

Appendix 9

Whale Tail 2025 Annual Open Pit Geomechanical Inspection Report

March 10, 2026

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Dear Katie,

RE: Meadowbank Complex - Amaruq Site - 2025 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 2025 annual inspection of the open pits at the Amaruq Site between August 11 and 13, 2025 with Arron Haselhorst (Rock Mechanics Technician) and Katie Hawley (Strategic Rock Mechanics Engineer) of AEM. The results of the inspection are summarized in this letter and detailed in Appendix A. A draft letter was provided to AEM for review and comment on December 17, 2025.

2.0 2025 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. Additional detail and context are provided in Appendix A. Progress on the recommendations is summarized

in Table 2. AEM were able to address and close approximately a third of the recommendations that were open at the time of the 2024 annual inspection.

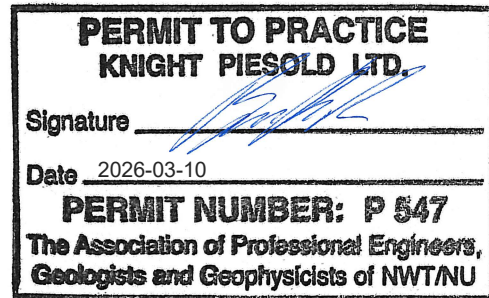
Table 2 Status of Annual Review Recommendations

Priority	Open in 2024 Review	Closed or N/A	New or Re-opened	Reclassified	Open in 2025 Review
P1	0	0	0	0	0
P2	12	6	3	+1 / -2	8
P3	11	6	5	+2	12
P4	7	2	2	-1	6
Total	30	14	10	-	26


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.



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: 

- Attachments:**
- Table 1 Rev 0 Recommendations Summary
 - Appendix A Meadowbank Complex - Amaruq Site - 2025 Annual Open Pit Geomechanical Inspection

/bdp

TABLE 1
AGNICO EAGLE MINES LIMITED
MEADOWBANK COMPLEX - AMARUQ SITE
2023 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	2025 Status and Comments	2025 Recommendations	Priority			
Rock Mass Characterization		Undertake structural mapping to: a) Define the northeast dipping joint set in the lower Phase 2 Southeast Wall of the Whale Tail open pit. b) Refine the extent 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 design, the I/RV 2 open pit North Wall etc.), increasing the importance of validating the model through mapping in the open pit 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 Sectors A1K, E4, D4K, and I/RV 2A. 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.	Structural mapping has not been completed since 2023 inspection. There is a need for periodic mapping to confirm the rock mass characteristics that underpin the design recommendations or when unexpected conditions are encountered (e.g., sheared Malic Volcanics).	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 extent 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 I/RV 2A. 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.	The Rock Mechanics team has completed structural mapping of four general areas within the Whale Tail Pit (East Wall above and below the ramp, Southeast Wall below the ramp). The data have not yet been consolidated or reviewed for trends. No mapping is currently undertaken to validate the Brittle / High Strain Structure model. The Rock Mechanics team has completed structural mapping of four general areas within the Whale Tail Pit (East Wall above and below the ramp, Southeast Wall below the ramp). The data have not yet been consolidated or reviewed for trends. No mapping has been completed in the I/RV pits. The commitment in the GCMF has been clarified and now specifies that mapping is to be completed annually or when unusual conditions are observed.	Complete structural mapping in the I/RV open pits to confirm the general trends in the orientation of the foliation and to validate the High Strain / Brittle Structure model. This is particularly important for the V2A and the V2V1AK design sectors. Confirm the joint sets that formed the wedge in the South Wall of the I/RV 2 open pit. Consolidate and review the structural mapping for the Whale Tail Pit to confirm the general structural trends as well as the extent of Structural Domains 2, 5 and 6 in the Southeast, South and Southeast Walls. Continue to complete structural mapping in the Whale Tail Pit. Assess the potential impact on the open pit slope performance and design if there are significant changes to the interpretation of the rock mass structure.	Complete structural mapping in the I/RV open pits to confirm the general trends in the orientation of the foliation and to validate the High Strain / Brittle Structure model. This is particularly important for the V2A and the V2V1AK design sectors. Confirm the joint sets that formed the wedge in the South Wall of the I/RV 2 open pit. Consolidate and review the structural mapping for the Whale Tail Pit to confirm the general structural trends as well as the extent of Structural Domains 2, 5 and 6 in the Southeast, South and Southeast Walls. Continue to complete structural mapping in the Whale Tail Pit. Assess the potential impact on the open pit slope performance and design if there are significant changes to the interpretation of the rock mass structure.	P2		
		Complete geotechnical mapping on a regular basis, consistent with the commitments in the GCMF. 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 I/RV 2A and V2E of the I/RV 2 pit.	The Rock Mechanics team commits to undertaking spot mapping every 150 m along each of the final benches. The mapping is not fully 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 focused on critical areas in Design Sector D4 of the Whale Tail pit and Design Sector V2A of the I/RV 2 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 I/RV 2 pit.	Complete the original recommendation. The mapping should include Design Sectors A1K, D4K, F6 and I/RV 2A and V2E.	Geotechnical 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 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 conditions are encountered (e.g., sheared Malic Volcanics).	Complete geotechnical 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 GCMF should be clarified accordingly.	The Rock Mechanics team has completed rock mass quality spot mapping of four general areas within the Whale Tail Pit (East Wall above and below the ramp, Southeast Wall below the ramp). The data have not yet been consolidated or reviewed for trends. No mapping has been completed in the I/RV pits. The commitment in the GCMF has been clarified and now specifies that mapping is to be completed annually or when unusual conditions are observed.	Complete geotechnical mapping to validate and refine the High Strain / Brittle Structure Model. This is particularly important for the following areas: - I/RV North and Northeast walls (V2A and V2V1AK design sectors). - Whale Tail Northwest, Northeast, Southeast, and Southwest walls (A1K, B2K, D4K, H5, and G2 design sectors). Complete geotechnical mapping to validate the lithology model, particularly the extent of the Komatite in the South Wall of the Whale Tail Pit. Assess the potential impact on the open pit slope performance and design if there are significant changes to the interpretation of the structures and model. These activities have been broken out as a separate recommendation as the mapping is best completed by Geology.	Complete geotechnical mapping to validate and refine the High Strain / Brittle Structure Model. This is particularly important for the following areas: - I/RV North and Northeast walls (V2A and V2V1AK design sectors). - Whale Tail Northwest, Northeast, Southeast, and Southwest walls (A1K, B2K, D4K, H5, and G2 design sectors). Complete geotechnical mapping to validate the lithology model, particularly the extent of the Komatite in the South Wall of the Whale Tail Pit. Assess the potential impact on the open pit slope performance and design if there are significant changes to the interpretation of the structures and model. These activities have been broken out as a separate recommendation as the mapping is best completed by Geology.	P2		
											P3	
												P2
Design	Review of 5-Year Mine Plan and LOM	(New Recommendation in 2024)			Recovery of the crown pillar between the underground workings and the open pit is planned for the second half of 2023. 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.	The various commitments related to the crown pillar, including from previous design studies and the 2024 workshop, are tracked in a table by the Rock Mechanics team. Progress is being made. The Underground Weekly Planning meeting minutes summarize the progress of lighting the steps and development below the crown pillar. The cable bolts are being installed in the footwall drive intersections as each slope is mined. This is being tracked through the slope PSDs.	None. Continue to track this work to completion.		Complete		
		(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 2023. This is likely too early to ensure that the benches remain frozen. Mining in this area is planned to be completed by April 2024.	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 the event a number of benches can be excavated and buttressed during the winter than currently planned.	The timing of the development of the benches and the subsequent buttress below the ramp in the Northeast Wall of the Whale Tail open pit was reviewed during the inspection. The buttress has not yet been incorporated into the LOM or Budget mine plans. A high-level review suggests that it will be possible to mine the benches while they are frozen and to construct the buttress prior to freshet. However, the details are important and need to be worked through.	Design the buttress in detail and include it in the LOM and Budget mine plans. Ensure that the benches will remain frozen between establishing the benches and constructing the buttress prior to freshet. If this is not possible, a revised mining strategy will be required for this area.	P2			
		(New Recommendation in 2025)						Most recent rockfalls have occurred along High Strain Brittle Structures #1, #2 and #3 in the Northeast Wall and along the contacts of the Komatite in the South Wall. The mine has started to anticipate these failures by projecting the contacts to the next bench and making these areas a focus of monitoring and scaling. Scaling the wedges can be ineffective if the benches are established in the winter and the rock mass remains frozen. The wedges fall during or after freshet as the rock mass thaws. These wedges are expected to continue to form as the open pit continues to depth.	Review the location and impact of potential future failures along the HSBs and contacts (particularly where they are located along the ramp) and develop a mitigation plan developed. This could include local adjustments to the bench geometry / form (blading to mine out potential wedges, shear pins, buttresses, rockfall berms, a bouscous monitoring plan, etc.).	Review the location and impact of potential future failures along the HSBs and contacts (particularly where they are located along the ramp) and develop a mitigation plan developed. This could include local adjustments to the bench geometry / form (blading to mine out potential wedges, shear pins, buttresses, rockfall berms, a bouscous monitoring plan, etc.).	P3	
		(New Recommendation in 2025)						The 2023 ST 208 will be exposed in the East Wall of the Whale Tail below the ramp in the Northeast Wall and along the contacts of the Komatite in the South Wall. The slope is partially backfilled with unconsolidated Rockfill (URF). Once exposed in the open pit, the URF will be a potential rockfall hazard. In addition, migration of the URF could result in a loss of confinement, leading to the contacts between the slopes, increasing the potential for a bench-scale instability (which could impact the benches above).	Review measures for managing the slope and develop a detailed plan for incorporation into the mine plan. These measures could include: - Modifying the local bench geometry to remove or reduce the size of lower formed by the exposure of the slope in the wall. - Flagging inhibitors to the URF, digging chain-link mesh over the area, and/or constructing rockfall berms to manage the rock fall hazard. - Installing ground support (e.g., cable bolts) to reinforce the brow above the slope.	Review measures for managing the slope and develop a detailed plan for incorporation into the mine plan. These measures could include: - Modifying the local bench geometry to remove or reduce the size of lower formed by the exposure of the slope in the wall. - Flagging inhibitors to the URF, digging chain-link mesh over the area, and/or constructing rockfall berms to manage the rock fall hazard. - Installing ground support (e.g., cable bolts) to reinforce the brow above the slope.	P3	
Design Verification and Optimization		Document the bench performance and key rock mass characteristics in the I/RV 2 open pit and compare them to the design. In particular, it is important to verify that the north wall is being established in the Malic Volcanics and below the Brittle Structure exposed along the contact between the Malic Volcanics and the Komatite as the slope geometry recommendations for the V2A and V2E design sectors are based on this premise.	The bench performance of the I/RV 2 open pit was reviewed as part of the Open Pit Ground Control Quarterly Reports in Q3 2022 and Q1 2023. The shales 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 I/RV 2 pit and compare them to the design. Continue to document and review the bench performance. Update the process of completing a detailed review of the design of the I/RV 2 open pit, including the bench performance and rock mass characteristics.	Documentation of the lithology, rock mass quality, and rock mass structure in the I/RV 2 pit has not been completed in 2024. This is because mining has focused on the backblast 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 resumes on the footwall (i.e., V2A design sector). The review of the design of the I/RV 2 open pit was completed by I/RV in 2024. The review is documented in letter M24-02020 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 mass quality, and rock mass structure in the V2A design sector of the I/RV 2 pit, and along the contacts 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.	This work remains outstanding. Mining of the North Wall of the I/RV 2 was limited to a couple of benches over the last two months.	This recommendation has been grouped with the recommendations in the Rock Mass Characterization section.	N/A			
		(New Recommendation in 2024)						Back break was measured for the I/RV 2 pit for Q3-Q4 of 2024. The backbreak averaged 1.8 to 2 m (excluding the first bench which is influenced by surface effects). However, catch bench compliance was not assessed. The catch bench compliance was assessed in Q2 2025. The catch benches evaluated achieved the required width of 1 m with 79% reliability. This is consistent with the design basis. The catch bench performance needs to be more consistently compared to the design basis. Recommend continuing to complete this as part of the Quarterly Summary Reports.	Consistently complete the catch bench compliance reviews as part of the Quarterly Summary Reports. Priority reduced to P3 given the progress demonstrated over the last year.	P3		
		(New Recommendation in 2024)						Rock Mechanics has recently started to review and document the catch bench compliance for the Whale Tail pit. Previous efforts focused solely on measuring the backblast and this change is endorsed.	Complete systematic reviews of the catch bench compliance for all new benches in the Whale Tail pit.	Catch bench compliance was reviewed for each of the final benches established since Q2 2024. The catch benches achieved the required 8 m with 75 to 80% reliability. This is consistent with the design basis.	None. Continue to complete the catch bench compliance reviews.	Complete
		(New Recommendation in 2023)						Periodically compile and review the data from the SSR, GNS3 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 P3 based on the time available to collect and review these data before the crown pillar is recovered.	The mine is planning to supplement the data from the GNS3 beacons and SAA with InSAR and periodic LiDAR scans. While the expansion of the monitoring program is a good initiative, there is a need to start reviewing the existing monitoring data in aggregate and using it to validate the numerical modeling results. As time passes, the value that can be obtained from the process is diminishing.	Complete the 2024 recommendations. At least an initial review should be completed in Q4 2025.	P2	
		(New Recommendation in 2024)						Confirm the extent of Structural Domain 5 and adjust the implementation of the slope geometry recommendations for the South and Southeast walls accordingly (i.e., Design Sectors H6H and F6G5). The observed slope performance in the Southeast Wall suggests that Design Sector F6 may extend deeper than currently planned.	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 position of the D1-D2 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-cut on 206L in the underground mine.	Structural mapping has been completed on the lower South Wall over the last year. These data can be used to refine / confirm the transition from Structural Domain 5 to 6. The data have not yet been consolidated and reviewed. Observations in the open pit suggest that the active bench has reached the transition to Structural Domain 5. These are a positive development.	This recommendation has been grouped with the recommendations in the Rock Mass Characterization section.	N/A
		(New Recommendation in 2024)							Mapping of the cross-cut on 206L in the underground mine was completed in 2024. The measured orientation of the foliation is consistent with the expectation that it folds to the north.	None. Complete periodic mapping in the open pit to verify the dip of the foliation. This is covered by a recommendation above.	Complete	
Implementation, Inspections and Monitoring	Inspections	I/RV 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 open pit. 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 I/RV 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 analysis pit. These areas are tracked on the Hazard Maps. A rockfall berm has not been constructed along the inside of the ramp in the I/RV West 2 pit. However, access to the I/RV West 2 pit is prevented by a berm and access is not currently planned.	None	The I/RV West 2 pit is periodically accessed by dewatering personnel who have been trained along the ramp, below a series of rockfall hazards. While Rock Mechanics completes an inspection of the ramp before allowing access, the hazards have not been mitigated. If access into the open pit continues to be required, these hazards need to be mitigated. As a result this recommendation has been re-opened.	Permanently close the open pit or mitigate the rockfall hazards above the I/RV West 2 Ramp. Mitigation is expected to require the removal of the loose material at the crest of the slopes and/or the construction of a rockfall berm along the inside of the ramp).		P2			
		(New Recommendation in 2025)						The Hazard Map has been updated to show the location of the Komatite Zones (which trigger the Working With Komatite procedure) and the position of beems. The mine has also started using Green Cardies to demarcate geotechnical hazards. These are a positive development.	This recommendation is not considered applicable given the current capabilities of the Rock Mechanics team. The recommendation would revert if the team changed. Consider developing more detailed guidance in the event of a future change in personnel.	N/A		
		(New Recommendation in 2025)						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. A spotter is required in Medium Risk areas but not in Low Risk areas. Remedial measures are required in High or Very High Risk areas and these areas are demarcated with a berm or cardies. The Low and Medium Risk areas are only communicated via the hazard maps and are not demarcated in the field. However, the hazard maps are not routinely carried by personnel working in the pit and are not updated outside of the regular two-week cycle. As a result, it is not clear whether personnel can reliably apply the Work Close to Pit Wall procedure. Note that the Drillers and Blasters only work on patterns generated by Rock Mechanics through the Wall Approval procedure, as such the personnel most likely to be exposed to Medium Risk areas are Surveyors and Geologists.	Review the integration between the Work Close to Pit Wall procedure and the hazard maps to ensure that the procedure can be consistently implemented as intended.	P2		
		(New Recommendation in 2024)						The I/RV West 2 pit is periodically accessed by dewatering personnel who have been trained along the ramp, below a series of rockfall hazards. While Rock Mechanics completes an inspection of the ramp before allowing access, the hazards have not been mitigated. If access into the open pit continues to be required, these hazards need to be mitigated. As a result this recommendation has been re-opened.	Develop a checklist to improve consistency among staff and to avoid hazards being missed.	P4		
(New Recommendation in 2024)							The Low and Medium Risk areas are only communicated via the hazard maps and are not demarcated in the field. However, the hazard maps are not routinely carried by personnel working in the pit and are not updated outside of the regular two-week cycle. As a result, it is not clear whether personnel can reliably apply the Work Close to Pit Wall procedure. Note that the Drillers and Blasters only work on patterns generated by Rock Mechanics through the Wall Approval procedure, as such the personnel most likely to be exposed to Medium Risk areas are Surveyors and Geologists.	Develop 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 used 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.	The drone surveys are summarized in reports that present a side-by-side comparison of the current and prior conditions of the catch benches. These are nice summaries. The reports currently focus on overall slope performance. There is value in periodically including close-ups of specific areas of interest (e.g., areas with Edge Protection along ramp) where the drone is best-suited to identifying potential instabilities.	Periodically include close-up photos of specific areas of interest in the drone survey reports. This should include the bench and bench crest with the Edge Protection above the South Wall failure.	P3	

TABLE 1
AGNICO EAGLE MINES LIMITED
MEADOWBANK COMPLEX - AMARUG SITE
2025 ANNUAL OPEN PIT GEOMECHANICAL INSPECTION
RECOMMENDATIONS SUMMARY

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Observations, Comment and Recommendations										
Category	Topic	2023 Recommendations	2023 Status and Comments	2023 Recommendations	2024 Status and Comments	2024 Recommendations	2024 Status and Comments	2025 Recommendations	2025 Status and Comments	Priority
Instrumentation and Monitoring		(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 Konatite 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 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 Konatite 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.	Define additional SSR alarms that consider the potential for large-scale slope instability that manifested over an extended period. The length of the period is likely to be limited by noise in the data (e.g., atmospheric effects).	The potential for monitoring longer-term deformation using the radar is limited based on discussions with GroundProbe. The procedure was in the order of 3 months.	None. Continue to periodically monitor longer-term deformation trends. Changes in slope behaviour should trigger a review.		Complete
		(New Recommendation in 2024) Define a red trigger for the SSR TARP to provide a backup for unprecipitated 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 unprecipitated 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 of an unprecipitated / unexpected instability is missed.	Define a commitment to review the effectiveness of the SSR alarm parameters on an annual basis. If the observed/unexpected 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.	The SSR alarm parameters were reviewed by AEM and GroundProbe in July 2024 and the impact of different thresholds considered. The velocity threshold was reduced from 1.3 mm/hr to 1 mm/hr over Zones 2, 3 and 3 contiguous pixels. In certain areas, the alarm is sometimes missed by trends over 60 minutes and 3 pixels over 2 scans.	Define a commitment (e.g., in the GCMPI) to review and update the alarm parameters annually as well as after major failures or failures where the SSR alarms were ineffective so ensure that they remain effective.		P3
		(New Recommendation in 2024) Explain in the GCMPI 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.	The Ground Control Monitoring Using Radar System Procedure was updated in July and an amended approach. The updated procedure now explains the common alarm triggers used and provides guidance on how they can be adjusted based on different circumstances.	None. Finalize the procedure once it is approved.		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.			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.	One additional GNSS beacon was installed in the North Wall of the Whale Tail Pit in the Greywacke in April 2025.	Finalize the instrumentation locations and complete the planned instrumentation.		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.			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.	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.	An alarm has been specified for 10 mm/hr. The ability to set more restrictive alarms is constrained by the precision of the beacons. The available data suggest that this alarm may be triggered by spurious readings.	Investigate whether the base station is moving and whether it needs to be relocated to a stable area.		P3
Implementation: Inspections and Monitoring		(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.			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.	The area has been opened to two-lane traffic after Edge Protection was installed. A localized SSR alarm has been defined for the bench below the area and visual inspections are completed every two weeks.	Supplement the visual inspections of the bench with the Edge Protection with close-up photos of the bench and bench crest using the drone.		N/A
		(New Recommendation in 2025) The design of the IVR V2 open pit North Wall is sensitive to the position and orientation of the High Steam / Brittle Structures, as well as the presence of Konatite. This is one of very few design factors at Amarug where the potential for one-way scale failures limit 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.	Plan for full-time SSR coverage of the North Wall of the IVR V2 open pit once mining of the North Wall resumes.	A third SSR has been purchased for use at IVR and is expected to arrive in Q3 of 2025.	Set-up and incorporate the third SSR into the monitoring program as planned.		P3	
		(New Recommendation in 2023) Implement a mechanism within the Hazard Tracking Database to flag overdue corrective actions. If an action has been suspended or the hazard mitigated through other means the action should be closed out.	Hazards with overdue corrective actions or that have been investigated for extended durations are not flagged. In some cases, corrective actions that have been suspended 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 requires more information. This is a key tool for understanding failures and for revalidating the slope design and other control measures.	Complete the original recommendation.	The database has been cleaned up.	None. Continue to periodically review and clean-up the database.		Complete
		(New Recommendation in 2023) There are multiple hazards documented in the Hazard Tracking Database that have not been closed out or 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.	This work remains outstanding.	Complete the original recommendation.	This work remains outstanding.	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.		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 revalidating 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, 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).	Define criteria for what type of events are recorded in the Rockfall Database. Events that resulted in injury or damage to equipment under different circumstances, should always be recorded in the database. Priority decreased to P4.	This work remains outstanding. The criteria for which rockfalls to be documented is still limited to reportable rockfalls in the GCMPI.	In practice, the Rock Mechanics team documents all rockfalls regardless of size. Large failures are reliably captured but smaller rockfalls likely are not.	Redefine the criteria in the GCMPI for what type of events are recorded in the Rockfall Database. Events that could have plausibly resulted in injury or damage under different circumstances, as well as unusual occurrences, should also be recorded in the database.		P4
Hazard Tracking		(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.	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 Steam 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. - Whether the failure is part of a larger trend. - Action or follow-up items.	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. - Whether the failure is part of a larger trend. - Action or follow-up items.	None. Continue to complete reviews as appropriate.		Complete		
		(New Recommendation in 2024) 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 Steam 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.	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 Steam 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. - Whether the failure is part of a larger trend. - Action or follow-up items.	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. - Whether the failure is part of a larger trend. - Action or follow-up items.	None. Continue to complete reviews as appropriate.		Complete		
		(New Recommendation in 2024) Mining in the IVR V1 open pit and Whale Tail Extension is complete, but both are still assessed as part of the long-term waste management strategy for the mine. As a result, concern will be travelling on the ramps in these pits on an on-going basis. The mine currently manages these risks through regular inspections by the Rock Mechanics team.	Establish a rockfall berm along the inside of the IVR V1 open pit and Whale Tail Extension ramps.	Evaluate the use of a rockfall berm along the inside of the IVR V1 open pit and Whale Tail Extension ramps instead of relying on regular inspections to manage the rockfall hazard.	This work remains outstanding.	Establish a rockfall berm along the inside of the IVR V1 open pit and Whale Tail Extension ramps.	Priority increased to P2 based on the rockfall hazard.		P2	
		(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.	The design was developed and installed a Geobagging rockfall barrier along approximately 20 m of the crest above the ramp in the Southeast Wall.	None.	Review the need for rockfall mitigation measures in this area, such as a rockfall berm or a rockfall barrier.	Confirm the extent of the rockfall. If the rockfall extends further to depth than currently estimated, the catch bench width may need to be increased.		P3	
		(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.	A step-in with a rockfall berm was constructed on the 5025 bench to address the rockfall hazard below the failure.	None.	Complete the planned activities.		Complete		
Implementation: Other Controls		(New Recommendation in 2025) The mine has continued to iterate and improve on the blasting program. Additional improvements were discussed during the annual inspection, including: - Developing dedicated blasting practices for all bench configurations in the Konatite. - Setting up periodic meetings between Blasting and Rock Mechanics to review progress and discuss additional opportunities. - Incorporating Rock Mechanics in the design and sign-off process for blast patterns to ensure that geotechnical considerations are taken into account.	Complete the planned activities.	Complete the planned activities.	Complete the planned activities.	Complete the planned activities.		P3		
		(New Recommendation in 2025) The mine has continued to iterate and improve on the blasting program. Additional improvements were discussed during the annual inspection, including: - Developing dedicated blasting practices for all bench configurations in the Konatite. - Setting up periodic meetings between Blasting and Rock Mechanics to review progress and discuss additional opportunities. - Incorporating Rock Mechanics in the design and sign-off process for blast patterns to ensure that geotechnical considerations are taken into account.	Complete the planned activities.	Complete the planned activities.	Complete the planned activities.	Complete the planned activities.		P3		
Training		(New Recommendation in 2025) 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 Role and Responsibilities document for the Rock Mechanics team is a good starting point.	An initial skills matrix has been developed. It will be updated but a good start should be expanded to include other key skills such as pit wall inspections and approvals.	Review the skills matrix to include all key skills needed for Rock Mechanics personnel to effectively manage the geomechanical hazards in the open pits.		P4
		(New Recommendation in 2025) The program resources and staff are considered adequate for the current demands on the Ground Control Program. However, additional demands will be placed on the program in the future due to the extension of the underground mine life and the expected expansion of the IVR open pits. As a result, the team will need to manage the recovery of the crown pillar below the WHL open pit at the same time as the mining of the south wall of the IVR open pit. Both of these areas are considered higher risk and will require greater attention. The adequacy of the team's resources in the coming years should be reviewed.	Review the resources and staff available to the Rock Mechanics team relative to the expected demands on the team over the next few years. Adjust the resources and/or plan accordingly.	Review the resources and staff available to the Rock Mechanics team relative to the expected demands on the team over the next few years. Adjust the resources and/or plan accordingly.	Review the resources and staff available to the Rock Mechanics team relative to the expected demands on the team over the next few years. Adjust the resources and/or plan accordingly.	Review the resources and staff available to the Rock Mechanics team relative to the expected demands on the team over the next few years. Adjust the resources and/or plan accordingly.	Review the resources and staff available to the Rock Mechanics team relative to the expected demands on the team over the next few years. Adjust the resources and/or plan accordingly.		P4	
		(New Recommendation in 2025) Add the following to the Quarterly Summary Reports to improve the communication of the completed rock mechanics activities and their effectiveness: a) This reports include a dashboard summary of the activities completed, but there is no reference to the commitments in the GCMPI. 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.	Complete the original recommendation.	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.	Complete the original recommendation.	The Quarterly Reports now include a dashboard indicating the team's commitments and their compliance with them.	This recommendation is considered closed. The portion of the recommendation relating to control effectiveness has been broken out as a new recommendation.		Complete
		(New Recommendation in 2025) The effectiveness of the controls (e.g., radar alarms, visual inspections, etc.) have not been quantified.	Complete the original recommendation.	Complete the original recommendation.	Complete the original recommendation.	Complete the original recommendation.	Complete the original recommendation.	Complete the original recommendation.		P4
		(New Recommendation in 2025) The effectiveness of the controls (e.g., radar alarms, visual inspections, etc.) have not been quantified.	Complete the original recommendation.	Complete the original recommendation.	Complete the original recommendation.	Complete the original recommendation.	Complete the original recommendation.	Complete the original recommendation.		P4
Ground Control Program		(New Recommendation in 2025) The effectiveness of the controls (e.g., radar alarms, visual inspections, etc.) have not been quantified.	Complete the original recommendation.	Complete the original recommendation.	Complete the original recommendation.	Complete the original recommendation.	Complete the original recommendation.	Complete the original recommendation.		P4
		(New Recommendation in 2025) The effectiveness of the controls (e.g., radar alarms, visual inspections, etc.) have not been quantified.	Complete the original recommendation.	Complete the original recommendation.	Complete the original recommendation.	Complete the original recommendation.	Complete the original recommendation.	Complete the original recommendation.		P4
Documentation		(New Recommendation in 2025) The following comments are provided for the GCMPI: 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) (S.2.1.3) - Review and revise the commitments for drone monitoring so that they are focused and achievable. c) (S.2.2) - Clarify that the collected data should be compared to the design basis for the open pit in addition to looking for trends. d) (S.4.1) - Note that crack meters and extensometers have not been installed and clarify that vibrating wire piezometers and inclinometers are not currently being monitored. A plan with the location of the instrumentation should be included or referenced. e) (S.5) - Reference a register that tracks who has received what geomechanical training. f) (S.6) - 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 JMR. g) Describe and include a commitment to the bench approval process.	The updates to the GCMPI incorporated changes b), c), d), f) and g). While the GCMPI now includes a plan showing the location of the instrumentation, the plan is out of date.	1) 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 and how they perform in the open pits. 2) Reference a register that tracks who has received what geomechanical training. 3) Update the plan showing the position of the instrumentation.	The GCMPI was comprehensively updated in June 2024. As part of this, the plan showing the position of the instrumentation was updated. The GCMPI now includes a brief discussion of Geotechnical Areas of Concern as 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 GCMPI 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 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. d) Reference a register that tracks who has received what geomechanical training. e) Briefly describe the rockfalls that have occurred in the Geotechnical Areas of Concern (Sec 3.1.2).	The GCMPI was comprehensively updated in June 2025. Key changes include: - A summary of key design changes. - An overview of the geotechnical risks and failure modes. - An overview of the expected interaction between the open pit and the underground mine. - Updates to the overview of the instrumentation and monitoring program. The decision of key design changes since the previous version of the GCMPI is very useful but it will become difficult to understand the progression of the changes over time. Recommended summarizing previous changes and the applicable design documents in a brief table.	Additional comments on GCMPI 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 and how they perform in the open pits. b) Reference a register that tracks who has received what geomechanical training. c) Briefly summarize previous design changes and the applicable design documents in a brief table to supplement the current discussion of key changes since the last GCMPI update. d) Clarify that the TDR is not currently monitored (See S.4.1.5).		P4
		(New Recommendation in 2025) The following comments are provided for the GCMPI: 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) (S.2.1.3) - Review and revise the commitments for drone monitoring so that they are focused and achievable. c) (S.2.2) - Clarify that the collected data should be compared to the design basis for the open pit in addition to looking for trends. d) (S.4.1) - Note that crack meters and extensometers have not been installed and clarify that vibrating wire piezometers and inclinometers are not currently being monitored. A plan with the location of the instrumentation should be included or referenced. e) (S.5) - Reference a register that tracks who has received what geomechanical training. f) (S.6) - 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 JMR. g) Describe and include a commitment to the bench approval process.	The updates to the GCMPI incorporated changes b), c), d), f) and g). While the GCMPI now includes a plan showing the location of the instrumentation, the plan is out of date.	1) 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 and how they perform in the open pits. 2) Reference a register that tracks who has received what geomechanical training. 3) Update the plan showing the position of the instrumentation.	The GCMPI was comprehensively updated in June 2024. As part of this, the plan showing the position of the instrumentation was updated. The GCMPI now includes a brief discussion of Geotechnical Areas of Concern as 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 GCMPI 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 and how they perform in the open pits. b) Reference a register that tracks who has received what geomechanical training. c) Briefly summarize previous design changes and the applicable design documents in a brief table to supplement the current discussion of key changes since the last GCMPI update. d) Clarify that the TDR is not currently monitored (See S.4.1.5).	Additional comments on GCMPI 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 and how they perform in the open pits. b) Reference a register that tracks who has received what geomechanical training. c) Briefly summarize previous design changes and the applicable design documents in a brief table to supplement the current discussion of key changes since the last GCMPI update. d) Clarify that the TDR is not currently monitored (See S.4.1.5).		P4	

101070922480A/Compendium/2025-0145 - Luder - Amarug Annual Open Pit Inspection/Print/Tab1 - Amarug - 2025 Annual Open Pit Inspection/Recommendations Summary (March 10/2025).xlsx/Print

APPENDIX A

Meadowbank Complex - Amaruq Site - 2025 Annual Open Pit Geomechanical Inspection

(Pages A-1 to A-65)



Meadowbank Complex - Amaruq Site

2025 Annual Open Pit Geomechanical Inspection

August 11 to 13, 2025

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 evaluations of the expansion of the IVR Open Pits was completed in 2024 and 2025.
- KP has completed the annual inspections for the open pits at the Amaruq Site since 2019. The 2025 annual inspection was completed by Mr. Ben Peacock, P.Eng., during a site visit from August 11 to 13, 2025. 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 11 and 12, 2025 (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
- Mr. Arron Haselhorst (Rock Mechanics Technician) and Ms. Katie Hawley (Strategic Rock Mechanics Engineer) of AEM participated in the inspections.



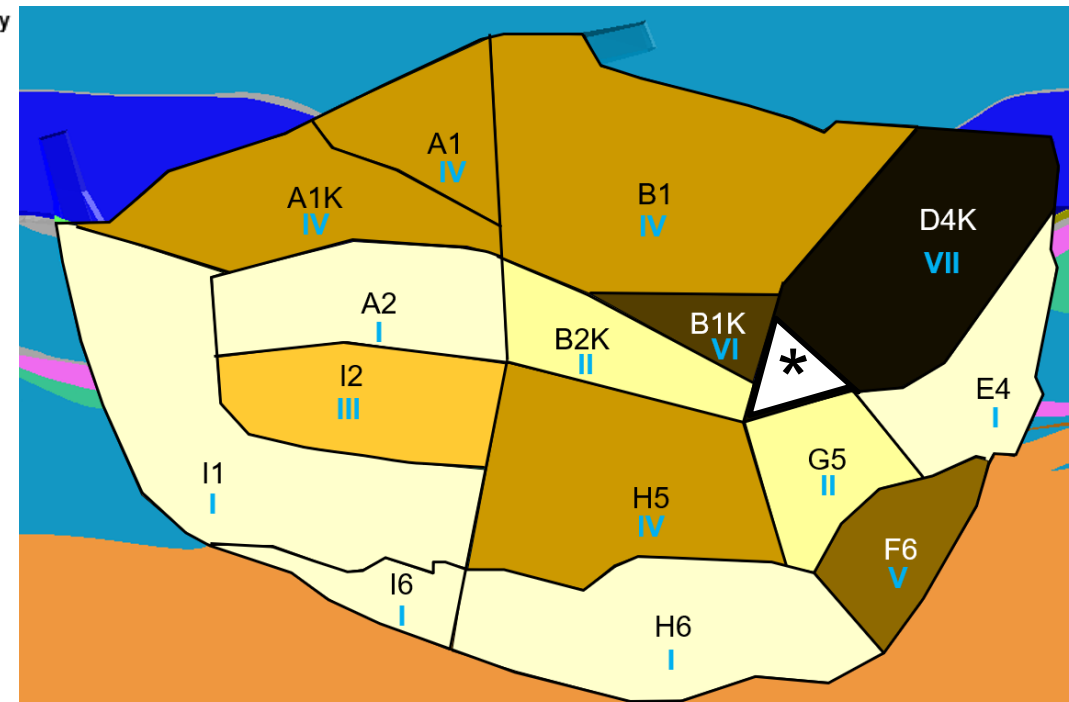
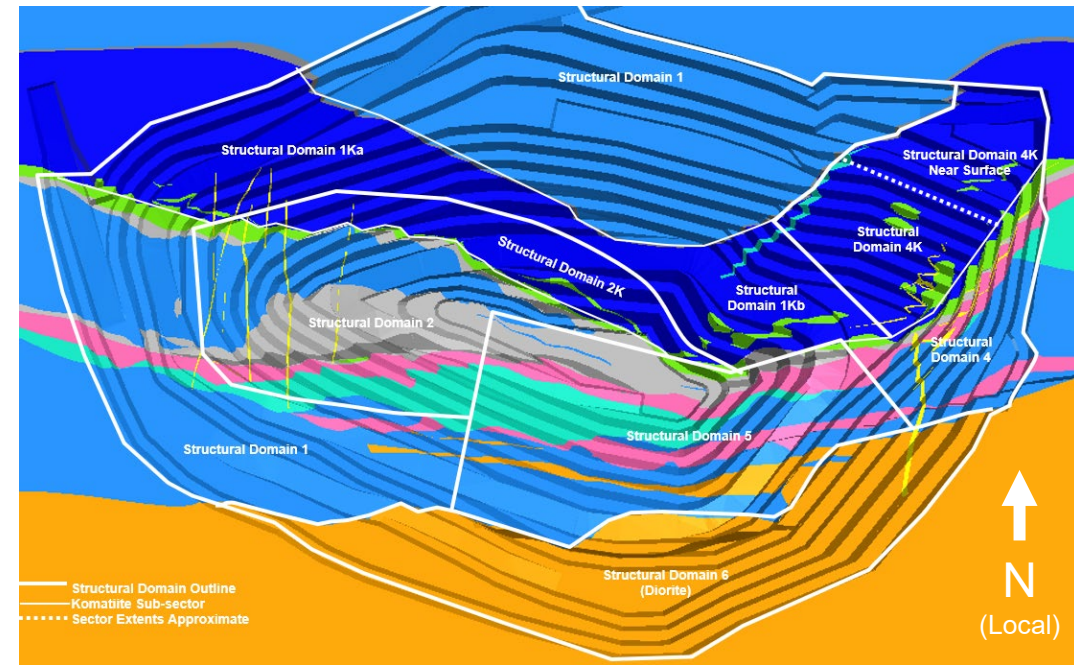
Whale Tail Open Pit



Whale Tail Open Pit

Design

- The WHL-V14F open pit is the current design for the Whale Tail deposit. The design replaces the previous V14B design and includes a small step-in in sectors A1K/ A2K.
- 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.



LITHOLOGY LEGEND:

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

Base Bench Geometry

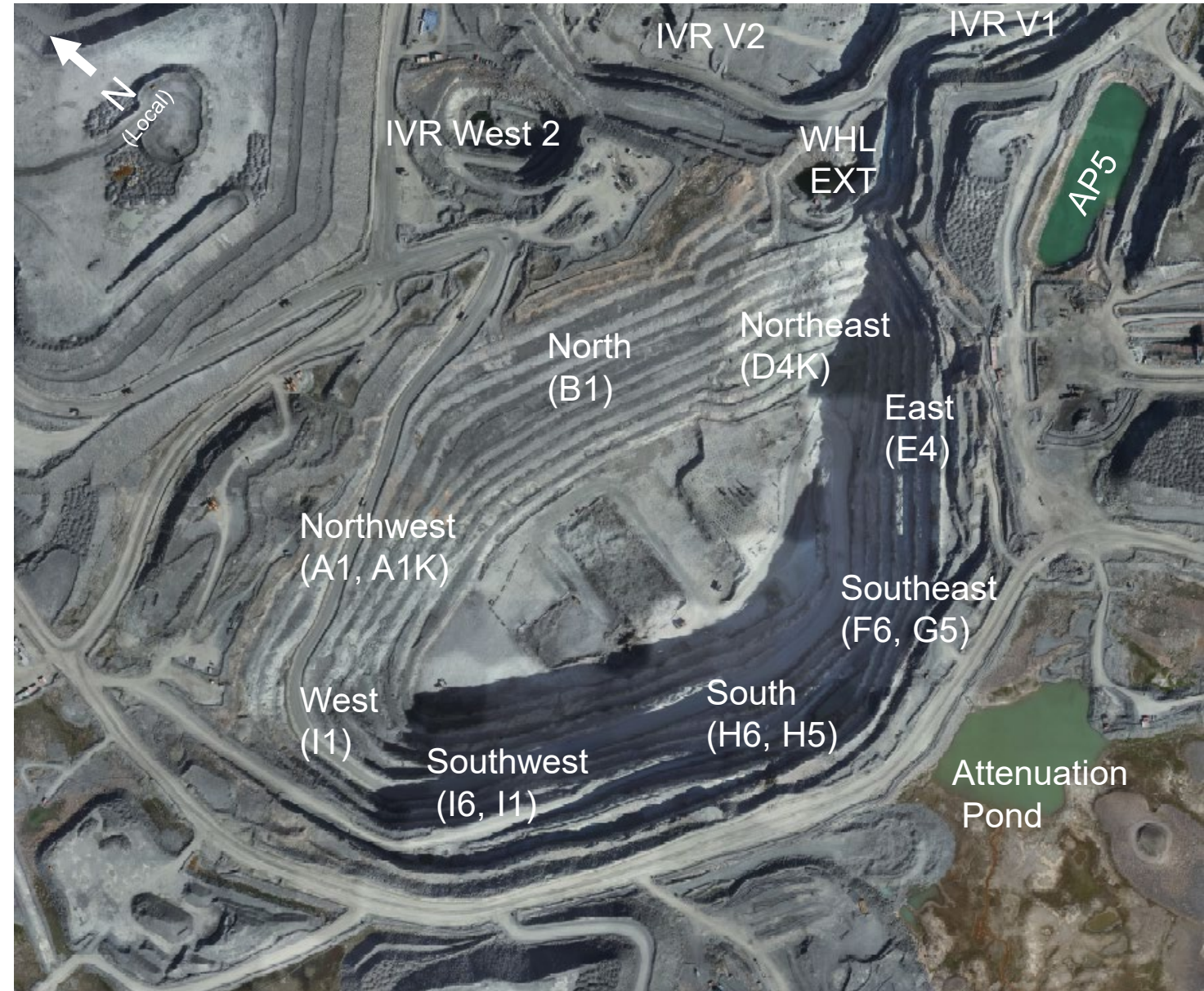
I	BASE CASE BFA: 75° Bench Width: 10 m Bench Height: 21 m IRA: 53°
II	KOMATIITE BFA: 75° Bench Width: 10.5 m Bench Height: 21 m IRA: 52°

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°

Whale Tail Open Pit Inspection

- The Whale Tail open pit was inspected on August 11 and 12, 2025. 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

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



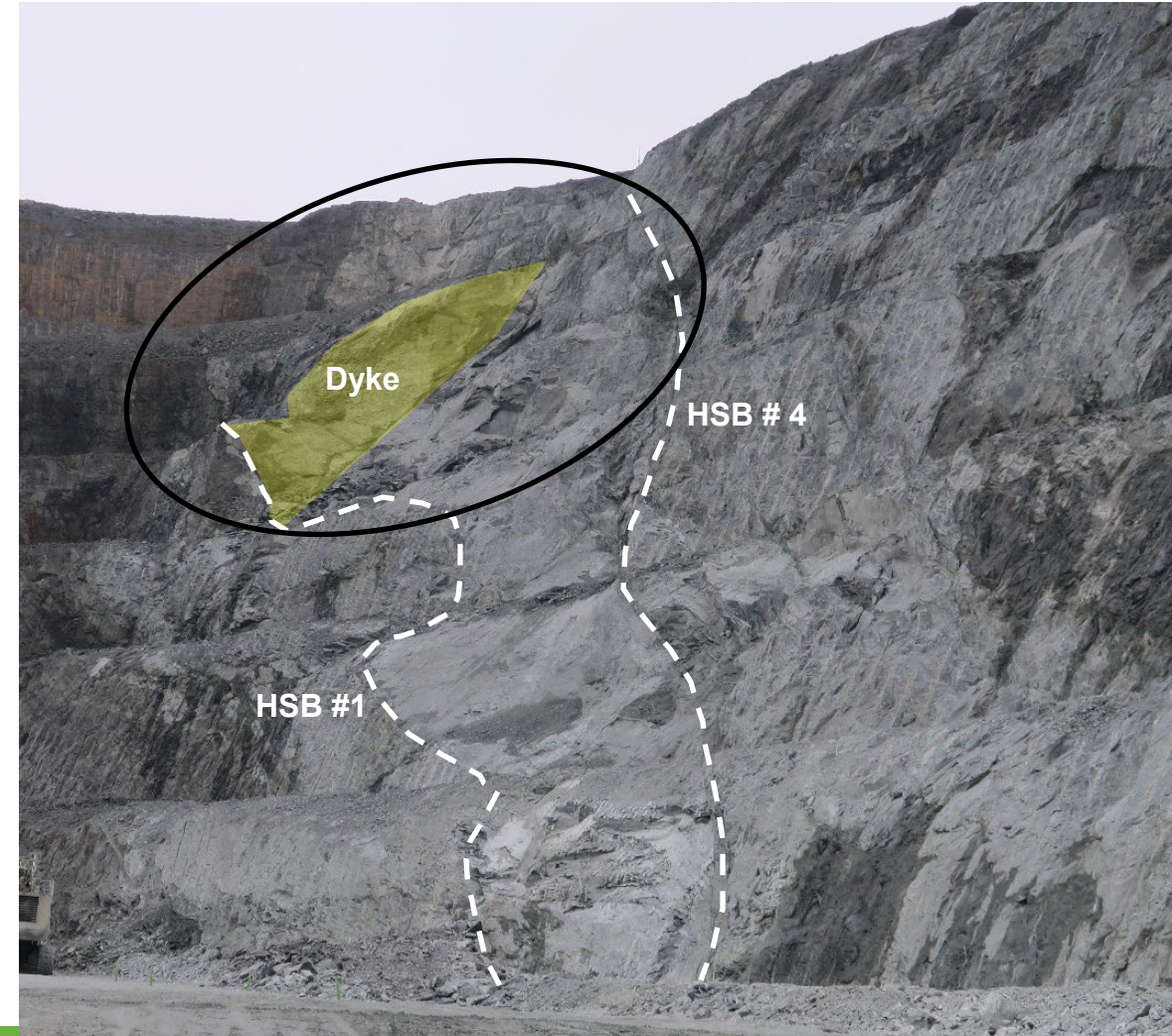
- Final wall in Design Sector A1/A1K.
- The benches in the Greywacke and Oxidized Greywacke are generally performing well.
- A series of bench-scale failures have occurred in the Komatiite along three High-Strain / Brittle Structures since September 2023, including 11 failures between August 2024 and August 2025. 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). The wedge is discussed further on a subsequent slide.



Whale Tail Open Pit

Observations - Northwest Wall Failures on HSB #4/#1

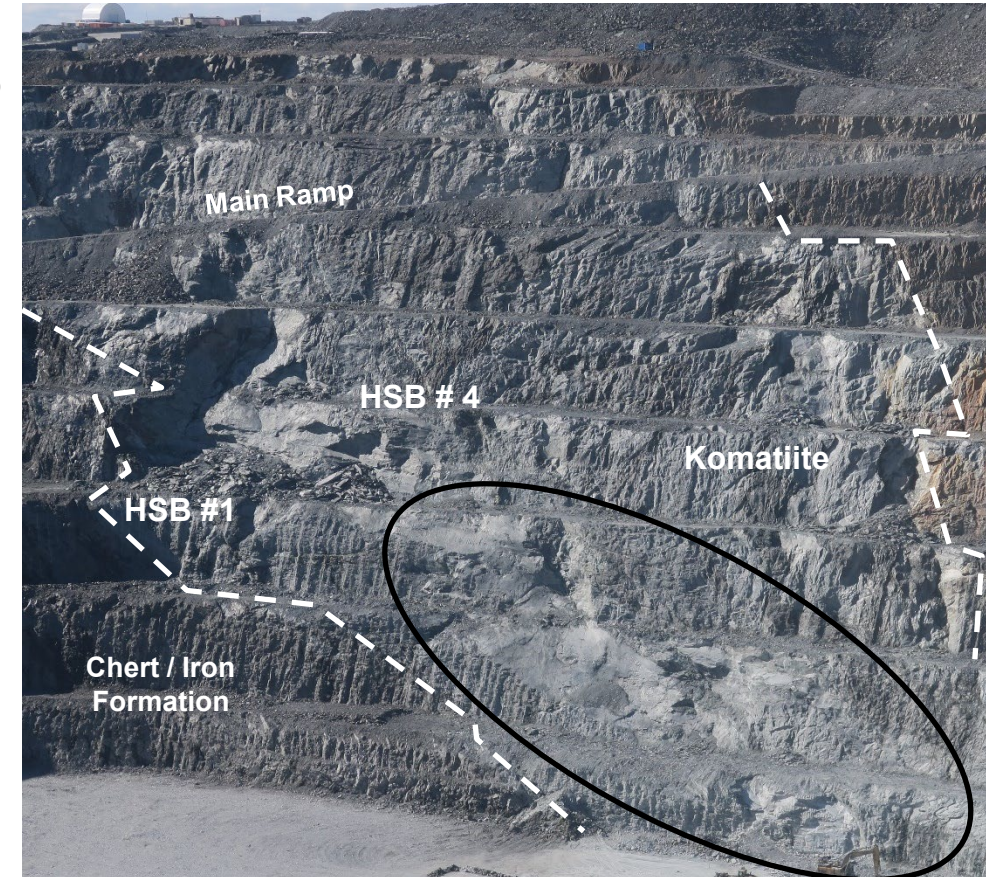
- Four bench scale wedge failures occurred on the upper Northwest Wall between September 2023 and July 2024, which linked together to form a multi-bench scale failure (circled in black). A further three failures occurred in this area in June and July 2025. The tonnage of all of the individual failures ranged from 300 to 9,600 tonnes, with a cumulative tonnage to date of approximately 20,200 tonnes.
- All of the failures that occurred in 2025 were retained on the catch benches. In each case, a berm was in place at the toe of the slope, but failed material was not reported to have reached the berm.
- The multi-bench failure is a compound wedge formed by:
 - High-Strain/Brittle Structure (HSB) #4 on the east side. This is categorized by AEM as a Major Structure.
 - A dyke appears to control the upper west side of the failure.
 - The structural control for the base of the failure is less clear. It may be the S3 foliation but could also be part of a family of sigmoidal structures between the two HSBs.



Whale Tail Open Pit

Observations - Northwest Wall Failures on HSB #4/#1 (Cont'd)

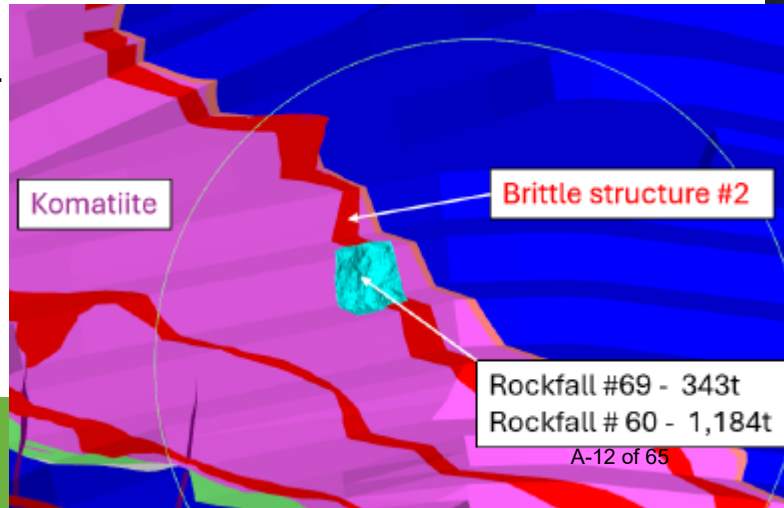
- A second series of five failures occurred on the lower Northwest Wall between HSB #4 and #1 (circled in black), often initiating on HSB 4. One failure occurred in February 2025 and the remainder occurred in June and July, 2025. The individual failures ranged in size from 225 to 10,500 tonnes, with a cumulative tonnage to date of 15,700 tonnes.
- All of the failures occurred when a berm was in place as required by the Working with Komatiite procedure, and all of the failed material was retained by the berms. The 225 tonne failure on July 4, 2025 occurred when an adjacent area was being scaled and the berm had been partially removed to allow access. However, the berm was in place directly below the failure.
- These failures are planar failures along the basal plane of the wedge that formed in the upper Northwest Wall. The basal plane structure appears to be constrained by HSB #1 and #4 and thus may be associated with a shear zone. One possibility is that these are associated with the southeast dipping reverse shears identified by David Rhys of Panterra Geoservices in 2023. The lithology models suggests that north-south trending sub-vertical dykes may have acted as release planes but it was difficult to find evidence of this in the field.
- These failures are expected to continue to occur as HSB #4 and #1 are exposed in new benches. Comments on managing these failures are provided on a subsequent slide.



Whale Tail Open Pit

Observations - Northwest Wall Failures on HSB #2

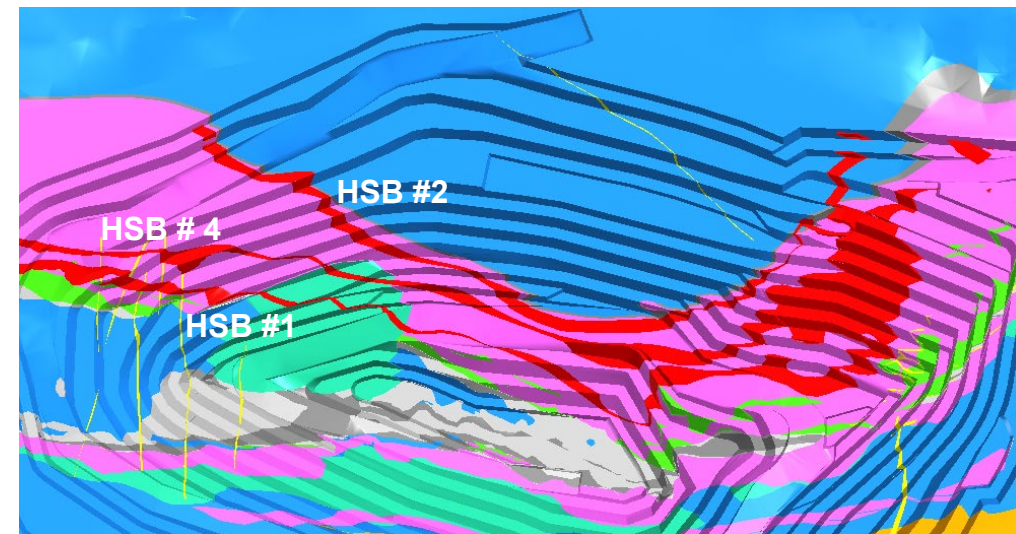
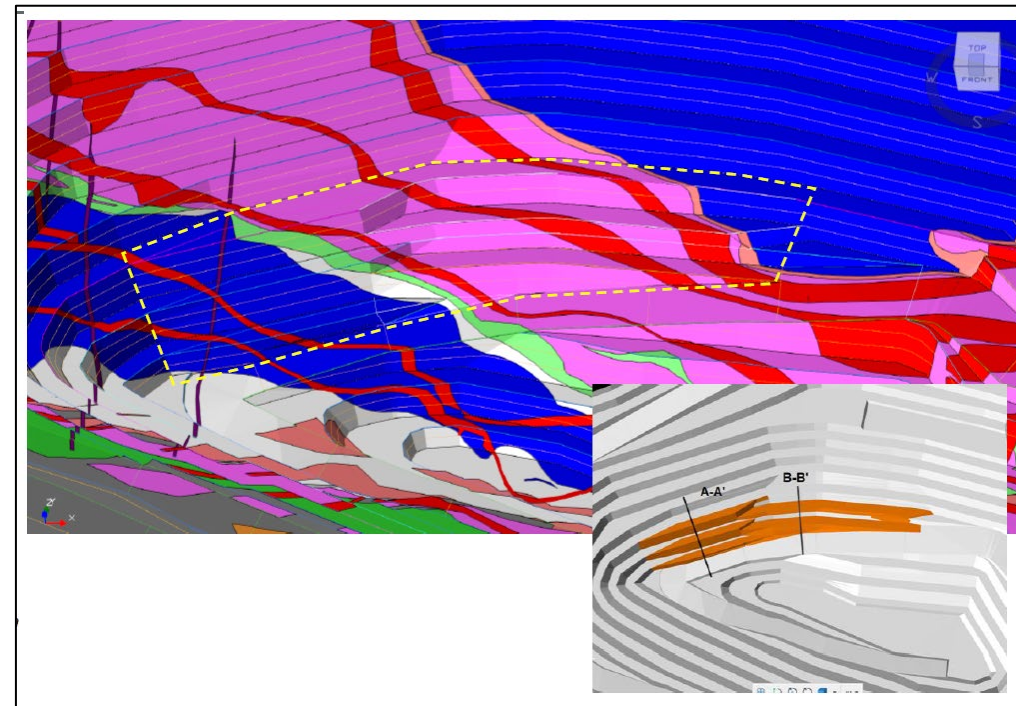
- Two bench scale wedge failures occurred along HSB #2 since the last annual inspection (circled in black at right). An initial wedge failure of 1,200 tonnes occurred in September 2024. A second failure of 350 tonnes occurred in the same location in June 2025 during freshet.
- HSB #2 is close to, and sometimes coincident with, the northern contact between the Komatiite and the Greywacke.
- HSB#2 formed the northern side of the failure plane while the western failure plane appears to have been through the rock mass.
- In both cases, the failed material was retained on the catch bench below the failure and no material was reported to reach the working floor of the open pit.
- Similar failures are expected to continue to occur along HSB#2. This area should continue to be a focus of scaling when establishing new benches.
- In some cases, trim blasting could be used to proactively remove the potential wedge.



Whale Tail Open Pit

Observations - Northwest Discussion

- While the Komatiite itself has performed well in the Northwest Wall, failures are expected to continue to occur along HSB #1, #4, and (to a lesser extent) #2.
- The loss of the catch benches increases the rockfall hazard for mining activities below this area. While this is currently being managed with berms, AEM has adjusted the mine plan to create a small step-in above the ramp in the area outlined in yellow in the image at upper right. This is reasonable but it required locally steepening the bench face angle of the benches in the Greywacke between the step-in and the ramp. There is an increased potential for bench-scale failures as a result and the area should be carefully monitored. Note that design changes of this magnitude should be reviewed by the Design Engineer (KP).
- The Brittle / High-Strain Structures should be mapped and the results used to validate/refine the structural model.
- The location and impact of potential future failures along the HSBs should be reviewed (particularly where they are located along the ramp) and a mitigation plan developed. This could include local adjustments to the bench geometry / trim blasting to mine out potential wedges, shear pins, buttresses, etc.



Whale Tail Open Pit

Observations - Northwest Wall - Wedge

- The wedge was identified above the ramp 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.
- No significant changes in the condition of the wedge were observed between the 2023 and 2025 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).



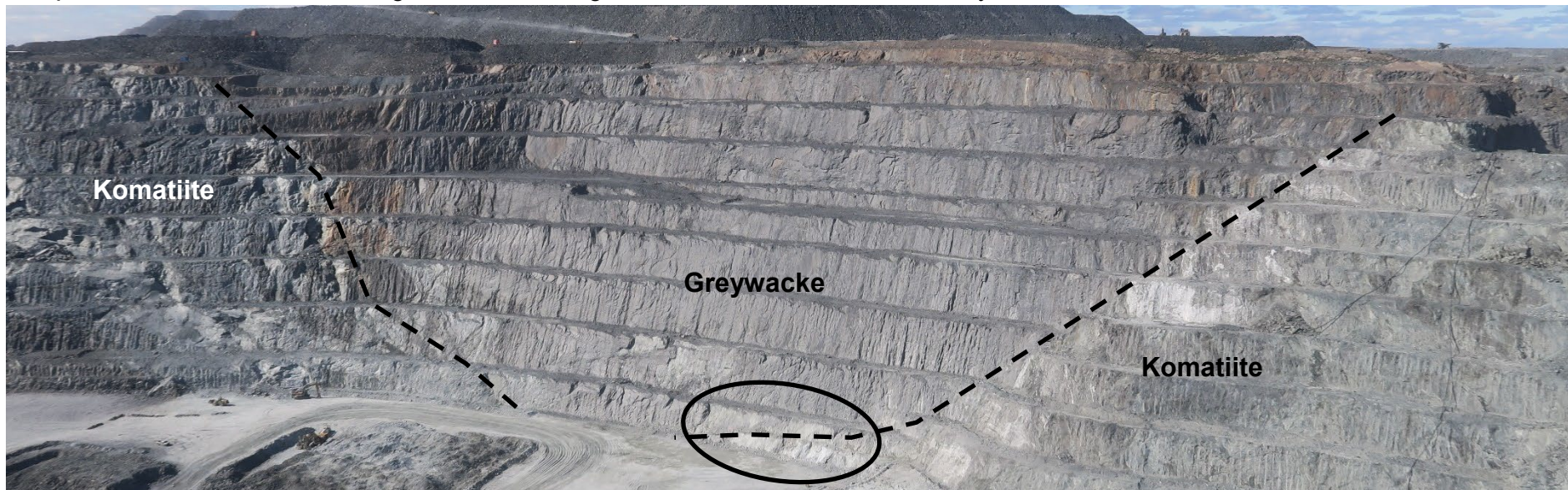
Whale Tail Open Pit

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.
- To date, the benches have performed better than expected, with the bench face often standing steeper than the foliation in the Greywacke. As the wall transitions into Design Sectors B1K and B2K with depth, the bench faces are expected to more consistently break to the foliation. This is evident in the increased crest loss experienced at the eastern end of the most recent bench (circled below)
- There is a potential for localized wedge failures along the contact between the Greywacke and the Komatiite in the next few benches.



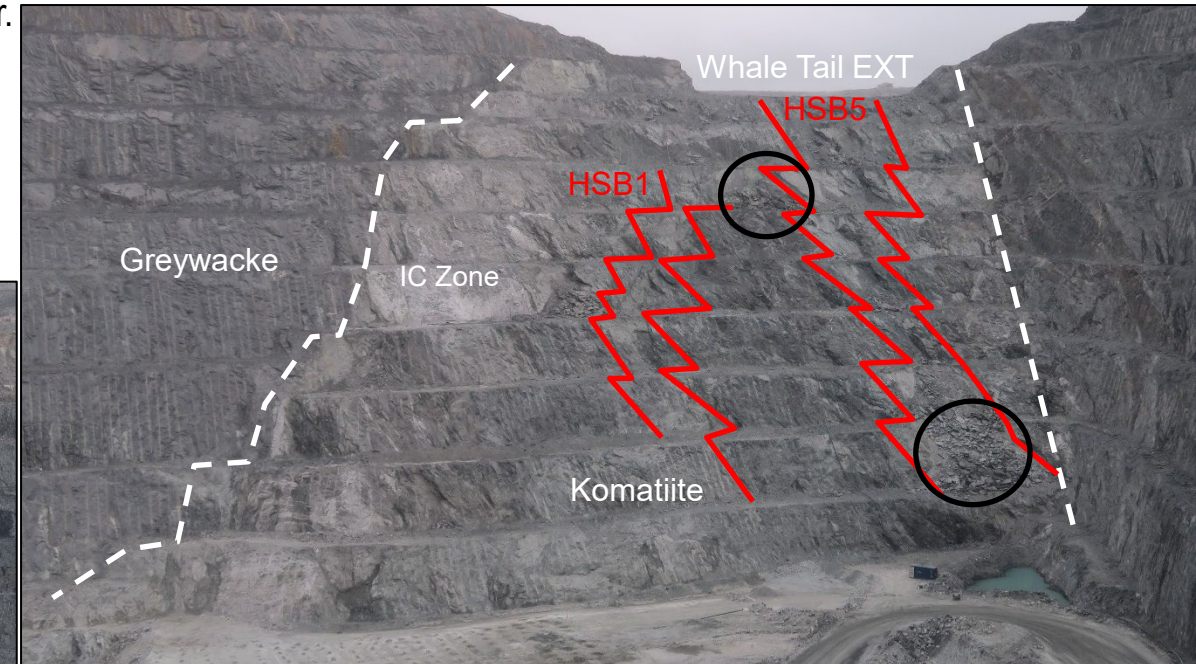
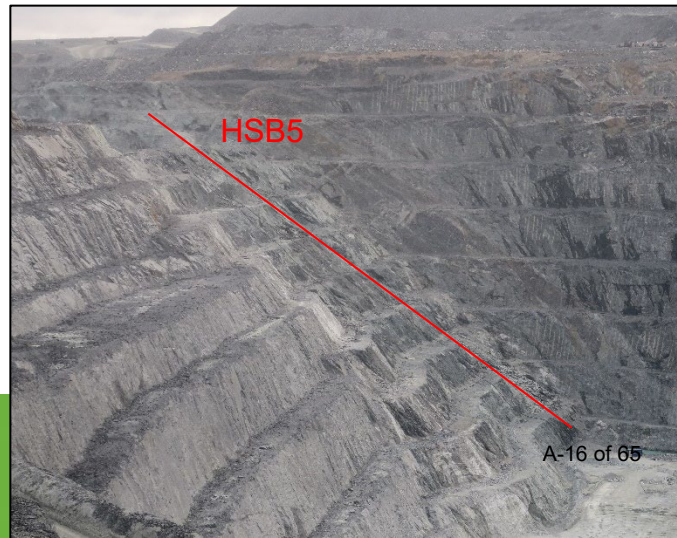
Whale Tail Open Pit

Observations - Northeast Wall

BFA: 55°
Bench Width: 11 m
Bench Height: 14 m
IRA: 34°



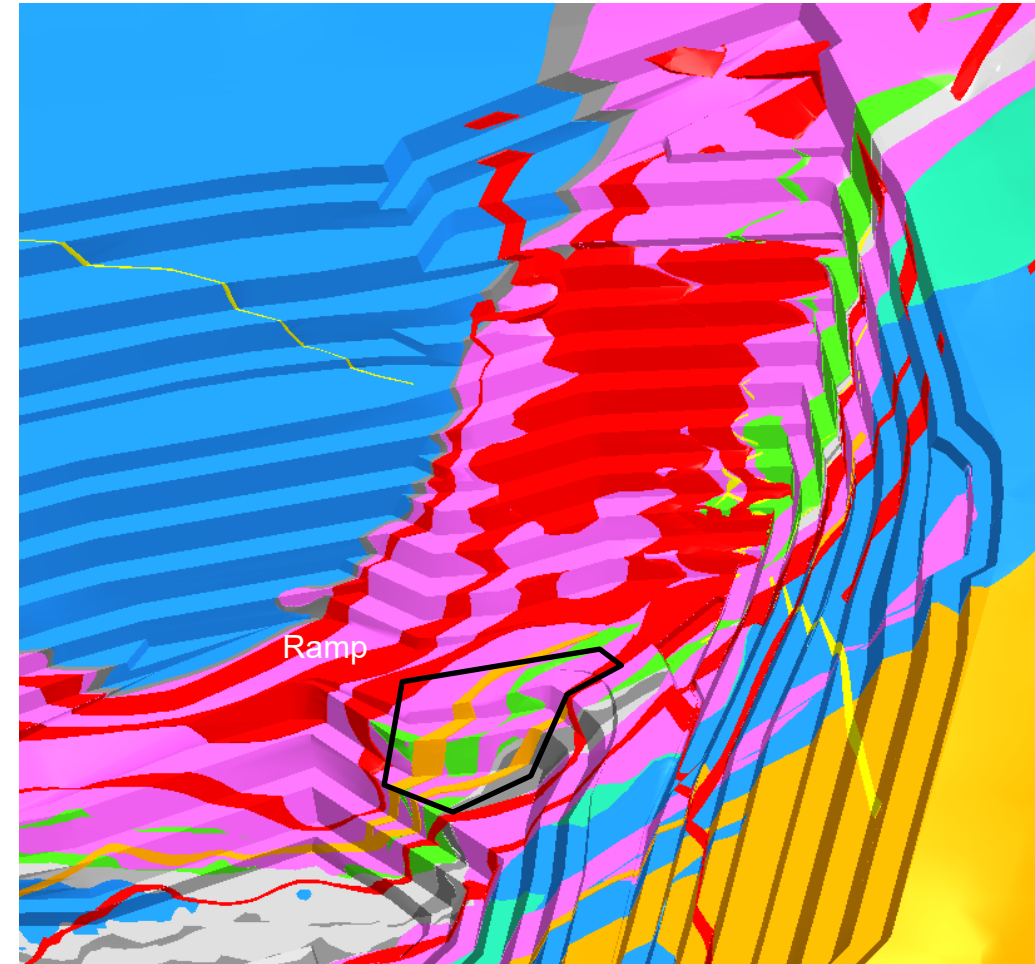
- Final wall in Design Sector D4K.
- This sector is within the Komatiite and has been characterized by a series of bench scale failures associated with the weak rock mass and the High-Strain / Brittle Structures (select structures are shown in red below). The slope design was revised in December 2021 and has been successful in managing the performance of the slope.
- Two rockfalls have occurred in this sector since the last annual inspection, ranging in size from 500 to 900 tonnes (circled below). Both of the failures occurred in the fall, above the active bench and in an area where berms were in place due to the Working with Komatiite Procedure. The failure mechanism is a hybrid wedge failure along the foliation, consistent with previous failures in this sector.
- High Strain / Brittle Structure #5 has had the greatest impact on slope performance to date. The benches within the IC Zone along the west contact have performed better than the other benches in the Komatiite.
- 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 is a key tool for managing the geotechnical risk in this sector.



Whale Tail Open Pit

Observations - Northeast Wall (Cont'd.)

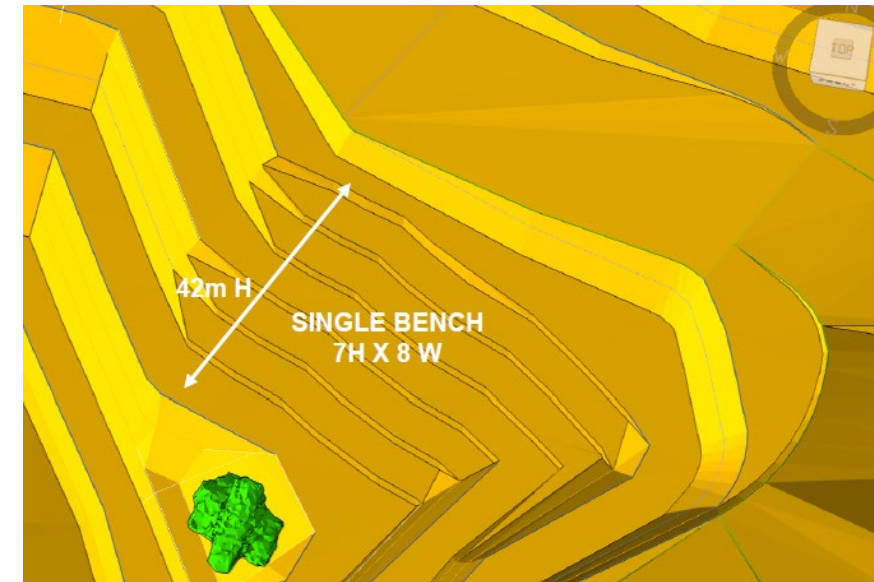
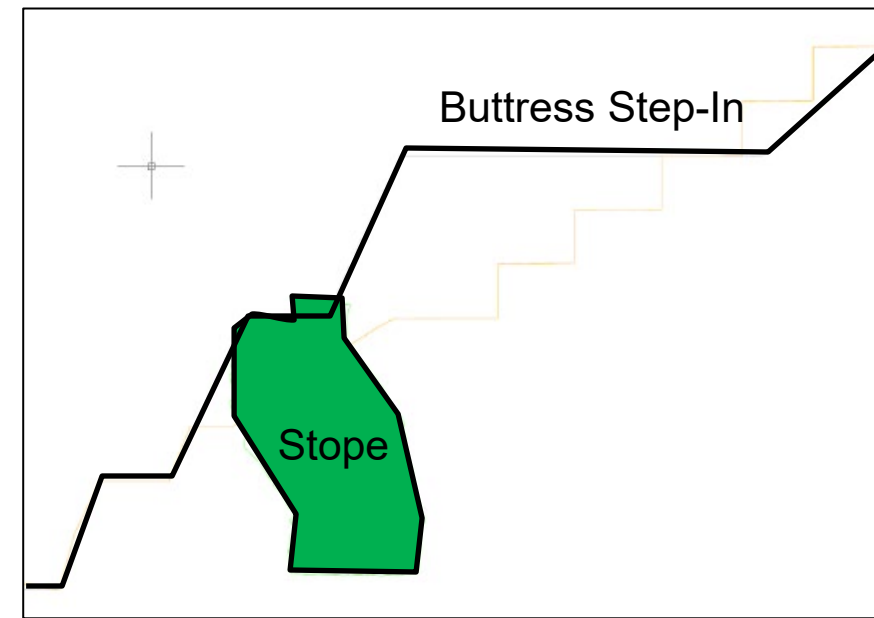
- Two benches (one 7 m and one 21 m high) below the ramp in the Northeast Wall of the Whale Tail open pit are intended to be established during the winter to take advantage of the strengthening effect of the frozen rockmass within the permafrost. The benches are outlined in black at right and are intended to be buttressed before the rock mass thaws. If the rock mass thaws before the benches are buttressed, bench-scale and multi-bench scale failures are expected to occur.
- The first 7 m bench is planned to be established in October 2025 and the second bench is planned to be completed by March 2026. The buttress has not yet been designed in detail and has not been incorporated into the LOM or budget mine plans. A high-level review suggests that it could be constructed by the end of April, but this needs to be confirmed.
- The buttress should be designed in detail and included in the LOM and Budget mine plans. Ensure that the benches will remain frozen between development and buttressing prior to freshet. If this is not possible, a revised mining strategy will be required for this area.
- It is important that the orientation of the foliation and HSB Structures be confirmed through mapping as these benches are established.



Whale Tail Open Pit

Observations - Northeast Wall (Cont'd)

- The 260-ST-206 is located below the step-in on which the buttress will be constructed. The stope was planned to be backfilled with Cemented Rockfill (CRF) but began to cave during backfill placement and had to be backfilled with Unconsolidated Rockfill (URF) to stabilize the stope. The majority of the stope is backfilled with URF and caved material.
- URF will be exposed in the open pit wall and will be a potential rockfall hazard. In addition, migration of the URF could result in a loss of confinement acting on the benches intersected by the stope, increasing the potential for a bench-scale instability (which could impact the buttress above). However, a portion of the bench is expected to be established in the Chert and Iron Formation, which are the most competent units at the deposit.
- The mine has been evaluating different options for managing the URF. The focus to date has been on modifying the slope above the stope to use single benching and eliminate the step-out in order to allow the URF to be graded to the angle of repose once it is exposed (see image at lower right). This results in an inter-ramp angle that is steeper than what the analyses suggest is achievable.
- Recommend reviewing more tactical measures for managing the stope including:
 - Modifying the local bench geometry to remove or reduce the size of brows formed by the exposure of the stope in the wall.
 - Applying shotcrete to the URF, draping chain-link mesh over the area, and/or constructing rockfall berms to manage the rock fall hazard.
 - Installing ground support (e.g., cable bolts) to reinforce the brow above the stope.



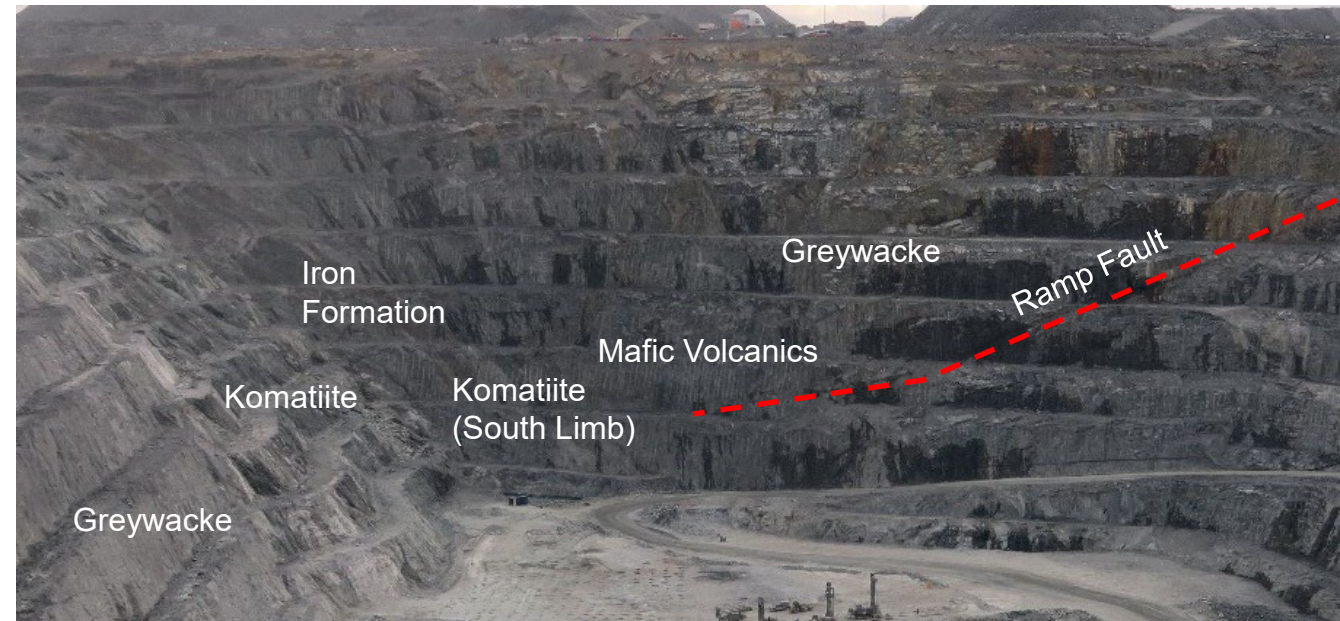
Whale Tail Open Pit

Observations - East Wall

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



- Final wall in Design Sector E4, transitioning into G5.
- Note that the southern portion of this wall, in Design Sectors F6 and G5, is discussed on the next slide.
- 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.
- Minor seepage is consistently occurring along the benches from the crest of the open pit to the base. The source of this is uncertain. One possibility is AP5 which is located east of the open pit along strike of the lithologies and HSBs exposed in the southern portion of the wall.
- Significant seepage was observed at the base of the East Wall. Intercepted groundwater from the South Wall is directed along a ditch on the inside of the ramp to a sump in the Northeast corner of the open pit. Water from the ditch is likely also flowing below the ramp and daylighting in the lower East Wall. It is expected that an ice wall will form below the ramp.



Whale Tail Open Pit

Observations - Southeast Wall

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



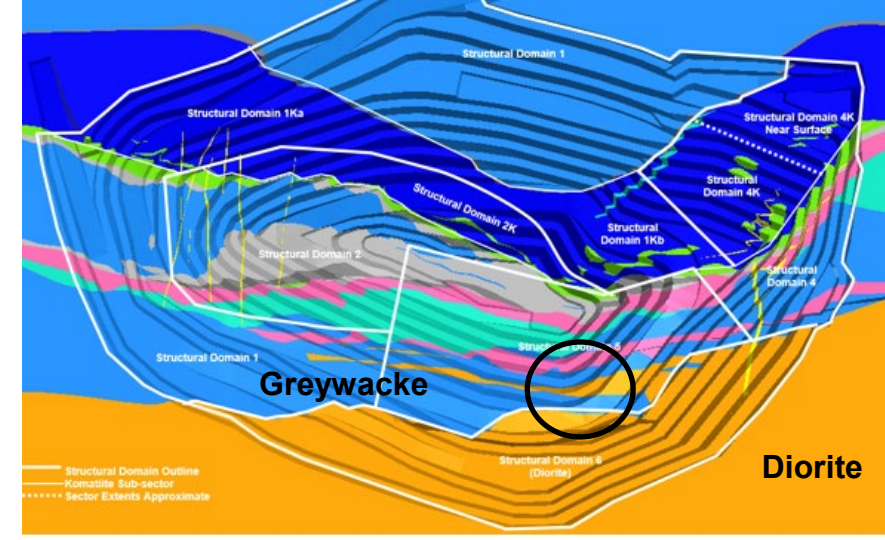
- Final wall in Design Sector F6, transitioning to G5.
- The slope geometry recommendations for this sector were adjusted in early 2023 by AEM to reduce the catch bench width from 16 m to 13 m based on the observed slope performance.
- Subsequently, the 5046 bench experienced > 6 m of crest loss over significant intervals of the catch bench. An additional catch bench was added above the ramp as a rockfall protection measure and a rockfall fence was installed in November 2024 (circled in black at right).
- Three rows of vertical dowels with lengths of 3 or 6 m were installed along the outside of the ramp for a distance of 75 m in this sector (circled in white at right). The dowels were effective at reducing the crest loss.
- The lower wall has now largely transitioned out of the Diorite (Design Sector F6) and into the Greywacke and Komatiite (Design Sector G5).
- The slope geometry recommendations for G5 are based on the expectation that Joint Set C will no longer control the bench geometry. This should be validated in the field as it is possible that Design Sector F6 extends deeper than currently believed.



Whale Tail Open Pit

Observations - Southeast Wall (Cont'd)

- A small intrusion of Diorite was expected below the ramp in this corner (circled area in plan at upper right).
- Inspection of the benches below the ramp suggest that the Diorite is more extensive than expected (outlined at lower right). Increased crest loss along Joint Set C within the Diorite has reduced the capacity of the catch benches. In addition, the blocky nature of the Diorite creates a rockfall hazard.
- The extents of the Diorite and the performance of the catch benches should be closely monitored in this area. The available infill drilling should be reviewed to assist with this. The catch bench width may need to be increased if the Diorite continues to extend to depth.
- Review the need for rockfall mitigation measures in this area, such as a rockfall berm or a rockfall barrier.



Whale Tail Open Pit

Observations - South Wall

- Final wall in Design Sectors H6 (Diorite) and H5 (predominantly Greywacke and Mafic Volcanics with intervals of Komatiite).
- The benches below the ramp are expected to be within Structural Domain 5. North dipping structures in this domain are expected to limit the achievable bench face angle. Local evidence of this is now being observed (see image at lower right) but in some areas the effect is limited to increased crest loss. Periodic mapping is recommended to confirm the extents of this domain.
- Seepage continues below the sump and horizontal drains in the upper wall (which is in talik) and is now occurring in the benches below the ramp. An ice wall forms in the winter months but current practices, including scaling the ice, have been effective at limiting its impact on operations. Icefalls have not been reported.
- A series of bench-scale failures have occurred along contacts in this wall (outlined in white below with contacts in red). These are discussed on the next slide.

H6

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

H5

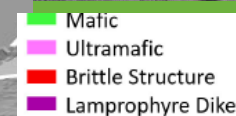
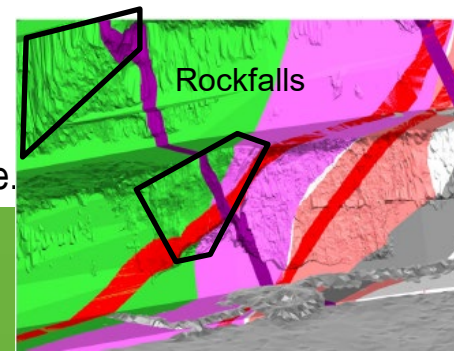
BFA: 65°
Bench Width: 10.5 m
Bench Height: 21 m
IRA: 46°



Whale Tail Open Pit

Observations - South Wall (Cont'd.)

- In June 2024, a bench scale failure occurred below the ramp along what is believed to be the contact between the Komatiite and the Mafic Volcanics (see image at upper right). The ramp was reduced to single lane traffic, a berm constructed, and a monitoring plan developed. Edge protectors were installed in late 2024 to reduce the width of the berm and to allow two lane traffic to resume. The area continues to be a focus of monitoring efforts.
- At the time of the 2024 annual inspection, it was recognized that bench-scale failures would continue to occur on persistent structures and lithological contacts that intersect the wall at a shallow angle.
- Since then, six rockfalls associated with four locations, including the failure below the ramp, have occurred (see previous slide). All of these rockfalls have occurred along the contacts of the Komatiite that intersect the wall at a shallow angle, creating thin wedges. In some cases, the north-south striking lamprophyre dykes have formed the other side of the wedge but in other cases the wedge has failed through the rock mass. Note that in-pit observations suggest that the Komatiite may be offset slightly relative to the lithology model.
- The mine has started to anticipate these failures by projecting the contacts to the next bench and making these areas a focus of monitoring and scaling. Scaling the wedges can be difficult if the benches are established in the winter and the rock mass remains frozen. The wedges fail during or after freshet as the rock mass thaws.
- These wedges are expected to continue to form as the open pit continues to depth.
- Alternative approaches for managing the wedges, include locally adjusting the bench design to mine out part or all of the wedge, taking a trim blast after the main blast to remove the wedge, ground support, and/or rockfall berms. The feasibility of these approaches should be reviewed in detail and implemented where possible.



Whale Tail Open Pit

Observations - Southwest Wall

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



- 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

- Mining of the Whale Tail Extension (WHL EXT) is 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.
- The WHL EXT is used for dewatering activities, requiring personnel to periodically enter the area. A rockfall berm should be installed along the inside of the ramp to mitigate the risks associated with the rockfall hazard in the Komatiite.

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°



Note that the picture is from 2024 and was used because it provides an effective overview of the area

IVR V1 & V2 OPEN PITS



IVR V1 & V2 Open Pits

General

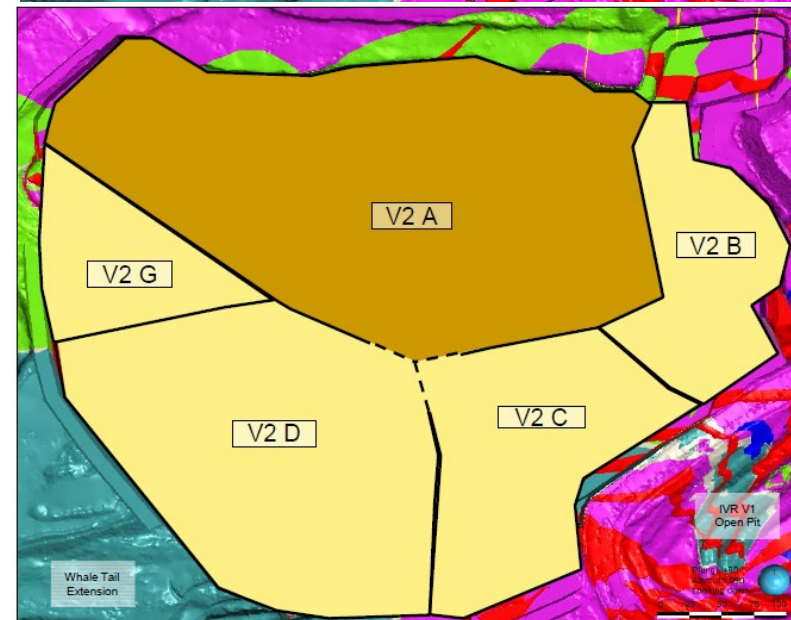
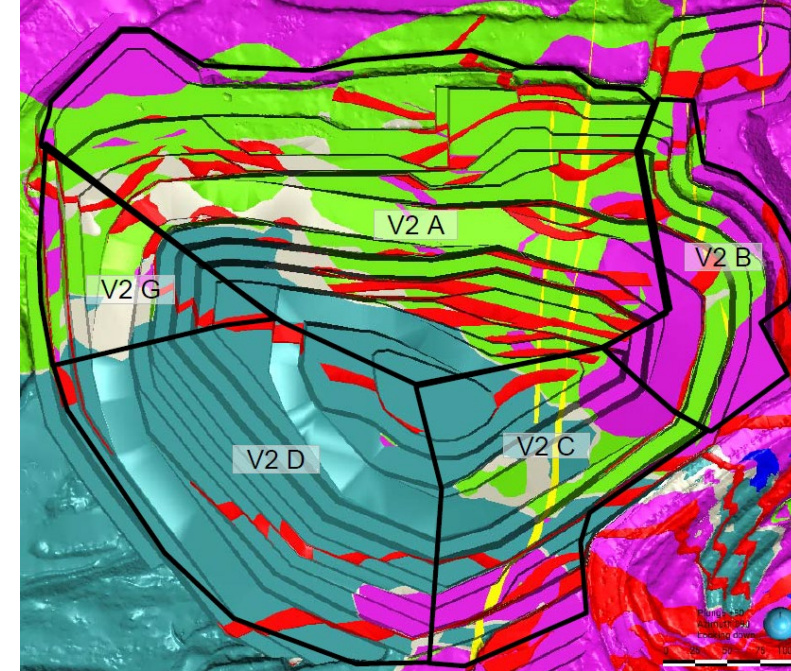
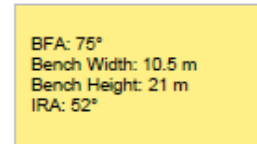
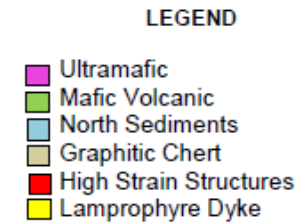
- The IVR V1 and IVR V2 open pits were inspected on August 12, 2025. Observations made during the inspection are summarized on the following slides.
- The approximate current pit geometry is shown at right. The walls inspected are labelled relative to mine north.
- Note that mining of the IVR V1 open pit is complete, and access is prevented by a berm. AEM and KP are currently evaluating the potential for mining out the saddle between the IVR V1 and V2 open pits. If undertaken, this would result in a single, larger open pit. The East Wall of the IVR V2 open pit is being pushed back in anticipation of a favourable outcome to this study.



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 current design for the V2 open pit is IVR2-V12B.
- The slope geometry recommendations for the IVR V1 open pit have not been provided for reference as mining of the open pit is complete.



IVR V1 Open Pit

Observations - General

VO A
BFA: 45°
Bench Width: 8 m
Bench Height: 14 m
IRA: 32°

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



- 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 impacted the ramp in 2023 (circled in black below) and further failures are possible in this area.
- No rockfalls have occurred since the 2024 annual inspection. Minor ravelling continues to occur along the high-strain / brittle structure in the west wall (circled in white below).
- No particular concerns were noted for the other walls.
- Access to the open pit is prevented due to overspill from the blasting of the V2 open pit. Access is periodically re-established for water management purposes. The ramp is inspected by Rock Mechanics each time. However, a rockfall berm has not been re-established along the inside of the ramp. The berm should be re-established.



IVR V2 Open Pit

Observations - General

- Mining activities in the IVR V2 open pit are focused on a pushback of the West and East walls. As a result, there has been limited change along the North Wall. There currently is no South Wall due to the interaction with the V1 open pit.
- No rockfalls have been reported in the open pit since the 2024 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: 40°



- Final wall established in the footwall of the deposit, primarily within the Mafic Volcanics. This wall has been extended due to the push backs of the East and West walls since the 2025 inspection but has not been advanced to depth.
- The observed slope behaviour continues to be consistent with expectations. While crest loss occurs along the foliation, most of the bench face is typically held at a steeper angle than the dip of the foliation.
- Many of the benches in the area (outlined in white) were established as single benches with larger catch benches for geological reasons. These benches were not pre-sheared and have experienced more crest loss as a result. This is not a concern as the rockfall hazard is mitigated by the reduced bench height and increased catch bench width.
- Several possible wedges formed by undulations in the foliation have been identified near the western end of the wall within the Mafic Volcanics (outlined in black). These possible wedges have not shown evidence of instability to date.



IVR V2 Open Pit

Observations - East Wall

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°



- The East Wall is being pushed back in anticipation of joining the IVR V2 and V1 open pits.
- At the time of the 2025 inspection, only a short interval of the East Wall was established and it had not yet been scaled. The East Wall below the pushback has not been advanced since the 2024 annual inspection and was largely obscured by overspill at the time of the 2025 inspection.
- The eastern extension of the North Wall has been exposed to a height of single bench and is shown below. The bench face is breaking back to the foliation, as expected. The orientation of the foliation and the lithologies forming the benches should be verified through mapping.
- The noses formed with the Turtlehead and with the IVR V1 open pit represent potential rockfall hazards. These will be mined out by the pushback, which is a favourable development from a geomechanical perspective.



North Wall Extension

East Wall

IVR V2 Open Pit

Observations - South Wall

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



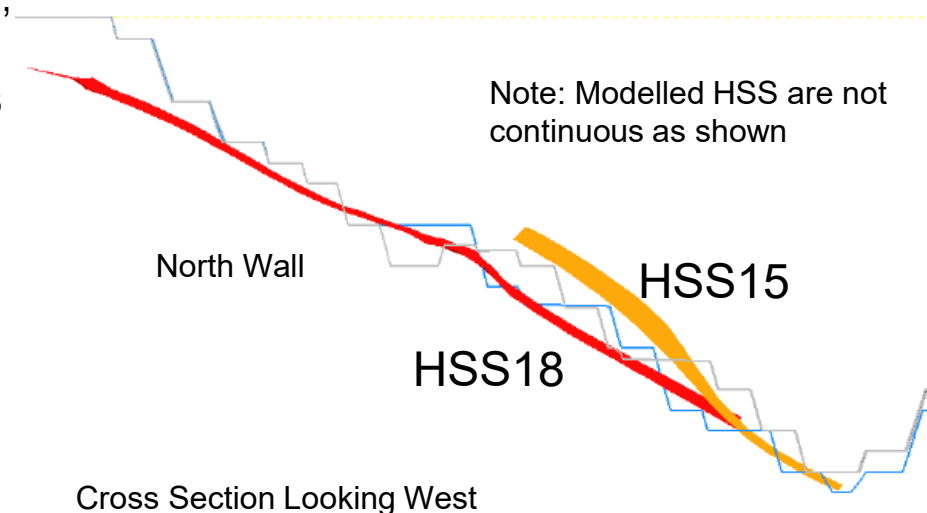
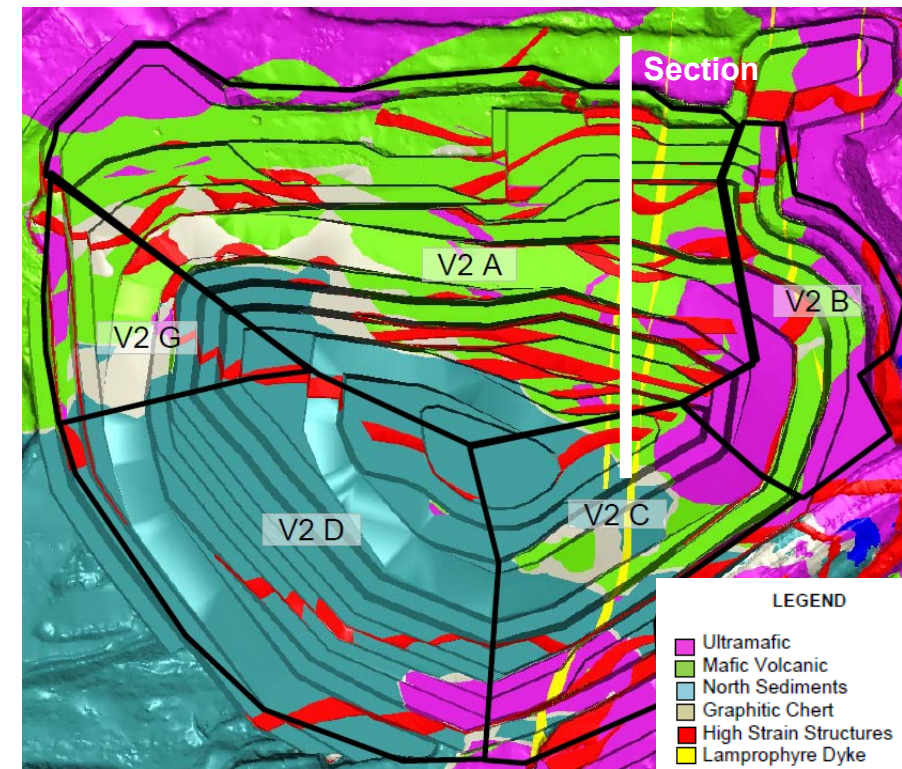
- The rock mass quality and rock mass structure in this wall are generally favourable and the performance of the initial bench has largely been consistent with expectations.
- However, a large potential wedge was identified in the initial flitch during mining and was proactively scaled out. Several smaller wedges formed by the same structures are present directly to the east of this area, at the crest.
- The joint sets that formed the wedge have not yet been confirmed. The sub-vertical set forming the eastern limit of the wedge may be Joint Set D while the shallower dipping set forming the western limit of the wedge may be Joint Set B. This should be confirmed and compared relative to the results of the stability analyses completed for this wall. If these features are more prominent than originally thought, the bench design may need to be adjusted.



IVR V2 Open Pit

Open Pit Design for North Wall

- 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 and structural 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 depending on the position and persistence of the weak intervals along this structure.
- There continues to be 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.



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 complete and it has reached the current pit floor.
- The rock mass structure is favourable in this sector and the benches have performed well. The wall continues to benefit from the improvements to drilling and blasting practices in 2024. Half-barrels are regularly observed.
- Several shallow-dipping HSB structures are exposed in the wall. The structures dip to the south and their impact has been limited to locally increased crest loss. However, this is a good opportunity to validate the HSB model.
- Seepage has been consistently observed from the northwest corner when the IVR West 2 open pit is full of water. When it was dewatered, the seepage stopped. The IVR West 2 open pit is along strike from the IVR V2 open pit and this suggests that there are permeable, continuous, thawed structures connecting the two open pits despite the expected presence of permafrost. Consider keeping the IVR West 2 open pit dewatered to the extent practical.



IVR WEST OPEN PITS



IVR West Open Pits

General

- The IVR West open pits were inspected on August 12, 2025. 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 2 is closed.
- The IVR West Mini Pit has been mined out by the pushback of the IVR V2 open pit.
- As a result, inspection comments are only be provided for the IVR West 2 open pit.



IVR West Open Pits

Observations - IVR West 2

- Mining of the IVR West 2 pit is complete. Access to the ramp is restricted by candles. A berm is no longer present.
- It is understood that the pit is periodically used by dewatering personnel who travel along the ramp. A rock mechanics inspection is completed each time access is required. No dewatering infrastructure was present within the pit at the time of the annual inspection.
- Multiple rockfall hazards are present along the crest of the open pit above the ramp, typically associated with overspill. If access into the open pit continues to be required, these hazards need to be mitigated (e.g., by constructing a rockfall berm or removing the loose material on the slopes).



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 12, 2025.
- 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 Global Navigation Satellite System (GNSS) Beacons, 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.
- Additional instrumentation has been installed since the 2024 annual inspection. Otherwise the slope monitoring program is similar to previous years.

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.
- The drone surveys are summarized in reports that present a side-by-side comparison of the current and prior conditions of the catch benches. These are nice summaries.
- Comments:
 - The drone inspection reports currently focus on overall slope performance. Recommend including close-ups of specific areas of interest (e.g., area with Edge Protectors along ramp) where the drone is best-suited to identifying potential instabilities.

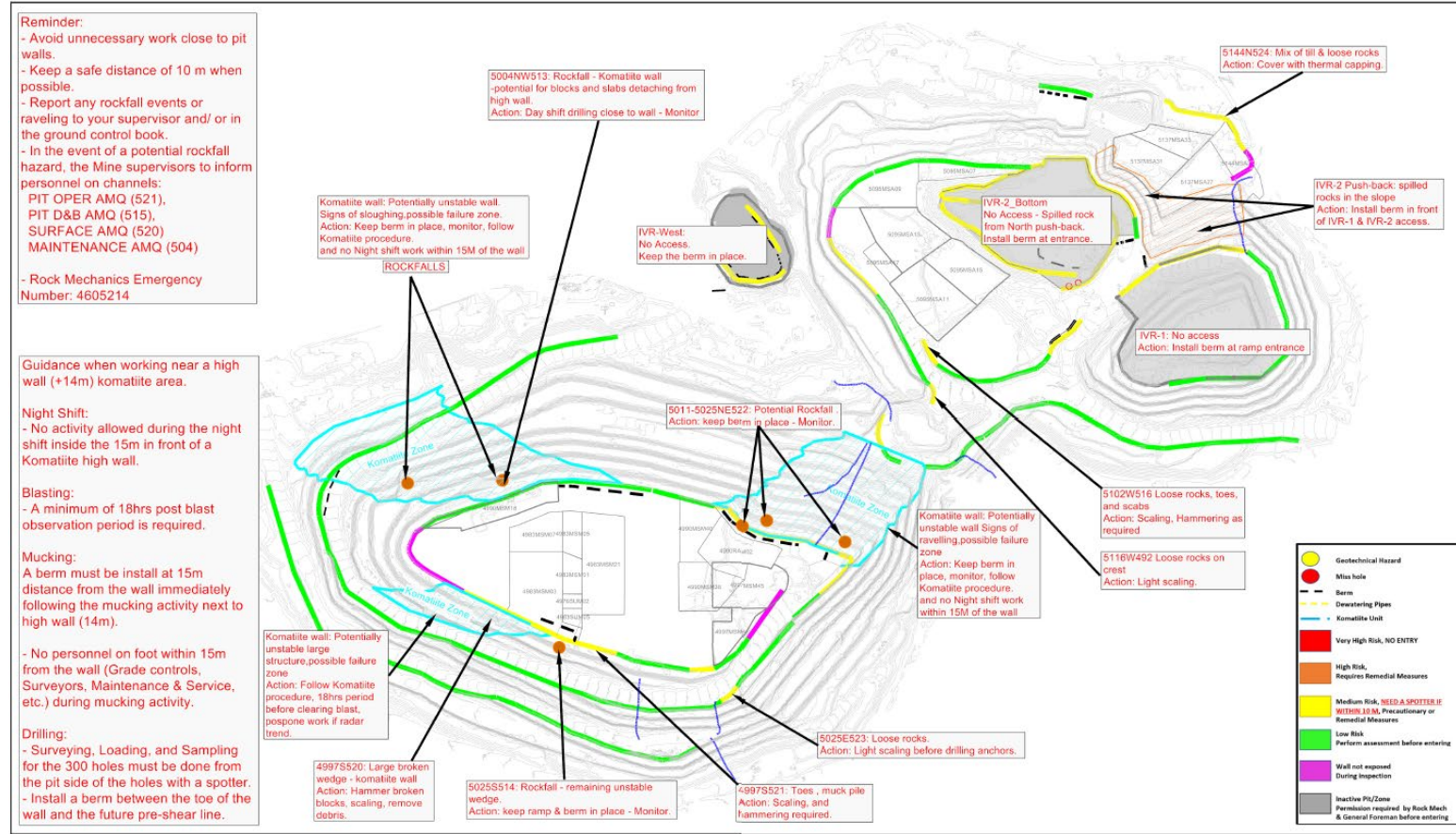
Table 5-5: Summary of Inspection Program

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 / 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. However, only two AEM personnel complete the maps and they feel that they use a similar approach. Recommend developing more detailed guidance in the event of a change in personnel.
- The hazard map has been updated to show the location of the Komatiite Zones (which trigger the Working With Komatiite procedure) and the position of berms. Green Candles are also used in the pit to demarcate geotechnical hazards. These are positive developments.



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).
- A spotter is required in Medium Risk areas but not in Low Risk areas. These areas are only communicated via the hazard maps and are not demarcated in the field. However, the hazard maps are not routinely carried by personnel working in the pit and are not updated outside of the regular two-week cycle. As a result, it is not clear whether personnel can reliably apply the Work Close to Pit Wall procedure.
- The personnel most likely to be affected are the Geologists and Surveyors; the other in-pit personnel typically do not work alone and the Drillers and Blasters do not work on a pattern unless it has been cleared by Rock Mechanics through the Wall Approval procedure.
- Recommend reviewing the integration between the Work Close to Pit Wall procedure and the hazard maps to ensure that the procedure can be consistently implemented as intended.

- 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.

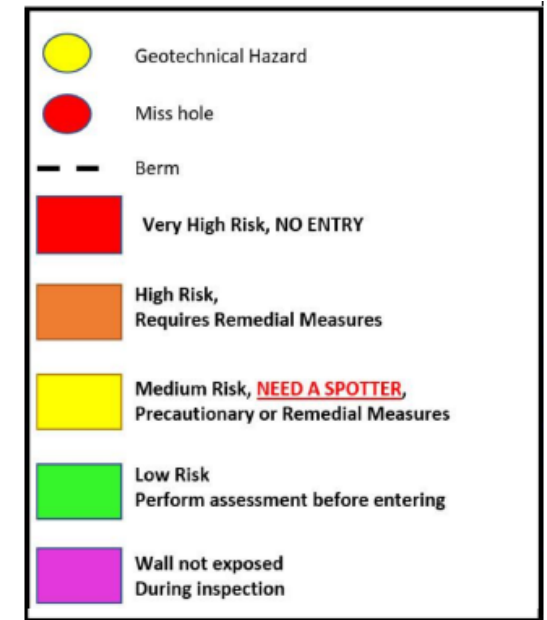


Monitoring and Inspections

Hazard / Risk Assessment (Cont'd)

- 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.
- The Hazard Tracking Database has been regularly used since the last annual inspection and no hazards were observed to be missing. The database has been significantly cleaned up since the last annual inspection.
- 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. Alternatively, these could be tracked in the Hazard Tracking Database with a specific identifier.

- 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

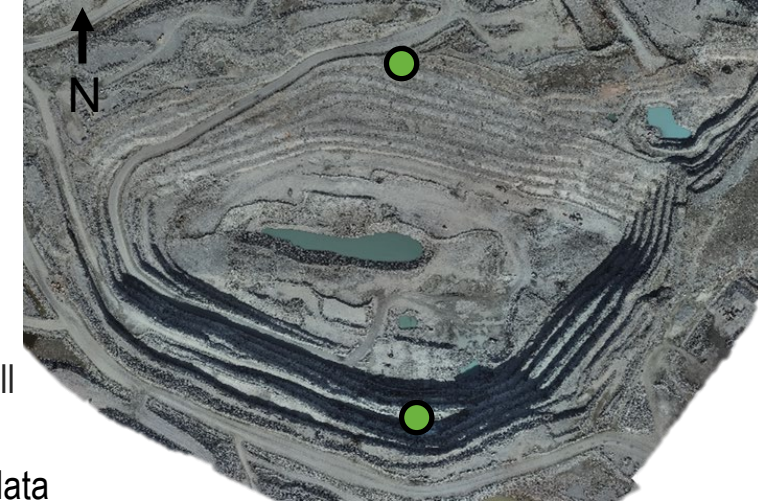
Bench Approval Process




- 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.
- Drill patterns are only released to Survey and the drills once the required wall approvals are completed.
- 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 now has three GroundProbe SSR-XT real aperture radars, with a new radar commissioned at the end of 2024. One radar covers the north wall of the Whale Tail Pit while the other radar covers the south wall (see image at right). The new radar is intended to allow coverage of the IVR V2 north wall.
- The Ground Control Monitoring Using Radar System procedure sets out responsibilities and how the SSR data are to be communicated. The procedure was updated in July 2025 and is awaiting approvals.
- The radar data are reviewed at least twice a day and whenever an alarm is 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. An attempt was made to establish red alarms for select areas of the open pit in Q2 of 2025 . This attempt was ultimately abandoned after repeated false alarms. Remove the Red alarms from the TARP if they will not be used.
- The updated procedure now explains the common alarm triggers used and provides guidance on how they can be adjusted based on different circumstances.
- 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 whenever there is an alarm.
- GroundProbe's Geotechnical Support Services (GSS) were retained in 2024 to provide supplementary 24/7 remote monitoring of the radar. It is understood that this is working well.



Example	Signification	Dispatcher's response
	No to low risk system or equipment issues	<ul style="list-style-type: none"> ➤ Contact Rock Mechanics personnel. The appropriate number will display on Alarm message ➤ Sepura # - 4605214 ➤ Ext: 4606920
	Low Risk Wall Movement or noise	<ul style="list-style-type: none"> ➤ Contact Rock Mechanics personnel. The appropriate number will display on Alarm message ➤ Sepura # - 4605214 ➤ Ext: 4606920
	HIGH Risk Wall Movement or noise	<ul style="list-style-type: none"> ➤ STOP operations in area ➤ Evacuate area ➤ IMMEDIATELY CALL ROCK MECHANICS PERSONNEL ➤ Sepura # - 4605214 ➤ Ext: 4606920

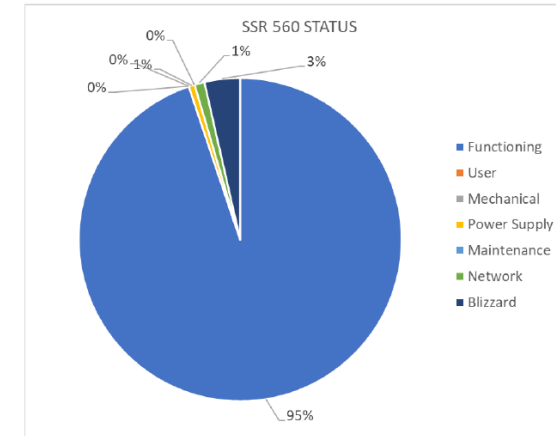
Monitoring and Inspections

SSR Monitoring - Coverage

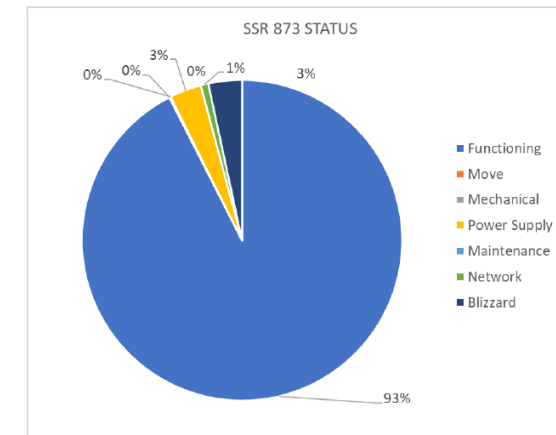
- With the introduction of the new radar, downtime has been notably reduced:
 - Radar SSR253 was operating 97% of the time in Q2-Q4 of 2024. It was used on an ad-hoc basis in 2025.
 - Radar SSR560 was operating at least 95% of the time in Q2-Q4 of 2024 and Q1-Q2 of 2025, with the exception of a period in August and September when it was down for more than two weeks due to mechanical and network issues.
 - The new radar, SSR 873 was commissioned at the end of November 2024 and has since been operating well with between 93 and 95% uptime.
- 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 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 2025

SSR 560



SSR 873



Monitoring and Inspections

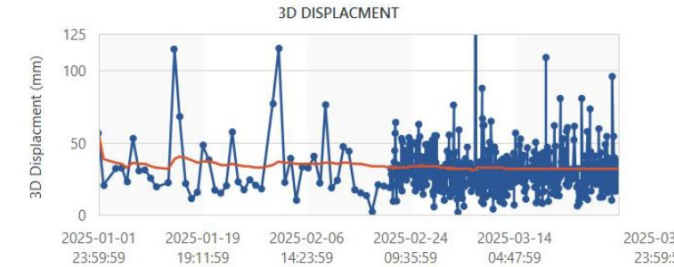
SSR Monitoring (Cont'd)

- The SSR was used to forecast 11 of the 19 reported bench failures and rockfalls that have occurred in the Whale Tail pit since the previous annual inspection in August 2024. Note that in one case the radar was down, resulting in a closure of the area to personnel, and in two cases the failure area had been masked ahead of a blast and the failures occurred during or immediately after the blast when personnel were not exposed.
- An alarm was triggered in advance for 8 of the 19 failures. Setting aside the 3 cases noted above, the remaining 8 failures that did not trigger an alarm ranged in size from 150 to 700 tonnes, with an average size of 400 tonnes. Smaller failures and rockfalls are more challenging to capture with the SSR and the mine employs other controls such as berms to mitigate the risk associated with these failures (discussed in a later section). Failures larger than approximately 1,000 tonnes have been reliably identified and an alarm triggered.
- The alarm parameters were reviewed by AEM and GroundProbe in July 2024 and the impact of different thresholds considered. The velocity threshold was reduced from 1.3 mm/hr to 1 mm/hr over 2 hours, 2 scans and 3 contiguous pixels. In certain areas, the alarm is sometimes relaxed to 1mm/hr over 80 minutes and 3 pixels over 2 scans.
- The SSR continues to be the primary monitoring tool and it is recommended that the alarm parameters be reviewed and reconciled annually as well as after major failures to ensure that they remain effective. A commitment should be made to this effect in the GCMP.
- The mine continues to review the expected radar coverage relative to the planned mining, which is good practice.
- The semi-permanent locations for the SSRs have resulted in a longer-term set of slope monitoring data. Based on discussions with GroundProbe, the utility of this data set for monitoring long-term slope performance is limited to approximately 3 months before excessive drift occurs. Rock Mechanics reviews the radar data for trends over a 3-week and 3-month timeframe each two-week rotation.

Monitoring and Inspections

GNSS Beacons

Data
from #5039



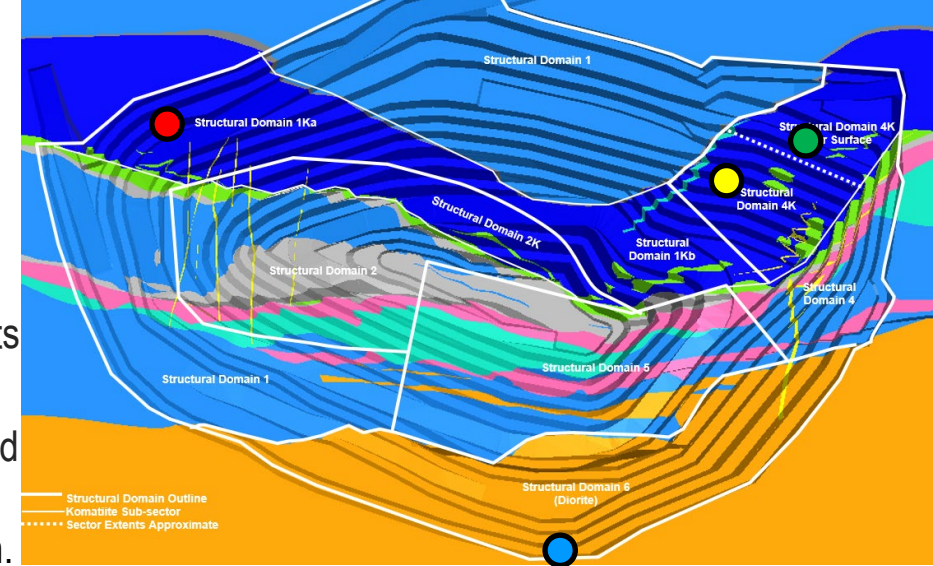
- The mine has installed GNSS beacons to complement the SSR data, provide a long-term deformation baseline, and to allow the true displacement vector of the slope to be measured. Four beacons were installed in 2023 and early 2024 in the Northeast and Northwest walls of the WHL open pit.
- Since the 2024 annual inspection, one additional GNSS/GPS (#5025) was installed in the Greywacke in the North Wall. The Greywacke is initially expected to experience less displacement than the Komatiite in the Northeast and Northwest walls and thus should be a useful point of comparison. The Greywacke is predicted to start to deform during the recovery of the crown pillar.
- The beacon installed on the ramp in the northwest wall is no longer functional as the battery has drained. The battery should be replaced.
- The beacon data are imprecise and are reviewed using moving averages. The displacement has averaged 5 to 10 mm over a 3 month period.
- The beacon data exhibit a clear trend into the open pit, which is consistent with expectations. However, there is an unexpected southwesterly component to the data. This may be due to movement of the base station at the crest of the northeast wall. AEM are current evaluating whether the base station should be relocated.
- The GNSS beacons are now fully integrated into the mine's monitoring system (e.g., MonitorIQ) and an alarm has been defined at 10 mm/hr. Due to the precision of the beacons, recommend defining the alarm over a longer time period (e.g. a week). A TARP still needs to be developed.
- The mine has budgeted for the installation additional beacons in 2026 and 2027, likely in the lower Northeast and Northwest Walls.



Monitoring and Inspections

Sub-Surface Monitoring

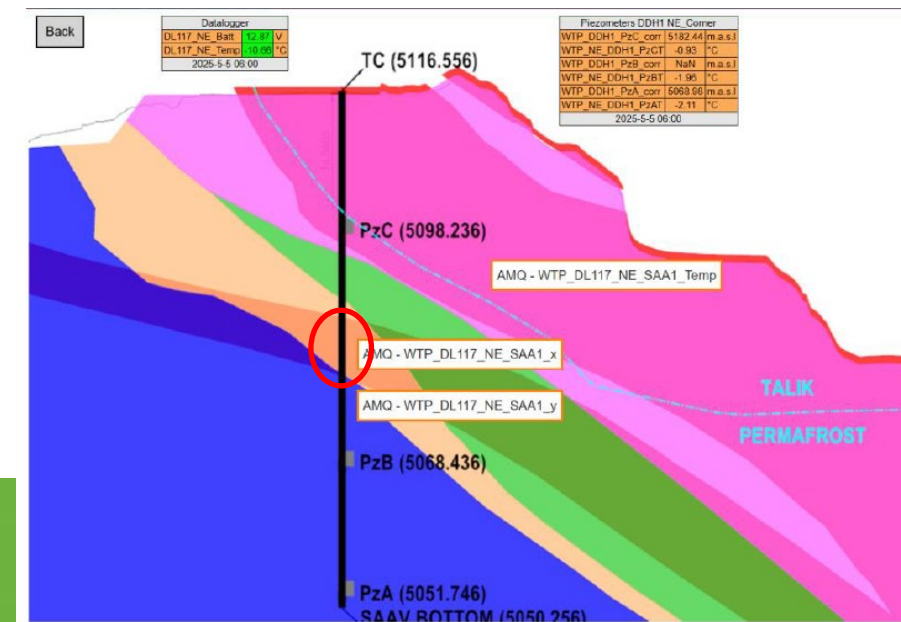
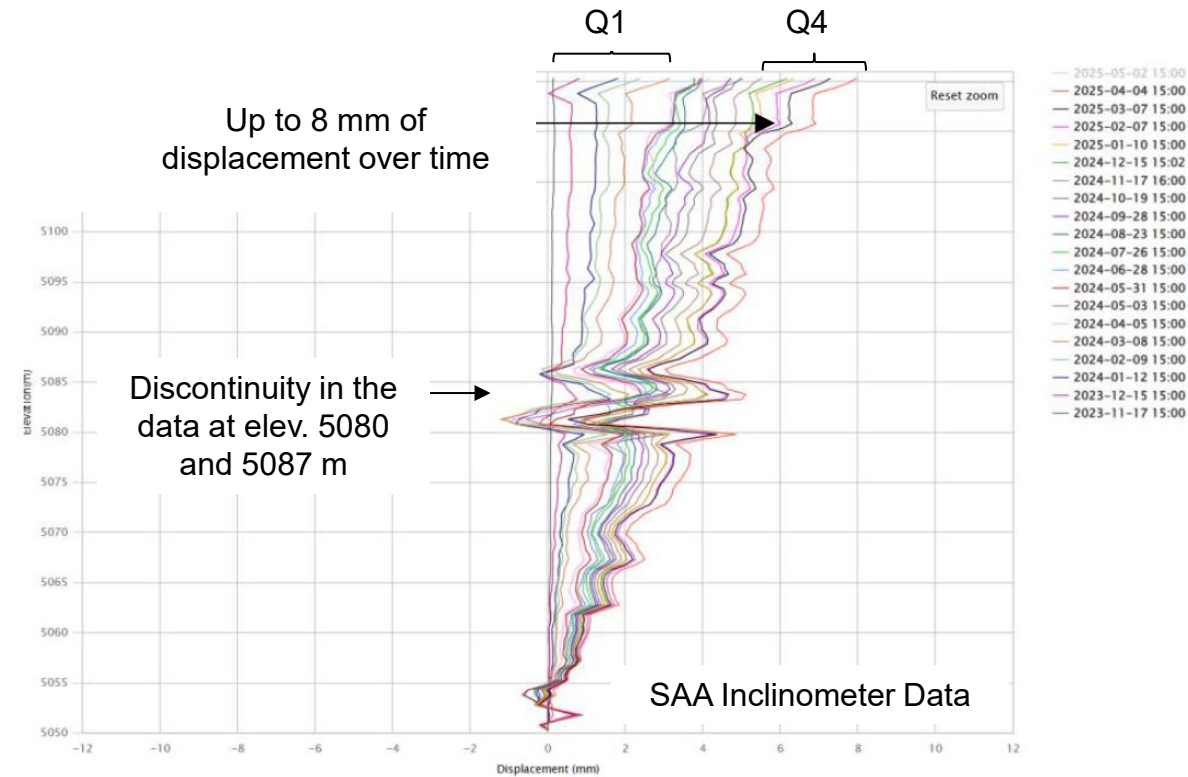
- The sub-surface geotechnical and hydrogeological instrumentation in the open pits consists of the following instruments in the Whale Tail pit:
 - A thermistor installed in the Northwest Wall (red dot at right) to a depth of 15 m behind the wall to better understand the active layer developed in the open pit. This instrument is working but the data were not reviewed as part of the annual inspection.
 - A thermistor string, five vibrating wire piezometers, and a TDR cable 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 data have largely stabilized, with limited changes due to recent mining. The TDR is available but is not currently being monitored.
 - An SAA inclinometer and VWP installed in the upper Northeast wall (green dot). 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 consisted displacement (8 mm since November 2023) towards the open pit and this is discussed further on the next slide.
 - 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.



Monitoring and Inspection

Sub-Surface Monitoring (Cont'd)

- The data from the SAA installed in the upper Northeast Wall of the WHL open pit are shown at upper right.
 - There are peaks in the data at elevation 5080 and 5087 (roughly the area circled in red at bottom right). These correspond to a contact between the Greywacke (blue) and the Chert (orange).
 - A high-level review of the data suggests that the displacement increased when mining was occurring at the toe of the slope in Q1 and Q4 2024. Recommend plotting the data relative to mining activities in this sector.
-
- All of the instruments are integrated into the mine's monitoring system (e.g., MonitorIQ). Trigger thresholds, alarms, and a TARP need to be developed for the SAA to govern the management and interpretation of the data.
 - Additional instrumentation should be installed as mining progresses (e.g., Design Sector A1K and IVR V2 Design Sector V2A).



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 and Reporting
- Quarterly Summary Reports
- Resources and Training

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: 2020-07-13				
Design:		[FACILITY_] [PHASE_] [VERSION] [DESIGN ITERATION] [DRAFT VERSION]						
DATE APPROVED								
SUBMITTED BY								
STRUCTURE	Open Pit <input type="checkbox"/> Dump <input type="checkbox"/>							
DESIGN SUBMITTED FOR APPROVAL								
Design								
Facility								
Geotechnical Parameters								
Block Model (for Open Pit only)								
Finalists (for Open Pit only)								
Gold Price (\$USD / oz)								
Exchange Rate (USD/CAD)								
SUPERSEDES								
Design								
Facility								
Geotechnical Parameters								
Block Model (for Open Pit only)								
Finalists (for Open Pit only)								
Gold Price (\$USD / oz)								
Exchange Rate (USD/CAD)								
DESCRIPTION								
							New Design Master	Minor
Mine Planning Engineer name:								
BASIC DESIGN PARAMETERS								
Correct pit shell used? Please indicate:							<input type="checkbox"/>	<input type="checkbox"/>
Correct Block Model used?							<input type="checkbox"/>	<input type="checkbox"/>
Correct Geotechnical Parameters used?							<input type="checkbox"/>	<input type="checkbox"/>
PIT GEOMETRY								
Design respects topography?							<input type="checkbox"/>	<input type="checkbox"/>
Bench elevations respect normal convention (intervals of 7)?							<input type="checkbox"/>	<input type="checkbox"/>
Minimum mining width respected?							<input type="checkbox"/>	<input type="checkbox"/>
Haulage ramp design parameters respected? (double lane) - If no, specify:							<input type="checkbox"/>	<input type="checkbox"/>
Haulage ramp design parameters respected? (single lane) - If no, specify:							<input type="checkbox"/>	<input type="checkbox"/>
Bench face angle & catchments respect design standards?							<input type="checkbox"/>	<input type="checkbox"/>
Inter-ramp heights & inter-ramp angles respect design standards?							<input type="checkbox"/>	<input type="checkbox"/>
DUMP GEOMETRY								
Dump lift height respects design parameters?							<input type="checkbox"/>	<input type="checkbox"/>
Signature:							Date:	<input type="checkbox"/>
Engineering Coordinator (or delegate) name:								
Design plotted official AEM layout with correct title block and information?							<input type="checkbox"/>	<input type="checkbox"/>
Scale/Directional Arrow/Gridlines included?							<input type="checkbox"/>	<input type="checkbox"/>
Layout clearly illustrates design change(s)/differences?							<input type="checkbox"/>	<input type="checkbox"/>
Quantitative (tonnes/ounces/grade) changes summarized on layout?							<input type="checkbox"/>	<input type="checkbox"/>
Signature:							Date:	<input type="checkbox"/>
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. The mine commits to completing structural and rock mass quality mapping at least annually and when unusual conditions are observed. Comments on the rock mass characterization are provided below.

- The Rock Mechanics team completed structural mapping and spot mapping of four general areas within the Whale Tail Pit (East Wall above and below the ramp, Southeast Wall below the ramp) since the last annual inspection. The data have not yet been consolidated or reviewed for trends. No mapping has been completed in the IVR open pits. No mapping is currently undertaken to validate the Brittle / High Strain Structure model.
- The deposits at Amaruq are notably structurally complex and rock mass structure often controls the slope performance. Mapping needs to 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. If there are significant changes to the interpretation of the rock mass structure, the potential impact on the open pit slope performance and design should be assessed.
- 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	Annually or when unusual conditions/conditions outside expectations occur	-	-
	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 mine commits to reviewing the bench performance quarterly.

- The achieved slope geometry is documented through 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.
- Catch bench width compliance for the WHL open pit was reviewed for each quarter since the last annual inspection. The catch benches achieved the required 8 m with 75 to 80% reliability. This is consistent with the design basis.
- Back break of the crests was measured for the IVR V2 open pit for Q3-Q4 of 2024. The backbreak averaged 1.6 to 2 m (excluding the first bench which is influenced by surface effects). However, whether or not this complied with the design basis was not assessed. Catch bench width compliance was subsequently assessed in Q2 2025 for the pre-sheared benches. The catch benches evaluated achieved the required width of 8 m with 79% reliability. This is consistent with the design basis.
- The catch bench performance needs to be consistently compared to the design basis. Recommend continuing to complete this as part of the quarterly reports.

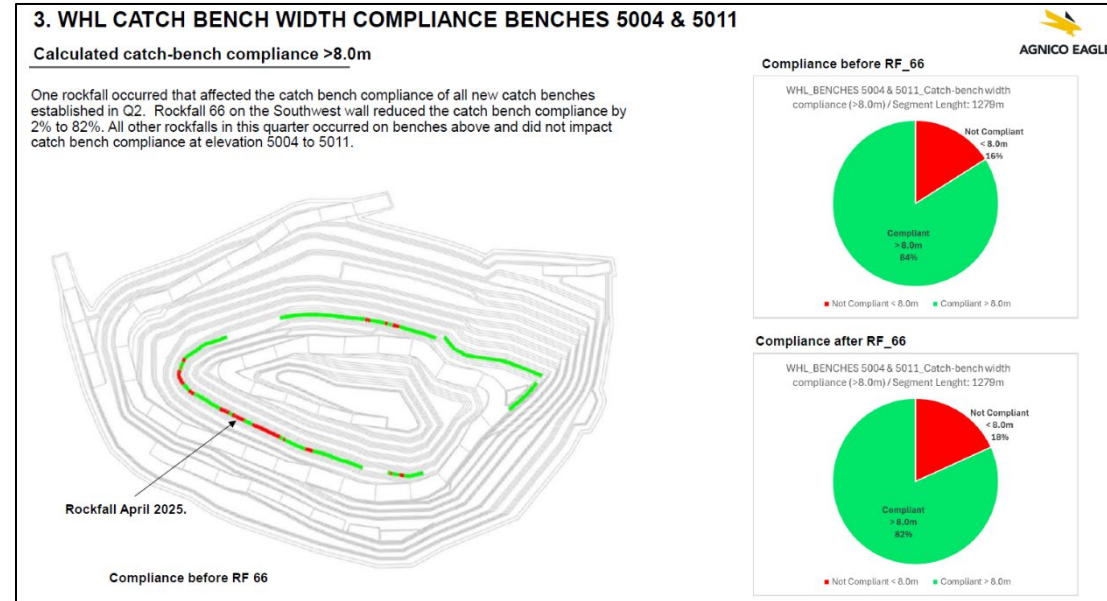


Table 5-6: Wall performance trend and actions

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)

- Crest loss at Amaruq is attributed to a combination of drilling and blasting practices, adverse rock mass structure (e.g., WHL Sector F6), and the use of scaling to remove identified hazards.
- 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. Key outcomes of this work since the last annual inspection include:
 - Line drilling is now budgeted and planned for all benches directly below the ramp.
 - A dedicated blasting pattern has been developed for benches with a 55° BFA that are within the Komatiite.
- The mine is considering developing dedicated blasting patterns for other bench configurations in the Komatiite, and this is encouraged.
- The possibility of periodic meetings between Blasting and Rock Mechanics was discussed during the site visit and this is also encouraged.
- It is recommended that Rock Mechanics be part of the design and sign-off process for blast patterns to help ensure that geotechnical considerations are taken into account (e.g., blasting away from a sensitive wall, planning for trim blasts along contacts, etc.).

Ground Control Program

Rockfall Database and Reporting

- Rockfalls are to be recorded in the Rockfall Database and a rockfall report is issued.
- 19 rockfalls have been recorded since the previous annual inspection in August 2024, all of which occurred in the Whale Tail open pit. These represent bench-scale instabilities or smaller rockfalls and can broadly be grouped as follows:
 - **Whale Tail Northeast Wall** - Two bench scale planar or wedge failures with a tonnage between 500 and 900 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** - Eleven individual rockfalls associated with four wedge or hybrid failures. The cumulative tonnage of the failures ranged from 150 to 15,800 tonnes. The largest failure occurred as a series of individual bench failures as the benches were developed but collectively represents a multi-bench failure.
 - **Whale Tail South Wall** - Six individual rockfalls associated with four wedge failures along lithology contacts. The cumulative tonnage of the failures ranged from 300 to 8,400 tonnes.
- These failures are described in greater detail earlier in this summary.
- 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, as well as unusual occurrences, should also be recorded in the database. For example, small rockfalls, or the potential wedge that was removed from the south wall of the IVR V2 open pit.

Ground Control Program

Rockfall Database and Reporting

- A Rockfall Report is completed for all reportable rockfalls and slope failures. Intelex reports are completed for rockfalls deemed to be near misses.
- The contents of the reports varies but has improved significantly since the last annual inspection. The reports now typically include:
 - A factual description of the event (conditions and chronology) and the consequences of the event
 - The primary and contributing causal factors, including lithology, structure, water, temperature, blasting, etc.
 - Whether the failure is part of a larger trend
 - Action or follow-up items
- In cases where multiple similar events have occurred, a more detailed discussion is typically included in the Quarterly Summary reports along with lessons learned.
- The reports typically do not consider the effectiveness of the existing controls. This is discussed further on the next slide.

REPORT TO MINES INSPECTOR

Date: October 10th, 2024
From: Agnico Eagle Mines – Meadowbank Division
To: Nunavut Mines Inspector

Issued pursuant to (Sections 16.01 & 16.02) of the Mine Health and Safety Act and Regulations for NWT & NU.

Event Description (Incident analysis):

On October 8th, 2024, at 10:20 AM, a fall of ground occurred on the Southwest wall of the Whale Tail pit.

The calculated tonnage of the rockfall is 1,102 tonnes. The event happened on bench elevation 5046 down to 5025 and it was entirely retained on the catch bench elevation 5025 with a run-off distance of 7m.

The area was identified as being problematic and an exclusion zone (safety berm) was put in place back in September at 13m away for the toe of the wall. On September 26th, a plan was established to leave this exclusion zone in place until all adjacent drill patterns were blasted to see if the effect of blast vibrations and rainfall would make it come down.

As planned, on October 8th at 10:20AM, the problematic structure fell on it's own.

No personnel were injured, and no equipment was damaged. There is potential for more raveling and rockfall in the area following this event.

Geological, Hydrogeological and Mining Contexts (Fundamental causes):

The rockfall occurred at the contact between the mafic and ultramafic lithological units. A brittle structure and Lamprophyre Dike also cross the wall at that location. The main structure plane is dipping 36° towards the pit side with a strike of 339° which is more in line with the lithological contact between mafic and ultramafic units. The break remains are forming a general flat shape although folded locally. A period of more than a month of heavy rain (+40mm) was recorded prior to the event. Running water was also seen before the rockfall.

Corrective or preventive actions:

1. Keep the berm in place to prevent entry and contain potential future rockfall / spill rocks.
2. Continue to apply the procedure "Working with Komatiite".
3. Have radar coverage when resuming work below the zone.
4. Continuous mapping of brittle structures and lithological contacts in Southwest of Whale Tail Pit

Ground Control Program

Control Effectiveness

- The mine relies on multiple controls to manage geotechnical risk, including design (e.g., adequate catch bench width), physical barriers (e.g. berms), and monitoring (e.g., inspections and the SSR).
- The effectiveness of these controls should be periodically reviewed (e.g., annually) to both confirm that the risk is being mitigated as intended and to communicate the value of the controls to other stakeholders. For example, the Working with Komatiite procedure constrains open pit operations but is one of the most effective controls currently in place at the mine for managing rockfalls.
- There are many possible ways of evaluating and quantifying control effectiveness. As one example, the successive elimination of hazards by layered hierarchy of controls is shown below for the rockfalls that occurred since the last annual inspection.

Control Type	Control	Number	Rockfall ID	Comment
Total Number of Failures		19		Since last annual inspection
Design / Physical Barrier	Retained on Catch Benches	7	RF61, RF63, RF69, RF70, RF71, RF74, RF78	
	Retained Within Working With Komatiite Procedure Berm	6	RF59, RF60, RF64, RF68, RF72, RF75	
	Retained Within Geotechnical Berm or Exclusion Zone (Candles)	4	RF62, RF66, RF76, RF77	Areas identified in advance by inspections, SSR, etc.
Procedural	Occurred During/Immediately After Blast	1	RF65	
	Area Evacuated due to SSR Alarm	0		
Uncontrolled	Reached Open Pit Floor without Control	1	A-62-0155 RF73	Occurred during scaling

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, although the Q3 and Q4 2024 reports were grouped. These reports are an important verification activity and provide a good summary of the ground control program activities.
- The reports include a dashboard summary of the activities complete and now compare the achieved frequency of the activities to the commitments in the GCMP. This is a good initiative and is endorsed.
- Recommend including a discussion of the effectiveness of the mine's controls (e.g., radar alarms, prior identification of rockfalls, etc.) at least on an annual basis.



2. QUARTERLY DASHBOARD Q2 2025



The Quarterly dashboard provides a general overview and statistical summary of the actions undertaken, events, and radar status.

Rockfall:

There were four reportable rockfalls during Q2 2025 and two non-reported rockfalls. The non-reportable rockfalls occurred in zones of previous rockfalls and so were not required to be reported.

Radars:

The percentage of time the radars were not monitoring are mainly due to network issues.

QUARTERLY DASHBOARD

	KPI	April	May	June	TOTAL	TARGET	VARIANCE
TASK	ROUTINE PITS INSPECTION	25	31	26	82	68	17%
	OFFICIAL WALL INSPECTION	1	3	2	6	6	0%
	PIT WALL APPROVAL	7	17	13	37	-	-
EVENT	IDENTIFIED HAZARD	5	11	3	19	-	-
	CORRECTED	5	11	3	19	19	0%
	REPORTABLE ROCK FALL	1	0	3	4	-	-
	ROCK FALL TONNAGE	3706	0	2464	6170	-	-
RADAR SSR253	% MONITORING TIME	0%	0%	0%	0%	0%	0%
	RADAR MOVE	0	0	0	0	-	-
RADAR SSR560	% MONITORING TIME	98%	99%	94%	97%	98%	-1%
	RADAR MOVE	0	0	0	0	-	-
RADAR SSR873	% MONITORING TIME	98%	100%	99%	99%	98%	1%
	RADAR MOVE	0	0	0	0	-	-

Ground Control Program

Resources and Training

- The composition of the rock mechanics team has changed since the last inspection and now consists of:
 - Katie Hawley, Strategic Rock Mechanics Engineer
 - Louis-Philippe Prevost, Rock Mechanics Engineer
 - Jasmine Sophie Papineau, Rock Mechanics Engineer
 - Vincent Duranleau, Rock Mechanics Technician
 - Arron Haselhorst, Rock Mechanics Technician
- The team is at full strength and, as a result, there are two to 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 staffing resources are considered adequate for the current demands on the Ground Control Program and the team are currently meeting most of their commitments. However, additional demands will be placed on the program due to the extension of the underground mine life and the expected expansion of the IVR open pits. As a result, the team will need to manage the recovery of the crown pillar below the WHL open pit at the same time as the mining of the north wall of the IVR open pit, both of which will require greater attention due to the increased likelihood of a hazard occurring. The adequacy of the team's resources in the coming years should therefore be reviewed.
- The development of a skills matrix is in progress. The initial version focuses on monitoring and instrumentation and now needs to be expanded to include other key skills such as pit wall inspections and approvals.
- 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

