FINAL

2024 Annual Facility Performance Report - SDH Tailings Management Area

Sä Dena Hes Mine, Yukon Territory, Canada

Teck Resources Limited

SRK Consulting (Canada) Inc. ▪ CAPR003248 ▪ September 2024

srk consulting

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Sä Dena Hes Mine, Yukon Territory, Canada

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Useful Definitions

This list contains definitions of symbols, units, abbreviations, and terminology that may be unfamiliar to the reader.

AEP	Annual Exceedance Probability
AFPR	Annual Facility Performance Report
ALARP	As Low As Reasonably Practicable
AMECFW	AMEC Foster Wheeler
CDA	Canadian Dam Association
DAR	Deviance Accountability Report
DBR	Design Basis Report
DDRP	Detailed Decommissioning Reclamation Plan
DSR	Dam Safety Review
EOR	Engineer of Record
FOS	Factor of Safety
GISTM	Global Industry Standard on Tailings Management
ICMM	International Council on Mining and Metals
IDF	Inflow Design Flood
InSAR	Interferometric Synthetic Aperture Radar
MAC	Mining Association of Canada
MAP	Mean Annual Precipitation
MERP	Mine Emergency Response Plan
NBC SHC	National Building Code Seismic Hazard Calculator
OMS	Operation, Maintenance and Surveillance
PGA	Peak Ground Acceleration
PMF	Probable Maximum Flood
RTFE	Responsible Tailings Facility Engineer
SDHOC	Sä Dena Hes Operating Corporation
SRS	Sediment Retaining Structure
TARP	Trigger Action Response Plan
TMA	Tailings Management Area
YG	Yukon Government

Executive Summary

This report presents the results of the 2024 Annual Facility Performance Review (AFPR) of the Sä Dena Hes Tailings Management Area (TMA). The TMA forms part of the closed Sä Dena Hes mine located near Watson Lake, Yukon. The only remaining tailings retaining embankment at the closed site is the North Embankment. A second embankment, referred to as the Sediment Retaining Structure (SRS), was also retained after closure of the site to collect sediment that would be generated from the till cap that was placed over the exposed tailings.

The inspection was completed by Peter Mikes, P.Eng. and Kyle Howse, of SRK Consulting (Canada) Inc. on July 9 and 10, 2024. SRK staff were accompanied by Chris Jeffrey, P.Eng. (Responsible Tailings Facility Engineer (RTFE)) and Jeff Allen of Teck.

The work was completed in accordance with Teck's Tailings and Water Retaining Structures Guideline and Policy (2019) and in observation of the Global Industry Standard on Tailings Management (GISTM 2020), inclusive of its expectation to be a public domain document indicative of the EOR's summary commentary of the annual performance of the TMA.

Summary of Facility Description

The original TMA consisted of three earth structures, which were referred to as the North Embankment, the South Dam, and the Reclaim Dam. The North Embankment and South Dam, which impounded the tailings, were constructed between July 1990 and October 1991. Both structures were built to a height of about 13 meters. The Reclaim Dam was built to retain supernatant water decanted from the tailings pond. The mine operation involved recycling of the retained water to the mill, with a controlled discharge when required into the adjacent Camp Creek from April to October each year.

Operations at Sä Dena Hes Mine commenced in July 1991 and were suspended in December 1992. Decommissioning of the site began in 2013 and was completed in 2015 by the Sä Dena Hes Operating Corp.

Tailings and water retaining structures that currently remain on the site are the North Embankment and the Sediment Retaining Structure (SRS). The SRS is a 7 m high embankment which impounds a small water pond.

Summary of Key Observations and Significant Changes

North Embankment

The North Embankment is currently stable and functioning in accordance with design parameters. The structure does not retain water except during snow melt when the tailings cover drainage channels may be restricted due to ice or snow blockages. During the June 2022 snow melt, ponded water overtopped the embankment resulting in an erosion gully that eroded approximately 415 m^3 of embankment fill with no tailings displaced. Once the pond had drained, the erosion discontinued. The gully was repaired in June 2022 and no signs of any instability were observed during the 2023 or 2024

site inspections. Long-term improvements to the facility are currently being planned to eliminate future risk of overtopping.

Except for NDW-4A, the piezometers are in good condition and continue to function as designed and with recorded water levels within their historical range. In the spring of 2024, the PVC pipe at NDW-4A rose due to frost jacking and the top elevation of the pipe, and corresponding water level readings, are uncertain. As a result, the NDW-4A piezometer is recommended to be replaced.

Sediment Retaining Structure

The SRS is functioning in accordance with design parameters. However, water appears to be flowing beneath the spillway riprap and geotextile and internally eroding the embankment material resulting in sediment accumulation downstream of the SRS and deformation of the spillway and crest. Planning is in progress to decommission the SRS by 2028.

Summary of Hazards and Potential Consequences

A required component of the AFPR is to review hazards and the consequences of different potential failure modes of the North Embankment and the SRS. There are three potential failure modes for tailings facilities – instability, internal erosion, and overtopping. Any number of potential failure mechanisms can be present to create one of those modes for a given facility – when a potential mechanism is shown to be credible then the facility has a credible failure mode.

The main potential failure mechanisms of the SRS are:

- Overtopping from one of:
  - runoff from extreme precipitation events that exceeds the flow capacity of the SRS spillway
  - ice build up and debris in the SRS spillway
- Internal Erosion (Piping)
- Slope instability

The main potential failure mechanisms for the North Embankment are:

- Overtopping due to a blockage of tailings cover drainage channels and subsequent build-up of a pond due to extreme precipitation and/or snowmelt
- Internal Erosion (Piping)

At the Sä Dena Hes TMA, there exists no credible catastrophic failure modes for the North Embankment and SRS and, as a result, no life safety concerns from these facilities. The 2024 AFPR concluded that the North Embankment and the SRS are in adequate condition and exceed the Canadian Dam Association (CDA) guidelines for stability (CDA 2019).

Teck is committed to the safe and environmentally responsible management of tailings facilities throughout the mining life cycle to minimize harm to the environment and protect the health and safety of our people and surrounding Communities of Interest. This commitment includes the implementation

of the Global Industry Standard on Tailings Management (GISTM), and industry-leading guidelines established by the International Council on Mining and Metals (ICMM), the Mining Association of Canada (MAC) and CDA.

All Teck tailings facilities are assessed for credible failure modes, and the outcomes from these credible failure scenario assessments inform Teck's risk management activities. CDA bases consequence classification on the downstream consequences of potential failure modes (not considering whether such failures are credible or not). This consequence classification has assessed environmental consequences in accordance with CDA, 2007. The GISTM bases consequence classification on downstream consequences of credible failure modes only. In both cases (CDA & GISTM), the North Embankment consequence classification is "Significant". The SRS is not a tailings retaining structure, and thus has only been assessed in accordance with CDA, 2007. The CDA consequence classification for the SRS is "Low". Consequence classification should not be confused with risk, as risk also requires the consideration of the likelihood of the event occurring. To better understand the risk that a tailings facility presents, Teck's risk assessments also consider both the likelihood and the consequences of a potential failure event.

Summary of OMS Manual and MERP

The Operation, Maintenance and Surveillance (OMS) Manual was last updated on December 19, 2023, and is reviewed annually. The latest update was prepared to incorporate the North Embankment erosion gully repairs and additional monitoring and maintenance requirements to prevent a similar incident in the future. SRK reviewed the OMS Manual and provided a mark-up of recommended edits that include updates of contact information, and protocols for remote surveillance camera monitoring of the North Embankment.

Teck developed a Mine Emergency Response Plan (MERP) for the site that was finalized on February 1, 2024, that is also reviewed annually. SRK has reviewed the TMA applicable sections of the MERP and found the plan to be adequate for the site.

Recommendations

A list of deficiencies or non-conformances noted from the AFPR are summarized in Tables E1 and E2. The list also includes outstanding deficiencies and non-conformances from previous reviews.

Table E1: Table of Recommendations for the 2024 TMA Inspection

Structure	ID No.	Deficiency or Non-Conformance	Applicable Regulation or OMS Reference	Recommended Actions	Priority (See Table Notes)	Recommended Deadline / Status
			2022 Recommendations			
North Embank-ment	2022-3	Drainage channel blockages on the tailings cover during snowmelt results in the formation of a pond adjacent to the North Embankment. In 2022, the pond overtopped the North Embankment and formed an erosion gully that required repairs.	OMS Section 5.2.1	Modify the dam to eliminate the risk of overtopping. Due to limitations in the tailings cover thickness, increasing the grade of the cover drainage channels is not possible without exposing tailings. As a result, raising the dam to increase the freeboard is recommended.	2	**In Progress** Design has been developed and is planned for implementation in 2025 (pending YG approval).
			2023 Recommendations			
North Embank-ment	2023-1	The amount of embankment seepage is unable to be determined as the monitoring station MH-02 is located approximately 35 m downstream of the embankment and captures mostly seepage from the valley sidewall.	-	Install a new seepage monitoring station near the embankment toe as part of North Embankment Upgrades.	4	**In Progress** Design has been developed and is planned for implementation in 2025 (pending YG approval).
North Embank-ment	2023-2	Seepage is present along an approximate 80 m long zone at the downstream toe and the ground at the lower portion of the embankment is moist and soft due to seepage and recent snowmelt. The relative contribution from snowmelt, seepage through the dam, and upward seepage from groundwater is unable to be determined.	-	To improve the understanding of the contributions of seepage through the embankment and from groundwater recharge, consider installing additional piezometers in the tailings upstream of the embankment and in the embankment fill and foundation in the downstream slope of the embankment.	4	**In Progress** Design has been developed and is planned for implementation in 2025 (pending YG approval).
Tailings Cover	2023-3	Several areas of ponding were present along with several areas of erosion.	OMS Section 5.2.1	As part of the upcoming North Embankment Upgrades, a review of the cover drainage network is recommended to reduce the amount of ponding and provide engineered erosion protection where required along drainage pathways.	4	**In Progress** Design has been developed and is planned for implementation in 2025 (pending YG approval).

Structure	ID No.	Deficiency or Non-Conformance	Applicable Regulation or OMS Reference	Recommended Actions	Priority (See Table Notes)	Recommended Deadline / Status
SRS	2023-4	Water is suspected to be flowing beneath the riprap and geotextile in the spillway and eroding the underlying SRS embankment and leading to embankment deformation.	OMS Section 5.2.1	Evaluate the long-term plan and intention of the SRS and, if the planned life exceeds the next five years (2028), the spillway should be reconstructed.	4	**Planning In Progress** Decommission the SRS or repair the spillway before 2028.
			2024 Recommendations			
North Embankment	2024-1	The NDW-4A PVC piezometer is frostjacking and the protective steel case surrounding the pipe is no longer able to be closed. As a result, the top elevation of the PVC pipe and water elevations at the piezometers are unknown.	OMS Section 5.2.1	As part of the upcoming piezometer installation program in 2025, replace NDW-4A with a new vibrating wire piezometer located near the embankment toe along a cross-section alignment with NDW-1A/B.	4	**New** Before the end of 2025.
SRS	2024-2	Beaver(s) have placed muck/debris up against the inlet of the spillway that has raised the water level in the SRS pond.	OMS Section 5.2.2.4	Implement measures to deter or prevent further activity by beavers that could compromise optimal functioning of the pond.	3	**New** Before the end of 2024.
TMA	2024-3	The OMS manual contact list and remote monitoring surveillance procedures are out of date.	OMS Section 1.3	Update the OMS Manual contact information and the protocols for remote surveillance camera monitoring of the North Embankment.	4	**New** Before the end of 2024

Notes: Priority ratings developed by Teck (2019). A general description of the priority rankings area as follows:

[1] Priority 1: A high probability or actual dam safety issue considered immediately dangerous to life, health or the environment, or a significant regulatory concern.

[2] Priority 2: If not corrected, could likely result in dam safety issues leading to injury, environmental impact, or significant regulatory action; or a repetitive deficiency that demonstrates a systematic breakdown of procedures.

[3] Priority 3: Single occurrences of deficiencies or non-conformances that alone would not be expected to result in dam safety issues.

[4] Priority 4: Best Management Practice as a suggestion for continuous improvement towards industry best practices that could further reduce potential risks. This typically includes ongoing construction items within the appropriate construction cycle.

1 Introduction

1.1 Purpose, Scope of Work, and Methodology

SRK Consulting (Canada) Inc. was retained by Teck Resources Limited on behalf of the Sä Dena Hes Operating Corp to complete the Annual Facility Performance Report (AFPR) of the closed Sä Dena Hes mine located near Watson Lake, Yukon.

The inspection was completed by Peter Mikes, P.Eng. and Kyle Howse, of SRK on July 9 and 10, 2024. SRK staff were accompanied by Chris Jeffrey, P.Eng. (Responsible Tailings Facility Engineer (RTFE)) and Jeff Allen of Teck. Chris Jeffrey and Jeff Basarich (Site Caretaker) were the primary contacts for information about the site conditions and performance during the past year.

This report presents the results of the 2024 performance for the period of June 2023 to July 2024 (reporting period) and includes the following structures and features:

- The Tailings Management Area (TMA) that includes:
  - The North Embankment
  - Tailings Cover
  - North Drainage Channel
  - Sediment Retaining Structure (SRS)

The scope of the work consisted of:

- A visual inspection of the physical condition of the structures and features to identify deficiencies and non-conformances:
- A review of the Operation, Maintenance and Surveillance Manual (OMS) and the Emergency Response Plan for the TMA as documented in Mine Emergency Response Plan (MERP).
- A review of the potential consequences of failure.
- A review of the routine site inspection forms provided by Teck.
- A review of the monitoring records, and data of the North Embankment provided by Teck.

1.2 Teck Corporate Policy

Teck is committed to the safe and environmentally responsible management of tailings facilities throughout the mining life cycle to minimize harm to the environment and protect the health and safety of our people and surrounding Communities of Interest. This commitment includes the implementation of the Global Industry Standard on Tailings Management (GISTM), and industry-leading guidelines established by the International Council on Mining and Metals (ICMM), the Mining Association of Canada (MAC) and Canadian Dam Association (CDA).

All Teck tailings facilities are assessed for credible failure modes, and the outcomes from these credible failure scenario assessments inform Teck's risk management activities. CDA bases consequence classification on the downstream consequences of potential failure modes (not considering whether such failures are credible or not). This consequence classification has assessed environmental consequences in accordance with CDA, 2007. The GISTM bases consequence classification on downstream consequences of credible failure modes only. In both cases (CDA & GISTM), the North Embankment consequence classification is "Significant". The SRS is not a tailings retaining structure, and thus has only been assessed in accordance with CDA, 2007. The CDA consequence classification for the SRS is "Low". Consequence classification should not be confused with risk, as risk also requires the consideration of the likelihood of the event occurring. To better understand the risk that a tailings facility presents, Teck's risk assessments also consider both the likelihood and the consequences of a potential failure event.

1.3 Regulatory Requirements and Guidelines

The site is regulated under Quartz Mining Licence QML-0004 and management of water is regulated by Water Use Licence QZ16-051. Both licenses approved the "Detailed Decommissioning and Reclamation Plan (DDRP) prepared by Teck (2015) that was implemented in 2013 through 2015.

- Clause 11.1 of Quartz Mining License QML-004 requires an inspection of all engineered structures, works and installations located at the site to be conducted by an independent engineer by September 30 of each year.
- Clause 45 of the Water Licence QZ16-051 also requires all earthworks and water retaining structures including, but not limited to, open pits, waste dumps, ditches, dikes, weirs and appurtenance be inspected by a Professional Engineer as per the Post-Closure Geotechnical Monitoring Plan (SRK 2014). The water licence requires annual inspections through 2026 and every five years thereafter until the expiry of the water licence at the end of 2040.

This report focuses on the TMA and associated water management infrastructure, inspection results for all other engineered structures are documented in a separate report.

This report reviews the performance of the TMA relative to the following:

- Guideline for Tailings and Water Retaining Structures (Teck 2019)
- Global Industry Standard on Tailings Management (GISTM 2020)
- ICMM Tailings Management: Good Practice Guide (ICMM 2021)
- Canadian Dam Association (CDA) Dam Safety Guidelines (CDA 2013) and the associated Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams (CDA 2019)
- Developing an Operation, Maintenance, and Surveillance Manual for Tailings and Water Management Facilities (MAC 2021)

2 Background

2.1 Facility Description

2.1.1 Overview

This section provides a description of the TMA components remaining at the site after decommissioning work was completed. A map showing the overall mine site is provided in Figure 1 with a general arrangement map of the TMA provided in Figure 2.

2.1.2 Tailings Management Area

The original TMA which extended from the North Embankment to the South Dam covered an area of approximately 0.2 km^2. During the operating life of the mine, approximately 700,000 tonnes of tailings (400,000 m^3 based on tailings density of 1.8 tonnes/m^3) were deposited into the impoundment, primarily at the northern end.

The tailings at the northern end of the TMA are retained by the North Embankment. The North Embankment is approximately 15 m high with a crest elevation of 1,100 m, a crest length of about 260 m, and a crest width of 10 m. A site plan and section through the embankment are shown in Figure 3. The embankment is an earthen, zoned embankment structure constructed between July 1990 and October 1991 in a single stage. In June 2022, an erosion gully developed in the embankment that required repairs that were also completed in June. The erosion was caused by ponded snow melt water overtopping the embankment due to blockage of drainage to the south caused by snow/ice. A cross section of the repaired embankment is presented in Figure 4. Plans for raising the embankment to provide additional freeboard are currently planned to proceed in 2025 pending Yukon Government (YG) approval.

Most of the tailings are within the northern half of the TMA, north of the original cofferdam that was removed in 2014. The tailings behind the North Embankment were capped with a till cover in 2014 to provide a means of controlling wind erosion of tailings and to provide a growth medium for revegetation. The cover thickness varies between approximately 0.4 m and 2.2 m and was constructed of excavated dam fill material. The cover was sloped away from the crest of the North Embankment in a southerly direction towards the SRS. Water is no longer regularly impounded in the TMA. A shallow swale was constructed down the middle of the cover to direct surface runoff on the cover to the SRS.

The SRS was constructed in 2014 by leaving in place a low-profile embankment composed of the former South Dam. The SRS is considered temporary, and Teck plans to remove the structure in the future. The primary function of the SRS is to retain sediment that may be transported from the till cover over time. The SRS is approximately 7 m high, with a crest length of about 80 m and crest width of 4 m. The depth of water behind the structure is a maximum of about 1.7 m. A spillway was constructed through the SRS to convey flows from the upstream catchment to the South Drainage Channel. The as-built location, plan and profile of the SRS are presented in Figure 5.

2.1.3 Tailings

The mineralization at Sä Dena Hes is characterized by zinc and lead sulphides with low concentrations of iron sulphides in association with abundant carbonates. Therefore, acid generation will not occur. Zinc, cadmium, and lead leaching are controlled by the oxidation of sphalerite (Zn, Cd) and galena under pH-neutral atmospheric conditions. Breakdown of sphalerite is apparent throughout the site. Acceleration of sphalerite oxidation is not expected in the absence of a mechanism to lower pH. Zinc and cadmium leaching is expected to continue but not to accelerate (Teck 2015).

2.1.4 North Drainage Channel

Three drainage channels were built as part of the 2014 TMA decommissioning (Figure 2). The longest of the three was constructed through the former Reclaim Dam and the pond area to route Camp Creek flows along its historical alignment. The other two drainages (the North Channel and the South Channel) were constructed to direct runoff from the covered tailings areas to the new Camp Creek Drainage Channel. There is also a drainage channel located down the middle of the cover that directs runoff from the tailings cover at the northern end of the TMA.

The North Drainage Channel is part of the TMA as it directs surface runoff around covered tailings to the SRS pond. The South Drainage Channel and Camp Creek Drainage Channel are downstream of the TMA and inspection results are reported separately.

The North Drainage Channel was constructed along the east side of the former South Pond to divert as much runoff as possible away from the tailings and soil cover during the first few years after the cover placement. Conveyed water is retained in the SRS pond to allow for sediments to be deposited before the water is discharged into Camp Creek. The channel length is about 300 m, and it was installed with riprap erosion protection placed on top of a non-woven geotextile. A plan, profile, and typical section of the channel is presented in Figure 6. The channel is designed for the 1 in 1000-year, 24-hour IDF. The upstream and downstream side slopes are 2H:1V. The average grade of the channel is 3%.

2.2 TMA Design Basis

Table 2-1 provides the relevant design criteria adopted for the TMA decommissioning in 2014 and 2015 (SRK 2013). Section 1.2 provides Teck's corporate policy regarding tailings management and design criteria for any future modifications.

Table 2-1: TMA Design Criteria

Parameter	North Embankment	SRS
Consequence Classification[1]	Significant	Low
Inflow design Flood (IDF)		
Minimum AEP[2]	1/3 between 1 in 1,000-year event and the PMF[3]	1 in 1,000-year event
IDF Peak Flow (m^3/s)	Not Applicable (no spillway)	5.4
Freeboard		
Minimum Operating Freeboard	Not Applicable (no water impounded)	1.0
Freeboard during passage of IDF		0.5
Seismic Event		
Minimum AEP[2]	1 in 2,475-year event	1 in 1,000-year event
PGA[4] (g)	0.20	0.073
Slope Stability FOS[5]		
Static	1.5	1.5
Pseudo-static	1.0	1.0
Post-earthquake	1.2	1.2

Notes:

[1] As per CDA 2013 classification
[2] AEP = Annual exceedance probability
[3] PMF = Probable maximum flood
[4] PGA = peak ground acceleration
[5] FOS = Factor(s) of Safety

2.3 Summary of History

The Sä Dena Hes mine was constructed in 1991 and operated for a 16-month period between August 1991 and December 1992. The Sä Dena Hes Operating Corporation (SDHOC) purchased the property from Curragh Resources Inc. in March 1994. The SDHOC is a joint venture between Teck Resources Limited (“Teck” - 50% ownership) and Pan Pacific Metal Mining Corp (50% ownership, a wholly owned subsidiary of Korea Zinc). Teck is the operator and manages the property under the joint venture agreement.

In 2014 and 2015 the mine site was closed and decommissioned in accordance with the DDRP (Teck 2015). The decommissioning and reclamation activities consisted of:

- Removal of the South and Reclaim Dams
- Relocation of the existing Camp Creek Diversion to its original creek alignment
- Construction of the SRS at the toe of the removed South Dam
- Construction of ancillary riprap lined drainage channels

- Placement of the till cover over the tailings that would remain stored on site behind the North Embankment
- Dismantling, decommissioning, and disposal of all site infrastructure including the mill
- Regrading and capping of the waste rock dump areas
- Landforming and capping of the mill area and other site disturbances
- Decommissioning of site access roads
- Revegetation (scarification, tree planting and seeding)

3 Surveillance and Maintenance during Reporting Period

The TMA is a closed facility. Teck conducts on-going maintenance and surveillance of the TMA and the water management infrastructure at the site including the access road from the Robert Campbell Highway as per the Sä Dena Hes OMS Manual (Teck 2023).

3.1 Surveillance

Surveillance of the TMA consists of routine visual inspections, remote camera visual monitoring of the North Embankment to monitor ponding[1], water quality sampling, and instrumentation monitoring (piezometers and seepage flow). In addition to the routine surveillance program, a bi-annual InSAR satellite data monitoring is used to identify areas of potential deformation that have not been identified through the existing surveillance program. A summary of the 2024 InSAR data and review of the instrumentation data is provided in Section 5.2.

Routine visual inspections are completed by the Site Caretaker in the spring and the fall, with an additional summer inspection (this report) completed by an engineer (EOR for the TMA). The Fall 2023 inspection was completed on September 9, 2023, and the Spring 2024 inspection was completed on June 1, 2024. The routine inspection forms are provided in Appendix E.

Satellite images were monitored and reviewed during late May and early June to track the snowpack melting process in the TMA. A remote camera was installed in the Spring of 2024 to allow for real-time visual monitoring of the North Embankment going forward. Considering the erosion event at the North Embankment in 2022, the monitoring is completed to identify the development of ponding near the North Embankment, which triggers an additional site inspection to determine if active management is needed so the pond drains away from the embankment. This process triggered a visual inspection on May 5, 2024, to confirm the extent of ponding and to determine if actions were required to prevent overtopping of the embankment. The visit determined that no actions were required and that drainage to the south (away from the embankment crest) was not impeded.

Water quality sampling is completed every two months and includes monitoring of seepage at the toe of the North Embankment. During the site visits by the sampling team, inspections of the North Embankment and the SRS spillway are made to check for blockages or subsidence.

3.2 Maintenance

In August 2023, maintenance was completed to address deficiencies identified in the 2023 AFPR:

- A small slough in the downstream slope of the SRS was repaired.

[1] A remove camera was installed in the Spring of 2024 to monitor ponding. Prior to this, satellite monitoring using Sentinel 2 Satellite data was used.

- Displaced riprap in the North Drainage Channel was put back in place.
- Erosion gulley at the North Drainage Channel and soil cover north of the SRS Pond were backfilled.

The maintenance items were inspected as part of the 2024 AFPR inspection and were found to be in acceptable condition.

4 Climate Data and Water Balance

4.1 Review and Summary of Climate Data

This section presents the current climate data for the site. As there is no weather station at the site, data from select local meteorological stations were used to determine temperatures, mean annual precipitation, and evaporation for the site. Regional and regression analyses were carried out by SRK to develop correlations from the available data to the site in absence of any site-specific data. Details of the correlation development are provided in SRK (2023b).

Table 4-1 and Figure 7 presents a comparison of the estimated climate conditions from July 2023 through June 2024 compared to average values. Mean site temperatures are estimated to be 2 °C cooler than temperatures at the Watson Lake Airport. The evaporation potential was estimated in the Hydrometeorological Characterization Report (SRK 2023b). ERA5-Land climatic gridded model produced by European Centre for Medium-Range Weather Forecasts (ECWFM) was used to predict a Mean Annual Precipitation (MAP) for the site of 675 mm.

Table 4-1: Site Climate Data (July 2023 through June 2024) Compared to Climate averages (1980-2021)

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Annual
Normals													
Daily Max. Temp [°C]	18.6	16.4	10.1	1.4	-10.0	-15.3	-15.7	-10.7	-3.9	3.8	11.1	16.9	1.9
Daily Min. Temp [°C]	5.5	3.6	-0.5	-6.7	-19.6	-25.3	-26.0	-24.0	-19.6	-9.8	-1.7	3.4	-10.1
Daily Mean Temp [°C]	12.1	10.0	4.8	-2.6	-14.8	-20.3	-20.9	-17.3	-11.7	-3.0	4.7	10.2	-4.1
Precip. (Site) [mm]	98	77	72	61	41	37	38	25	29	37	63	96	675
Reporting Period (July 2023 through June 2024)													
Mean Temp [°C]	15.6	13.5	6.9	-1.7	-12.6	-17.7	-23.2	-.2	-10.2	-1.1	5.8	12.4	-2.6
Precipitation [mm]	67	58	41	26	44	35	76	17	14	18	63	81	539

Sources: SRK (2023b), https://srk.sharepoint.com/sites/FS261/Internal/Monitoring%20Data/Climate/WatsonLake_Precip_rev01.xlsx?web=1

The Watson Lake A station was used as the reference station for the climate data as it is the most representative station close to the site that is currently active. Total precipitation recorded at Watson Lake Airport (Climate ID: 2101204) from July 2023 through June 2024 was reported as 372 mm. Using the undercatch correction factor of 1.13 (SRK 2018), total corrected annual precipitation at Watson Lake for the same period was 421 mm. A 1.28 ratio was applied to convert the corrected Watson Lake Airport precipitation to a representative site precipitation based on the ERA5-Land regression analysis (SRK 2023b) to result in a total precipitation of 539 mm for the site during the reporting period.

The climate data indicates that precipitation during the reporting period was 20% lower than the average.

The Yukon Government Department of Environment's Water Resources Branch issues the Yukon Snow Survey Bulletin and Water Supply Forecast three times annually in early March, April, and May

(YG 2024). Data from May 1, 2024, for the Liard River Basin (Hyland Meteorological Station) shows the Liard River basin-average snow water equivalent (SWE) was lower than the historical median and was estimated to be 81% of the historical median on May 1, with a SWE of 111 mm. A graph of the SWE over the winter of 2023-24 at the Hyland Station is provided in Figure 7.

4.2 Review of Water Balance and Freeboard

SRS

The SRS Pond has a maximum surface area of about 1,600 m^2 during the freshet high flow period. The catchment area for the SRS spillway is 1.33 km^2 as shown in Figure 8.

A simplified mean annual water balance calculation for the catchment above the SRS is summarized in Table 4-2 based on data compiled for the recent SRK hydrological study (SRK 2023b), the estimate of the site MAP during the reporting period (July through June), and the following assumptions:

- Inflow from the surrounding hillside catchment (1.17 km^2) based on a runoff coefficient of 0.60
- Inflow from the tailings till cover (0.16 km^2) based on a runoff coefficient of 0.50
- Direct precipitation input to the SRS pond (0.0016 km^2)

Outflow from the SRS pond is calculated as the difference between pond inputs and outputs based on the following assumptions:

- Mean annual lake evaporation of 345 mm (SRK 2023b). Use of the mean annual lake evaporation is considered more reasonable compared to developing a yearly correlation from Watson Lake data to due to the high variability in weather conditions between the two sites over smaller timescales.
- Seepage losses estimated at 0.5 L/s

Table 4-2: TMA Water Balance

Item	Units	Mean Annual	2023-2024
Precipitation	mm	675	539
Mean annual lake evaporation	mm	345	345
Mean annual run-on from the hillside catchment above the SRS	m^3	473,850	378,378
Direct Precipitation on the SRS pond surface	m^3	1,080	862
Mean annual runoff from tailings cover material	m^3	52,650	42,042
Total Annual Inflow	m^3	527,580	421,282
Annual pond evaporation losses	m^3	552	552
Seepage losses	m^3	15,768	15,768
Net Annual Discharge Volume over spillway	m^3	511,260	404,962

Sources : https://srk.sharepoint.com/sites/FS261/Internal/Site%20Water%20balance/2019-2020%20Water%20Balance%20SDH.xlsx?web=1
Note: The time period for 2023-2024 is July through June.

The SRS was designed to convey the 1 in 1,000-year flood event while maintaining 1 m of freeboard to the crest of the embankment. The climate data review found no indication of an extreme precipitation event that would have compromised the design freeboard during the past year.

North Embankment

The tailings behind the North Embankment were capped with a till cover in 2014 with the cover tied into the upstream crest of the embankment. The cover was sloped to drain water away from the crest and towards the SRS to the south. A shallow swale (main drainage swale) was constructed down the middle of the cover to direct the surface runoff on the cover to the SRS. A pond develops annually during the snowmelt period adjacent to the dam that is believed to be primarily caused by restricted drainage to the south, likely due to snow and/or ice blockages.

The 2022 AFPR recommended remedial actions to increase the North Embankment freeboard. The design has been finalized and is planned for implementation in 2025 (pending YG approval). The concept is to construct a berm on the North Embankment crest, following the dam slope, and to add a graded beach with a 3% slope (covering approximately 50 m) towards the south to improve the surficial flow.

4.3 Water Discharge Quality

The surface water quality discharge from the TMA is currently monitored every two months under the Yukon Water License QZ16-051. The groundwater quality is currently monitored under the same license. Water quality results are submitted to the Yukon Water Board as part of the Annual Water Licence. The report is due in March, the year following the operational period covered.

5 Site Observations

5.1 Visual Inspections

Weather during the July 9 and 10, 2024 site inspection was mostly sunny with temperatures ranging between approximately 14°C to 25°C. No precipitation was recorded at the Watson Lake Airport in the previous week leading up to the site inspection. The ground surface was free of snow and mostly dry.

Site observations are provided in the following subsections. Select photographs taken during the inspection are provided in Appendix A. The start of Appendix A also includes figures that provide the photograph locations and a tracklog of the inspection route.

5.1.1 North Embankment

A site plan and a section of the North Embankment are presented in Figure 3. Table 5-1 provides the inspection observations along with references to corresponding photographs and applicable recommendations.

Table 5-1: North Embankment Observations

Observation	Figure (App. A)	Photo	Associated Recommendation
■ The crest of the North Embankment is in good condition and shows no signs of deformation or abnormal settling.	A-5	NE-01, NE-02	n/a
■ Except for NDW-4A, the piezometers and settlement gauges are in good condition and function as designed. – The PVC pipe at NDW-4A rose due to frost jacking and the top elevation of the pipe is uncertain. The outer steel protective casing is loose and the annulus between the casing and PVC pipe is filled with water to surface. The water level in the well was near the bottom of the pipe. Frost jacking of the pipe is likely to continue.	A-6	NE-03, NE-04	2024-1
■ Water level readings were collected from all standpipe piezometers during the visit (Table 2). The water levels at all wells are lower compared to the last set of readings taken in June and are within their normal historical range.			n/a
■ Conditions at the embankment toe were similar to the June 2023 inspection but were generally drier due to the inspection taking place later in the year and with less precipitation prior to the inspection. – Spongy ground is present at the French Drain outlet. – The toe seepage was observed located 10 m west of the French Drain that extended approximately 2 m up from the embankment toe. The seepage was clear with no signs of sediment transport. This seepage is consistent with observations made in previous inspections.	A-9	NE-10	n/a
■ The downstream slope shows no signs of mass deformation nor is there any sign of bulging at the downstream toe. While there are a few shrubs and small trees on the slope, no excessive vegetation growth beyond the guidelines in OMS Manual was noted.	A-7	NE-05, NE-06	n/a

Observation	Figure (App. A)	Photo	Associated Recommendation
■ The downstream slope of the erosion gully repair area (2022) has been covered with an erosion control blanket with a small amount of grass vegetation present, mostly in the lower portion of the embankment where the ground was moist. The vegetation coverage has improved in the past year. The ground was wet at the outlet of the French Drain constructed as part of the gully repair.	A-8	NE-07, NE-08	n/a
■ Along the downstream toe of the embankment is an approximate 80 m long seepage zone (consistent with previous inspections). Seepage was observed to be clear.	A-7, A-9	NE-06, NE-09	n/a
■ Seepage emerges from the valley sidewalls downstream of the embankment, which is the largest contributor to the flow at the seepage monitoring station MH-02. Flow through MH-02 was estimated to be <0.5 L/s.			n/a
■ The amount of embankment seepage is unable to be determined accurately as the monitoring station MH-02 is located approximately 35 m downstream of the embankment and captures mostly seepage from the valley sidewalls.			2023-1

5.1.2 Sediment Retaining Structure

Figure 5 provides a site plan and sections of the SRS. Table 5-2 provides the inspection observations along with references to corresponding photographs and applicable recommendations.

Table 5-2: SRS Observations

Observation	Figure (App. A)	Photo	Associated Recommend-ation
■ No significant additional deformation was observed at the SRS spillway where water is suspected to be flowing beneath the riprap and geotextile in the spillway and eroding the underlying SRS embankment and leading to embankment deformation. This suspected mechanism is supported by the following observations:	A-12	SRS-04	2023-04
– Sediment accumulation immediately downstream of the spillway.	A-12	SRS-03	n/a
– The crest east of the spillway is lower in elevation compared to the west crest of the spillway with visible deformation observable on the upstream slope as indicated by folding of the jute-netting. A review of the 2022 lidar surface indicates that the east crest is 0.25 m lower than the west crest.	A-12	SRS-04	n/a
– Continuous cracking along the east side of the spillway.	A-11	SRS-02	n/a
■ Continued erosion beneath the spillway is expected.			
■ Beaver(s) have placed muck/debris up against the inlet of the spillway (up to about 20 cm) that has raised the water level in the SRS pond. The muck may be reducing the amount of water that is able to flow beneath the geotextile/riprap, limiting the ongoing embankment erosion and deformation that has been observed in the last few years at the spillway.	A-11	SRS-01	2024-2

Observation	Figure (App. A)	Photo	Associated Recommend-ation
■ The slough that was observed in 2023 on the downstream slope approximately 8 meters from the east abutment has been repaired.	A-13	SRS-05, SRS-06	n/a
■ Seepage was flowing from the SRS toe on the east side of the spillway with an estimated flow rate of 0.05 L/s. The seepage is consistent with previous years inspections.	A-13	SRS-06	n/a

5.1.3 Tailings Cover

Table 5-3 provides the inspection observations related to the TMA cover along with references to corresponding photographs and applicable recommendations.

Table 5-3: Tailings Cover Observations

Observation	Figure (App. A)	Photo	Associated Recommend-ation
■ Conditions are generally the same as those observed during the June 2023 inspection. At the time of the inspection, the ground was generally dry, with minimal ponding except in the main drainage swale and at the east side of the cover approximately midway between the North Embankment and former Coffer Dam.	A-14 to A-16	TC-01 to TC-06	n/a
■ The main drainage swale constructed within the cover to assist in directing runoff away from the North Embankment was clear of debris/vegetation and was functional. Small areas of ponding water were observed where there is no positive gradient along the channel.	A-14	TC-01	n/a
■ The erosion gulley observed in June 2023 inspection upstream of the SRS pond has been repaired. The gulley slopes were regraded, and fill placed in the bottom to form a trapezoidal channel. Groundwater recharge from west of the TMA flows through the channel with an estimated flow rate of approximately 0.5 L/s.	A-15	TC-05, TC-06	n/a
■ No change in condition was observed in the cover erosion that was observed in 2023 near the south end of the main tailings area (north of the former coffer dam) where water flows westward from the east side of the cover to the main drainage swale. The erosion feature is approximately 40 m long, includes two main drainage pathways that are up to 1 m wide and 0.3 m deep. No tailings were observed, the base of the gullies consists of cobbles and appear to be self-armouring.	A-14	TC-03	n/a

5.1.4 North Drainage Channel

A site plan of the North Drainage Channel is presented in Figure 6. Table 5-4 provides the inspection observations along with references to corresponding photographs and applicable recommendations.

Table 5-4: North Drainage Channel Observations

Observation	Figure (App. A)	Photo	Associated Recommend-ation
■ The channel is functioning as designed and is in good condition.			n/a
■ Since the June 2023 inspection, repairs were completed to address: – The riprap slippage that occurred immediately upstream of the channel outlet to the SRS. The riprap was replaced and conforms to the design geometry. – An erosion gulley that developed immediately to the west of the riprap movement noted above. The gully was backfilled with local sourced fill.	A-17	NDC-01, NDC-02	n/a
■ The French Drain that was installed in the North Drainage Channel Berm in 2020 to repair a slough in the berm was in good condition. The area is located 40 m upstream of the SRS Pond. Clear seepage was observed emerging from the base of the repair (as intended) with no signs of sediment transport.	A-18	NDC-03	n/a

5.2 Instrumentation Review

There are seven standpipe piezometers and three settlement gauges at the North Embankment. In addition, a remote monitoring camera was installed near the east abutment of the North Embankment in the Spring of 2024. The piezometer and settlement gauge instrumentation locations are shown in Figure 3. All elevations are based on a datum that was established during a LiDAR survey carried out in 2012. The original site datum used to design and build the structures in the early 1990's was about 2 m lower than the 2012 datum. All previous inspection reports, prior to 2014, used the 1990 datum.

The current instrumentation monitoring system is mainly located on the North Embankment crest. An internal erosion assessment completed in 2023 determined that piping through the embankment foundation is credible either through backwards erosion or through an existing defect (Section 6.1.2). To improve the understanding of the piezometric pressures and seepage gradients through the embankment and the foundation, additional piezometers are recommended as described in Section 6.1.2).

5.2.1 Water Levels

The water levels in the North Embankment standpipe piezometers are manually recorded bi-monthly and the results are reviewed by the EOR after each monitoring session. Figures D-1 to D-4 in Appendix D provides a plot of seasonal water levels since 2012.

Except for NDW-4A, the piezometers are in good condition and continue to function as designed. In the spring of 2024, the PVC pipe at NDW-4A rose due to frost jacking and the top elevation of the pipe, and corresponding water level readings are uncertain. The piezometer is recommended to be replaced.

The seasonal fluctuations recorded during the reporting period are consistent with those in previous years. The piezometer readings are evaluated against triggers in the Trigger Action Response Plan (TARP) was last updated in May 2023 (SRK 2023c). There were no piezometer trigger exceedances based on the updated FOS threshold criteria.

5.2.2 Discharge Flows

There is no discharge from the tailings surface behind the North Embankment. Runoff from the tailings cover is directed away from the North Embankment towards the SRS pond. Outflows from the SRS are not measured.

There is seepage from the hillside to the west of the North Embankment and minor seepage from the TMA which reports to MH-02. The MH-02 is about 35 m downstream and captures mostly seepage from the valley sidewalls. An additional seepage monitoring station near the embankment toe is recommended to be installed as the embankment seepage flow rate is unable to be determined accurately, and as noted in Section 6.1.2, internal erosion through the foundation is considered to be credible.

During the site inspection, seepage from the toe was estimated to be <0.1L/s and seepage at MH-02 was estimated to be <0.5 L/s (<30 L/min). Figure D-7 presents historical flow data from MH-02 since 1992 and shows that the flow rate was within the historical expected range.

5.2.3 Deformation/Settlement

North Embankment settlement gauge readings were collected between 1993 and 2020. Annual readings were discontinued after 2020 as displacements were negligible. The gauges remain in operational condition and are to be read following any major seismic event as per the OMS Manual. Figure D-5 provides the settlement gauge readings between 2015 and 2020 that show no significant elevation changes.

A site-wide InSAR survey was completed to analyze site-wide surface displacements at SDH using satellite imagery during snow-free periods between July 2021 and 2024 (3V Geomatics 2024). SRK was provided access to 3vGeomatics' web-based platform to review the results of the InSAR analysis. Figure D-6 in Appendix D provides a high-level overview of the displacements in the TMA area during this period. The results show no significant displacements occurring in the TMA area. Figure D-6 plots two representative areas within the TMA:

- Point A on the North Embankment: Data indicates no apparent movement.
- Point B on the Tailings Cover: Point B was selected in an area of the cover that showed the largest displacement. A review of the time series graph of displacement shows an approximately settlement rate of -0.3 cm/yr between 2021 and 2024.

Most other areas of the cover show no significant displacement trends. Based on the data, there is no clear displacement trend that can be identified in the TMA.

5.2.4 Freshet Satellite Monitoring

Following the 2022 North Embankment erosion event, the TMA surveillance program was revised to include monitoring of satellite imagery between April and June (or until the site is snow free) to identify any pond development adjacent to the North Embankment. Publicly available Setinall-2 satellite imagery was used, which provided an image of the site two to four times per week. The imagery indicates that a pond started to form sometime April 27 and May 2, 2024. Based on the imagery, a site inspection was completed on May 5 that found that the snowmelt on the cover was mostly complete and no additional actions were required to manage water. Select satellite images from the snowmelt period and the May 5, 2024, site inspection are provided in Appendix C.

Going forward, freshet monitoring will be mainly completed using a remote camera that was installed near the east embankment to provide daily images of the North Embankment and adjacent tailings cover area. An example image from the remote camera is shown in Figure B-10 in Appendix B.

5.3 Site Inspection Forms

The Teck Site Caretaker makes routine inspections of the TMA twice a year in the spring and the fall. No safety concerns related to the North Embankment and the SRS were identified during review of the routine inspection forms. The Fall 2023 and Spring 2024 routine inspection form are provided in Appendix E.

6 Facility Safety Assessment

6.1 Hazards and Failure Modes Review

As a permanently closed site, structures that have the potential to endanger human life or create environmental damage were either removed or upgraded to enhance long-term physical stability.

Hazards that could manifest themselves were identified for the North Embankment and SRS include runoff from extreme precipitation events, seismic events, ice-buildup and debris in the SRS spillway and Tailings Cover Drainage Channels, potential for liquefaction of the tailings, and flow capacity of the SRS spillway. This section reviews the hazards that have been identified for the North Embankment and the SRS and provides an assessment of the safety of these structures relative to the potential failure modes listed in the CDA (2019) Technical Bulletin.

6.1.1 Dam Overtopping

North Embankment

While the tailings cover is graded to allow water to drain to the south and away from the North Embankment crest, a review of publicly available satellite imagery indicates that water pools against the North Embankment during snow melt. The pooling is suspected to be caused by ineffective drainage to the south, likely due to the blockage of drainage channels due to snow and/or ice. Due to the limited freeboard, there is a risk that ponded water can overtop the dam in response to a rainfall event or snowmelt like that occurred in June 2022.

This overtopping mechanism was raised as a credible failure mechanism in the 2015 Dam Safety Review (DSR) (AMECFW 2016). In response to this concern, a hydrological study was completed (SRK 2018) to assess the likelihood of overtopping of the North Embankment in the event of an extreme design flood event that conserved a blockage of the central main drainage swale. The results indicated that during the Probable Maximum Flood (PMF), the North Embankment crest was not overtopped with ponded water reaching within a few centimeters of the embankment crest and with water diverted around the blockage through a secondary drainage channel to the east. The study did not consider blockages within the secondary channel. Considering the 2022 overtopping event, an engineering design has been developed to raise the embankment to provide additional freeboard to prevent a similar future event.

As part of the 2022 embankment repairs, the crest within the vicinity of the repair area was raised by approximately 0.5 m and the minimum crest elevation is now approximately 20 cm higher than it was prior to the gully; however, the embankment remains vulnerable to future erosion events during future snow melt periods. As noted above, the design of an embankment raise has been completed and satellite monitoring of the site during freshet is now conducted to track the development of a pond that triggers a site inspection and any preventative action.

SRS

The spillway in the SRS is a riprap lined channel designed to convey the 1 in 1,000-year IDF with 1.0 m of freeboard. As noted in the site inspection observations (Section 5.1.2), deformation of the crest in the vicinity of the spillway has been observed with an estimated settlement of 0.25 m. Even with the settlement, there is adequate freeboard remaining and the spillway is still expected to function in accordance with the design parameters.

6.1.2 Internal Erosion

North Embankment

The North Embankment was built as a tailings retaining structure designed to allow seepage through the dam. The dam has three zones: an upstream low permeability compacted zone of silty till, a semi pervious compacted central zone of sandy till and a compacted outer downstream shell of pervious sand and gravel. Underlying the dam is a native sandy, gravelly silt (till). There are no current indicators of fines being washed through to embankment, although there is some seepage evident at the downstream toe. This seepage is mixed in with historical spring activity that was noted during the embankment construction and the annual inspections. The tailings placed up against the upstream face of the embankment have significantly reduced the seepage loss since initial construction.

An internal erosion assessment (SRK 2024) determined that both the till and tailings materials are internally unstable and susceptible to suffusion, and that piping through the embankment foundation is credible based on the seepage analyses results and an evaluation of critical hydraulic gradients. The potential for piping through the foundation is supported by historical evidence of sand boils at the embankment toe when the impoundment was temporarily filled with water to an elevation of approximately 1,098.5 m in preparation of the mill start-up in 1991 (SRK 1992). Following this event during the mill start-up, the water level was lowered and subsequently the impoundment was filled with tailings which reduced the seepage and hydraulic gradient through the embankment. No evidence of internal erosion has been identified since this event.

The failure mode is considered non-catastrophic with no large-scale impacts due to the limited amount of water retained by the North Embankment. Any slope instability or sloughing caused by internal erosion would not likely result in a release of tailings due to the wide crest width, and the volume of tailings that would be released through a sinkhole would be minor due to the limited volume of free water.

Due to uncertainties in the seepage gradients through the structure, additional piezometers are recommended to be installed in the tailings, embankment, and foundation to improve the understanding of piezometric pressures, as well as material permeabilities. The data would be used to improve the accuracy of the seepage model and hydraulic gradients to better assess the credibility of internal erosion.

SRS

The SRS is an earthfill dam constructed of silty till that is classified as SM and ML as per the Unified Soil Classification System. This material type is considered to have a low resistance to piping (Rivard 1981). A coarse rock seepage control layer is present east of the spillway while no seepage control is present west of the spillway. While seepage through the embankment is barely measurable, there is one small boil that has been noted at the downstream toe of the SRS, but no loss of fines detected. The pond behind the SRS has a maximum depth of about 1.5 m and the average hydraulic gradient through the structure is 0.15. Based on the hydraulic gradient, material type, and guidance provided by Rivard (1981), internal erosion is plausible and should be monitored.

As noted in Section 5.1.2, water is suspected to be flowing beneath the SRS spillway riprap and geotextile leading to erosion of the underlying embankment fill and resulting in settlement of the crest and riprap deformation. Sediments accumulation was observed in the South Drainage Channel immediately downstream of the spillway. Continued erosion of sediment is expected; however, no immediate actions are recommended at this time since the structure is considered temporary and planned to be decommissioned by 2028. Should the SRS be required for a longer period, spillway repairs will be required.

6.1.3 Slope Stability

North Embankment

The most recent stability assessment for the North Embankment was completed in 2024 (SRK 2024) with the results shown in Table 6-1. The study included a liquefaction screening assessment that determined that liquefaction of the embankment and foundation is not expected during the 1 in 10,000-year seismic event. The liquefaction assessment used a peak ground acceleration (PGA) of 0.26 g from a probabilistic seismic hazard assessment completed in 2023 (SRK 2023a). A seismic displacement analysis was also completed that predicted the permanent displacement following the 1 in 10,000-year seismic event would be less than 25 cm.

The stability analysis results show that the North Embankment is stable under both static and seismic assessments with the structure exceeding minimum target FOS requirements.

Table 6-1: North Embankment Stability Analysis Results (SRK 2024)

Loading Condition	Target FOS	Calculated FOS
Long Term Static	1.5	1.6
Post-earthquake	1.2	1.6

SRS

The most recent stability analysis of the current configuration of the SRS (SRK 2015) indicates that the structure meets minimum target FOS requirements under both static and pseudo-static conditions. The stability analysis results are provided in Table 6-2. The seismic calculation was completed using a

PGA of 0.15 g (2010 NBC SHC), which was based on the target level for earthquake hazards suggested by CDA (2019) guidelines for a low consequence class dam in the passive care phase. It is also noted that the PGA based on the 2020 NBC SHC is now 0.10 g.

Table 6-2: SRS Stability Analysis Results

Loading Condition	Target FOS	Calculated FOS
Long Term Static	1.5	1.7
Pseudo-Static	1.0	1.2
Post-earthquake	1.2	1.6

6.1.4 Surface Erosion

North Embankment

The erosion gully observed in June 2022 was caused by a release of ponded water from the TMA and is considered an overtopping failure mode and not a surface erosion failure mode. No other signs of surface erosion were observed at the North Embankment.

Teck personnel conduct routine and event-driven inspections of the TMA and monitor the downstream dam slope for surface erosion caused by snow melt and rainfall runoff. The inspection frequency is considered appropriate to effectively monitor, track, and repair any erosion prior to any failure.

SRK completed a study (SRK 2018) to assess the erosion potential of the material on the downstream face that could occur due to extreme precipitation. The study concluded that existing sand and gravel material exposed on the downstream face is adequate to withstand the runoff from the 200-year, 24-hour rainfall event without any significant erosion. The design of the North Embankment raise (pending YG approval) includes placement of additional erosion protection on the downstream face to withstand erosion to a 1 in 10,000-year event.

SRS

GeoJute fabric protection on the downstream face of the SRS is in satisfactory condition and provides adequate protection against surface erosion. No signs of surface erosion were observed in areas protected by the GeoJute.

6.2 Review of Upstream and Downstream Conditions

The TMA is located on a catchment divide so all conditions are downstream. There are no identifiable hazards to the east and west sides of the valley adjacent to the TMA. There is no change in the downstream condition of the TMA to the north and to the south that affects the potential consequences of failure.

6.3 Consequences of Failure Review

North Embankment

Downstream of the North Embankment, the valley grade falls at approximately 7 to 9% towards False Canyon Creek, which conveys flows into the Frances River, a tributary of the Liard River. The area downstream is undeveloped with no identifiable population at risk, public roads, or any other infrastructure. The probability of a failure mode leading to large scale loss of tailings from the TMA is very low as there is no water impounded except for a limited volume during snow melt, no identifiable brittle failure mode as the dam is founded on dense till with a post-seismic FOS that indicates that the dam would still have a FOS above 1 in the event of an earthquake. As a result, no significant loss or deterioration of fish or wildlife habitat is expected with restoration highly possible.

The embankment is classified as 'Significant' consequence based on CDA (2013) criteria after the last DSR (AMECFW 2016). The embankment's consequence classification has also been reviewed against GISTM (GTR 2020) framework and was also assessed to be classified as 'Significant'.

SRS

Like the North Embankment, the area downstream of the SRS is undeveloped with no identifiable population at risk, public roads, or any other infrastructure. In addition, the reservoir capacity is small (800 m^3 of water) and as a result, no long-term environmental losses are expected.

The structure is classified as a 'Low' consequence based on CDA (2013) criteria.

6.4 OMS Manual Review

The latest revision of the OMS Manual was updated on December 19, 2023. The OMS Manual is reviewed annually and generally follows the Mining Association of Canada's guidelines for OMS Manuals (MAC 2021) and is adequate for the TMA. The last OMS manual update included several changes to incorporate the North Embankment erosion gully repairs in 2022 and additional monitoring requirements. In addition to the North Embankment revisions, the TARP has been updated based on the North Embankment piezometer trigger review (SRK 2023c).

SRK reviewed the most recent OMS Manual and has provided a mark-up of recommended edits. Most are minor changes; the most significant ones are revisions to incorporate changes to staffing and contact information, and an update of protocols for remote surveillance camera monitoring (to replace satellite image monitoring. Teck intends to publish an updated OMS prior to the end of 2024.

6.5 Mine Emergency Response Plan Review

Teck developed a Mine Emergency Response Plan (MERP) for Sä Dena Hes that was last updated on February 1, 2024. A tabletop test exercise of the MERP was completed during the 2020 annual inspection of the TMA, which involved a simulated tailings emergency scenario and included the EOR and Teck personnel, with the test findings incorporated into the MERP on December 14, 2021. SRK

reviewed the TMA applicable sections of the MERP in 2022 and found the plan to be adequate for the site.

The adequacy of the MERP was demonstrated during the response to the discovery of the North Embankment erosion gully on June 17, 2022, with risk mitigations and repairs implemented in a timely manner to minimize environmental impacts.

Teck is planning to carry out another tailings-related tabletop exercise before the end of 2024.

6.6 Design Basis Report and Deviance Accountability Tracking

A Design Basis Report (DBR) was prepared by SRK in March 2024 that compiles key project information and the design basis for the TMA. The DBR is to be updated every time there is a material change in the design assumptions, design criteria, design, or the knowledge basis. The DBR was reviewed as part of the AFPR with no changes required at this time.

A Deviance Accountability Tracking Spreadsheet has also been developed by Teck with input from the EOR in August 2024 to document deviations from the design or the expected conditions or performance since the previous DSR. This spreadsheet will be reviewed and updated annually by the EOR.

7 Summary and Recommendations

7.1 Summary of Construction and Operation Activities

The site is currently closed and there are no operational activities. Maintenance was completed in August 2023 to repair a small slough in the downstream slope of the SRS, and to repair erosion gulley and displaced riprap at the North Drainage Channel. In addition, a remote camera was installed at the North Embankment in Spring 2024.

7.2 Summary of Performance

The North Embankment is currently stable. The structure does not retain water except during snow melt when the tailings cover drainage may be restricted due to ice or snow blockages in the drainage channels. During the June 2022 snow melt, ponded water overtopped the embankment resulting in the development of an erosion gully that eroded embankment fill with no tailings displaced. Once the pond had drained, the erosion discontinued. No signs of instability were observed during the 2024 site inspection. An embankment raise has been designed for the North Embankment to increase the freeboard and eliminate the risk of overtopping like that occurred in 2022.

The SRS is functioning in accordance with design parameters. However, water appears to be flowing beneath the spillway riprap and geotextile that is internally eroding the embankment material resulting in sediment accumulation downstream of the SRS and deformation of the spillway and dam crest. Planning is in progress to decommission the SRS by 2028.

7.3 Summary of Climate and Water Balance

Based on observations at the Watson Lake Airport climate station, the climate during the reporting period of July 2023 through June 2024 was dryer than average with a total precipitation of 539 mm at the Site compared to the mean annual precipitation of 675 mm.

The TMA is designed to be a flow-through facility with no active water management required.

7.4 Summary of Changes to Facility or Upstream or Downstream Conditions

There were no significant changes in upstream or downstream conditions of the TMA that would affect the potential consequences of failure.

7.5 Table of Deficiencies and Non-Conformances

SRK has completed the 2024 facility performance review of Sä Dena Hes Mine, TMA and water management infrastructure and concluded that the North Embankment, the SRS, and the North Drainage Channel are in adequate condition.

Table 7-1 shows the recommendation priority ranking description developed by Teck, and Table 7-2 provides a summary of deficiencies and non-conformances noted during the 2024 performance review and outstanding deficiencies or non-conformances from previous reviews.

Table 7-1: General Description of Priority Rankings for Recommendations

Priority	Description
1	A high probability or actual dam safety issue considered immediately dangerous to life, health or the environment, or a significant regulatory concern.
2	If not corrected, could likely result in dam safety issues leading to injury, environmental impact, or significant regulatory action; or a repetitive deficiency that demonstrates a systematic breakdown of procedures.
3	Single occurrences of deficiencies or non-conformances that alone would not be expected to result in dam safety issues.
4	Best Management Practice as a suggestion for continuous improvement towards industry best practices that could further reduce potential risks. This typically includes ongoing construction items within the appropriate construction cycle.

Notes: Priority ratings developed by Teck (2019).

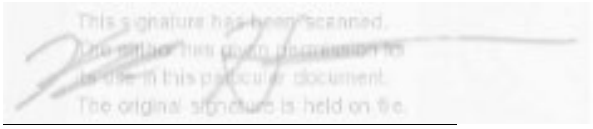
Table 7-2: Table of Recommendations for the 2024 TMA Inspection

Structure	ID No.	Deficiency or Non-Conformance	Applicable Regulation or OMS Reference	Recommended Actions	Priority (Table 7.1)	Recommended Deadline / Status
			2022 Recommendations			
North Embank-ment	2022-3	Drainage channel blockages on the tailings cover during snowmelt results in the formation of a pond adjacent to the North Embankment. In 2022, the pond overtopped the North Embankment and formed an erosion gully that required repairs.	OMS Section 5.2.1	Modify the dam to eliminate the risk of overtopping. Due to limitations in the tailings cover thickness, increasing the grade of the cover drainage channels is not possible without exposing tailings. As a result, raising the dam to increase the freeboard is recommended.	2	**In Progress** Design has been developed and is planned for implementation in 2025 (pending YG approval).
			2023 Recommendations			
North Embank-ment	2023-1	The amount of embankment seepage is unable to be determined as the monitoring station MH-02 is located approximately 35 m downstream of the embankment and captures mostly seepage from the valley sidewall.	-	Install a new seepage monitoring station near the embankment toe as part of North Embankment Upgrades.	4	**In Progress** Design has been developed and is planned for implementation in 2025 (pending YG approval).
North Embank-ment	2023-2	Seepage is present along an approximate 80 m long zone at the downstream toe and the ground at the lower portion of the embankment is moist and soft due to seepage and recent snowmelt. The relative contribution from snowmelt, seepage through the dam, and upward seepage from groundwater is unable to be determined.	-	To improve the understanding of the contributions of seepage through the embankment and from groundwater recharge, consider installing additional piezometers in the tailings upstream of the embankment and in the embankment fill and foundation in the downstream slope of the embankment.	4	**In Progress** Design has been developed and is planned for implementation in 2025 (pending YG approval).
Tailings Cover	2023-3	Several areas of ponding were present along with several areas of erosion.	OMS Section 5.2.1	As part of the upcoming North Embankment Upgrades, a review of the cover drainage network is recommended to reduce the amount of ponding and provide engineered erosion protection where required along drainage pathways.	4	**In Progress** Design has been developed and is planned for implementation in 2025 (pending YG approval).

Structure	ID No.	Deficiency or Non-Conformance	Applicable Regulation or OMS Reference	Recommended Actions	Priority (Table 7.1)	Recommended Deadline / Status
SRS	2023-4	Water is suspected to be flowing beneath the riprap and geotextile in the spillway and eroding the underlying SRS embankment and leading to embankment deformation.	OMS Section 5.2.1	Evaluate the long-term plan and intention of the SRS and, if the planned life exceeds the next five years (2028), the spillway should be reconstructed.	4	**Planning in Progress** Decommission the SRS or repair the spillway before 2028.
			2024 Recommendations			
North Embankment	2024-1	The NDW-4A PVC piezometer is frostjacking and the protective steel case surrounding the pipe is no longer able to be closed. As a result, the top elevation of the PVC pipe and water elevations at the piezometers are unknown.	OMS Section 5.2.1	As part of the upcoming piezometer installation program in 2025, replace NDW-4A with a new vibrating wire piezometer located near the embankment toe along a cross-section alignment with NDW-1A/B.	4	**New** Before the end of 2025.
SRS	2024-2	Beaver(s) have placed muck/debris up against the inlet of the spillway that has raised the water level in the SRS pond.	OMS Section 5.2.2.4	Implement measures to deter or prevent further activity by beavers that could compromise optimal functioning of the pond.	3	**New** Before the end of 2024.
TMA	2024-3	The OMS manual contact list and remote monitoring surveillance procedures are out of date.	OMS Section 1.3	Update the OMS Manual contact information and the protocols for remote surveillance camera monitoring of the North Embankment.	4	**New** Before the end of 2024

Closure

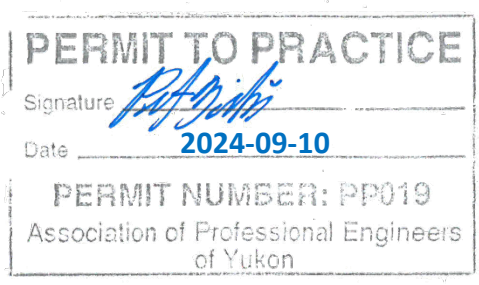
This report, 2024 Annual Facility Performance Review - SDH Tailings Management Area, was prepared by



Kyle Howse, EIT
Staff Consultant

and reviewed by

Peter Mikes, P. Eng
Principal Consultant,
Engineer of Record



All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

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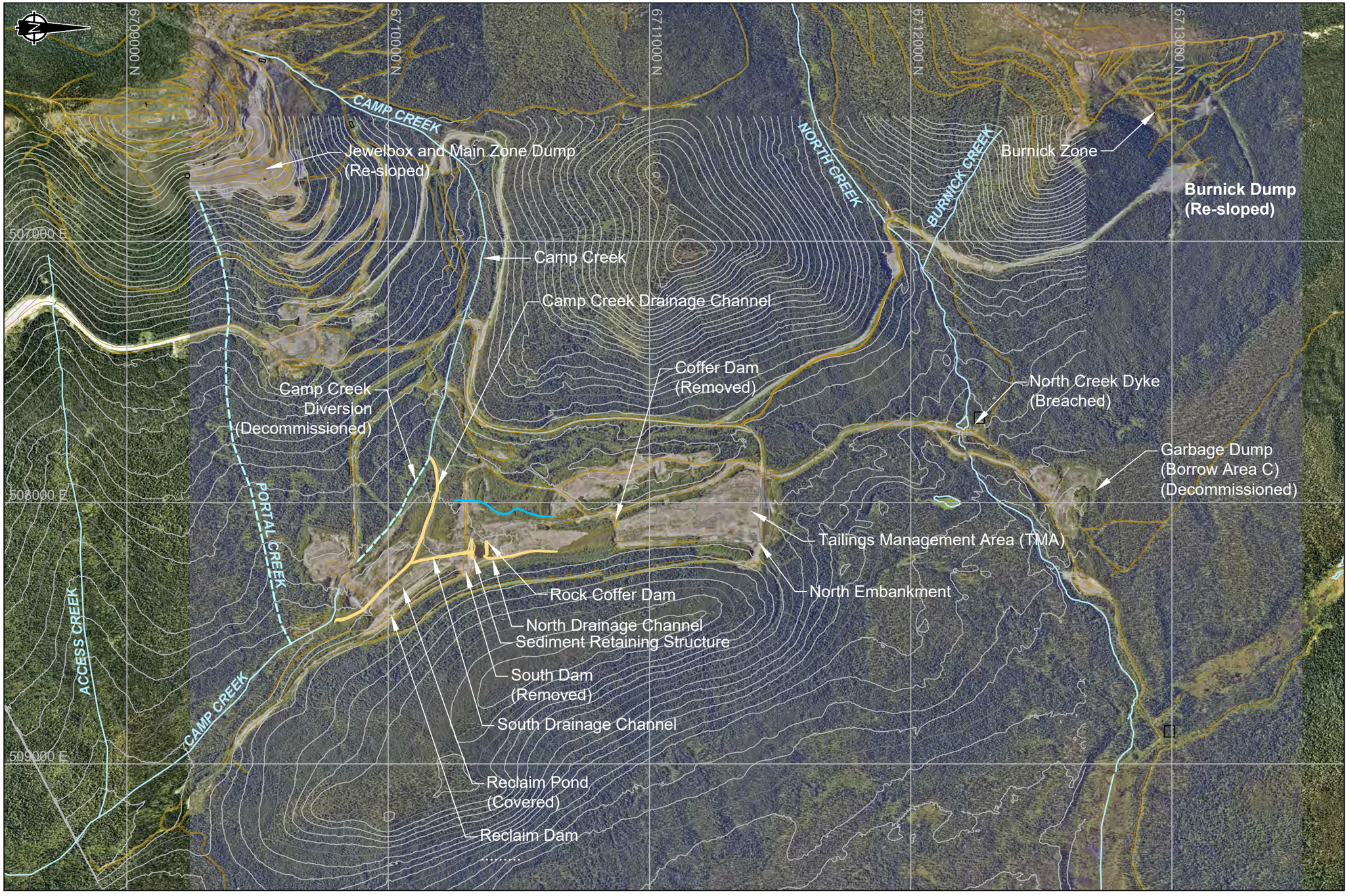
Appendix A Figures



LEGEND

Creeks

NOTES

1. Contours are shown at 10.0m intervals.
2. All units are in meters unless otherwise specified.

REFERENCES

1. Coordinate system is UTM NAD 83CSRS zone 9V.
2. 2022 topographic contour data and aerial photos provided by Teck.

0m 10 20 30 40 50 60

srk consulting

SRK JOB NO.: CAPR003248 | REG. NO.:

FILE NAME: CAPR002559 - GA.dwg

Teck

Sä Dena Hes

Annual Facility Performance Review

DRAWING TITLE: Vicinity Map

DATE: August 2024 | APPROVED: PM | FIGURE: 01

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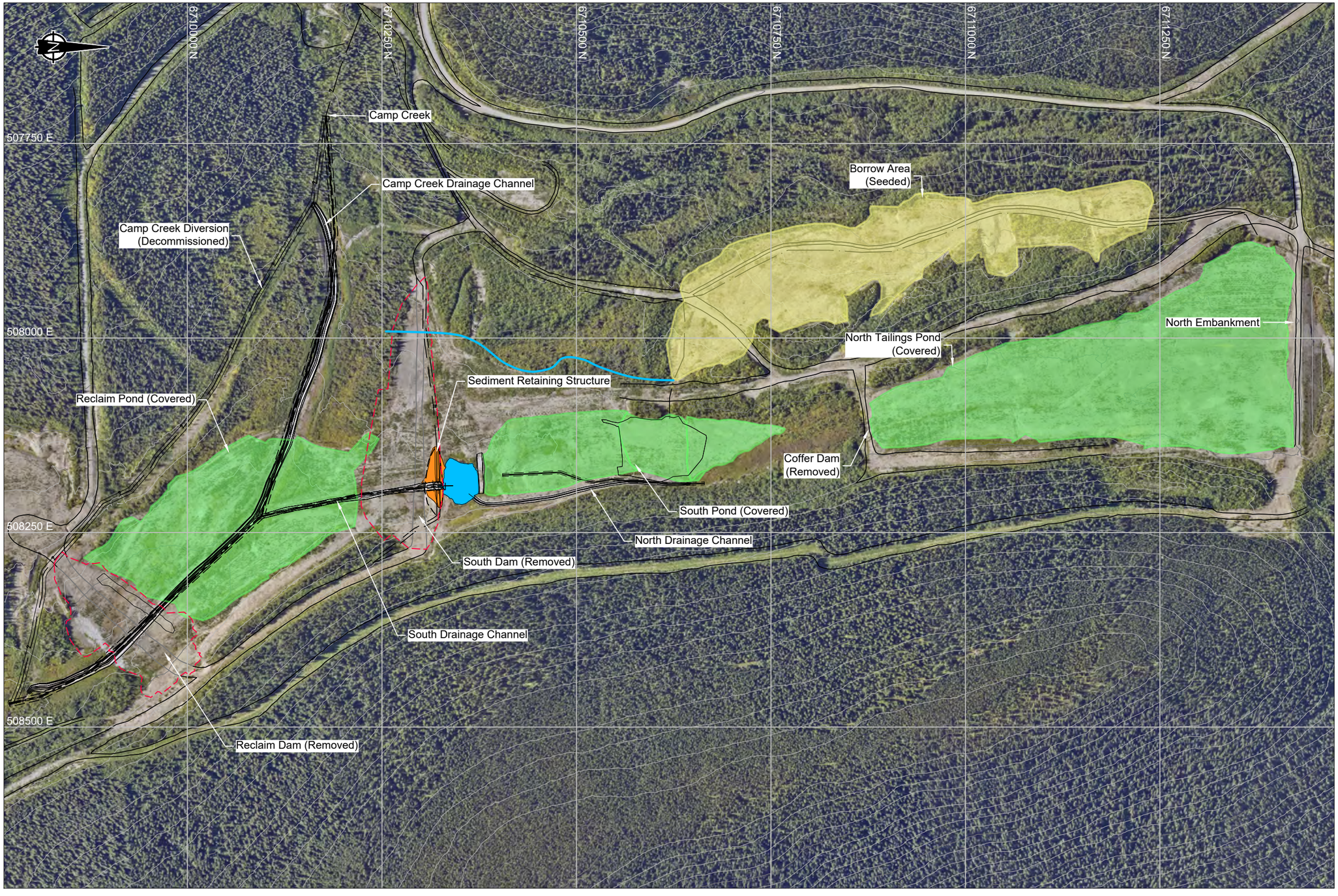

LEGEND

- Major Contour (5m interval)
- Minor Contour (1m interval)
- Edge of Road
- Design Edge of Road
- Camp Creek Drainage Channel
- Dam Excavation Extent
- Sedimentation Pond
- Capped Areas
- Seeded Area

NOTES

1. Contours are shown at 5.0m intervals.
2. All units are in meters unless otherwise specified.

REFERENCES

1. Coordinate system is UTM NAD 83CSRS zone 9V.
2. 2022 topographic contour data and aerial photos provided by Teck.
3. As-built survey data was collected by Yukon Engineering Services and Amec Foster Wheeler.
4. Tailings characterization work conducted by Golder Associates determined the location of capping at the South Pond and Reclaim Pond areas.

0m 50 100 150 200

srk .....

SRK JOB NO.: CAPR003248 | REG. NO.:

FILE NAME: CAPR002559 - Site GA.dwg

Teck

Sä Dena Hes

Annual Facility Performance Review

DRAWING TITLE:

TMA General Arrangement Map

DATE: August 2024 | APPROVED: PM | FIGURE: 02

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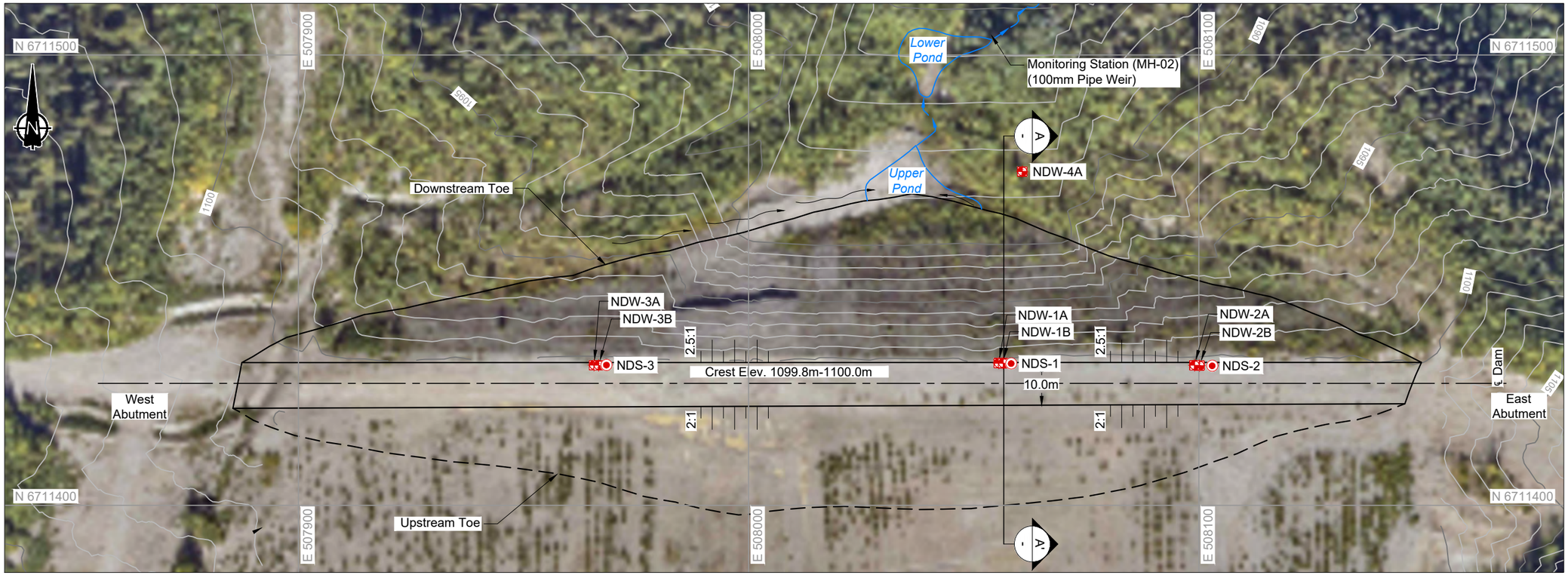
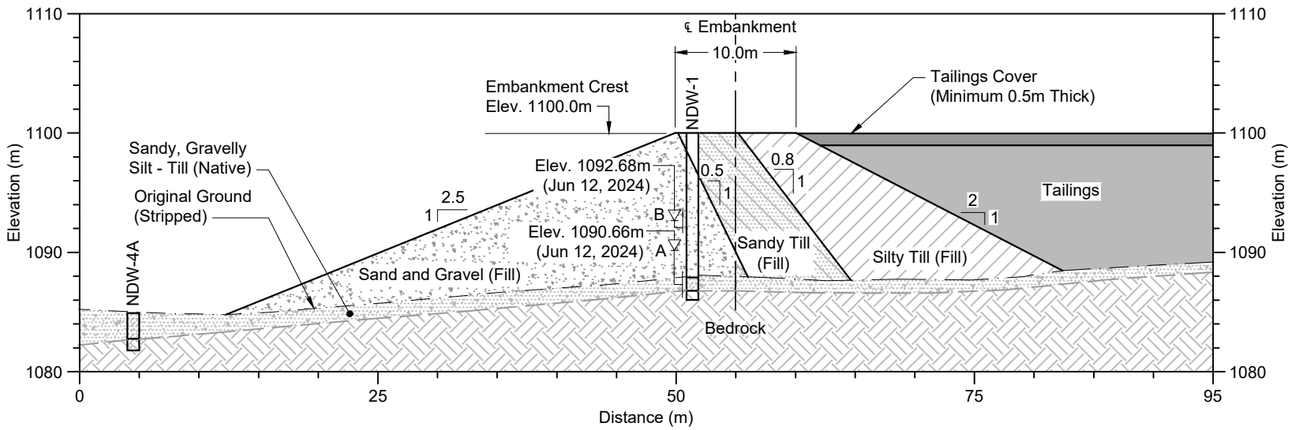


North Embankment Site Plan

0m 10 20 30 40



A
-

Typical Section

0m 5 10 15 20

LEGEND

- Piezometer head for Filter Zone Indicated
- Piezometers Installed (Nov. 1991)
- Settlement Gauge Installed (Nov. 1991)
- Bedrock
- Contours Major (Ground at 5.0m Intervals)
- Contours Minor (Ground at 1.0m Intervals)
- Contours Major (Tailings Cover at 0.5m Intervals)
- Contours Minor (Tailings Cover at 0.1m Intervals)
- Existing Ground (Stripped)
- Seepage
- Tailings Cover Limits
- Sandy Till (Fill)
- Sitly Till (Fill)
- Sand & Gravel (Fill)
- Silty Sand (Till)
- Gravelly Silty Sand (Till)
- Sand & Gravel (Native)
- Bedrock
- Tailings
- Tailings Cap

NOTES

1. Ground Contours are shown at 1.0m intervals.
2. All units are in meters unless otherwise specified.

REFERENCES

1. Coordinate system is UTM NAD 83CSRS zone 9V.
2. 2022 Site-wide LiDAR Survey and Aerial photo provided by Teck in 2022. Filename: SDH_2022_DEM.tif.

srk consulting

SRK JOB NO.: CAPR003248 | REG. NO.:

FILE NAME: CAPR002559 - North Dam.dwg

Teck

Sä Dena Hes

Annual Facility Performance Review

DRAWING TITLE:

North Embankment Site Plan and Typical Section

DATE:	APPROVED:	FIGURE:
August 2024	PM	03

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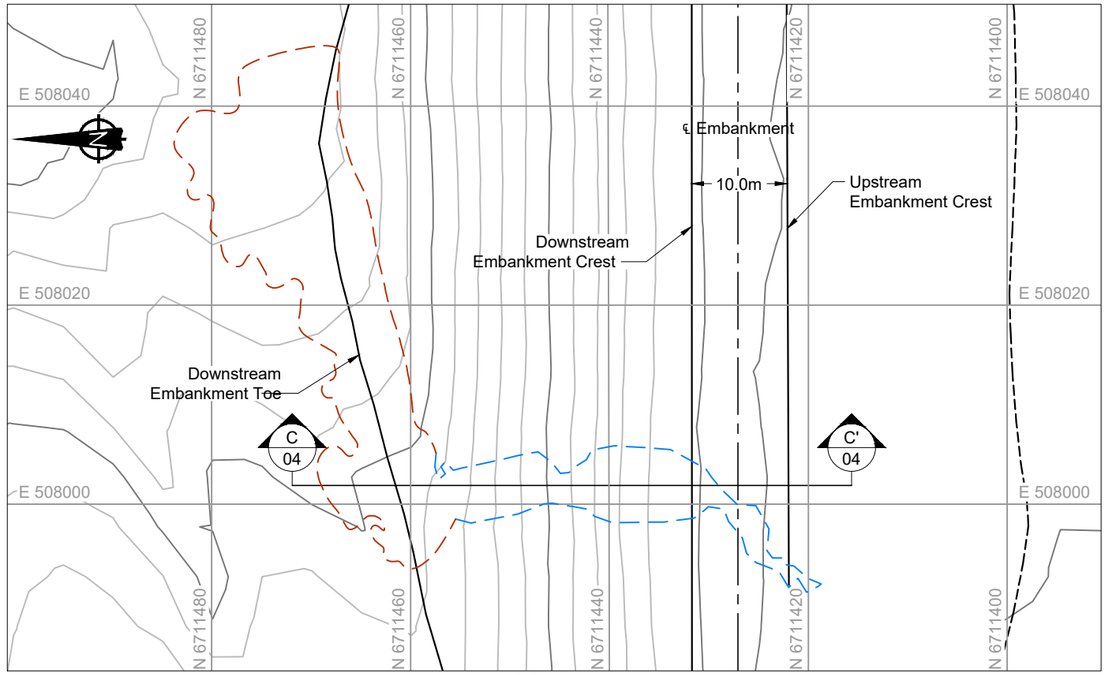
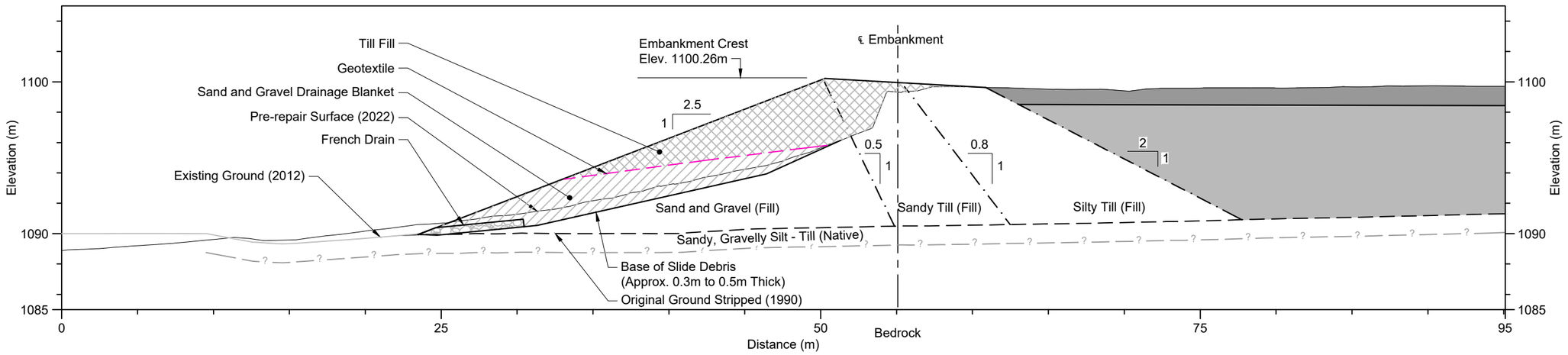


Plan View of Completed Repairs

0m 6 12 18 24



C
04

Erosion Gulley Cross Section

0m 3 6 9 12

LEGEND

- Bedrock
- Erosion Debris Extent
- Erosion Gulley Extent
- Existing Ground 2012
- Geotextile
- Pre-repair Surface 2022
- Original Dam
- Original Ground Stripped (Pre-Construction) 1990
- French Drain
- Sand and Gravel Drainage Blacket
- Till Fill
- Tailings
- Tailings Cover

NOTES

1. Contours are shown at 1.0m intervals.
2. All units are in meters unless otherwise specified.

REFERENCES

1. Coordinates are UTM Zone 9, NAD83
2. Topography provided by Teck in 2022. File Name: SDH_2022_DEM.tif.

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SRK JOB NO.: CAPR003248 | REG. NO.:

FILE NAME: CAPR002559 - North Dam Repair.dwg

Teck

Sä Dena Hes

Annual Facility Performance Review

DRAWING TITLE: North Embankment Repaired Cross Section

DATE: August 2024 | APPROVED: PM | FIGURE: 04

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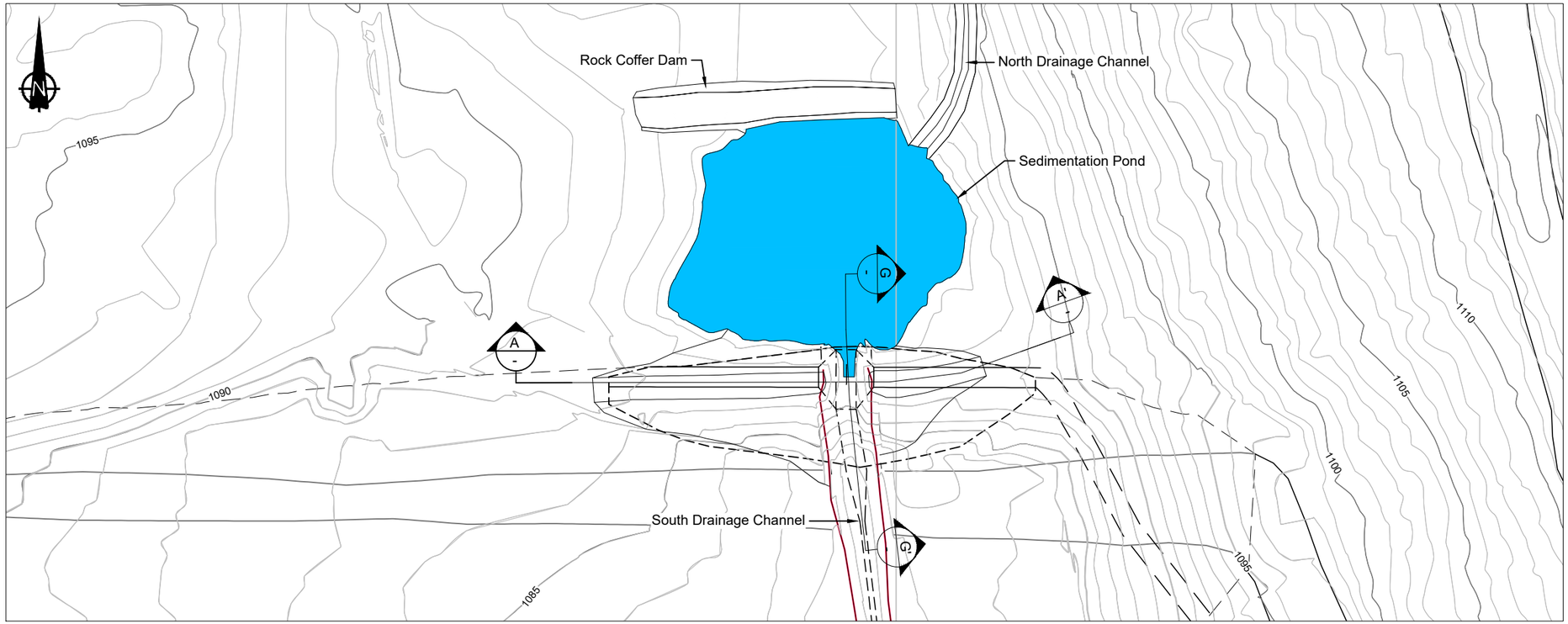
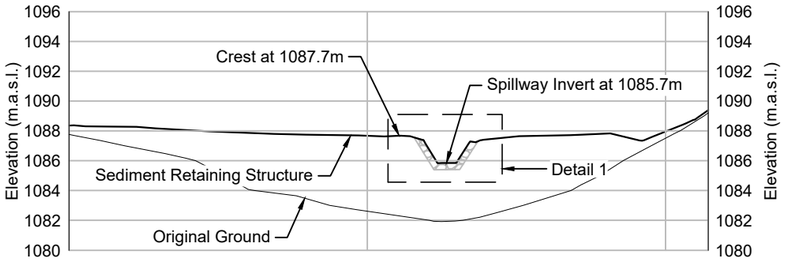


Plan

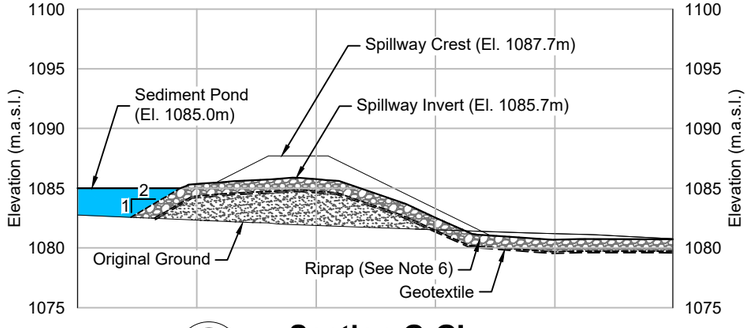
0m 10 20 30 40



A - Profile A-A'

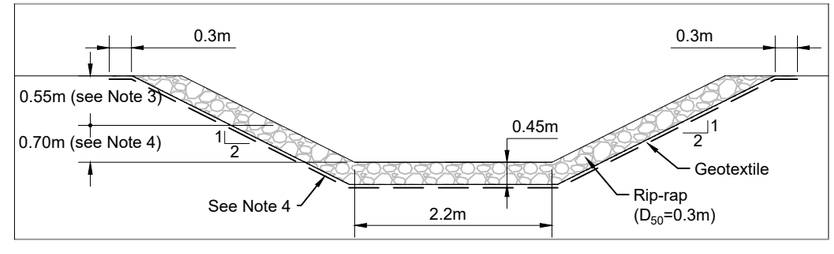
0m 10 20 30 40 Horizontal

0m 4 8 12 16 Vertical



G - Section G-G'

0m 5 10 15 20



1 - Detail 1 - Design Spillway Typical Section

N.T.S.

0m 10 20 30 40

LEGEND

- Major Contour (5m)
- Minor Contour (1m)
- Dam Crest
- Dam Toe
- Edge of Road
- Original Ground
- Non-woven Geotextile
- Riprap
- Sediment Pond

NOTES

1. Contours are shown at 1.0m intervals.
2. All units are in meters unless otherwise specified.
3. Excavated dam fill material was used to cap tailings. The final excavated surface was graded to promote drainage and blended topography into adjacent natural topography.
4. Rip rap from downstream toe buttress was salvaged and reused during channel construction.
5. The decant tower was demolished down to the foundation. Steel reinforced concrete was deposited in the onsite landfill located in Borrow Area C. The remaining concrete foundation was covered with dam fill material and graded to blend into topography.
6. Design extents of rip rap and geotextile, as no as-built survey.

REFERENCES

1. Coordinate system is UTM NAD 83CSRS zone 9V.
2. Topographic contour data and aerial photos were obtained from McElhanney and are based on August 15, 2012 LiDAR survey.

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SRK JOB NO.: CAPR003248 | REG. NO.:

FILE NAME: CAPR002559 - Sediment Retaining Structure.dwg

Teck

Sä Dena Hes

Annual Facility Performance Review

DRAWING TITLE: Sediment Retaining Structure Plan and Profile

DATE: August 2024 | APPROVED: PM | FIGURE: 05

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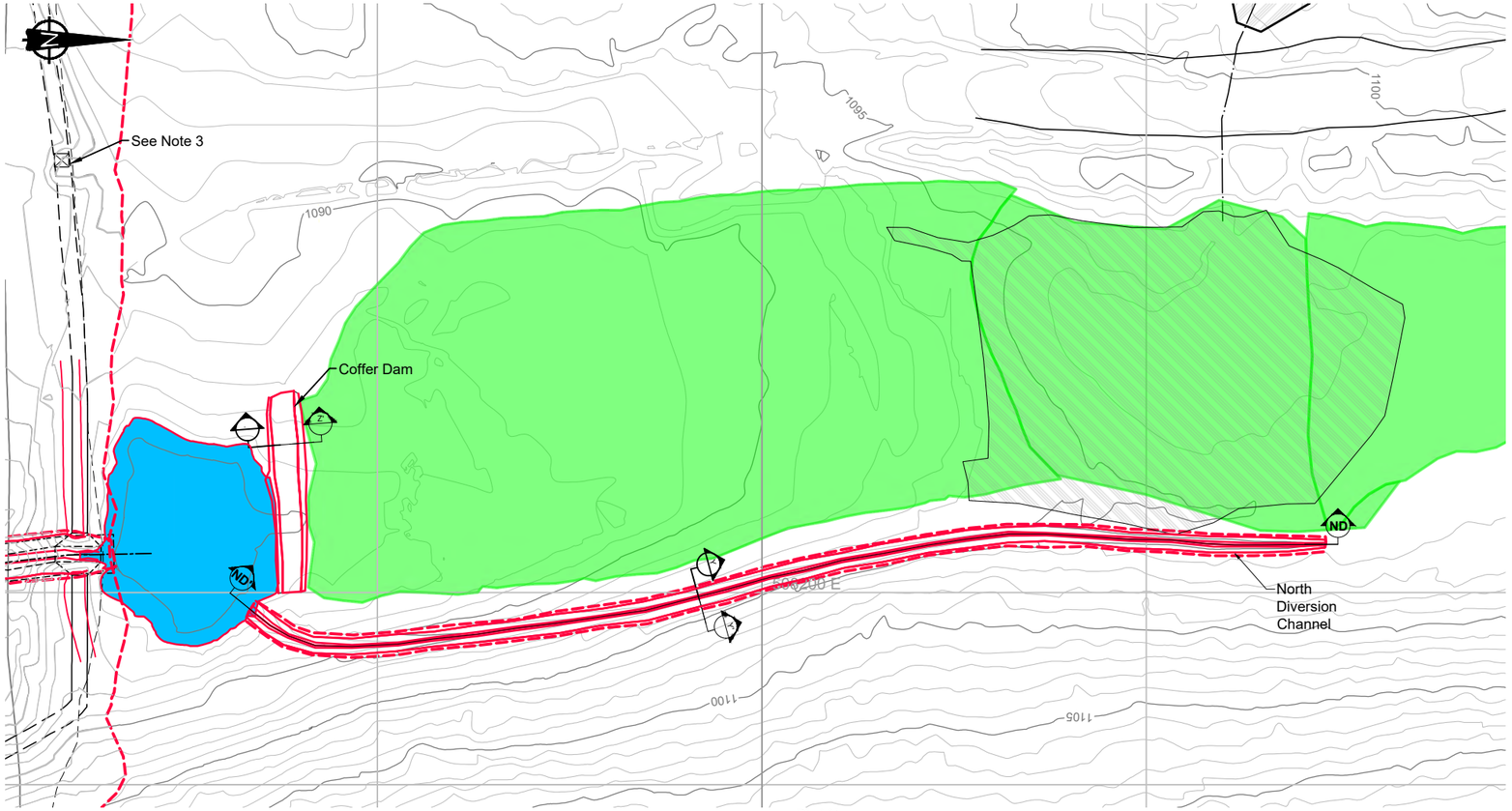
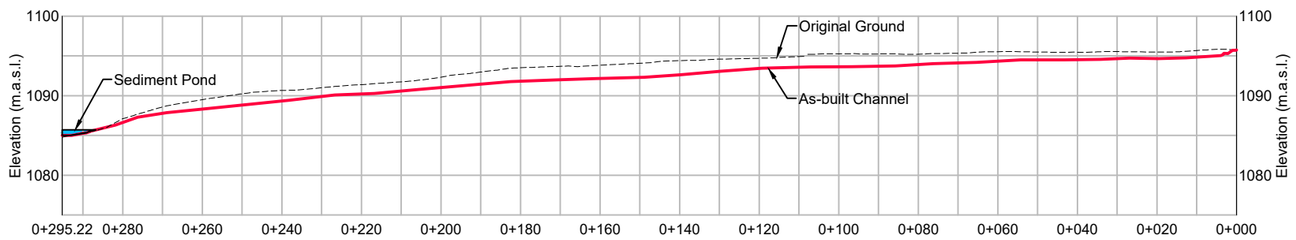


PLAN

0 5 10 15 20 25

Scale in Metres



ND - Profile ND - ND'

2x Vertical Exaggeration

Horizontal: 0 5 10 15 20 25 Scale in Metres

Vertical: 0 2.5 5 7.5 10 12.5 Scale in Metres

LEGEND

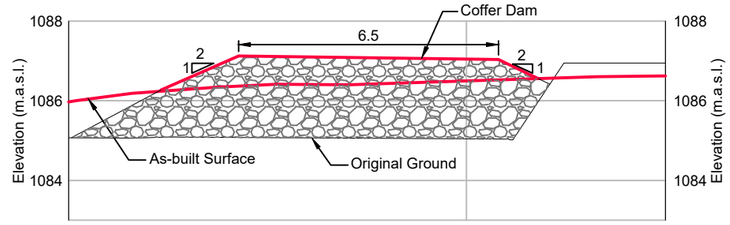
- Major Contours (5m)
- Minor Contours (1m)
- Edge of Road
- Tailings Pipeline
- Existing Ground (Profile)
- Non-woven Geotextile
- Covered Tailings (Proposed in Design)
- Rip Rap
- Sediment Pond (As-built)
- As-built Toe
- As-built Crest
- As-built Extent of Excavation / Fill

NOTES

1. Contours are shown at 1.0m intervals.
2. All units are in meters unless otherwise specified.
3. Based on field conditions the North Drainage Channel was realigned to avoid constructing the channel through deposited tailings.
4. Based on field conditions a Rock Cofferdam was constructed to retain soft tailings from sliding into the sediment retention pond during cover construction.
5. The decant tower was demolished down to the foundation. Steel reinforced concrete was deposited in the onsite landfill located in Borrow Area C. The remaining concrete foundation was covered with dam fill material and graded to blend into topography.
6. Design extents of rip rap and geotextile, as no as-built survey.

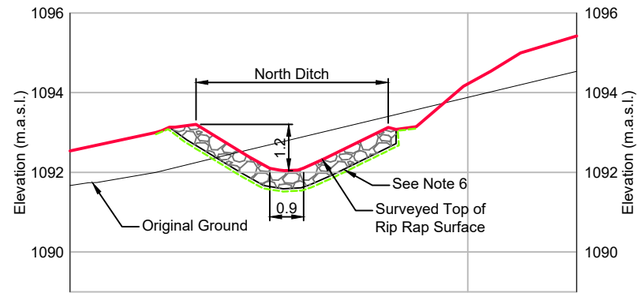
Design North Tailings Drainage Channel Riprap Volume Summary Table:

Location	D_{50} (m)	Armoring Depth (m)	Volume (m^3)
Y	0.3	0.45	638
Discharge Area	0.3	0.45	25



Z - Section Z - Z'

0 1 2 3 4 5 Scale in Metres



Y - Section Y - Y'

0 1 2 3 4 5 Scale in Metres

REFERENCES

1. Coordinate system is UTM NAD 83CSRS zone 9V.
2. Topographic contour data and aerial photos were obtained from McElhanney and are based on August 15, 2012 LiDAR survey.

srk consulting

SRK JOB NO.: CAPR003248 REG. NO.:

FILE NAME: CAPR002559 - North Drainage Channel.dwg

Teck

Sä Dena Hes

Annual Facility Performance Review

DRAWING TITLE: North Drainage Channel Plan, Profile and Sections

DATE: August 2024 APPROVED: PM FIGURE: 06

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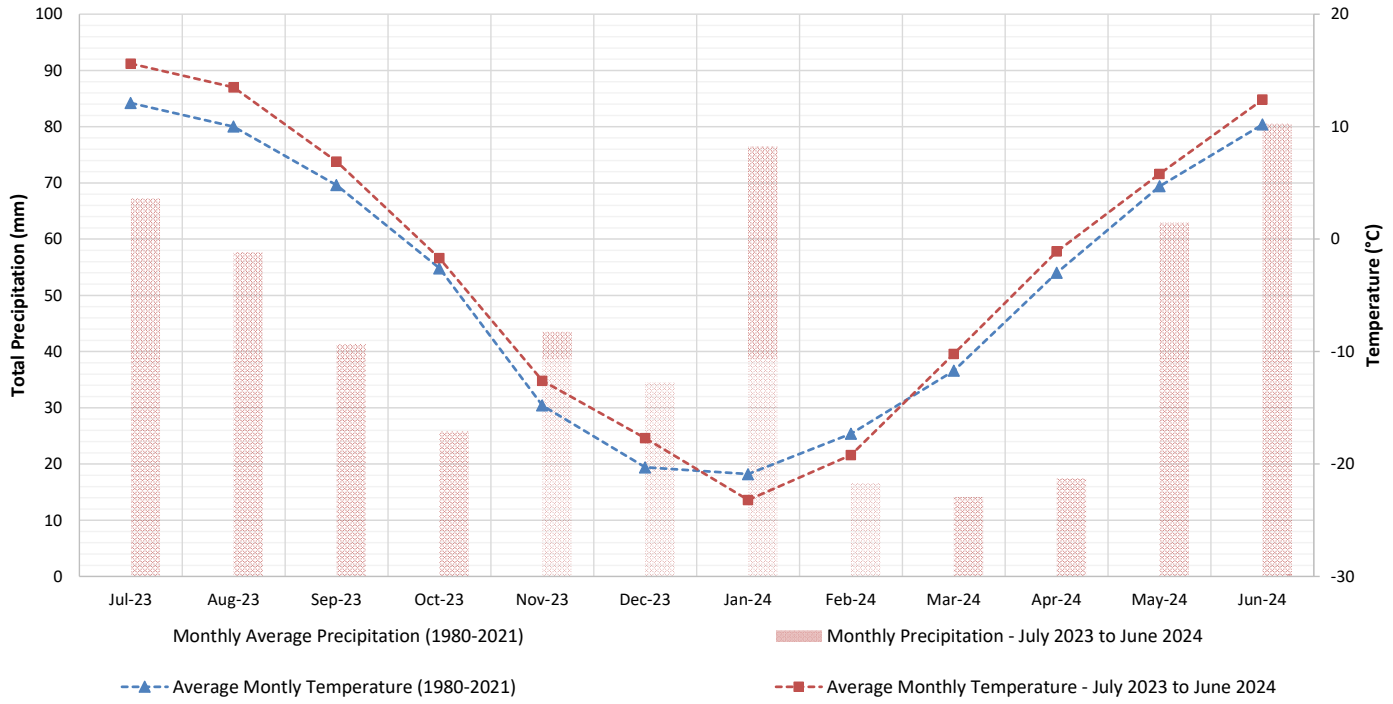
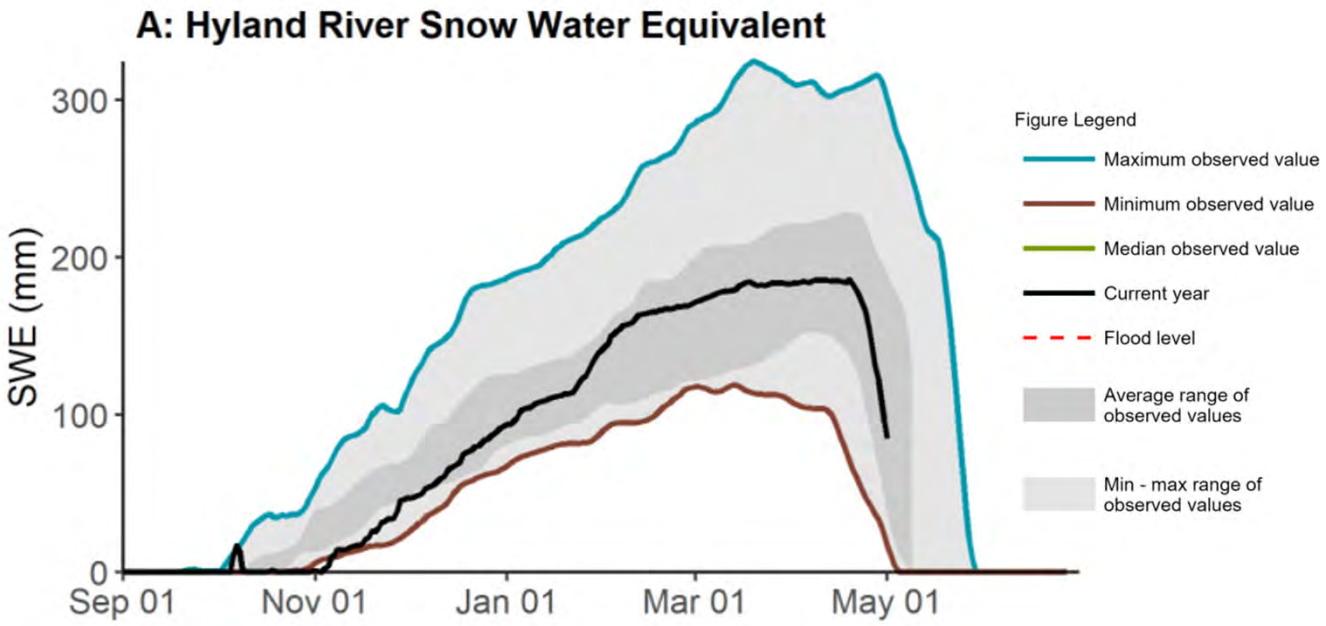
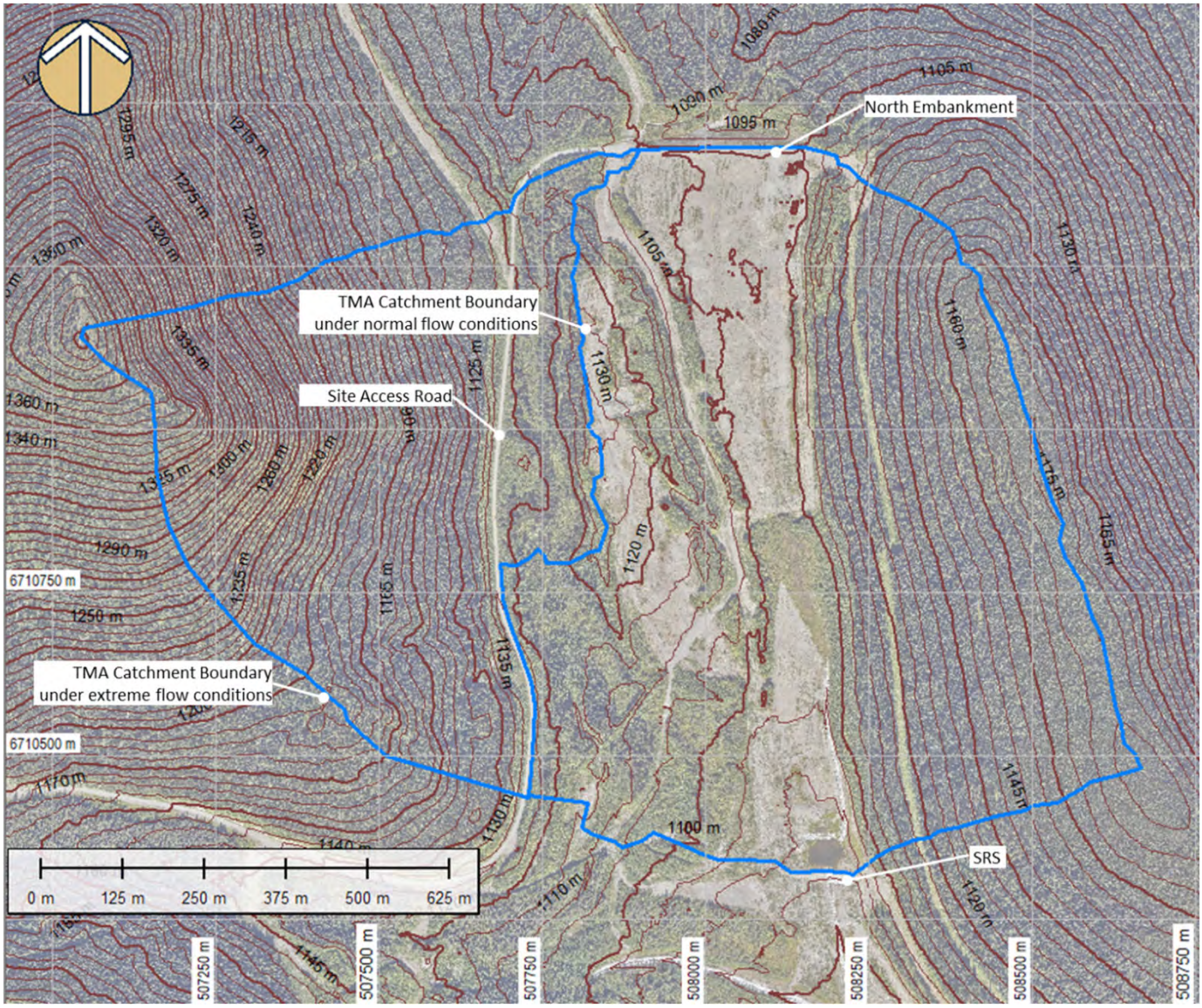


a) Monthly Precipitation and Temperature Data



b) Winter 2023-24 Liard River Basin Snow Water Equivalent Data

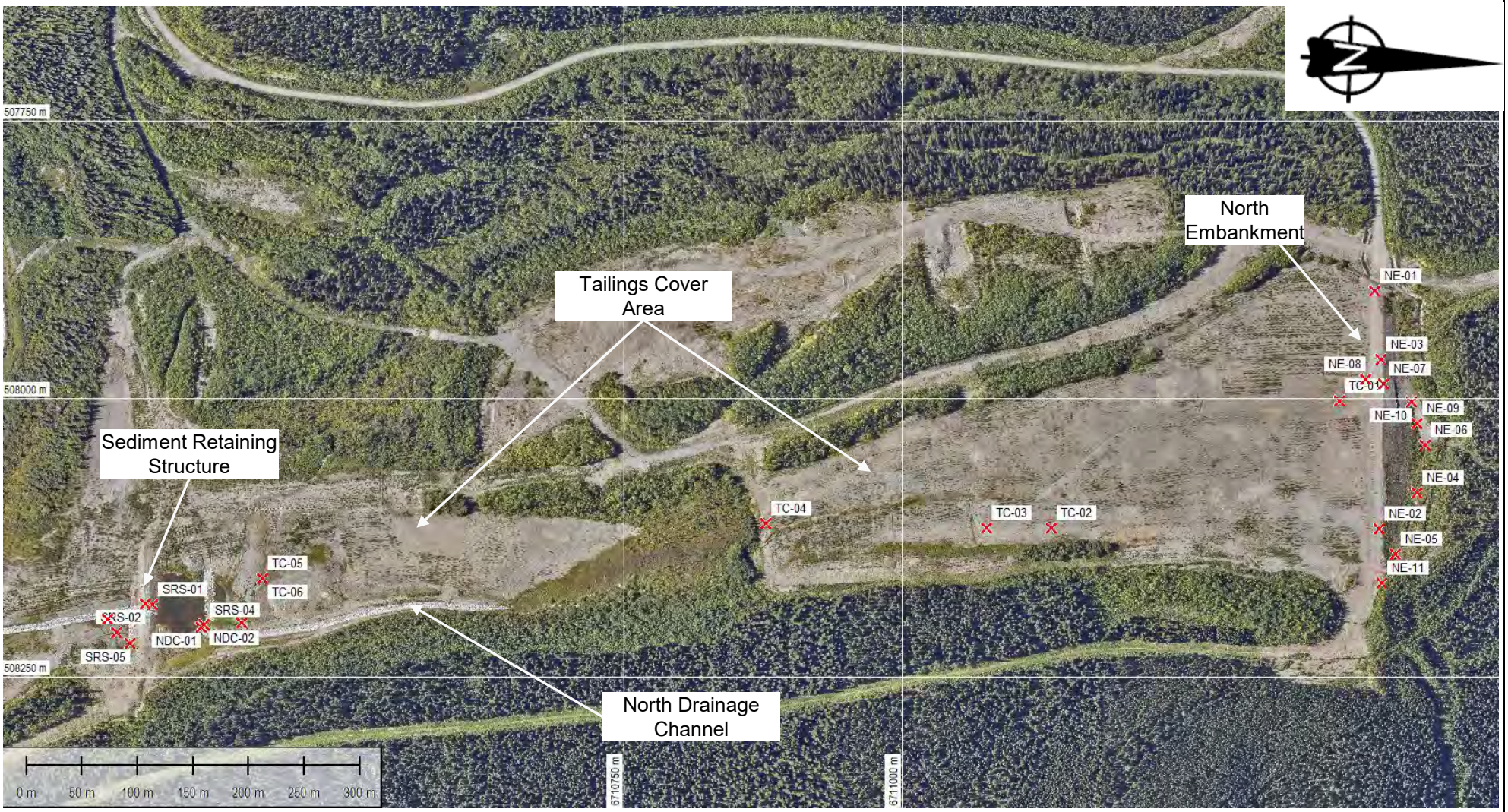
https://yukon.ca/sites/yukon.ca/files/env/env-snow-bulletin-may-2024-en.pdf



Sources : https://srk.sharepoint.com/sites/NA1CT008.075/Deliverables/Climate_Report/03_Figures/Fig2-3_TMA%20Catchment.pptx ?web=1

Notes: The normal flow boundary assumes the upstream diversions on the west side of the catchment are functional, while the extreme flow boundary assumes that the diversions fail.

Appendix B Site Photographs



Notes:
1. Orthographic photo depicts the 2022 surface.
2. Coordinate system is UTM NAD83 Zone 9.

GPS Track

Photo Location

srk consulting	Teck	Annual Facility Performance Review
Job No: CAPR003248 Filename: SDH_2024_AFPR_PhotoLocs.pptx	Sä Dena Hes	**Inspection Areas and Photo Logs**
		Date: August 2024 / Approved: PHM / Figure: **B-1**

Notes:
1. Orthographic photo depicts the 2022 surface.
2. Coordinate system is UTM NAD83 Zone 9.

✕ Photo Location

srk consulting

Teck

Annual Facility Performance Review

North Embankment Photo Locations

Job No: CAPR003248

Filename: SDH_2024_AFPR_PhotoLocs.pptx

Sä Dena Hes

Date: August 2024

Approved: PHM

Figure: **B-2**

Notes:
1. Orthographic photo depicts the 2022 surface.
2. Coordinate system is UTM NAD83 Zone 9.

✕ Photo Location

srk consulting

Teck

Annual Facility Performance Review

Sediment Retaining Structure and North Drainage Channel Photo Locations

Job No: CAPR003248

Filename: SDH_2024_AFPR_PhotoLocs.pptx

Sä Dena Hes

Date:	Approved:	Figure:
August 2024	PHM	**B-3**

Notes:
1. Orthographic photo depicts the 2022 surface.
2. Coordinate system is UTM NAD83 Zone 9.

GPS Track

Photo Location

srk consulting

Teck

Annual Facility Performance Review

Tailings Cover Area
Photo Locations

Job No: CAPR003248

Filename: SDH_2024_AFPR_PhotoLocs.pptx

Sä Dena Hes

Date: August 2024

Approved: PHM

Figure: **B-4**

Photo NE-01: North Embankment alignment seen from the west abutment; it shows no abnormal deformation.

Photo NE-02: A closer look to the North Embankment crest seen from the east abutment.

srk consulting	Teck	2024 Annual Facility Performance Review
		North Embankment
Job No: CAPR003248 Filename: SDH_2024_AFPR_Photolog.pptx	Sa Dena Hes	Date: July 2024 / Approved: PHM / Figure: **B-5**

Photo NE-03: North Embankment crest piezometers casings.

Photo NE-04: NDW-A4 Piezometer raised above the top of the protective casing due to frostjacking.

srk consulting	Teck	2024 Annual Facility Performance Review
		North Embankment
Job No: CAPR003248 Filename: SDH_2024_AFPR_Photolog.pptx	Sa Dena Hes	Date: July 2024 / Approved: PHM / Figure: **B-6**

Photo NE-05: North Embankment downstream slope vegetation seen from the east abutment.

Photo NE-06: North Embankment downstream slope vegetation seen from the toe.

Photo NE-07: North Embankment gully repair erosion control blanket on the downstream slope.

Photo NE-08: North Embankment gully repair erosion control blanket.

srk consulting	Teck	2024 Annual Facility Performance Review		
		North Embankment		
Job No: CAPR003248 Filename: SDH_2024_AFPR_Photolog.pptx	Sa Dena Hes	Date: July 2024	Approved: PHM	Figure: **B-8**

Photo NE-09: Seepage and soft ground observed at the embankment toe during the inspection 10 m west of the French Drain outlet.

Photo NE-10: Seepage emerging from the French Drain in the 2022 repair area.

srk consulting	Teck	2024 Annual Facility Performance Review
		North Embankment
Job No: CAPR003248 Filename: SDH_2024_AFPR_Photolog.pptx	Sa Dena Hes	Date: July 2024 / Approved: PHM / Figure: **B-9**

Photo NE-11: A remote-monitoring camera was installed east of the North Embankment to allow for real-time visual monitoring. Camera transmits via satellite.

Photo NE-12: Photo from the remote monitoring camera on July 10, 2024.

Photo SRS-01: Beaver activity placement of muck immediately upstream of the SRS spillway.

Photo SRS-02:Transverse crack across the dam crest approximately 1m east of the spillway seen from the crest of the SRS.

srk consulting	Teck	2024 Annual Facility Performance Review **Sediment Retaining Structure**
Job No: CAPR003248 Filename: SDH_2024_AFPR_Photolog.pptx	Sa Dena Hes	Date: July 2024 | Approved: PHM | Figure: **B-11**

Photo SRS-03: Sediment accumulation and vegetation growth downstream of the SRS spillway. Looking upstream.

Photo SRS-04:The crest east of the spillway is lower in elevation compared to the west crest of the spillway with visible deformation observable on the upstream slope

Photo SRS-05: Repaired sloughing area near the east abutment of the SRS. An erosion protection mat was installed on the slope as part of the repair.

Photo SRS-06:Repaired slough area seen from downstream position. The area is away from the spillway and the ponded water area, and approximately 8 meters from the east abutment. Seepage is seen flowing from the SRS toe on the east side of the spillway.

Photo TC-01: Main drainage swale looking south from near the North Embankment. Vegetation is developing over the area, being less dense in areas that pond during freshet.

Photo TC-02: Drainage swale on the east edge of the TMA looking north..

Photo TC-03: Eroded area of the cover where a drainage swale east of the main drainage swale of the cover flows to the west into the main drainage swale. No change in condition compared to the 2023 inspection.

Photo TC-04:Outlet of the main drainage swale at the former coffer dam.

srk consulting	Teck	2024 Annual Facility Performance Review		
		Tailings Cover Area		
Job No: CAPR003248 Filename: SDH_2024_AFPR_Photolog.pptx	Sa Dena Hes	Date: July 2024	Approved: PHM	Figure: **B-15**

Photo TC-05: Repaired erosion area (repaired in August 2023). Looking downstream towards the SRS.

Photo TC-06: Repaired erosion area near the south end of the main tailings area (repaired in August 2023). Looking upstream to the northwest.

srk consulting	Teck	2024 Annual Facility Performance Review **Tailings Cover Area**
Job No: CAPR003248 Filename: SDH_2024_AFPR_Photolog.pptx	Sa Dena Hes	Date: July 2024 | Approved: PHM | Figure: **B-16**

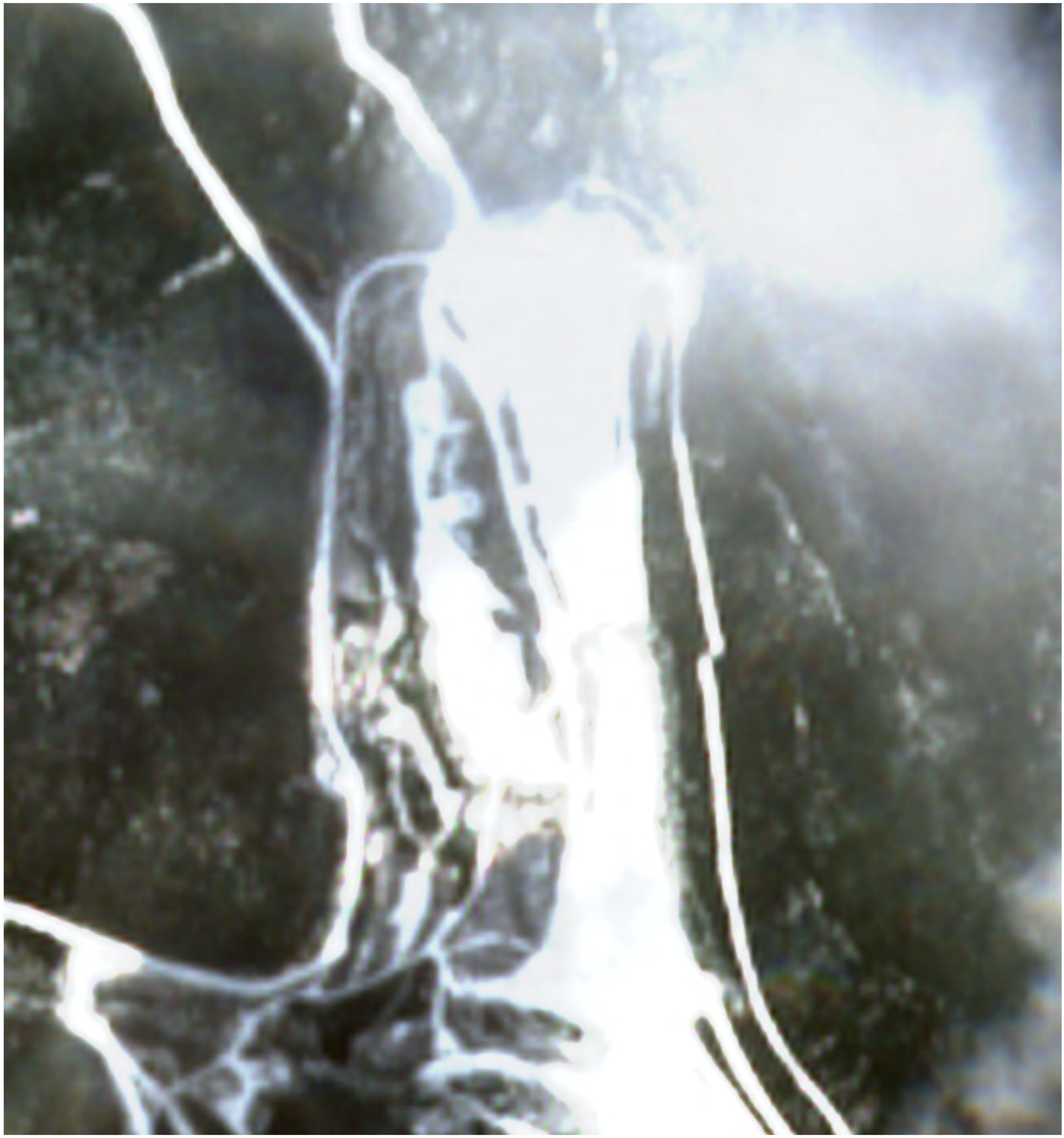
Photo NDC-01: Repaired area at the North Drainage Channel outlet where riprap movement was observed during the 2023 inspection.

Photo NDC-02: Repaired erosion gully immediately to the west of the riprap movement area.

srk consulting	Teck	2024 Annual Facility Performance Review
		North Drainage Channel
Job No: CAPR003248 Filename: SDH_2024_AFPR_Photolog.pptx	Sa Dena Hes	Date: July 2024 / Approved: PHM / Figure: **B-17**

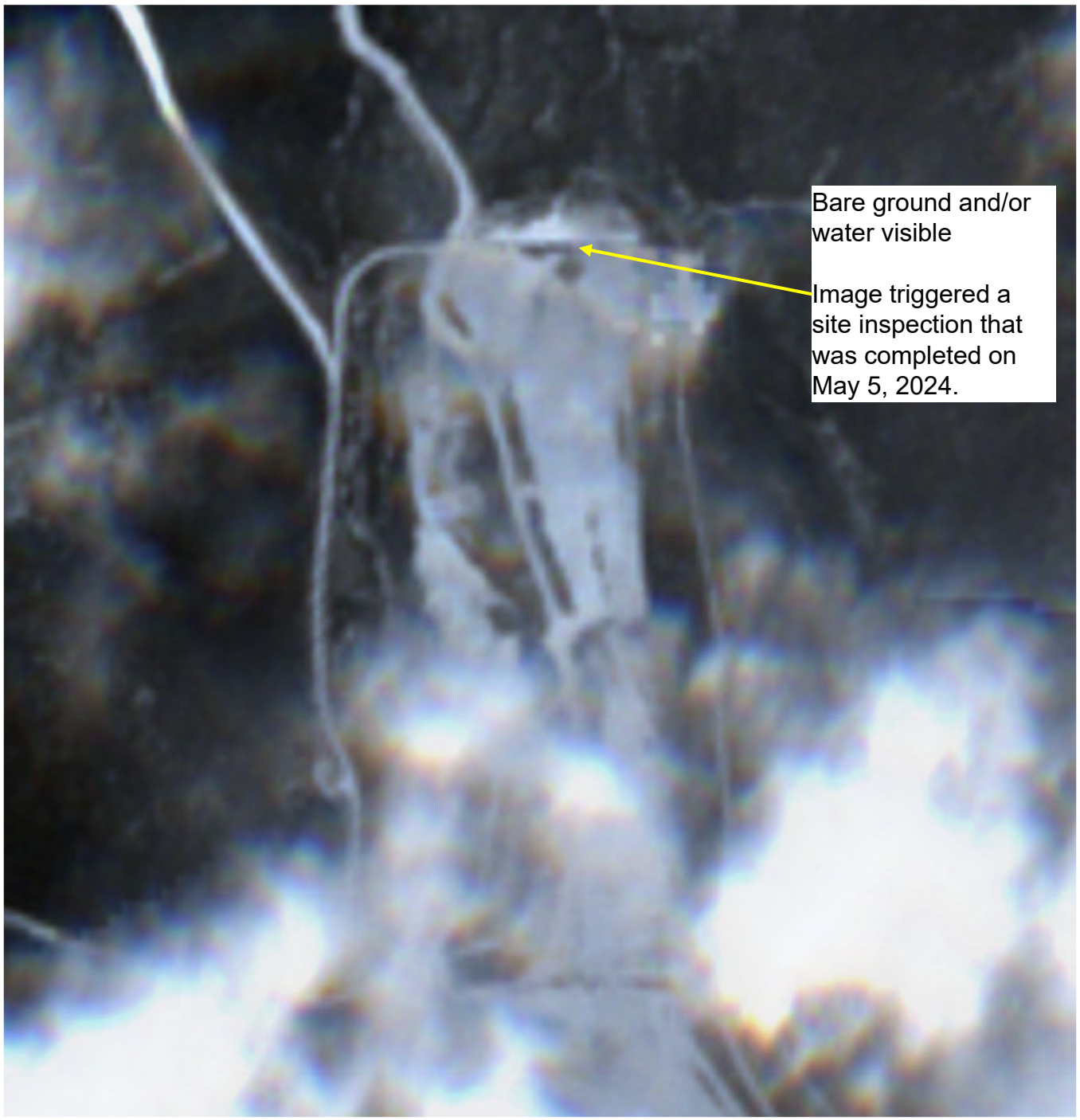
Photo NDC-03: Repaired area of the North Drainage Channel Berm where a slough was repaired in 2020 with a French Drain. Clear seepage was flowing through the base of the drain.

Appendix C Satellite Imagery



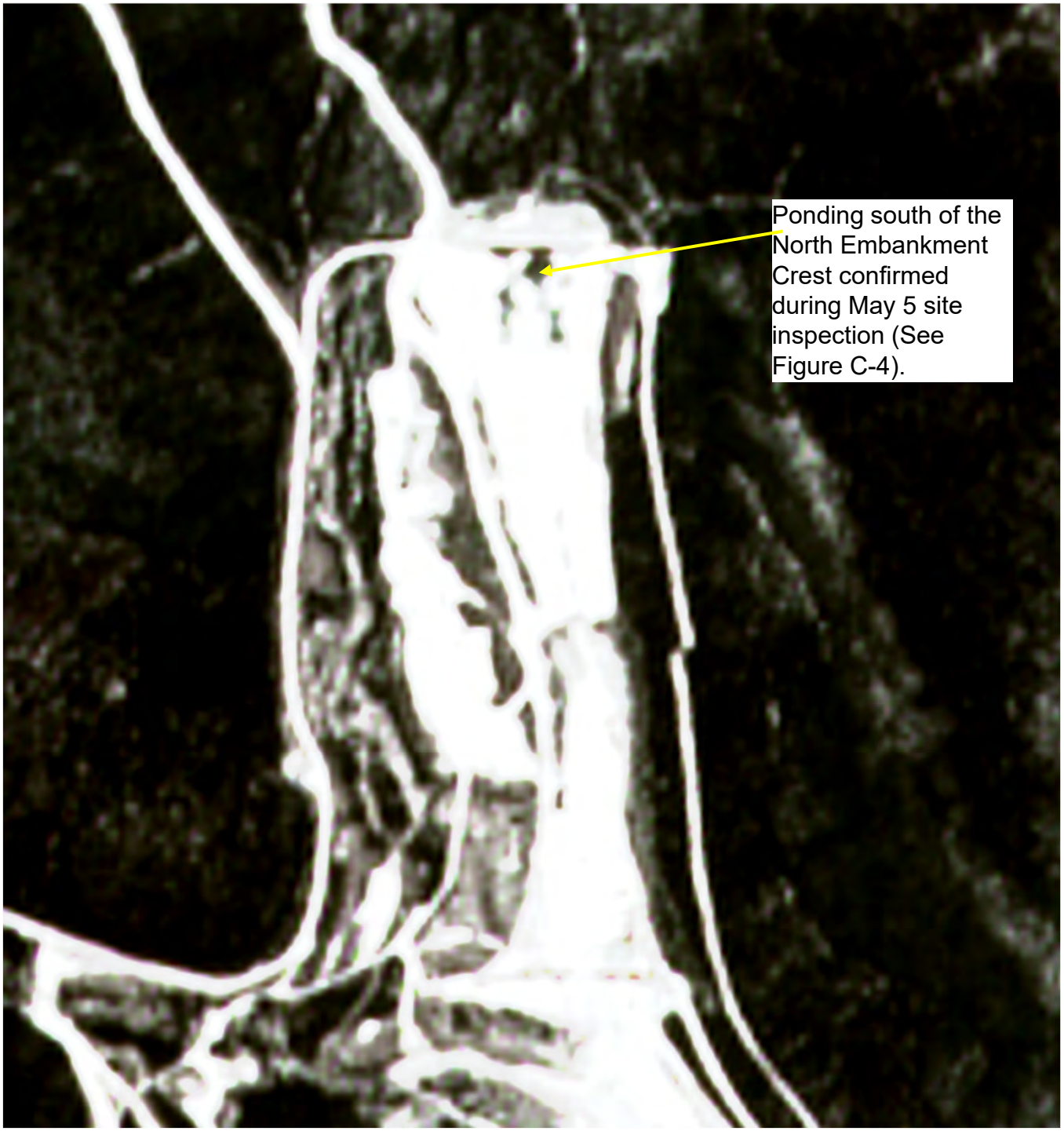
Notes:
1. Sentinal-2 L2A, true colour.
2. Imagery obtained from Copernicus Open Access Hub.

srk consulting	Teck	Satellite Imagery		
		April 27, 2024		
Job No: CAPR003248 Filename: Figures_SDH-NorthDam_Satellite.pptx	Sä Dena Hes	Date: August 2024	Approved: P. Mikes	Figure: **C-1**



Notes:
1. Sentinal-2 L2A, true colour.
2. Imagery obtained from Copernicus Open Access Hub.

srk consulting	Teck	Satellite Imagery		
		May 2, 2024		
Job No: CAPR003248 Filename: Figures_SDH-NorthDam_Satellite.pptx	Sä Dena Hes	Date: August 2024	Approved: P. Mikes	Figure: **C-2**



Notes:
1. Sentinal-2 L2A, true colour.
2. Imagery obtained from Copernicus Open Access Hub.

srk consulting	Teck	Satellite Imagery		
		May 4, 2024		
Job No: CAPR003248 Filename: Figures_SDH-NorthDam_Satellite.pptx	Sä Dena Hes	Date: August 2024	Approved: P. Mikes	Figure: **C-3**

Photo C-1: Ponding adjacent to the North Embankment. Photo taken from East of the TMA looking west.

Photo C-2: Ponding/ice along the Main Drainage Channel looking north.

Photo C-3: Ponding adjacent to the North Embankment. Photo taken from near piezometer NDW-1A/B looking west..

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Satellite Imagery

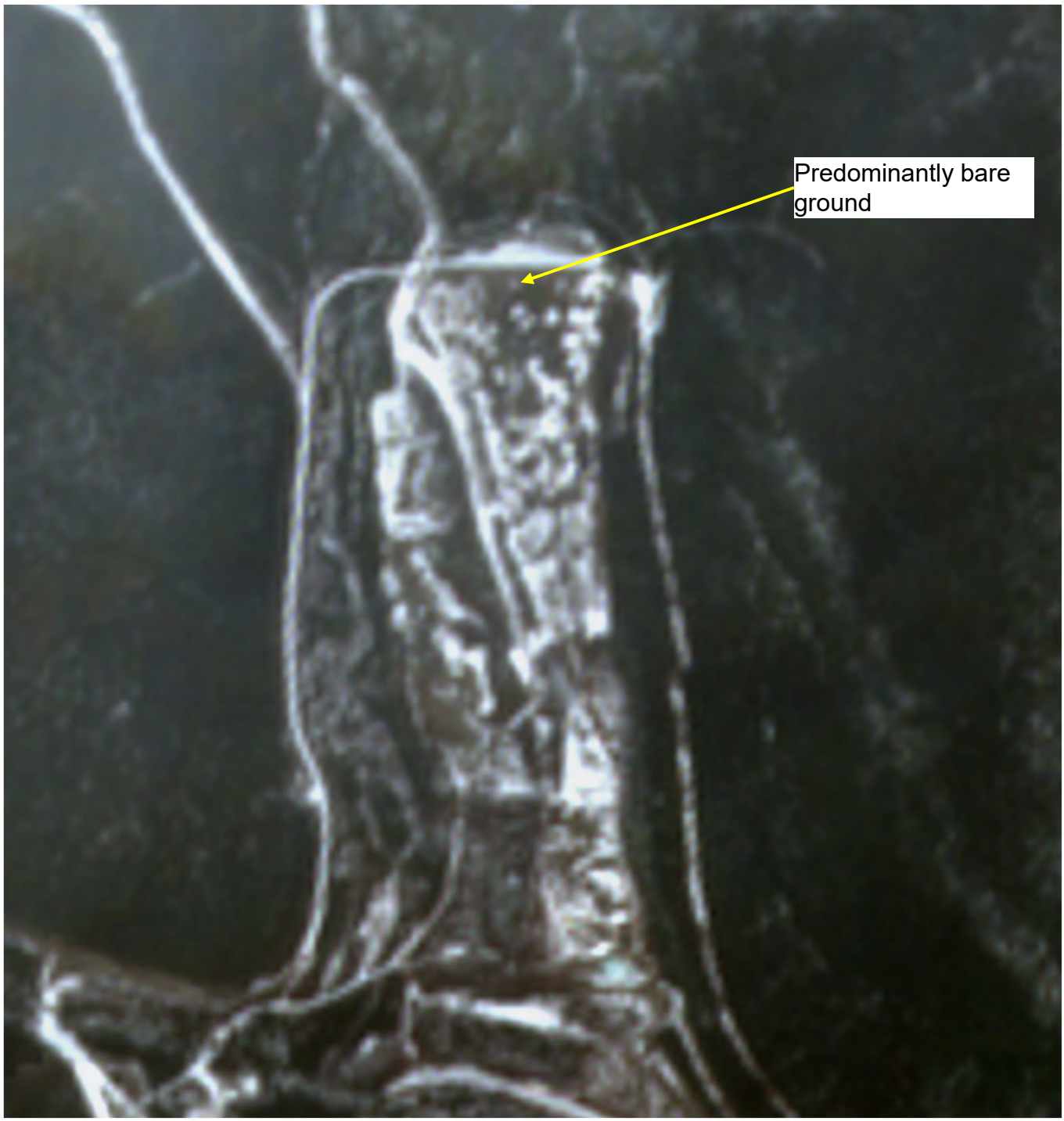
May 5, 2024 – Site Observations

Job No: CAPR003248

Filename: Figures_SDH-NorthDam_Satellite.pptx

Sä Dena Hes

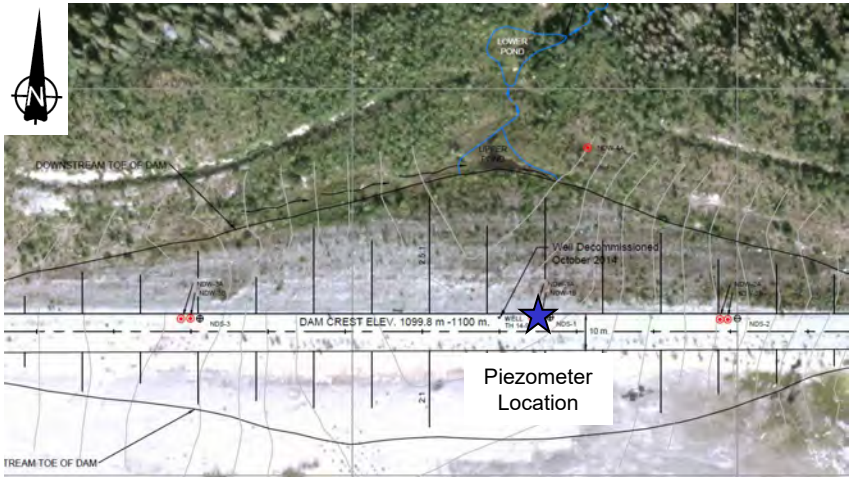
Date:	Approved:	Figure:
August 2024	P. Mikes	**C-4**



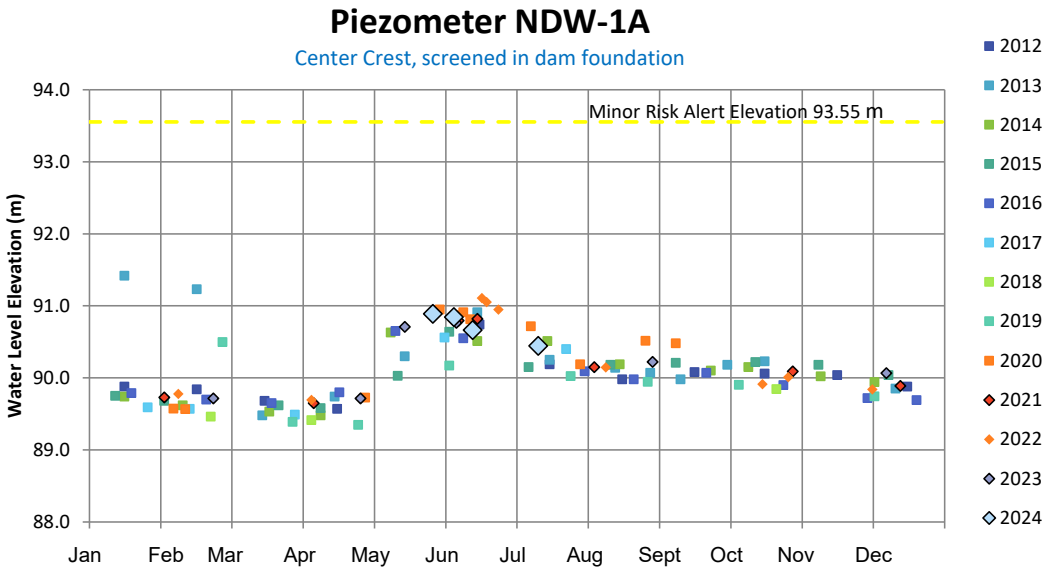
Notes:
1. Sentinal-2 L2A, true colour.
2. Imagery obtained from Copernicus Open Access Hub.

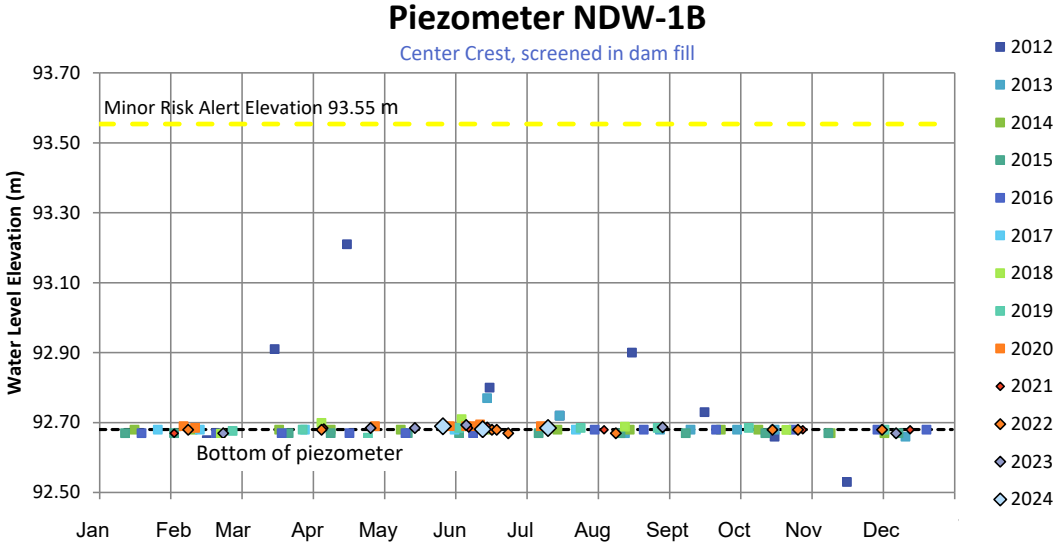
srk consulting	Teck	Satellite Imagery
		May 11, 2024
Job No: CAPR003248 Filename: Figures_SDH-NorthDam_Satellite.pptx	Sä Dena Hes	Date: August 2024 / Approved: P. Mikes / Figure: **C-5**

Appendix D Instrumentation Data



Notes:
1. Orthographic Photo depicts the pre-decommissioned surface on August 12, 2012
2. Co-ordinate system is UTM NAD 83 CSRS Zone 9V.





Source File:
https://srk.sharepoint.com/:x:/r/sites/FS261/Internal/Monitoring%20Data/NDMPiezolevels_2023Edition_rev01.xlsx

srk consulting

Job No: CAPR003248
Filename: AppD-Instrumentation Data.pptx

Teck

Sa Dena Hes

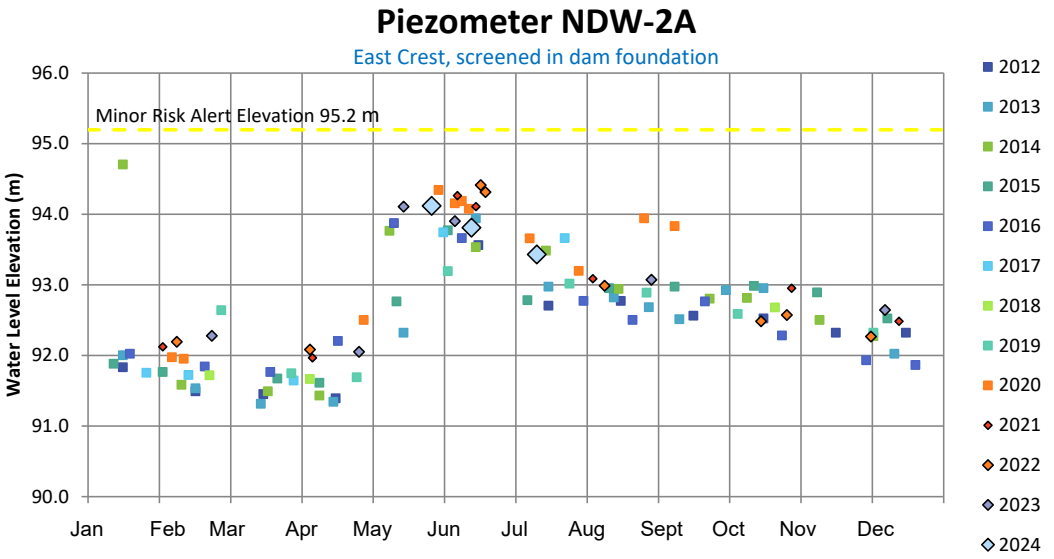
Annual Facility Performance Review

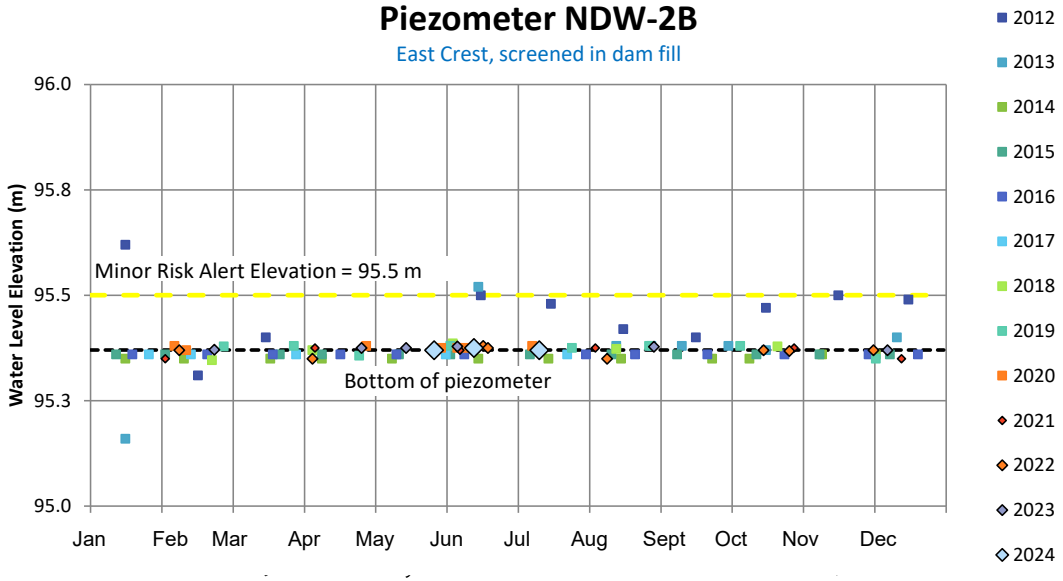
North Dam Piezometers NDW-1A and NDW-1B

Date:	Approved:	Figure:
August 2024	P. Mikes	**D-1**

Notes:

1. Orthographic Photo depicts the pre-decommissioned surface on August 12, 2012
2. Co-ordinate system is UTM NAD 83 CSRS Zone 9V.





Source File:
https://srk.sharepoint.com/:x:/r/sites/FS261/Internal/Monitoring%20Data/NDMPiezolevels_2023Edition_rev01.xlsx

srk consulting

Job No: CAPR003248
Filename: AppD-Instrumentation Data.pptx

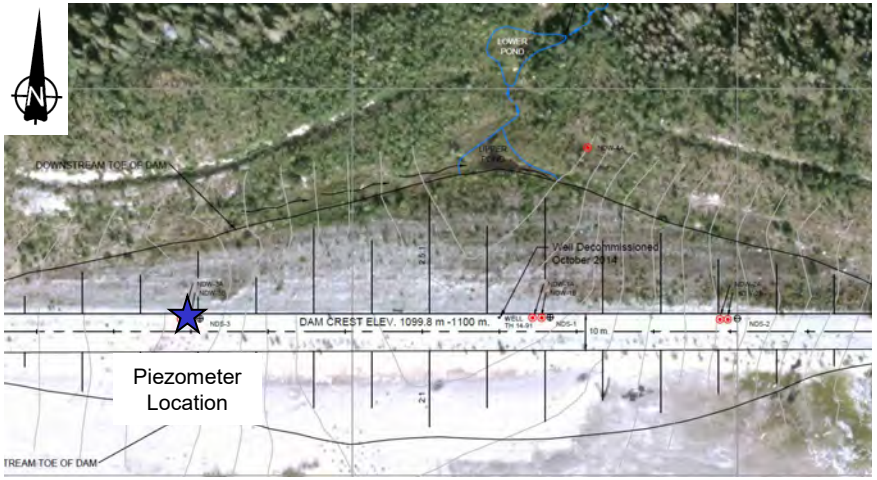
Teck

Sa Dena Hes

Annual Facility Performance Review

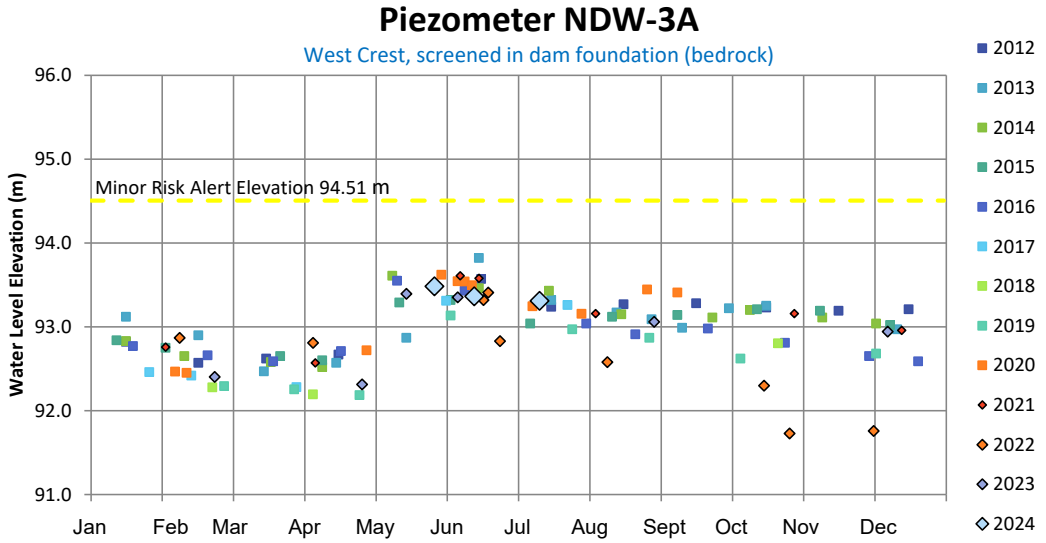
North Dam Piezometers NDW-2A and NDW-2B

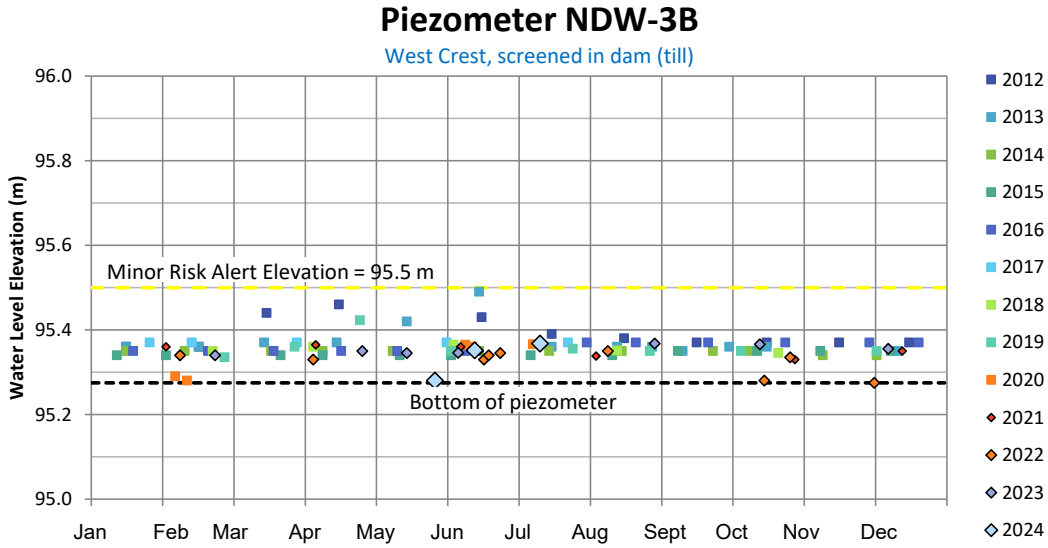
Date:	Approved:	Figure:
August 2024	P. Mikes	**D-2**



Notes:

1. Orthographic Photo depicts the pre-decommissioned surface on August 12, 2012
2. Co-ordinate system is UTM NAD 83 CSRS Zone 9V.





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srk consulting

Job No: CAPR003248
Filename: AppD-Instrumentation Data.pptx

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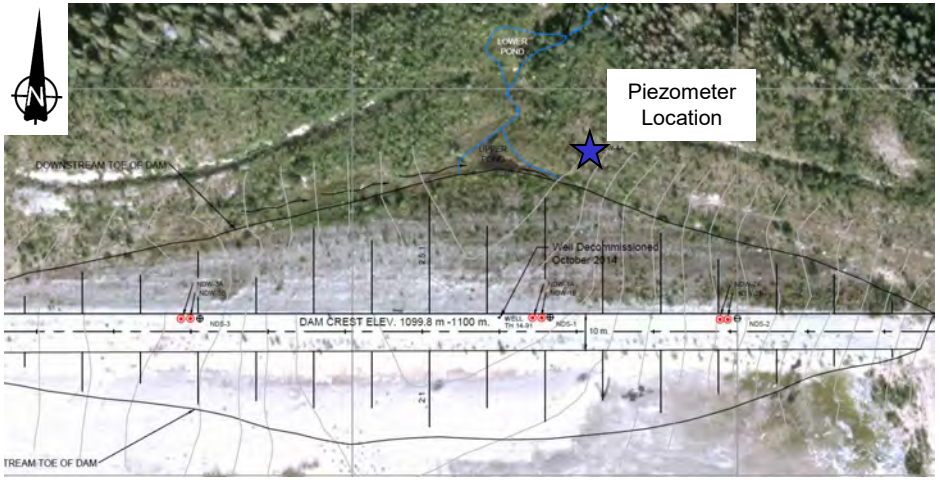
Sa Dena Hes

Annual Facility Performance Review

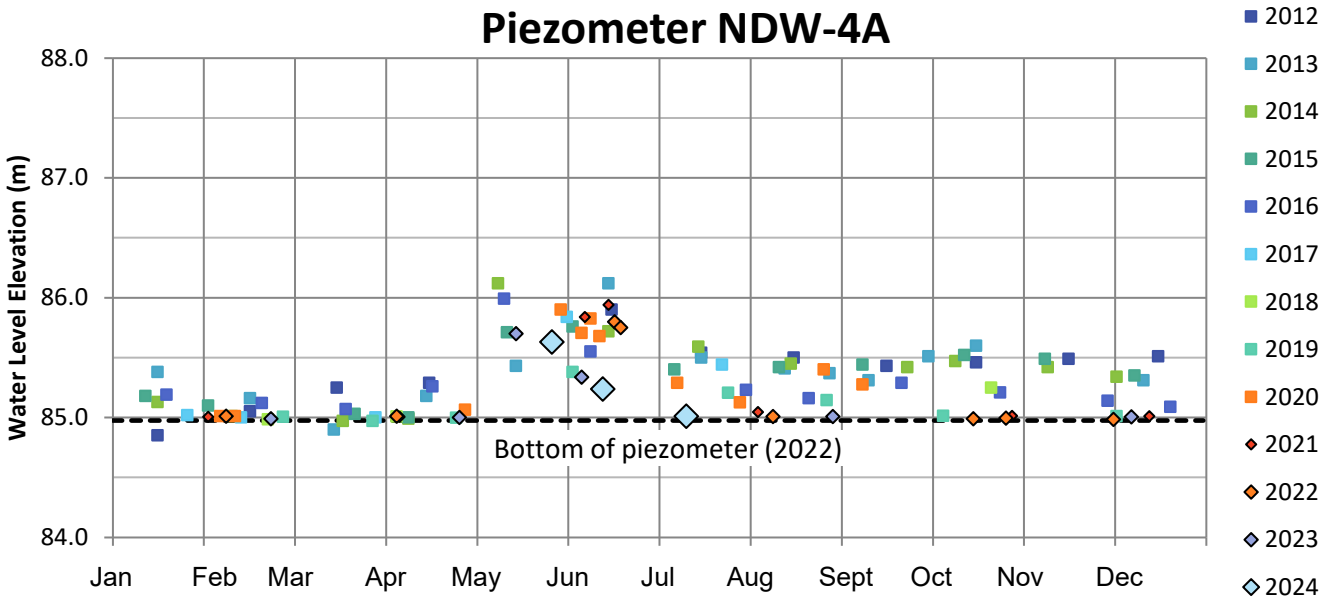
North Dam Piezometers NDW-3A and NDW-3B

Date:	Approved:	Figure:
August 2024	P. Mikes	**D-3**



NOTE: In the spring of 2024, the PVC pipe was observed to have rose due to frost jacking and the top elevation of the pipe is uncertain. As a result, water level readings in 2024 are not accurate.

Notes:
1. Orthographic Photo depicts the pre-decommissioned surface on August 12, 2012
2. Co-ordinate system is UTM NAD 83 CSRS Zone 9V.



Source File:
https://srk.sharepoint.com/:x:/r/sites/FS261/Internal/Monitoring%20Data/NDMPiezolevels_2023Edition_rev01.xlsx

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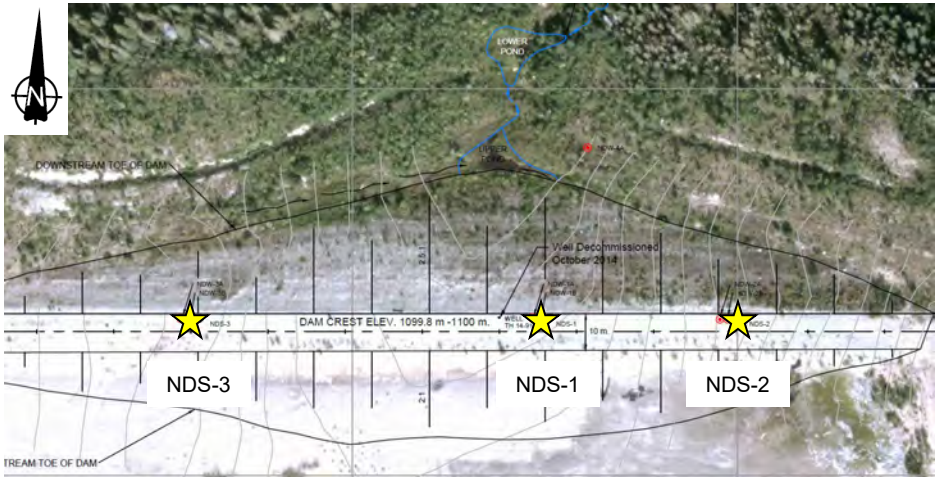
Annual Facility Performance Review

North Dam Piezometers NDW-4A

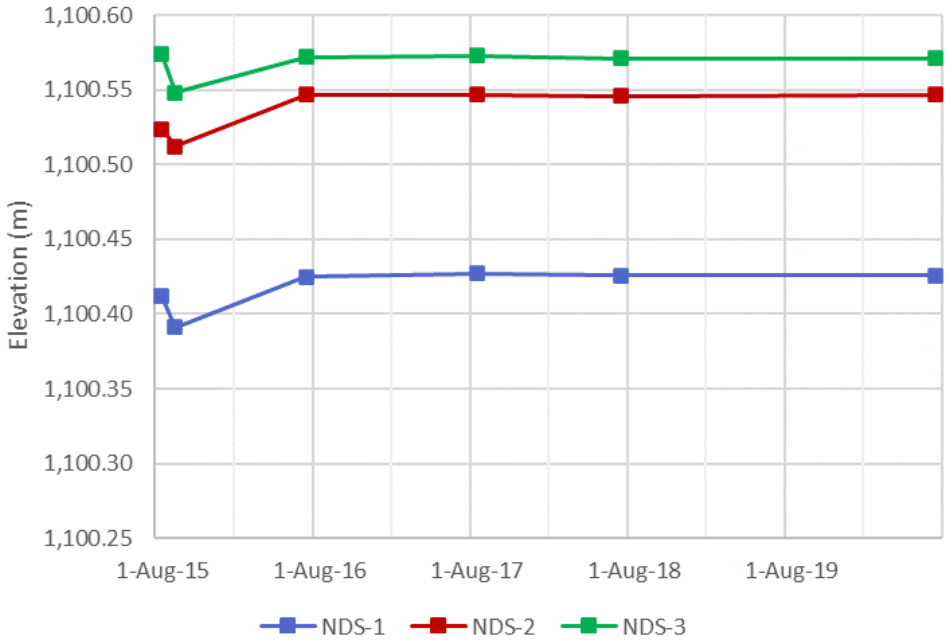
Job No: CAPR003248
Filename: AppD-Instrumentation Data.pptx

Sa Dena Hes

Date: August 2024
Approved: P. Mikes
Figure: **D-4**



Notes:
1. Orthographic Photo depicts the pre-decommissioned surface on August 12, 2012
2. Co-ordinate system is UTM NAD 83 CSRS Zone 9V.



Threshold Criteria (masl)

	Acceptable	Warning	Alarm
NDS-1	1,100.425	1,100.375	1,100.325
NDS-2	1,100.545	1,100.495	1,100.445
NDS-3	1,100.570	1,100.520	1,100.470

Elevation Readings

	Settlement Pins			
Date	NDS-1	NDS-2	NDS-3	Notes
6-Aug-15	1,100.412	1,100.524	1,100.574	
10-Sep-15	1,100.391	1,100.512	1,100.548	
1-Jul-16	1,100.425	1,100.547	1,100.572	2016 and onward readings are relative to BM 103
1-Aug-17	1,100.427	1,100.547	1,100.573	
25-Jul-18	1,100.426	1,100.546	1,100.571	
24-Jul-20	1,100.426	1,100.547	1,100.571	

Source File:
https://srk.sharepoint.com/:x:/r/sites/FS261/Internal/Monitoring%20Data/NDMPiezolevels_2023Edition_rev01.xlsx

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Job No: CAPR003248
Filename: AppD-Instrumentation Data.pptx

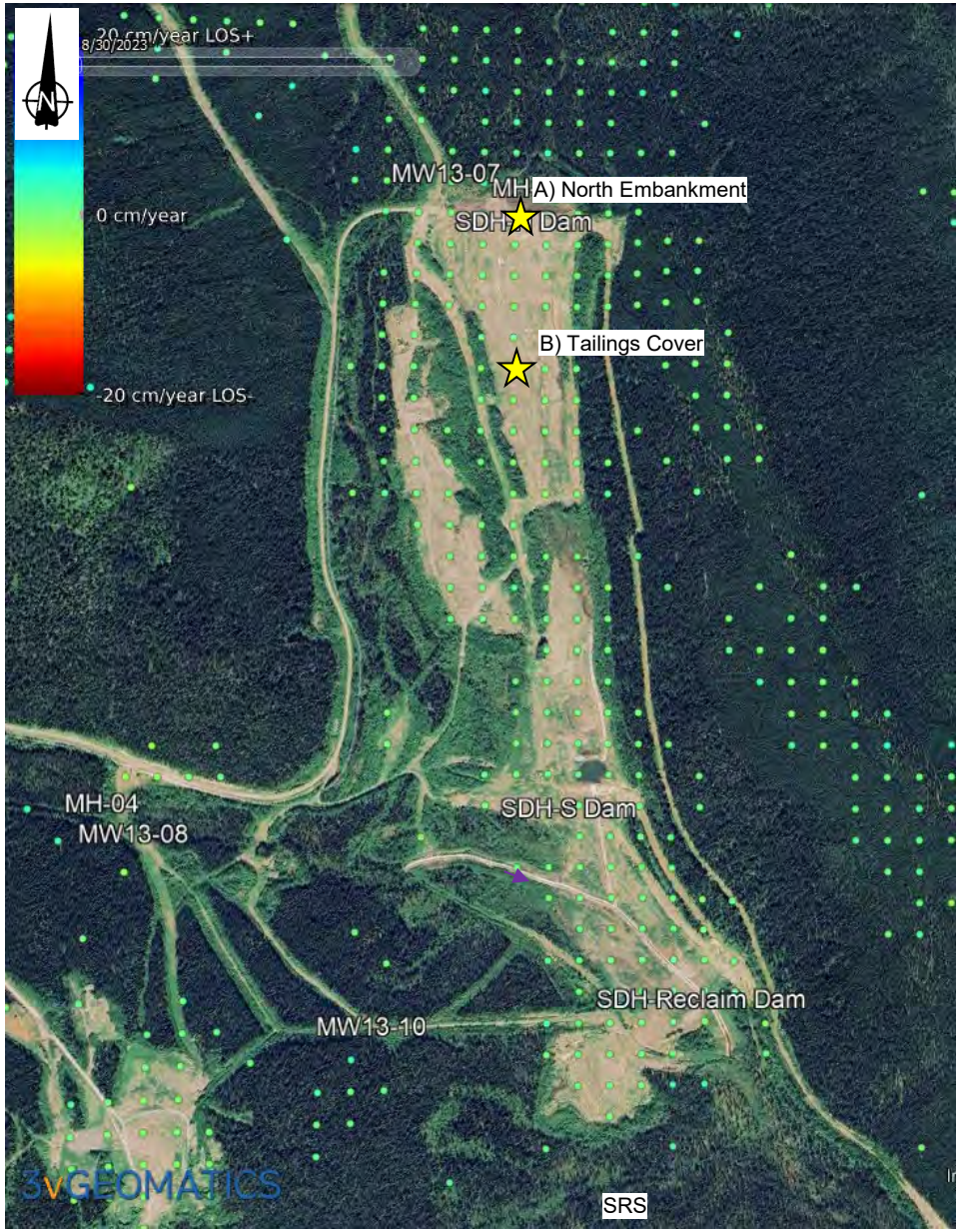
Teck

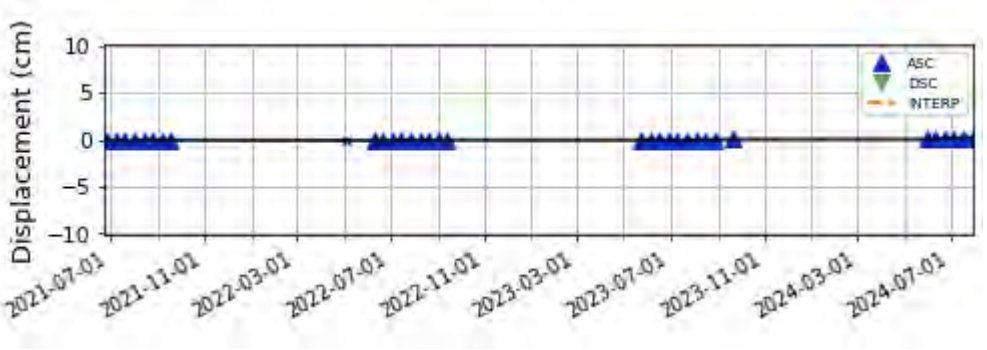
Sa Dena Hes

Annual Facility Performance Review

North Dam Settlement Pins

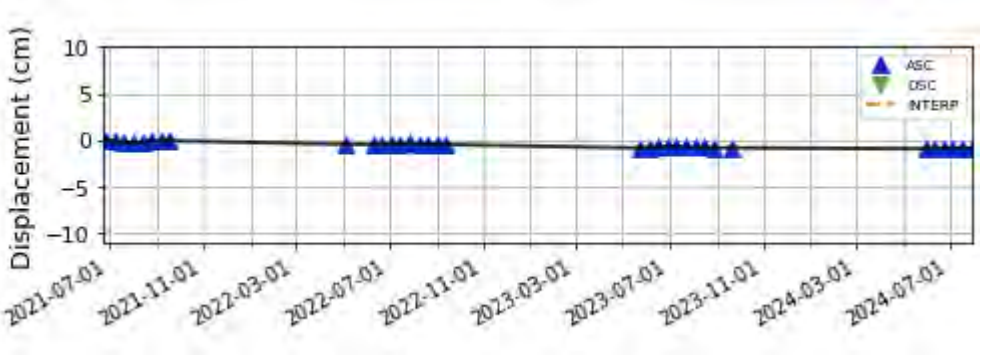
Date: August 2024
Approved: P. Mikes
Figure: **D-5**





A) North Embankment:

1. Graph shows displacement on the crest during snow-free months between July 2021 and July 2024.
2. No apparent movement detected.

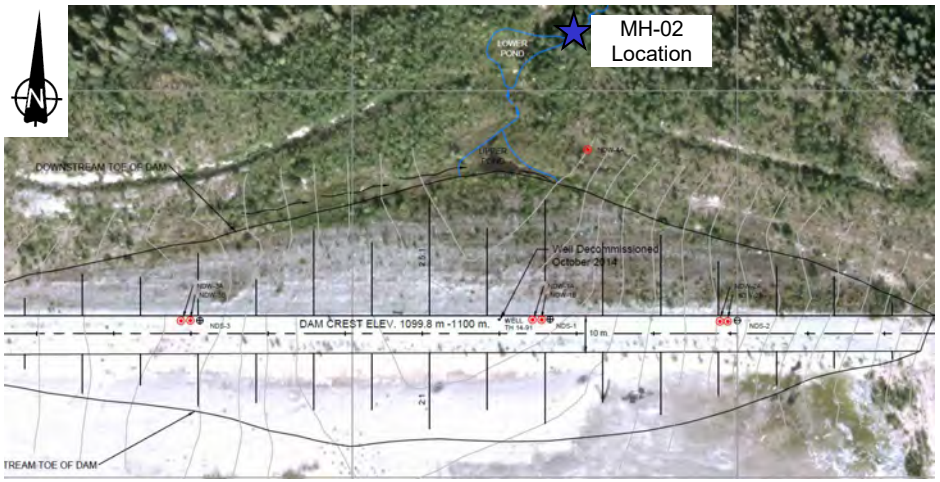


B) Tailings Cover

1. Graph shows cumulative displacement on the crest during snow-free months between July 2021 and July 2024.
2. Data shows an minor amount of settlement with an average displacement rate of -0.3 cm/yr.

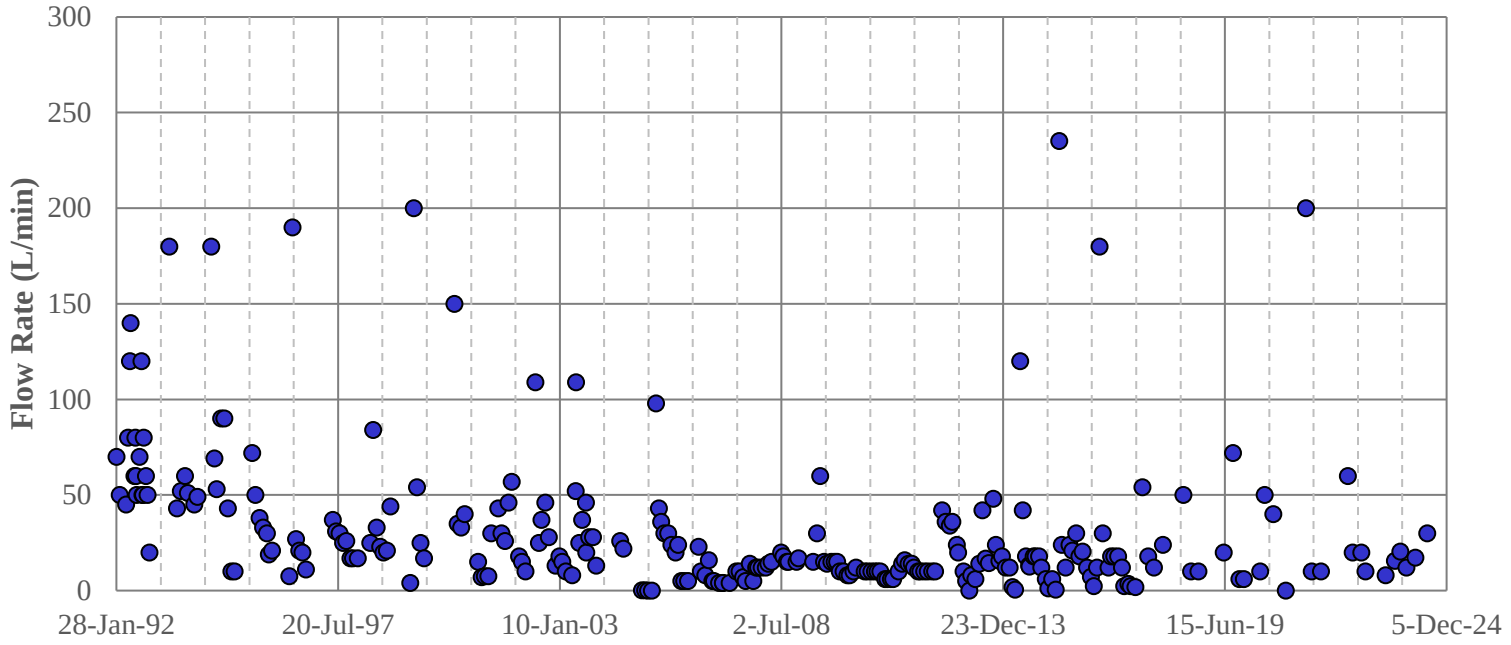
Source:
https://motionary.3vgeomatics.com

srk consulting	Teck	Annual Facility Performance Review	
Job No: CAPR003248 Filename: AppD-Instrumentation Data.pptx	Sa Dena Hes	**InSAR Displacement Data – July 2021 to July 2024**	
		Date: August 2024	Approved: P. Mikes
			Figure: **D-6**



Notes:

1. Orthographic Photo depicts the pre-decommissioned surface on August 12, 2012
2. Co-ordinate system is UTM NAD 83 CSRS Zone 9V.



Source File:
https://srk.sharepoint.com/sites/FS261/Internal/Monitoring%20Data/MH-02_Seepage_Flow.xlsx?web=1

srk consulting

Teck

Annual Facility Performance Review

MH-02 Flow Data

Job No: CAPR003248

Filename: AppD-Instrumentation Data.pptx

Sa Dena Hes

Date: August 2024

Approved: P. Mikes

Figure: **D-7**

Appendix E Routine Inspection Forms

Fall 2023

Sa Dena Hes Mine Site Geotechnical Inspection

No.
00010

Photo Discription	Photo	Photo Location
2nd crossing repairs		

North Dam

Date:
16/09/2023

Ponded Water
Shallow pond approximately 50m from crest following center drainage swale. Few small puddles following drainage swale along upstream crest. Dam crest in good general condition.

Erosion
2 - small rills 4m east of jute, midway of downstream face. Filled in.

Settlement/Depressions
No Issues

Cracks/Movement
No Issues

Vegetation
Grasses appear to be growing on the sandy patches of downstream slope.

Downstream Toe Seepage
West side of toe dry. East side toe near center has usual seeps. Slightly less seepage than usual. Minimal seepage from East hillside to near center of dam.

North Dam Photo's

No.
00010

Sa Dena Hes Mine Site Geotechnical Inspection

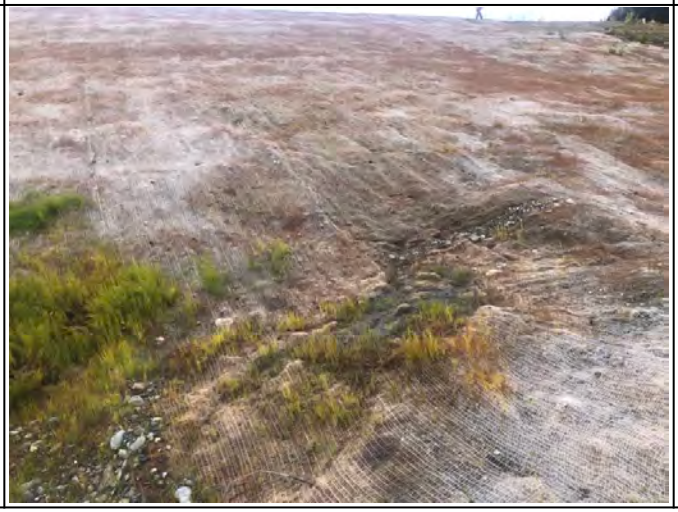
Photo Discription	Photo	Photo Location
Small rills downstream face		Latitude: 60.538914 Longitude: -128.853851
Vegetation catching on sandy patches of face		Latitude: 60.538815 Longitude: -128.854553

No.
00010

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Seepage along west side toe to center of dam appears dry		Latitude: 60.539040 Longitude: -128.854492
Start of toe seepage		Latitude: 60.538956 Longitude: -128.854523

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Seepage directed away from toe		Latitude: 60.539013 Longitude: -128.854401
Seeded grasses over dam repair appear to be growing well		Latitude: 60.539047 Longitude: -128.854172

No.
00010

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
East side of downstream dam face. Seepage from area where french drain installed during repairs		Latitude: 60.538864 Longitude: -128.854385
Center East side ponding and seepage		Latitude: 60.538895 Longitude: -128.853729

No.
00010

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Small trees will need to be trimmed next summer		Latitude: 60.538639 Longitude: -128.853943
Few puddles along drainage path		Latitude: 60.538883 Longitude: -128.854004

North Pond Cap

Date:

Settlement/Depressions

Vegetation

Sa Dena Hes Mine Site Geotechnical Inspection

No.
00010

16/09/2023

General Appearance
Alder & willow took a substantial height growth spurt this summer. Areas up to 3m tall. Generally about 2m.

Erosion
Few erosion rills along lower half of drainage swale. Depth up to 40cm.

No Issues

Standing Water
Areas of ponding/puddling along length of swale.

Evaporite Salts
No Issues

Definite areas where planted tree growth is not catching as well. Grasses seem slow to catch and may be inhibited by the alder.

Drainage Swale
Shallow pool approximately 50m from upstream crest, occasional puddling across cap in low spots.

North Pond Photo's

Photo Discription	Photo	Photo Location
Nort pond cap		Latitude: 60.538727 Longitude: -128.851135

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
North pond cap 2		Latitude: 60.538723 Longitude: -128.851135

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Center swale ponding		Latitude: 60.538021 Longitude: -128.854034

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
North pond cap, center looking south.		Latitude: 60.536304 Longitude: -128.852966
Erosion rills approximately 2/3 of the way south to old coffer dam		Latitude: 60.535606 Longitude: -128.852783

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Shallow pooling along southern portion of center drainage swale.		Latitude: 60.535500 Longitude: -128.852997

Sa Dena Hes Mine Site Geotechnical Inspection

No.
00010

Photo Discription	Photo	Photo Location
Area of old coffer dam		Latitude: 60.533791 Longitude: -128.852509

South Pond Cap

Date:
16/09/2023

General Appearance
Tree growth not as robust in north portion of cap, south end significantly better.

Erosion
No Issues

Settlement/Depressions
No Issues

Standing Water
No Issues

Evaporite Salts
No Issues

Vegetation
No Issues

Drainage Swale
No Issues

South Pond Photo's

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
North end of cap		Latitude: 60.531254 Longitude: -128.852142
South easterly section to SRS		Latitude: 60.531204 Longitude: -128.852112

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
South Westerly direction		Latitude: 60.531273 Longitude: -128.852066
Southern half of S. cap some rilling along any slightly steeper grades throughout cap.		Latitude: 60.530651 Longitude: -128.850937

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
S. Cap to SRS		Latitude: 60.530655 Longitude: -128.850952

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Ponding and hillside seepage north westerly of SRS		Latitude: 60.529900 Longitude: -128.852570

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Rills from west hillside seepages		Latitude: 60.529999 Longitude: -128.852585

Sa Dena Hes Mine Site Geotechnical Inspection

No.
00010

Photo Discription	Photo	Photo Location
West hillside seepage		Latitude: 60.530315 Longitude: -128.852615

North Diversion Channel

Date:
16/09/2023

Slideslopes
No Issues

Riprap
Covered exposed geotextile in channel and erosion above SRS

Debris
No Issues

Sa Dena Hes Mine Site Geotechnical Inspection

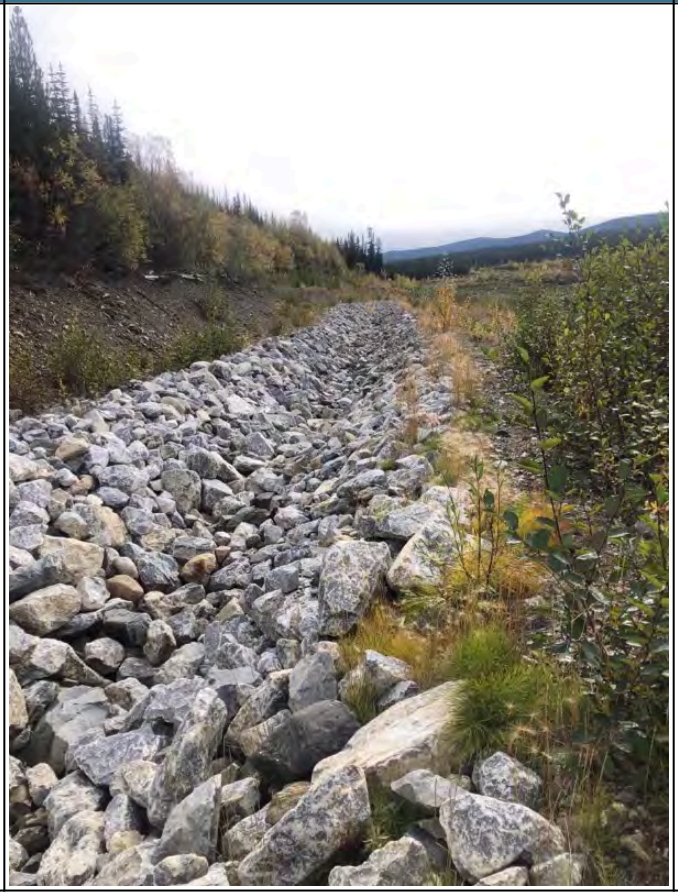
No.
00010

North Diversion Photo's

Photo Discription	Photo	Photo Location
North end of N. channel, looking south		Latitude: 60.531826 Longitude: -128.851212

Sa Dena Hes Mine Site Geotechnical Inspection

No.
00010

Photo Discription	Photo	Photo Location
Midway-Looking south		Latitude: 60.530994 Longitude: -128.850998

No.
00010

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Riprap repair near SRS		Latitude: 60.529396 Longitude: -128.850494

Sediment Retaining Structure (SRS)

Date:
16/09/2023

Depth of water at spillway
Level with bottom of riprap

Sloughing of spillway slopes
Side-slopes starting to slough

Spillway riprap
Settlement of riprap on slopes

Debris at spillway inlet
Cleaned small amount of woody debris.

Erosion
Downstream slopes beside spillway eroding, rill, & cracks.

Settlement/Depressions
No Issues

Sinkholes
No Issues

Cracks/Movement
No Issues

Debris
No Issues

Vegetation
No Issues

Downstream Toe Seepage
No Issues

East Hillside Seepage
Appears to be some seepage from hillside.

SRS Photo's

No.
00010

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Hillside seepage into SRS		Latitude: 60.529564 Longitude: -128.850861
Cover repair of geotextile above SRS		Latitude: 60.529686 Longitude: -128.850967

No.
00010

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Pond		Latitude: 60.529705 Longitude: -128.851562
Overview		Latitude: 60.529255 Longitude: -128.851639

No.
00010

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Rill and cracking west side of downstream spillway		Latitude: 60.528957 Longitude: -128.850800

Sa Dena Hes Mine Site Geotechnical Inspection

No.
00010

Photo Discription	Photo	Photo Location
Downstream face repair		
Spillway		

South Drainage Channel

Date:

Riprap

Sa Dena Hes Mine Site Geotechnical Inspection

No.
00010

16/09/2023

Iron staining starts 500m downstream from SRS

Slideslopes

Minor settlement along edges of channels above riprap, where geotextile ends.

Debris

No Issues

South Drainage Photo's

Photo Discription	Photo	Photo Location
From SRS		Latitude: 60.528454 Longitude: -128.850677

Spring 2024

Sa Dena Hes Mine Site Geotechnical Inspection

No.
00011

Photo Discription	Photo	Photo Location
Looking downstream		Latitude: 60.545845 Longitude: -128.857697

North Dam

Date:
25/05/2024

Ponded Water
No Issues

Erosion
No Issues

Settlement/Depressions
Newly observed small settlement along toe 1m above ponded area. It may have been more noticeable due to lack of current vegetation. Area of about 1m, depth of 10-14cm.
No sign of turbidity in ponded water.

Cracks/Movement
Piezometer NDW-4A - inner casing appears to be sticking up out of the outer casing slightly more than previously. Inner casing had been cut off to allow lid on outer casing to close. Monitor this to see if possibly frost jacking. +- 3cm of the outer casing. No other signs of movement.
Well bottom & inner casing depth appear

Downstream Toe Seepage
Seepage/runoff clear, no sign of turbidity. Signs of iron staining in ponded area near the middle of dam at the toe is average. Small amount of iron staining near 2nd silt fence from West seepage channel. Previously noted. Appears average.

Sa Dena Hes Mine Site Geotechnical Inspection

unchanged.

Vegetation

Few willows to be trimmed this season

North Dam Photo's

Photo Discription	Photo	Photo Location
East across dam		Latitude: 60.538818 Longitude: -128.856216

No.
00011

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Snow melt/seepage from west downstream side of dam		Latitude: 60.538925 Longitude: -128.855743

No.
00011

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Drainage along west toe of dam		Latitude: 60.539040 Longitude: -128.854645

No.
00011

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Toe seepage from French drain area of dam repair		Latitude: 60.539082 Longitude: -128.854156

No.
00011

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Toe seepage 10m east of dam repair. Previously noted.		Latitude: 60.539085 Longitude: -128.853989

No.
00011

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Iron staining from center of toe seepage. Previously noted.		Latitude: 60.539078 Longitude: -128.853943

No.
00011

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Toe seepage		Latitude: 60.538918 Longitude: -128.854279

Teck

Sa Dena Hes Mine Site Geotechnical Inspection

No.
00011

Photo Discription	Photo	Photo Location
NDW-4A cutoff Oct 13, 2022		

Sa Dena Hes Mine Site Geotechnical Inspection

No.
00011

Photo Discription	Photo	Photo Location
NDW-4A May 25, 2024		

Sa Dena Hes Mine Site Geotechnical Inspection

No.
00011

Photo Discription	Photo	Photo Location
Settlement not previously noticed		

Sa Dena Hes Mine Site Geotechnical Inspection

No.
00011

Photo Discription	Photo	Photo Location
Iron staining patch near 2nd silt fence from west seepage channel		

North Pond Cap

Date:
25/05/2024

General Appearance
Generally good. Hillside seeps along east side.

Settlement/Depressions
No Issues

Standing Water
Water has drained thoroughly via center drainage

Vegetation
Alders budding

Drainage Swale
No Issues

Sa Dena Hes Mine Site Geotechnical Inspection

Erosion

No Issues

swale.
Few shallow small ponded areas along east & west sides of cap. Normal wet area in trees along west side 300m south of dam.

Evaporite Salts

No Issues

North Pond Photo's

Photo Discription	Photo	Photo Location
Drainage swale looking south		Latitude: 60.538799 Longitude: -128.854004

No.
00011

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
200m downstream of dam		Latitude: 60.537384 Longitude: -128.854004

No.
00011

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Ponding along east bank approx 400m south of dam		Latitude: 60.535664 Longitude: -128.851959

No.
00011

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Erosion on cap midway to old coffer dam		Latitude: 60.535595 Longitude: -128.852081
North pond cap		Latitude: 60.535709 Longitude: -128.852188

No.
00011

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
North pond cap 2		Latitude: 60.535709 Longitude: -128.852188
South end of center drainage swale		Latitude: 60.533802 Longitude: -128.851807

No.
00011

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Wet area west side of cap.		Latitude: 60.537113 Longitude: -128.855911

South Pond Cap

Date:
26/05/2024

General Appearance
No Issues

Erosion
No Issues

Settlement/Depressions
No Issues

Standing Water
No Issues

Evaporite Salts
No Issues

Vegetation
Sparse vegetation along north west side of cap.

Drainage Swale
No Issues

South Pond Photo's

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
South pond cap		
North west cap		

No.
00011

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
North east end of south tailings cap& start of north diversion channel		
Hillside seeps, ponding, general appearance south cap, looking S/W		

No.
00011

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
South cap		
Midway south cap		

North Diversion Channel

Date:

Riprap

Sa Dena Hes Mine Site Geotechnical Inspection

No.
00011

26/05/2024

Minor settlement over length of channel

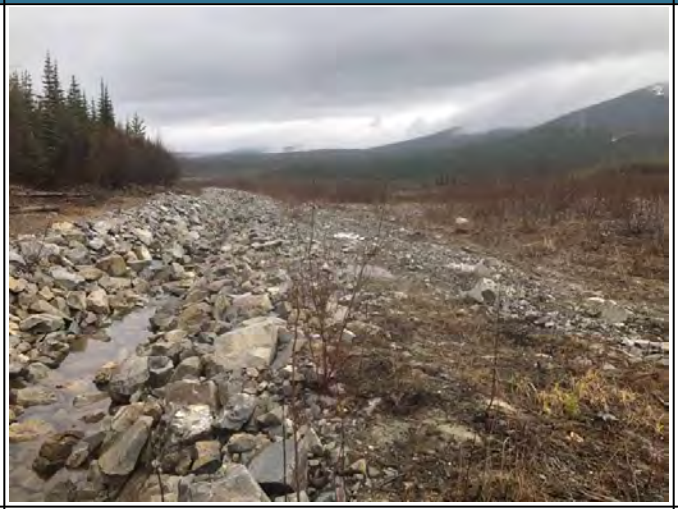
Slideslopes

Few cracks along length where geotextile stops along top of the banks. This is present along all the diversion channels.

Debris

No Issues

North Diversion Photo's

Photo Discription	Photo	Photo Location
Upper north diversion channel		
South end of north channel		

Sa Dena Hes Mine Site Geotechnical Inspection

No.
00011

Sediment Retaining Structure (SRS)

Date:
26/05/2024

Depth of water at spillway
Level with bottom of riprap

Sloughing of spillway slopes
Slough repair appears to be in good shape.

Spillway riprap
No Issues

Debris at spillway inlet
No Issues

Erosion
No Issues

Settlement/Depressions
No Issues

Sinkholes
No Issues

Cracks/Movement
Cracks along downstream spillway riprap getting larger. Up to 15cm deep & 12 cm wide. Parallel to entire length of downstream face.

Debris
No Issues

Vegetation
No Issues

Downstream Toe Seepage
Average seepage, no sign of turbid water downstream. Small spring/ boil was below SRS toe no longer present.

East Hillside Seepage
Yes

SRS Photo's

Photo Discription	Photo	Photo Location
Upstream SRS		

Sa Dena Hes Mine Site Geotechnical Inspection

Photo Discription	Photo	Photo Location
Cracking along spillway		
Downstream spillway		

Sa Dena Hes Mine Site Geotechnical Inspection

No.
00011

Photo Discription	Photo	Photo Location
SRS repair		
SRS repair, hillside seeps, iron stain from apparently hillside.		

South Drainage Channel

Date:

Riprap