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## Document Description

Annual Physical Stability Assessment Report – Victoria Gold – Eagle Gold Project

### Project Description:

Visual inspection of the following structures: Open Pit, Platinum Gulch Dump, Eagle Pup Dump, Lower Dublin South (Control) Pond, Primary Crusher, Secondary & Tertiary Crushers, Secondary Stockpile, Adsorption, Desorption and Recovery (ADR) Plant, Heap Leach Facility, Heap Leach Overburden Stockpile, Event Pond, Ditches A, B, and C, Truck Shop, Orica Laydown, Various Un-named Stockpiles.

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IFA	- Issued for Approval	AB	- As Built
IFQ	- Issued for Quotation	IAF	- Issued as Final

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## 1 BACKGROUND

In September, 2021, Allnorth Consultants Limited (Allnorth) was retained by Victoria Gold Corp. (VGC) to conduct a visual physical stability assessment of their Eagle Gold mining operation located in Mayo Mining District, Yukon, Canada in support of Quartz Mining License QML-0011. Spencer Bergin, EIT of Allnorth conducted the inspection on September 8<sup>th</sup> and 9<sup>th</sup>. The inspection was limited to visual inspection and did not include any specific geotechnical or structural testing or evaluation. Visual inspection generally consisted of traversing the structures on foot, and viewing the structures in their entirety from accessible vantage points. Any issues that were discovered were investigated and documented with detailed notes and photographs. The Allnorth inspector was given complete freedom in determining what to look at, and was not restricted access to any locations within the site. Conditions on site were sunny and clear for inspections.

Allnorth previously completed similar inspections in September of 2020, 2019, and 2018. Some photos taken during these inspections were used for comparison. Some areas had no basis for comparison, as construction was underway during the previous inspection, and has since been completed. Any photos included from the previous inspections are noted.

The mining project was currently extracting, storing, processing, and refining ore at the time of inspection. Construction of all major infrastructure has been completed and development of successive phases of the Heap Leach Facility (HLF), open pit mine and waste rock area expansion continue. As the project is in the early stages, historical records for survey data are limited to certain facilities at this time. As more survey data is collected and made available this can be used for stability monitoring and will likely become part of the physical stability assessment in the future.

## 2 SCOPE

This report outlines the findings of the physical stability assessment conducted from September 8<sup>th</sup> – 9<sup>th</sup> of 2021. This report documents the findings of the physical stability assessment and makes recommendations for remediation, additional inspection or monitoring of the issues identified. The following structures were included in the assessment:

- Lower Dublin South (Control) Pond and outfall,
- Secondary Stockpile (also known as 90 Day Stockpile),
- Heap Leach Facility,
- Heap Leach Overburden Stockpile,
- Open Pit,
- Platinum Gulch Dump,
- Eagle Pup Dump,
- Cut and fill slopes of the Primary, Secondary, and Tertiary Crushers including MSE walls,
- Cut and fill slopes of the Adsorption, Desorption and Recovery Plant,
- Event Pond,
- Ditches A, B, and C,
- Truck Shop,
- Orica Laydown,
- Various un-named stockpiles

The purpose of the inspection is to identify any visual indicators associated with instability of mass earth structures, including but not limited to tension cracking, bulging, pooled water above the slope or near the toe of the slope, falling material, indications of creep, slumps, deposits of debris, or cracking in bedrock. Additionally, constructed slopes were reviewed for slope angles and compared against the recommend slope angles for known material types on site. Refer to **Appendix A** for a map showing the site plan for the 2021 inspection. A site plan for the 2020 and 2019 inspections are available in **Appendix B** and **C** for comparison. A site plan for the 2018 inspection was not available.

### 3 LOWER DUBLIN SOUTH (CONTROL) POND

#### 3.1 Diversion Ditch Overflow

Some minor erosion was noticed above the shed which houses the junction of pipes and is adjacent to the rip-rapped groundwater diversion ditch (Figure 1), no other items noted. There is an outlet sump and weir which were constructed between the 2018 and 2019 inspections; no issues noted (Figure 2).



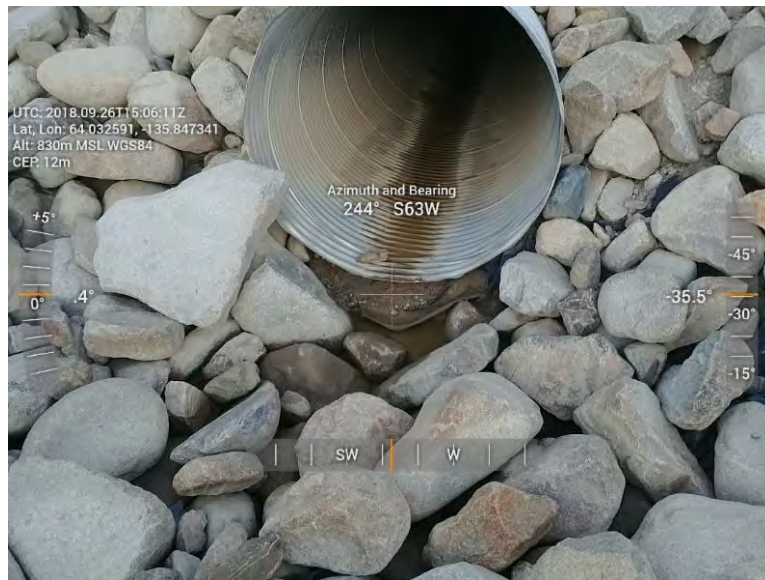
**Figure 1: LDSP – Erosion adjacent to Shed and Diversion Ditch**



**Figure 2: LDSP – Outlet Sump and Weir**

### 3.2 1500mm Spillway Outlet Culvert

1. The condition of this culvert appears to be the same compared to the previous years inspections (Figure 3, Figure 4, Figure 5). No water was observed flowing through the culvert in the 2018 and 2019 and 2021 inspections (Figure 6). No concerns noted.



**Figure 3: LDSP - 1500mm Culvert 2018 Inspection**

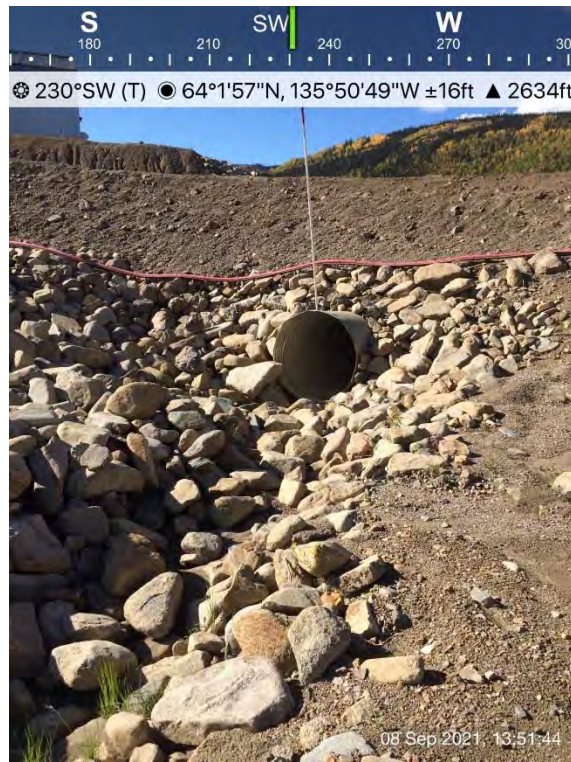




**Figure 4: LDSP - 1500mm Culvert 2019 Inspection**



**Figure 5: LDSP - 1500mm Culvert 2020 Inspection**



**Figure 6: LDSP - 1500mm Culvert 2021 Inspection**

### 3.3 Cut slopes

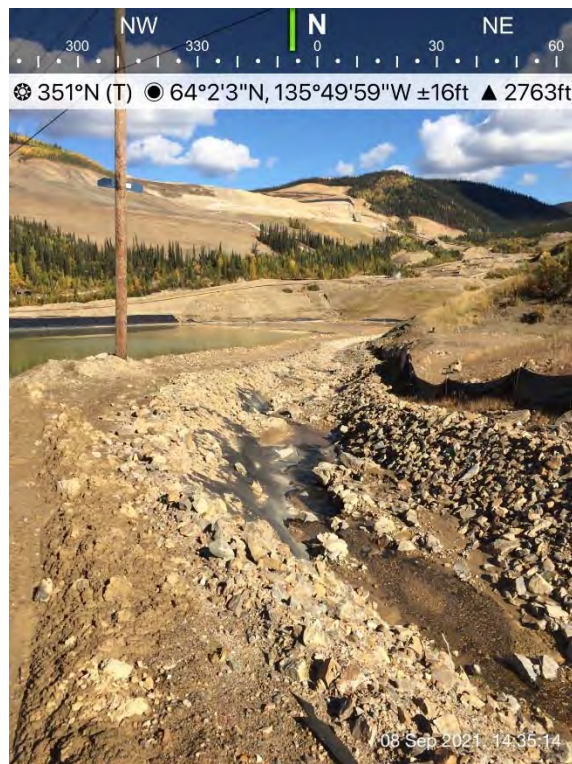
1. Some saturated material and erosion was noted on the slope of the southwest corner of the Control Pond over the width of the narrow access road in 2019 and 2020 (Figure 7, Figure 8) but this erosion was rectified with the completion of Ditch A between the 2020 and 2021 inspections (Figure 9).



**Figure 7: LDSP – Erosion on the Southwest slope 2019**



**Figure 8: LDSP – Erosion on the Southwest slope 2020**



**Figure 9: LDSP – Erosion rectified on the Southwest slope 2021**

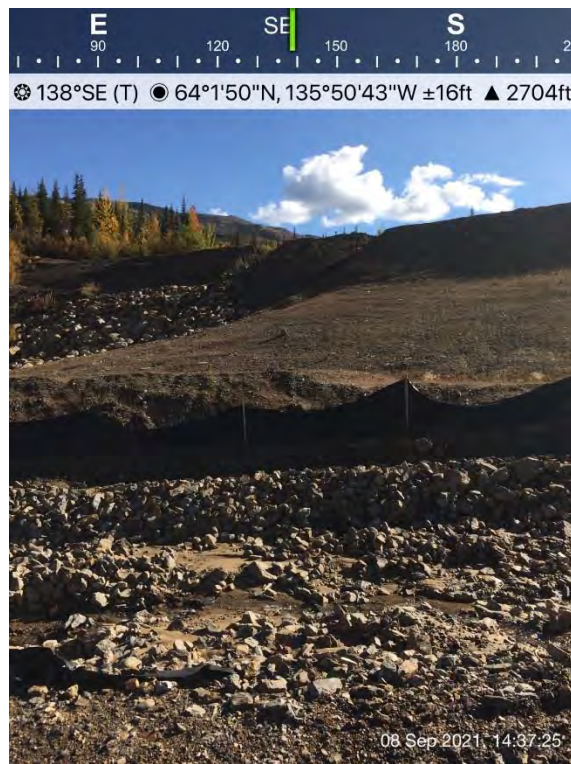
2. There was some flow into Ditch A on the Southwest corner of the LDSP from a culvert crossing a former construction access road, which was observed in 2019 and 2020 (Figure 10, Figure 11) and still present as of this inspection (Figure 12).



**Figure 10: LDPS – Some flow from adjacent culvert 2019**



**Figure 11: LDPS – Some flow from adjacent culvert 2020**



**Figure 12: LDPS – Some flow from adjacent culvert 2021**

## **4 SECONDARY STOCKPILE**

### **4.1 Benches and Cut Slopes**

1. The Secondary Stockpile (also known as the 90 Day Stockpile) was completed in 2020 (Figure 13). Some over-steepened cut slopes were observed on this inspection where the slopes had begun to collapse/erode and material was collecting at the base of the slope (Figure 14).



**Figure 13: Secondary Stockpile Cut Slopes 2020**



**Figure 14: Secondary Stockpile Cut Slopes 2021**

## 4.2 Perimeter Interception Ditch

1. A perimeter interception ditch extends around the downhill toe of the Secondary Stockpile area. The construction of this ditch was not complete in 2020 but has since had rock armoring installed (Figure 15, Figure 16). Issues noted in the 2020 inspection including over-steepened and sloughing slopes on the interception ditch appear to have since been addressed.



**Figure 15: Perimeter Ditching 2020**



**Figure 16: Perimeter Ditching 2021**

2. The outlet of one side of the perimeter ditch does not currently tie into the collection sump, this was observed in 2020 as well. (Figure 17, Figure 18).



**Figure 17: Unconnected Ditch Section 2020**



**Figure 18: Unconnected Ditch Section 2021**

## 5 HEAP LEACH FACILITY

### 5.1 HLF Overview

1. The Heap Leach Facility (HLF) is currently operational. In 2019 the Phase 1A expansion had been constructed as shown in Figure 19. By the time of the 2020 inspection the Phase 1B



expansion was largely complete as shown in Figure 20. During the 2021 inspection land was being cleared and graded for the Phase 2 expansion as shown in Figure 21.



**Figure 19: Heap Leach Facility Overview 2019**



**Figure 20: Heap Leach Facility Overview 2020**



**Figure 21: Heap Leach Facility Overview 2021**

## 5.2 Toe Slope

1. Some scouring and rilling was noted along the toe slope below the HLF and above the unnamed stockpile area and HLF Underdrain Monitoring Vault in the 2020 inspection (Figure 22). The slope has since been seeded and there appears to be less scouring of material off the toe slope (Figure 23).



**Figure 22: Scouring and rilling along toe slope of HLF (2020)**



**Figure 23: Seeded grass on toe slope of HLF (2021)**

### 5.3 Phase 1B Interception Ditch

1. The phase 1B interception ditch was constructed before the 2020 inspection. The interceptor ditch has collected silt/material in some sections, indicating scour and/or erosion on the uphill cut slope and/or sloughing from the access road (Figure 24). The same section with material collection appears unfinished, with geotextile installed but no rock armoring present.



**Figure 24: Material deposited in HLF Phase 1B Interceptor Ditch**

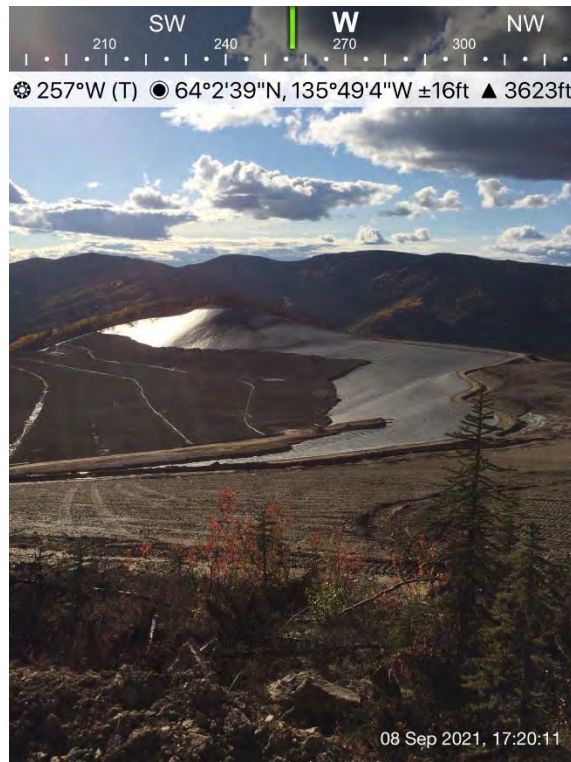
2. In addition to the material build-up shown in Figure 24 the West end of the interception ditch has material build-up at the drain pipe away from the HLF; the drain pipe was buried under silt and was not visible (Figure 25).



**Figure 25: Phase 1B Interception Ditch buried drain pipe**

## 5.4 Phase 2 Grade Clearing

1. The Phase 2 of the HLF was mostly cleared at the time of inspection with grading nearly finished as well (Figure 26, Figure 27). No issues noted for the cleared area.



**Figure 26: Phase 2 graded area (in foreground)**



**Figure 27: Phase 2 graded area**

## 6 HEAP LEACH OVERBURDEN STOCKPILE

1. Overburden from clearing and grading of the HLF expansions has been placed along the North-West back slope of the HLF. Site representatives stated that the HLF overburden pile had shifted and partially collapsed some time in the late summer, roughly 4 – 5 weeks prior to the 2021 inspection (Figure 28, Figure 29).



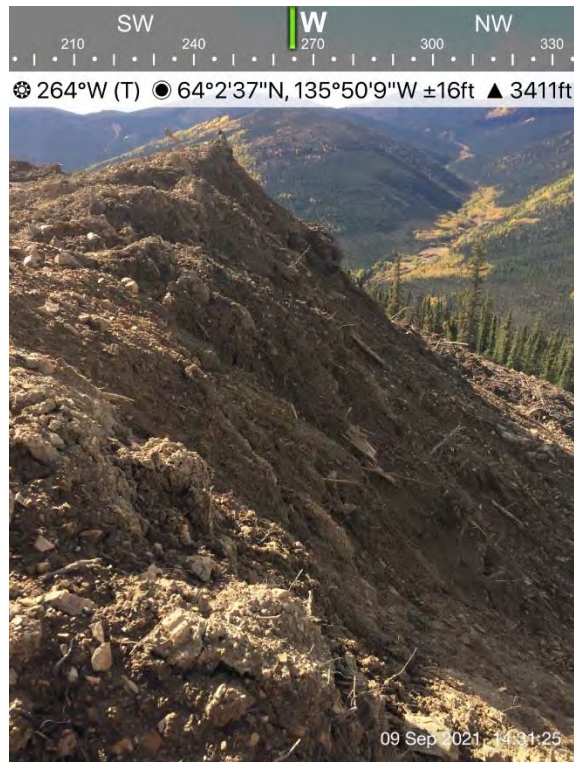
**Figure 28: HLF Overburden Stockpile collapse – plan view**



**Figure 29: HLF Overburden Stockpile collapse – plan view**

2. The slope of an uncollapsed section of the overburden pile was roughly measured with a meter stick and a smart phone protractor application to be between 40 and 50 degrees from horizontal at the location shown in Figure 30.





**Figure 30: HLF Overburden Stockpile slope**

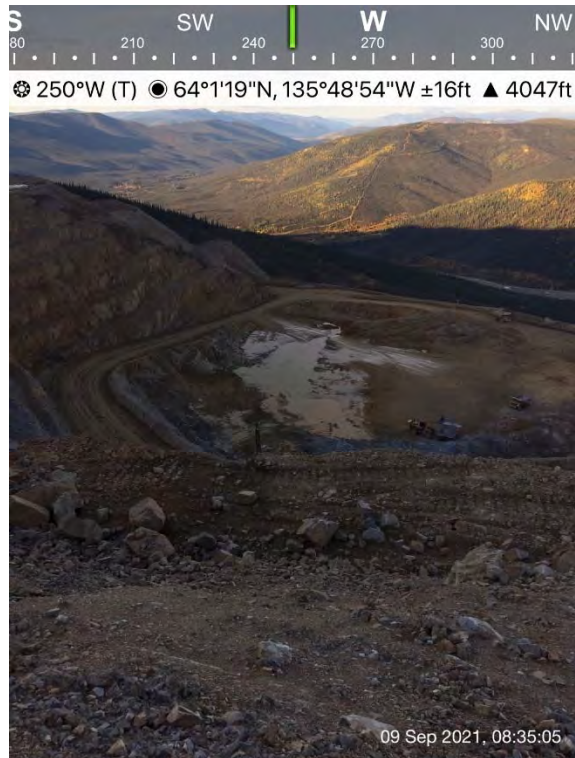
## 7 OPEN PIT

1. The pit walls appear stable, and constructed in competent rock (Figure 31).



**Figure 31: Phase 1 Pit Walls**

2. There is a section at the base of the pit where water collects and is unable to drain, resulting in pooled water (Figure 32).

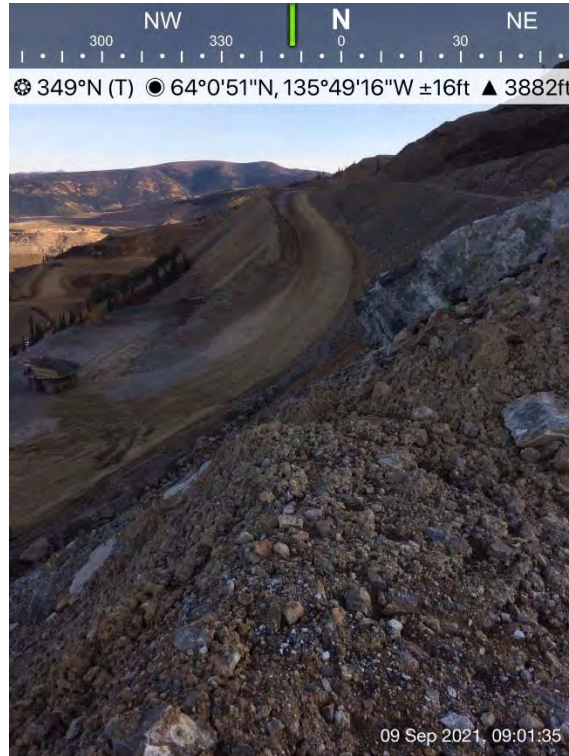


**Figure 32: Phase 1 Pit pooled water**



## 8 PLATINUM GULCH DUMP

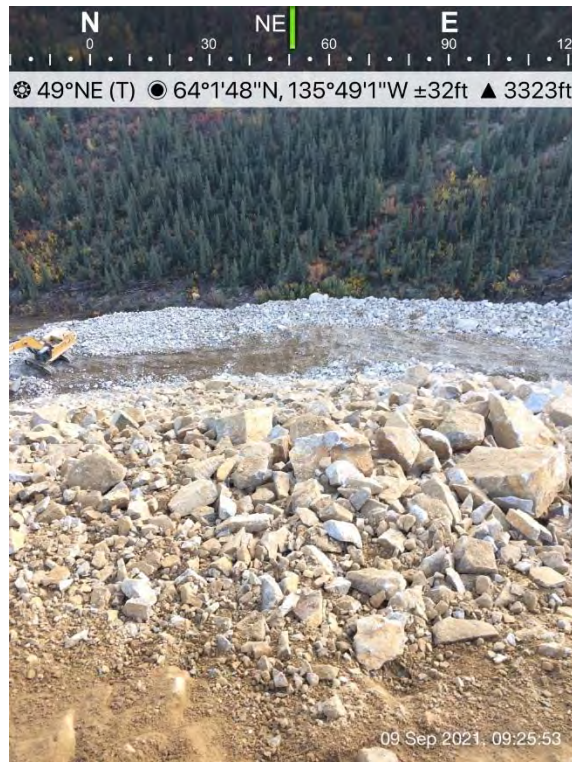
1. Platinum Gulch Dump is currently operational, and the side slopes appear to be stable. See Figure 33 below.



**Figure 33: Platinum Gulch Dump Fill Slope**

## 9 EAGLE PUP DUMP

1. The Eagle Pup Dump was under construction during the 2021 inspection, with drain rock being placed at the base of the slope as shown in Figure 34. No issues noted.

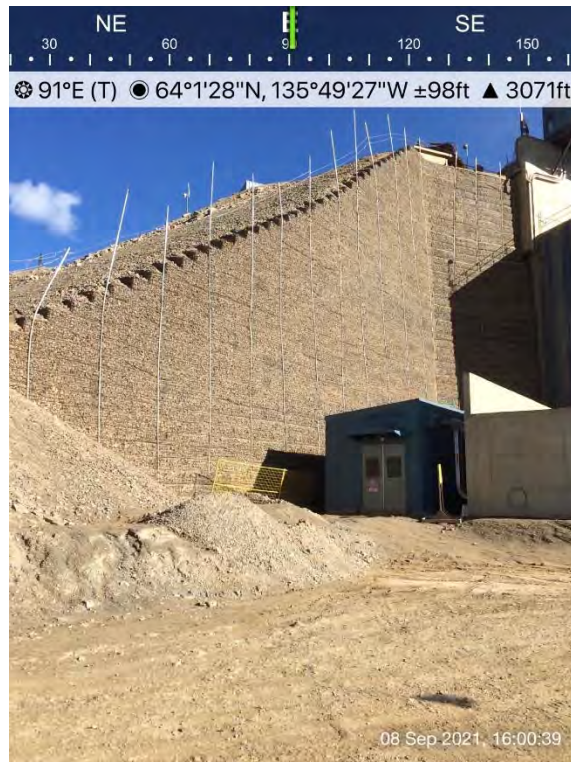


**Figure 34: Eagle Pup Dump drain rock**

## 10 PRIMARY CRUSHER

### 10.1 MSE Walls

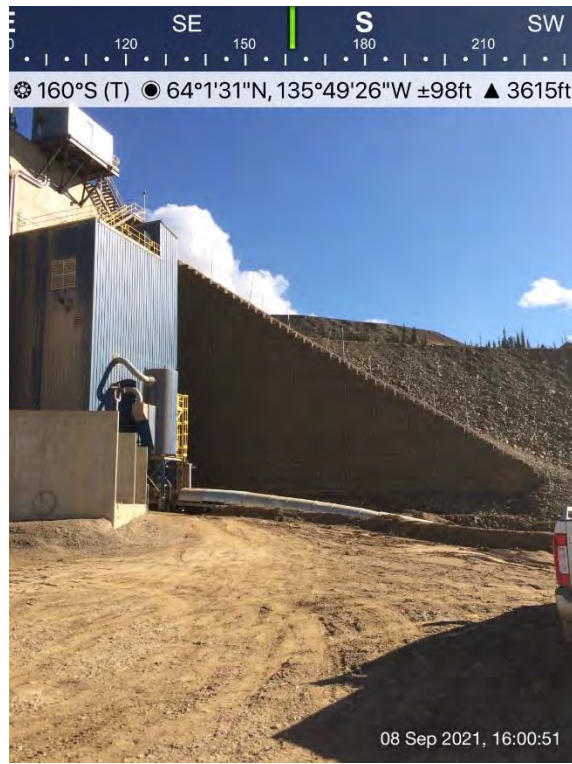
1. No apparent damage or deterioration was noted during the inspection of the Primary Crusher MSE wall (Figure 35 - Figure 38). No changes were visually identified from the 2020 inspection.



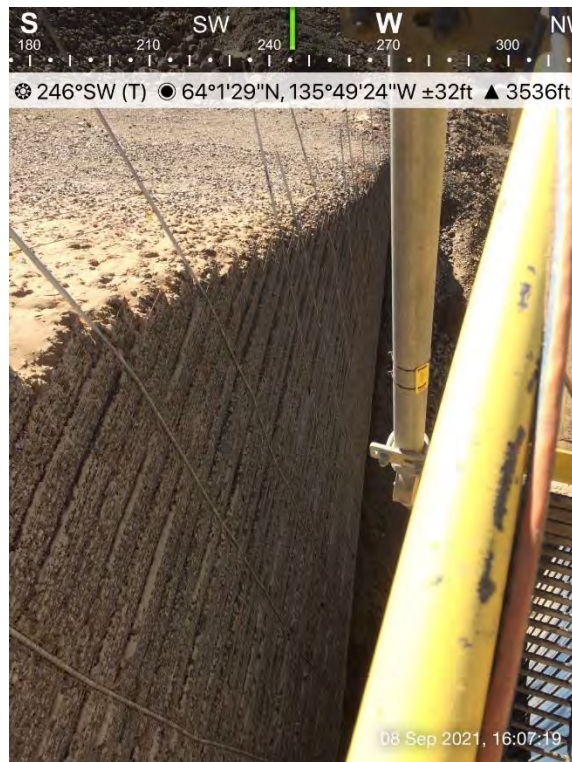
**Figure 35: Primary Crusher North-West Wall**



**Figure 36: Primary Crusher North-West Wall**



**Figure 37: Primary Crusher South-East Wall**



**Figure 38: Primary Crusher South-East Wall**

## 10.2 Cut and Fill slopes

1. Cut and fill slopes appear to be acceptable, no stability or erosion issues noted. (Figure 39).

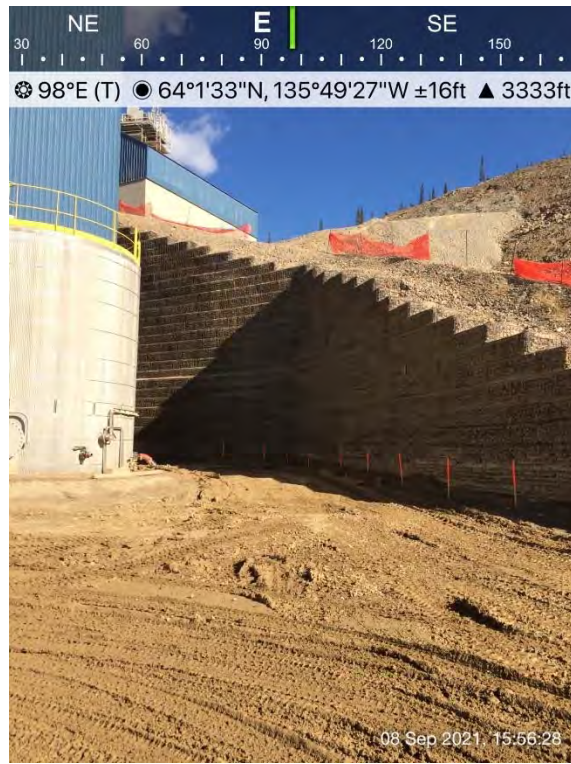


**Figure 39: North-West fill slopes**

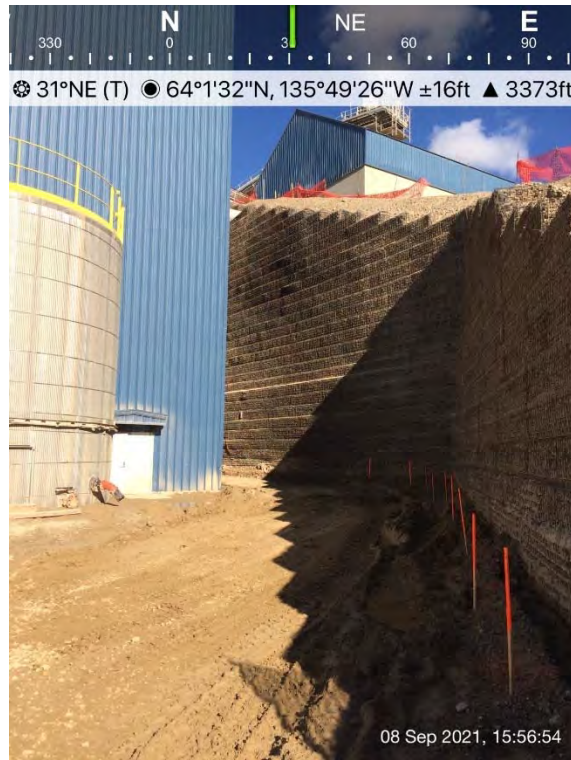
## 11 SECONDARY/TERTIARY CRUSHER

### 11.1 MSE Wall

1. No apparent damage or deterioration was noted during the inspection of the Secondary/Tertiary Crusher MSE wall (Figure 40 - Figure 42). No changes were visually identified from the 2020 inspection.

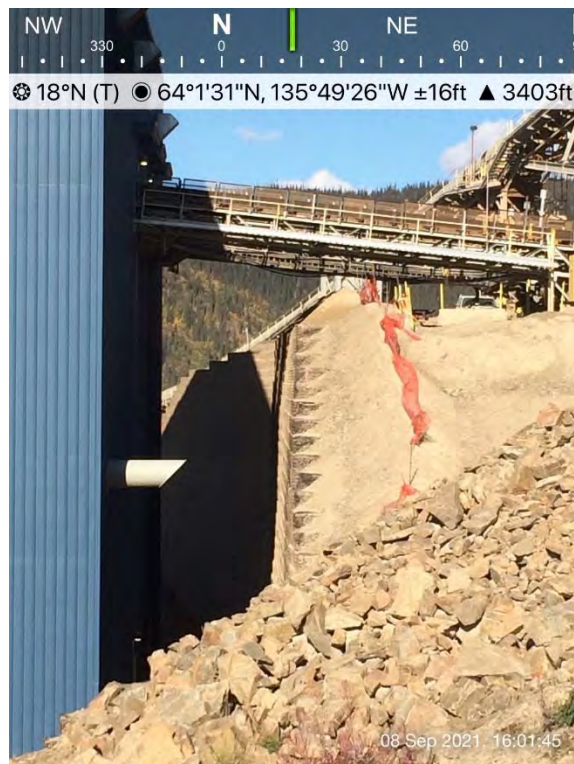


**Figure 40: South side of MSE wall**



**Figure 41: MSE wall behind secondary/tertiary crusher**

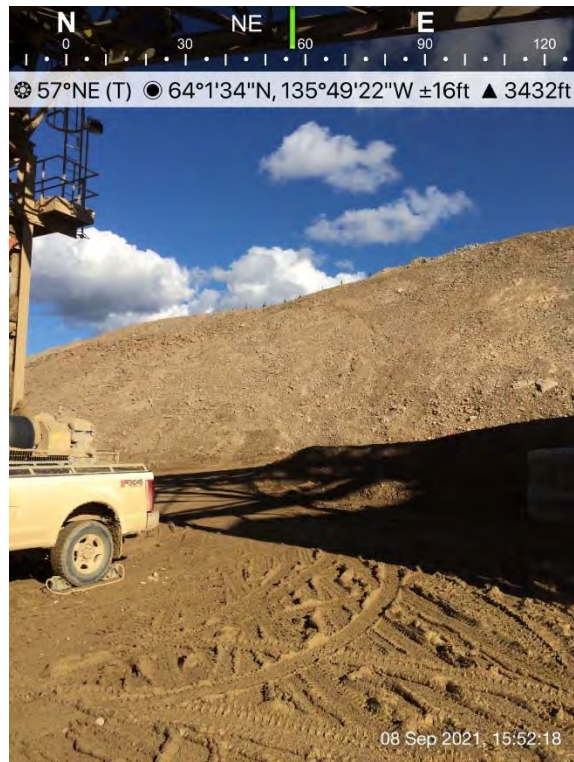




**Figure 42: MSE wall behind secondary/tertiary crusher**

## 11.2 Cut Slopes

1. Observed locations behind the secondary crusher showed no signs of stability or erosion issues (Figure 43). Some outcrops of rippable rock visible.



**Figure 43: Cut slopes above Secondary/Tertiary Crusher**

## **12 ADSORPTION, DESORPTION, AND RECOVERY PLANT (ADR)**

### **12.1 Cut and Fill Slopes**

1. Cut slopes behind the ADR area appear to be competent rock, with some minor rilling and unraveling (Figure 44)



**Figure 44: Slopes behind ADR (2021)**

## 12.2 North Toe Ditch

1. There is a small V ditch, referred to here as the North Toe Ditch (Figure 45), with sides close to 1:1 cut at the base of a large steep slope which is cut into bedrock; the ditch is not armored and contains loose gravel and fines, although there are no apparent scouring issues. There is also a culvert which has been installed along the ditch alignment.



**Figure 45: Typical North Toe Ditch cross section**

## **13 EVENT POND**

### **13.1 Cut/Fill Slopes**

1. The event pond was constructed between the 2018 and 2019 inspections, with hillslope unraveling noted in the 2019 inspection.



**Figure 46: Overall view of event pond**

2. Rill erosion and scour channels on the cut slopes above the event pond and the heap leach spillway were noted in this inspection as shown in Figure 47.



**Figure 47: Rill erosion above HLF spillway**

## 13.2 Pooling Water

1. Pooling water appeared to be forming above the North-East corner of the Event Pond at the time of this inspection (Figure 48). Pooling water had also been noted in this location on the 2020 inspection (Figure 49).



**Figure 48: Pooling water above Event Pond 2021**



**Figure 49: Pooling water above Event Pond 2020**

### 13.3 Heap Leach Spillway

1. As noted in Section 13.1 scouring was observed upslope and downslope of the heap leach spillway, with material being deposited within the spillway. There is also damage to the spillway liner in sections; site representative reported that this was from an excavator clearing the spillway of snow during winter operations (Figure 50).

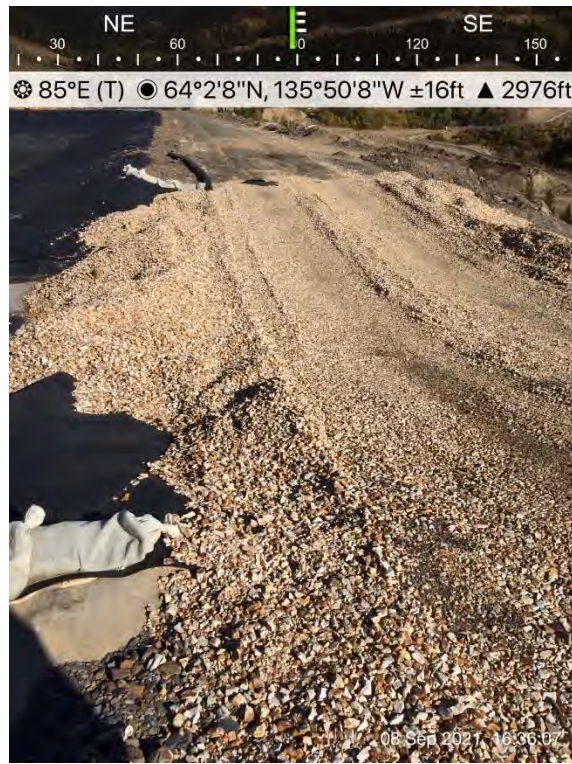


**Figure 50: Heap leach spillway damage**

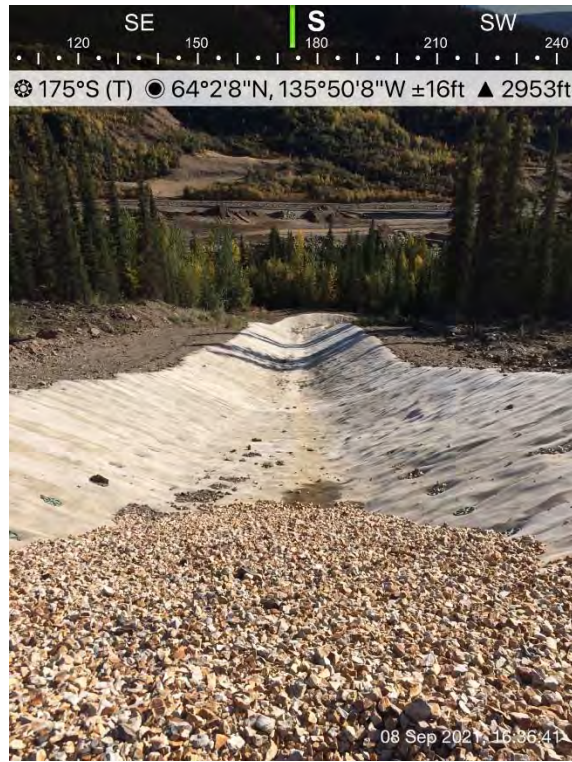
### 13.4 Events Pond Emergency Spillway

1. The emergency spillway has been temporarily blocked by crushed material by site to provide equipment access to the South-East corner of the pond as there is no other easy equipment access to that area of the pond and crush needed to be placed to prevent damage to the spillway liner (Figure 51, Figure 52).





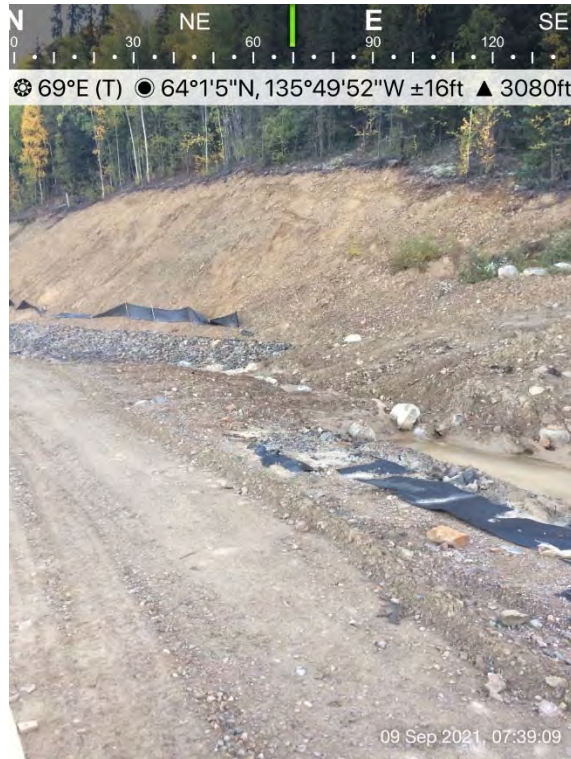
**Figure 51: Events Pond Emergency spillway crush blockage**



**Figure 52: Events Pond Emergency spillway crush blockage**

## 14 DITCH A

1. Ditch A carries flow from the Platinum Gulch Dump down to the Control Pond. The ditch was mostly completed at the time of the 2020 inspection and has since been finished. A section of the ditch below the Platinum Gulch Dump has been filled with material to provide a temporary vehicle access across the ditch below the dump (Figure 53).

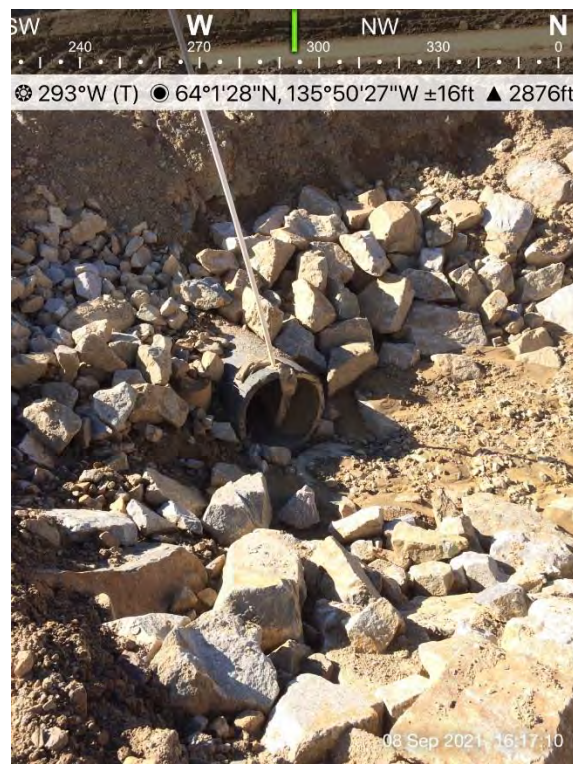


**Figure 53: Ditch A material blockage**

2. A culvert for a tie-in ditch from the Secondary Stockpile perimeter ditch was observed to be blocked with sediment/material in the 2020 inspection (Figure 54). The sump was dug out and the culvert uncovered and replaced since the previous inspection (Figure 55).



**Figure 54: Secondary Stockpile drainage ditch culvert blocked 2020**



**Figure 55: Secondary Stockpile drainage ditch culvert unblocked 2021**

## 15 DITCH B

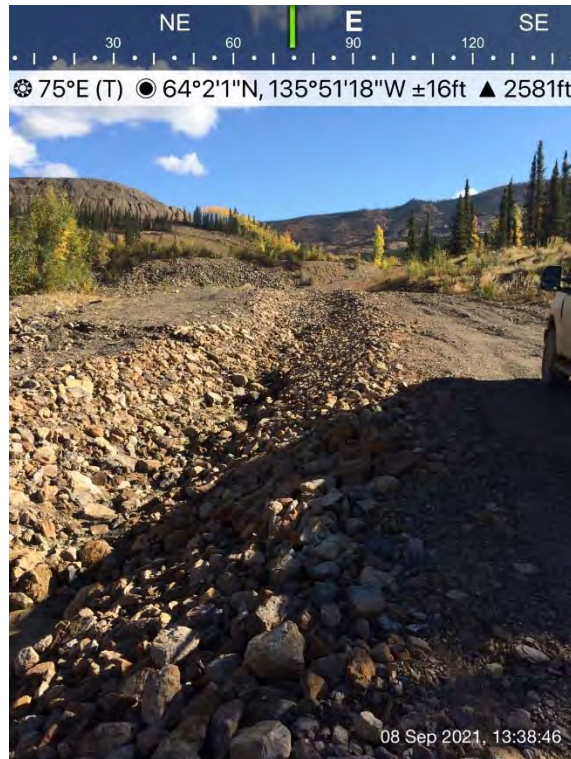
1. Ditch B was unfinished during the 2020 inspection but has since been extended and completed. No issues noted during this inspection (Figure 56).



**Figure 56: Ditch B (view towards LDSP)**

## 16 DITCH C

1. Diversion Ditch C begins at the 1500mm outlet culvert for the Control Pond and terminates in Haggart Creek. This ditch acts as both an emergency spillway if the Control Pond is filled over capacity or a conveyance channel for water released from the control pond through the low level outlet. There was no flow visible in the ditch during this inspection (Figure 57) as opposed to a steady flow during the 2020 inspection (Figure 58).



**Figure 57: Ditch C typical section (2021)**



**Figure 58: Ditch C typical section (2020)**

2. Pooling water and sedimentation was observed in the 2020 inspection on the North side of Ditch C immediately West of the culvert from the LDSP spillway to Ditch C (Figure 59). The area was dried out during the 2021 inspection with pooled sediment present (Figure 60).



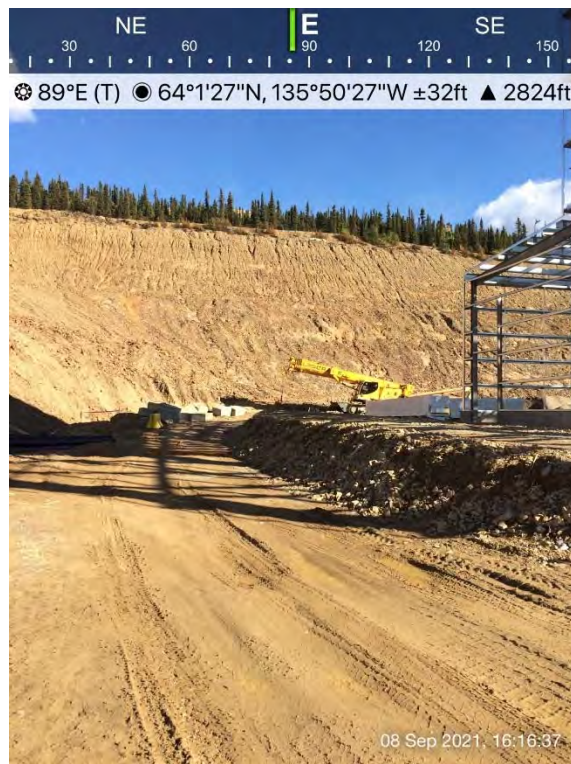
**Figure 59: Pooled water above Ditch C (2020)**



**Figure 60: Dried sediment above Ditch C (2021)**

## 17 TRUCK SHOP

1. The truck shop was under construction at the time of this inspection. The grade had been cleared and the steel frame of the structure had been erected. Some rilling was present on the cut slope behind the truck shop (Figure 61)



**Figure 61: Truck Shop cut slopes**

2. A drain ditch had been cut around the base of the cut slope and tied into Ditch A. In one section of the drain ditch rebar had been placed for storage, obstructing the ditch (Figure 62).



**Figure 62: Drain ditch rebar blockage**

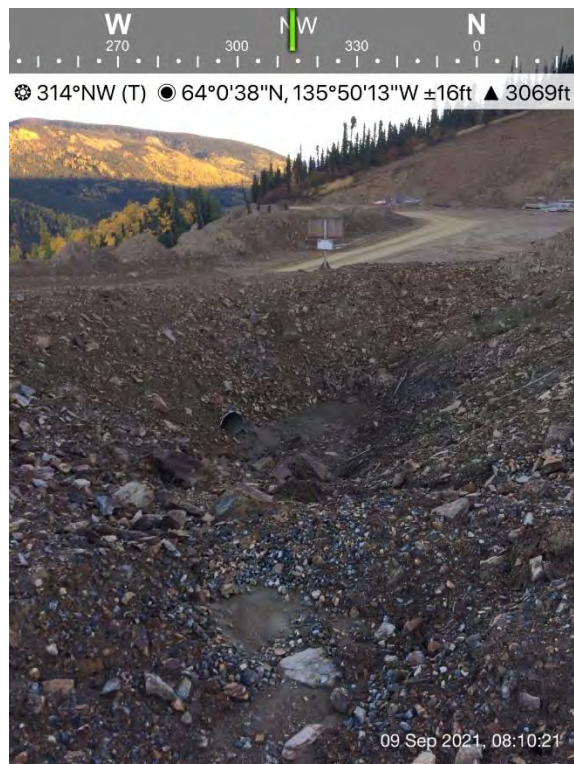
## 18 ORICA LAYDOWN

1. An unlined, unarmored ditch from the portable structures of the laydown has pools of sediment (Figure 63) but the overall grade of the ditch continues to flow to the sump (Figure 64) uninterrupted. No issues noted.



**Figure 63: Orica ditch sediment build-up**

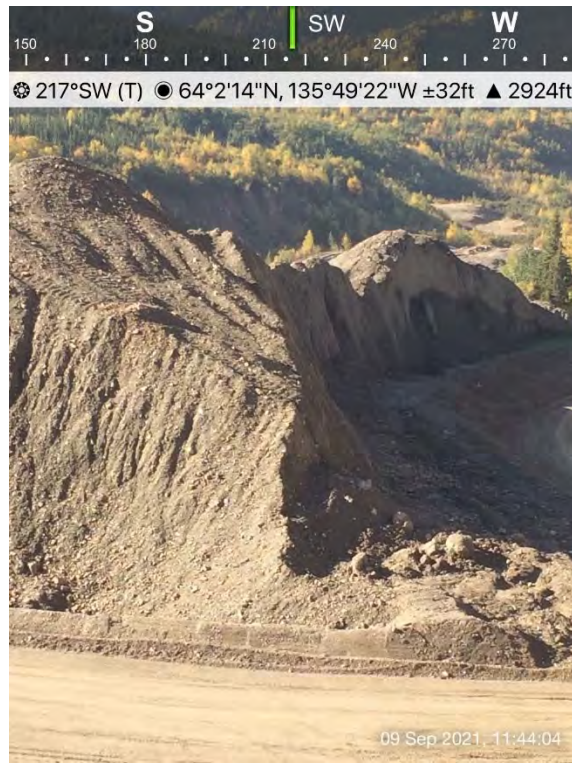




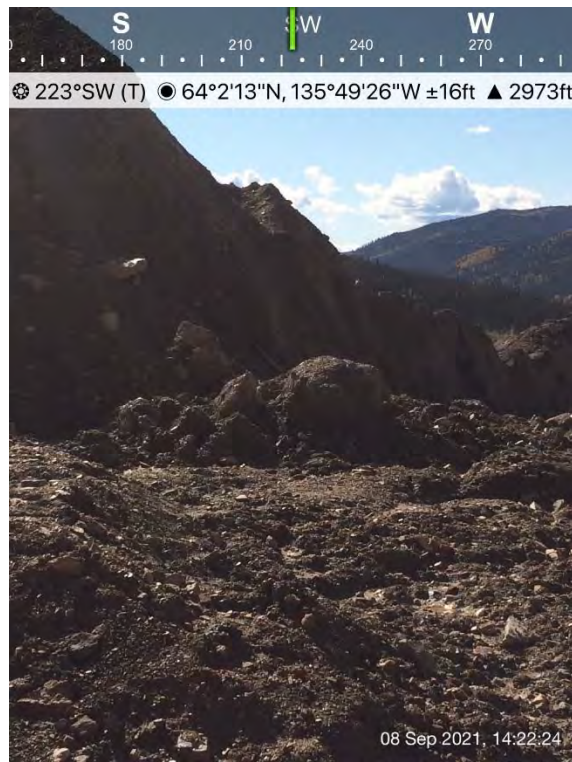
**Figure 64: Orica ditch sump & drain outfall**

## 19 UN-NAMED STOCKPILE AREA

1. Several un-named overburden stockpiles have been placed to the south of the HLF and Event Pond. Some of the stockpiles have over-steepened sides (Figure 65, Figure 66), but there is little risk to other infrastructure. The area is currently mostly un-used.



**Figure 65: Some stockpiles with steep side slopes**



**Figure 66: Additional stockpiles with steep side slopes**



## 20 RECOMMENDATIONS

### 20.1 General

1. VGC should assign a qualified, on site, individual to be responsible for monitoring and documentation of any mass earth structures that have significant risks in the case of a failure. The individual should develop a standard operating procedure for the monitoring and risk management of these structures. This individual should be responsible for coordination with a qualified professional to review monitoring data for concerns and trends, if they are not qualified themselves.
2. VGC should continue to assign individuals to document and be responsible for the monitoring and construction of any structures to determine if the structures are constructed in accordance with design. Any variations between design documents and final construction should be included in final record drawings.
3. Any finalized construction of mass earth structures should include a final construction report that includes any operational and maintenance requirements (if any) to ensure stability of the structure.
4. VGC should consider a monitoring program to assist in early warning and detection of any movements in mass earth structures. Such a program might use permanent survey points, slope inclinometers, piezometers, or other tools to measure internal/external movements and pore water pressures. Such a monitoring program should be developed with the assistance of and be implemented with the oversight of a qualified professional.
5. For any stockpiles, cut slopes, and/or fill slopes with over-steepened slopes that do not require immediate rectification (due to proximity to structures, roadways, active work areas, etc) VGC should still cordon off the area above and/or below the over-steepened slope depending on what would be accessible to site staff.

### 20.2 LDSP (Control Pond)

1. Monitor cut slopes above Ditch A for further erosion and sloughing.

### 20.3 Secondary Stockpile

1. Monitor over-steepened slopes, cordon off if accessible by site staff.
2. Tie the perimeter ditch into the collection sump.

### 20.4 Heap Leach Facility (HLF)

1. Continue to monitor the toe slope below the HLF for rill erosion.
2. Check Phase 1B Interception Ditch and monitor sediment collection. Clear sediment collection at drain sump.



## 20.5 Heap Leach Overburden Stockpile

1. Continue to monitor pile for further collapse. Work in conjunction with regulators and geoscience/engineering professionals to design a short term immediate remedy and long term solution to the issue.

## 20.6 Open Pit

1. Monitor pooled water at base of pit, remove water via trash pump as needed.

## 20.7 Platinum Gulch Dump

1. No specific recommendations at this time.

## 20.8 Eagle Pup Dump

1. No specific recommendations at this time.

## 20.9 Primary Crusher and MSE Wall

1. A monitoring program should be established using regular survey of the MSE walls, to detect any potential movement. 3D scanning equipment would provide an adequate monitoring program, with scan frequency to be determined between site and an experienced professional.

## 20.10 Secondary/Tertiary Crusher and MSE Wall

1. A monitoring program should be established using regular survey of the MSE walls, to detect any potential movement. 3D scanning equipment would provide an adequate monitoring program, with scan frequency to be determined between site and an experienced professional.

## 20.11 ADR

1. No specific recommendations at this time.

## 20.12 Event Pond

1. Monitor minor erosion of cut slopes and maintain as required.
2. Monitor pooling water above the North side of the Event Pond and regrade area to prevent pool formation or install a water handling system (sump pumps, etc.).
3. Monitor material deposits on HLF spillway and Event Pond to ensure the spillway and pond designs are not compromised through either blockage of flow or reduced pond capacity.
4. Repair excavator damage to HLF spillway liner.
5. Clear crushed material out of Event Pond spillway mouth. If equipment access is needed for the South-East corner of the pond consider constructing additional road accesses as appropriate.

## 20.13 Ditch A

1. Clear soil & rock bridge from upper section of Ditch A. Consider constructing additional road accesses as appropriate to avoid having to fill Ditch A for vehicle crossings.



## 20.14 Ditch B

1. No specific recommendations at this time.

## 20.15 Ditch C

1. Monitor for potential of pooling water above Ditch C at camp road crossing.

## 20.16 Truck Shop

1. Monitor cut slopes for rilling and erosion.
2. Relocate rebar so that it does not block the perimeter drainage ditch.

## 20.17 Orica Laydown

1. Monitor perimeter sump for flow interruptions/blockages and consider re-trenching if pooled water observed.

## 20.18 Un-Named Stockpile Area

1. Flag over-steepened slopes in area to protect site staff. Consider dismantling over-steepened slopes depending on proximity to roadways, areas frequented by site staff.

## 21 CONCLUSION

The structures reviewed in this inspection generally show little evidence of movement or risk indicators. Where risk of movement was identified, the risk is typically low and the consequence of a small instability is managed by minimizing exposure to workers, infrastructure or high value natural resources. Slopes reviewed meet the recommendations for slope angles in most locations.

The exception is the collapse of sections of the Heap Leach Overburden pile. This poses a risk to the surrounding environment and requires a swift action plan involving mine management, regulators, and pertinent geotechnical and engineering professionals.

VGC representatives have noted that they have surveys and monitoring programs for infrastructure where a risk of failure would have significant consequences (i.e. the Open Pit, Platinum Gulch Dump, HLF) but review of that survey data was not included as a part of this inspection. Comparisons to inspection reports from previous years have been noted where relevant.

There are some minor erosional and stability concerns within the project, that can be addressed with some minor planning and maintenance as mining operations continue in order to moderate or eliminate the associated risks.



We trust this report satisfies your requirements at this time and thank you for the opportunity to work with you on the project. If you have questions or concerns do not hesitate to contact our office.

Yours truly,

**ALLNORTH CONSULTANTS LIMITED**

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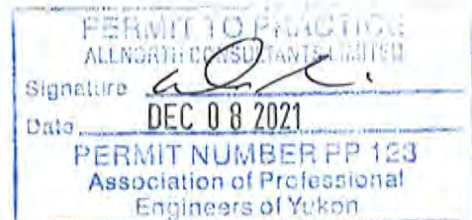


DEC 08 2021

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Division Manager

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Any opinions of probable cost provided in the report are based on Allnorth's experience and information available to Allnorth at the time such estimates are made. Client acknowledges that due to assumptions that must be made, Allnorth shall not be liable for the accuracy of such estimates.



## **Appendix A Site Plan (2021 Inspection)**



Heap Leach Facility (Phase 2)

HLF Over-Burden Collapse

ADR Plant

Former Nu-Way Crusher Pad

Heap Leach Facility (Phase 1)

Event Pond

LDSP (Control) Pond

Un-named Stockpile Area

Ditch C

Ditch B

Secondary Stockpile

Truck Shop

Secondary/Tertiary Crushers

Primary Crusher

Eagle Pup Dump

Open Pit

Ditch A

Platinum Gulch Dump

Orica Laydown



## **Appendix B Site Plan (2020 Inspection)**



Heap Leach Facility  
(Phase 1B Expansion)

Former Nu-way Crusher Pad

ADR Plant

Event Pond

LDSP (Control Pond)

Ditch C

Ditch B

Secondary Stockpile

Secondary/Tertiary Crushers

Primary Crusher

Open Pit

Ditch A

Orica Laydown

Platinum Gulch Dump

Un-named Stockpile Area

## **Appendix C Site Plan (2019 Inspection)**



Phase 1 Interception Ditch

Upper Overburden Stockpile

Heap Leach Facility

ADR Plant

Borrow Pit / Future Landfill

ADR

Phase 1 Heap Leach Facility

Event Pond

Events Pond

Stockpile

Unnamed Stockpile Area

Ditch C

Camp

Control Pond

Ditch B

LDSP (Control) Pond

Stockpile

Conveyor

Future EP, WRSA

Septic Field

Warehouse

Stockpile

90 Day Stockpile

Stockpile

Secondary and Tertiary Crusher

Primary Crusher

Camp Road

Power Plant Substation Waste Management

90 Day Storage

Crushing Circuit

Ditch A

Open Pit

Open Pit

Possible Future Ice Rich Material Storage

PG WRSA In Use

Platinum Gulch Dump

Explosives Storage

Orica Laydown

Transmission Line

