addition to the IDF (i.e., 92,100 m³), below the freeboard limit (i.e., 0.5 m).

Immediately downstream of the East Berm there are two vegetated areas which are fully contained by access road fills and are referred to herein as the treed areas. The 7-Day Pond TSF and treed areas are the low points of the surrounding catchment.

Tailings are discharged at the south end of the 7-Day Pond TSF, forming a beach which slopes to the north and a semi-permanent pond within the basin. A fixed pumping system was installed at the low point of the beach in 2020 and is operated, as required, to maintain a low pond volume. The pumping system is operated by the Mill Operations Department. Since this system has been installed, HVC have operated the facility with very limited ponding, as discussed in Section 5.3.

Table 2.1 Summary of Approximate Dam Geometry

Dam	Construction Method	Nominal Crest Elevation (m)	Max. Berm Height (m)	Crest Length (m)	Min. Crest Width (m)	Upstream Slope	Overall Downstream Slope
East Berm	Unknown	1261.8 ⁽²⁾	6	200	8	1.5H:1V	1.5H:1V

Notes:

- All dimensions are based on the Photosat survey dated September 27th, 2020 and on an aerial survey completed on November 2nd, 2020, provided by HVC.
- Crest elevation reported as top of road surfacing material over the East Berm, which raises the low point of the top of general fill (used to measure flood compliance) from 1261.5 m to ~El. 1261.8 m.

3 ACTIVITIES DURING REVIEW PERIOD

During the review period, the 7-Day Pond TSF was maintained within the design basis and specified operational conditions of the approved design. There were no significant remedial or construction activities required or completed during the review period.

Some tailings were excavated from of the drainage channel, between the pond and the fixed pumping system (within the facility), in Q3 2022. Approximately 13,000 m³ of tailings (net) were deposited between October 2021 and August 2022 (date of the last survey within the review period).

4 WATER MANAGEMENT

4.1 Overview

The schematic of the tailings and water management system for the 7-Day Pond TSF is shown in Figure 3. Inflow and outflow rates/volumes are not monitored. The primary outflows from the facility are:

- Seepage from the 7-Day Pond TSF reports to the Valley Pit where it becomes part of pit water management. When needed, the Mill Operations Department deploys portable pumps to draw down the water level in the 7-Day Pond TSF; pumped outflows are returned to the Highland Mill.
- Reclaiming water for the mill process using a dewatering pump system that is operated on an as needed basis to maintain normal operating pond levels in the impoundment and to reduce seepage losses.

4.2 Climate

HVC provided climate data from the L-L Dam Weather Station³. KCB adjusted the L-L Dam Weather Station data to the Historical Average Lornex Synthetic Record⁴, using the HVC Lornex Area⁵ adjustment factors provided in the Surface Water Quantity Existing Conditions report (Golder 2021). These adjustment factors were selected as the Lornex area elevation is consistent with the 7-Day Pond TSF catchment⁶. HVC also maintains a climate station at Shula Flats that can be used, similar to the L-L Dam Weather Station, to reflect climate conditions at the 7-Day Pond TSF.

In addition, KCB reviewed the climate data from the Kamloops Pratt Road Weather Station⁷ (Environment Canada Station No. 116C8P0, El. 729.0 m, 60 km to the east) to review and compare precipitation trends against the L-L Dam Weather Station data.

Table 4.1 summarizes the monthly precipitation during the review period from the reference climate stations as well as the monthly average values, also corrected based on HVC Lornex Area factors from the Surface Water Quantity Existing Conditions report (Golder 2021), for comparison. The monthly precipitation record for the reporting period is shown on Figure 4.1. Overall observations regarding precipitation trends are as follows:

- For months which had >95% of daily readings, 4 of the 10 months reported above average precipitation: October and November 2021; and June and July 2022. June measured the largest precipitation (69.3 mm) which was also the largest increment above historic average (67%).

³ L-L Dam Weather Station: El. 1186 m; distance to the 7-Day Pond TSF: 14 km to the northwest.

⁴ Obtained from the Lornex Weather Station: El. 1268 m; distance to the 7-Day Pond TSF: 1.4 km to the northwest.

⁵ HVC Lornex Area: mean El. 1268 m; distance to the 7-Day Pond TSF: 1.4 km to the southeast.

⁶ 7-Day Pond TSF: about El. 1262 m.

⁷ The Kamloops Pratt Road Weather Station was used for comparison rather than the Kamloops Airport Station (El. 345.3 m, 44 km away in the NE direction) because the elevation is closer to that of the L-L Dam Weather Station and climate is sensitive to elevation.

- Precipitation from December 2021 to May 2022 was 33% below the historic average; the lowest rain in magnitude and relative to historic averages was during March and April 2022. As will be discussed later, this was also the period when snowmelt occurred, and the low precipitation during this period impacted the intensity of freshet.

KCB also reviewed the available rainfall data for storm events and note the following:

- All rainfall storm events during the review period were less than the 10-year return period event: 40 mm in 24 hours (Golder 2021). The largest 24-hour rainfall events measured at the L-L Dam Weather Station during the review period were 23.9 mm on November 15, 2021; 20.4 mm on July 3, 2022; and 15.5 mm on June 14, 2022.
- In November 2021, a combination of rainfall and early season snowmelt led to significant regional flooding and damage to public and private infrastructure, which impacted communities closest to the HVC Mine Site. Based on the L-L Dam Weather Station, the magnitude of the event was less than a 10-year return period at the HVC Mine Site.

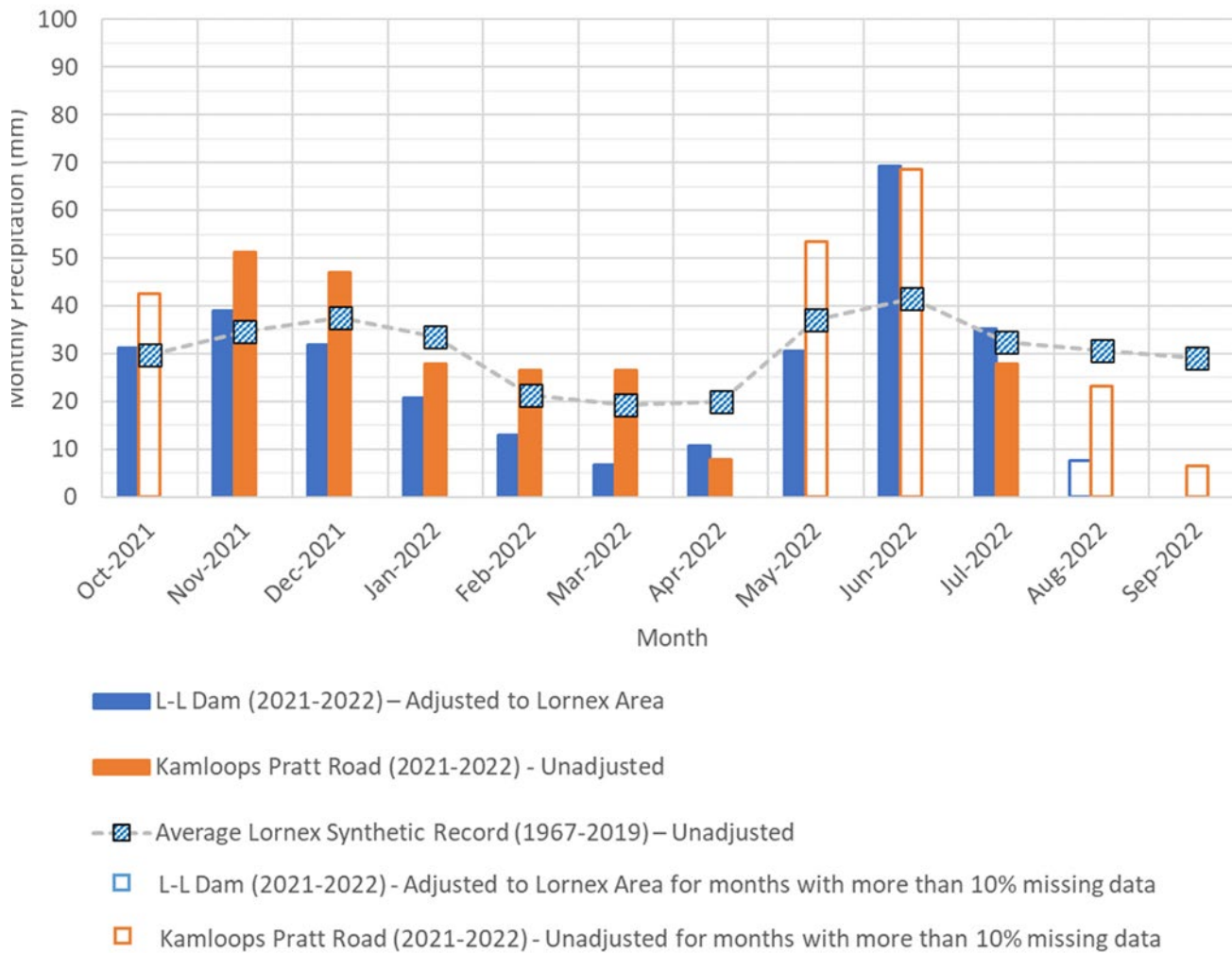
Table 4.1 Monthly Precipitation for Review Period

Month	Availability of Data (%)		Precipitation (mm)		
	L-L Dam Weather Station	Kamloops Pratt Road Weather Station	L-L Dam Weather Station Data (Corrected) ⁽¹⁾	Kamloops Pratt Road Weather Station ⁽²⁾	Historical Monthly Average Climate Values (Corrected) ^(1,3)
Oct 2021	100	81	31.1	42.6	29.7
Nov 2021	100	100	39.1	51.2	34.7
Dec 2021	100	100	31.8	47.0	37.6
Jan 2022	100	100	20.6	27.8	33.5
Feb 2022	100	100	12.9	26.6	21.2
Mar 2022	100	100	6.8	26.6	19.2
Apr 2022	100	100	10.7	7.9	20.0
May 2022	100	71	30.5	53.4	37.2
Jun 2022	100	83	69.3	68.6	41.5
Jul 2022	98	100	35.1	27.8	32.4
Aug 2022	24	83	7.6	23.2	30.7
Sept 2022	0	77	<i>No readings</i>	6.4	29.1
Annual Total	-	-	290.1	409.1	366.6

Notes:

1. Available data from L-L Dam climate station was adjusted by a L-L Dam-to-Lornex Area adjustment factor of 0.93 (Golder 2021).
2. Environment Canada Station No. 116C8P0, El. 729.0 m, 60 km to the east.
3. Historic monthly averages are based on the Lornex synthetic climate record and) using appropriate adjustment factors provided in Golder (2021).

Figure 4.1 Monthly Precipitation

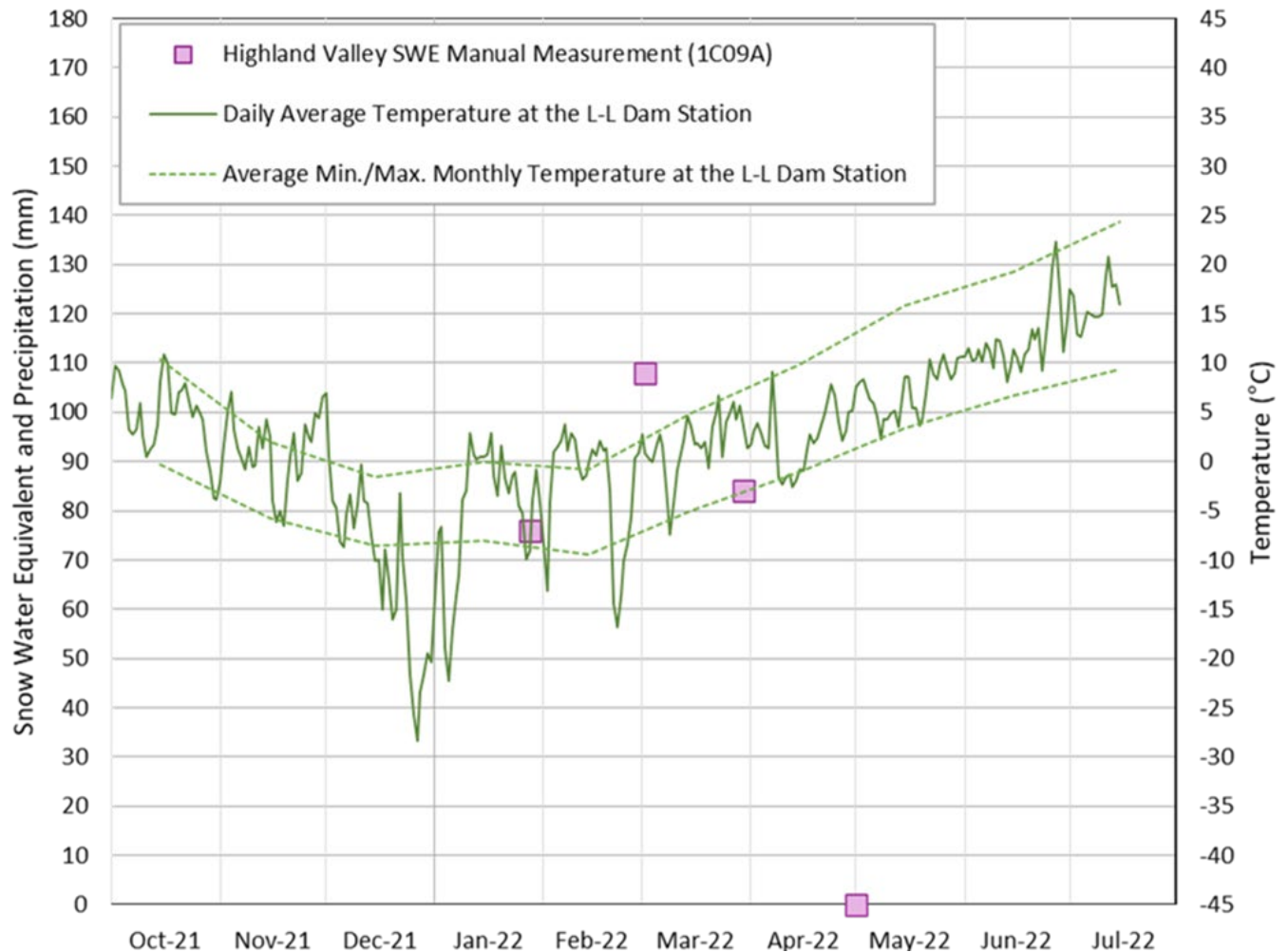


Seasonal snowpack depth is not measured at the L-L Dam Weather Station. Instead, HVC monitors snowpack with monthly measurements at the Highland Valley Snow Survey Station (Station No. 1C09A). Snowpack measurements were made from January through May and are reported on Figure 4.2 in snow-water equivalent (SWE) along with temperature data from the L-L Dam Weather Station from October 2021 to July 2022. The following observations are inferred from these data:

- The daily temperatures recorded between January and June 2022 are generally within the historic monthly average records based on Golder (2021), with some notable cold periods prior to March 2022.
- Snowpack melt started in March, but the majority of melt occurred during April, with all snow gone by May 1. This is consistent with the historic warming period and the forecast snowmelt pattern used in the HVC site-wide water balance, based on Golder (2020).

- Consistent with historic observations, temperature, not rain, is the primary factor that drove snowmelt during the review period. Snowmelt started in March, when daily temperatures started to rise and were consistently above 0°C, and had completed by the end of April. During that same period, precipitation was less than 50% of historic averages (Table 4.1).

Figure 4.2 Temperature Records and Measured Snowpack between October 2021 and July 2022



Notes:

- SWE is manually measured at the Highland Valley snow pillow station (1C09A), typically once per month.
- Daily average temperature data at the L-L Dam Weather Station for 2022 was provided by HVC.
- The average maximum and minimum monthly temperatures at the L-L Dam Weather Station were developed by Golder (2021).

4.3 Water Balance

Figure 3 is a simplified flow schematic for the pond. Inflows and outflows are not measured but outflows are sufficient to prevent accumulation of water in the impoundment over an annual basis and to maintain sufficient flood capacity to store the IDF (Table 4.3). Refer to Section 5.3 for further discussion of pond levels during the review period.

As described in the OMS Manual (HVC 2021), the storage capacity of the facility is monitored through periodical surveys. Table 4.2 summarizes the changes in available storage capacity in the 7-Day Pond TSF since the East Berm crest was raised in October 2020.

Table 4.2 Change in Storage Capacity since October 2020 East Berm Crest Raise

Survey Date	Storage Volume Available below El. 1261.0 m ⁽¹⁾ (m ³)	Change in Volume (Tailings and Water) (m ³)
September 27, 2020	136,230	-
October 8, 2021	132,548	-3,682
August 19, 2022	119,505	-13,043

Notes:

1. El. 1261.0 m is minimum crest elevation minus the flood freeboard requirement (0.5 m).

4.4 Flood Management

The 7-Day Pond TSF applicable design criteria and flood characteristics are summarized in Table 4.3 and meet HSRC requirements (EMLCI 2021b). Based on the available storage during the review period (Table 4.2), the 7-Day Pond TSF was operated with sufficient capacity to store the IDF with adequate flood freeboard (0.5 m).

Table 4.3 Inflow Design Flood for 7-Day Pond TSF

Dam	Outflow/Storage	Inflow Design Flood		IDF Depth	IDF Volume
		Required ⁽¹⁾	Design Event		
East Berm	Stored	1/3 rd between the 1,000-year and PMF	1/3 rd between the 1,000-year and PMF	180.7 mm ⁽²⁾	92,100 m ³

Notes:

1. Per HSRC (EMLCI 2021b) for tailings and water retaining facilities.
2. Based on Golder (2016).

5 REVIEW OF MONITORING RECORDS AND DOCUMENTS

5.1 Monitoring Plan Compliance

The OMS Manual (HVC 2021) was prepared in 2021 in accordance with the industry guidance documents (MAC 2019). The OMS Manual, which documents existing routine activities and surveillance requirements, was reviewed as part of the preparation of this AFPR. The document includes operational procedures for routine tailings excavation, including preparation of a work plan prior to the work which must be approved by the TSF Qualified Person.

The 7-Day Pond TSF surveillance program, described in the OMS Manual, is appropriate for the facility. It includes visual inspections, pond level readings, and a Trigger-Action-Response-Plan (TARP). Surveillance information is reviewed by HVC, including the TSF QP. There were no exceedances of any of the TARP levels during the review period.

Two event-driven inspections were conducted by HVC during the review period, at the TSF QP's discretion:

- following discharge of tailings from the Mill into the facility between June 5 and 6; and
- following the Mill going down temporarily due to a power bump on September 14.

No unusual conditions were observed during the even-driven inspections. The EoR was notified, and no further actions were recommended.

Surveillance activities and frequencies, specified in the OMS Manual (HVC 2021), are summarized in Table 5.1. Surveillance records provided to KCB by HVC, and reviewed by the EoR, demonstrate that OMS Manual (HVC 2021) requirements were met during the review period.

The most recent dam safety review (DSR) of the 7-Day Pond TSF was completed by SRK Consulting (SRK) in 2018. The report concluded that the facility is well-managed, with a high level of technical stewardship and appropriate operating procedures, and the failure modes are understood and effectively controlled. All recommendations from SRK (2019) have been addressed, and the next DSR is due in 2023.

Table 5.1 Monitoring Activities

TSF Monitoring	Minimum Frequency	Responsible Party	Documentation	2022 Frequency Compliance	Notes for the Review Period
Inspections					
Routine Visual Inspection ⁽¹⁾	Quarterly	HVC	HVC Inspection Reports (Reviewed by KCB)	Yes	Conducted in Feb., Mar., Jun., and Aug.
Event-Driven Inspection	Event Driven ⁽²⁾	HVC		N/A	Two event-driven inspection; see Section 5.1.
Annual Facility Performance Report (AFPR)	Annually	KCB		Yes	This report.
Dam Safety Review	Every 5 years	HVC	Report	N/A	Next DSR due in 2023.
Instrumentation Monitoring					
Pond level	Monthly	HVC	HVC Inspection Reports (Reviewed by KCB)	Yes	-
Surveys					
Available Storage	Every 6 Months	HVC	HVC Internal Report (Reviewed by KCB as part of AFPR)	Yes	Conducted on June 17, 2022
Facility Aerial Surveys	Every 6 Months	HVC		yes	Conducted on August 23, 2022
Facility Record Surveys	After Each Construction Activity	HVC		Yes	Conducted on June 17, 2022

Notes:

- Visual inspections include pond level measurements and observations for any evidence of unusual conditions and/or dam safety concerns (e.g., settlement, sinkholes, slope sloughing, erosion, seepage, piping, etc.).
- HVC staff are to complete an event-driven inspection in response to one of the following events: earthquake greater than magnitude 5 within 100 km of the site, or any earthquake felt at site; and rainfall event greater than the 10-year, 24-hour duration storm; 39.9 mm (Golder 2020).

5.2 Routine Visual Inspection

The purpose of routine visual inspections is to identify conditions that might indicate changes to the TSF and the East Berm performance. Based on the available records, routine visual inspections did not identify any unusual conditions at the 7-Day Pond TSF.

5.3 Pond Level and Freeboard

During the review period, HVC operated the 7-Day Pond TSF with a minimal pond by use of the fixed pumping system installed in 2020. Key observations, based on historical pond levels and pond levels during the review period, are as follows:

- The pond level is only surveyed when access to the pond is safe (i.e., pond level at or above about El. 1258.0 m). Visual inspections of the pond to estimate its level and to assess safe accessibility to survey were conducted monthly.
- There has been no significant pond at the 7-Day Pond TSF during the reporting period:
 - ◆ The pond level varied between 1258.7 m (May 6, 2022) and 1258.5 m (September 16, 2022).
 - ◆ The maximum pond level was measured on July 15, 2022 (El. 1259.0 m).
 - ◆ The pond level was too small for safe survey access between October 2021 and May 2022 (i.e., pond level was below ~El. 1258.0 m).
- At the end of the review period, the 7-Day Pond TSF had an available storage capacity of about 119,500 m³ below the minimum flood freeboard level (El. 1261.0 m). This storage capacity is about 27,500 m³ greater than the IDF (92,100 m³; see Table 4.3).

HVC has adopted 0.5 m as the target minimum flood freeboard⁸ for the facility. This exceeds the minimum freeboard required to accommodate wind and wave run-up based on the method proposed by CDA (2019), which is recommended by HSRC (EMLCI 2021b). The minimum freeboard measured during the review period at the 7-Day Pond TSF was > 1.5 m.

5.4 Geotechnical Instrumentation

There are no geotechnical instruments at the 7-Day Pond TSF. None are recommended at this time.

5.5 Seepage

Seepage from the 7-Day Pond TSF is collected in the Wishing Well Sump located in the Valley Pit. This sump also collects water from other sources, and water is pumped from the sump to the thickeners.

⁸ Vertical distance between the peak IDF (Table 4.3) flood level and low point of the perimeter crest.

No Seepage was observed from the East Berm downstream slope during the July 26, 2022 site visit or reported as by HVC during the review period.

5.6 Water Quality

HVC's Water Quality Monitoring and Reporting Plan, approved under the PE-376 effluent permit (MECCS 2022), specifies minimum water-quality sampling requirements at the HVC Mine Site. There are no sampling requirements downstream of the 7-Day Pond TSF. In addition, seepage from this facility is ultimately captured in the Valley Pit dewatering system, as presented in the hydrogeological conceptualization included in the 2021 Highland Valley Copper Groundwater Quality Report (Golder, 2022). Seepage from the 7-Day Pond TSF, during the review period, was captured and reclaimed for use as mill process water.

6 SITE VISIT OBSERVATIONS AND PHOTOGRAPHS

Copies of the field site visit checklist, photographs and summary observations made during the 2022 AFPR site visit are included in Appendix I. No issue in terms of dam safety was observed. A summary of general observations and comments during 2022 AFPR site visit is as follows:

- The East Berm was in good physical conditions.
- There was a visible tailings beach and signs of recent deposition, which is consistent with the tailings discharge into the facility that occurred in early June (Section 5.3).

7 ASSESSMENT OF DAM SAFETY

7.1 Review of Potential Downstream Consequences

Conditions and land use downstream of the 7-Day Pond TSF were reviewed by HVC and KCB during the review period as part of the failure mode review (Section 7.2), and no significant changes were identified.

HVC and KCB reviewed the current IDF and earthquake design ground motion (EDGM) for each of the 7-Day Pond TSF to confirm they meet or exceed the equivalent requirements under the HSRC (EMLCI 2021b), which defines such requirements based on a consequence classification.

At the request of HVC, the AFPR does not include any reference to a consequence classification for the 7-Day Pond TSF. Consequence classification is not part of HVC's tailings management governance and stewardship because there are components of that system that do not align with HVC's safety culture, where any fatality represents an unacceptable consequence. HVC's internal governance has been developed to align with the GISTM (2020) requirements and to meet or exceed requirements under the HSRC (EMLCI 2021b).

7.2 Failure Mode Review

HVC's stated long-term goal for their TSFs is to reach landform status, with all potential failure modes that could result in catastrophic release of tailings and/or water being either reduced to non-credible or managed to ALARP (i.e., as low as reasonably practicable) under appropriate loading conditions. KCB fully supports this goal, which is also consistent with the GISTM (2020).

Potential failure modes for the 7-Day Pond TSF were reviewed by HVC and KCB during the review period based on available information and existing controls. The review concluded that potential failure modes are being managed appropriately.

Design and operational controls in place to manage potential failure modes are summarized below, along with their status at the end of the review period.

Overtopping

Following the crest raise of the East Berm in 2020, the 7-Day Pond TSF has adequate capacity to store the IDF (Table 4.3), required under HSRC, with adequate freeboard. Overtopping risks are further managed by the following:

- using the pumping system installed in 2020 to maintain pond levels well below threshold levels to increase available storage and reduce seepage to the pit (e.g., facility operated with excess flood storage during the review period; Section 5.3); and
- implementing the facility's OMS Manual and TARP, which include procedures for routine tailings excavation (i.e., increasing storage capacity) and outline the actions to be taken by HVC to respond to elevated pond levels, including implementation of additional preventative controls, if required.

Slope Stability – Foundation / Dam Fill / Earthquake

Based on site investigations (KCB 2019b), the East Berm is founded on competent Glacial Till. The dam fill and foundation materials are not susceptible to significant strength loss or liquefaction based on comparison to similar materials under similar conditions around the site. Slope stability met or exceeded the Canadian Dam Association (CDA) Dam Safety Guidelines (CDA 2019) for static (≥ 1.5), pseudo-static (≥ 1.0), and post-earthquake stability (≥ 1.2), and comply with requirements of HSRC (EMLCI 2021b).

Internal Erosion

The primary controls for managing internal erosion through the East Berm are the berm's fill and foundation materials (sandy gravel and glacial till) and the distance between the pond and the berm during normal operating conditions, which reduces the piezometric levels and seepage gradients near the berm.

During a sufficiently large flood event (e.g., IDF), water may temporarily pond against the East Berm increasing the gradients against the structure.

7.3 Emergency Preparedness and Response

The 7-Day Pond TSF EPRP forms a part of the OMS Manual (HVC 2021), and is consistent with other tailings facilities at the site and site emergency procedures.

The EPRP includes procedures and contacts based on current site-wide emergency plans. The EPRP is appropriate for the existing structure and includes a list of mitigative actions that can be taken in response to potential unusual or emergency conditions.

On October 26, 2022, participants from HVC's operation team (including site management), including a representative designated by the HVC QP, and the KCB's EoR representative for the Highland TSF participated in a simulated exercise to test the TSF mine emergency response plans.

8 SUMMARY

Based on the review of measured performance and observations summarized herein, KCB conclude the 7-Day Pond TSF performed as expected, was maintained within design requirements, and operated in accordance with the OMS Manual (HVC 2022) from October 2021 through September 2022.

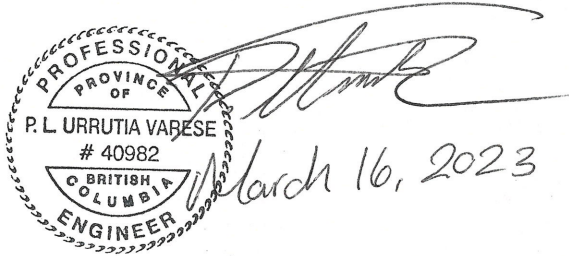
All the recommendations related to facility performance identified during past AFPRs and the DSR (SRK 2019) have been closed and no new dam safety recommendations were identified during the 2022 AFPR.

9 CLOSING

We thank you for the opportunity to work on this project. Should you have any questions, please contact the undersigned.

KLOHN CRIPPEN BERGER LTD.

B.C Permit to Practice No. 1000171



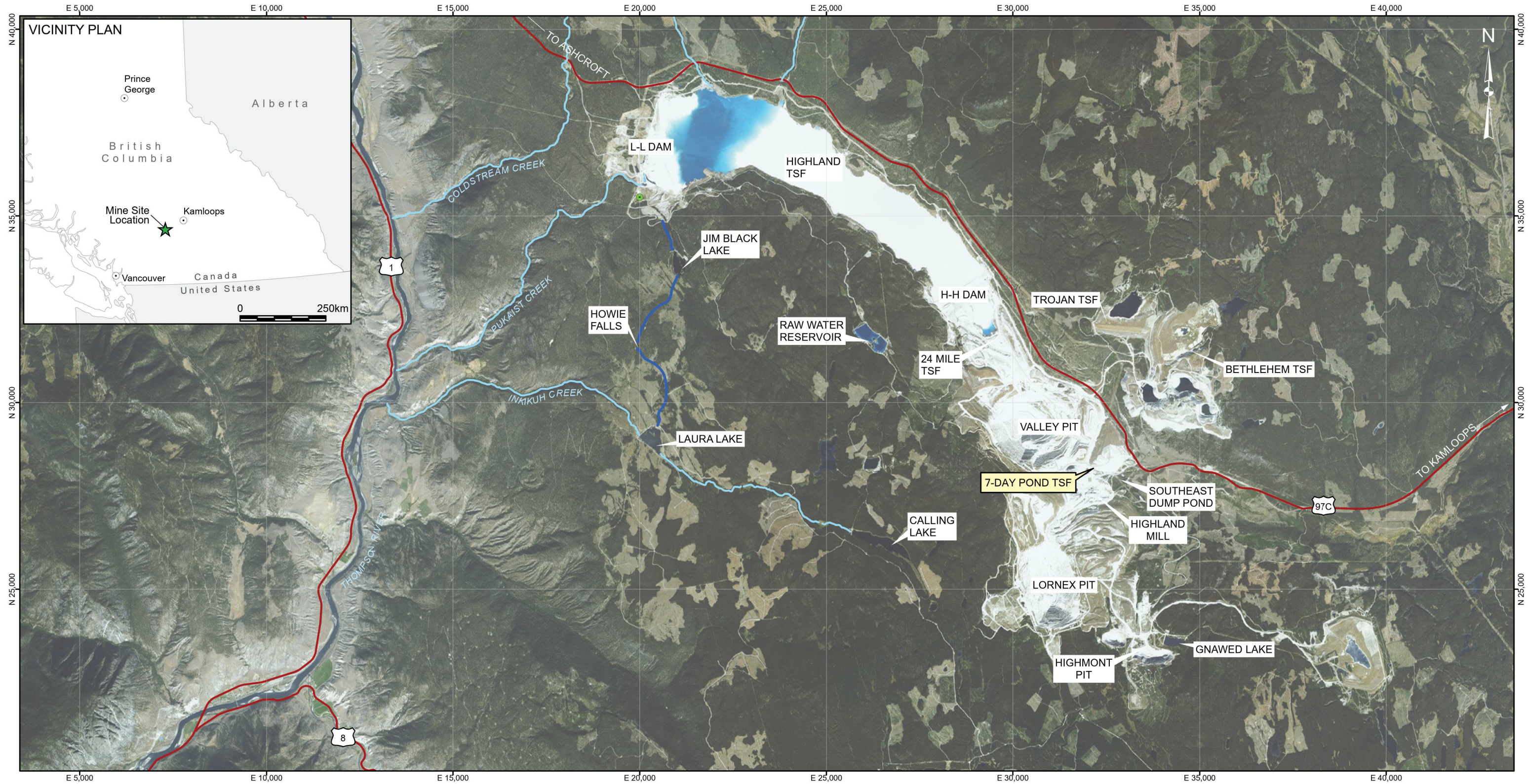
Pablo Urrutia, P.Eng.
Engineer of Record, Designated Representative
Senior Geotechnical Engineer, Associate

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FIGURES

- Figure 1 Mine Site Plan
- Figure 2 7-Day Pond TSF – Plan
- Figure 3 Flow Schematic



- LEGEND**
- L-L DAM WEATHER STATION
 - CREEK/RIVER
 - HIGHWAY
 - INKIKUH DIVERSION

- NOTES:**
1. PROJECTION: HVC MINE GRID.
 2. TSF = TAILINGS STORAGE FACILITY.
 3. HIGHWAY AND CREEK DATA FROM THE GOVERNMENT OF CANADA (CANVEC).
 4. IMAGERY FROM ESRI.

NOT FOR CONSTRUCTION

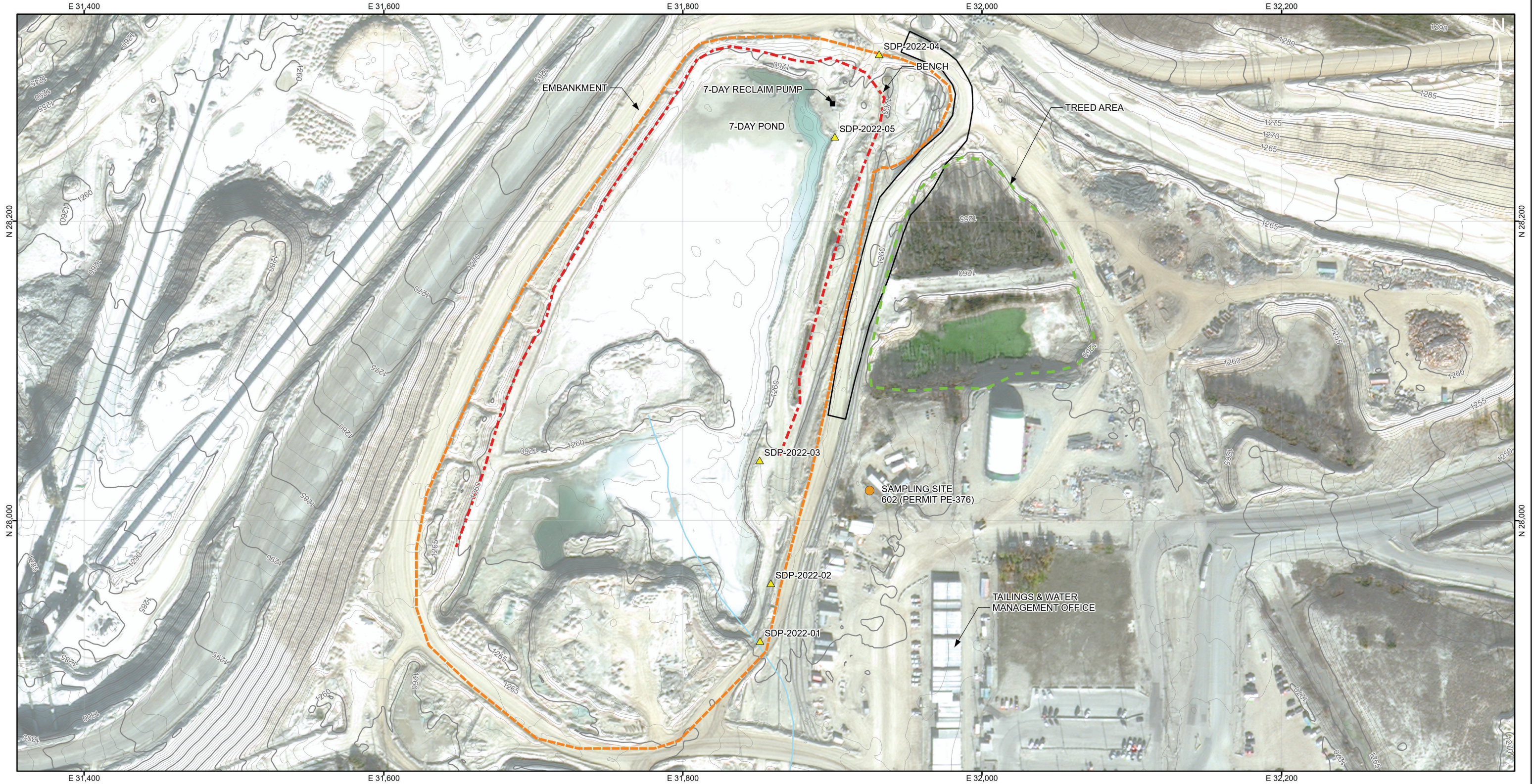
TO BE READ WITH KLOHN CRIPPEN BERGER REPORT DATED: MARCH 2023



SCALE 0 5km

CLIENT	Highland Valley Copper / Teck	
PROJECT	7-DAY TAILINGS STORAGE FACILITY 2022 ANNUAL FACILITY PERFORMANCE REPORT	
TITLE	MINE SITE PLAN	
SCALE	PROJECT No.	FIG No.
AS SHOWN	M02341C42	1

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LEGEND

- ▲ WAYPOINT (SDP-2022-xx)
- SAMPLING SITE
- EMBANKMENT
- - - BENCH
- DAM
- CREEK
- ▭ TREED AREA

NOTES:

1. PROJECTION: HVC MINE GRID.
2. IMAGERY FROM HVC OBTAINED OCTOBER, 2021.
3. TOPOGRAPHY FROM HVC OBTAINED SEPTEMBER, 2020.

NOT FOR CONSTRUCTION

TO BE READ WITH KLOHN CRIPPEN BERGER REPORT DATED: MARCH 2023

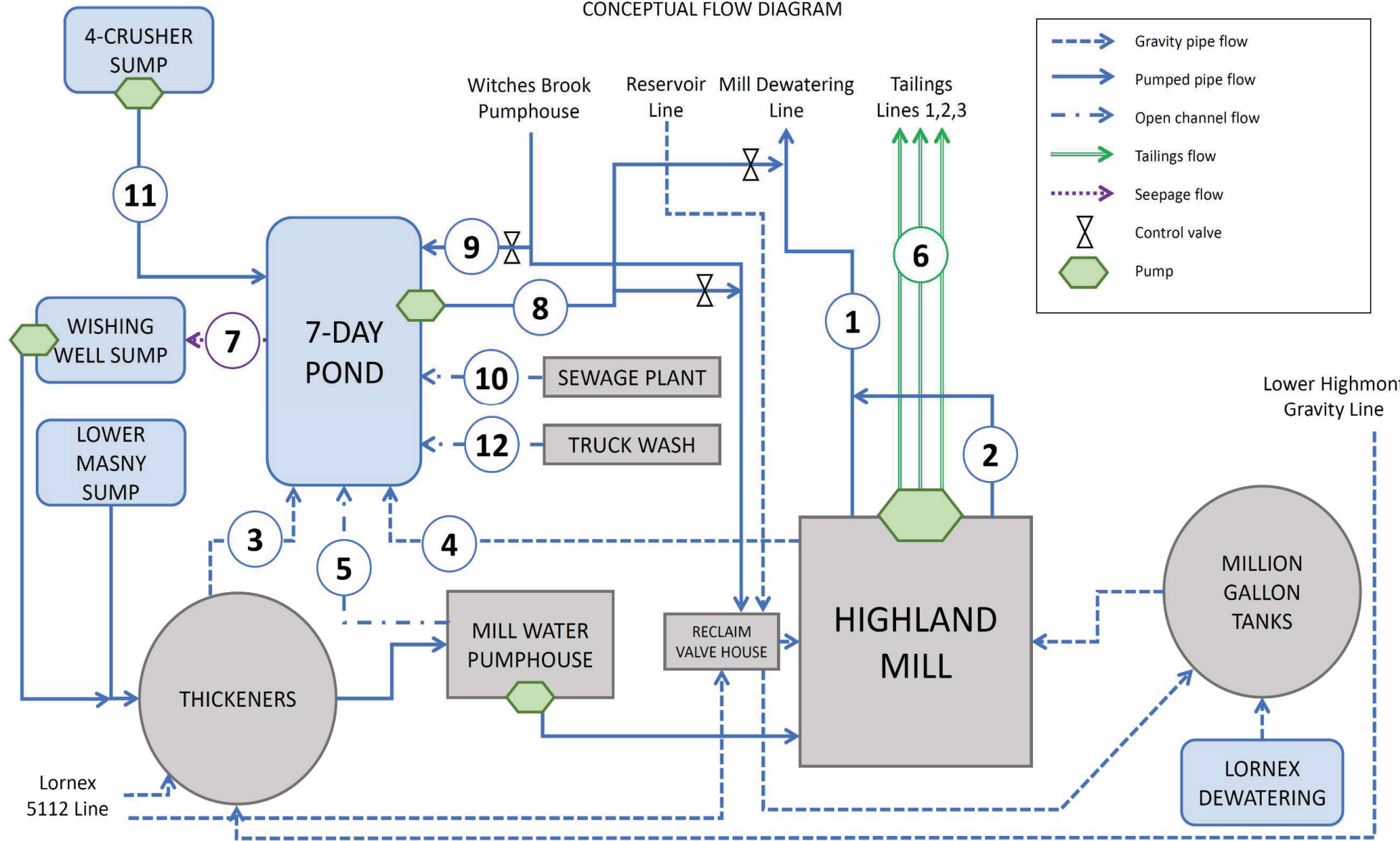


SCALE 0 100m

<small>CLIENT</small>	Highland Valley Copper / Teck		
<small>PROJECT</small>	7-DAY POND TAILINGS STORAGE FACILITY 2022 ANNUAL FACILITY PERFORMANCE REPORT		
<small>TITLE</small>	7-DAY POND PLAN		
<small>SCALE</small>	<small>PROJECT No.</small>	<small>FIG No.</small>	
AS SHOWN	M02341C42	2	

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7-DAY POND AREA
CONCEPTUAL FLOW DIAGRAM



No.	Name	Description	Status
1	Mill Dewatering Line	36" dia. HDPE pipe	Operational
2	Old #3 Tailings Line to MDL	36" HDPE Pipeline	Operational
3	Inflow #3	HDPE pipe, semi-regular flow from thickener overflow (majority) and surface water around the Mill (minor component).	Operational
4	Inflow #2 (a.k.a. Dog & Easy)	36" dia. HDPE pipe, irregular flow from: i) overflow from MOP (connects U/S of discharge point); ii) overflow from sump in Mill which collects excess surface water from cleaning activities.	Operational
5	Overflow from Mill Water Pump House	Irregular open channel overflow from 325 ft Thickeners	Operational
6	Tailings Lines	36" HDPE Pipelines	Operational
7	Seepage to Valley Pit	Seepage reports to Wishing Well Sump in Valley Pit	N/A
8	Pump to Mill Diversion Line	HDPE pipeline and portable pump (deployed when needed)	N/A
9	Witches Brook Drain	6" HDPE pipe with control valve, capped	Operational
10	Inflow from Sewage Treatment Plant	Regular, treated effluent in trench running south to north and discharging at the NE corner of the pond	Operational
11	Inflow from No. 4 Crusher	1x HDPE pipe, irregular flow	Operational
12	Inflow from Truck Wash	Surface runoff from truck wash collected by drainage ditch	Operational

NOT FOR CONSTRUCTION

TO BE READ WITH KLOHN CRIPPEN BERGER REPORT DATED: MARCH 2023

CLIENT Highland Valley Copper / Teck		PROJECT 7-DAY POND TAILINGS STORAGE FACILITY 2022 ANNUAL FACILITY PERFORMANCE REPORT	
TITLE FLOW SCHEMATIC FOR 7-DAY POND TAILINGS STORAGE FACILITY		SCALE NTS	
PROJECT No. M02341C42		FIG. No. 3	
Klohn Crippen Berger			

APPENDIX I

Site Visit Checklist, Observations and Photographs

Appendix I Site Visit Checklist, Observations, and Photographs

SITE VISIT CHECKLIST

Facility:	7-Day Pond TSF	Site Visit Date:	July 26, 2022
Weather:	Sunny	KCB Representatives:	Pablo Urrutia, P.Eng. Cheryl Torres, Civil Consultant Andrew Cote, EIT
Freeboard (pond level to dam crest):	2.6 m		

Outlet Condition Survey

Description	Outlet Controls?	Was it flowing?	Flow rate	Visual Review?	Testing / Detailed Site Visit?
Fixed Pumping System	Yes	Pump was on	N/A	N/A	N/A

Are the following components of the facility in **SATISFACTORY CONDITION?**

(check one if applicable)

WASTE DUMP WALLS	Yes/No
U/S Slope	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Crest	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Were any of the following **POTENTIAL PROBLEM INDICATORS** found?

INDICATOR	WASTE DUMP WALLS
Piping	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Sinkholes	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Seepage	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
External Erosion	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Cracks	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Settlement	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Sloughing/Slides	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Animal Activity	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Excessive Growth	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Excessive Debris	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

List and describe any deficiencies (all deficiencies require assessment and/or repair):

- No dam safety deficiencies observed.

Comments / Notes:

- Refer to Site Visit Observations section.

SITE VISIT OBSERVATIONS

- **Crest:** The haul road which forms the crest of the dam around 7-Day Pond TSF was in good physical condition. No indicators of significant concern were observed (e.g., cracking, slumping) (Photo I-1 and Photo I-2).
- **Upstream and Downstream Slopes:** Upstream and downstream slopes were in good physical condition. They were not vegetated and no indicators of significant concern were observed (e.g. animal activity, cracking, slumping, surface erosion features).
- **Tailings Beach and Pond:** Impoundment had a visible beach as well as ponded water near the outlet. The v-notch weir near the inlet was buried by tailings, and the east flank trench was filled with tailings and water (Photo I-1).
- **Outflow Pump:** Fixed pumping system operational.
- **Seepage:** None observed.

SITE VISIT PHOTOGRAPHS

LEGEND:

- SDP = 7-Day Pond.
- SDP-2022-## refers to 2022 AFPR waypoint on Figure 2.
- All photographs taken during the site visit July 26, 2022.

Photo I-1 7-Day Pond TSF. Two inflow pipes observed: one pipe discharging clear water at the time of the site visit (SDP-2022-01, SDP-2022-02 and SDP-2022-03)



Photo I-2 7-Day Pond TSF crest (SDP-2022-04)



Photo I-3 Treed area downstream (D/S) of East Berm



Photo I-4 **7-Day Pond TSF impoundment. Structure within TSF impoundment is part of permanent dewatering-pump system. Pumping system was active at the time of the site visit (SDP-2022-04)**



Photo I-5 7 Day Pond TSF impoundment view from north abutment. Poned water observed at the time of the site visit (SDP-2022-05)

