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Mason Mantla, Chair Wek'èezhìı Land and Water Board PO Box 32 Wekweètì, NT X0E 1W0, Canada

21 November 2024

Dear Mr. Mantla,

Subject: 2024 Annual Dam Safety Inspection – Processed Kimberlite Containment Facility and Water Management Pond System

Please find attached the Annual Dam Safety Inspection (DSI) Report for 2024. The inspection covers the following facilities referenced in The Diavik Diamond Mines (2012) Inc. Type A Water License (W2015L2-0001):

- Processed Kimberlite Containment Facility (PKCF) (Part G, Condition 27i)
- Drainage Control and Collection System (Part G, Condition 28f)

The following recommendations from WSP Canada Inc, the PKCF and Drainage Control and Collection System Engineer of Record (EoR), were made and DDMI actions (Implementation Plan) identified as a result of the inspections. DDMI actions and Implementation Plan can be seen under the 2024 Comments and Recommended Actions heading in Table 2.

Please do not hesitate to contact Nicole Goodman at <u>nicole.goodman@riotinto.com</u> or Kyla Gray (<u>kyla.gray@riotinto.com</u>; 867-445-4922) with any questions or concerns.

Yours sincerely,

Matthew Breen Digitally signed by Matthew Breen Date: 2024.11.18 16:03:44-07'00'

Matt Breen Chief Operating Officer

Cc: Marie-Eve Cyr, WLWB Anneli Jokela, WLWB Mufaro Chivasa Date: 2024.11.18 14:15:58

Mufaro Chivasa Manager, DDMI Technical

Attachments: Report on PKCF and Water Management Ponds – 2024 Annual Dam Safety Inspection for Diavik Diamond Mines (2012) Inc. by WSP Canada Inc. – November 2024

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Table 1: Priority Descriptions

Priority	Description
1	A high probability or actual dam safety issue considered immediately dangerous to life, health or the environment, or a significant risk of regulatory enforcement.
2	If not corrected, could likely result in dam safety issues leading to injury, environmental impact or significant regulatory enforcement; 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 - Further improvements are necessary to meet industry best practices or reduce potential risks.



Table 2: WSP Canada Inc (EOR) 2024 DSI Recommendations and DDMI Implementation Plan

Location	Recommendation Description	Source of	Priority	Recommended	2024 Comments and
		Recommendation	Leve	Timeline/Status	Recommended Actions
		PKC Faci	lity		
West Dam	Complete the spillway chute construction, including the erosion protection, as per revised timing	2022 DSI	2	Complete	Complete
East Dam	Backfill erosion gullies with rockfill to Backfill erosion gullies with rockfill to prevent accumulation of snow and increased erosion. DDMI backfilled larger erosion gully in 2022 with jaw run rockfill. Some additional erosion occurred. DDMI have plan in place to relocate the haul road which will remove the issue of continued erosion. Erosion is not currently a dam stability concern and can be monitored during operation, more robust repair required for closure	2019 DSI	m	Partially complete	On Hold – Repairs required at closure
West Dam South Dam	Place liner cover materials (CPK) over anchor trench to protect liner and prevent liner movement and add additional fill to support CPK.	2024 DSI	ო	Q3 2025	Work is ongoing with a target for completion in summer 2025.
	Drainage C	ontrol and C	collect	ion Systen	
Pond 2	Include monitoring, review, and recommendations for filling of sinkholes in geotechnical inspection reports. Survey cracking and sinkholes to confirm distance from	2019 DSI	ε	Closed	Closed – Superseded by ongoing operations recommendations.

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Closed, pond closure works underway.	Complete	Complete	Area will be assessed, and a plan developed to mitigate impacts from runoff.	Pond spillway will be assessed, and a plan developed to complete this work in 2025.	Overflow paths for these structures have been determined and spillways will be evaluated and further work developed as required.	Partially complete - Recommendation is in further
Closed	Complete	Complete	Q2 2025	Q3 2025	Q3 2025	Q3 2025
3	Э	3	e	б	З	ю
2020 DSI	2023 DSI	2023 DSI	2019 DSI	2019 DSI	2019 DSI	2022 DSI
Repair erosion on downstream crest of spillway.	For sinkholes at crest, include monitoring, review and recommendations for filling sinkholes in geotechnical inspection reports. Survey sinkholes to confirm liner distance.	For slumped liner cover near north abutment, establish monitoring plans to assess displacement. Consider options to buttress upstream toe.	The areas showing signs of erosion should be repaired to allow runoff from the haul road to get over this area into the pond. A plan to manage runoff water entering from the haul road should be developed. Plan in development to place till and erosion protection over areas of damaged liner.	Remove the road blocking the Pond 4 spillway and raise the pipeline.	Establish an emergency spillway at Pond 1 and Pond 5 or at least evaluate where overflow would go. Pond 1 and Pond 5 are buttressed by haul roads, so not having a spillway is likely not a dam stability concern.	Direct run-off and mud from South Haul Road culvert into Pond 5
Pond 2	Pond 13	Pond 4	Pond 1	Pond 4	Pond 1 and Pond 5	Pond 5

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	upstream of the dam toe to avoid water saturating the toe berm.				planning and will target completion in 2025.
Pond 10	Regrade crest area and form a ditch directing runoff from road into Pond 10	2020 DSI	4	Q3 2025	A plan will be developed, and a ditch will be evaluated and constructed as required in 2025.
Pond 3	Regrade gravel berm supporting a pipeline blocking the Pond 3 emergency spillway and reinstate blocking to raise the pipeline out of the channel.	2023 DSI	m	Q2 2025	Recommendation is in planning and will target completion in 2025.
Pond 5	Develop a mitigation plan or water management plan for Pond 5 to meet the design intent of the pond.	2023 DSI	ю	Q3 2025	Recommendation is in planning and will target completion in 2025.
Pond 12	Place pipe on blocks or cribbing to allow flow under the pipe through the emergency spillway, or remove pipe, prior to freshet.	2024 DSI	3	Q1 2025	Recommendation is in planning and will target completion in 2025.



REPORT

Processed Kimberlite Containment Facility and Water Management Ponds — 2024 Annual Dam Safety Inspection

Diavik Diamond Mine

Submitted to:

Diavik Diamond Mines (2012) Inc.

PO Box 2498 300 - 5201 - 50th Avenue Yellowknife NT X1A 2P8

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Submitted by:

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WSP Reference No: CA0035294.6784-2549-R-Rev0-2000

Diavik Work Plan No. 773

Diavik PO No. 3106303935

November 15, 2024

Distribution List

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Electronic Copy: WSP Canada Inc.

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Executive Summary

This report presents the 2024 Annual Dam Safety Inspection (DSI) for the Processed Kimberlite Containment (PKC) Facility and associated water management ponds at the Diavik Diamond Mine (2012) Inc. (DDMI) Diavik Mine Site in the Northwest Territories. The inspection was carried out between August 19 and August 22, 2024, by Jeffrey Kwok, P.Eng. and Jack Hindmarsh, P.Eng., both employees of WSP. Based on the visual observations during the August 19 to August 22, 2024 site inspection, and instrument data review herein; the PKC Facility and water management ponds at the Diavik Diamond Mine appeared safe with no deficiencies requiring immediate actions and are considered to meet their design intent.

The principal observations are summarised below.

General PKC Facility Condition:

- The PKC Facility dams are in good condition with no significant signs of instability, cracking, erosion, settlement, or lateral movement that threatens overall stability of the dams.
- The spillway chute construction was completed in August 2024.

Seepage Management:

- Seepage conditions from the PKC Facility have generally reduced and improved, continuing the trend observed in the 2023 DSI reporting period. This is largely due to the completion of fine processed kimberlite (FPK) deposition in April 2023 and the management of the PKC pond in the northwest corner of the facility.
- No seepage was observed from the South Dam.
- Seepage into the East Dam has reduced, with seepage managed by the remaining seepage collection wells.
- Seepage from the North Dam remains low and continues to be retained by the North Country Rock Pile (NCRP).
- Seepage into the West Dam has decreased, with ongoing management of a small surface pond located in the northwest corner and the West Cell.

Thermal Conditions:

- The thermal conditions in the PKC Facility dams are generally consistent with those observed in during 2023 DSI, with most areas either cooling or showing a relatively constant trend.
- The South Dam key trench and downstream foundation are frozen based on available instrumentation.
- The East Dam generally shows frozen conditions in the foundation and rockfill dam. Thermistors installed in the cut-off trench upstream of the East Dam indicate that the key trench is likely marginally thawed at about 1°C to 0°C on the east side of the historical South Barge Road, but the key trench is frozen upstream of the main section of the East Dam.
- The North Dam foundation is frozen with stable temperatures.

The West Dam key trench and foundation are frozen, with a cooling trend observed in the downstream rockfill. Thermistors installed downstream of the West Dam foundation cut-off trench indicate marginally frozen to thawed conditions with generally stable temperatures.

Water Management Ponds:

The water management ponds are generally in good condition, with no immediate dam safety concerns.
Some maintenance items from previous inspections require addressing.

There are no new or outstanding Priority 1 or 2 recommendations for the PKC Facility or the water management ponds. Remaining Priority 3 and 4 recommendations from 2019 to 2023 are provided in Table 2 in the report body. New Priority 3 recommendations are provided in Table 3 in the report body, with priority descriptions provided in Table 4 and Table 5 provides recommendations for ongoing operations.

Study Limitations

WSP Canada Inc.("WSP") prepared this report solely for the use of the intended recipient, Diavik Diamond Mines (2012) Inc. (DDMI), in accordance with the professional services agreement between the parties. In the event a contract has not been executed, the parties agree that the WSP General Terms for Consultant shall govern their business relationship which was provided to you prior to the preparation of this report.

The report is intended to be used in its entirety. No excerpts may be taken to be representative of the findings in the assessment.

The conclusions presented in this report are based on work performed by trained, professional and technical staff, in accordance with their reasonable interpretation of current and accepted engineering and scientific practices at the time the work was performed.

The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation, using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by WSP and other engineering/scientific practitioners working under similar conditions, and subject to the same time, financial and physical constraints applicable to this project.

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APPENDICES

Appendix A Annual Dam Inspection Reports

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1.0 INTRODUCTION

WSP Canada Inc. (WSP) was retained by Diavik Diamond Mines (2012) Inc. (DDMI) to perform the 2024 annual dam safety inspection (DSI) for the Pond 3 Dam, the Processed Kimberlite Containment (PKC) Facility dams, and the runoff collection pond dams. Part H of the Water Licence (W2015L2-0001, October 2015, last amended April 2024) requires that an inspection and reporting for the PKC Facility dams and associated Water Drainage and Collection System (water management ponds') dams be carried out by a geotechnical engineer annually.

Mr. Jeffrey Kwok, P.Eng., and Mr. Jack Hindmarsh, P.Eng., of WSP carried out the annual inspection between August 19 and August 22, 2024. The last annual DSI (WSP 2023a) was carried out in August 2023. The Pond 3 Dam, the PKC Facility dams, and the water management pond dams are inspected weekly by DDMI geotechnical technicians.

The annual inspection involved walking the crests and downstream toes of each of the structures where accessible and along the upstream toes where not inundated. In some cases, it was not possible to walk the downstream toe of some structures due to access constraints from the terrain, high-voltage cables, and safety (i.e., DDMI personnel exclusion zone at the downstream toe of the PKC Facility). The condition of the structures was observed and recorded, and representative photographs were taken. Dam inspection reports and photographs taken during the inspection are presented in Appendix A. Summary tables of instrumentation installed in the PKC Facility are presented in Appendix B. Ground temperature records from thermistors installed in the dams and their foundations, and weekly inspection reports, were provided by DDMI and were reviewed as part of the annual inspection. Thermistor data are presented in Appendix C. Instrumentation locations are shown in plan and on representative cross-sections in Figure 1 to Figure 8. Seepage management zones and piezometer and seepage collection well pumping data are shown in Figure 9 to Figure 13. Inclinometer and shape acceleration array (SAA) data are presented in Figure 14 to Figure 17.

This report was prepared in a manner consistent with the level of care and skill ordinarily exercised by members of the engineering and science professions currently practising in the Northwest Territories, subject to the time limits and physical constraints applicable to this report. No other warranty, express or implied, is made. For additional information, reference should be made to the Study Limitations, which precedes the main text of this report.

2.0 CLIMATIC CONDITIONS AT TIME OF INSPECTION

Weather conditions were generally mild, with a mix of sunshine and cloud and temperatures ranging from approximately 15°C to 20°C during the inspection period. Winds were calm. The water elevation (elev.) in Lac de Gras was 415.38 m at the time of the inspection in August 2024, which was about 0.23 m higher than the elevation during the August 2023 DSI.

3.0 POND 3 (ON-LAND DREDGED SEDIMENT STORAGE FACILITY)3.1 Background

Pond 3 was initially designed to store sediments and water from the dredging of the A154 Dike footprint and was designated the On-Land Dredged Sediment Storage Facility (OLDSSF). This facility consisted of three perimeter dams (OLDSSF North, East, and West dams) and one pervious dam (OLDSSF Pervious Dam). The OLDSSF was also used as a clarification pond during dewatering of the A418 Dike footprint. The OLDSSF East, Pervious, and North dams have been completely covered by the North Country Rock Pile (NCRP). The OLDSSF West Dam is now the only structure forming Pond 3 and is used as a multi-purpose water management facility, including for surface runoff, seepage collection, and flood management from the PKC Facility and NCRP. In 2016, Pond 3 temporarily stored sediment-rich water from the A21 Dike construction dredging. The PKC Phase 7 spillway construction started in 2022 along the PKC West Dam down into the Pond 3 impoundment. The closure configuration stilling basin for the PKC closure spillway chute was completed in January 2024 at the toe of Phase 7 spillway chute. The rip rap erosion protection layer of the Phase 7 spillway was completed in August 2024.

3.2 Dam Stability and Seepage Inspection

During the inspection, a walkover was conducted along the crest and upstream slope of Pond 3. A permanent pipeline is in place for pumping water from Pond 3 to the North Inlet.

The Pond 3 Dam shows stable conditions with no signs of movement, settlement, heaving, sloughing, cracking, or seepage that would compromise the integrity of the structure.

The downstream slope and toe were observed from the downstream crest of the dam due to access constraints. As in previous years, limited amount of runoff had collected in natural depressions downstream of the dam. No signs of water flow could be observed from the crest.

The water level was at elev. 422.2 m in August 2024, at the time of the inspection, providing storage for the inflow design flood plus an additional 152,000 m³ storage. The water edge of the pond was about 40 to 50 m from the upstream toe of the Pond 3 Dam. The upstream slope of the Pond 3 Dam had wave erosion scars from historical high-water levels. Compared to previous years, no evident changes to the erosion scars were observed. The erosion does not threaten the integrity of the dam due to the thickness of crushed rockfill cover over the upstream slope.

Inspection sheets detailing observations, photographs and any recommendations from the 2024 inspection of the South Dam are provided in Appendix A. Recommendations are summarized in Section 6.0.

3.3 Emergency Spillway

The Pond 3 emergency spillway is located near the south abutment of the Pond 3 Dam. The spillway is a shallow depression in the crest of the dam. A portion of the A21 pipeline installed in 2015 is located along the downstream crest of the dam and spillway. The pipeline was raised on blocking in October 2020, which improved the ability for flows to pass through the spillway under the pipeline. In 2023, some of the blocking had been removed and a small berm existed beneath the pipeline, likely as a result of snow-clearing or grading. Condition appears unchanged in 2024. It is recommended that the A21 pipeline blocking be reinstated, and the berm regraded to provide flow over the spillway without significant obstruction.

The Pond 3 catchment area is the pond footprint and a portion of the NCRP. Potential seepage from the PKC Facility North Dam reports to Pond 3, however, no seepage has been reported since early 2016.

The current freeboard and spillway design of the PKC Facility considers that the inflows to the PKC Facility that cannot be stored in the PKC Facility are routed into Pond 3 (Golder 2021c).

Pond 3 is required to store either the environmental design flood or the inflow design flood for both the PKC Facility and the Pond 3 catchment areas. In 2024 and at the current water level, Pond 3 has a storage capacity that is approximately 1.2 times the inflow design flood volume or approximately 2.5 times the environmental design flood volume. This storage capacity allows for operational pond storage while still maintaining storage for the design flood events.

An assessment of the existing Pond 3 storage and spillway capacity was completed along with evaluation of the risk classification of the Pond 3 Dam, and it was determined that an upgrade to the existing Pond 3 spillway was not required (Golder 2021d) for the current configuration. However, the assessment assumes the downstream Pond 3 spillway invert is at elev. 435.73 m and that the base of the A21 pipeline is at elev. 435.94 m. DDMI implemented a monitoring and trigger action response plan in 2021 for Pond 3 to always maintain storage for the inflow design flood, which has been met since 2021.

3.4 Instrumentation

Ground temperature cables (thermistor strings) were installed at three locations (Stations 0+556, 0+685, and 0+723) in the Pond 3 Dam foundation at the time of construction, between December 2000 and March 2001. There are three sets of thermistors at each location and are installed upstream (US), downstream (DS), and within the cut-off trench (KT). Thermistor readings have been taken routinely except for two thermistors (T685-US and T723-US) which stopped functioning prior to 2021 and are no longer read.

Thermistor data are presented in Appendix C and are summarized as follows:

- The dam foundation is frozen at the instrumentation locations.
- The upstream thermistor at Station 0+556 has shown similar seasonal temperature variations since 2014 with an overall slight cooling trend.
- Thermistors in the cut-off trench continue to show slight seasonal variation. These thermistors have shown a relatively stable trend over the DSI reporting period. Recorded temperatures in the three thermistors range from about -4.5°C to -3.5°C, similar to 2023.
- Downstream thermistors show seasonal variation with temperatures ranging between -6.5°C and -4.5°C, except for beads in the upper 4 m zone at thermistor T556-DS, where a maximum temperature of about -2°C has been measured during the summer months. The downstream thermistors generally show a relatively constant trend.

4.0 PROCESSED KIMBERLITE CONTAINMENT FACILITY4.1 Background

4.1.1 Overview

The PKC Facility is designed, constructed, and operated to provide for the safe, long-term containment of by-products of processing kimberlite ore at the Diavik Mine. In past operations, it has also provided an equalization reservoir for excess supernatant water and runoff water for process plant reuse. Since 2020 the PKC Facility has not been used to the same degree for water management because the pond storage capacity reduced as FPK deposition continued. The PKC Facility consists of four adjoining lined dams with a total perimeter length of approximately 5.7 km enclosing the approximately 1,560,000 m² PKC Facility area. Since early 2023, placement of the closure rockfill closure cover has been advancing over the FPK beaches and the CPK final raise, generally progressing from the perimeter of the impoundment advancing towards the centre. The configuration of the PKC Facility at the time of the 2024 inspection is shown in plan in Figure 1.

4.1.2 Construction

The PKC dams comprise a downstream rockfill shell and a filter-compatible liner bedding system supporting a low hydraulic conductivity element (either high-density polyethylene, bituminous geomembrane, or till) on the upstream face. The PKC dams were founded on frozen soil or bedrock foundation with the liner anchored in a cut-off trench excavated in the foundation.

The PKC dams have been raised in stages. The West and East PKC starter dams were constructed with a crest elevation of 430 m in 2001 and 2002. The dams were raised to elev. 435 m in 2003 (Phase 2), to 440 m in 2004 (Phase 3), to 445 m in 2006 (Phase 4), to 460 m in 2007 through 2010 (Phase 5), and to 465 m in 2011 through 2015 (Phase 6). The PKC Facility was enclosed by the four PKC perimeter dams (South, East, West, and North dams) by the construction of the South and North dams to elev. 460 m during Phase 5. Phase 7 construction of the lined dams to elev. 469 m started in 2019 and was completed in January 2023 (WSP 2023b). The Phase 7 spillway across the dam crest was constructed by fall 2021 and the downstream chute was completed on August 4, 2024 (Section 4.10). Placement of CPK in the Southwest Cell, West Cell and along the West Dam, and construction of the PKC rockfill closure cover was underway during the 2024 DSI.

4.1.3 Operation

Deposition

The PKC Facility has been receiving processed kimberlite materials since November 2002. The by-products of processing kimberlite ore at the Diavik Mine process plant consist of coarse processed kimberlite (CPK), and until October 2023, FPK. Approximately 30.4 million tonnes of FPK and 14.6 million tonnes of CPK have been placed in the facility (through the end of August 2024). The CPK is hauled by truck from the process plant and stacked within the PKC Facility. The FPK was pumped as a low-density slurry from the process plant through insulated pipelines and perimeter discharged through a series of spigots upstream of the PKC lined dams. In June 2016, modifications were made to the process plant so that the coarser fraction of the FPK stream (grit fraction) was added to the CPK stream. The resulting material was referred to as grit-rich CPK and grit-poor FPK. The modifications in the plant resulted in an average annual output of approximately 50% grit-rich CPK and 50% grit-poor FPK between June 2016 and June 2023, after which the de-grit circuit was turned off. The perimeter discharge of FPK was completed in April 2023. FPK deposition resumed temporarily in September 2023 to improve the final FPK surface for closure by spigotting FPK into the central PKC pond. Final FPK deposition in the PKC Facility was completed in October 2023. FPK deposition was transitioned from the PKC Facility to the A418 Processed Kimberlite to Mine Workings (A418 PKMW) Facility on April 14, 2023. Grit-rich FPK (de-grit circuit turned off) is expected to continue to be routed to the A418 PKMW until the end of operations. Grit-poor CPK will continue to be placed in the PKC Facility throughout this time.

Cell Management

The PKC Facility was originally split into three cells (the Main, North, and South cells) by the South and North Spigot roads. FPK deposition was planned for the Main Cell and CPK placement was planned in the North and South cells. However, the first several years of operation produced less CPK than expected, so modifications were made to use the North and South cells for FPK storage. During fall 2013, a CPK causeway (Southeast CPK Cell causeway) was built over the FPK beach from approximately Station 71+105 to Station 71+845 to develop the Southeast Cell for CPK placement at the southeast corner of the PKC Facility. During spring 2015, a CPK causeway (West CPK Cell causeway) was built over the FPK beach from approximately Station 70+500 to Station 75+300 to enlarge the West Cell for CPK placement at the southwest corner of the PKC Facility. FPK was deposited into the South and North cells, and the South Spigot Road and North Spigot Road were intentionally overtopped with FPK in 2014/2015 and 2015/2016, respectively, combining the South Cell and North Cell with the Main Cell. FPK has been deposited into all cells. CPK has been trucked and dumped in the West, Southeast, and North cells. In 2020, based on the higher production of FPK relative to CPK, the West Cell was used for additional FPK storage while the Phase 7 dam raise to elev. 469 m was completed.

Processed Kimberlite Production

Modifications to the process plant in June 2016 resulted in larger quantities of grit-rich CPK production, so the storage plan was revised. A grit-rich CPK berm was constructed approximately 100 m upstream of the dams over the FPK beach as part of the initial grit-rich CPK placement, and the FPK pipelines were relocated onto the berm for deposition of grit-poor FPK upstream of the berm. Grit-rich CPK placement has continued between the upstream berm and the dams and will also continue in the Southeast and West cells through to the end of operations. The location of raises to the grit-rich CPK has been adjusted, typically downstream towards the lined dam, to account for variation in the FPK/CPK split.

Water Management

Excess process slurry water and runoff from the PKC Facility was managed in the PKC pond until transition to the A418 PKMW Facility in April 2023. Prior to the ceasing FPK deposition in the PKC Facility, the PKC pond was generally maintained in a central location within the Main Cell of the PKC Facility for water reclaim to the process plant using a barge that was located off the South Barge Road.

FPK deposition planning for the Phase 7 dam raise to elev. 469 m, and the final CPK raise construction required a modified sloped to spillway geometry and slopes towards the northwest corner of the facility. This geometry allowed FPK to rise above elev. 465 m to gain storage while maintaining the Phase 6 spillway (invert elev. 464.6 m) operational until the Phase 7 dam liner and spillway were complete in fall 2021. As a result, water reclaim was moved to a decant sump constructed in the northwest corner of the facility, adjacent to the spillway.

The northwest decant sump is connected to the A21 pipeline for transfer to the North Inlet. The reclaim barge was removed from the facility in September 2020. The process plant reclaims water from the North Inlet through the east side pipeline. The PKC pond volume is generally maintained in the northwest corner of the facility and managed with pumping from the northwest decant sump.

4.1.4 Seepage and Thermal Conditions

Historically during winter conditions, seepage and runoff flowing through the rockfill shell of the dams froze as it reached the downstream side of the rockfill shell and formed an ice-rich rockfill zone that now blocks the flow of upstream runoff and seepage water within the rockfill shell. The rockfill shell is up to 200 m wide at the base and the central zone of the rockfill shell has remained unfrozen and runoff and seepage water accumulates within the rockfill shell behind the ice-rich rockfill zone in some areas. The formation of ice within the East Dam and West Dam rockfill shell was first observed in about 2007 and 2010, respectively. Starting in 2010, a network of wells has been installed to monitor and collect seepage and runoff retained within the rockfill shell of the East and West dams. To prevent large accumulations of water within the rockfill shells, pump sizes in the seepage collection wells were upgraded in April 2015 and additional standby wells were installed in 2016.

Higher than anticipated seepage rates from the East, North, and West dams were first experienced in late 2012 and early 2013. DDMI in collaboration with WSP (then Golder Associates Ltd.) and a third party, EBA Engineering Consultants Ltd., reviewed the influence of potential factors on seepage at a workshop in July 2013. A network of internal rockfill structures built within the PKC Facility as access roads and FPK pipeline platforms was identified as a key factor to increasing hydraulic connectivity between the PKC pond and the PKC dams, which enabled higher than anticipated seepage rates. A drilling program was completed during 2013 to install depressurization wells in the North Spigot Road rockfill upstream of the East and North dams to lower the head acting on the suspected areas of seepage, and short-term FPK deposition planning was used to build up FPK beaches over the North Barge Road and the South Spigot Road. These actions lowered the seepage rate through the North Dam and the north portion of the East Dam.

In 2015 and 2016, DDMI implemented additional seepage mitigation measures, including deposition of FPK to overtop the North Spigot Road and increase the FPK beach thickness over the North Barge Road and installation of five seepage collection or monitoring wells in the rockfill shell of the East, North, and West dams for damaged well replacements and additional redundancy.

Seepage rates increased through the South Barge Road into the East Dam starting in 2012, which have been managed with the downstream seepage collection wells. A seepage mitigation design for the internal South Barge Road was developed and constructed in 2019. Cemented rockfill (CRF) was placed around the perimeter of the South Barge Road rockfill extending from the crest of the rockfill to below the pond. In addition, CPK was placed adjacent to the CRF along the east and west sides of the South Barge Road and overlapping panels of bituminous geomembrane liner were placed around the perimeter of the South Barge Road, extending over the CRF on the slopes and over a portion of the crest. FPK was deposited on both sides of the barge road to push the pond away from the South Barge Road and build the FPK up over the CRF on the sides of the barge road. Seepage rates started reducing in September 2019 due to a combination of the seepage mitigation construction, the FPK deposition, and a reduction in the pond elevation. FPK deposition occurred over the South Barge Road as part of the sloped to spillway deposition geometry in late 2020 and early 2021.

4.2 Dam Classification

The design criteria adopted for the PKC Facility dams were originally based on consequence classification from the 1999 edition of the Canadian Dam Association (CDA) Dam Safety Guidelines, and the facility was classified with a "High" consequence of failure. The most recent CDA Dam Safety Guidelines were updated in 2013 (CDA 2013), and additional guidance was made available for mining dams in the *Technical Bulletin: Application of Dam Safety for Mining Dams* (CDA 2019).

The guidelines (CDA 2013, 2019) include a system to rank dams according to the consequences of a hypothetical dam failure. Potential life loss, environmental losses, cultural losses, and economic losses are considered in the classification. The consequence categories are based on incremental losses that a failure of the dam might inflict on downstream or upstream areas, or at the dam location itself. Incremental losses are those over and above losses that might have occurred in the same natural event or condition had the dam not failed. Infrastructure and economic consequences are based on third-party losses. The classification provides guidance on the standard of care expected of dam owners and designers.

Golder (2021a) presents an updated dam breach and inundation study for the Phase 7 design considering a maximum dam crest elevation of 475 m. The results were reviewed by DDMI and WSP and confirmed the estimated potential for loss of life at 10 or fewer, which is consistent with previous "High" consequence of failure classification. Based on the Phase 7 dam break and inundation study for up to a elev. 475 m crest, the current dam classification remains as "High" and the assessment of each category is as follows:

- Population at risk Permanent.
- Loss of life 10 or fewer.
- Environmental and cultural values Some impact to the environment is possible should the containment fail, including some loss of important fish and wildlife habitat and tundra disturbance, for which restoration or compensation is considered possible.
- Infrastructure and economics Low third-party economic losses.

The last dam safety review was conducted in 2018 (Tetra Tech 2018), as required under conditions of Water Licence W2015L2-0001 issued to DDMI by the Wek'èezhìi Land and Water Board, with a recommendation to carry out the next Dam Safety Review in 2025, which is consistent with the frequency recommended by CDA (2013, 2019) and the Global Industry Standard on Tailings Management (GISTM 2020).

4.3 Dam Seepage Management and Instrumentation

The instrumentation installed within the PKC Facility to manage seepage, monitor water levels, and thermal conditions are shown in Figure 1 and Figure 2. Eight instrumentation cross-sections have been developed to facilitate monitoring and review of conditions in the dams as shown in Figure 3 to Figure 8. DDMI manages seepage in the PKC Facility using 12 seepage management zones (Zones 1 to 11 and 3B) as shown in Figure 9. Plots of the seepage/pumping data and piezometer elevations for the zones are shown in Figure 10 to Figure 12. DDMI provided pumping and piezometer data up to the beginning of September 2024 for review as part of the DSI.

Two seepage collection wells were actively pumping at the time of the DSI in the East and West dams as summarized in Table 1. Additional standby wells are not being operated in the rockfill shell of the East and West dams. These wells are used as observational wells to monitor water levels. Standby wells in the South Dam were decommissioned to accommodate Phase 7 dam raise construction since there has not been seepage observed from the South Dam. Standby wells in the North Dam were decommissioned as part of NCRP closure work as they were not required.

A network of downstream collection ponds and shallow downstream sumps provide containment for the limited seepage that is not retained behind the ice-rich rockfill. Water that collects in the ponds is pumped to the process plant or the North Inlet.

Thermistors installed in the West and East dams are used to delineate and monitor the ice-rich rockfill and foundation. The accumulation of water within the rockfill shell of the PKC Facility dams upstream of the ice-rich rockfill has the potential of thawing the foundation of the dams and the upstream liner cut-off trench. Thermal monitoring is further discussed in Section 4.4.

Piezometers and wells are used to monitor water levels and seepage inflow rates in the dam shells and water levels are generally kept low by pumping from the seepage collection wells. Upstream depressurization wells are located in the internal rockfill structures upstream of the liner; however, these have not been operated since August 2017 and are now decommissioned. Vibrating wire piezometers were installed in the wells, upstream of the East and West Dams, prior to decommissioning.

Appendix B, Table B-1 presents a summary of depressurization, observation, and collection wells and piezometers that have been active and monitored in the PKC Facility throughout the DSI reporting period. Wells and piezometers that have been destroyed, decommissioned or otherwise no longer monitored prior to the 2024 DSI reporting period are not included in Appendix B, Table B-1.

The water levels in the rockfill shells of the East and West dams are below the levels used in the slope stability assessment for the Phase 7 Dam Raise Design (Golder 2018). No signs of instability of the PKC dams have been observed.

Refer to Sections 4.6 to 4.8 for a discussion of seepage and water levels for each PKC Facility dam.

PKC Facility Dam	Seepage Zone	Well Name	Pumping to	Active Pumping Rate (August 2024) (L/s)
Faat	6	PKCE-SCW-2530	East Side Pipeline	3.1
East	7	PKCE-SCW-1972	East Side Pipeline via Pond 1	– (a)
West	11	PKCW-SCW-4982	North Inlet via Pond 4	8.7
			Total	11.8

Table 1: Summary of Active Seepage Collection Wells in August 2024

(a) PKCE-SCW-1972 decommissioned in June 2024.

4.4 Thermal and Creep Deformation Monitoring

A number of ground temperature thermistor cables were installed in the dam foundations at the time of the initial dam construction, and many of these are operational and continue to be monitored. Additional instruments have been installed in key areas during operations to provide additional monitoring data.

The functioning thermistors in the PKC Facility dams between August 2023 and September 2024 are summarized in Appendix B Table B-2. The thermistor monitoring data are presented in Appendix C. DDMI provided thermistor data up to September 2024 for review as part of the DSI.

There are four inclinometers installed in the East PKC Dam to monitor potential movements in the ice-rich foundation. As part of the Phase 7 design (Golder 2018), DDMI retrofitted three of the conventional inclinometers with shape acceleration array (SAA) instruments and data loggers, in 2021 and 2022, to provide consistent monitoring of potential dam foundation movements in the ice-rich foundation of the East Dam. Fill material had fallen into the remaining slope inclinometer during past dam construction, but DDMI has since re-established manual inclinometer readings. The existing inclinometers and SAAs in the PKC Facility dams as of September 2023 are summarized in Appendix B, Table B-3. Cumulative displacement plots are presented in Figure 14 through Figure 17.

Readings from inclinometer PKCE-IN2500 (Figure 14), which is installed in the Main East Dam near Station 72+575, indicate that total movement in the downstream direction within the ice-rich till layer is less than 20 mm over the 14 years since it was first installed, equating to an average of less than 2 mm/year of deformation. The installation of PKCE-IN2500 may have some unsupported sections along the inclinometer casing that allows movements that are not related to creep of the foundation soils; regardless, the movements are small and within design criteria limits. The design creep rate for the ice-rich till foundation is 0.01 m/m/yr (i.e., each 1 m thickness of ice-rich till could experience a maximum of 0.01 m of horizontal displacement in a year) (WSP 2022). The movements measured in PKCE-IN2500 are within the upper 1.5 to 2 m of the ice-rich till and the estimated rate of creep is about 0.001 m/m/yr, which is an order of magnitude less than the allowable design rate. The SAA inclinometers, PKCE-SAA2335, PKCE-SAA2800-DS, and PKCE-SAA2900-DS (Figure 15 to Figure 17), show less than 10 mm cumulative displacement in the 2.5 to 3 years following their install.

Figure 1 and Figure 2 present plans showing the PKC Facility instrumentation, and instrumentation cross-sections are shown in Figure 3 to Figure 8. Refer to Sections 4.6 to 4.9 for a discussion of thermal conditions for each dam.

No visible signs of substantial movement or settlement were observed during the inspection.

4.5 Processed Kimberlite Containment Facility Pond

Excess water in the PKC Facility has been managed with pumps in the northwest decant sump area and from portable pumps around the former central pond. A relatively small pond has been maintained in the northwest corner extending to the centre of the facility throughout the reporting period. The pond elevation in the northwest decant sump was approximately elev. 465.5 m at the time of the DSI.

4.6 South Dam

The South Dam extends from the junction with the West Dam at Station 70+000 to the junction with the East Dam at Station 71+870. The dam is a lined embankment with a rockfill shell supporting a liner on the upstream face. The liner is supported on till in the lower portion of the dam and on granular bedding in the upper section. The liner is tied into a till-filled cut-off trench excavated into bedrock along the full length of the dam. The liner extends from the cutoff trench to the final lined elevation of 469 m and is covered by CPK to elev. 474 m between the Southeast Cell and the West Cell.

Inspection sheets detailing observations, photographs and any recommendations from the 2024 inspection of the South Dam are provided in Appendix A. Recommendations are summarized in Section 6.0.

4.6.1 Seepage from the South Dam

No seepage has been observed from the South Dam since 2012. The four seepage zones (Zone 7, 8, 9 and 10) used to manage seepage in the past no longer have active seepage collection wells due to reduced potential seepage since end of FPK deposition. Seepage collection well PKCE-SCW-1972 in Zone 7 was decommissioned in June 2024.

The South Dam seepage management zones are summarized as follows:

- Zone 7 (Upstream): Old South Spigot Road Upstream of Dam Seepage was managed by PKCE-SCW-1972 until it was decommissioned in June 2024. Water level in Zone 7 has stabilized at elev. 440.3 m and now flows to Zone 6, managed by PKCE-SCW-2530.
- Zone 8: Southeast CPK Cell section Potential seepage would have reported to PKCS-SCW-1567 or PKCS-SCW-1040, which have both been decommissioned.
- Zones 9 and 10: Central South Dam and West CPK Cell sections Potential seepage would report to Pond 7.

Potential seepage from the South Dam continues to be monitored by DDMI. No signs of flow were observed downstream of the South PKC Dam during the 2024 DSI.

4.6.2 Thermal Conditions in the South Dam

Instruments had been installed in the South Dam adjacent to the Southeast Cell (Zone 8) due to the proximity to the South Barge Road and because there is soil in the foundation of the dam in this area. The remainder of the South Dam foundation is largely bedrock and there has not been any seepage observed that would warrant instrumentation monitoring. One instrument on the South Dam is installed in Zone 7, PKCS-T1760-KT, while the remainder of the Zone 7 instruments are installed at the intersection of the South and East dams and are summarized in the East Dam Thermal Conditions (Section 4.7.1).

The following trends are observed in the South Dam instruments:

Thermistor PKCS-T1760-KT installed west of the South Barge Road (Zone 7) had shown a cooling trend in the upper 5 m of the foundation since fall 2019 until the lower beads stopped functioning in winter 2022. The remaining functional thermistor beads show that temperatures have remained stable within facility. Refer to Section 4.7.2 (East Dam) for a discussion of the remaining thermistors near the South Barge Road.

- Thermistors PKCS-T1540-DS, PKCS-T1550-DS, and PKCS-T1560-DS installed in the sloped liner bedding of the South PKC Dam (along the Southeast CPK Cell in Zone 8) continue to show that the upstream key trench is marginally frozen to frozen and that there is limited seasonal influence of the beads on the dam slope since 2016. The beads in PKCS-T1540-DS, PKCS-T1550-DS, and PKCS-T1560-DS show relatively constant thermal conditions and most of the beads have remained frozen since 2021. Some beads between elev. 451 and 454 m have reported thawed conditions throughout the 2024 reporting period, however, temperatures are relatively stable and consistent with previous years.
- Since thermistor PKCS-T1555-DS was installed in the Zone 8 downstream rockfill shell of the South Dam in September 2017, it has continued to record temperatures below -2°C in the rockfill shell and the foundation of the dam since 2020. Seasonal temperature fluctuations occur in the rockfill above elev. 447 m. All beads reported temperatures below -2.5°C throughout the 2024 reporting period.

4.7 East Dam

The East Dam extends from the junction with the South Dam at Station 71+870 to the junction with the North Dam at Station 73+180. The dam is a zoned embankment with a rockfill shell supporting a low hydraulic conductivity element in the upstream section. The low hydraulic conductivity element consists of a liner within a till zone in the lower portion of the dam and on granular bedding in the upper section. The liner is tied into a till- and silty-sand-filled cut-off trench, excavated into bedrock or ice-poor till over most of the dam. Between approximately Station 72+805 and 73+150 the liner is tied into a till wedge. The till wedge extends from a till-filled cut-off trench, which is excavated into the frozen till foundation. Below elev. 450 m, the upstream slope of the dam is constructed at 3H:1V. Above elev. 450 m the upstream slope is constructed at 1.5H:1V from about Station 72+805 m to 469 m) is constructed with an upstream slope of 1.5H:1V along the length of the East Dam. The Phase 7 Final Raise of the East Dam is completed to the design elevation of between 473 and 474 m, and the rockfill closure cover is completed along the length of the East and the upstream area.

Inspection sheets detailing observations, photographs and any recommendations from the 2024 inspection of the Est Dam are provided in Appendix A. Recommendations are summarized in Section 6.0.

4.7.1 Seepage from the East Dam

The primary method of monitoring seepage through the East PKC Dam is a network of wells installed in the downstream rockfill shell. Refer to Appendix B, Table B-1 for a list and details of wells. The East Dam has been split into three seepage management zones as shown in Figure 9 (Seepage Zones 4, 6, and 7). Seepage Zone 5 located upstream zone of the East Dam is associated with the historical North Spigot Road and is no longer related to the performance of the PKC Facility Dams, so is not discussed herein.

Seepage reporting to the East PKC Dam embankment is currently managed in the following collection wells:

Zone 4: North Section – reports to Seepage Collection Well PKCE-SCW-2795. There is currently limited direct seepage into Zone 4, as such the pumping at PKCE-SCW-2795 has not been required. Water accumulating in the rockfill shell is expected to start to flow to Zone 4 of the East Dam when the water level reaches an elevation of about 439 m in Zone 6.

- Zone 6: Main Section reports to Seepage Collection Well PKCE-SCW-2530. It is estimated that water accumulating in the rockfill shell starts to flow to Zone 4 of the East Dam when the water level reaches an elevation of about 439 m in Zone 6.
- Zone 7: South Barge Road Section reported to Seepage Collection Well PKCE-SCW-1972 until pumping ceased in October 2023 prior to the annual freeze up, and then decommissioned in June 2024 due to a continuing trend of reduced seepage into Zone 7. It is estimated that once water accumulating in the rockfill shell reaches elev. 440.3 m, it flows to Zone 6 where it is managed by PKCE-SCW-2530.

The seepage through the East PKC Dam is temporarily retained within the rockfill shell, held back by ice-rich rockfill within the downstream toe of the rockfill shell. The seepage collection wells allow seepage water that accumulates within the East Dam to be pumped through the east side pipeline to the process plant. Seepage and runoff that is not intercepted by the seepage collection wells can potentially exit the rockfill shell and report to Pond 1, Pond 5, or a shallow downstream sump (PKCE-DS-SUMP 3) from where the seepage water is pumped to the PKC Facility or the North Inlet. Seepage or runoff downstream of Zone 7 would ultimately report to Pond 12.

East Dam seepage is generally interpreted to be primarily driven by the historical South Barge Road connection to the PKC Facility pond. Since ceasing FPK deposition in 2023, the pond is generally maintained only in the Northwest Decant, as such, East Dam seepage from Zone 6 has generally decreased since then. Zone 4 has limited direct seepage and generally only has water reporting to it if pumping is not available in Zone 6.

At the time of the 2024 DSI inspection, total East Dam seepage was approximately 3.3 L/s, which is a reduction of the seepage rate of approximately 30% compared to the same time in 2023. The seepage rate reduction is similar to that observed between 2022 and 2023.

4.7.2 Thermal Conditions in the East Dam

The overall thermal conditions observed in 2024 in the East Dam were generally consistent with the thermal conditions in 2023 with some small variations.

Thermal conditions in Zone 7 remained consistent with 2023 observations with continued cooling trend that are interpreted to be a result of continued reduced seepage since the 2019 improvement to the historical South Barge Road and since ceasing of FPK deposition in April 2023. The ice rich rockfill downstream of Zone 7 is frozen and continues to show a cooling trend.

Thermal conditions in 2024 in Zone 6 remained consistent with 2023 observations. Thermistors showed stable frozen temperatures in the central portion of the dam fill and foundation and a cooling trend in the downstream portion of the dam fill and foundation. The cooling trend is primarily attributed to continued reduction of seepage from the South Barge Road and less seepage water within the rockfill shell. Frozen conditions below -5°C are maintained in the foundation below the downstream slope of the dam in Zone 6.

Thermal conditions in 2024 in Zone 4 remained generally consistent with 2023 observations. The liner key trench may be locally thawed at the intersection of the East Dam and the historical North Spigot Road based on historical data from thermistors that have since been destroyed. The remaining thermistor in the North Spigot Road area has reported frozen conditions throughout the reporting period. The downstream dam foundation and rockfill shell remains frozen and has shown a cooling trend since 2021, with some seasonal variation above elev. 445 m.

Additional details of the thermal conditions in the East Dam are summarized for each seepage management zone below.

Zone 7: South End of East Dam (approximately Station 71+870 to 72+250)

The key trench is likely thawed east of the South Barge Road, but may be cooling based on the following:

- PKCE-T1823-KT is located east of the South Barge Road and historically has shown that the foundation and key trench in this area is thawed. Many of the beads on PKCE-T1823-KT have stopped working since 2021, including those within the upper portion of the foundation.
- Thermistor PKCE-T2023-KT, near Station 72+095, historically has reported about -1°C at the elevation of the key trench. Many beads have stopped working on this thermistor, including those at elevations similar to the key trench. The beads that continue to provide data above the key trench elevation indicate that temperatures are stable and just below freezing.

Thermistors installed through the ice-rich rockfill at the south end of the East Dam show that the ice-rich rockfill continues to show a cooling trend:

- Thermistors PKCE-T1931A-DS (angled downstream) and PKCE-T1931B-DS (vertical) installed in the East Dam downstream of the South Barge Road shown a cooling trend since 2020 in the lower portion of the rockfill and in the till foundation. It is interpreted that the cooling trend is a result of decreased seepage from the South Barge Road and a further decrease once FPK deposition ceased in 2023. All the beads along PKCE-T1931A-DS have been frozen and below -2° C since mid 2021. The foundation till and rockfill at PKCE-T1931B-DS has been below 0°C since 2021. Both PKCE-T1931A-DS and PKCE-T1931B-DS were removed during closure works in August 2024. There has not been any seepage reporting to the downstream of the rockfill shell in this area.
- Thermistor PKCE-T2005-DS (vertical) and PKCE-T2009-DS (angled downstream) are installed in the downstream rockfill shell and foundation east of PKCE-T1931A/B-DS. Thermistor PKCE-T2005-DS has shown a relatively stable trend since 2019 with temperatures below 0°C since 2020, until it was removed during closure works in August 2024. Thermistor PKCE-T2009-DS (angled downstream) installed downstream of PKCE-T2005-DS continued to indicate the foundation and ice-rich rockfill is frozen at temperatures between -6°C and -8°C. The temperatures at PKCE-T2009-DS showed similar seasonal fluctuations compared to previous years and have continued to show a gradually cooling trend until it was removed during closure works in August 2024.
- Thermistors PKCE-T2119-DS and PKCE-T2190-DS installed in the downstream rockfill shell of the south end of the East Dam (east and downstream of PKCE-T2005-DS and PKCE-T2009-DS) continue to indicate that the rockfill is frozen, with seasonal thaw variation above about elev. 449 m. Temperatures in both the lower rockfill and till foundation temperatures have remained between -2°C and -5°C throughout the 2024 reporting period. The seasonal fluctuations in the rockfill at thermistor PKCE-T2119-DS are similar to previous years and may be showing a slight warming trend in the shallower beads within the active layer of the rockfill.

Zone 6: Main East Dam (approximately Station 72+250 to 72+700)

In the Main East Dam area (Zone 6) where ice-rich conditions occur in the foundation, the bedrock, foundation till, liner key trench, and rockfill shell are frozen:

- Thermistors PKCE-T2558-KT and PKCE-T2725-KT at the cut-off trench have historically shown frozen conditions with a small warming trend and plateaued in 2022. Both thermistors have been unreadable since November 2022 although reading is still attempted by DDMI site technicians. The last successfully recorded temperatures range between about -0.5°C and -3°C.
- Thermistors PKCE-T2399A-CL and PKCE-T2399B-CL in the rockfill shell and foundation below the upstream crest of the dam indicate frozen conditions between -1.5°C and -2.5°C in the foundation during the 2024 DSI reporting period. Temperatures in the rockfill and foundation between approximately elev. 426 and 442 m have continued to show a cooling trend in 2024, similar conditions since August 2021. The cooling trend is likely due to reduced seepage and pumping in Zone 6 since May 2021 in addition to ceasing FPK deposition in 2023, which has reduced the water level in Zone 6 and the volume of water ponding in this area.
- Thermistors PKCE-T2558-CL PKCE-T2725-CL and PKCE-T2765-CL installed in the foundation below the upstream slope of the dam show marginally frozen to frozen conditions between approximately -0.4°C and -1.9°C within the foundation throughout the 2024 DSI reporting period except for PKCE-T2725-CL. In general, the temperatures are consistent and stable. Thermistor PKCE-T2725-CL has not been successfully read since November 2022, although reading is still attempted by DDMI site technicians.
- Temperatures in the foundation of the downstream portion of the rockfill shell were between about -5°C and -8°C at the location of thermistors PKCE-T2601-DS, PKCE-T2734-DS, and PKCE T2765-DS. PKCE-T2725-DS had shown a cooling trend from late 2007 until early 2023 when instrument readings were no longer successfully obtained, although reading is still attempted by DDMI site technicians. Most of these thermistors have continued to show a cooling trend in the foundation for many years.

Zone 4: North End of East Dam (approximately Station 72+700 to 73+180)

At the intersection of the East Dam and the North Spigot Road, the liner key trench may be locally thawed in some areas. The thermistors that were reporting thawed conditions have been destroyed. The foundation and rockfill shell are frozen based on the following:

- At PKCE-T3080B-KT, temperatures in the cut-off trench were relatively constant between -0.4°C and -3°C during the 2024 DSI reporting period. A slight cooling trend has continued since 2019. Some beads continue to fluctuate that may not be functioning correctly.
- Thermistors installed near the centreline of the dam (PKCE-T2700-CL, PKCE-T2780-CL, PKCE-T2800-DS, and PKCE-T2900-DS) show freezing temperatures within the foundation and rockfill shell. The foundation temperatures range from approximately -2°C to -5°C and have remained relatively consistent with minor fluctuations in the rockfill temperatures and continue cooling trend throughout the 2024 DSI reporting period.

4.8 North Dam

The North Dam extends from the junction with the East Dam at Station 73+180 to the junction with the West Dam at Station 74+711. The dam is a zoned embankment with a downstream rockfill shell supporting a low hydraulic conductivity element in the upstream section. The low hydraulic conductivity element comprises a liner supported on granular liner bedding. From the historical North Spigot Road (near Station 74+400) to the West PKC Dam, the lower portion of the liner is supported on till. The liner is tied into a till-filled cut-off trench excavated into bedrock along the full length of the dam. Bentonite-enriched sand and gravel was placed over the liner in the liner key-in trench. The NCRP abuts the North Dam along the complete length of the North PKC Dam. The PKC closure cover ties into the NCRP closure cover.

Inspection sheets detailing observations, photographs and any recommendations from the 2024 inspection of the North Dam are provided in Appendix A. Recommendations are summarized in Section 6.0.

4.8.1 Seepage from the North Dam

North Dam has been split into three seepage management zones as shown in Figure 9 (Zone 1, 3, and 3B). Zone 2 is an upstream zone associated with the historical North Spigot Road and no longer related to performance of the PKC Facility dams, so is not discussed herein. Refer to Appendix B, Table B-1 for a list and details of the instruments installed in the North Dam.

Inferred seepage due to water loss from the pond in the northwest decant sump, adjacent to the North Dam, was observed by DDMI in August 2024. Some minor settlement of FPK has occurred upstream of the North Dam, interpreted as thawing of ice-rich FPK material upstream of the liner. There continues to be no direct observation of seepage into Pond 3 from the North Dam. The NCRP prevents observation of seepage in the rest of the downstream. However, a very slow rate of water level rise in the instruments in the NCRP is interpreted to be due to a very low level of seepage (likely less than 1 L/s). The following text provides additional details regarding North Dam seepage.

The North PKC Dam is divided into three zones:

- **Zone 1: West Section** reports to Pond 3.
- **Zone 3: Central Section** reports to the NCRP with potential to reach Pond 3.
- **Zone 3B: East Section** reports to the NCRP from where it can report to Pond 1.

No seepage has been observed into Pond 3 during the DSI reporting period, consistent with previous years. Potential seepage exiting the north side of the NCRP would report to either Pond 2 or the North Inlet. No seepage has been observed from the north side of the NCRP to date and no seepage has been observed into Pond 1 from the NCRP.

Vibrating wire piezometer PKCN-V4000-DS is used to monitor the water level in Zone 3 in the NCRP downstream of the North Dam between the OLDSSF East and Pervious dams (Figure 9). The OLDSSF East and Pervious dams are buried within the NCRP. At the time of the 2024 inspection, the water level within the NCRP in Zone 3 was at about elev. 440.9 m which is an increase of 0.2 m reported the 2023 DSI. The water level in Zone 3 of the North Dam has continued to have a very slow rate of rise each year that is interpreted to be due to a consistently very low rate of seepage (likely less than 1 L/s) through the North Dam. The water level is above the crest of the OLDSSF East Dam and the OLDSSF Pervious Dam within the NCRP (Figure 9). Rising of the water level above the crest of the OLDSSF East Dam and OLDSSF Pervious Dam is likely due to ice buildup over the crest of the buried dams and blockage or freezing of the OLDSSF Pervious Dam.

4.8.2 Thermal Conditions in the North Dam

Thermistors in the North Dam key trench and foundation show frozen conditions at the locations of the thermistors, consistent with observations from the 2023 DSI.

- Key trench and foundation beads showed marginally frozen to frozen conditions with temperatures between 0°C and about -2.5°C at thermistors installed in the east area of the North Dam (Zone 3B) (PKCN-T3126-DS, PKCN-T3320-KT, and PKCN-3450-DS) with a slight cooling trend. One thermistor installed at the west area of the North Dam (Zone 1) was frozen showed stable temperatures below -1.5°C (PKCN-T4350-US) and one thermistor (PKCN-T4589-DS) showing generally marginally frozen to frozen conditions and stable temperatures from 0 to -2°C, with beads from elev. 455 to 465 m showing stable thawed conditions, consistent with previous years.
- Key trench and foundation beads in thermistors installed in the central area (Zone 3) of the North Dam (PKCN-T4038E-KT and PKCN-T4038W-KT) generally show marginally frozen to frozen conditions between 0°C and -1.7° C, similar to previous years.
- Thermistors installed at shallow depth beneath the sloped liner (PKCN-T3126-DS, PKCN-T3180-DS, PKCN-T3450-DS, and PKCN-T4060-DS) in Zones 3 and 3B are generally marginally frozen to frozen conditions with temperatures between 0°C and -5°C T with minimal to no seasonal fluctuations since 2018. One thermistor (PKCN-T4060-DS) showed a short period of warming from July 2024 where marginally frozen temperatures rose, with some beads reporting temperatures slightly above zero degrees, before dropping below zero degrees again in September 2024.

4.9 West Dam

The West Dam extends from the junction with the North Dam at Station 74+711 to the junction with the South Dam at Station 75+649. The dam is a zoned embankment with a downstream rockfill shell supporting a low hydraulic conductivity element in the upstream section. The low hydraulic conductivity element consists of a liner within a till zone in the lower portion of the dam and a liner supported on granular liner bedding in the upper portion. The liner is tied into a till- and silty-sand-filled cut-off trench excavated into bedrock or ice-poor till along the full length of the dam. The alignment of the liner key trench in the foundation of the West Dam extends downstream below the main section of the dam between approximately Station 74+975 and 75+160. The key trench on either side of this area is perpendicular to the dam alignment. The downstream shift in the key trench in this area was constructed to avoid a talik below a historical lake within the footprint of the dam to maintain the key trench within frozen ground further downstream. The Phase 7 Final raise is complete to elev. 473 m with ongoing placement of upstream CPK between Station 74+850 and 75+050. The PKC rockfill closure cover has not yet been constructed over the West Dam but has been constructed over the FPK upstream of the dam from Station 74+950 to 75+200 and upstream of the West Cell Causeway.

Inspection sheets detailing observations, photographs and any recommendations from the 2024 inspection of the West Dam are provided in Appendix A. Recommendations are summarized in Section 6.0.

4.9.1 West Dam Seepage

There is one seepage management zone for the West Dam, Zone 11, as shown in Figure 9. Seepage through the West PKC Dam is temporarily retained within the rockfill shell by ice-rich rockfill that has formed in the downstream toe area of the rockfill shell. Seepage is managed by PKCW-SCW-4982 installed in the downstream rockfill shell. PKCW-SCW-4957 is available to resume pumping should additional capacity be required. Pumping is suspended annually at PKC-SCW-4982 to prevent ice buildup in Pond 4 during the freezing months. During the reporting period, this occurred between mid December 2023 and early March 2024. The water level in the rockfill shell rose by approximately 6 m during this time. When pumping resumed, pre-December 2023 levels were reached by late March 2024. Refer to Table 1 for a list and details of the wells.

The seepage rate into the West Dam has continued to show a declining trend during the 2024 reporting period, likely due to the end of FPK deposition into the PKC facility in April 2023 and continued dewatering of the PKC pond. A small volume of free water remains in the northwest decant sump and in the West Cell, which will likely continue to contribute to seepage.

During the DSI, small water ponds were observed over the tundra along the toe of the West Dam between Pond 4 and the South Dam as in previous years. No signs of water flow were observed so this ponding is interpreted to be surficial run-off. Seepage collection infrastructure downstream of the West Dam includes Pond 4, the seepage collection channel, and Pond 3.

The upstream piezometers/wells located around the West Cell (PKCW-V5320-US and PKCW-UDW-5343) have shown steady levels throughout the DSI reporting period.

The piezometric levels in PKCW-V4900-US, PKCW-V4992-US, and PKCW-V5094-US, located upstream of the main section of the West Dam, have generally shown a steady declining trend. Seasonal fluctuations reflecting recharge interpreted to be related to the Northwest Decant water level are observed annually with the rise in recharge occurring during the open water season.

4.9.2 Thermal Conditions in the West Dam

The overall thermal conditions observed in 2024 in the West Dam remained consistent with observations from 2023 with some minor variations.

The West Dam key trench remains frozen with a cooling trend observed in the thermistors downstream of the main key trench. The portion of the key trench that runs perpendicular to the West Dam shows stable marginally frozen conditions. Thermistors in the foundation below the centerline and downstream slope of the dam continue to show frozen conditions. Seasonal increases in temperature that had occurred upstream of the West Cell have continued to reduce since FPK deposition in the West Cell had ceased in 2022.

Additional details of the thermal conditions in the West Dam are summarized below:

The dam foundation is frozen at the location of the following key trench thermistors: PKCW-T4855-KT, PKCW-T5006-KT, and PKCW-T5041-KT. Thermistor PKCW-T5006-KT is located downstream of the West Dam key trench and has recorded a cooling trend in the foundation and rockfill since 2022 with temperatures between -2°C and -2.8°C. Thermistor PKCW-T5041-KT is located downstream of the southern section of the key trench that runs perpendicular to the West Dam and has reported stable marginally frozen conditions between 0°C and -1.0°C in the foundation during the DSI reporting period, a consistent trend since ceasing West Cell deposition in 2022.

- Thermistor PKCW-T4855-KT is located downstream of the northern section of the key trench that runs perpendicular to the West Dam and continues to report stable marginally frozen conditions in the foundation between 0 and -1°C, similar to previous years.
- The six thermistors installed in the West Dam in 2019 (PKCW-T4896-CL, PKCW-T4901-DS, PKCW-T4906-KT, PKCW-T4994-CL, PKCW-T4999-DS, and PKCW-T5004-KT) show the foundation and rockfill are generally frozen. The foundation and rockfill are frozen at temperatures around -1°C to -3.5°C at PKCW-T4906-KT and PKCW-T5004-KT and the rockfill is frozen at temperatures around -6°C to -9°C at PKCW-T4999-DS and PKCW-T4901-DS. Thermistor PKCW-T4994-CL has recorded slightly above 0° in the rockfill, however has become relatively stable since ceasing FPK deposition from the West Dam and West Cell. Thermistor PKCW-T4896-CL has reported frozen conditions throughout the reporting period showing a relatively constant trend with previous years.
- The thermistors installed beneath the liner adjacent to the West Cell (PKCW-T5375-DS, PKCW-T5385-DS, and PKCW-T5395-DS) have been reporting consistent temperatures since FPK deposition in the West Cell ceased in 2021. Beads below elev. 460 m generally show either a slightly cooling trend or remain relatively constant throughout the reporting period, similar to that observed in the 2023 DSI.
- Thermistor PKCW-T4844-US installed upstream of the main section of the West Dam has been reporting marginally frozen temperatures since 2019. However, a warming trend is observed starting in September 2023 in the lower three beads (elev. 437 to 441 m). The trend appears to be gradual in the last quarter of 2023 but began to accelerate in May 2024. The increase in temperature may be associated with increased water recharge in the West Dam from the elevated pond level in the northwest corner since May 2024.
- Thermistor PKCW-T5200-US installed upstream of the West Dam, below the West Cell causeway, has been showing consistent temperatures generally between -1°C and -0.5°C since ceasing FPK deposition in West Cell in 2022 and has generally shown a slight cooling trend since this time.

4.10 Emergency Spillway

The PKC spillway is located in the northwest corner of the facility near Station 74+750. The Phase 7 spillway across the dam crest was constructed in fall 2021 and the spillway chute construction was generally completed on August 7, 2024. The Phase 7 spillway and chute will remain operational until the closure spillway is constructed.

Since completion of FPK deposition and the resulting reduction of pond volume, there is limited storage and attenuation capacity in the facility and the spillway will likely be used to manage precipitation events. The spillway is designed to manage flows from a probable maximum flood event by routing flow to Pond 3, which provides sufficient storage to manage water from the PKC Facility for a PMF event.

The Phase 7 spillway is a CRF-lined trapezoidal spillway with a 32 m base width and 3H:1V side slopes (Golder 2021b). The spillway invert is at elev. 468.2 m at the upstream crest and slopes downstream at 2%. An approach channel was constructed upstream of the spillway to direct flows to the spillway from the northwest decant sump pond.

Inspection sheets detailing observations, photographs and any recommendations from the 2024 inspection of the spillway are included in the West Dam subsection of in Appendix A. Recommendations are summarized in Section 6.0.

4.11 **Operational Documents**

DDMI formally updated the PKC Facility operation, maintenance, and surveillance manual and the emergency response plan in September 2024 (DDMI 2024a,b). These documents are updated continuously to reflect the current configuration of the PKC Facility, and personnel updates. The OMS and ERP is to be reviewed at least annually and updated as necessary.

5.0 WATER MANAGEMENT PONDS

A network of water management ponds has been constructed to collect seepage from the PKC Facility and surface runoff from within the disturbed areas of the Diavik Mine site. The collection ponds that were functional at the time of the 2024 inspection were Ponds 1, 2, 4, 5, 7, 10, 11, 12, and 13.

The dam of each pond was inspected from the crest and toe, where not flooded or inaccessible, for signs of instability and seepage.

The collection ponds were generally in good condition and appeared stable at the time of the 2024 inspection with some maintenance items required to be addressed that had been identified in previous years. No dam safety concerns were identified for any of the ponds that require immediate attention.

Closure construction works was in progress at Pond 2 and Pond 7 at the time of inspection. The Pond 2 liner had been breached, as planned in the closure design. Foundation improvement works for the PKC Facility East Dam closure buttress was in progress in the Pond 5 impoundment area at the time of the inspection.

The Pond 12 emergency spillway was observed to be obstructed by two pipes. One appeared to be a dewatering line or similar, while the other was a disconnected section of pipe. A new recommendation to resolve the obstruction of the Pond 12 emergency spillway is presented in Section 6.0.

Inspection sheets detailing observations, photographs and any recommendations from the 2024 inspection of each of the collection ponds are provided in Appendix A. Recommendations are summarized in Section 6.0.

6.0 CONCLUSION AND RECOMMENDATIONS

The results of the 2024 annual DSI carried out at the Diavik Mine site indicate that the PKC Facility dams and remaining water management pond dams are in good condition. There was no sign of significant instability, cracking, erosion, settlement, or lateral movement that threatens the overall stability of the dams. Construction of the downstream spillway chute was completed in August 2024. Continued CPK placement to elev. 473 to 475 and construction of the PKC closure cover was ongoing at the time of the 2024 DSI.

PKC Facility – Seepage Conditions

Seepage Conditions in the PKC Facility have continued to show a general reduction in seepage, continuing trends observed during the 2023 DSI, largely as a result of ceasing FPK deposition in April 2023 and managing the PKC pond in the northwest corner of the facility. Key observations are:

- No seepage from the South Dam was observed, as with previous years.
- Ice-rich rockfill in the downstream toe of the PKC East and West dams continues to allow seepage collection to be managed using a series of seepage collection wells before it reaches the downstream seepage water management ponds.
- Seepage into the East Dam continues to reduce since ceasing of FPK deposition in April 2023 and management of the PKC pond in the northwest corner.
- Inferred seepage was observed from the northwest decant on the North Dam in August 2024 with associated settlement of FPK upstream of the liner, interpreted to caused by the thaw of ice-rich FPK at depth. Seepage is interpreted to be flowing into the NCRP. NCRP instrumentation indicates seepage of approximately 1 L/s is accumulating in the NCRP and is similar to previous years.
- Seepage into the West Dam has generally continued to decrease. A small pond is retained in the northwest corner of the facility and the West Cell likely continues to contribute to seepage into the West Dam.

PKC Facility – Thermal Conditions

Thermal conditions in the PKC Facility have continued similar trends that were observed in during the 2023 DSI generally showing a cooling or relatively constant trends with typically frozen conditions in the key trenches and foundations and in the majority of downstream rockfill. Key observations are:

- South Dam thermistors indicated that the key trench and downstream foundation are frozen and show a stable or cooling trend.
- East Dam thermistors on the east side of the historical South Barge Road (Zone 7) indicate that the key trench is likely thawed but continues to cool. Thermistors upstream of the main valley section (Zone 6) show frozen conditions. Thermistors in the downstream shell, downstream of the historical South Barge Road have shown a cooling trend and are mostly frozen.
- North Dam thermistors show that the foundation is frozen and show a relatively constant trend.
- West Dam thermistors show frozen conditions in the downstream of the main key trench and marginally frozen conditions observed key trench that runs perpendicular to the West Dam. Thermistors in the foundation below the centreline and downstream show frozen conditions with a cooling trend.

Water Management Ponds

The water management ponds were generally in good condition. There were no concerns with the overall stability of the dams; however, there were several observations of items that need to be repaired or addressed.

Recommendations

Table 2 provides a summary of recommended actions for the PKC Facility dams and water management ponds from the 2019 to 2023 inspections; actions completed, superseded or otherwise closed out are shown in with grey shading. Table 3 provides a summary of recommended actions from the 2024 inspection. Table 4 provides descriptions of the priority ratings assigned to each observed issue and recommendation. Table 5 provides a summary of recommendation of the PKC Facility and water management ponds.

Table 2: Recommendations from Dam Safety	Inspections from 2019 to 2023
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Recommendation ID by Date	Location	Identified Issue	Recommendation	Priority ^(a)	Status	Updated Recommended Timing for Action
2022-03	West Dam	Phase 7 spillway chute was not complete.	Complete the spillway chute construction, including the erosion protection, as per revised timing agreed in RFI documentation.	2	Complete.	n/a
2020-04	Pond 2 spillway	Erosion on downstream crest of spillway.	Repair erosion.	3	Closed – pond closure works underway.	n/a
2020-05	Pond 5	Liner slumped on dam crest due to water build up under liner. Liner cut to relieve pressure.	Drain water from behind the liner and repair and replace fill materials. Or, due to limited time until closure, it may be suitable to cover the torn liner with till to provide a low permeability element and address further issues with uplift pressures in the future as needed. Torn liner is a water management issue, not a dam stability issue. Pond 5 is buttressed by the South Haul Road.	3	Superseded by Recommendation 2023-03.	n/a
2019-04	Pond 2	Cracks and sinkholes on the crest of the Pond 2 rockfill shell.	Sinkhole to be backfilled or delineated to prevent injury to personnel.	3	Superseded by ongoing operations recommendation in Table 5.	n/a
2023-04	Pond 13	Sinkholes developed at crest.	Include monitoring, review, and recommendations for filling sinkholes in geotechnical inspection reports. Survey sinkholes to confirm distance from liner.	3	Complete.	n/a
2023-02	Pond 4	Liner cover slumped down upstream slope near north abutment.	Establish monitoring plan to assess displacement. Consider options to buttress upstream toe.	3	Complete	n/a
2019-01	PKC – East Dam	Development of erosion gullies on the downstream slope of the East Dam due to grading mud and water from the haul road after high rainfall events through localized openings in the crest of the dam.	Backfill erosion gullies with rockfill to prevent accumulation of snow and increased erosion. DDMI backfilled larger erosion gully in 2022 with jaw run rockfill. Some additional erosion occurred. DDMI have plan in place to relocate the haul road which may remove the issue of continued erosion, however, should still be repaired. Erosion is not currently a dam stability concern and can be monitored during operation, more robust repair required for closure.	3	Partially complete.	On hold – required at closure
Recommendation ID by Date	Location	Identified Issue	Recommendation	Priority ^(a)	Status	Updated Recommended Timing for Action
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2019-03	Pond 1	Erosion of liner cover and bedding and damage to liner from haul road surface runoff and water discharged at the crest of the dam downstream of the liner.	The areas of erosion should be repaired for management of storm events. The defects are not a dam stability concern. Repairs should manage runoff from the haul road over the liner into the pond without further erosion. A plan to manage runoff water entering from the haul road should be developed. Plan in development to place till and erosion protection over areas of damaged liner.	3	Not complete.	Q2 2025
2019-07	Pond 4 ^(b)	Spillway obstructed by pipeline or road.	Remove spillway obstruction caused by the road and raise the pipeline.	3	Not complete.	Q3 2025
2019-08	Pond 1 and 5	Pond 1 and Pond 5 do not have an emergency spillway.	Build an emergency spillway at Pond 1 and Pond 5 or evaluate and document where overflow would go. Pond 1 and Pond 5 are buttressed by haul roads, so not having a spillway is likely not a dam stability concern.	3	Not complete.	Q3 2025
2020-06	Pond 10	Erosion on crest and upstream slope at north abutment area.	Regrade crest and upstream slope where erosion has occurred and construct a ditch or culvert directing runoff from the road into Pond 10 where flows will not erode the dam.	4	Not complete.	Q3 2025
2022-04	Pond 5	Culvert from South Haul Road is resulting in mud and water ponding on the Pond 5 toe berm and some erosion.	Direct run-off and mud from South Haul Road culvert into Pond 5 upstream of the dam toe to avoid water saturating the toe berm.	3	Partially complete – outflow improved but drainage continues to buildup/saturate on toe berm.	Q3 2025
2023-01	Pond 3	Spillway blocked by pipeline and small gravel berm.	Regrade gravel berm and reinstate blocking to raise the pipeline to establish assessed geometry (Golder 2021c).	3	Not complete.	Q2 2025
2023-03	Pond 5	Pond 5 liner damaged and northern end of toe berm displacing.	Develop mitigation plan or water management plan for Pond 5 to meet the design intent of the pond.	3	Not complete.	Q3 2025

(a) See Table 4 for priority descriptions.

(b) Pond 2 removed from recommendation as pond closure breach works underway.

DDMI = Diavik Diamond Mines (2012) Inc.; DSI = dam safety inspection; PKC = Processed Kimberlite Containment; n/a = not applicable.

Table 3: Recommend	ations from the	2024 Dam Sa	afety Inspection

ID	Location	Identified Issue	Recommendation	Priority ^(a)	Recommended Timing for Action
2024-01	West Dam South Dam	Exposed liner in anchor trench on the West Dam and South Dam adjacent to the West Cell.	Place liner cover material (CPK) over anchor trench to protect liner and prevent liner movement and add additional fill to support CPK.	3	Q3 2025
2024-02	Pond 12	Emergency spillway blocked by pipes on upstream crest.	Place pipe on blocks or cribbing to allow flow under the pipe through the emergency spillway, or remove pipe, prior to freshet.	3	Q1 2025

(a) See Table 4 for priority descriptions.

Table 4: Priority Descriptions

Priority	Description
1	A high probability or actual dam safety issue considered immediately dangerous to life, health or the environment, or a significant risk of regulatory enforcement.
2	If not corrected, could likely result in dam safety issues leading to injury, environmental impact or significant regulatory enforcement; 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 – Further improvements are necessary to meet industry best practices or reduce potential risks.

Table 5: Recommendations for Ongoing Operation from 2024 Dam Safety Inspection

Location	Recommendations for Ongoing Operation
PKC – East and West Dams	Continue to keep the water level within the rockfill shell of the East and West dams low and monitor thermal conditions in the foundation.
West Dam	Continue to monitor cracking in spillway CRF.
All Ponds	Continue to maintain low water levels in the collection ponds.
Pond 2	Sinkhole adjacent to former A21 pipe crossing to be backfilled or delineated to prevent injury to personnel.
Pond 4	Continue to monitor upstream slope and assess displacement.
Pond 11	Monitor erosion in spillway. Repair if erosion reaches liner or is substantially cutting into dam shell.

PKC = Processed Kimberlite Containment; CPK = coarse processed kimberlite; CRF = cemented rockfill.

Signature Page

WSP Canada Inc.



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JFH/JEK/ldj/lt



Jeffrey Kwok, P.Eng. Senior Principal Geotechnical Engineer L1969

PERMIT TO PRACTICE WSP canada Inc.
Signature
PERMIT NUMBER: P407
NT/NU Association of Professional Engineers and Geoscientists

https://wsponlinecan.sharepoint.com/sites/ca-2024ca136784/shared documents/06. deliverables/02. issued/2549-r-rev0-2000-2024 annual dam safety inspection/ca0035294.6784-2549-r-rev0-2000-annual dsi report 15nov_24.docx

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25 mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOV



EXISTING THERMISTOR LOCATION TABLE						
	0701071005	PHASE 7	EASTING	NORTHING	DATE	
NAME	STRUCTURE	STATION	(m)	(m)	INSTALLED	
PKCS-T1760B-KT	SOUTH	71+841	533077	7151563	JUL 2018	
PKCE-T1823A-KT	EAST	71+883	533173	7151614	2017	
PKCE-T1823B-KT	EAST	71+883	533173	7151614	2017	
PKCE-T1889-DS	EAST	71+947	533260	7151473	2019	
PKCE-T1931AB-DS(1)	EAST	71+989	533302	7151467	2019	
PKCE-T1931BB-DS(1)	EAST	71+989	533302	7151475	2019	
PKCE-T1931AA-DS(1)	EAST	71+989	533302	7151467	2019	
PKCE-T1931BA-DS ⁽¹⁾	EAST	71+989	533302	7151475	2019	
PKCE-T1967A-DS (1)	EAST	72+025	533338	7151465	DEC 2019	
PKCE-T2005-DS (1)	EAST	72+061	533374	7151475	2017	
PKCE-T2009-DS (1)	EAST	72+064	533377	7151467	2019	
PKCE-T2023A-KT (2)	EAST	72+082	533395	7151645	2018	
PKCE-T2023B-KT (2)	EAST	72+082	533395	7151645	2018	
PKCE-T2119A-DS	EAST	72+083	533496	7151437	2017	
PKCE-T2119B-DS	EAST	72+083	533496	7151437	2017	
PKCF-T2190A-DS	FAST	72+240	533623	7151406	2017	
PKCF-T2190B-DS	FAST	72+240	533623	7151406	2017	
PKCE-T2558-KT (3)	FAST	72+390	533564	7151699	JAN 2002	
PKCF-T2558-CI	FAST	72+405	533618	7151686	JAN 2002	
PKCE-T2601-DS	EAST	72+432	533683	7151680	SEP 2006	
PKCE-T2385A-US	EAST	2+385	533589	7151767	FEB 2020	
PKCE-T2385B-US	EAST	2+385	533589	7151767	FEB 2020	
PKCE-T2399A-CL	EAST	72+474	533666	7151738	2012/2013	
PKCE-T2399B-CL	EAST	72+474	533666	7151738	2012/2013	
PKCE-T2725-CL (2)	EAST	72+556	533755	7151782	2001/2002	
PKCE-T2725-DS (4)	EAST	72+557	533694	7151817	2001/2002	
PKCE-T2725-KT (2)	EAST	72+562	533650	7151848	2001/2002	
PKCE-T2734-DS	EAST	72+566	533744	7151799	OCT 2006	
PKCE-T2765-CL	EAST	72+596	533714	7151851	JAN 2002	
PKCE-T2765-DS	EAST	72+597	533775	7151817	JAN 2002	
PKCE-T2700A-CL	EAST	72+777	533864	7151958	2013	
PKCE-T2700B-CL	EAST	72+777	533864	7151958	2013	
PKCE-T2780A-CL	EAST	72+856	533938	7151984	AUG 2013	
PKCE-T2780B-CL	EAST	72+856	533938	7151984	AUG 2013	
PKCE-T2800A-DS	EAST	72+877	533966	7151972	SEP 2013	
PKCE-T2800B-DS	EAST	72+877	533966	7151972	SEP 2013	
PKCE-T3080B-KT	EAST	72+894	533937	7152080	JUN 2006	
PKCE-T2824A-US (5)	EAST	72+900	533943	7152082	FEB 2013	
PKCE-T2824B-US	EAST	72+900	533943	7152082	FEB 2013	
PKCE-T2900A-DS	EAST	72+976	534059	7152009	SEP 2013	
PKCE-T2900B-DS	EAST	72+976	534059	7152009	SEP 2013	
PKC-Z2-T2	PKC CLOSURE COVER	N/A	533253	7152020	JUN 2023	
PKC-580-2-T1	PKC CLOSURE COVER	N/A	533297	7152097	JUL 2023	
PKC-530-2-T1	PKC CLOSURE COVER	N/A	532981	7151931	JUL 2023	

(1) DESTROYED SEPTEMBER 2024 (2) NO READING SINCE NOVEMBER 2022.

(3) CEASED WORKING 2023
 (4) NO READING SINCE FEBRUARY 2023.
 (5) ERRONEOUS READINGS SINCE JUNE 2023

EXISTING VIBRATING WIRE PIEZOMETER LOCATION TABLE						
NAME	STRUCTURE	PHASE 7	EASTING	NORTHING	DATE	
INAIVIE	SIRUCIURE	STATION	(m)	(m)	INSTALLED	
PKCE-C1823-US	EAST	71+883	533173	7151614	2017	
PKCE-V2385-US	EAST	72+462	533589	7151766	2019	
PKCE-V2678-US	EAST	72+757	533791	7152034	JAN 2021	
PKCE-V2824-US	EAST	72+900	533943	7152082	FEB 2013	
PKC-Z2-V2	PKC CLOSURE COVER	N/A	533253	7152020	JUN 2023	
PKC-580-2-V1A	PKC CLOSURE COVER	N/A	533297	7152097	JUL 2023	
PKC-580-2-V1B	PKC CLOSURE COVER	N/A	533297	7152097	JUL 2023	
PKC-530-2-V3A	PKC CLOSURE COVER	N/A	532981	7151931	JUL 2023	
PKC-530-2-V3B	PKC CLOSURE COVER	N/A	532981	7151931	JUL 2023	
0+335 UPPER	SOUTH BARGE ROAD	N/A	533115	7151892	APR 2022	
0+335 LOWER	SOUTH BARGE ROAD	N/A	533115	7151892	APR 2022	
0+380 UPPER	SOUTH BARGE ROAD	N/A	533123	7151935	APR 2022	
0+380 LOWER	SOUTH BARGE ROAD	N/A	533123	7151935	APR 2022	
0+325 MID	PKC CLOSURE COVER	N/A	533132	7151883	MAY 2022	
0+325 LOWER	PKC CLOSURE COVER	N/A	533132	7151883	MAY 2022	
0+337 UPPER	PKC CLOSURE COVER	N/A	533132	7151894	MAY 2022	
0+337 MID	PKC CLOSURE COVER	N/A	533132	7151894	MAY 2022	
0+337 LOWER	PKC CLOSURE COVER	N/A	533132	7151894	MAY 2022	

EXISTING OBSERVATION WELL LOCATION TABLE							
NAME	STRUCTURE	PHASE 7 STATION	EASTING (m)	NORTHING (m)	DATE INSTALLED		
PKCE-SCW-2320 (6)	EAST	72+396	533625	7151671	MAY 2010		
PKCE-SCW-2340 (6)	EAST	72+416	533636	7151688	MAY 2010		
PKCE-SCW-2520	EAST	72+595	533726	7151843	MAY 2010		
PKCE-SCW-1937	EAST	71+994	533307	7151504	2016		
(6) FROZEN							

EXISTING SEEPAGE COLLECTION WELL LOCATION TABLE							
NAME	STRUCTURE	PHASE 7 STATION	EASTING (m)	NORTHING (m)	DATE INSTALLED		
PKCE-SCW-2530	EAST	72+606	533731	7151851	2016		
PKCE-SCW-1972 (7)	EAST	72+030	533342	7151505	2016		
PKCE-SCW-2795 (8)	EAST	72+870	533959	7151966	MAY 2013		

⁽⁷⁾ DECOMMISSIONED IN JUNE 2024.
⁽⁸⁾ REQUIRES ELECTRICAL REPAIR TO RESUME PUMPING.

EXISTING INCLINOMETER LOCATION TABLE							
NAME STRUCTURE PHASE 7 EASTING NORTHING DATE STATION (m) (m) INSTALLE							
PKCE-SAA2335	EAST	72+498	533669	7151683	2011		
PKCE-IN2500	EAST	72+646	533715	7151827	MAY 2010		
PKCE-SAA2800-DS	EAST	72+947	533966	7151972	JUL 2013		
PKCE-SAA2900-DS	EAST	73+046	534059	7152009	JUL 2013		

DIAVIK DIAMOND MINES (2012) INC. 2024 ANNUAL DAM SAFETY INSPECTION

PROJECT

PKC INSTRUMENTATION PLAN - 2 OF 2

PROJECT NO.	PHASE/TASK/DOC.	REV.	FIGURE
CA0035294.6784	2000/2400/2549	0	2





PROJECT NO.	PHASE/TASK/DOC.	REV.	FIGURE
CA0035294.6784	2000/2400/2549	0	4

UPSTREAM PKCE-SCW-2530 CL o/s -3.7 m 485 PKCE-T2399-CL CL o/s -4.6 m o/s -65.7 m 480 PKCE-IN2500 CL o/s -5.8 m 475 PKCE-SAA2335 PKCE-T2734-DS CL o/s +25.1 m CL o/s +33.3 m o/s -112.1 m o/s +25.8 m 470 EAST DAM 465 PKCE-T2601-DS CL o/s +38.8 m o/s -107.8 m 460 SEE NOTE 6 455 PKCE-T2725-KT CL o/s -72.7 m o/s +92.2 m ROCKFILL CPK / FPK SHELL WATER ABOVE EL. 439.0 m FLOWS 445 TO NORTH MAIN CELL SECTION 급 440 RÓCKFILL PKCE-T2765-CL SEE NOTE 6 435 PKCE-T2725-DS CL o/s +51.2 m o/s +16.5 m 0/s +56.3 r PKCE-T2725-CL CL 0/s -19.1 m 0/s +16.5 m 430 PKCE-T2765-DS CL o/s +51.4 m o/s +56.8 m _ PKCE-T2558-CL CL o/s -20.7 m o/s -134.6 m 425.66 R/PK POND 5 WL. 424.86 m 425 ______F______ ┤╴┤╪ SEE NOTE 9) 420 415 1 410 BEAD 6 - ERRONEOUS DATA SINCE APRIL 2020 405 400 -80 -70 -60 -50 -40 -30 -20 -10 20 30 40 50 60 70 80 90 100 110 120 0 10 OFFSET DISTANCE (m) SCALE 1:400 m D CROSS-SECTION - STA. 72+540 1人2/ INSTRUMENTATION NAMING CONVENTION: PKC DAM SEGMENT PKCE - 12734 - DS — DAM INSTRUMENT LOCAL (ie. E - EAST DAM INSTRUMENT TYPE PKC DAM (DS - DOWNSTREAM) W - WEST DAM (T-THERMISTOR) PHASE 5 (US - UPSTREAM) S - SOUTH DAM (T-THERMISTOR) CHAINAGE (CL - CENTRELINE) N - NOTTH DAM (IN-INCLINOMETER) (CL - CENTRELINE) CHAINAGE (CL - CENTRELINE) (KT - KEY TRENCH) (TP - TILL PLUG) (IN-INCLINOMETER) (V-VIBRATING WIRE PIEZOMETER) N - NORTH DAM B - FPK BEACH) LEGEND THERMISTOR BEAD - THAWED (SEE NOTE 4) ------ UPSTREAM ROCKFILL THERMISTOR BEAD - FROZEN (SEE NOTE 5) -ORIGINAL GROUND SURFACE MAY 2024 EXISTING NOTES THERMISTOR BEAD - MISSING THIS FIGURE IS INTENDED FOR CLIENT'S ONE TIME USE ONLY AND IT IS NOT INTENDED OR REPRESENTED BY WSP 1 PARTY, INCLUDING, BUT NOT LIMITED TO, THE CLIENT, ITS EMPOLES, AGENTS, SUBCONTRACTORS OR SUBSEQUE SPECIFIC PROLECT OR FUTURE PROJECTS, WHETHER CLIENT'S OR OTHERWISE, WITHOUT WSP'S PRIOR WRITTEN F GROUND SURFACE ALL UNITS ARE IN METRES UNLESS NOTED OTHERWISE PIEZOMETRIC LEVEL IN STATIONING REFERS TO PHASE 7 DESIGN ALIGNMENT. WL. 455.84 m GEOSYNTHETIC LINER -----AUGUST 2023 (SEE NOTE 7) PKC WATER LEVEL ELEVATION WAS 465.54 m ON 24 SEPTEMBER 2024. BEAD LOCATION NOTED AS THAWED IF ANY RECORDED TEMPERATURE WAS PIEZOMETRIC LEVEL IN INTERFACE BETWEEN ROCKFILL OR WL. 455.8 m 4. R/PK CLIENT GREATER THAN 0°C BETWEEN SEPTEMBER 2023 AND SEPTEMBER 2024. PROCESSED KIMBERLITE AND FOUNDATION AUGUST 2024 (SEE NOTE 8) DIAVIK DIAMOND MINES INC. BEAD LOCATION NOTED AS FROZEN IF ALL RECORDED TEMPERATURES WERE LESS THAN 0°C BETWEEN SEPTEMBER 2023 AND SEPTEMBER 2024. 5 REFERENCES BEAD ELEVATIONS ESTIMATED BASED ON RECORDED DEPTH AT TIME OF INSTALLATION. 6. ORIGINAL GROUND SURFACE PROVIDED BY DDMI, FILE NAME: "Origiinal-Ground-Air-Conts.sdf", RECEIVED: 10 AUGUST 2000. 2008 ROCKFILL SURFACE CREATED USING 3D FACES EXTRACTED FROM HISTORICAL SURVEY PROVIDED BY DDMI, 2. 2023 PIEZOMETRIC WATER LEVEL READINGS TAKEN IN AUGUST 2023 UNLESS NOTED OTHERWISE. 7. FILE NAME: "jun2008 rockfill.dwg", SURVEYED: JUNE 2008, RECEIVED: 01 OCTOBER 2020. 3. PKC FACILITY TOPOGRAPHY PROVIDED BY DDMI REPRESENTING MAY 2024 GROUND SURFACE, CONSULTANT YYYY-MM-DD 2024-11-14 PKC FACILITY TOPOGRAPHY PROVIDED BY DUMI REPRESENTING MAT 2021 OF COMPLEXING STRATE 2021 OF COMPLEXING MAT 2021 OF COMPLEXING STRATE 20 8. 2024 PIEZOMETRIC WATER LEVEL READINGS TAKEN AUGUST 2024 UNLESS NOTED DESIGNED E. ROZAK PREPARED J. HOPSON REVIEWED J. HINDMARSH APPROVED J. KWOK



DOWNSTREAM

490



PKCW-V4900-US PKCW-T4900-US CL o/s -58.7 m CL o/s -57.8 m o/s 7.7 m o/s -7.9 m PKCW-T4896-CL CL o/s +5.4 m o/s -3.8 m PKCW-T4901A-DS CL o/s +8.9 m o/s +2.0 m PKCW-T4844-US 475 PKCW-T4855-KT CL o/s -8.8 m o/s -46.9 m o/s -67.7 m PKCW-T4906-DS ркс WEST DAM CL o/s +9. o/s +6.9 m 470 POND PKCW-T5006A-KT CL o/s +19.8 m o/s -42.3 m 465 ROCKFILL SHELL 460 FPK / CP 455 450 · / 🛨 445 ROCKFILL 44(435 430 ----425 420 _R/PK R/PK 415 410 SEE NOTE 9 -405 400 395 -150 -140 -130 -120 -110 -100 -90 -80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 OFFSET DISTANCE (m) SCALE 1:400 m G CROSS-SECTION - STA. 75+025 INSTRUMENTATION NAMING CONVENTION: PKC DAM SEGMENT PKCE - 12734 - DS DAM INSTRUMENT LOCAL (ie. E. EAST DAM INSTRUMENT TYPE PKC DAM (DS - DOWNSTREAM) W - WEST DAM (T-THERMISTOR) (US - UPSTREAM) 0 - OUTUBLE (C-ENTRE) (US - UPSTREAM) (T-THERMISTOR) (IN-INCLINOMETER) (V-VIBRATING WIRE CHAINAGE (CL - CENTRELINE) (KT - KEY TRENCH) S - SOUTH DAM N - NORTH DAM (TP - TILL PLUG) B - FPK BEACH) PIEZOMETER) LEGEND THERMISTOR BEAD - THAWED (SEE NOTE 4) -- UPSTREAM ROCKFILL THERMISTOR BEAD - FROZEN (SEE NOTE 5) ORIGINAL GROUND SURFACE GURE IS INTENDED FOR CLIENT'S ONE TIME USE ONLY AND IT IS NOT INTENDED ON INCLUDING, BUT NOT LIMITED TO, THE CLIENT, ITS EMPLOYEES, AGENTS, SUBOON IN CROLECT OR FUTURE PROJECTS, WHETHER CLIENT'S OR OTHERWISE, WITHOUT × MAY 2024 EXISTING NOTES THERMISTOR BEAD - MISSING ALL UNITS ARE IN METRES UNLESS NOTED OTHERWISE STATIONING REFERS TO PHASE 7 DESIGN ALIGNMENT. GROUND SURFACE WL. 455.84 m PIEZOMETRIC LEVEL IN CLIENT PKC WATER LEVEL ELEVATION WAS 465.54 m ON 24 SEPTEMBER 2024. BEAD LOCATION NOTED AS THAWED IF ANY RECORDED TEMPERATURE WAS -----GEOSYNTHETIC LINER AUGUST 2023 (SEE NOTE 6) DIAVIK DIAMOND MINES INC. 4 INTERFACE BETWEEN ROCKFILL OR WL. 455.8 m PIEZOMETRIC LEVEL IN GREATER THAN 0°C BETWEEN SEPTEMBER 2023 AND SEPTEMBER 2024. _____R/<u>PK____</u>___ PROCESSED KIMBERLITE AND FOUNDATION AUGUST 2024 (SEE NOTE 7) BEAD LOCATION NOTED AS FROZEN IF ALL RECORDED TEMPERATURES WERE LESS 5. THAN 0°C BETWEEN SEPTEMBER 2023 AND SEPTEMBER 2024. 2023 PIEZOMETRIC WATER LEVEL READINGS TAKEN IN AUGUST 2023 UNLESS REFERENCES 6. CONSULTANT YYYY-MM-DD 2024-11-14 ORIGINAL GROUND SURFACE PROVIDED BY DDMI, FILE NAME: "Origiinal-Ground-Air-Conts.sdf", RECEIVED: 10 AUGUST 2000. 2008 ROCKFILL SURFACE CREATED USING 3D FACES EXTRACTED FROM HISTORICAL SURVEY PROVIDED BY DDMI, NOTED OTHERWISE 7. 2024 PIEZOMETRIC WATER LEVEL READINGS TAKEN AUGUST 2024 UNLESS NOTED DESIGNED E. ROZAK FILE NAME: "Jun2008 rockfill.dwg", SURVEYED: JUNE 2008, RECEIVED: 01 OCTOBER 2020. PKC FACILITY TOPOGRAPHY PROVIDED BY DDMI REPRESENTING MAY 2024 GROUND SURFACE, OTHERWISE PIEZOMETRIC LEVEL READING IN WELL WITH ACTIVE PUMP. THERMISTOR DOES NOT PUNCTURE LINER. VARIABILITY IN DAM GEOMETRY AT 3. 8. PREPARED J. HOPSON SURVEYED: 25 MAY 2024, RECEIVED: 05 JUNE 2024, FILE NAME: "SRF-PKC-240525.XML." 4. UPSTREAM ROCKFILL AND CPK BOUNDARIES PROVIDED BY DDMI, FILE NAME: "WEST DAM SECTIONS AS-BUIL_221011.DWG", EXACT THERMISTOR LOCATIONS. PKCW-T4855-KT IS NORTH OF THE KEY TRENCH THAT RUNS PERPENDICULAR TO THE WEST DAM. REVIEWED J. HINDMARSH RECEIVED: OCTOBER 08, 2022. APPROVED J. KWOK



PKCW-SCW-4982 CL o/s +10.8 m o/s -18.0 m 480 PKCW-T4994-CI CL o/s +14.7 m PKCW-T5000-US CL o/s -51.6 m o/s -1.4 m PKCW-V5094-US CL o/s -90.0 m CL o/s -89.2 m o/s +134.4 m o/s -9.5 m 475 PKCW-T5004A-ł CL o/s +17.7 m o/s +4.8 m PK POND WEST DAM 470 PKCW-T4999-DS CL o/s +17.8 m o/s -0.2 m 465 FPK / CPK SEE NOTE 9 460 ROCKFILL PKCW-T5041-KT CL o/s -12.7 m SHELL 455 450 WL.447.06 445 ROÇKFILL 440 435 430 ___< 425 420 415 410 SEE NOTE 9 -405 400 395 -150 -140 -130 -120 -110 -100 -90 -80 -70 -60 -50 -40 -30 -20 20 30 40 50 60 -10 0 10 OFFSET DISTANCE (m) SCALE 1:400 m H CROSS-SECTION - STA. 75+125 INSTRUMENTATION NAMING CONVENTION: PKC DAM SEGMENT PKCE - J2734 - DS- DAM INSTRUMENT LOCAL (ie. E - EAST DAM INSTRUMENT TYPE PKC DAM (DS - DOWNSTREAM) W - WEST DAM (T-THERMISTOR) PHASE 5 (US - UPSTREAM) S - SOUTH DAM (T-THERMISTOR) CHAINAGE (CL - CENTRELINE) N SOUTH DAM (IN-INCLINOMETER) (LT - KEY TRENCH) CHAINAGE (CL - CENTRELINE) (KT - KEY TRENCH) (TP - TILL PLUG) (IN-INCLINOMETER) (V-VIBRATING WIRE PIEZOMETER) N - NORTH DAM B - FPK BEACH) LEGEND THERMISTOR BEAD - THAWED (SEE NOTE 4) ------ UPSTREAM ROCKFILL THERMISTOR BEAD - FROZEN (SEE NOTE 5) -ORIGINAL GROUND SURFACE × MAY 2024 EXISTING THERMISTOR BEAD - MISSING THIS FIGURE IS INTENDED FOR CLIENT'S ONE TIME USE ONLY AND IT IS NOT INTENDED OR REPRESENTED BY WSP 1 PARTY, INCLUDING, BUT NOT LIMITED TO, THE CLIENT, ITS EMPOLES, AGENTS, SUBCONTRACTORS OR SUBSEQUE SPECIFIC PROLECT OR FUTURE PROJECTS, WHETHER CLIENT'S OR OTHERWISE, WITHOUT WSP'S PRIOR WRITTEN F GROUND SURFACE NOTES PIEZOMETRIC LEVEL IN VIBRATING WIRE PIEZOMETER WL. 455.84 m ۰ ALL UNITS ARE IN METRES UNLESS NOTED OTHERWISE STATIONING REFERS TO PHASE 7 DESIGN ALIGNMENT. AUGUST 2023 (SEE NOTE 6) PIEZOMETRIC LEVEL IN WL. 455.8 m CLIENT PKC WATER LEVEL ELEVATION WAS 465.54 m ON 24 SEPTEMBER 2024. BEAD LOCATION NOTED AS THAWED IF ANY RECORDED TEMPERATURE WAS -----GEOSYNTHETIC LINER AUGUST 2024 (SEE NOTE 7) DIAVIK DIAMOND MINES INC. 4 INTERFACE BETWEEN ROCKFILL OR GREATER THAN 0°C BETWEEN SEPTEMBER 2023 AND SEPTEMBER 2024. BEAD LOCATION NOTED AS FROZEN IF ALL RECORDED TEMPERATURES WERE LESS _____R/<u>PK____</u>___ PROCESSED KIMBERLITE AND FOUNDATION 5. THAN 0°C BETWEEN SEPTEMBER 2023 AND SEPTEMBER 2024. 2023 PIEZOMETRIC WATER LEVEL READINGS TAKEN IN AUGUST 2023 UNLESS REFERENCES 6. CONSULTANT YYYY-MM-DD 2024-11-14 ORIGINAL GROUND SURFACE PROVIDED BY DDMI, FILE NAME: "Origiinal-Ground-Air-Conts.sdf", RECEIVED: 10 AUGUST 2000. 2008 ROCKFILL SURFACE CREATED USING 3D FACES EXTRACTED FROM HISTORICAL SURVEY PROVIDED BY DDMI, NOTED OTHERWISE 7. 2024 PIEZOMETRIC WATER LEVEL READINGS TAKEN AUGUST 2024 UNLESS NOTED DESIGNED E. ROZAK FILE NAME: "jun2008 rockfill.dwg", SURVEYED: JUNE 2008, RECEIVED: 01 OCTOBER 2020. PKC FACILITY TOPOGRAPHY PROVIDED BY DDMI REPRESENTING MAY 2024 GROUND SURFACE, OTHERWISE PIEZOMETRIC LEVEL READING IN WELL WITH ACTIVE PUMP. THERMISTOR DOES NOT PUNCTURE LINER. PKCW-T4855-KT IS SOUTH OF THE KEY 3. 8. PREPARED J. HOPSON SURVEYED: 25 MAY 2024, RECEIVED: 05 JUNE 2024, FILE NAME: "SRF-PKC-240525.xml." 9. 4. UPSTREAM ROCKFILL AND CPK BOUNDARIES PROVIDED BY DDMI, FILE NAME: "WEST DAM SECTIONS AS-BUIL_221011.DWG", TRENCH THAT RUNS PERPENDICULAR TO THE WEST DAM. REVIEWED J. HINDMARSH RECEIVED: OCTOBER 08, 2022. APPROVED J. KWOK





1. FIGURE PROVIDED BY DIAVIK DIAMOND MINES (2012) INC.

NOTES







PROJECT DIAVIK DIAMOND I 2024 ANNUAL DAM	MINE 1 SAFETY INSPECTIC	DN				
PIEZOMETRIC WATER LEVEL AND PUMPING SUMMARY – ZONES 2, 3						
PROJECT NO. CA0035294.6784	PHASE/TASK/DOC. 2000/2400/2549	REV. Rev0	FIGURE 10			

REVIEWED

APPROVED

JFH

JEK



CONSULTANT

- 2. 3. Red text in legend denotes instrumentation / wells no longer operational.
- 4. Data provided by DDMI and plotted by WSP.

2024-11-14 YYYY-MM-DD PREPARED ER JFH DESIGNED REVIEWED JFH APPROVED JEK

PROJECT DIAVIK DIAMOND MINE 2024 ANNUAL DAM SAFETY INSPECTION					
TITLE PIEZOMETRIC WATER LEVEL AND PUMPING SUMMARY – ZONES 4, 5, 6					
PROJECTNO		DEV	FIGURE		
CA0035294.6784	2000/2400/2549	Rev0	FIGURE 11		



CONSULTANT

operational.

FILE PATH: https://golderassociates.sharepoint.com/f:/r/sites/169811/Project%20Files/6%20Deliverables/01%20Working/2507-R-RevA-2000%20Annual%20DSI?csf=1&web=1&e=bTb

3. Data provided by DDMI and plotted by WSP.

2024-11-14 PREPARED ER DESIGNED JFH REVIEWED JFH APPROVED JEK

YYYY-MM-DF

TITLE PIEZOMETRIC WATER LEVEL AND PUMPING SUMMARY - ZONES 7, 8



- operational.
- 2. Data provided by DDMI and plotted by WSP.

CONSULTANT 2024-11-14 YYYY-MM-DD PREPARED ER JFH DESIGNED REVIEWED JFH APPROVED JEK

PROJECT DIAVIK DIAMOND MINE 2024 ANNUAL DAM SAFETY INSPECTION
TITLE PIEZOMETRIC WATER LEVEL AND PUMPING SUMMARY – ZONE 11

rev. Rev0 CA0035294.6784 2000/2400/2549

figure 13



NOTES

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APPROVED

JEK

PROJECT DIAVIK DIAMOND 2024 ANNUAL DA	MINE M SAFETY INSPECTI	ON
IITLE INCLINOMETER PK	CE-IN2500	
PROJECT NO. CA0035294.6784	PHASE/TASK/DOC. 2000/2400/2549	REV. Rev0





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Cumulative Displacement (mm)

FILE PATH: https://golderassociates.sharepoint.com/f:/r/sites/169811/Project%20Files/6%20Deliverables/01%20Working/2507-R-RevA-2000%20Annual%20DSI?csf=1&web=1&e=bTby





Cumulative Displacement (mm)

FILE PATH: https://golderassociates.sharepoint.com/f:/r/sites/169811/Project%20Files/6%20Deliverables/01%20Working/2507-R-RevA-2000%20Annual%20DSI?csf=1&web=1&e=bTby



APPENDIX A

Annual Dam Inspection Reports

West SED Dam – Pond 3

Inspection By:	Jeffrey Kwok and Jack Hindmarsh
Accompanied By:	Dan Guigon, DDMI
Weather Conditions:	Fine / Cloudy

Inspection Date: August 19, 2024

Temperature: 15°C

INSPECTION ITEM	YES	NO	рното	COMMENTS AND OTHER DATA
 1. DAM CREST 1.1 Surface Cracking 1.2 Settlement 1.3 Lateral Movement 1.4 Reservoir Level & Freeboard 1.5 Distance to Pond 1.6 Other Unusual Conditions 	x x	× × ×	1, 7	 Good condition, similar to previous years. Low pond level, significant freeboard. Pumping from pad at dam toe near the north abutment.
 2. UPSTREAM SLOPE 2.1 Signs of Erosion 2.2 Signs of Movement (Deformation) 2.3 Cracks 2.4 Other Unusual Conditions 	×	x x x	2, 5, 6	 Minor wave erosion and some of the boulders used for the upstream safety berm have rolled onto the slope, similar to previous years. Pond level lower than in 2023. Pond was well upstream of dam toe. Construction of the PKC spillway chute and stilling basin complete. Chute and stilling basic extend into the Pond 3 impoundment area.
 3. DOWNSTREAM SLOPE 3.1 Signs of Erosion 3.2 Signs of Movement (Deformation) 3.3 Cracks 3.4 Seepage or Wet Areas 3.5 Other Unusual Conditions 		× × × × ×	3, 4	 Slope was in good condition. The downstream slope was observed from the downstream crest of the dam due to access constraints. No changes from previous years observed.
 4. DOWNSTREAM TOE AREA 4.1 Seepage from Dam 4.2 Signs of Turbidity in Seepage Water 4.3 Snow Accumulation 4.4 Vegetation & Ice Features 4.5 Discoloration 4.6 Other Unusual Conditions 		X N/A X X X X	3, 4	 The downstream toe was observed from the downstream crest of the dam due access constraints. Limited water in natural depressions were observed downstream of dam, less than previous years. No signs of flow could be observed from the crest of the dam.

INSPECTION ITEM	YES	NO	рното	COMMENTS AND OTHER DATA
5. EMERGENCY SPILLWAY 5.1 Surface Condition Issues 5.2 Signs of Erosion 5.3 Signs of Movement (Deformation) 5.4 Cracks 5.5 Settlement 5.6 Vegetation 5.7 Presence of Debris or Blockage 5.8 Slope Protection 5.9 Instability of Side Slopes 5.10 Other Unusual Conditions	X	* * * * * * * *	1	 A21 pipeline remains along the downstream crest of the Pond 3 Dam. The pipeline was raised in October 2020 on blocking where it crosses the spillway channel. Blocking had since shifted in 2023 and still obstructs the spillway. In 2023, snow clearance/grading had created a small berm creating a minor obstruction of the spillway channel, which remains in 2024.
6. INSTRUMENTATION 6.1 Thermistors 6.2 Settlement Monuments 6.3 Other	x x	×		

7. NOTES

Pond 3 Dam is in good condition; no signs of instability or seepage were observed.

At the time of the inspection, the pond level was low and the upstream dam slope and toe were exposed. The PKC Facility spillway reports to Pond 3 when the PKC spillway is used. Construction of the PKC Facility spillway chute was completed in 2024 and extends into the Pond 3 impoundment.

The Pond 3 emergency spillway was obstructed at the time of the inspection by a small berm and the A21 pipeline where the cribbing to raise the pipe off the crest had shifted.

The North Country Rock Pile (NCRP) has been re-sloped to 3H:1V, covered with till and partially covered with rockfill upstream of Pond 3. The life-of-mine-dump portion of the NCRP remains uncovered as it's continuing to receive Type II/III rockfill.

Pond 3 can provide storage for either the Environmental Design Flood or the Inflow Design Flood (IDF) for the combined PKC Facility and Pond 3 catchments. Pond 3 spillway and water management requirements for the PKC Facility and Pond 3 were reviewed and summarized in a technical letter (Golder Ref. No. 2101 issued 12 August 2021). It was determined that a Pond 3 spillway upgrade was not necessary as long as the water level in Pond 3 is managed to maintain storage for a probable maximum precipitation (PMP) event within the pond (Golder 2021d).

Recommendation:

• Emergency spillway to be cleared of obstructions caused by the A21 pipeline and the graded berm. Downstream section of spillway invert to be elev. 435.63 m and base of A21 pipeline to be above elev. 436.0 m to not impede flow (WSP Reference: 19115651-2101-L-Rev0-1000, dated 12 August 2021).

Inspector's Signature:

Date:

November 15, 2024







Photograph Pond 3 – 1: View to the southeast along the crest of Pond 3 Dam. The A21 pipeline along the downstream crest of Pond 3 Dam and runs through the spillway. The pipeline was raised on blocks in October 2020 but blocks had shifted in 2023, obstructing the spillway. A small berm from crest/road maintenance also obstructs the spillway.



Photograph Pond 3 – 2: View to the northwest across Pond 3 from southern abutment.



Photograph Pond 3 – 3: View along the downstream slope of Pond 3. 2023 photo looking to the north and 2024 photo looking to the southwest.



Photograph Pond 3 – 4: View along the downstream slope of Pond 3 Dam. 2023 photo looking to the southwest and 2024 photo looking to the northwest.



Photograph Pond 3 – 5: View of upstream slope and toe of northern half of Pond 3 Dam. Pond level lower in 2024 than 2023.



Photograph Pond 3 – 6: View of Pond 3, from crest of PKC Phase 7 spillway looking west.



Photograph Pond 3 – 7: Crest of Pond 3 Dam, looking north.

South PKC Dam – Station 70+000 to 71+870

Inspection By:	Jeffrey Kwok and Jack Hindmarsh
Accompanied By:	Dan Guigon, DDMI

Weather Conditions: Fine / Cloudy

Inspection Date: August 20, 2024

Temperature: 15°C

INSPECTION ITEM	YES	NO	РНОТО	COMMENTS AND OTHER DATA
 1. DAM CREST 1.1 Surface Cracking 1.2 Settlement 1.3 Lateral Movement 1.4 Reservoir Level & Freeboard 1.5 Distance to Tailings Pond 1.6 Other Unusual Conditions 	x	x x x x x	1,7,9	 FPK in West Cell at approximately elev. 468 m to 469 m along the dams with some low areas around elev. 466 m to 467 m. Some ponding in the low areas. The final raise to elev. 473 m to 474 m was complete between West Cell and Southeast Cell and closure cover placed. PKC Main Cell Pond in northwest corner and centre of facility.
2. UPSTREAM SLOPE 2.1 Signs of Erosion 2.2 Signs of Movement (Deformation) 2.3 Cracks 2.4 Other Unusual Conditions		x x x x x	2,3,7,9	 Construction of Phase 7 dam raise to 469 m complete in 2021. Closure cover completed in the PKC Main Cell along the length of the South Dam. Liner exposed at one location at approximately station 70+200. Solar farm exists upstream of the South Dam on the closure cover between 70+600 and 71+100. One localized area of ponding observed in the Southeast Cell
 3. DOWNSTREAM SLOPE 3.1 Signs of Erosion 3.2 Signs of Movement (Deformation) 3.3 Cracks 3.4 Seepage or Wet Areas 3.5 Other Unusual Conditions 	x	x x x x	4,5,6	 Local over-steepened section of downstream slope with fine grained rockfill exposed near Sta. 70+300, shows signs of historic excavation, condition was similar to previous years. Mostly bedrock foundation.
 4. DOWNSTREAM TOE AREA 4.1 Seepage from Dam 4.2 Signs of Turbidity in Seepage Water 4.3 Snow Accumulation 4.4 Vegetation & Ice Features 4.5 Discoloration 4.6 Other Unusual Conditions 	x	x x x x x	4,5,6	 Minor ponded water along toe between Sta. 70+000 and 70+200; no flow visible. Similar to previous years.

INSPECTION ITEM	YES	NO	рното	COMMENTS AND OTHER DATA	
 5. EMERGENCY SPILLWAY 5.1 Surface Condition Issues 5.2 Signs of Erosion 5.3 Signs of Movement (Deformation) 5.4 Cracks 5.5 Settlement 5.6 Vegetation 5.7 Presence of Debris or Blockage 5.8 Slope Protection 5.9 Instability of Side Slopes 5.10 Other Unusual Conditions 		N/A		 PKC spillway at north end of West Dam (see West Dam inspection report for details). 	
6. INSTRUMENTATION6.1 Thermistors6.2 Settlement Monuments6.3 Other	x	x x			

7. NOTES

The South Dam was in good condition at the time of the inspection. No surficial ponding observed at the crest.

CPK/final raise placement complete between the West Cell and Southeast Cell. Rockfill cover yet to be completed at the eastern extent of the South Dam.

PKC Closure Cover upstream of the South Dam in the Main Cell is complete. A solar farm was constructed in 2023 and 2024 on the closure cover upstream of the South Dam. CPK placement continues in the Southeast Cell.

Liner exposed at the anchor trench where CPK liner cover has eroded adjacent to the West Cell at approximately Station 70+150.

The West Cell pond-level had been drawn down throughout summer 2022 by pumping to the Main Cell and has not required continued pumping since this time. CPK placement has occurred in the West Cell through the summer of 2024 to form containment cell in the eastern corner of the West Cell for future extra-fine FPK management.

Visual evidence of continued West Cell FPK consolidation is no longer visible in 2024.

Recommendations:

- Repair liner cover over areas where liner is exposed at anchor trench near Station 70+200.
- Cover exposed liner at approximately Station 70+150 adjacent to the West Cell.

Inspector's Signature:	Date:	November 15, 2024
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Photograph South PKC Dam – 1: Phase 7 elev. 469 m crest of the South PKC Dam looking southeast near 70+900 (2023 photo) and looking northwest near 70+500 (2024 photo). Upstream CPK berm on left side of both photos; covered with closure rockfill cover in 2024 photo.



Photograph South PKC Dam – 2: Phase 7 elevation 469 m crest looking southeast over the West Cell. Settlement resulting from consolidation of FPK evident in cracking/slumping of FPK along the upstream slope in 2023 now appears to have slowed or ceased.



Photograph South PKC Dam – 3: View of the upstream slope of the South PKC Dam at elevation 469 m and Southeast Cell area. CPK is being stored in the Southeast Cell and in similar condition to 2023. A small isolated pond retained in the cell.


Photograph South PKC Dam – 4: View from the elevation 469 m crest to the southeast along the downstream slope and toe of the South PKC Dam near Sta. 71+100 (2023) and Sta. 70+700 (2024), looking towards the South Country-Rock Pile.



Photograph South PKC Dam – 5: View to the northwest along the South PKC Dam downstream slope and toe near Sta. 70+800. Toe and downstream slope are in good condition similar to previous years.



Photograph South PKC Dam – 8: View of downstream slope of the South Dam rockfill shell at approximately 70+300. Fine grained granular fill material visible on slope as in previous years.



Photograph South PKC Dam – 9: Liner exposed through the CPK cover of the anchor trench at approximately Station. 70+150.

East PKC Dam – Station 71+870 to 73+180

Inspection By: Jeffrey Kwok and Jack Hindmarsh

Accompanied By: Dan Guigon, DDMI

Weather Conditions: Fine / Cloudy

Inspection Date: August 20, 2024

Temperature: 15°C

INSPECTION ITEM	YES	NO	РНОТО	COMMENTS AND OTHER DATA
 DAM CREST 1.1 Surface Cracking 1.2 Settlement 1.3 Lateral Movement 1.4 Reservoir Level & Freeboard 1.5 Distance to Tailings Pond 1.6 Other Unusual Conditions 	x	X X X X X	1,2,3	 East Dam crest at 465 m is used as a haul road. Mud is graded through breaks in the windrow/safety berms during wet months. Areas were dry during the 2024 inspection and in good condition.
 2. UPSTREAM SLOPE 2.1 Signs of Erosion 2.2 Signs of Movement (Deformation) 2.3 Cracks 2.4 Other Unusual Conditions 		X X X X	2,7	 CPK placement to approximately elev. 473 m is complete along the length of the East Dam and covered with rockfill closure cover. PKC Closure cover has been placed upstream of the East Dam over the FPK in the main cell.
 3. DOWNSTREAM SLOPE 3.1 Signs of Erosion 3.2 Signs of Movement (Deformation) 3.3 Cracks 3.4 Seepage or Wet Areas 3.5 Other Unusual Conditions 		X X X X X	4,5,6,7	 The downstream slope was in good condition at the time of the inspection; however, some localized erosion where runoff from the haul road along the 465 m crest run down the dam shell. Area is planned to be repaired during construction of the East Dam closure buttress.
 4. DOWNSTREAM TOE AREA 4.1 Seepage from Dam 4.2 Signs of Turbidity in Seepage Water 4.3 Snow Accumulation 4.4 Vegetation & Ice Features 4.5 Discoloration 4.6 Other Unusual Conditions 	x	X X X X X X	5,6,7	 No signs of seepage were observed at the downstream toe of the dam.
5. EMERGENCY SPILLWAY 5.1 Surface Condition Issues 5.2 Signs of Erosion 5.3 Signs of Movement (Deformation) 5.4 Cracks 5.5 Settlement 5.6 Vegetation 5.7 Presence of Debris or Blockage 5.8 Slope Protection 5.9 Instability of Side Slopes 5.10 Other Unusual Conditions		N/A		 PKC spillway at north end of West Dam (see West Dam inspection report for details).
6. INSTRUMENTATION 6.1 Thermistors 6.2 Settlement Monuments 6.3 Other	x x	x		 Observation wells, piezometers and inclinometers.

7. NOTES

The East Dam was in good condition during the site visit. The final raise to elev. 473/474 m is covered with the rockfill closure cover along the length of the East Dam. The closure cover extends along the past FPK beach along the entire upstream of the East Dam.

Localized shallow erosion gullies formed in the downstream slope after the 2019 inspection due to grading mud and water off the dam crest through openings in the downstream safety berm appear in similar condition in 2024. The erosion gullies will be repaired during the East Dam closure buttress construction, scheduled to be completed in 2025.

No signs of seepage were observed at the downstream toe of the dam. East Dam seepage is being managed by the seepage collection well PKCE-SCW-2530 in the rockfill shell of the dam. Seepage collection well PKCE-SCW-1972 was decommissioned in May/June 2024.

Recommendation:

• Erosion gullies at developed on the downstream slope are to be repaired during construction of the East Dam closure buttress.

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Date:

November 15, 2024



Photograph East PKC Dam – 1: Upstream crest and CPK zone near Sta. 72+500 (2023 photo taken from elevation 474 m) and closure cover completed in 2024 (photo taken from elevation 469 m crest).



Photograph East PKC Dam – 2: Upstream crest and CPK zone looking south. CPK placement and 3:1 re-slope complete in 2023. Rockfill closure cover along 3:1 CPK Phase 7 slope completed in 2024.



Photograph East PKC Dam – 3: Haul road on elev. 465 m crest of the East PKC Dam looking north from near Sta. 72+500 towards NCRP. 465 m crest in good condition during 2023 DSI visit. Rockfill closure cover along 3:1 CPK Phase 7 slope completed in 2024.



Photograph East PKC Dam – 4: Downstream slope looking north from approx. Sta. 72+400 above Pond 5.



Photograph East PKC Dam - 5: View of area downstream of the East Dam from near Sta. 72+950.



Photograph East PKC Dam – 6: Downstream slope of East Dam downstream of Zone 7 seepage zone Sump 10 removed in 2024 during closure resloping works.



Photograph East PKC Dam – 7: View of localized shallow erosion gullies in the downstream slope of the East Dam near 72+600 (right). DDMI placed jaw run rockfill to repair gully in 2022, but some additional erosion has since occurred. Channel continues to incise into dam and fines accumulating at the dam toe. Incision appears siimilar to 2023 with an increase accumulation of material at the toe.

North PKC Dam - Station 73+180 to 74+711

Inspection By:	Jeffrey Kwok and Jack Hindmarsh
Accompanied By:	Dan Guigon, DDMI

Weather Conditions: Fine / Cloudy

Inspection Date: August 20, 2024

Temperature: 15°C

INSPECTION ITEM	YES	NO	РНОТО	COMMENTS AND OTHER DATA		
 DAM CREST 1.1 Surface Cracking 1.2 Settlement 1.3 Lateral Movement 1.4 Reservoir Level & Freeboard 1.5 Distance to Tailings Pond 1.6 Other Unusual Conditions 		× × × × × ×	3	 The North Country Rock Pile closure cover had been constructed over the length of North Dam from 73+180 to 74+400, where a small area of CPK remains exposed adjacent to the NW decant. 		
 2. UPSTREAM SLOPE 2.1 Signs of Erosion 2.2 Signs of Movement (Deformation) 2.3 Cracks 2.4 Other Unusual Conditions 		X X X X	1,2,3	 The majority of the upstream slope of the North Dam is covered by the PKC Closure Cover rockfill which extends over the dam and ties into the NCRP closure cover. An area of FPK remains uncovered between 73+850 to 74+250 and extends approximately 100 m into the facility. A small patch of exposed liner where it enters the anchor trench along the northern tie-in with the spillway CRF, similar to that observed in the 2022 inspection. 		
 3. DOWNSTREAM SLOPE 3.1 Signs of Erosion 3.2 Signs of Movement (Deformation) 3.3 Cracks 3.4 Seepage or Wet Areas 3.5 Other Unusual Conditions 		X X X X X	_	 The North Dam is entirely buttressed by the NCRP, so there is no exposed downstream slope. 		
 4. DOWNSTREAM TOE AREA 4.1 Seepage from Dam 4.2 Signs of Turbidity in Seepage Water 4.3 Snow Accumulation 4.4 Vegetation & Ice Features 4.5 Discoloration 4.6 Other Unusual Conditions 	x	X X X X X	_	 The North Dam is fully buttressed by the NCRP, so downstream toe area is within the NCRP. 		

INSPECTION ITEM	YES	NO	РНОТО	COMMENTS AND OTHER DATA
5. EMERGENCY SPILLWAY 5.1 Surface Condition Issues 5.2 Signs of Erosion 5.3 Signs of Movement (Deformation) 5.4 Cracks 5.5 Settlement 5.6 Vegetation 5.7 Presence of Debris or Blockage 5.8 Slope Protection 5.9 Instability of Side Slopes 5.10 Other Unusual Conditions	x		_	 PKC spillway at north end of West Dam (see West Dam inspection report for details).
6. INSTRUMENTATION6.1 Thermistors6.2 Settlement Monuments6.3 Other	x x	х		

7. NOTES

North Country Rock Pile buttresses the downstream side of the North Dam. North Country Rock Pile closure cover extends over the North Dam crest ties into the PKC Closure Cover rockfill along the majority of the North Dam.

Water was ponded in the northwest decant sump at approximately elev. 466.1 m.

There are no 2024 recommendations for the North Dam.

Inspector's Signature:

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Date:

November 15, 2024





Photograph North PKC Dam – 1: Upstream along North PKC Dam looking west (2023) and southwest (2024). PKC closure cover constructed in 2023 over the length of the North Dam and ties into the NCRP closure cover. PKC closure cover does not yet extend upstream along the FPK beach from Sta. 73+900 to 74+200.



Photograph North PKC Dam – 2: PKC area of FPK beach upstream of the North Dam where PKC closure cover rockfill does not yet extend from Sta. 73+900 to 74+200.





Photograph North PKC Dam – 3: Exposed liner at downstream edge of anchor trench at North Dam / spillway CRF tie-in at 74+700. Exposed liner observed at the time of 2023 inspection and remains in similar condition in 2024.

West PKC Dam - Station 74+711 to 75+649

Inspection By:	Jeffrey Kwok and Jack Hindmarsh
Accompanied By:	Dan Guigon, DDMI

Weather Conditions: Fine / Cloudy

Inspection Date: August 20, 2024

Temperature: 15°C

INSPECTION ITEM	YES	NO	рното	COMMENTS AND OTHER DATA
 1. DAM CREST 1.1 Surface Cracking 1.2 Settlement 1.3 Lateral Movement 1.4 Reservoir Level & Freeboard 1.5 Distance to Tailings Pond 1.6 Other Unusual Conditions 		X X X X X X	3,5	 PKC Main Cell Pond in northwest corner at approximately elev. 466.1 m. Minor localized ponding in centre of Main Cell. FPK upstream of the West Dam in the Main Cell is approximately at elev. 468 m between 74+850 and 75+000. CPK final raise placed to elev. 473 m along length of West Dam. Upstream CPK to elev. 473 m yet to be placed between 74+850 and 75+000.
 2. UPSTREAM SLOPE 2.1 Signs of Erosion 2.2 Signs of Movement (Deformation) 2.3 Cracks 2.4 Other Unusual Conditions 		X X X X	4,7	 The upstream CPK berm along the West Dam is at approximately elev. 473 m. Closure cover placement on the Main Cell upstream of the West Dam complete between 75+000 and the West Cell. Erosion of the CPK liner cover at the anchor trench has exposed liner at approximately 75+500.
 3. DOWNSTREAM SLOPE 3.1 Signs of Erosion 3.2 Signs of Movement (Deformation) 3.3 Cracks 3.4 Seepage or Wet Areas 3.5 Other Unusual Conditions 		X X X X X	1,2	 Some large overhanging boulders on the downstream rockfill slope.
 4. DOWNSTREAM TOE AREA 4.1 Seepage from Dam 4.2 Signs of Turbidity in Seepage Water 4.3 Snow Accumulation 4.4 Vegetation & Ice Features 4.5 Discoloration 4.6 Other Unusual Conditions 	x	X X X X X	1,2	 Minor ponding over tundra near dam toe as in previous years, no signs of seepage from the dam toe. Seepage is collected in rockfill shell and managed with pumping.

INSPECTION ITEM	YES	NO	рното	COMMENTS AND OTHER DATA
5. EMERGENCY SPILLWAY 5.1 Surface Condition Issues 5.2 Signs of Erosion 5.3 Signs of Movement (Deformation) 5.4 Cracks 5.5 Settlement 5.6 Vegetation 5.7 Presence of Debris or Blockage 5.8 Slope Protection 5.9 Instability of Side Slopes 5.10 Other Unusual Conditions		* * * * * * * * *	5,6	 The Phase 7 spillway across the dam crest was completed in 2021 and the downstream portion was completed in 2024. A crack in the CRF side slope at the southwest, downstream side of the spillway was observed in 2022 and appears to have propagated in length through CPK and CRF. The crack aperture is approximately 15 to 30 mm. Cracking observed in CRF on southwest side of invert and side slope at upstream edge of CRF in 2022 and appears in similar condition in 2023. Riprap apron placed at the end of the spillway CRF is in good condition and ties into the Phase 7 chute riprap.
6. INSTRUMENTATION 6.1 Thermistors 6.2 Settlement Monuments 6.3 Other	x x	х		 Observation wells and piezometers.

7. NOTES

West Dam was in good condition. Minor isolated erosion observed in CPK liner cover at 469 m crest, improved since 2023.

No signs of seepage in the downstream toe area at the time of the 2024 DSI.

The Phase 7 spillway chute was completed on August 1, 2024.

A crack in the CRF side slope at the southwest invert and crest and the CPK of the spillway abutment was observed first in 2022 and has since propagated in length with an approximate aperture of 15 to 30 mm. Cracking appears upstream of the liner. Cracking observed in the CRF spillway invert and side slope at upstream, southwest edge of spillway appeared to be in similar condition to 2022.

Exposed liner observed during the 2024 DSI at the northeast spillway extent downstream of the trafficable crest was repaired with a thin lift of CPK in November 2024. As this area of the liner anchor trench is not protected by a rockfill berm, placement of signage or delineators to prevent trafficking on the liner cover would reduce opportunity for damage to liner cover in the future.

Exposed liner at the Phase 7 anchor trench was visible adjacent to the West Cell at Station 75+550.

Recommendation:

• Cover exposed liner with CPK at approximately Station 75+550 adjacent to the West Cell.

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Date:

November 15, 2024



Photograph West PKC Dam – 1: View of the downstream slope of West PKC Dam from about Sta. 75+450 looking north. Downstream slope is in good condition.



Photograph West PKC Dam – 2: View of the downstream slope from about Sta. 75+100 looking southwest. Seepage collection channel downstream of dam toe. Till berm constructed to direct seepage observed from November 2021 to February 2022 to Pond 4. No seepage in this area has been noted since 2022.



Photograph West PKC Dam – 3: View from Sta. 74+900 to the south looking along the upstream crest. Upstream CPK raised to elev. 473 m between 2022 and 2023. Closure clover is yet to be placed on the 3:1 slope.



Photograph West PKC Dam – 4: West Cell area near Sta. 75+300 looking south. FPK was last deposited into West Cell in 2021. West Cell causeway at left of photo raised in 2022 to elev. 473 m. CPK road under construction in 2024 to create a containment cell for EFPK planned to be excavated from the closure spillway inlet channel.



Photograph West PKC Dam – 5: Spillway channel across the West Dam crest looking upstream in left photos, looking parallel to crest in right photo. Sinkholes were observed by DDMI upstream of the PKC spillway in August 2022 and were backfilled during September 2022. Some further development has occurred in the sinkholes since the 2023 DSI.



Photograph West PKC Dam – 6: Cracking observed in CRF in south side slope at downstream end of CRF (left), closeup of cracked CRF (centre and right). Condition of cracking in CRF at spillway invert has developed since 2023 in aperture width and appears upstream of the liner anchor trench.



Photograph West PKC Dam – 7: Erosion has occurred of the CPK liner cover in the anchor trench adjacent to the West Cell at approximately Station 75+550, likely caused for past spigotting or FPK pipe break.

Pond 1

Inspection By:	Jeffrey Kwok and Jack Hindmarsh	Inspection Date:August 19, 2024		
Accompanied By:	Dan Guigon, DDMI			
Weather Conditions:	Fine / Cloudy	Temperature:	15°C	

INSPECTION ITEM	YES	NO	РНОТО	COMMENTS AND OTHER DATA
 1. DAM CREST 1.1 Surface Cracking 1.2 Settlement 1.3 Lateral Movement 1.4 Reservoir Level & Freeboard 1.5 Distance to Pond 1.6 Other Unusual Conditions 	x x x	X X X	1,3,4	 Erosion observed on the crest and upstream slope in three locations as a result of runoff entering from the haul road. Conditions were similar to those observed in previous years. See additional notes for upstream slope. Water level kept low with pumping; pond was away from the upstream dam toe.
 2. UPSTREAM SLOPE 2.1 Signs of Erosion 2.2 Signs of Movement (Deformation) 2.3 Cracks 2.4 Other Unusual Conditions 	x x	x x	1,2,3,4	 Previous historical liner damage, and erosion of upstream liner cover and bedding (due to water runoff from haul road) observed. Erosion since originally observed in 2016 continues to increase in 2024. Erosion of liner cover and bedding at south end of dam is allowing water under liner - this area should be repaired, and a water diversion/control plan implemented. Water from Pond 5 was being discharged into Pond 1 at the time of inspection.
 3. DOWNSTREAM SLOPE 3.1 Signs of Erosion 3.2 Signs of Movement (Deformation) 3.3 Cracks 3.4 Seepage or Wet Areas 3.5 Other Unusual Conditions 		X X X X X	6	 Pond 1 is buttressed downstream by the South Haul Road. No signs of instability.
 4. DOWNSTREAM TOE AREA 4.1 Seepage from Dam 4.2 Signs of Turbidity in Seepage Water 4.3 Snow Accumulation 4.4 Vegetation & Ice Features 4.5 Discoloration 4.6 Other Unusual Conditions 		X N/A X X X X	6	 Pond 1 dam is buttressed by the South Haul Road. No seepage observed coming from the haul road toe. No ponded water observed on tundra in the downstream toe area – drier than previous years. Downstream toe observed from crest of South Haul Road, due to access constraints.

INSPECTION ITEM	YES	NO	РНОТО	COMMENTS AND OTHER DATA
5. EMERGENCY SPILLWAY				
5.1 Surface Condition Issues				
5.2 Signs of Erosion				
5.3 Signs of Movement (Deformation)				
5.4 Cracks				
5.5 Settlement		N/A		 No emergency spillway currently exists.
5.6 Vegetation				
5.7 Presence of Debris or Blockage				
5.8 Slope Protection				
5.9 Instability of Side Slopes				
5.10 Other Unusual Conditions				
6. INSTRUMENTATION				
6.1 Thermistors		Х		
6.2 Settlement Monuments		Х		
6.3 Other		Х		

7. NOTES

The Pond 1 pump and pipeline are connected to the east side pipeline. The water level is kept low in Pond 1. Pond 1 can receive flows from Ponds 5, 10, 11, 12 and 13.

Generally, the pond level is operated and maintained well below the damaged liner, so containment is only needed for temporary ponding associated with a storm event. The damaged liner is a water containment and management issue, not a dam stability concern.

Areas with erosion and liner damage is to be repaired to reinstate water containment. Condition in 2024 remains similar, however erosion has continued to increase since first observed in 2016.

Pond 1 does not have an emergency spillway.

Recommendations:

- A plan to manage surface runoff water entering from the haul road should be developed to prevent continued erosion of the liner cover and degradation of the liner and crest.
- Repair damaged Pond 1 liner to re-establish Pond 1 capacity or develop a water management plan for Pond 1 to manage water below damaged liner.

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Photograph Pond 1 – 1: View of upstream slope of Pond 1 near access ramp to Pond 1 pump. Surface erosion continues over an area of exposed high density polyethylene liner. Erosion of cover and liner bedding is similar to previous years' inspections.



Photograph Pond 1 – 2: Possible bulging of area upstream of dam toe at south end of Pond 1 first observed in September 2020 just north of erosion shown in Photo 1. No further movement observed in 2024.



Photograph Pond 1 – 3: View of the Pond 1 dam crest and upstream slope. Erosion of the liner cover crest and upstream slope due to temporary discharge of water on the downstream side of the liner crest in 2014. Conditions observed in 2024 is similar to previous years.



Photograph Pond 1 – 4: View of crest and upstream slope of Pond 1 where the haul road berm was excavated in 2017 to allow for a new access to the Pond 1 dam crest area. Erosion of crest and upstream slope similar to observations in previous years.



Photograph Pond 1 – 5: Pond 1 water level kept low by pumping. Water level observed in 2024 was similar to 2023.



Photograph Pond 1 – 6: View to the north along the toe of the south haul road downstream of Pond 1. No signs of seepage observed from crest; lower lake level downstream than observed in pervious years.
Pond 2

Inspection By:	Jeffrey Kwok and Jack Hindmarsh	Inspection
Accompanied By:	Dan Guigon, DDMI	
Weather Conditions:	Fine / Cloudy	Temperatu

Inspection Date: August 19, 2024

Temperature: 15°C

INSPECTION ITEM	YES	NO	рното	COMMENTS AND OTHER DATA
 1. DAM CREST 1.1 Surface Cracking 1.2 Settlement 1.3 Lateral Movement 1.4 Reservoir Level & Freeboard 1.5 Distance to Pond 1.6 Other Unusual Conditions 	×	X X X X	4,5,6	 Pond 2 breach excavations were underway at the time of the inspection. The liner had been breached in both locations and the majority of the downstream portion of the excavations were complete. The Pond 2 dam crest is very wide and accommodates several laydown areas. Settlement, and sinkholes were previously observed on the crest of the dam near old trailers appear to be filled in. No new sinkholes observed in 2024.
 2. UPSTREAM SLOPE 2.1 Signs of Erosion 2.2 Signs of Movement (Deformation) 2.3 Cracks 2.4 Other Unusual Conditions 	x x	x x	2,3,4,8	 Areas of settlement previously observed on the upstream slopes have now been removed during the excavation of the breaches. Sinkholes observed in 2022 in fill material adjacent to the access ramp to the pump pad, upstream of the liner have continued to increase and enlarged in diameter than previous years. The upstream area was being graded to limit ponding as part of the site wide grading design for closure.
 3. DOWNSTREAM SLOPE 3.1 Signs of Erosion 3.2 Signs of Movement (Deformation) 3.3 Cracks 3.4 Seepage or Wet Areas 3.5 Other Unusual Conditions 		X X X X X	1,7	 Downstream slope inspected from the dam crest due to access constraints. Slope is in good condition.

INSPECTION ITEM	YES	NO	РНОТО	COMMENTS AND OTHER DATA
 4. DOWNSTREAM TOE AREA 4.1 Seepage from Dam 4.2 Signs of Turbidity in Seepage Water 4.3 Snow Accumulation 4.4 Vegetation & Ice Features 4.5 Discoloration 4.6 Other Unusual Conditions 	x	X N/A X X X	1,7	 Downstream toe area could not be inspected due to access constraints. Small ponds of water in tundra near the downstream toe, similar to previous years. No signs of seepage were noted.
5. EMERGENCY SPILLWAY 5.1 Surface Condition Issues 5.2 Signs of Erosion 5.3 Signs of Movement (Deformation) 5.4 Cracks 5.5 Settlement 5.6 Vegetation 5.7 Presence of Debris or Blockage 5.8 Slope Protection 5.9 Instability of Side Slopes 5.10 Other Unusual Conditions	x	X X X X X X X X X X X X X X X X X X X	N/A	 Spillway has been removed during the breach excavation of Pond 2.
6. INSTRUMENTATION6.1 Thermistors6.2 Settlement Monuments6.3 Other		X X	N/A	

7. NOTES

Pond 2 was being breached as part of closure activities at two locations at the time of inspection. The dam liner had been breached, as planned, prior to the inspection. The impoundment area was being filled and graded to prevent water ponding, as part of the site wide grading plan for closure. A new pipe bench was being constructed to allow the A21 pipeline to be routed around the two breach locations and allows light vehicles to bypass the breach areas.

The emergency spillway, no longer required, has been removed during breaching work.

Following completion of breaching works, Pond 2 will no longer be capable of impounding water and will no longer be considered a dam.

Recommendations:

Sinkholes that had developed in 2022 near the access ramp to the upstream remain a hazard to
personnel and should be delineated or backfilled.

Inspector's Signature:

Date:

November 15, 2024



Photograph Pond 2 – 1: View to the north along the western downstream toe of Pond 2 dam. Breaching underway in 2024. 2024 photo shows breach 2B rockfill excavation.



Photograph Pond 2 – 2: View to the south along the upstream toe of Pond 2 dam. Some water ponded near upstream toe in 2023 has since been drawn down during dam breach closure works in 2024.



Photograph Pond 2 – 3: View of upstream toe of Pond 2 dam. The water level has been drawn down during the Pond 2 breaching works. The upstream pond area was being backfilled and graded at the time of the 2024 DSI.



Photograph Pond 2 – 4: Upstream crest and pipeline along the Pond 2 dam, looking north, settled with creep of the upstream slope north of the pump access ramp. Settlement and creeping of the upstream slope appears to be similar to previous years.



Photograph Pond 2 – 5: Local pond downstream of Pond 2 dam near northeast abutment; similar conditions to those observed in previous years.



Photograph Pond 2 – 6: Pond 2B breach. Bulk rockfill excavation underway at the time of the 2024 DSI including breach of the pond liner, looking east and west, left and right photograph, respectively.



Photograph Pond 2 – 7: Pond 2A breach. Bulk rockfill excavation underway at the time of the 2024 DSI including breach of the pond liner.



Photograph Pond 2 – 8: Sinkholes in fill upstream of liner near access ramp to pump, looking north. Photographs show sinkholes in material placed for pipe access. Some continued development of sinkholes appears to have occurred in 2024.

Pond 4

Inspection By:	Jack Hindmarsh	Inspection Date	August 20, 2024:
Accompanied By:	Dan Guigon, DDMI		
Weather Conditions:	Fine / Cloudy	Temperature:	15°C

INSPECTION ITEM	YES	NO	РНОТО	COMMENTS AND OTHER DATA
 1. DAM CREST 1.1 Surface Cracking 1.2 Settlement 1.3 Lateral Movement 1.4 Reservoir Level & Freeboard 1.5 Distance to Pond 1.6 Other Unusual Conditions 	x	x x x x x	1,6	 Dam crest in good condition. Very small pond of water where seepage collection well discharges at the toe of the West Dam. Minor standing water observed in drainage ditch from southwest abutment.
 2. UPSTREAM SLOPE 2.1 Signs of Erosion 2.2 Signs of Movement (Deformation) 2.3 Cracks 2.4 Other Unusual Conditions 	x	× × ×	3,4,5	 Past displacement observed in the upstream toe near the north abutment does not appear to be progressing. Minor vegetation on slope, similar to previous years.
 3. DOWNSTREAM SLOPE 3.1 Signs of Erosion 3.2 Signs of Movement (Deformation) 3.3 Cracks 3.4 Seepage or Wet Areas 3.5 Other Unusual Conditions 		X X X X X	3,6	 Good condition. Observed from dam crest.
 4. DOWNSTREAM TOE AREA 4.1 Seepage from Dam 4.2 Signs of Turbidity in Seepage Water 4.3 Snow Accumulation 4.4 Vegetation & Ice Features 4.5 Discoloration 4.6 Other Unusual Conditions 		X N/A X X X X	3,6	 Observed from dam crest. Could not walk along downstream toe due to access limitations. Vegetation between Pond 4 dam and lake. Lake level lower and further away from toe than previously observed.
5. EMERGENCY SPILLWAY 5.1 Surface Condition Issues 5.2 Signs of Erosion 5.3 Signs of Movement (Deformation) 5.4 Cracks 5.5 Settlement 5.6 Vegetation 5.7 Presence of Debris or Blockage 5.8 Slope Protection 5.9 Instability of Side Slopes 5.10 Other Unusual Conditions	x	X X X X X X X X	7	 The spillway is located at the south end of the Pond 4 dam. Spillway blocked by A21 pipeline and road, similar condition to previous years.
6. INSTRUMENTATION 6.1 Thermistors 6.2 Settlement Monuments 6.3 Other	х	X X	N/A	

7. NOTES

The Pond 4 pond is kept low by pumping. Pond 4 primarily receives water from the Seepage Collection well on the West Dam throughout the open water months. Discharges ceases in winter months to prevent ice buildup.

Displacement of the upstream toe was observed at adjacent to the north abutment in 2022. Surface cracking is visible; however, no apparent further movement was noted during the inspection. DDMI monitors movement as an inspection item in the routine inspections.

The crest and downstream slopes are in good condition; no signs of seepage or instability were observed.

Recommendations:

Address obstructions to the Pond 4 spillway caused by the A21 pipeline and access road.

Inspector's Signature:	Shah	Date:	November 15, 2024
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Photograph Pond 4 – 1: Overview of Pond 4 from the south abutment looking north. Low water level is maintained in Pond 4. Water is discharged from the West Dam seepage collection well directly into Pond 4. The rock-lined collection channel along the West PKC Dam toe and is conveyed to the Pond 4 sump.



Photograph Pond 4 – 2: View of the collection channel along the toe of the West PKC Dam which drains into Pond 4. Channel appeared dry at time of inspection.



Photograph Pond 4 – 3: View to the north along the downstream slope of Pond 4 dam. Downstream slope is in good condition. Lac de Gras encroaches on downstream toe area at north end.

Reference No. CA0035294.6784-2549-R-Rev0-2000 November 2024



Photograph Pond 4 – 4: View to the south along the upstream slope of Pond 4 dam. Similar condition to 2023.