Appendix 9

Whale Tail 2024 Annual Open Pit Geomechanical Inspection

February 3, 2025

Christian Tremblay
Engineering General Supervisor
Agnico Eagle Mines Limited - Meadowbank Division - Nunavut
Baker Lake, Nunavut X0C 0A0
Canada

Knight Piésold Ltd.
200 - 1164 Devonshire Avenue
North Bay, Ontario
Canada, P1B 6X7
T +1 705 476 2165
E northbay@knightpiesold.com
www.knightpiesold.com

Dear Christian,

RE: Meadowbank Complex - Amaruq Site - 2024 Annual Open Pit Geomechanical Inspection

1.0 INTRODUCTION

Agnico Eagle Mines Limited (AEM) operates the Meadowbank Complex in Nunavut, Canada. The complex consists of the Meadowbank and Amaruq Sites. The Amaruq Site consists of several open pits at the Whale Tail and IVR deposits, and an underground mine at the Whale Tail deposit. Knight Piésold Ltd. (KP) has been providing geomechanical support for the Amaruq Site since 2015 and has completed the annual third-party inspections for the open pits and underground mine since 2018.

Mr. Ben Peacock, P.Eng., completed the 2024 annual inspection of the open pits at the Amaruq Site between August 13 and 19, 2024 with Antoine Laporte (Interim Engineering Coordinator), Vincent Duranleau (Rock Mechanics Technician) and Katie Hawley (Rock Mechanics Engineer) of AEM. Christian Tremblay (Interim Engineering General Supervisor) of AEM also participated in portions of the inspection. The results of the inspection are summarized in this letter and detailed in Appendix A.

This letter supersedes the letter issued on January 28, 2025 (ref. NB24-0145).

2.0 2024 INSPECTION RESULTS

Observations made during the site visit were grouped according to the following four headings at AEM's request.

- **Priority 1 (P1) -** A high priority or structural safety issue considered immediately dangerous to life, health or the environment or to result in immediate and significant regulatory enforcement.
- **Priority 2 (P2) -** An issue that, if not corrected, could plausibly result in a structural safety issue leading to injury, environmental impact or significant regulatory enforcement. Also includes repeated deficiencies that demonstrate a systematic breakdown of procedures.
- **Priority 3 (P3) -** Single occurrences of deficiencies or non-conformances that in isolation are unlikely to result in safety issues. Also includes recommendations for pro-active measures and design validation.
- **Priority 4 (P4) -** Opportunity for improvement, for example to meet industry best practices. Also includes recommendations relating to proper documentation.

The observations and associated recommendations were reviewed with AEM during the site visit. New findings as well as the status of findings from previous annual inspections are summarized in Table 1. Note that Table 1 was issued to AEM for review and discussion on September 20, 2024. Additional detail and context are provided in Appendix A. Progress on the recommendations is summarized in Table 2.

Table 2 Status of Annual Review Recommendations

Priority	Open in 2023 Review	Closed or N/A in 2024 Review	Reclassified in 2024 Review	Open in 2024 Review
P1	0	0	0	0
P2	8	5	1	12
P3	19	13	0	11
P4	6	2	1	7
Total	33	20	2	30

3.0 CLOSING

We trust this letter meets your present needs. Please do not hesitate to contact us should you require anything further.

Yours truly,
Knight Piésold Ltd.

REGISTERED PROFESSIONAL ENGINEER
B.D. PEACOCK
LICENSEE
2025-02-03
NT/NU

PERMIT TO PRACTICE
KNIGHT PIESOLD LTD.
Signature
Date 2025-02-03
PERMIT NUMBER: P 647
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

Prepared:
Ben Peacock, P.Eng.
Specialist Engineer | Associate

Reviewed:
Robert A. Mercer, Ph.D., P.Eng.
Principal Engineer

Approval that this document adheres to the Knight Piésold Quality System: BDP

Attachments:

Table 1 Rev 0	Recommendations Summary
Appendix A	Meadowbank Complex - Amaruq Site - 2024 Annual Open Pit Geomechanical Inspection

/bdp

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TABLE 2

AGNICO EAGLE MINES LIMITED
MEADOWBANK COMPLEX - AMARUQ SITE

2024 ANNUAL OPEN PIT GEOMECHANICAL INSPECTION
RECOMMENDATIONS SUMMARY

Print Feb-03-25 11:39:39

Observations, Comment and Recommendations							
Category	**Topic**	**2022 Recommendations**	**2023 Status and Comments**	**2023 Recommendations**	**2024 Status and Comments**	**2024 Recommendations**	**Priority**
Design	**Rock Mass Characterization**	Undertake structural mapping to: a) Define the northwest dipping joint set in the lower Phase 2 Southeast Wall of the Whale Tail open pit b) Better define the extents of Structural Domain 5 in the Whale Tail open pit c) Validate the Brittle Structure model	This work has not yet been completed. The original recommendations remain relevant. Key decisions are being made based on the Brittle / High Strain Structure model (e.g., Whale Tail open pit lower Northeast Wall redesign, tactical measures for the Whale Tail open pit Northwest Wall, design of the IVR V2 open pit North Wall etc.), increasing the importance of validating the model through mapping in the open pits and underground mine. While it is unrealistic to assume that all structures will agree with the model, it is expected that many of the major structures will be able to be identified consistently across the open pit slopes.	Complete the original recommendation, with a particular focus on validating the Brittle / High Strain Structure model. Key areas include Design Sector A1K, E4, D4K, and IVR V2A. If there are significant changes to the interpretation of the structures, the potential impact on the open pit slope performance and design should be assessed. Priority increased to P2.	This work has not yet been completed. The original recommendations remain relevant. Structural mapping has not been completed since 2023 inspection.	Complete regular structural mapping with the objectives of: - Confirming the general structural trends (e.g., the dip of the foliation). - Identifying prominent structures that can strongly influence slope performance, including the Brittle / High Strain Structures. - Confirming the extents of Structural Domain 5 in the South Wall of the Whale Tail Pit. - Validating the Brittle / High Strain Structure model. Key areas include Design Sector A1K, D4K, H5, G5 and IVR V2A. If there are significant changes to the interpretation of the structures, the potential impact on the open pit slope performance and design should be assessed.	P2
		Complete geomechanical mapping on a regular basis, consistent with the commitments in the GCMP. Mapping is particularly important in Q2 and Q3 when the bench faces are clear of snow. The mapping should focus on critical areas of the open pit, including Design Sectors D4K and F6 of the Whale Tail pit and V0A, V2A and V2E of the IVR pits.	The Rock Mechanics team commits to undertaking spot mapping every 150 m along each of the final benches. The mapping is not reliably completed; 18 locations were mapped in the first quarter of 2023 but none were mapped in the second quarter. The mapping to date has been focussed on critical areas in Design Sector D4 of the Whale Tail pit and Design Sector V0A of the IVR V1 pit, which is endorsed. The mapping should also include Design Sectors A1K F6 at the Whale Tail pit and Design Sectors V2A and V2E of the IVR V2 pit.	Complete the original recommendation. The mapping should include Design Sectors A1K, D4, D4K, F6 and IVR V2A and V2E.	Geomechanical mapping has not been completed since the 2023 inspection. The commitment for spot mapping has been reduced from "once every 150 m along each of the final benches" to on a "as needed basis". There is a need for periodic mapping to confirm the rock mass characteristics that underpin the design recommendations or when unexpected/unusual conditions are encountered (e.g., sheared Mafic Volcanics).	Complete geomechanical mapping to confirm the rock mass design parameters and characterize any unusual or unexpected conditions. The mapping could be completed annually or when unusual conditions are observed. The commitment in the GCMP should be clarified accordingly.	P3
	Open Pit Design	Review the risks associated with future access below the failure in the Phase 1 North Wall of the Whale Tail open pit for water management purposes. Implement mitigation measures as appropriate.	This will be done when access is needed to Phase 1.	Complete original recommendation prior to re-accessing Phase 1 of the Whale Tail open pit.	The failure has been mined out and is no longer a hazard.	None.	N/A
		(New Recommendation in 2023)	The Whale Tail Extension is planned to be used for water management purposes in the future. This will require periodic access along the ramp. The ramp is located within poor quality Komatiite and ravelling and small-scale rockfall is likely to occur over time.	Review the risks associated with future access along the ramp in the Whale Tail Extension for water management purposes. Implement mitigation measures as appropriate.	The Whale Tail Extension is considered an active working area when it is used for dewatering activities, and is included in the official wall inspections that are completed every two weeks. When the area is inactive for an extended period (e.g., over the winter), access is prevented with a berm. A special inspection is completed by Rock Mechanics before personnel can re-enter the area. Permission for re-entry is communicated via email.	None.	Complete
		(New Recommendation in 2023)	The IVR V1 open pit is currently inactive and barricaded but is planned to be used for water management purposes in the future. This will require periodic access along the ramp and rockfall hazards are present above and below the ramp. An existing multi-bench failure on the North Wall could break back further into the ramp.	Review the risks associated with future access along the ramp in the IVR V1 open pit for water management purposes. Implement mitigation measures as appropriate.	IVR V1 is considered an active working area when it is used for dewatering activities, and is included in the official wall inspections that are completed every two weeks. When the area is inactive for an extended period (e.g., over the winter), access is prevented with a berm. A special inspection is completed by Rock Mechanics before personnel can re-enter the area. Permission for re-entry is communicated via email.	None.	Complete
	Review of 5-Year Mine Plan and LOM	(New Recommendation in 2023)	The review of the IVR V2 007 mine plan considered the potential influence of the high-strain/brittle structures on bench scale failures. However, the potential for inter-ramp scale failures on the footwall was not considered. The influence of changing wall orientation on the potential for kinematic failures was also not considered.	Consider the potential for inter-ramp scale failures in addition to bench and overall slope scale failures during reviews of the mine plan.	The potential influence of the high-strain / brittle structures on the performance of the IVR V2 open pit slopes was evaluated by KP in 2024. The results of the review are documented in letter NB24-00250 issued in March 2024.	None.	Complete
		(New Recommendation in 2024)			Recovery of the crown pillar between the underground workings and the open pit is planned for the second half of 2026. Extraction of the crown pillar is likely to adversely influence slope performance, including in areas that have performed well to date. A workshop was held on August 21, 2024 to review the risks associated with the recovery of the crown pillar and to identify potential control measures. A series of follow-up action items were identified.	Implement the actions identified during the crown pillar workshop. Assign priorities and track progress.	P3
		(New Recommendation in 2024)			The benches below the ramp in the Northeast Wall of the Whale Tail open pit are intended to be established during the winter months in order to take advantage of the strengthening effect of the permafrost. The benches will then be buttressed. In the current LOM, the first two benches are established by the end of September 2025. This is likely too early to ensure that the benches remain frozen. Mining in this area is planned to be completed by April 2026.	Review the timing of the development of the benches below the ramp in the Northeast Wall of the Whale Tail open pit and ensure that they will remain frozen between development and buttressing prior to freshet. Ensure the construction of the buttress is included in the LOM and Budget mine plans. Note that there may be an opportunity to recover more ore in this area if a greater number of benches can be excavated and buttressed during the winter than currently planned.	P2
	Design Verification and Optimization	Review the failure in the Phase 1 North Wall of the Whale Tail open pit in greater detail to better understand the failure mechanism, likely contributing factors, and the potential for the failure to continue below the ramp. A Maptek scan is recommended to better define the failure geometry.	A detailed review and back-analysis of the failure had not been completed at the time of the audit. A Maptek scan has been completed for the failure.	Complete the original recommendation.	A detailed review and back-analysis of the failure has not been completed. However, Phase 1 has been essentially mined out, and there is now limited benefit to completing this review.	None.	N/A
		Document the bench performance and key rock mass characteristics in the IVR V2 open pit and compare them to the design. In particular, it is important to verify that the north wall is being established in the Mafic Volcanics and below the Brittle Structure expected along the contact between the Mafic Volcanics and the Komatiite as the slope geometry recommendations for the V2A and V2E design sectors are based on this premise.	The bench performance of the IVR V2 open pit was reviewed as part of the Open Pit Ground Control Quarterly Reports in Q3 2022 and Q1 2021. The lithologies and high-strain/brittle structures exposed in the open pit slopes have not been reviewed relative to the design. The rock mass quality and structure encountered in the pit had not been quantitatively documented at the time of the audit.	Document the lithology, rock mass quality, and rock mass structure at regular intervals in the IVR V2 pit and compare them to the design. Continue to document and review the bench performance. KP is in the process of completing a detailed review of the design of the IVR V2 open pit , including the bench performance and rock mass characteristics.	Documentation of the lithology, rock mas quality, and rock mass structure in the IVR V2 pit has not been completed in 2024. This is because mining has focussed on the pushback of the west wall where the slope performance is less sensitive to the expected variation in rock mass characteristics. These activities should be resumed once mining restarts on the footwall (i.e., V2A design sector). The review of the design of the IVR V2 open pit was completed by KP in 2024. The review is documented in letter NB24-00250 issued in March 2024. The slope performance in the V2A design sector will be sensitive to the position and characteristics of the high-strain/brittle structures. The bench performance of the final walls is reviewed as part of the quarterly reports.	Document the lithology, rock mas quality, and rock mass structure in the V2A design sector of the IVR V2 pit, with a particular focus on the position, orientation, and characteristics of the high-strain/brittle structures. The existing benches should be mapped as soon as practical and periodic mapping should be planned for when mining resumes in this design sector.	P3
		(New Recommendation in 2024)			The catch bench width compliance for the IVR V2 pit continues to be challenging, with only 60% of the catch benches established to date achieving a width of 8 m. Approximately 85% of the catch benches achieved a width of 6 m, which has been demonstrated to be adequate for retaining rockfall. The underperforming catch benches are not limited to any one design sector, and include walls with favourable rock mass conditions. As a result, it is likely that the cause is linked to operational factors. The on-going efforts to reduce backbreak appear to be having a positive effect but this has not been quantified.	Review the causes of the poor catch bench width compliance in the IVR V2 pit including drilling, blasting, and scaling practices resulting in crest loss and/or hard toes. Summarize the status and effectiveness of the previous initiatives to reduce the catch bench loss. Implement measures to improve the catch bench width compliance and track their progress (e.g., on a monthly or quarterly basis). The mine needs to demonstrate that the minimum catch bench width can be reliably achieved or the design catch bench width will need to be increased or a variance obtained from the WSCC. Priority based on potential for an order from the regulator.	P2
		(New Recommendation in 2024)			Rock Mechanics has recently started to review and document the catch bench width compliance for the Whale Tail pit. Previous efforts focused solely on measuring the backbreak and this change is endorsed.	Complete systematic reviews of the catch bench width compliance for all new benches in the Whale Tail pit.	P3
		(New Recommendation in 2023)	The redesign of the Northeast wall of the Whale Tail open pit is based in part on the results of a numerical model that have not yet been validated. There is a need to validate the numerical model results and thus the slope design.	Use the numerical model to define criteria for comparing the model results to the observed/measured performance of the Northeast Wall. Use these criteria to verify the slope design.	This work remains outstanding. The mine has installed an SAA and three GNSS beacons in the Northeast Wall since the previous annual inspection and the SSR has recently been moved to a position on the South Wall where it will have long-term coverage of the Northeast Wall. These data can be used to validate the numerical model and better predict both the long-term slope performance and the impact of crown pillar recovery on the slopes.	Periodically compile and review the data from the SSR, GNSS beacons, and SAA. The interpretation of the slope deformation developed from these data should then be compared to the slope performance predicted by the model. It is recommended that this be done quarterly or semi-annually. Priority increased to P2 based on the time available to collect and review these data before the crown pillar is recovered.	P2
		(New Recommendation in 2024)			The open pit is reaching the expected boundary between Structural Domains 5 and 6. The position of this boundary is uncertain and is based on discontinuity orientation data from a limited number of drillholes. There is a significant difference in the expected slope performance and the slope geometry recommendations for design sectors H5 and G5 in Structural Domain 5 and the overlying design sectors H6 and F6 in Structural Domain 6. It is important that the appropriate slope geometry is implemented for the encountered conditions. The observed slope performance in the Southeast Wall suggests that Design Sector F6 may extend deeper than currently planned.	Confirm the extents of Structural Domain 5 and adjust the implementation of the slope geometry recommendations for the South and Southeast walls accordingly (i.e., Design Sectors H6/H5 and F6/G5).	P2
		(New Recommendation in 2024)			The open pit slope geometry recommendations and expected slope performance for the future lower Northwest and North Wall of the Whale Tail open pit is sensitive to whether or not, and to what degree, the S1-S2 foliation and Brittle / High Strain Structures folds and dips to the north at depth in the pit. There is limited drillhole coverage of this area.	Review the confidence in the dip of the foliation and Brittle / High-Strain Structures at the base of the final Northwest and North walls of the Whale Tail open pit. If the confidence is limited, collect additional data to confirm the orientation of the S1-S2 foliation and the orientation and position of the Brittle / High Strain Structures in this area. This could be through diamond drilling or through mapping of the cross-cuts on 260L in the underground mine.	P3
Implementation: Excavation	**Thermal Capping**	Remediate the thermal cap in the IVR V2 "Turtlehead".	The thermal cap was not remediated. Mining of the "Turtlehead" is now complete and access to the area has been limited with a berm. As a result, there is no exposure of personnel to the rockfall hazard caused by the gaps in the thermal cap.	Whether or not remediation of the thermal cap is required given the lack of exposure should be confirmed with the WSCC. Priority reduced from P2 as mining is no longer occurring in the area and personnel are not exposed to the rockfall hazard. Recommendation can be removed if WSCC confirms the regulatory requirement is not applicable.	It is understood that the mine inspector visited the area with AEM and did not have any concerns.	None.	N/A
	Drill and Blast	Complete the recommended blasting trials. In particular, the development of a blasting pattern for the Komatiite is likely to be beneficial to bench performance.	Initial trials were completed but further work stopped due to the departure of several Drill and Blast personnel. To date, the trials have not resulted in significant changes to drilling and blasting practices. The mine intends to revisit the trials in the future.	Complete the original recommendation.	The Drill and Blast team is trialling different options for reducing crest loss and blast damage. The backbreak associated with each trial is assessed. Electrical detonators have been implemented. The changes appear to be resulting in improved bench performance in the Komatiite.	Continue the trials. Sufficient progress has been made that this recommendation has been closed. The impact of drill and blast practices on catch bench performance at IVR V2 will need to continue to be tracked as part of the recommendation above.	Complete
		Implement a year-round blasting quality control program, at a minimum measuring blasthole depth.	A blasting quality control program has not been implemented.	Complete the original recommendation.	The drills have been outfitted with a Wenco system that tracks hole depths and angles. Drilling quality control has improved.	None.	Complete
	Water Management	(New Recommendation in 2023)	The sump on the 5081 bench of the South Wall of the Whale Tail open pit is unlined. Water from the sump is seeping through the face of the bench below and will create an ice wall during winter. The ramp will eventually be located below this location.	Evaluate options for lining the sump to limit the re-infiltration of water.	The base of the sump was sealed with a combination of Komatiite, bentonite and cement and the walls were lined. Unfortunately the liner was subsequently damaged during ice clearing activities.	None. The mine has other indicatives underway to manage the groundwater seepage in the South Wall.	Complete

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TABLE 2

AGNICO EAGLE MINES LIMITED
MEADOWBANK COMPLEX - AMARUQ SITE

2024 ANNUAL OPEN PIT GEOMECHANICAL INSPECTION
RECOMMENDATIONS SUMMARY

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Observations, Comment and Recommendations							
Category	**Topic**	**2022 Recommendations**	**2023 Status and Comments**	**2023 Recommendations**	**2024 Status and Comments**	**2024 Recommendations**	**Priority**
Implementation: Inspections and Monitoring	**Inspections**	(New Recommendation in 2023)	A potential wedge has been identified in the Northwest wall of the Whale Tail Open pit, above the Phase 2 ramp. If the wedge were to fail, it is likely that material would reach the ramp. The wedge is currently being monitored using visual inspections, drone surveys, and the slope stability radar.	Continue to monitor the wedge. If further deterioration of the wedge is observed, review and implement mitigation measures (e.g., knocking down the wedge).	No change was observed in the wedge relative to the 2023 annual inspection. The Rock Mechanics team continues to monitor the wedge as part of the regular open pit inspections.	This recommendation is being closed as the wedge is being routinely monitored as part of the ground control program at the mine.	N/A
		(New Recommendation in 2023)	IVR West 2 was barricaded upon completion of mining. This was an effective method of managing the risk associated with the identified rockfall hazards in the pit. It was identified during the 2022 annual review that access would eventually be required for dewatering purposes and that the construction of a rockfall berm along the inside of the ramp was recommended prior to re-entry. However, in late June or early July, dewatering personnel were allowed access to install a pump at the base of the ramp. The rockfall berm had not been constructed. A rock mechanics inspection was not completed prior to personnel accessing the pit. The pump was installed below a rockfall hazard and adjacent several large blocks that had fallen onto the ramp. These rockfall hazards were either not identified by the dewatering personnel or were identified and no action was taken. The hazard was identified during the 2023 annual inspection and the pump was removed and the pit barricaded the following day.	Ensure that a rock mechanics inspection is completed before work activities resume in barricaded areas. The intent is to re-assess existing hazards and to assess whether new hazards have developed over time. All hazards should be mitigated before access is allowed. A rockfall berm should be constructed along the inside of the ramp if the IVR West 2 pit is used for water management in the future. Prior to the removal of the pump and the re-establishment of the barricade, this was a P1 priority.	A rock mechanics inspection is now completed before work resumes in a closed area/open pit. These areas are tracked on the Hazard Maps. A rockfall berm has not been constructed along the inside of the ramp in the IVR West 2 pit. However, access to the IVR West 2 pit is prevented by a berm and access is not currently planned.	None.	Complete
		Review the use of the Hazard Maps: a) Refine the legend on the Hazard Map to clearly note the restrictions associated with the risk ratings (e.g., Yellow – Spotter Required). b) Provide more detailed guidance, including examples, on how to determine the risk ratings. c) Consider the use of physical markers (e.g., pylons) in the open pit to remind personnel of hazards that are not bermed off (e.g., Yellow Zones). d) Consider a separate method for communicating the corrective actions to Operations so that it is clear that the Hazard Map is closed on existing hazards rather than whether or not work has been completed. This could be captured within the Bench Approval process. e) Two of the hazards noted as requiring ongoing monitoring in the Hazard Tracking Database have been removed from the hazard map. All current hazards requiring mitigation should be shown on the Hazard Map.	The use of the Hazard Maps has been reviewed. a) The legend has been revised to clearly indicate the need for a spotter in Medium Risk (Yellow) areas b) There continues to be limited guidance on how to determine the risk ratings. The mine relies on practical training by the Rock Mechanics Coordinator. While the training is important, the ratings are a critical aspect of hazard management at the mine and more detailed formal guidance on their selection should be developed. c) The mine has considered the use of physical markers in the open pit to demarcate the Yellow hazard areas that are not bermed off but has concluded that it would be impractical to implement d) The Hazard Map is focussed on rock mechanics hazards. While corrective actions related to the identified hazards are noted on the map, the corrective actions are primarily communicated and tracked through the Pit Wall Approval procedure and the Hazard Tracking Database. e) Not all existing hazards are shown on the map. This is discussed separately as a new recommendation under Hazard Tracking, below	Provide more detailed guidance, including examples, on how to determine the risk ratings. Priority has been revised to P3.	This work remains outstanding.	Complete the 2023 recommendation. The objective is to promote consistency among rock mechanics personnel and to help guide less experienced personnel.	**P3**
		Review the Pit Wall Approval process: a) Review the communication of bench approvals with Engineering and Operations to ensure that the process is reliably followed b) Incorporate a checklist to improve consistency between staff and avoid hazards being missed c) Limit approvals in key sectors (e.g. WHL F6) to experienced staff	The list of upcoming patterns is reviewed each morning during the daily production meeting. This includes whether or not the walls adjacent the pattern have been approved. The mine is in the process of updating the Pit Wall Approval procedure so that patterns are only released to Survey once the required wall approvals are completed. This is endorsed. A checklist has not yet been implemented. The Rock Mechanics team currently relies on practical training in the field for new staff. Approvals in key sectors are now only completed by experienced staff.	Update the Pit Wall Approval procedure as planned. Continue to recommend the development of a checklist to improve consistency between staff and avoid hazards being missed. Priority has been revised to P3.	The Pit Wall Approval procedure has been updated so that patterns are only released to the drillers and Survey once the required pit wall approvals are completed. This is an excellent approach.	None.	Complete
					A checklist has not yet been implemented. The Rock Mechanics team currently relies on practical training in the field for new staff.	Continue to recommend the development of a checklist to improve consistency among staff and to avoid hazards being missed.	**P4**
		(New Recommendation in 2024)			The Rock Mechanics team completes drone surveys of the open pit slopes each month during the summer. While the photos and videos are saved on the network, the results of the surveys are not reported.	Document the drone surveys in brief reports. The reports should present the conditions in key areas as well as any observations of slope instability or unusual conditions.	**P3**
	Instrumentation and Monitoring	Formally identify sectors of the open pit where SSR is a critical control for achieving an acceptable level of residual risk. Develop a process to stop or modify mining activities in these areas when SSR coverage is not available. This could be captured within the SSR TARP.	Sectors of the open pit where SSR is a critical control are now identified in the Ground Control Monitoring Using Radar System Procedure (Northeast and Northwest Walls of the Whale Tail open pit). When the SSR is offline, a Grey Alarm is triggered. On day shift, the Rock Mechanics team would be aware of the alarm and could stop or modify mining activities in these sectors. However, on night shift Dispatch does not contact the Rock Mechanics team if a Grey Alarm is triggered. As a result, no action would be taken until the start of the next day shift.	Empower Dispatch to pull personnel out of sectors where SSR is a critical control in the event that the SSR is offline (e.g., a Grey Alarm triggers). Update the procedure to reflect this change.	The process has been changed. Dispatch contacts Rock Mechanics any time a Grey Alarm is triggered, including on night shift.	None.	Complete
		Review the effectiveness of the SSR alarm parameters in 2022 and establish a commitment to review the parameters annually.	The SSR alarm parameters had not been reviewed at the time of the audit. It is understood that the mine intends to implement an annual review.	Complete the original recommendation.	The SSR alarm parameters were reviewed by Tetratech in July, 2024 after the rockfall on the WHL South Wall. The velocity threshold was reduced from 1.3 mm/hr to 1 mm/hr over 2 scans and 3 pixels. Alternate time periods and pixel configurations were considered.	None.	Complete
		(New Recommendation in 2024)			The SSRs for the Whale Tail pit have been moved to semi-permanent locations. This will result in a much longer-term set of monitoring data to assess the slope performance than has been available to date. The Komatiite in the Northeast and Northwest slopes is likely to experience more deformation over time than the other lithologies. It is possible that this deformation could be a precursor to a large-scale instability. The current SSR alarms are focussed on relatively brittle small-scale failures and the mine would benefit from defining additional alarms that consider longer-term trends over a larger area of the slope.	Define additional SSR alarms that consider the potential for large-scale slope instability that manifest over an extended period. The length of the period is likely to be limited by noise in the data (e.g., atmospheric effects).	**P2**
		(New Recommendation in 2024)			The SSR alarm parameters are currently reviewed infrequently and on an ad-hoc basis. The SSR is a key tool for managing the risk associated with slope failures at the mine and there is a need to periodically review the effectiveness of the alarm parameters.	Define a commitment to review the effectiveness of the SSR alarm parameters on an annual basis, if the observed/anticipated slope performance changes, or if a significant instability did not trigger an alarm. The alarms should be updated as necessary based on the results of the review. GroundProbe's GSS can assist with the review process if needed.	**P3**
		Define a red trigger for the SSR TARP to provide a backstop for unprecedented or unexpected conditions.	A global Red Alarm trigger has not been defined. The intent is to define these on a case by case basis for high risk activities requiring constant monitoring.	Continue to recommend the development of a Red Alarm for at least the areas of the open pit where SSR is a critical control. The intent is to capture unprecedented or unexpected conditions.	A Red Alarm has not been developed and the mine's preference is to always have Rock Mechanics in the loop before a decision is made to evacuate personnel from a particular area. The mine has retained GroundProbe's Geotechnical Support Services (GSS) to provide 24/7 remote monitoring of the SSR. Alarms and unusual trends are communicated to the Rock Mechanics team, including a member on call during the night shift. As a result, someone from the Rock Mechanics team reviews all alarms promptly. The use of GSS reduces the likelihood that an unprecedented / unexpected instability is missed.	This recommendation is being closed. However, the development of a Red Alarm would provide a backstop to the current SSR monitoring process and may still be needed in the future depending on the slope performance or mining activities. If a Red Alarm will not be defined, it should be removed from the TARP.	N/A
		(New Recommendation in 2023)	The TARP indicates that Rock Mechanics personnel are to be contacted if a Grey Alarm is triggered. However, the alarm notification itself says not to contact Rock Mechanics.	Revise the notification for the Grey Alarm so that it is consistent with the TARP.	The Grey Alarm notifications have been aligned with the TARP.	None.	Complete
		Explain in the GCMP or radar monitoring procedure why the SSR alarms have been set at their current values and provide guidance on how they can be adjusted based on different circumstances.	The Ground Control Monitoring Using Radar System Procedure sets out the current alarm triggers and when they can be adjusted. However, no guidance is provided on how to adjust them based on different circumstances.	Complete the original recommendation. While it is recognized that it is not practical to cover all eventualities, recommend providing additional guidance on how to define alarm criteria.	This work remains outstanding.	Complete the original recommendation.	**P4**
		Implement an additional surface monitoring system, such as prisms or GPS beacons, to complement the SSR, provide a long-term deformation baseline, and to allow the true displacement vector to be measured.	The Rock Mechanics team has researched the use of GPS beacons but the purchase of these beacons had not been budgeted or planned at the time of the audit. The mine is trialling the use of corner reflectors as history / reference points for the SSR. This is endorsed.	Complete the original recommendation. The GPS beacons are promising. Recommend budgeting for the installation of several beacons.	Four GNSS/GPS beacons have been installed in the Whale Tail open pit, and the mine has budgeted for five more beacons in 2025.	None.	Complete
		(New Recommendation in 2024)			The existing GNSS/GPS beacons are installed in areas identified as having an increased potential or consequence of slope deformation. This is reasonable. However, there is value in having one or more beacons installed in areas expected to be stable in order to define a baseline.	Develop a comprehensive monitoring plan for the LOM. As part of the plan, Install GNSS/GPS beacons on the North Wall of the Whale Tail pit in the Greywacke. Installing the beacons in the lower North Wall will also allow them to be used to assess whether the Greywacke starts to deform during recovery of the crown pillar as predicted by the numerical model.	**P3**
		(New Recommendation in 2024)			The GNSS/GPS beacons have been installed but are not yet fully integrated into the mine's monitoring system. As a result, the data are not consistently available or reviewed for trends. Trigger thresholds, alarms, and a TARP have not yet been developed. There is considerable scatter (e.g., +/- 2 cm) in the data. It is likely that the raw data are being presented without processing.	Fully integrate the GNSS/GPS beacons into the mine's monitoring system, including MonitorIQ. Define a TARP and alarms for the beacons. Review the scatter in the data with the service provider. One option to better understand the accuracy of the instruments is to compare the data with the deformation reported by the SSR.	**P2**
		(New Recommendation in 2024)			The ramp above the South Wall failure in the Whale Tail pit is currently restricted to single lane traffic. The failure was reviewed in detail as part of the annual inspection. Further progression of the failure towards the ramp was identified as unlikely but possible. Re-opening the ramp to two-way traffic will require the implementation of monitoring and mitigation measures to manage the risk associated with this possibility.	Develop a monitoring and mitigation plan for the failure in the South Wall of the Whale Tail pit, below the ramp. One option discussed during the annual inspection would be to re-position the berm at the crest of the failure, to prevent access to the area affected by the plausible progression of the failure. The failure could then be monitored using a combination of the SSR and visual inspections. A location-specific alarm should be defined for the failure (e.g., using the criteria suggested by GroundProbe).	**P2**
		(New Recommendation in 2023)	The design of the IVR V2 open pit North Wall is sensitive to the position and orientation of the High Strain / Brittle Structures, as well as the presence of Komatiite. This is one of very few design sectors at Amaruq where the potential for inter-ramp scale failures limited the slope design. As a result, increased monitoring is recommended.	Plan for full-time SSR coverage of the North Wall of the IVR V2 open pit once mining extends further to depth in 2024.	The purchase of a third SSR unit to allow for full time coverage of the IVR V2 open pit is being considered for the 2025 budget. Mining of the North Wall is currently paused as mining activities are focussed on the pushback to the west.	Plan for full-time SSR coverage of the North Wall of the IVR V2 open pit once mining of the North Wall resumes. The SSR should be supplemented with other monitoring systems (e.g., GNSS/GPS beacons, SAAs, etc.). Develop an overall monitoring plan for the IVR V2 North Wall.	**P3**
		(New Recommendation in 2023)	The mine has planned and budgeted the installation of Shape Array Accelerometers (SAAs) and Vibrating Wire Piezometers (VWPs) in the Northeast wall of the Whale Tail open pit. This is endorsed. The original plan was for three instrumented drillholes but this has since been reduced to two.	Recommend implementing the original plan for three instrumented drillholes. This will improve the coverage of the Northeast wall above the future ramp position and will provide additional redundancy in the event that an instrument is damaged.	Two instrumented drillholes were completed. One of the SAAs was damaged during installation and sub-surface deformation monitoring is limited to the upper Northeast wall as a result. Access to the benches above the ramp in the Northeast wall is no longer practical.	None.	N/A
	Hazard Tracking	Implement a mechanism within the Hazard Tracking Database to flag overdue corrective actions. If an action has been superseded or the hazard mitigated through other means the action should be closed out.	Hazards with overdue corrective actions or that have been unmitigated for extended durations are not flagged. In some cases, corrective actions that have been superseded are noted as such and the action closed out, but this is not consistently done. This aspect of this recommendation is discussed as part of the new recommendation below.	Complete the original recommendation.	A mechanism within the Hazard Tracking Database to flag overdue corrective actions remains outstanding. There is a need to clean up the database so that is it an effective tool.	Complete the original recommendation.	**P2**
		(New Recommendation in 2023)	Not all identified hazards are documented in the Hazard Tracking Database. For example, the rockfall hazard above the ramp in the IVR West 2 Pit identified during the 2022 annual inspection was not documented and had not been mitigated prior to the 2023 annual inspection. No hazards were recorded in the database in July or August 2023.	Review the use of the Hazard Tracking Database with the Rock Mechanics team. Ensure all identified hazards are documented. Consider tracking the number of entries each month to monitor both wall performance and how well the database is being used.	The Hazard Tracking Database has been regularly used since the last annual inspection and no hazards were observed to be missing.	None. Consider tracking the number of entries each month to monitor both wall performance and how well the database is being used. This is covered by the recommendation on the Quarterly Summary Reports, below.	Complete
		(New Recommendation in 2023)	There are multiple hazards documented in the Hazard Tracking Database that have not been closed out but are noted as being removed from the Hazard Maps as mining is not currently occurring in the area. There is no mechanism to ensure these hazards are revisited or mitigated before mining in the area resumes.	Develop a process to track hazards that have not been eliminated but are being managed through exclusion zones (or other means of limiting exposure). The intent is to ensure they are identified, communicated to personnel and mitigated prior to resuming work in the area. For example, this could be accomplished using a new status in the database and/or with a separate layer on the Hazard Maps.	This work remains outstanding.	Complete the original recommendation.	**P2**
		(New Recommendation in 2023)	Not all rockfalls have been documented in the Rockfall Database. This is a key tool for understanding failures and for refining/validating the slope design and other control measures.	Document all rockfalls (at least to the extent practical) in the rockfall database. Define criteria for what type of events are recorded in the rockfall database. Events that resulted in injury or damage to equipment, or could plausibly have done so under different circumstances, should always be recorded in the database.	All rockfalls since the last annual inspection have been documented in the database, regardless of whether or not they are reportable to the mine inspector (> 50 t). However, the criteria for which rockfalls are to be documented is still limited to reportable rockfalls in the GCMP.	Define criteria for what type of events are recorded in the rockfall database. Events that could have plausibly resulted in injury or damage to equipment under different circumstances, should always be recorded in the database. Priority decreased to P4.	**P4**
		(New Recommendation in 2024)			A rockfall report is completed for all rockfalls and slope failures. The content of the reports varies but typically focuses on a factual description of the event (conditions and chronology), the consequences of the event, and the immediate corrective actions to be taken. While the reports are typically well done, they consider the events in isolation. Often the preliminary report issued within 24 hours of the event is not updated or elaborated on. Intelex reports are completed for rockfalls deemed to be Near Misses. There is a need to complete a more detailed review and back-analysis of some of these failures, both to identify root causes / lessons learned and to better anticipate similar failures in the future. Examples include: - Trends, such as the repeated failures along the Brittle / High Strain Structure in the Northwest Wall of the Whale Tail pit. - Failures with an increased consequence, such as the failure below the ramp on the Southwest Wall of the Whale Tail pit. - Unusual occurrences (e.g. larger failures) or cases where the existing procedures did not function as intended or desired.	Complete a detailed review and back-analysis of clusters of slope failures, unusual failures, or failures with an increased consequence. The review should consider: - The primary and contributing causal factors, including lithology, structure, water, temperature, blasting, etc. - The effectiveness of the applied controls - Lessons learned. - The potential for other similar failures. - Action or follow-up items Define a commitment for these reviews in the GCMP.	**P3**

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TABLE 2

AGNICO EAGLE MINES LIMITED
MEADOWBANK COMPLEX - AMARUQ SITE

2024 ANNUAL OPEN PIT GEOMECHANICAL INSPECTION
RECOMMENDATIONS SUMMARY

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Observations, Comment and Recommendations							
Category	**Topic**	**2022 Recommendations**	**2023 Status and Comments**	**2023 Recommendations**	**2024 Status and Comments**	**2024 Recommendations**	**Priority**
Implementation: Other Controls	**Managing Exposure / Barricades**	(New Recommendation in 2024)			Mining in the IVR V1 open pit and Whale Tail Extension is complete, but both are still accessed as part of the long-term water management strategy for the mine. As a result, personnel will be travelling on the ramps in these pits on an on-going basis. The mine currently manages geotechnical risks along the ramps, including rockfall hazards, through regular inspections by the Rock Mechanics team.	Evaluate the use of a rockfall berm along the inside of the IVR V1 open pit and Whale Tail Extensions ramps instead of relying on regular inspections to manage the rockfall hazard.	**P4**
		(New Recommendation in 2024)			The partial or complete loss of catch benches in the lower Southeast Wall of the Whale Tail pit directly above the ramp increases the rockfall hazard for the ramp in this area. While rockfalls have not been reported or observed in this area, the potential for rockfall has been identified.	Evaluate and implement measures for mitigating the rockfall hazard. For example, installing a rockfall barrier on the crest of the bench above the ramp.	**P2**
		(New Recommendation in 2024)			The loss of catch benches as a result of the failures in the Northwest Wall of the Whale Tail pit increases the hazard associated with rockfall in this area.	Construct a rockfall berm on the catch bench below the Northwest Wall failure.	**P2**
Ground Control Program	**Training**	Develop a skills matrix to help identify training needs.	A skills matrix has not been developed. The Rock Mechanics team has experienced significant turnover, with only three staff remaining from a year ago. This puts an increased demand on training and knowledge sharing.	Complete the original recommendation.	This work remains outstanding.	Complete the original recommendation. The recently developed Roles and Responsibilities document for the Rock Mechanics team is a good starting point.	**P4**
	Documentation	Add the following to the Quarterly Summary Reports to improve the communication of the completed rock mechanics activities and their effectiveness: a) The reports include a dashboard summary of the activities complete, but there is no reference to the commitments in the GCMP. Recommend including a column in the dashboard indicating the target frequency for the tracked items. b) Consider including a slide commenting on the effectiveness of the mine's controls (e.g. radar alarms, prior identification of rockfalls, etc.)	The recommended changes have not been implemented. While the reviews of the bench performance summarized in the reports are well done, the results are not consistently compared to expectations / the design basis.	Complete the original recommendation. Directly compare the results of the bench performance reviews to the bench design. For example, does the backbreak exceed the amount that was designed for?	The Quarterly Summary reports are comprehensive and well done. However, while they summarize the various activities of the Rock Mechanics team, they do not compare them to the relevant commitments. The effectiveness of the controls (e.g., radar alarms, visual inspections, etc.) have not been quantified. The reviews of the catch bench performance now compare the measured catch bench width to the 8 m minimum.	Complete the original recommendation.	**P4**
		(New Recommendation in 2023)	The commitment to issue the Quarterly Summary Reports is not being met. Reports were issued in Q1 and Q3 2023 but not in Q2.	Issue the Quarterly Summary Reports each quarter.	Quarterly Summary Reports were issued for Q3 and Q4 of 2023 and Q1 and Q2 of 2024.	None.	Complete
		The following comments are provided for the GCMP: a) Consider adding a one-page overview of the deposit geology and mine plan, including key information such as the ultimate pit dimensions, approximate mine life, major lithologies, etc. b) (5.2.1.3) - Review and revise the commitments for drone monitoring so that they are focussed and achievable c) (5.3.2) Clarify that the collected data should be compared to the design basis for the open pit in addition to looking for trends d) (5.4.1) Note that crack meters and extensometers have not been installed and clarify that vibrating wire piezometers and thermistors are not currently being monitored. A plan with the location of the instrumentation should be included or referenced. e) (5.5) Reference a register that tracks who has received what geomechanical training f) (B) Provide greater clarity and detail on the input the team provides to the mine planning and approval process. For example, the input to the Bench Master and 3MR g) Describe and include a commitment to the bench approval process	The updates to the GCMP incorporated changes b), c), d), f) and g). While the GCMP now includes a plan showing the location of the instrumentation, the plan is out of date.	a) Consider adding a one-page overview of the deposit geology and mine plan, including key information such as the ultimate pit dimensions, approximate mine life, major lithologies, etc. Focus on the major lithologies/domains and how they perform in the open pits. b) Reference a register that tracks who has received what geomechanical training. c) Update the plan showing the position of the instrumentation.	The GCMP was comprehensively updated in June 2024. As part of this, the plan showing the position of the instrumentation was updated. The GCMP now includes a brief discussion of Geotechnical Areas of Concern in each pit. This is a good practice. However, the discussion often does not include an overview of the slope instabilities and rockfalls that have occurred to date in those areas. The other recommendations remain outstanding.	Additional comments on GCMP content include the following: a) Consider adding a one-page overview of the deposit geology and mine plan, including key information such as the ultimate pit dimensions, approximate mine life, major lithologies, etc. Focus on the major lithologies/domains and how they perform in the open pits. b) Include a discussion of expected failure modes. For example, kinematic wedge or planar failures on the S1/S2 foliation are the dominant control on bench performance. c) Reference a register that tracks who has received what geomechanical training. d) Briefly describe the rockfalls that have occurred in the geotechnical areas of concern (Sec 3.1.2).	**P4**

REV	DATE	DESCRIPTION	PREP'D	RVW'D
0	03FEB25	ISSUED WITH TRANSMITTAL NB25-00120	BDP	RAM

APPENDIX A

Meadowbank Complex - Amaruq Site - 2024 Annual Open Pit Geomechanical Inspection

(Pages A-1 to A-63)

Meadowbank Complex - Amaruq Site

2024 Annual Open Pit Geomechanical Inspection

August 13 to 19, 2024

Knight Piésold CONSULTING

Adding value. Delivering results.

Outline

Introduction

Whale Tail Open Pit

IVR V1 & V2 Open Pits

IVR West Open Pits

AP5

Monitoring and Inspections

Ground Control Program

Introduction

Introduction

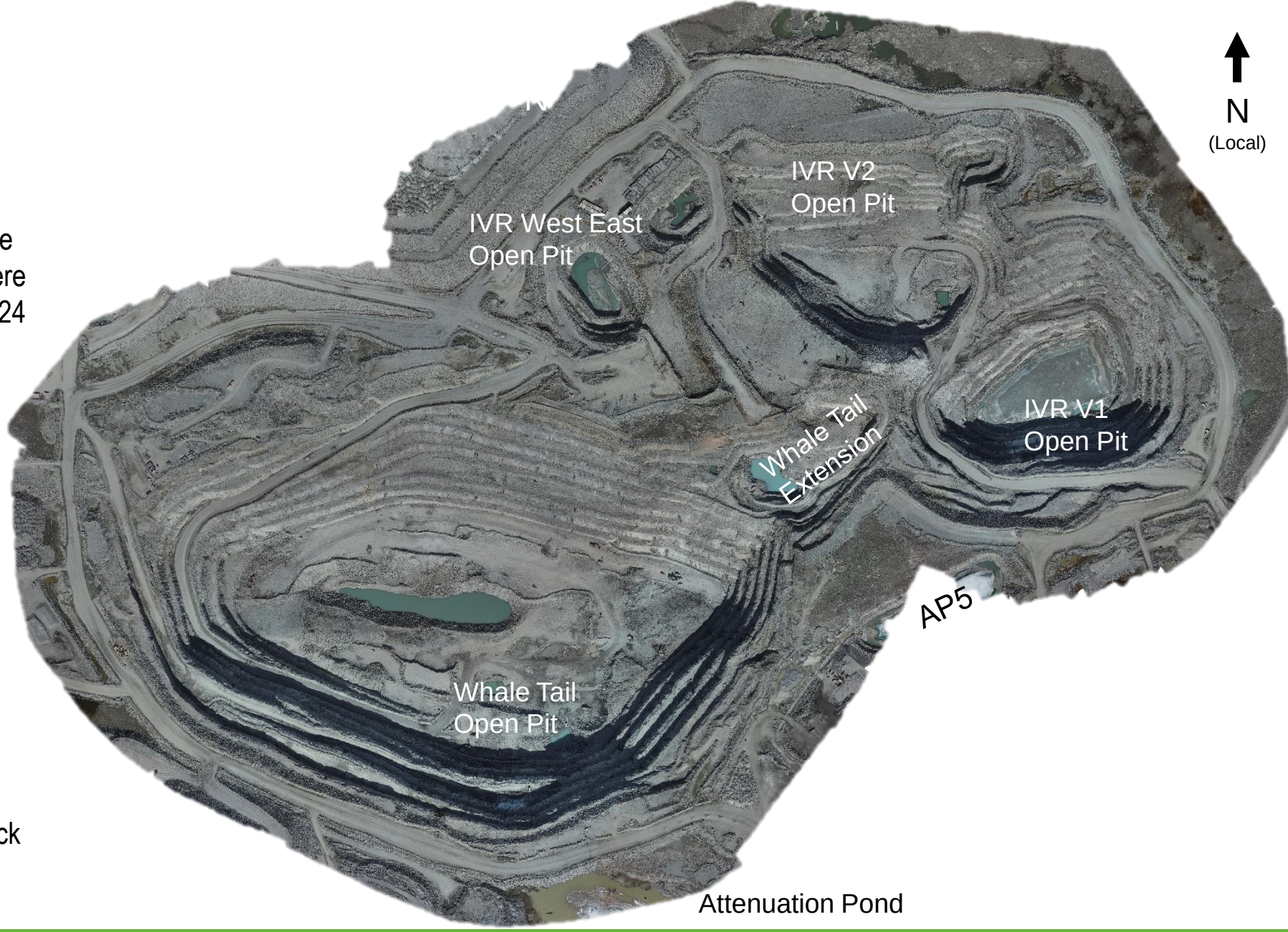
General

- Agnico Eagle Mines (AEM) operates the Meadowbank Complex in Nunavut. The complex consists of the Meadowbank and Amaruq Sites.
- The Amaruq Site consists of the Whale Tail and IVR deposits. The Whale Tail Open Pit entered commercial production in 2019 and the IVR V1 Open Pit entered production in 2020. Underground mining at the Whale Tail deposit is also underway.
- Knight Piésold (KP) has been providing geomechanical support for the Amaruq Site since 2015, including a 2018 feasibility design for the Whale Tail Open Pit, a 2019 feasibility design for the IVR V1 and V2 Open Pits, and several design studies for the underground mine. A detailed review of the Whale Tail Open Pit slope performance was completed in 2021 and 2022 and an evaluation of the expansion of the IVR V2 Open Pit was completed in 2024.
- KP has completed the annual inspections for the open pits at the Amaruq Site since 2019. The 2024 annual inspection was completed by Ben Peacock, P.Eng., during a site visit from August 13 to 19, 2024. The inspection is summarized in this presentation, along with a summary of other related discussion topics.

Introduction

Inspection

- The following open pits and surface excavations at the Amaruq Site were reviewed on August 13 and 14, 2024 (shown at right):
  - Whale Tail (WHL) Open Pit, including the WHL Extension
  - IVR V1 Open Pit
  - IVR V2 Open Pit
  - IVR West East Open Pit
  - AP5
- Christian Tremblay (Interim Engineering General Supervisor), Antoine Laporte (Interim Rock Mechanics Coordinator), Vincent Duranleau (Rock Mechanics Technician) and Katie Hawley (Rock Mechanics Engineer) of AEM participated in the inspections.

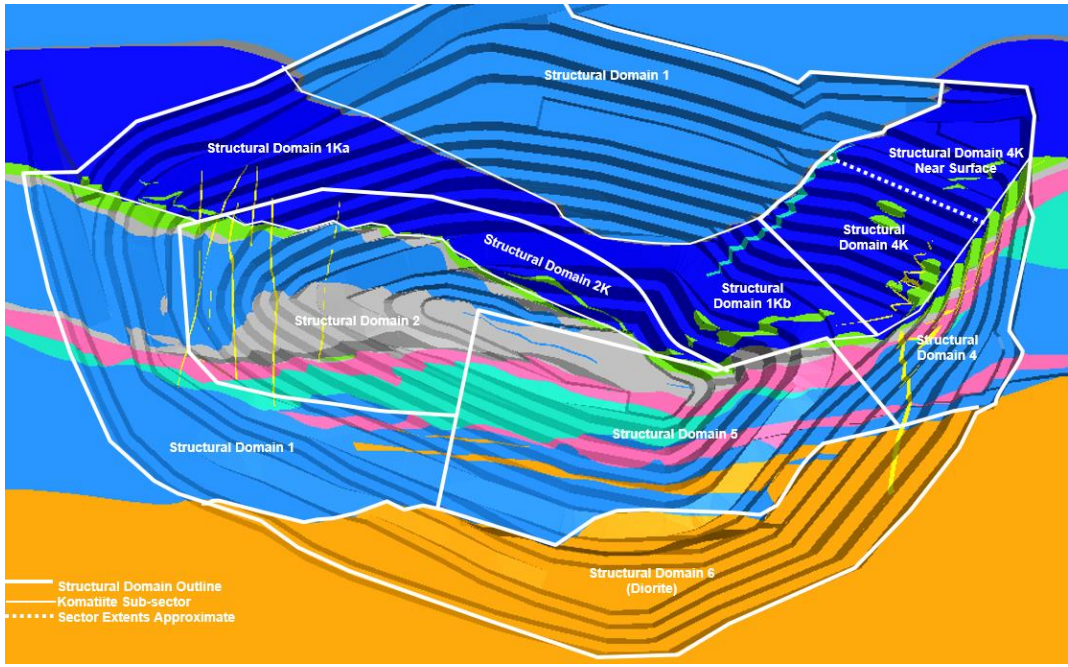


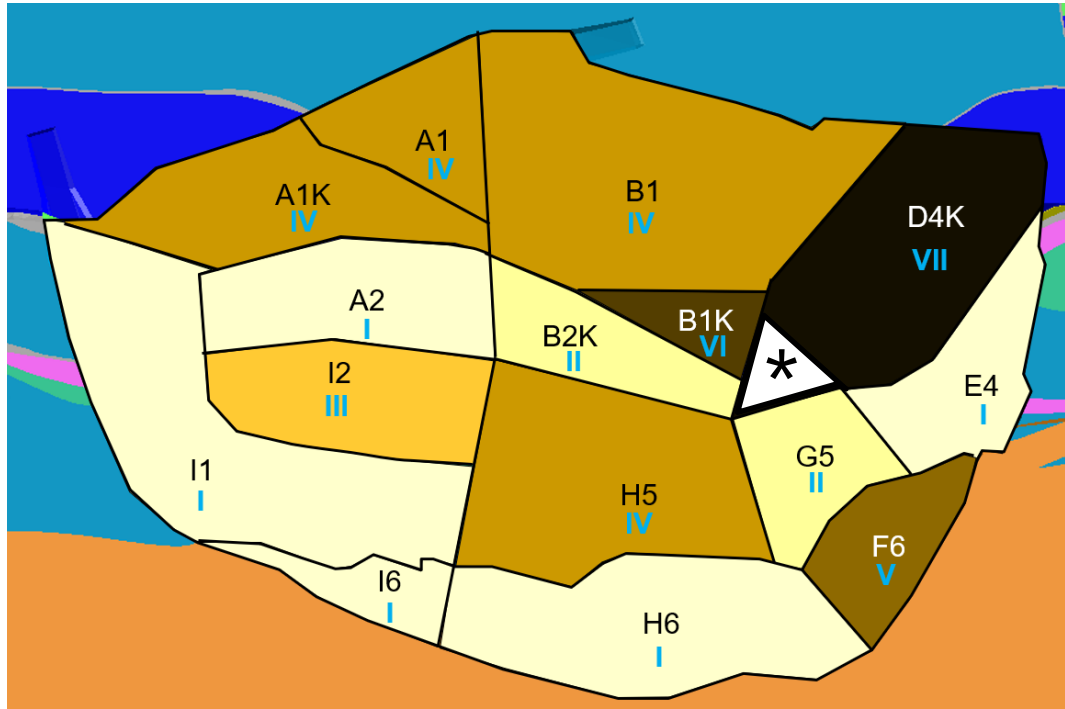
Whale Tail Open Pit

Whale Tail Open Pit

Design

- The WHL-14B open pit is the current design for the Whale Tail deposit
- The structural domains (which control the achievable slope geometry in many cases) are shown at upper right along with the lithologies expected in the final open pit walls.
- The design sectors and slope geometry recommendations are shown at lower right. The recommendations for the portion of Design Sector 1Kb below the ramp (marked with an "*" at lower right) vary with the strike of the wall. The benches striking 110° will be mined in the winter and buttressed before freshet.
- The catch bench width in Design Sector F6 was reduced from 16 to 13 m in 2023 based on a review by AEM.
- The WHL Extension at the northeastern end of the open pit is complete.





Bench Geometry Controlled by Bench-Scale Failures

III	BFA: 65° Bench Width: 10 m Bench Height: 21 m IRA: 47°
IV	BFA: 65° Bench Width: 10.5 m Bench Height: 21 m IRA: 46°
V	BFA: 75° Bench Width: 16 m Bench Height: 21 m IRA: 44°
VI	BFA: 55° Bench Width: 10.5 m Bench Height: 21 m IRA: 40°
VII	BFA: 55° Bench Width: 11 m Bench Height: 14 m IRA: 34°

Base Bench Geometry

I	BASE CASE BFA: 75° Bench Width: 10 m Bench Height: 21 m IRA: 53°
II	KOMATIITE BFA: 75° Bench Width: 10.5 m Bench Height: 21 m IRA: 52°

LITHOLOGY LEGEND:

- GREYWACKE
- CHERT
- KOMATIITE - NORTH LIMB
- KOMATIITE - SOUTH LIMB
- IRON FORMATION
- MAFIC VOLCANICS
- DIORITE
- RAMP FAULT

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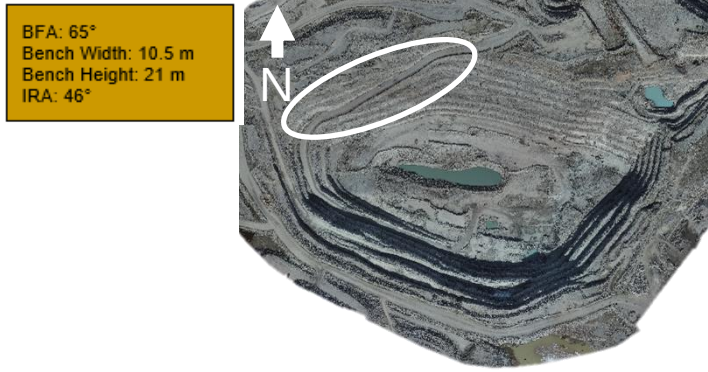
Whale Tail Open Pit

Inspection

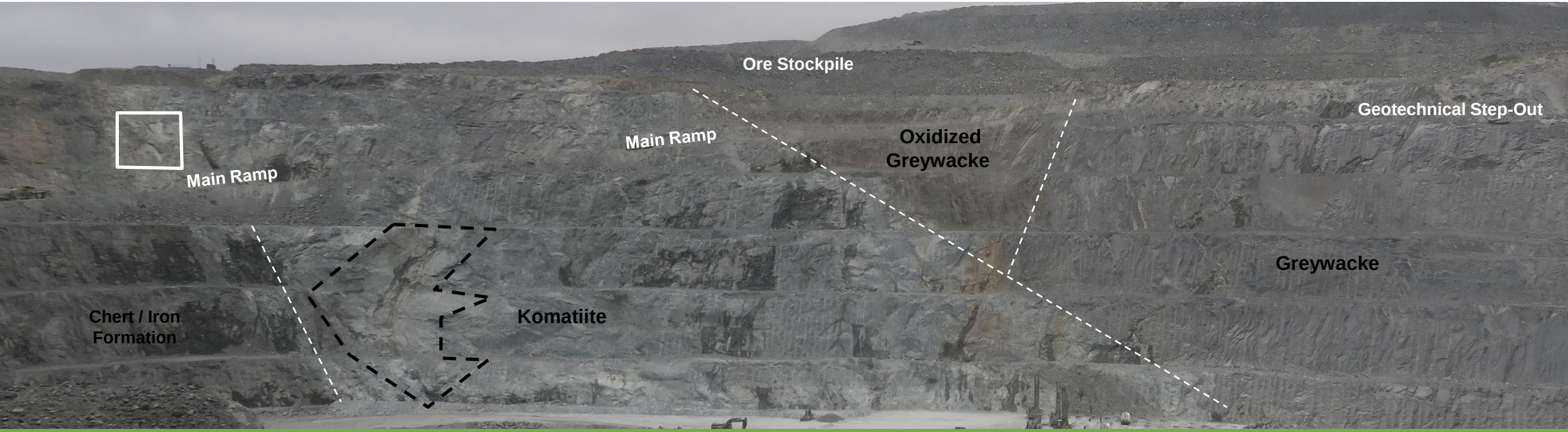
- The Whale Tail open pit was inspected on August 13 and 14, 2024. Observations made during the inspection are summarized on the following slides.
- The approximate open pit geometry at the time of the visit is shown at right. The walls inspected are labelled relative to mine north. The labels in brackets refer to the related design sector.

Whale Tail Open Pit

Observations - Northwest Wall



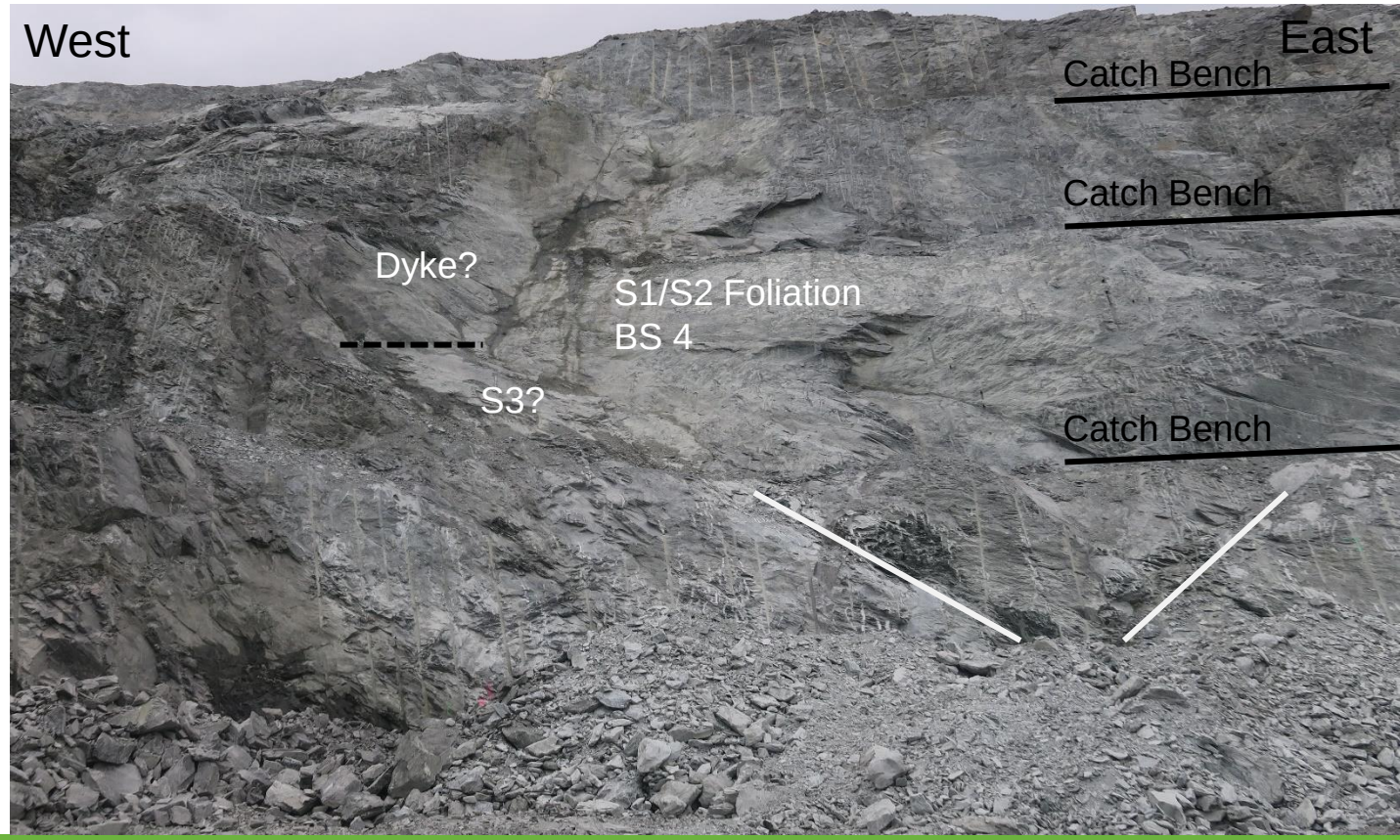
- Final wall in Design Sector A1/A1K.
- The benches in the Greywacke and Oxidized Greywacke are generally performing well.
- The benches in the Komatiite below the ramp have experienced significant backbreak in the northwest corner, as well as a sequence of bench-scale failures (outlined below in black). This is discussed further on the next slide. Elsewhere in the sector the Komatiite has performed well.
- A potential wedge is present above the ramp (white box below). The wedge is discussed further on a subsequent slide.



Whale Tail Open Pit

Observations – Northwest Wall Failure

- Four bench scale wedge failures occurred on the Northwest Wall between September 2023 and July 2024, linking together to form a multi-bench scale failure. The tonnage of the individual failures ranged from 300 to 9600 tonnes, with a cumulative tonnage of 17,800 tonnes. This is the largest failure in the open pit to date.
- The failure ultimately formed a compound wedge:
  - The east side of the failure is parallel to the S1-S2 foliation and occurred along Brittle / High-Strain Structure 4. This is categorized by AEM as a Major Structure.
  - The upper west side of the failure appears to have occurred along a dyke (either I3 or I4).
  - The control for the lower west side of the failure is less clear but is thought to be the S3 foliation.
- Brittle / High-Strain Structure 4 defined the northern limit of a zone of sheared Komatiite that resulted in significant backbreak along the ramp in 2022/2023. This was discussed during the 2023 annual inspection.
- The initial failure was forecast by the slope stability radar. The area was beamed off for the subsequent failures.
- Another potential wedge formed by the same structures is present on the current bench (outlined in white). The mine has attempted to scale down this wedge several times.



Whale Tail Open Pit

Observations – Northwest Wall Failure (Cont'd)

- The loss of the catch benches increases the rockfall hazard for mining activities below this area. While a temporary rockfall berm was in place at the time of the annual inspection, it will be removed during the mining of the next flitch. It is recommended that a permanent rockfall berm be constructed below this area, either on the current bench or the next one.
- The LOM and Budget mine plans should be reviewed to assess whether similar bench or multi-bench scale failures are possible on the Brittle / High-Strain Structures, Dykes, and the S3 foliation. It is expected that the likelihood for these failures will reduce as mining extends to depth because the dykes are most prominent at the west end of the open pit.
- Potential future multi-bench scale failures should be flagged in the LOM/ Budget mine plan. A monitoring plan should be developed and the mine plan reviewed to mine out, reduce the size of, or manage the failure. It is expected that potential bench scale failures can continue to be managed using the existing tactical measures
- A larger scale failure (e.g., inter-ramp scale) is considered unlikely. The current slope stability radar monitoring and GNSS beacon are effective tools for identifying any potential large-scale instabilities.
- It is recommended that the Brittle / High-Strain Structures be mapped and the results used to validate/refine the structural model.
- Rockfall reports were completed for each of the failures. However, the potential for similar failures (e.g., on the subsequent bench) was not identified. Trends, such as these repeated failures along the Brittle / High Strain Structures should trigger a more detailed review and back-analysis. The objective is to understood the root causes and to better anticipate or eliminate similar failures in the future. This is discussed in more detail in the Ground Control Program section of this presentation.

Whale Tail Open Pit

Observations - Northwest Wall - Wedge

- A wedge is present above the ramp (lower photo).
- The potential for a wedge was originally identified in 2020. Ravelling of material over time has resulted in the wedge becoming more prominent. It is believed that most of the ravelling occurred when the Phase 2 Ramp was established below this area between December 2022 and January 2023.
- There is a partial bench between the wedge and the Phase 2 ramp. However, it is likely that material would reach the ramp if the wedge failed.
- The wedge is a focus of the regular visual inspections and the drone surveys. The mine has also defined a specific radar alarm for this area.
- No significant changes in the condition of the wedge were observed between the 2023 and 2024 annual inspections.
- Continue to monitor this area closely, both from the ramp and the overlook above. If further deterioration is observed, further mitigation will be required (e.g., knocking down the wedge).

Whale Tail Open Pit

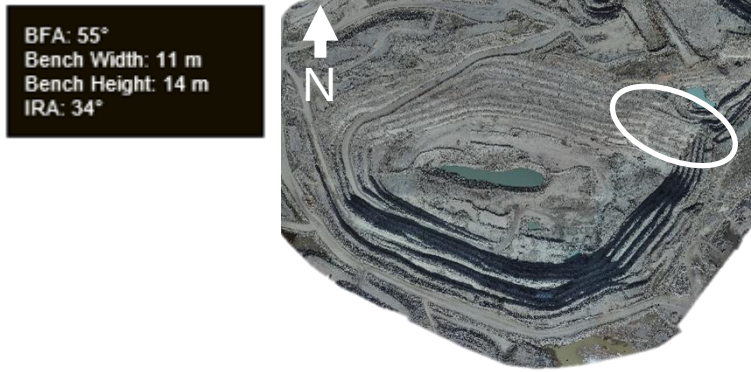
Observations - North Wall

BFA: 65°
Bench Width: 10.5 m
Bench Height: 21 m
IRA: 46°

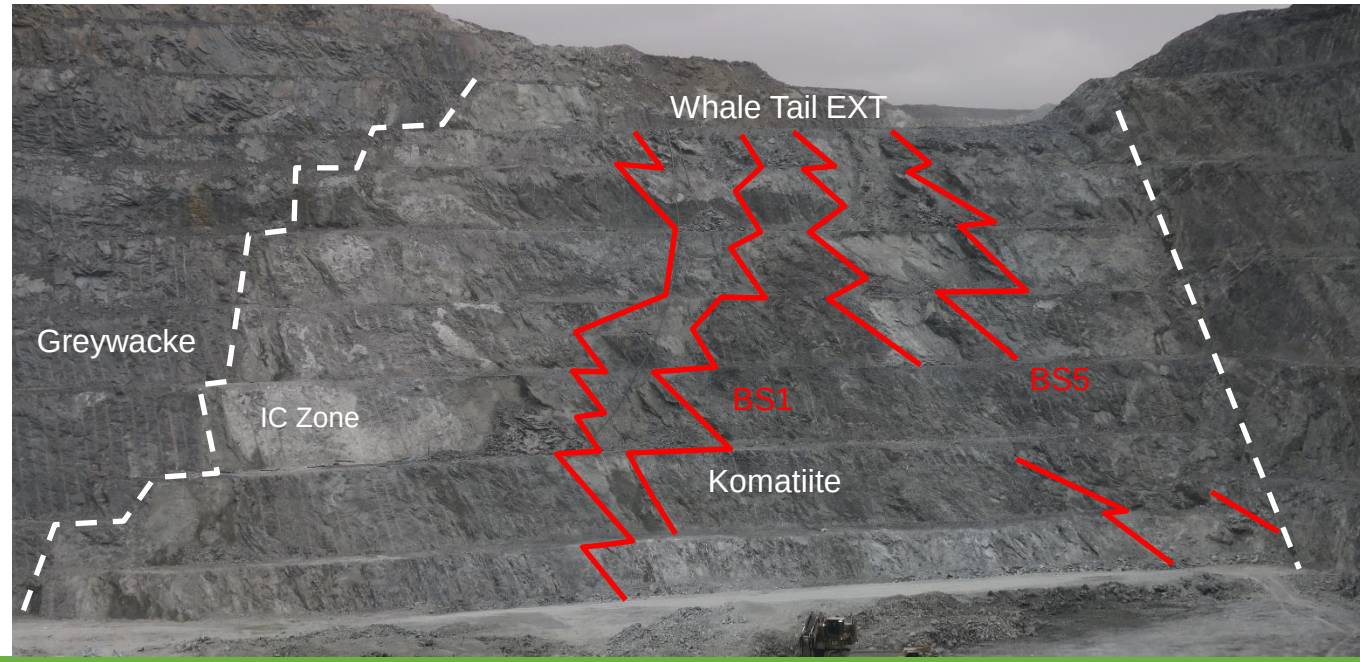
- Final wall in Design Sector B1.
- Approximately two benches have been mined on this wall since the last annual inspection.
- There have been no slope failures since the last annual inspection.
- The benches are performing better than expected, with the bench face often standing steeper than the foliation.

Whale Tail Open Pit

Observations - Northeast Wall

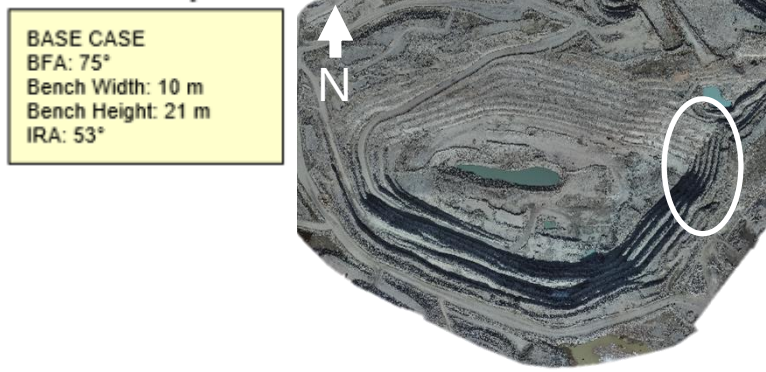


- Final wall in Design Sector D4K.
- This sector is within the Komatiite and has been characterized by a series of bench scale failures associated with the weak rock mass and the High-Strain / Brittle Structures (select structures are shown in red below). The slope design was revised in December 2021 and has been successful in managing the performance of the slope.
- Four rockfalls and bench-scale failures have occurred in this sector since the last annual inspection, ranging in size from 23 to 480 tonnes. All of the failures occurred behind berms between April and July 2024 and the failure mechanism is consistent with previous failures in this sector.
- It is expected that rockfalls and bench-scale failures will continue to occur. The wall continues to be a focus for the Rock Mechanics team. The Working with Komatiite Procedure introduced in 2024 is a key tool for managing the geotechnical risk in this sector.
- The benches within the IC Zone along the west contact have performed better than the other benches in the Komatiite. This zone is pinching out and the behaviour of the Komatiite may be reverting to its typical performance, with localized failures along the contact.
- The lower two benches have performed better than expected, with only small rockfalls along the High Strain Structures. This could be linked to better blasting, or a reduction in water on the slope due to the mining of the Whale Tail EXT.



Whale Tail Open Pit

Observations - East Wall

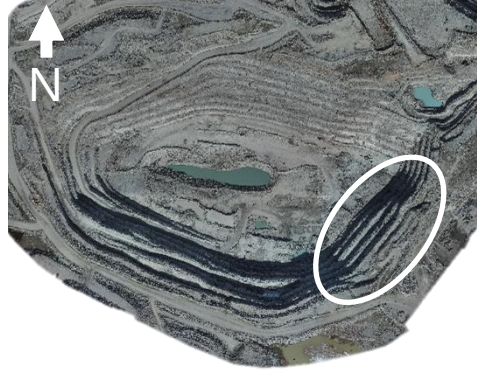


- Final wall in Design Sector E4.
- The benches have generally performed well. Increased crest loss occurred on the upper benches where adverse structure (Joint Set B or C) is present. The foliation strikes roughly perpendicular to the wall, which is favourable for bench stability.
- The rock mass is generally competent, though localized shear zones attributed to the Brittle / High Strain Structures and the Ramp Fault are observed within it.
- These structures represent a potential rockfall hazard, but this has not been an issue to date.
- There is an interval of intensely foliated/sheared Mafic Volcanics in the lower benches. This has not significantly impacted bench performance to date. However, the extents of this unit should be reviewed and the potential impact on subsequent benches assessed. It may be associated with Brittle / High Strain Structure #3.

Whale Tail Open Pit

Observations - Southeast Wall

BFA: 75°
Bench Width: 16 m
Bench Height: 21 m
IRA: 44°

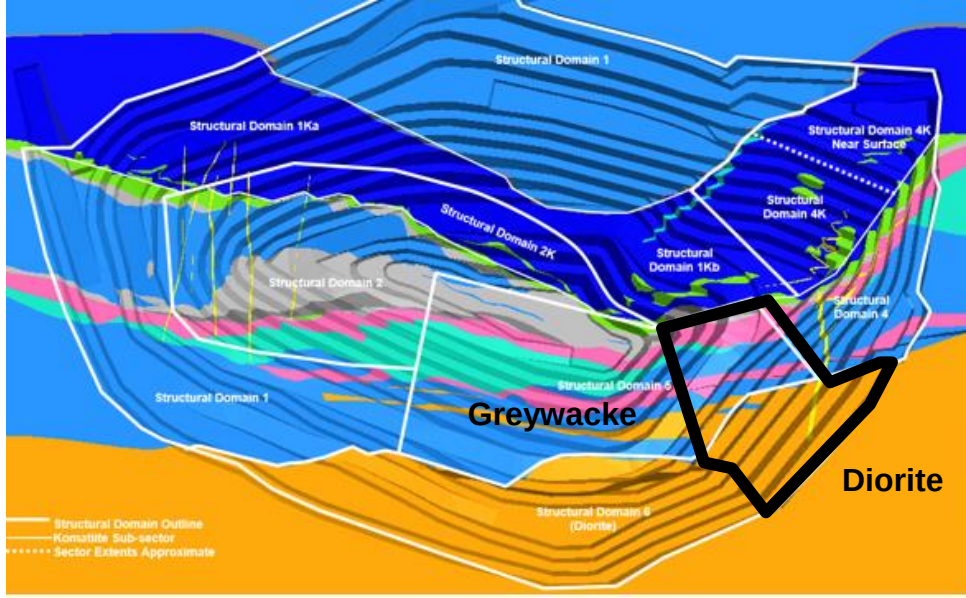


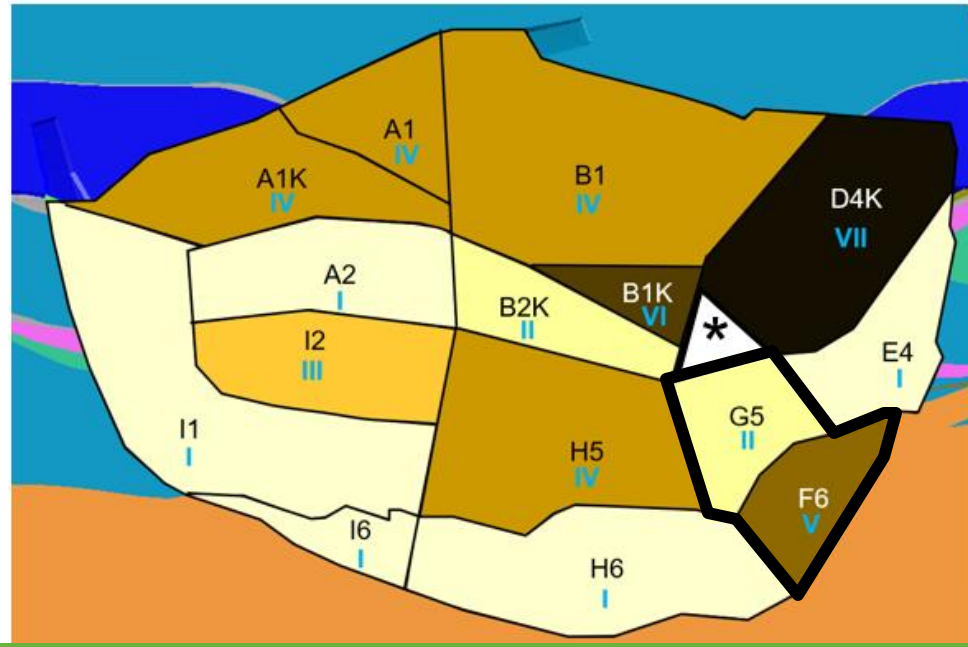
- Final wall in Design Sector F6
- The slope geometry recommendations for this sector were adjusted in late 2021. A catch bench width of 16 m, was thought to be achievable, with the expectation of backbreak in the order of 8 m along Joint Set C. The benches initially performed better than expected, with backbreak typically less than 4 m, and AEM reduced the design catch bench width to 13 m in March 2023.
- Subsequently, the 5046 bench experienced > 6 m of crest loss over significant intervals of the catch bench. While rockfalls have not been reported or observed in this sector to date, the potential for rockfall exists.
- As the ramp will pass below this sector, a decision was made to add an additional catch bench (5034). The bench was being scaled at the time of the visit, but it also appears to have experienced significant crest loss.
- Different alternatives for managing the rockfall hazard were discussed during the visit. AEM is planning to install a Geobrugg rockfall barrier along the crest of the 5034 catch bench where the catch bench capacity has been lost. This is endorsed.

Whale Tail Open Pit

Observations - Southeast Wall (Cont'd)

- Based on the observed catch bench performance, the design catch bench width in Design Sector F6 should be revisited.
- Crest loss on the next bench could reduce the usable width of the ramp. Consider installing vertical dowels along the outside of the ramp in this sector to reduce crest loss.
- Note that the wall is expected to transition out of the Diorite and into Greywacke and Komatiite just below the current elevation. At that point the slope geometry recommendations for Design Sector G5 will apply.
- The slope geometry recommendations for G5 incorporate a 10.5 m catch bench width based on the expectation that Joint Set C will no longer control the bench geometry.
- The change in rock mass structure needs to be validated in the field before the bench design is changed. It is possible that Design Sector F6 extends deeper than currently believed.





Whale Tail Open Pit

Observations - South Wall

- Final wall in Design Sectors H6 (Diorite) and potentially H5 (predominantly Greywacke and Mafic Volcanics with intervals of Komatiite).
- The wall has reached an elevation where Structural Domain 5 is expected to be exposed in the wall. North dipping structures in this domain are expected to limit the achievable bench face angle. Periodic mapping is recommended to confirm the extents of this domain.
- A sump and horizontal drains were established on the South Wall (circled in white) to intercept seepage from the base of the talik below the former Whale Tail Lake and prevent the formation of an ice wall directly above the ramp. Significant seepage has been observed on the wall below the sump and AEM is currently reviewing options for managing the seepage and ice in this area. This is endorsed.
- A bench-scale failure occurred below the ramp in June 2024 (outlined in black below). The failure is discussed in detail on the next slide.

Whale Tail Open Pit

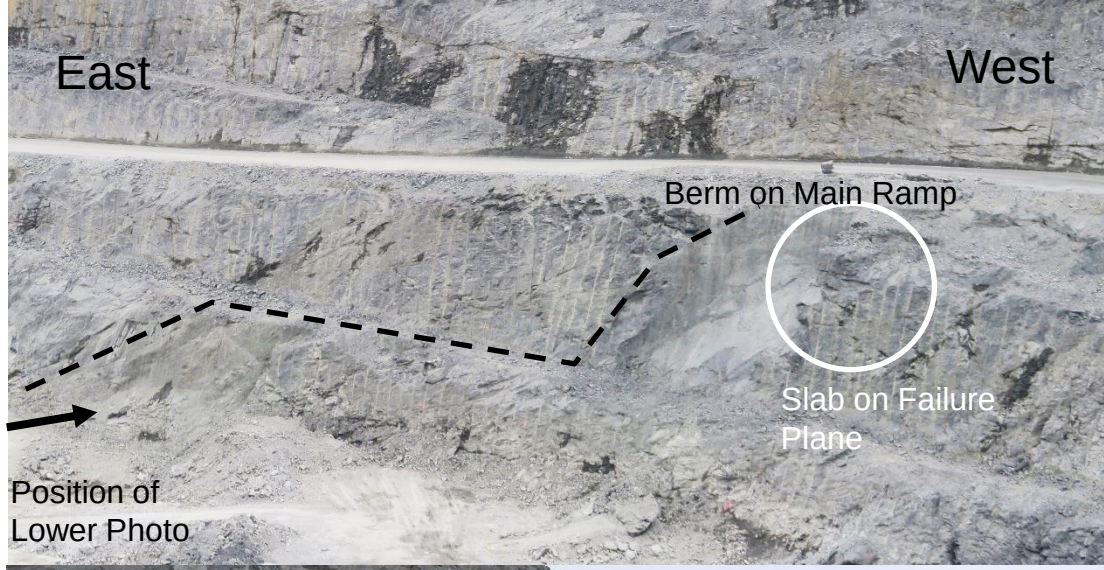
Observations – South Wall Failure

- On June 16, 2024, a 500 tonne bench scale failure occurred below the ramp (see image at upper right). Most of the material was retained on the catch bench immediately below the failure but some reached the next bench where a pattern was being drilled.
- Evidence of the impending failure was captured by the SSR but was not noticed by the Rock Mechanics team. The SSR alarmed at approximately the same time as the failure occurred. As a result, no warning was given for the failure.
- Two drills were working on the pattern directly below this bench at the time of the failure. No personnel were hurt or equipment damaged, and the area was barricaded.
- Due to concerns about the potential for the failure to propagate back towards the ramp, the ramp was reduced to single lane traffic and a berm constructed.
- A specific monitoring plan was developed to allow the failure to be cleaned up and the pattern drilled and blasted. The slope stability radar was moved to directly in front of the failure, mining was restricted to day shift and a spotter was used. This was well done.
- The failure subsequently progressed, with 2,900 tonnes failing on June 25. This was forecast several days in advance by the SSR and personnel removed from the area. No further failures or rockfalls have occurred. The failure at the time of the inspection is shown at lower right.
- During the inspection a number of topics related to this failure were discussed, including the potential causes of the failure, the possibility of reverting to two-lane traffic on the ramp, the possibility of future similar failures, and a long-term monitoring strategy.

Whale Tail Open Pit

Observations – South Wall Failure

- The failure occurred progressively as a wedge within the Mafic Volcanics. The eastern side of the failure occurred along a structure parallel to the foliation and that extends to the next bench (see dashed line in photo at upper right and photo at lower right). It is not clear whether this structure is folded or actually represents two intersecting structures. The west side of the failure occurred through the rock mass.
- A Lamprophyre Dyke was modelled along the western limit of the failure, though it was not possible to conclusively identify it in the field.
- A modelled Brittle / High Strain Structure is not located in the vicinity of the failure. Sheared Mafic Volcanics were observed along the structure that forms the eastern side of the failure surface at the base of the next bench but there was no evidence of this unit in the immediate vicinity of the failure.
- A slab remains against the failure plane, despite efforts to scale it down, and it poses a hazard for personnel working below the failure area. Mining activities directly below the slab should continue to be limited to the day shift with a spotter. The area should continue to be closely monitored and inspected by Rock Mechanics after each blast.



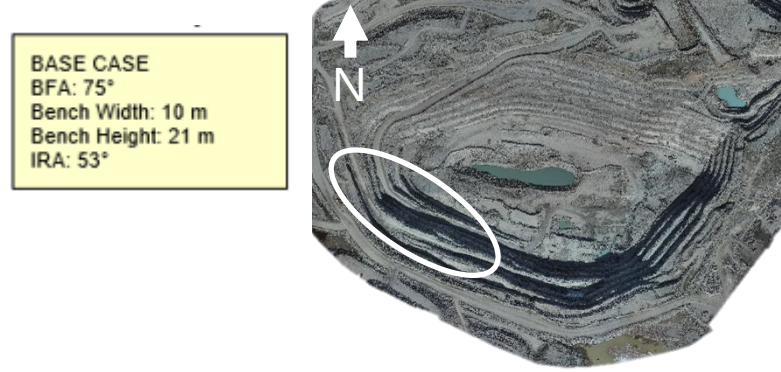
Whale Tail Open Pit

Observations – South Wall Failure

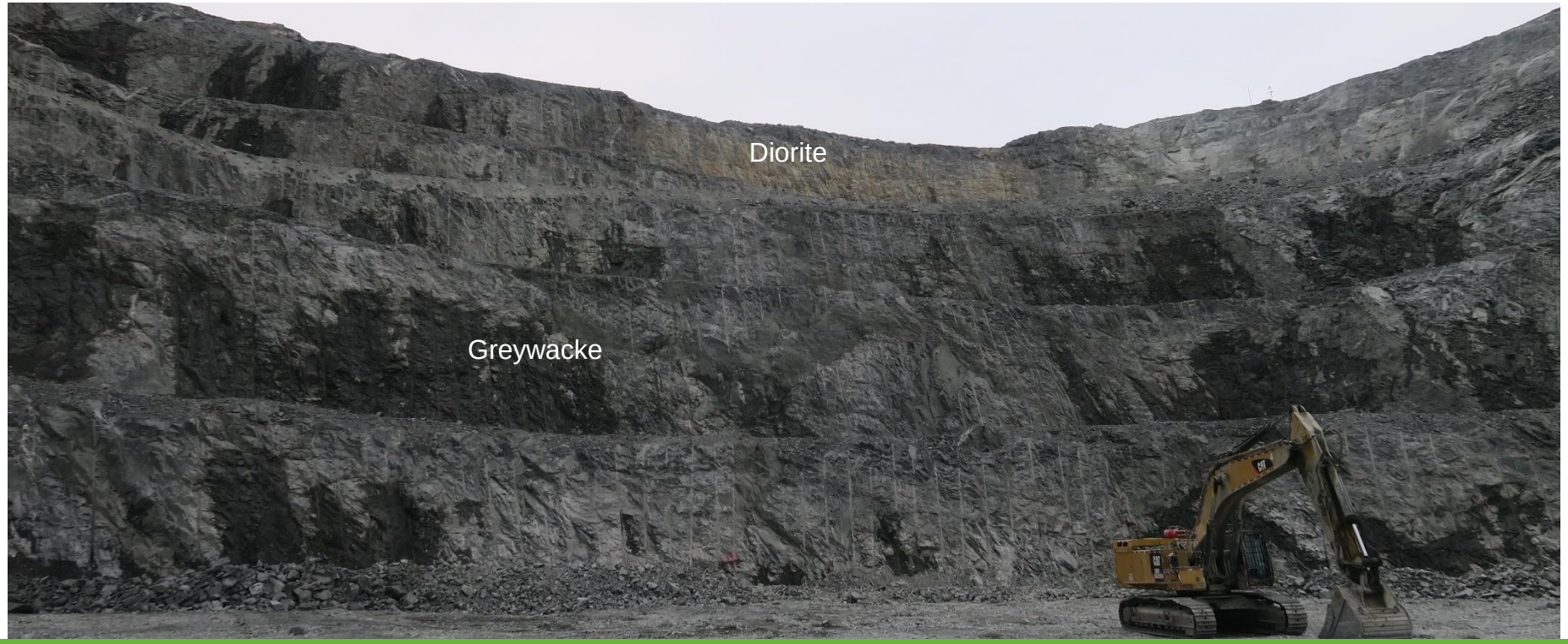
- The potential for reducing the size of the exclusion zone on the ramp to allow two-lane traffic was discussed. One possible approach is to reposition the existing berm along the worst plausible scenario for propagation of the failure to the ramp above. The objective is to keep personnel and equipment outside of an immediate failure. A combination of a berm and edge protector may provide sufficient space to allow 2 lane traffic. The failure zone and slab should continue to be monitored with the SSR and visual inspections. A specific radar alarm should be defined for this area (e.g., one pixel, 0.5 mm, one scan).
- In response to the gaps identified in the initial detection of the failure, the mine retained Tetratech to provide training on the use of the radar. The mine also began using GroundProbe's real-time monitoring service to provide a second set of eyes on the radar. Finally, the alarm parameters were reviewed and adjusted (see section on monitoring and inspections later in this presentation). However, it is important to note that the review concluded that the new alarm parameters would still not have triggered with sufficient notice to respond.
- Bench-scale failures will continue to occur on persistent structures and lithological contacts that intersect the wall at a shallow angle. This is most likely on the southern side of the open pit. The potential for future similar failures should be considered as part of geomechanical reviews of the budget and LOM mine designs.

Whale Tail Open Pit

Observations - Southwest Wall



- Final wall in Design Sectors I6 (Diorite) and I1 (predominantly Greywacke).
- The wall is generally performing well. However, there continue to be challenges with drilling and blasting practices resulting in crest loss or hard toes on the benches.

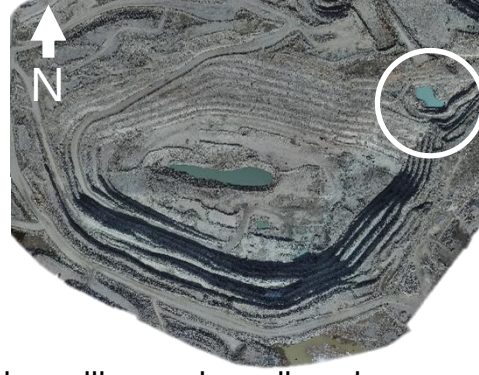


Whale Tail Open Pit

Observations - Whale Tail EXT

BASE CASE
BFA: 75°
Bench Width: 10 m
Bench Height: 21 m
IRA: 53°

KOMATIITE
BFA: 75°
Bench Width: 10.5 m
Bench Height: 21 m
IRA: 52°



- Mining of the Whale Tail Extension (WHL EXT) is now complete.
- The northwest wall is primarily within Greywacke and the southeast wall is within the Komatiite. The Komatiite is of poor quality and ravelling and small-scale rockfalls are expected to occur over time. To date they have been managed through inspections and scaling.
- On-going dewatering activities are planned for the WHL EXT, though none were occurring at the time of the annual inspection as mining off the IVR V2 pushback has temporarily blocked access to the area. Once access is re-established, a rockfall berm should be installed along the inside of the ramp to mitigate the risks associated with the rockfall hazard in the Komatiite.

Whale Tail Open Pit

Comments on Life of Mine Plan

- The LOM for the Whale Tail open pit was reviewed and discussed with AEM during the site visit. Key observations are summarised below for reference.
- 2025 EOY
  - Northeast Wall - Starting to establish the benches in the lower Northeast wall below the ramp. The timing of these benches is key as they must be established in winter when the rock mass is frozen. The LOM has the first two benches established by September, which is too soon.
  - Northwest Wall – Continued interactions with Brittle Structures could result in further bench-scale failures. Issues will shift to the east and could improve.
  - South Wall – Monitor the lithology contacts and the potential for bench-scale failures. The management of water and ice below the ramp will be an important consideration. Consider prioritizing mining against this wall in winter and avoiding it in the spring.
- 2026 April
  - Northeast Wall – The lower Northeast wall below the ramp will be fully established. The buttress for this wall will need to be constructed by this time. There is a potential opportunity to take more ore below the corner with a goodbye cut as long as the buttress can be built in time.
  - North Wall – The ramp will be established along the base of the North wall. The crest performance and the potential for back break is sensitive to the interpretation of the Brittle Structures.
  - Continue monitoring potential interactions with Brittle Structures in the Northwest wall and lithology contacts in the South wall.
- 2026 EOY
  - Starting to mine the crown pillar in the second half of 2026.
  - Southwest Wall – Monitor for potential for planar failure above the base of the ramp in Design Sector I2.
- 2027 July
  - End of mining

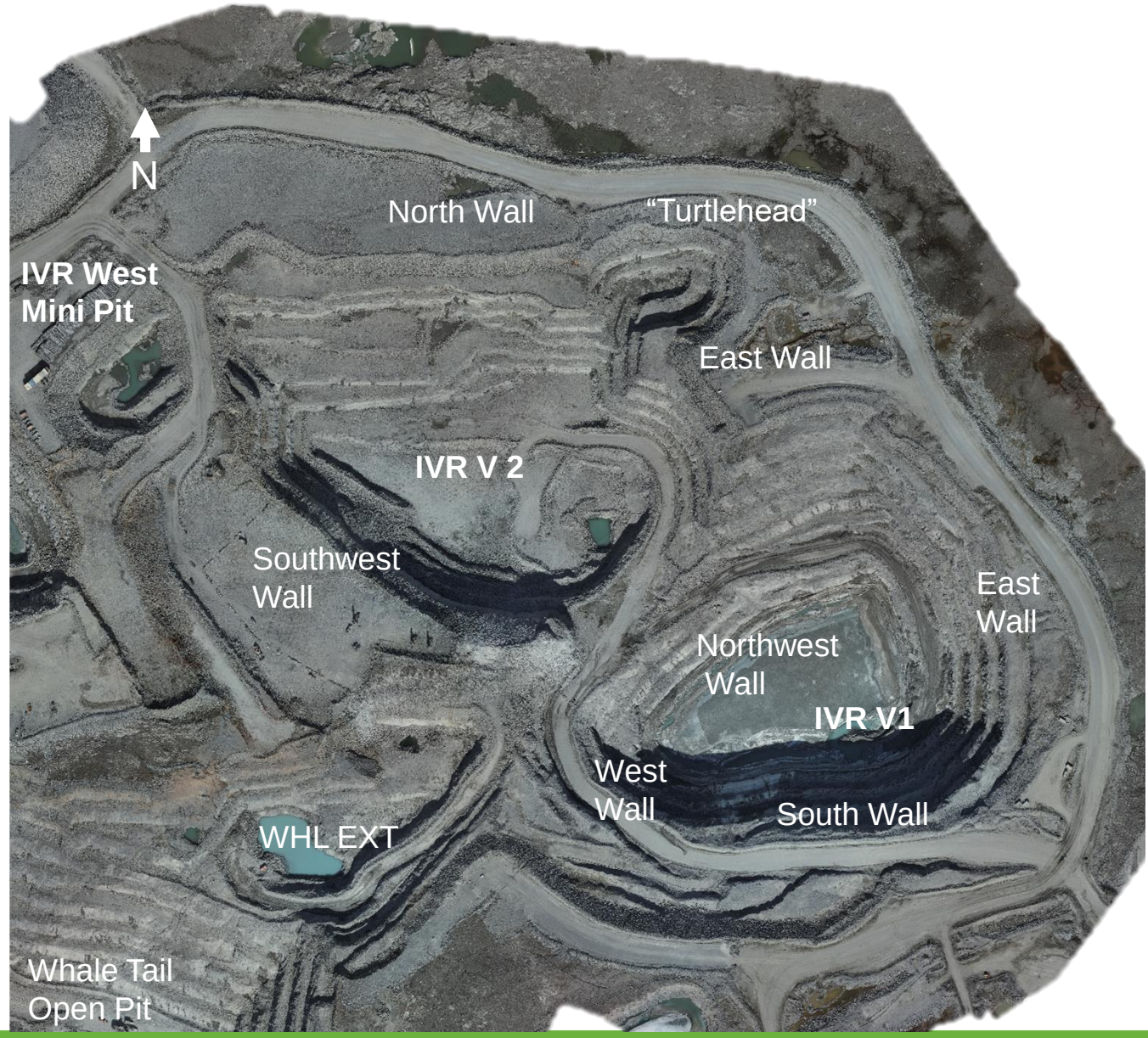
IVR V1 & V2 OPEN PITS

IVR V1 & V2 Open Pits

General

- The IVR V1 and IVR V2 open pits were inspected on August 13 and 14, 2023 . Observations made during the inspection are summarized on the following slides.
- The approximate current pit geometry is shown at right. The walls inspected are labelled relative to mine north.

- Note that mining of the IVR V1 open pit is now complete, and access is prevented by a berm. It is understood that it will be used for water management in the future.

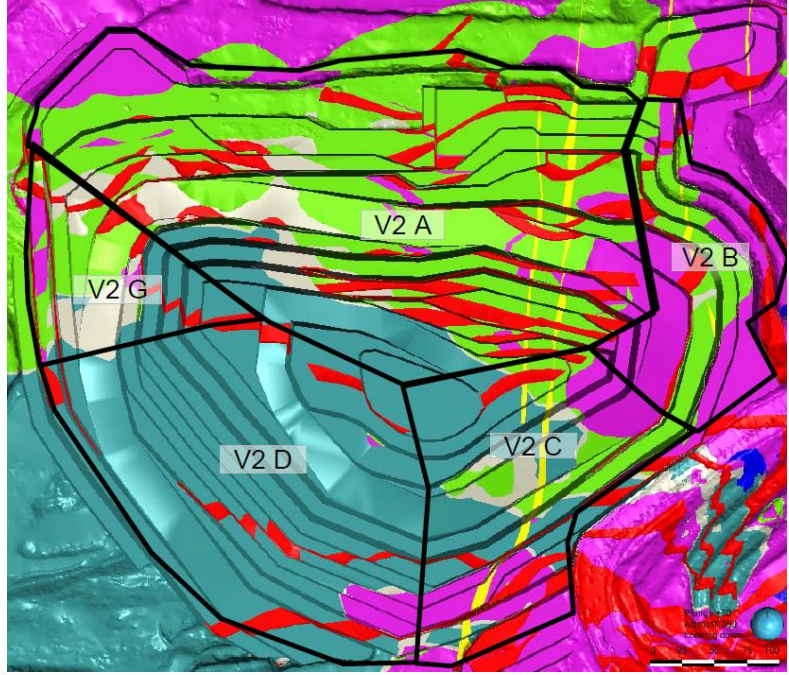


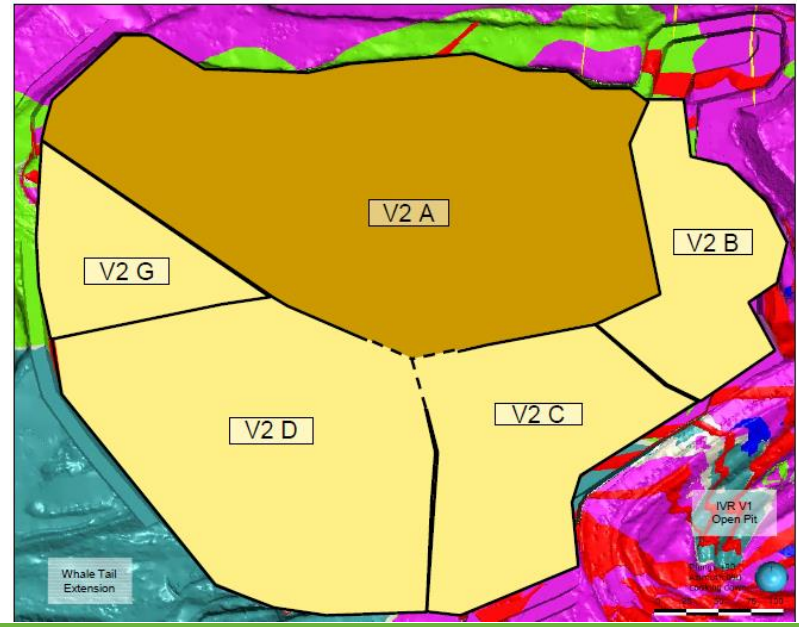
IVR V1 & V2 Open Pits

Design

- The slope geometry recommendations for the IVR V2 open pit were updated by KP in March 2024 and are shown at right for reference.
- The design sectors and the lithologies expected in the final open pit walls are shown at upper right. The slope geometry recommendations are shown at lower right.
- The current design for the V2 open pit is IVR-2_ELOM_OCT23_REV08B.

- The slope geometry recommendations for the IVR V1 open pit have not been provided for reference as mining of the open pit is complete.





BFA: 75°
Bench Width: 10.5 m
Bench Height: 21 m
IRA: 52°

V2 A & V2 E
BFA: 75°
Bench Width: 10 m
Bench Height: 14 m
IRA: 46°

IVR V1 Open Pit

Observations - Northwest Wall

- The Northwest Wall is the footwall of the deposit and was established primarily within the Komatiite.
- Several bench scale failures and rockfalls have occurred over time on this wall, primarily associated with planar or wedge failures along the foliation. A progressive failure below the ramp (circled in black below) has impacted the ramp. Further failures are possible in this area.
- Two rockfalls and a bench-scale failure have occurred since the last annual inspection and are circled in white below. These failures occurred after mining in the open pit was completed and access to the pit was prevented. Two of the failures are associated with progressive ravelling of a high-strain / brittle structure in the western corner of the pit. The third failure was a 1,580 t wedge failure on the foliation.
- Access to the open pit continues to be prevented due to overspill from the blasting of the V2 open pit. It is understood that access will be re-established in the future for water management purposes. As part of this process, the ramp should be inspected by Rock Mechanics, a rockfall berm re-established along the inside of the ramp, and the hazard associated with the failures below the ramp reviewed.

IVR V1 Open Pit

Observations - East and South Walls

BFA: 75°
Bench Width: 10.5 m
Bench Height: 21 m
IRA: 52°

- No particular geomechanical concerns; these walls have performed well.
- Cross-cutting structures resulted in numerous small wedges in the upper benches of the East Wall, and significant scaling was required when the benches were established. There was a concern that the benches would ravel over time. However, to date, very little material has accumulated on the catch benches.

IVR V2 Open Pit

Observations - General

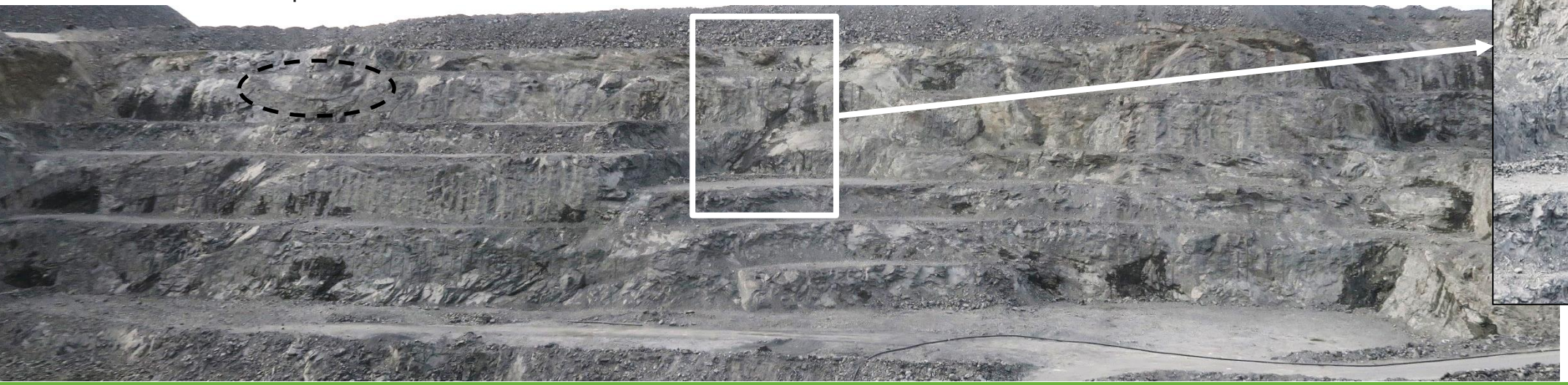
- Mining activities in the IVR V2 open pit is are focused on a pushback of the west wall. As a result, active mining was not occurring along the other walls of the open pit and these areas were not accessible during the annual inspection.
- No rockfalls have been reported in the open pit since the 2023 annual inspection.
- Comments on specific locations within the pit are provided on the following slides.

IVR V2 Open Pit

Observations - North Wall

V2 A & V2 E
BFA: 75°
Bench Width: 10 m
Bench Height: 14 m
IRA: 46°

- Final wall established in the footwall of the deposit, primarily within the Mafic Volcanics.
- The observed slope behaviour is consistent with expectations. While crest loss occurs along the foliation, the bench face is typically held at a steeper angle than the dip of the foliation. However, crest loss has been greater than planned. This is discussed further later in this presentation.
- A prominent structure with graphite infill has resulted in a local loss of the catch benches across multiple benches (outlined in white below). This may be High-Strain/Brittle Structure 18.
- A possible wedge formed by an undulation in the foliation was previously identified near the western end of the wall within the Mafic Volcanics (circled in black). The condition of the wedge has not obviously changed since the last annual inspection.



IVR V2 Open Pit

Observations - East Wall

BFA: 75°
Bench Width: 10.5 m
Bench Height: 21 m
IRA: 52°

- The East Wall is performing well. However, the crest loss has been greater than planned. This is attributed to the previous Drill and Blast practices.
- The noses formed with the Turtlehead and with the IVR V1 open pit represent potential rockfall hazards and should continue to be a focus of the visual inspections.
- Note that the lowermost bench was recently established and has not yet been scaled.

IVR V2 Open Pit

Observations - West Wall

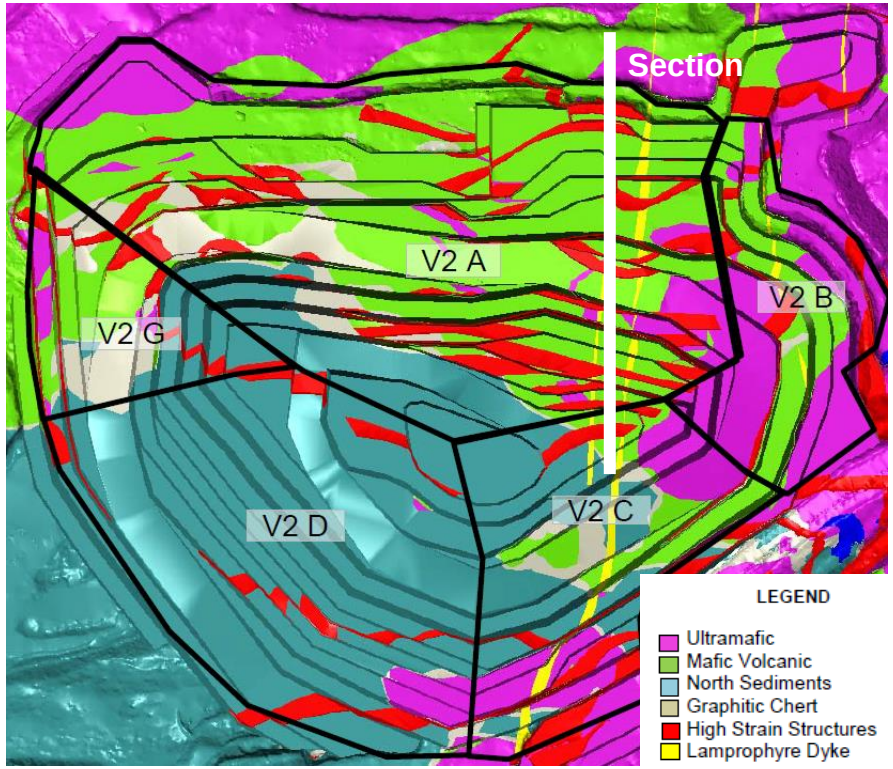
BFA: 75°
Bench Width: 10.5 m
Bench Height: 21 m
IRA: 52°

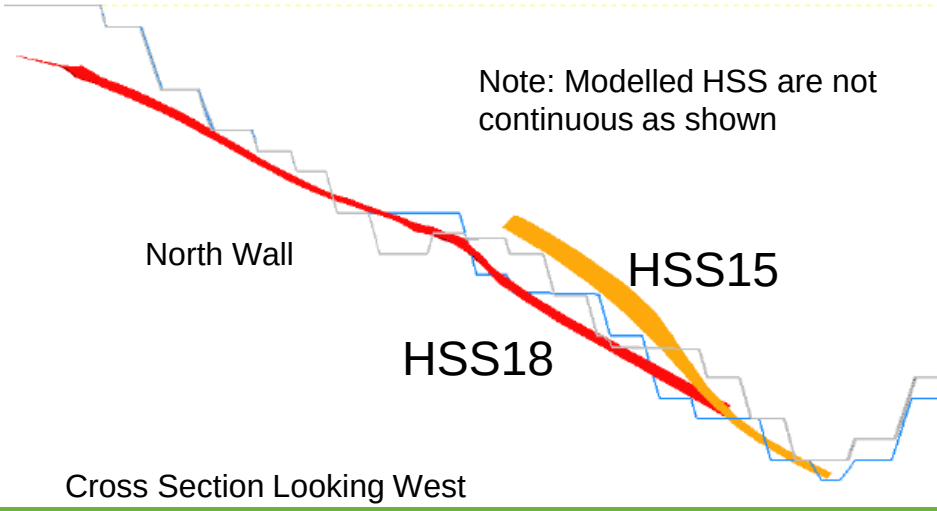
- The pushback of the west wall is in progress. Only a single bench was exposed at the time of the annual inspection.
- The rock mass structure is favourable is this sector and the bench has performed well.
- The bench is expected to be established in a combination of Mafic Volcanics and Komatiite. An interval of Komatiite was observed towards the northern end of the wall (outlined below). It is important for the performance of the North Wall that the Komatiite not extend into that wall in significant quantities. Comments on the design of the open pit are provided on the next slide.
- Previous drilling and blasting practices were adversely impacting the performance of the benches on the west and east walls, with hard toes, crest loss, and frozen rock on the face regularly observed. Drilling and blasting practices have been progressively improved in the first half of 2024. The push back bench appears to have benefited from this approach and half-barrels are regularly observed. The impact has not yet been quantified, but this is a positive development.

IVR V2 Open Pit

IVR V2 Open Pit Design

- The slope geometry recommendations for the North Wall (Design Sector V2A) are particularly sensitive to the presence of the Komatiite and the position and orientation of the large-scale structures.
- The lithologies and rock mass structure at the deposit are particularly complex and the minor units and small-scale folding cannot reasonably be captured in the 3D geology models. These models only represent the dominant trends.
- The slope design is based on the expectation that the wall will be primarily established within the Mafic Volcanics and Greywacke rather than the weaker Komatiite.
- Several High-Strain / Brittle Structures are located behind or in proximity to the North Wall, including HSS #14, #15 and #18. The slope design is sensitive to the position and continuity of these structures, especially HSS #18. The slope geometry recommendations are based on the current understanding that HSS #18 is not continuous at an inter-ramp scale. However, multi-bench scale failures could occur along the weak intervals associated with this structure.
- As a result, there is a need for on-going geological and geomechanical mapping to confirm the lithology and rock mass structure exposed in the pit walls. If there are significant changes to the interpretation of the Komatiite or High-Strain / Brittle Structures, the potential impact on the open pit slope performance and design should be assessed.





Cross Section Looking West

IVR WEST OPEN PITS

IVR West Open Pits

General

- The IVR West open pits were inspected on August 14, 2024. Observations made during the inspection are summarized on the following slides.
- The approximate current pit geometry is shown at right.
- Mining of all three open pits is now complete.

- IVR West 1 has been completely backfilled with waste rock and no slopes are visible.
- IVR West East (formerly referred to as IVR West 2) is closed.
- The IVR West Mini Pit is being incorporated into the IVR V2 open pit. Access is currently not possible as a result of the pushback of the IVR V2 pit and it was not included in the annual inspection as a result

IVR West Open Pits

Observations - IVR West 2

- Mining of the IVR West 2 pit is complete. A berm has been constructed on the ramp to prevent access to the open pit.
- It is understood that the pit is periodically used as a discharge point for water management but is never accessed. No dewatering infrastructure is present within the pit.
- Multiple rockfall hazards are present along the crest of the open pit above the ramp. If a decision is ever made to re-enter the pit, these hazards will need to be mitigated.

Looking North

AP5

AP5

Observations

- Attenuation Pond 5 is a former quarry located to the east of the WHL open pit that is now used for water management. The pond was inspected on August 14, 2024.
- The pond is partially flooded, with one to two benches exposed above the pond water level. As a result, a detailed inspection could not be completed.
- No stability concerns were identified in the exposed slopes.
- Pumps were present at the time of the inspection.

Monitoring and Inspections

Monitoring and Inspections

General

- The slope monitoring program at the mine currently consists of the following primary components:
  - Observations and Ground Control Log Book entries from mine personnel
  - Visual inspections
    - Routine and special geotechnical inspections
    - Official wall inspections
    - Drone inspections
    - Bench approvals
  - Slope Stability Radar (SSR) monitoring
  - Instrumentation, consisting of a Shape Accelerometer Array (SAA), a Time Domain Reflectometry (TDR) cable, Vibrating Wire Piezometers (VWPs), and thermistors.
- Maptek LiDAR scans are used to document the achieved slope geometry but are not used for monitoring.

Monitoring and Inspections

Visual Inspections

- The frequency of each inspection, the person responsible and the communication of the observations are defined in the GCMP (at right).
- The routine and special visual inspections are documented with photos and summarized in email reports to the shared Rock Mechanics email account. The documentation focuses on specific identified or reported hazards.
- The official wall inspections are completed by a multi-disciplinary group, which considers all of the open pit walls rather than specific hazards. The inspections are documented with photos and in a formal report.
- Comments:
  - The drone inspections are not currently documented. Recommend developing a brief report that tracks key areas and any newly identified areas of interest/concern.

Table 5-5: Summary of Inspection Program

Structure	Responsible	Type	Frequency	Reporting	Distribution List
Whale Tail and IVR pit	Rock Mechanics Engineer or Technician	Routine visual inspection	1 x 2 days	Email highlighting the main observation and conclusions	Meadowbank Mine Operation Supervisors
		Pit wall approval inspection	Every drill and blast pattern adjacent to a pit wall	Pit wall approval sheet	Meadowbank Mine Operation Supervisors, D&B Engineering and Surveyors
		Official wall inspection	Biweekly	Wall inspection map and report	Surveyors, Grade control, Mine Ops, E&I, Environment, Mine inspector, Geology team
		Drone inspection	Monthly from May to September	Email highlighting the main observation and conclusions. Quarterly ground control report.	Meadowbank Mine Operation Supervisors
		Special visualization inspection	After each of these events: •New potential geotechnical hazard was identified by personnel working in the open pit and/or reported in the ground control book. • Rockfall (in area of event) •Earthquake	Ground control book and email highlighting the main observation and conclusions	Meadowbank Mine Operation Supervisors
	Rock Mechanics Engineer and third-party reviewer	Annual pit slope performance	Once per year	Annual pit slope performance review	Mine inspector, Regulators

Monitoring and Inspections

Hazard and Action Item Tracking

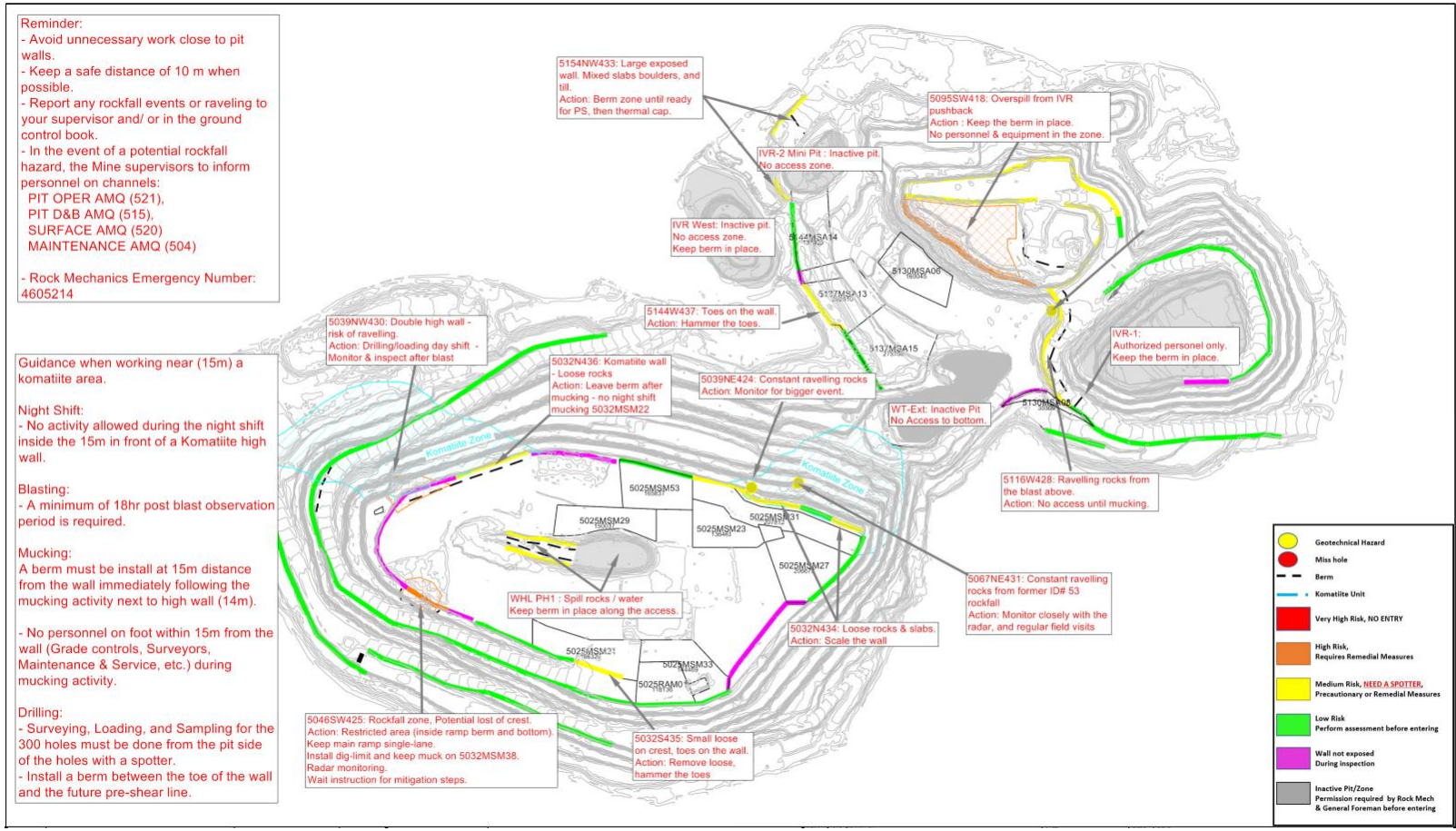
- Hazards, the associated risk rating, and any required corrective actions are tracked in a database. An example from the database is shown below.
- A total of 93 hazards were identified between July 2023 and August 2024. The most common hazards are associated with rockfall hazards or loose. The remainder are typically associated with radar trends, hard toes or icefall hazards.
- A due date to complete the corrective actions is specified. The database would benefit from a mechanism to flag overdue corrective actions so that they aren't overlooked. The database would benefit from a periodic review to clean-up entries.
- The Hazard Tracking Database has been regularly used since the last annual inspection and no hazards were observed to be missing.

Date	ID	Pit/Quarry	Geotechnical Hazard	Corrective Measure	Due date	ompleted (Yes/No)	ate complete	Approved by	Status2
06-16-2024	5046SW425	WHL	Toppling rockfall Structures. Hold on current drilling pattern, pending investigation	KEEP THE BERM IN PLACE, MONITOR	ongoing	No			2
06-16-2024	5039E426	WHL	Large chunky slips on crest, and small scabs on the wall, with a few toes	Knock down slips, scale wall, and hammer toes	2024-06-20	YES	2024-06-25	VD	4
06-16-2024	5151S427	IVR-2Ext	Exposed Till and loose rock	Install a berm between future toe of the thermal capping, and drilling surface	2024-06-20	YES	2024-06-28	VD	4
06-28-2024	5116W428	IVR1	Raveling debris from mining the IVR pushback. Material can eventually fill up the berm.	Authorized personnel only. Keep the berm in place. Empty the berm if it becomes full.	Ongoing	NA	2024-07-25	VD	4
06-28-2024	5032NE429	WHL	Newly exposed final wall; presence of loose rock and toes	Scale and hammer the wall.	2024-07-03	YES	2024-07-25	VD	4
06-28-2024	5039NW430	WHL	Double high wall, no more catch bench to retain unravelling material. Zone where multiple rockfalls occurred over the last year. Potential for more rockfalls to come especially when raining.	Day shift working only directly in front of the zone. Enhance radar monitoring	Ongoing	NA			2
07-09-2024	5067NE431	WHL	Augmented Radar movment/Ravelling on the ID# 53 rockfall zone	Monitor closley the area with frequent field visits	Ongoing	N/A			3
07-09-2024	5116W432	IVR1-2	Raveling, and plates breaking of the wall	Keep Berm in place at the toe of the wall, and candle off IVR main access	Ongoing	N/A	N/A	VD	4

Monitoring and Inspections

Hazard / Risk Assessment

- Identified hazards and the required mitigation work are tracked on a Hazard Map available to the workforce that is updated every two weeks.
- Comments on the maps and their integration with work near the pit walls is provided on the next slide.
- There continues to be limited guidance on how to select the risk ratings. Recommend providing detailed guidance, including examples, on how to determine these ratings. The goal is to ensure that each member of the Rock Mechanics team can perform the assessment in a consistent and reliable manner.
- Note that these are hazard ratings and not risk ratings since only the likelihood of a failure is considered in the rating system.

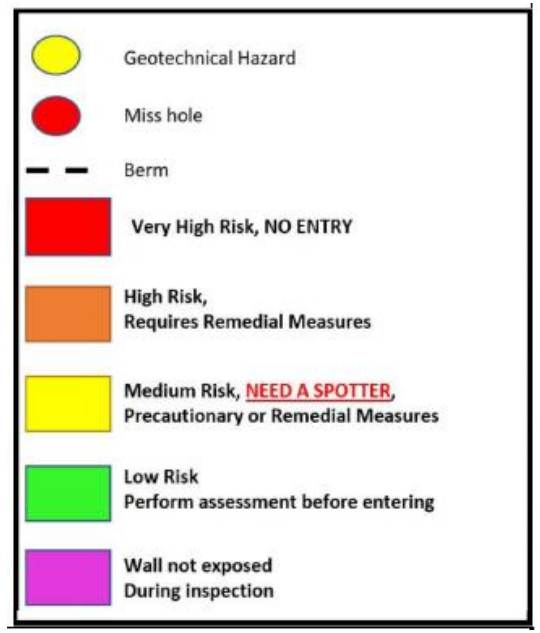


Monitoring and Inspections

Hazard / Risk Assessment (Cont'd)

- The hazard maps form the basis for the risk-based Work Close to Pit Wall procedure, which is a key process for managing geotechnical risk (excerpt shown at right).
- The hazard maps focuses on rock mechanics hazards. While corrective actions related to the identified hazards are noted on the map, the corrective actions are primarily communicated and tracked through the Pit Wall Approval procedure and the Hazard Tracking Database.
- There are multiple hazards documented in the Hazard Tracking Database that have been removed from the Hazard Maps as they are located in inactive areas or exclusion zones. These measures address the short-term risk but there is currently no mechanism to ensure these hazards are revisited or mitigated before mining resumes or prior to access for other activities (e.g., dewatering).
- Recommend having a layer on the map that remains internal to the Rock Mechanics team that tracks long-term hazards and areas that are a focus of monitoring (e.g., the wedge above the ramp on the West Wall of the Whale Tail pit) that do not necessarily need to be communicated to the larger workforce.

- Red Zone: An area defined as very high risk.
- Orange Zone: An area defined as high risk. It is a section of the Pit Walls requiring remedial work.
- Yellow Zone: An area defined on the Wall Inspection Map as medium risk. It is a section of the Pit Walls requiring remedial work or precautionary measures, as well as a spotter.
- Green Zone: An area defined on the Wall Inspection Map as low risk. It's a section of Pit Wall where no special work is planned, but an initial assessment is always performed before approaching wall.
- Purple Zone: An area defined on the Wall Inspection Map as an area where the wall was not exposed at the time of previous inspection.



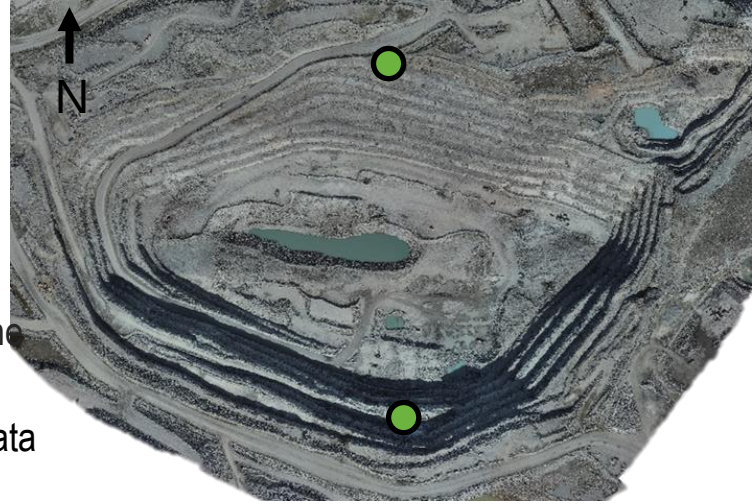
Monitoring and Inspections

Bench Approval Process

- Rock Mechanics completes a Pit Wall Approval for all benches on the final walls (both ultimate pit and interim stages). This process is a key control for managing potential rockfalls and bench-scale instabilities and is formalized within the Pit Wall Approval procedure.
- The condition of the bench and whether or not the face has been adequately scaled is assessed. The process is intended to be completed after each flitch is established and before work resumes in the area. A standard two-page report is issued each time.
- The mine has updated the Pit Wall Approval procedure so that drill patterns are only released to Survey and the drills once the required wall approvals are completed. This is endorsed.
- The use of a checklist to improve consistency between staff and avoid hazards being missed continues to be recommended.

Monitoring and Inspections

SSR - General



- The mine has two GroundProbe SSR-XT real aperture radars. Typically, one radar covers the north wall of the Whale Tail Pit while the other radar covers the south wall (see image at right).
- The Ground Control Monitoring Using Radar System procedure sets out responsibilities and how the SSR data are to be communicated. The procedure was last revised in December 2023.
- The radar data are reviewed at least twice a day and whenever alarms are triggered. The process followed when an alarm is triggered is defined in a TARP, shown at lower right.
- The TARP describes Grey, Orange and Red alarms. In practice Red alarms have not been established and the current monitoring strategy relies on an experienced operator who is familiar with the historical slope performance and is comfortable interpreting the data and adjusting the triggers for the Orange alarms on a case-by-case basis. The establishment of a Red alarm continues to be recommended to provide a backstop to the current process and to help manage potential larger-scale failures. If a Red alarm is not defined, the TARP should be updated.
- Neither the procedure nor the GCMP explain why the alarms have been set at their current values or provide actionable guidance on how they can be adjusted based on different circumstances. While it is recognized that it is not practical to cover all eventualities, additional guidance should be provided on how to define alarm criteria.
- Someone from Rock Mechanics is designated as being on-call and has a pager if they cannot be immediately reached or it is night shift. The on-call person is notified for any alarms.
- GroundProbe's Geotechnical Support Services (GSS) were retained in 2024 to provide supplementary 24/7 remote monitoring of the radar. This is endorsed.

Example	Signification	Dispatcher's response
GREY 	No to low risk system or equipment issues	➢ Contact Rock Mechanics personnel. The appropriate number will display on Alarm message ➢ Sepura # - 4605214 ➢ Ext: 4606920
ORANGE 	Low Risk Wall Movement or noise	➢ Contact Rock Mechanics personnel. The appropriate number will display on Alarm message ➢ Sepura # - 4605214 ➢ Ext: 4606920
RED 	HIGH Risk Wall Movement or noise	➢ STOP operations in area ➢ Evacuate area ➢ IMMEDIATELY CALL ROCK MECHANICS PERSONNEL ➢ Sepura # - 4605214 ➢ Ext: 4606920

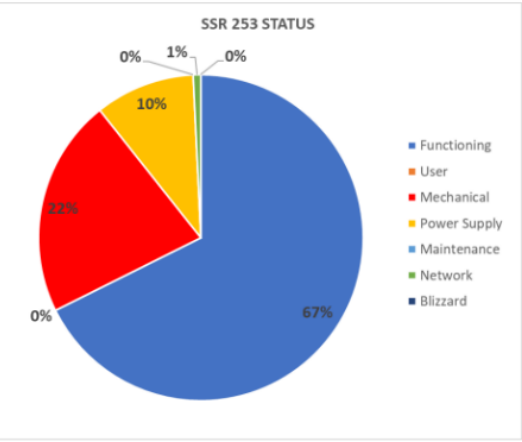
Monitoring and Inspections

SSR Monitoring - Coverage

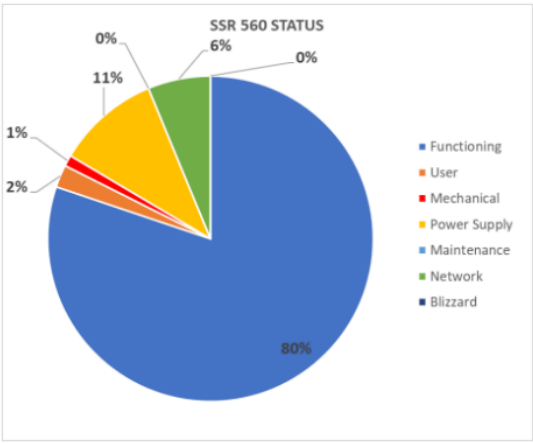
- There continue to be challenges in radar availability due to mechanical breakdowns and parts issues:
  - Radar SSR253 was operating 73% of the time in Q3/Q4 of 2023 and 67% of the time in Q1 of 2024. Spare parts had to be flown in from South Africa. The availability in Q2 of 2024 was 99%.
  - Radar SSR560 was operating 80% of the time in Q1 of 2024 due to an issue with the external power supply. Availability in Q3/Q4 of 2023 and Q2 of 2024 was 95% and 99% respectively.
- The radar is the primary monitoring system for the open pit slopes, and periods of downtime significantly impact the mine's ability to manage geotechnical risk. The age of the radars (especially SSR253) increases the likelihood of downtime. The mine is evaluating the purchase of an additional SSR in 2025 which will help mitigate this risk. This is endorsed.
- The mine has identified sectors of the open pit where the SSR is critical for achieving an acceptable level of residual risk. These are documented in the Monitoring Procedure but have not been communicated outside of the Rock Mechanics team.
- If a radar goes down, a Grey Alarm is triggered. In these cases, the Rock Mechanics on-call is informed and will reviews the situation and stop or modify mining activities as appropriate.

Summary of SSR Availability in Q1 2024

SSR253



SSR560



Monitoring and Inspections

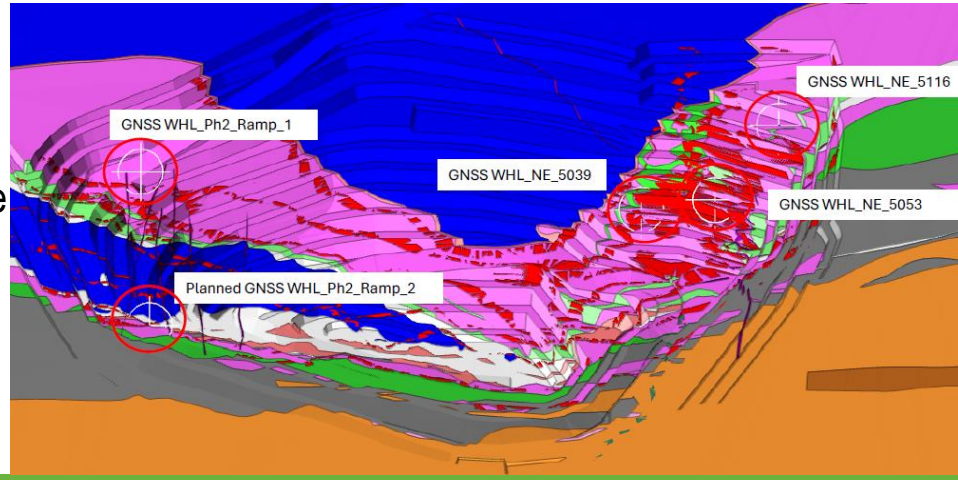
SSR Monitoring (Cont'd)

- The SSR was involved in the forecasting of 4 of the 10 reported bench failures and rockfalls that have occurred in the Whale Tail pit since the previous annual inspection in July 2023.
- An alarm was triggered in advance for 3 of the 10 failures. In the case of the July 2024 bench scale failure in the South Wall below the ramp, the alarm only triggered after the failure. While the detection of smaller failures and rockfalls with SSR is challenging, an alarm was not triggered for the 2,000 tonne failure that occurred on the Northwest Wall in May 2024.
- The alarm parameters were reviewed by AEM and GroundProbe in July 2024 and the impact of different thresholds considered. The velocity threshold was ultimately reduced from 1.3 mm/hr to 1 mm/hr over 2 scans and 3 pixels. The SSR is the primary monitoring tool and there is a need to review and reconcile the alarm parameters annually as well as after major failures to ensure that they remain effective.
- The mine continues to review the expected radar coverage relative to the planned mining. With the completion of the interim pit phases, re-positioning of the radar occurs much less frequently.
- The semi-permanent locations for the SSRs will result in a much longer-term set of monitoring data to assess the slope performance than has been available to date. The Komatiite in the Northeast and Northwest slopes is likely to experience more deformation over time than the other lithologies. It is possible that this deformation could be a precursor to a large-scale instability. The current SSR alarms are focused on relatively brittle small-scale failures and the mine would benefit from defining additional alarms that consider longer-term trends over a larger area of the slope.
- The design of the IVR V2 open pit North Wall is sensitive to the position and orientation of the High Strain / Brittle Structures, as well as the presence of Komatiite. This is one of very few design sectors at Amaruq where the potential for inter-ramp scale failures limited the slope design and no instrumentation is currently installed in this slope. As a result, it is recommended that the mine plan for full-time SSR coverage of the North Wall of the IVR V2 open pit once mining extends further to depth. The mine is currently considering this for the 2025 budget.

Monitoring and Inspections

GNSS Beacons

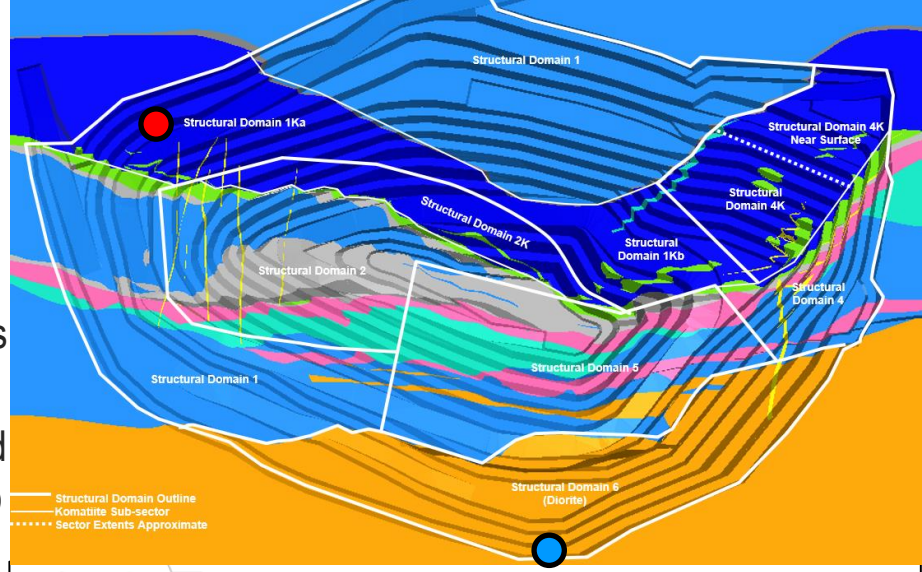
- An additional surface monitoring system, such as prisms or GPS beacons, has been recommended in previous annual inspections to complement the SSR, provide a long-term deformation baseline, and to allow the true displacement vector to be measured.
- Since the 2023 annual inspection, four GNSS/GPS have been installed in key areas of the WHL open pit:
  - One on the northwest wall, adjacent the main ramp in the Komatiite
  - Three on the northeast wall in the Komatiite
- The GNSS/GPS beacons are not yet fully integrated into the mine's monitoring system (e.g., MonitorIQ). Trigger thresholds, alarms, and a TARP need to be developed to govern the management and interpretation of the beacon data.
- There is considerable scatter (e.g., +/- 2 cm) in the beacon data that currently limits their usefulness. It is likely that the raw data are being presented without processing. The mine has made repeated efforts to resolve this with the service provider and these efforts are on-going.
- The mine has budgeted for the installation for five more beacons in 2025.
- The existing GNSS/GPS beacons are installed in areas identified as having an increased potential or consequence of slope deformation. While this is a reasonable approach, there is value in having one or more beacons installed in areas expected to be stable in order to define a baseline (e.g., the upper North Wall of the WHL open pit).
- It is recommended that at least one of the new beacons be installed in the lower North Wall to assess whether the Greywacke starts to deform during the recovery of the crown pillar, as predicted by the numerical model.

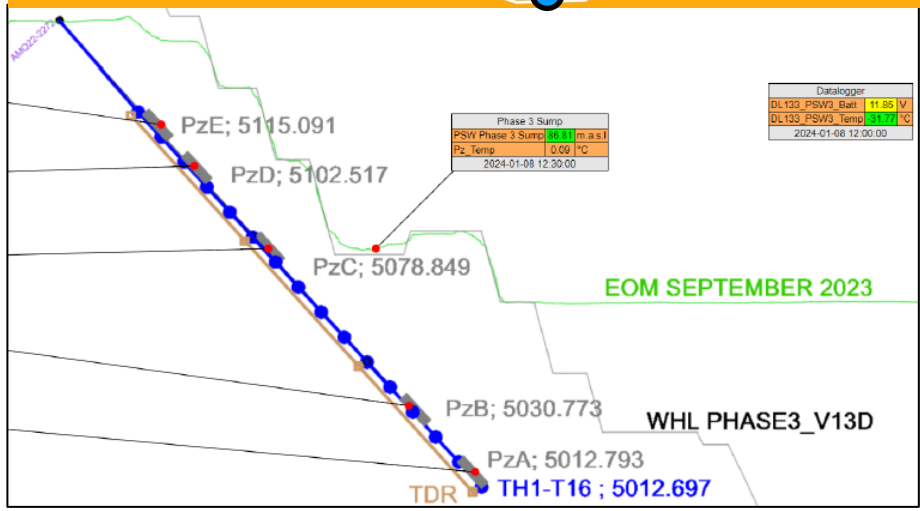


Monitoring and Inspections

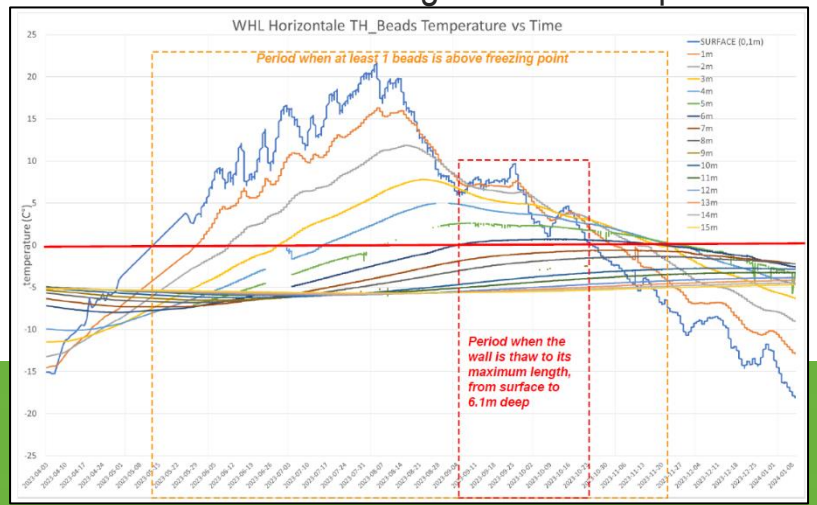
Sub-Surface Monitoring

- The sub-surface geotechnical and hydrogeological instrumentation in the open pits consists of the following instruments in the Whale Tail pit:
  - A thermistor installed in the Northwest Wall (red dot at right) to a depth of 15 m behind the wall. The data indicate that the rock mass is fully frozen during winter but thaws to a depth of 6.5 m over approx. 4 months starting in May. Freeze back started in late October and took approx. 1 month. This information is useful for better understanding the timing and behaviour of rockfalls in the open pits.
  - 5 VWPs and a thermistor string installed in a single drillhole in the South Wall (blue dot at right) in order to monitor the hydrogeological conditions within the talik exposed in the south wall. The mine has done a nice job summarizing and reviewing the data. The data show a clear response to mining and are consistent with a gradual drawdown of the piezometric surface as mining extends to depth.





Cross Section of TDR/VWP/Thermistor String in South Wall



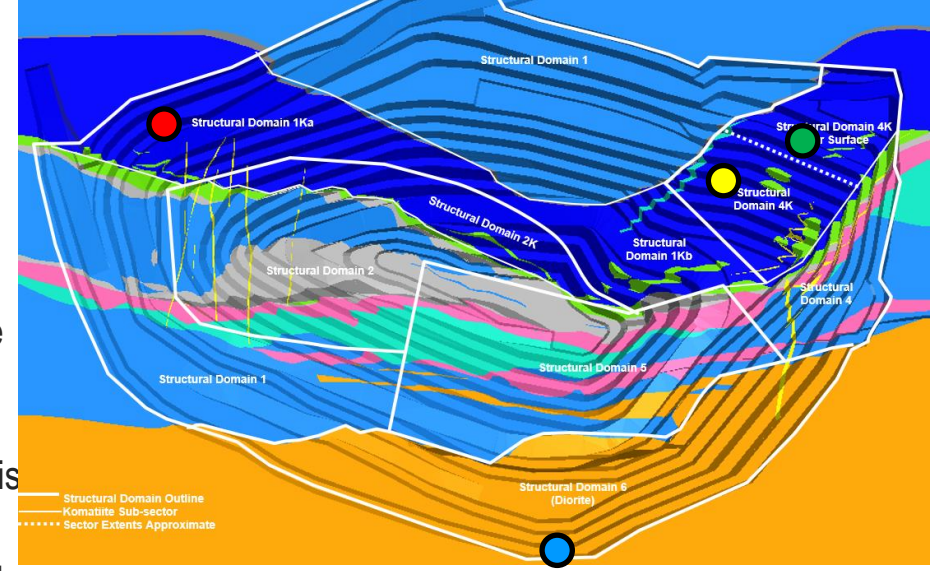
Northwest Wall Thermistor String Data

Monitoring and Inspections

Sub-Surface Monitoring (Cont'd)

- A TDR was installed in the same hole as the VWP in the South Wall (blue dot at right). The data were reasonable and showed no evidence of deformation until April 4, 2023, when all data were lost below the first crimp at approx. 18 m. The cause for this is under investigation and blast damage is suspected. There is no evidence of slope instability in this area. The TDR is not currently being monitored.
- An SAA inclinometer and VWP were installed in the upper Northeast wall (green dot) in Q4 2023. This area was originally in a closed talik associated with Whale Tail lake but the instrumentation indicates that the rock mass is now frozen. The SAA has reported limited displacement (2 mm) towards the open pit (see graph at lower right). As a result of communication issues, these instruments are not currently monitored.
- A second SAA inclinometer and VWP were installed in the lower Northeast Wall (yellow dot) in Q1 2024. The SAA was damaged during installation and only the VWP is functional.

- The inclinometer is not yet fully integrated into the mine's monitoring system (e.g., MonitorIQ). Trigger thresholds, alarms, and a TARP need to be developed to govern the management and interpretation of the instrument data. The communication issue should be resolved.
- Additional instrumentation should be installed as mining progresses (e.g., Design Sector A1K and potentially IVR V2 Design Sector V2A).
- Ideally there would be additional inclinometers and/or TDRs in the Northeast wall that cross the northern contact of the Komatiite. However, this is likely not feasible due to access limitations.



SAA Inclinometer Data

Ground Control Program

Ground Control Program

General

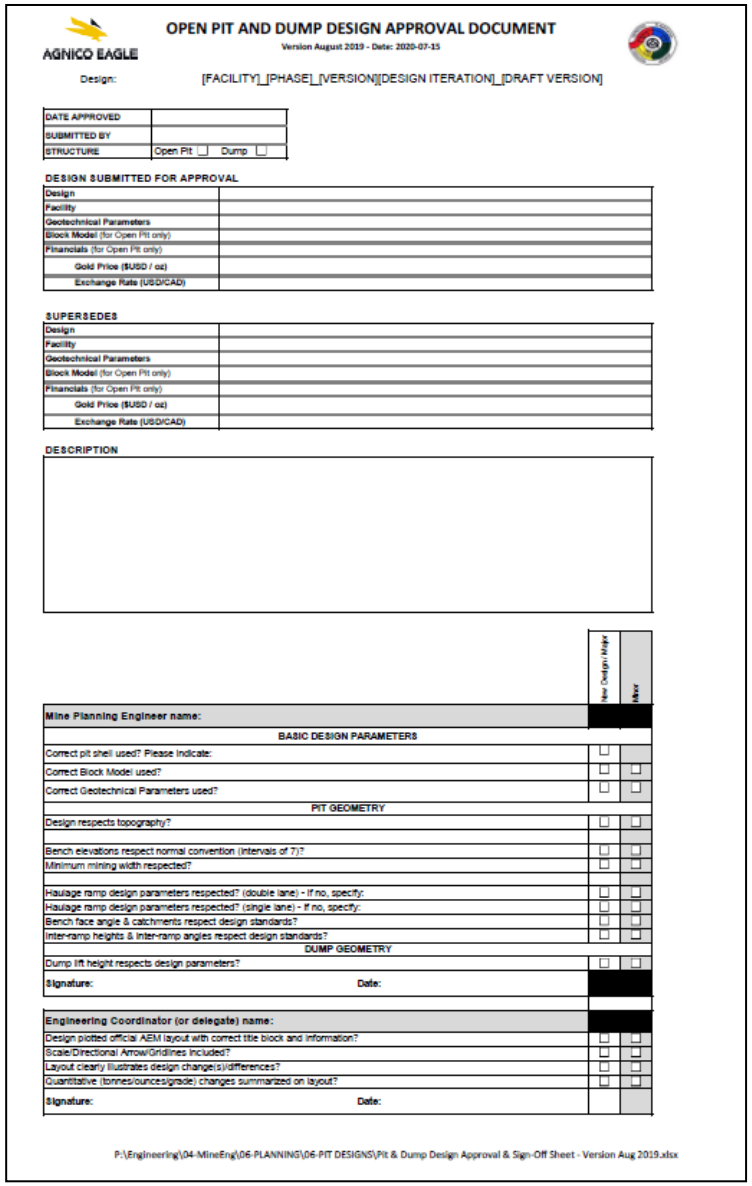
Comments on the following aspects of the ground control program for the open pits are provided on the following slides:

- Mine Design Input and Review
- Data Collection and Design Verification
- Rockfall Database
- Quarterly Summary Reports
- Resources and Training
- Ground Control Management Plan (GCMP)

Ground Control Program

Mine Design Input and Review

- The rock mechanics team provides input to the mine design and planning process as follows:
  - **Bench Master -** The Bench Master is reviewed by the rock mechanics team as part of the sign-off process (example at right).
  - **Weekly Mine Planning Meeting -** Attended by a member of the rock mechanics team. The mine plan for the next two weeks is discussed, and any rock mechanics considerations identified. Key decisions are documented in meeting minutes.
  - **Three Month Rolling Mine Plan (3MR) -** The rock mechanics team provides input to the 3MR as part of the mine planning meetings. High-level comments are documented in an overall summary presentation.
  - **Budget Mine Plan and Life of Mine Plan -** The rock mechanics team reviews the mine plan and key geomechanical considerations are summarized in a series of slides.



AGNICO EAGLE

OPEN PIT AND DUMP DESIGN APPROVAL DOCUMENT

Version August 2019 - Date: 2020-07-15

Design: [FACILITY]_[PHASE]_[VERSION][DESIGN ITERATION]_[DRAFT VERSION]

DATE APPROVED	
SUBMITTED BY	
STRUCTURE	Open Pit ☐ Dump ☐

DESIGN SUBMITTED FOR APPROVAL

Design	
Facility	
Geotechnical Parameters	
Block Model (for Open Pit only)	
Financials (for Open Pit only)	
Gold Price ($USD / oz)	
Exchange Rate (USD/CAD)	

SUPERSEDES

Design	
Facility	
Geotechnical Parameters	
Block Model (for Open Pit only)	
Financials (for Open Pit only)	
Gold Price ($USD / oz)	
Exchange Rate (USD/CAD)	

DESCRIPTION

	Your Design Major	Minor
Mine Planning Engineer name:		
BASIC DESIGN PARAMETERS		
Correct pit shell used? Please indicate:	☐	
Correct Block Model used?	☐	☐
Correct Geotechnical Parameters used?	☐	☐
PIT GEOMETRY		
Design respects topography?	☐	☐
Bench elevations respect normal convention (intervals of 7)?	☐	☐
Minimum mining width respected?	☐	☐
Haulage ramp design parameters respected? (double lane) - If no, specify:	☐	☐
Haulage ramp design parameters respected? (single lane) - If no, specify:	☐	☐
Bench face angle & catchments respect design standards?	☐	☐
Inter-ramp heights & inter-ramp angles respect design standards?	☐	☐
DUMP GEOMETRY		
Dump lift height respects design parameters?	☐	☐
Signature: **Date:**		
Engineering Coordinator (or delegate) name:		
Design plotted official AEM layout with correct title block and information?	☐	☐
Scale/Directional Arrow/Gridlines included?	☐	☐
Layout clearly illustrates design change(s)/differences?	☐	☐
Quantitative (tonnes/ounces/grade) changes summarized on layout?	☐	☐
Signature: **Date:**		

P:\Engineering\04-MineEng\06-PLANNING\06-PIT DESIGNS\Pit & Dump Design Approval & Sign-Off Sheet - Version Aug 2019.xlsx

Ground Control Program

Data Collection & Design Verification – Rock Mass Characterization

The mine collects information to support design verification and reconciliation. These efforts can be broadly grouped into rock mass characterization and slope performance reconciliation. Comments on the rock mass characterization are provided below.

- The mine previously committed to completing structural and rock mass quality mapping for at least one location each 150 m along the length of the benches in the final walls.
- This has been reduced to an “as-needed basis” in 2024, and no geomechanical mapping has been completed since the 2023 annual inspection.
- The deposits at Amaruq are notably structurally complex and rock mass structure often controls the slope performance.
- Mapping should be completed to confirm the structural trends in each design sector, help verify/refine the brittle/high strain structural model, and to help identify prominent structures that could strongly influence slope performance. This recommendation has been outstanding for several years.
- While mapping should be completed in all of the design sectors, particular attention should be paid to design sectors A1K, D4/D4K, F6 and H5 of the Whale Tail pit and Sector V2A of the IVR V2 pit. The mapping could be shared between Rock Mechanics and Geology.

- Note that Maptek LiDAR scans are completed for all benches on the final walls and are of sufficient resolution to allow discontinuity orientation data to be obtained. Measurements from the scans can be used supplement the structural mapping, especially in hard to access areas.

Table 5-7: Summary of Data Collection and Analysis Program

Structure	Responsible	Type	Frequency	Reporting	Distribution list
Whale Tail pit and IVR pit	Rock Mechanics Engineer or Technician	Wall mapping	As needed basis	-	-
	Survey team	LiDAR or Drone wall scanning	Monthly	-	-
	Rock Mechanics Engineer or Technician	Quarterly ground control report	Quarterly	Quarterly ground control report	Engineering team, EoR & Mine Ops if required

Ground Control Program

Data Collection & Design Verification – Bench Performance

- The achieved slope geometry is documented through the Maptek scans completed for all final walls. The scans are used to measure backbreak of the catch benches and the results are summarized in the quarterly reports.

- The assessments of the catch bench performance are well done. However, the results are not consistently compared to the design basis. Recommend directly comparing the results of the bench performance reviews to the bench design (e.g., does the backbreak exceed the amount planned for?).

- The assessments of catch bench performance to date have focused on the IVR open pits, though an assessment of recent benches in the WHL open pit was completed in August 2024. In the future, the new benches in each of the open pits should be consistently evaluated.

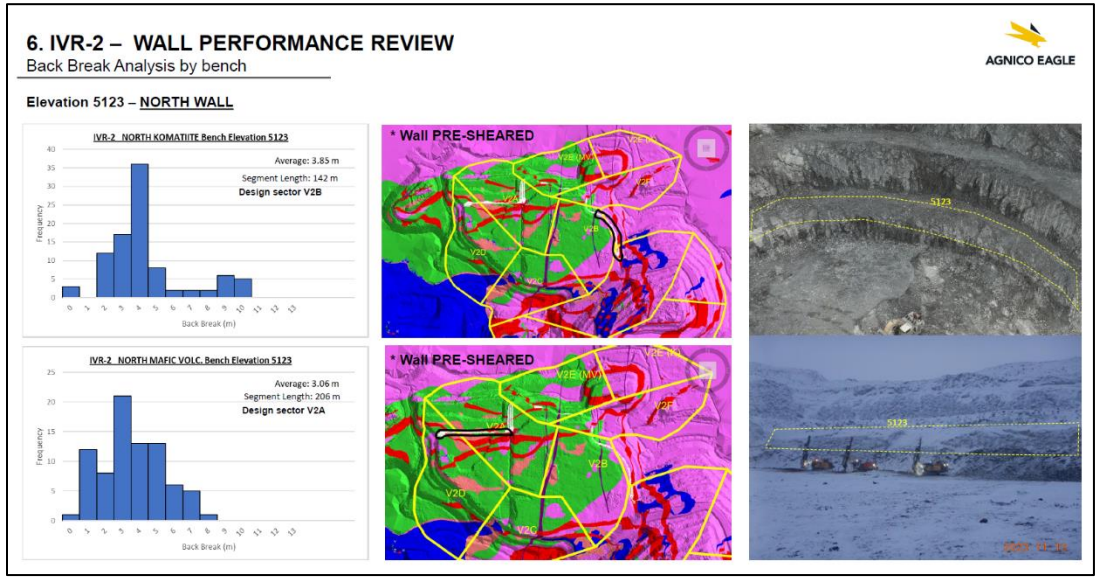


Table 5-6: Wall performance trend and actions

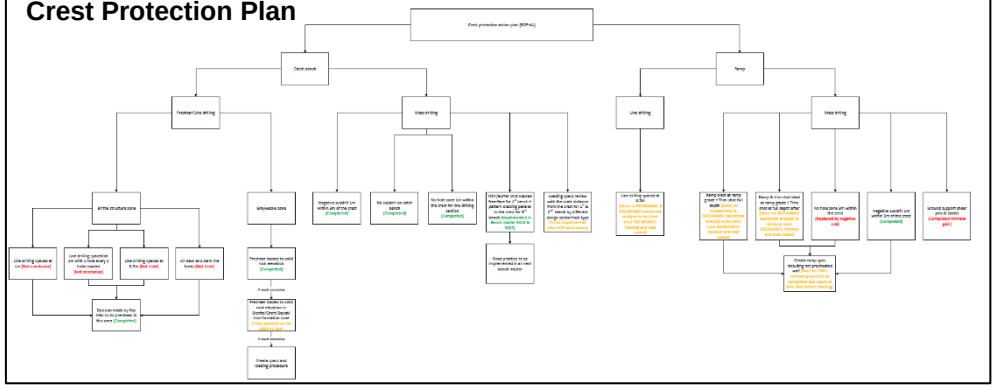
Trend	Actions
Wall performed as expected	- No action required
Wall performed less than expected	- Identify potential cause - Notify designer - Develop mitigation plan and implement specific action plan with the different stakeholders (Rock Mech., Designer, Mine planner, Production, Mine Operations).
Wall performed better than expected	- Identify possible cause - Notify designer - Evaluate the possibility of using more aggressive slope parameters with the different stakeholders (Rock Mech., Designer, Mine planner, Production, Mine Operations)

Ground Control Program

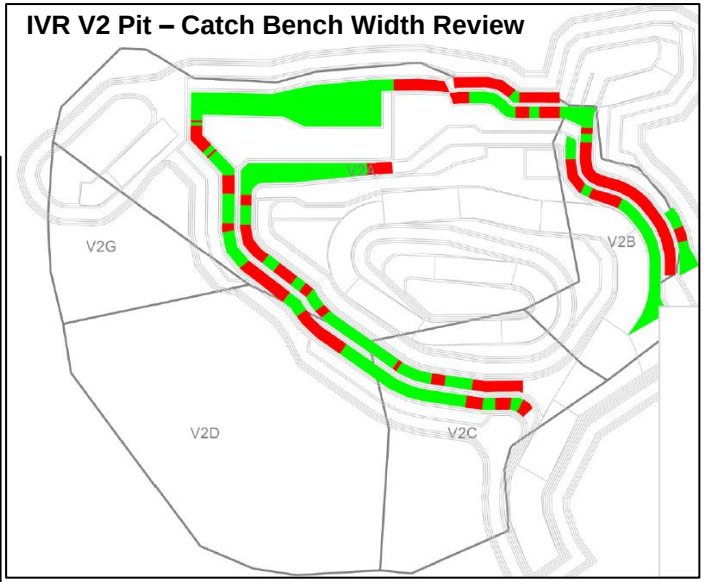
Data Collection & Design Verification – Bench Performance (2)

- In several design sectors, the effective catch bench width has often been less than design and, in some cases, the regulated 8 m minimum. This includes the IVR V2 open pit and Design Sector I1 in the WHL open pit.
- During the site visit, no immediate rockfall hazards were observed in these areas.
- Observations made during this and previous reviews suggest that the dominant cause is poor drilling and blasting practices, though adverse rock mass structure (e.g., WHL Sector F6) and scaling to remove identified hazards can also be factors.
- The mine implemented a Crest Protection Plan in 2024 and has progressively iterated through a series of trials to improve the catch bench performance. This includes line drilling, air-decking, negative sub-drill near the future crest position, etc. This is an important development and should be continued until the minimum catch bench width is reliably achieved.
- The status and effectiveness of the initiatives to reduce the catch bench loss needs to be compiled and quantified.
- Ultimately the mine needs to demonstrate that the minimum catch bench width cant be reliably achieved. Otherwise the design catch bench width will need to be increased or a variance obtained from the WSCC.

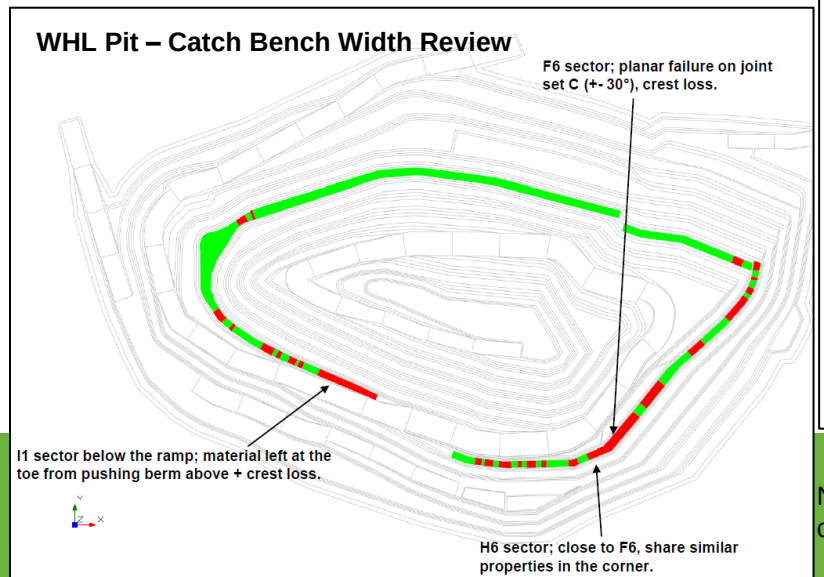
Crest Protection Plan



IVR V2 Pit – Catch Bench Width Review



WHL Pit – Catch Bench Width Review



Note, green shading indicates a catch bench width of 8 m or more

Ground Control Program

Rockfall Database and Reporting

- Rockfalls are to be recorded in the Rockfall Database and a rockfall report is issued.
- 13 rockfalls have been recorded since the previous annual inspection in July 2023. Of these, three occurred in the closed IVR V1 open pit, and ten occurred in the Whale Tail open pit. These represent bench-scale instabilities or smaller rockfalls and can broadly be grouped as follows:
  - IVR V1 – Progressive ravelling and rockfalls along a contact as well as a bench scale wedge failure on the footwall. These failures are consistent with the expected performance of the open pit slopes.
  - Whale Tail Northeast Wall – Four bench scale planar or wedge failures with a tonnage between <50 and 500 tonnes occurred along brittle / high strain structures in the Komatiite. All of the failures were retained on the bench below or by a berm at the toe of the bench. These failures are consistent with the expected performance of this sector.
  - Whale Tail Northwest Wall – Four wedge failures with a cumulative tonnage of 17,800 tonnes. The failures occurred as individual bench failures as the benches were developed but collectively represent a multi-bench failure. The failure mechanism is complex and these failures are described in greater detail earlier in this summary.
  - Whale Tail Southwest Wall – A progressive wedge failure with a cumulative tonnage of 3,400 tonnes occurred directly below the ramp. This failure is described in greater detail earlier in this summary.
- The documentation of the failure characteristics in the database has become less complete over the last year. The database should be periodically reviewed for consistency and completeness.
- There is a need to clarify the criteria for what type of events are recorded in the rockfall database. While events that meet the reporting threshold for the WSCC are recorded, events that could have plausibly resulted in injury or damage under different circumstances, should always be recorded in the database.

Ground Control Program

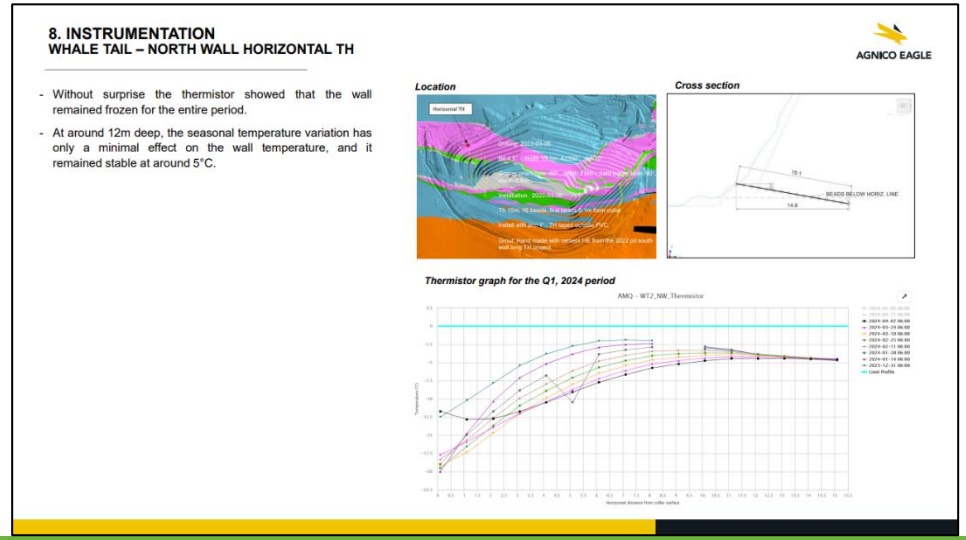
Rockfall Database and Reporting

- A report is completed for all reportable rockfalls and slope failures. In practice these reports are completed for almost all events. Intelex reports are completed for rockfalls deemed to be near misses.
- The contents of the reports varies but typically focuses on a factual description of the event (conditions and chronology), the consequences of the event, and the immediate corrective actions to be taken. While the reports are typically well done, they consider the events in isolation and do not always consider the effectiveness of the existing controls or whether there are lessons to be learned.
- There is a need to complete a more detailed review and back-analysis of some of these failures, both to identify root causes / lessons learned and to better anticipate similar failures in the future. Examples include:
  - Trends, such as the repeated failures along the Brittle / High Strain Structure in the Northwest Wall of the Whale Tail pit.
  - Failures with an increased consequence, such as the failure below the ramp on the Southwest Wall of the Whale Tail pit.
  - Unusual occurrences (e.g. larger failures) or cases where the existing procedures did not function as intended or desired.
- The review should consider:
  - The primary and contributing causal factors, including lithology, structure, water, temperature, blasting, etc.
  - The effectiveness of the applied controls
  - Lessons learned.
  - The potential for other similar failures.
  - Action or follow-up items
- Define a commitment for these reviews in the GCMP.

Ground Control Program

Quarterly Summary Reports

- The mine has committed to producing a report every quarter that summarizes the slope performance, monitoring and instrumentation activities, and rock mass characterization data collected over the reporting period. Progress updates are also provided on any projects.
- The quarterly reports have been completed as planned for each quarter since the last annual inspection. These reports are an important verification activity and provide a good summary of the ground control program activities. The following comments from previous annual inspections remain applicable:
  - The reports include a dashboard summary of the activities complete, but there is no reference to the commitments in the GCMP. Recommend including a column in the dashboard indicating the target frequency for the tracked items.
  - Consider including a slide commenting on the effectiveness of the mine's controls (e.g., radar alarms, prior identification of rockfalls, etc.).
- These reports are also a potential mechanism for summarizing trends in wall performance (e.g. repeat failures in one sector, general patterns in the monitoring and radar data, etc.).



Ground Control Program

Resources and Training

- The composition of the rock mechanics team has changed since the last inspection and now consists of:
  - Antoine Laporte, Interim Rock Mechanics Coordinator
  - Katie Hawley, Rock Mechanics Engineer
  - Jasmine Sophie Papineau, Rock Mechanics Engineer
  - Vincent Duranleau, Rock Mechanics Technician
  - Arron Haselhorst, Rock Mechanics Technician
- The team is supported by several former members of the rock mechanics team:
  - Christian Tremblay, Interim General Supervisor for Engineering – Approx. 15 to 20% of his time is spent on rock mechanics
  - Amadou Traore, Underground Supervisor for Engineering – Approx. 20% of his time is spent on rock mechanics for the underground mine
- The team is at full strength and, as a result, there are typically three rock mechanics staff on site at any given time. These staff are responsible for the open pits as well as the underground mine, though in practice the two technicians focus on the open pits and the two engineers focus on the underground mine. The team are currently meeting most of their commitments for the open pits.
- The development of a skills matrix to help identify training needs continues to be recommended. The recently developed Roles and Responsibilities document for the Rock Mechanics team is a good starting point.
- The team has a full suite of appropriate software, including Rocscience software as well Leapfrog, Maptek, and Pix4D. The team primarily uses Deswik for visualization.


THANK
YOU