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Allnorth Information		VICTORIA GOLD CORP.	
Project #:	**2002684**		
Document #:	**201215**	Client Project #:	
Document Rev. #:	**1**	Client Document #:	
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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, Lower Dublin South (Control) Pond, Secondary Crusher, Primary Crusher, Secondary Stockpile, Adsorption, Desorption and Recovery Plant, Heap Leach Facility, Events Pond, Ditches A, B, and C, Former Nuway Crusher Pad, Orica Laydown, Various Un-named Stockpiles.

REVISION HISTORY

Revision	Status	Date	Prepared By	Checked By	Approved By	Description of Revision
A	IFR	20/10/06	SBB	DW	DW	Issued for Review
0	IAF	20/10/26	SBB	DW	DW	Issued as Final
1	IAF	20/12/15	SBB	DW	DW	Issued as Final

Status:

PRE	- Preliminary	IFP	- Issued for Procurement
IFR	- Issued for Review and Comment	IFC	- Issued for Construction
IFA	- Issued for Approval	AB	- As Built
IFQ	- Issued for Quotation	IAF	-Issued as Final

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1 BACKGROUND

In September, 2020, 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 23rd and 24th. 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 clear for inspections though the on-site representative indicated that there had been heavy rain recently and through-out the summer.

Allnorth previously completed similar inspections in September of 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 2019 and 2018 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. A few remaining areas are under construction or will be further developed within the next year such as Ditch A and B. 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 23rd-24th of 2020. 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,
- Open Pit
- Platinum Gulch 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,
- Events Pond,
- Ditches A, B, and C,
- Former Nuway Crusher Pad,
- 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 2020 inspection. A site plan for the 2019 inspection is available in **Appendix B** 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 pooling of water was noticed at the shed which houses the junction of pipes and is adjacent to the rip-rapped groundwater diversion ditch (Figure 1), no other items noted. Site noted that there was above average rainfall throughout the summer and leading up to the site visit which may have lead to this and other instances of pooling water on site. There is an outlet sump and weir which were constructed between the 2018 and 2019 inspections; no issues noted (Figure 2).

Figure 1: LDSP – Pooling 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 (Figures 3 and 4). No water was observed flowing through the culvert in the 2018 and 2019 inspections but a steady flow was observed for this inspection (Figure 5). No concerns noted.

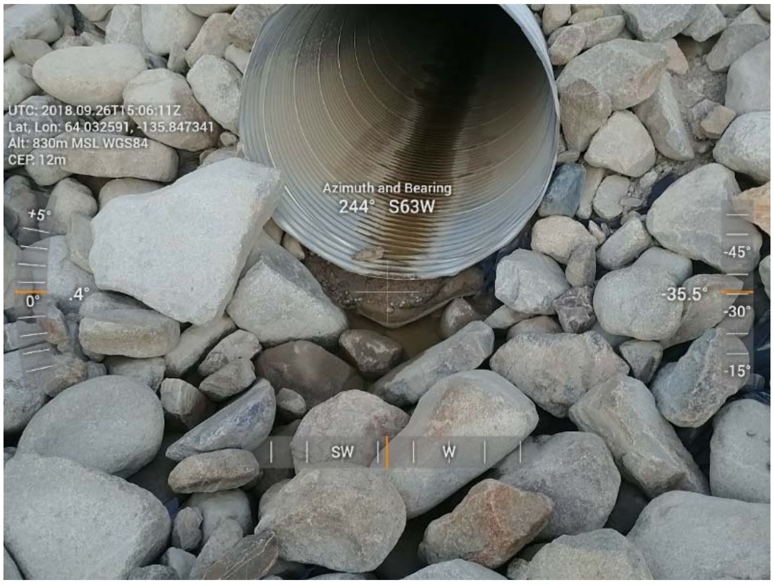

Figure 3: LDSP - 1500mm Culvert 2018 Inspection

Figure 4: LDSP - 1500mm Culvert 2019 Inspection

Figure 5: LDSP - 1500mm Culvert 2020 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 (Figure 6) and does not appear to have been completely rectified as of this inspection (Figure 7). Water flowing down Ditch A may be leaking into the fill in this area. There was some flow into this area from a culvert crossing a former construction access road, which was observed in 2019 (Figure 8) and still present as of this inspection (Figure 9). This area will be included in the Ditch A remediation effort which was observed to be underway in other areas during the site inspection. This would include lining and armoring Ditch A.

Figure 6: LDSP – Erosion on the Southwest slope 2019

Figure 7: LDSP – Erosion on the Southwest slope 2020

Figure 8: LDPS – Some flow from adjacent culvert 2019

Figure 9: LDPS – Some flow from adjacent culvert 2020

4 SECONDARY STOCKPILE

4.1 Benches and Cut Slopes

1. The Secondary Stockpile (also known as the 90 Day Stockpile) was under construction in 2019 (Figure 10) and was completed by the time of this inspection (Figure 11). Some over-steepened cut slopes were observed in the 2019 inspection (photos unavailable) however they appear to have been addressed as of this inspection (Figure 12).

Figure 10: Secondary Stockpile under construction 2019

Figure 11: Secondary Stockpile completed 2020

Figure 12: Secondary Stockpile Cut Slopes 2020

4.2 Perimeter Interception Ditch

1. A perimeter interception ditch extends around the downhill toe of the Secondary Stockpile area (Figure 13 and Figure 14). The construction of this ditch is not yet complete, as it is currently un-lined with no rock armoring, and is founded on native soils, and over-steepened and sloughing in places.

Figure 13: Perimeter Ditching

Figure 14: Perimeter Ditching

2. In one location some pooling of water has occurred as it appears that the final grade has not been completed (Figure 15).

Figure 15: Pooling water in perimeter ditch

3. The outlet of one side of the perimeter ditch does not currently tie into the collection sump (Figures 16).

Figure 16: Unconnected Ditch Section

4. The Secondary Stockpile perimeter ditch eventually ties into Ditch A, with part of the connecting ditch blocked by a buried culvert. This is noted in Section 12 – Ditch A.

5 HEAP LEACH FACILITY

The Heap Leach Facility (HLF) is currently operational. In 2019 the Phase 1A expansion had been constructed as shown in Figure 17. By the time of the 2020 inspection the Phase 1B expansion was largely complete with placement of overliner drain fill and PLS collection piping ongoing as shown in Figure 18.

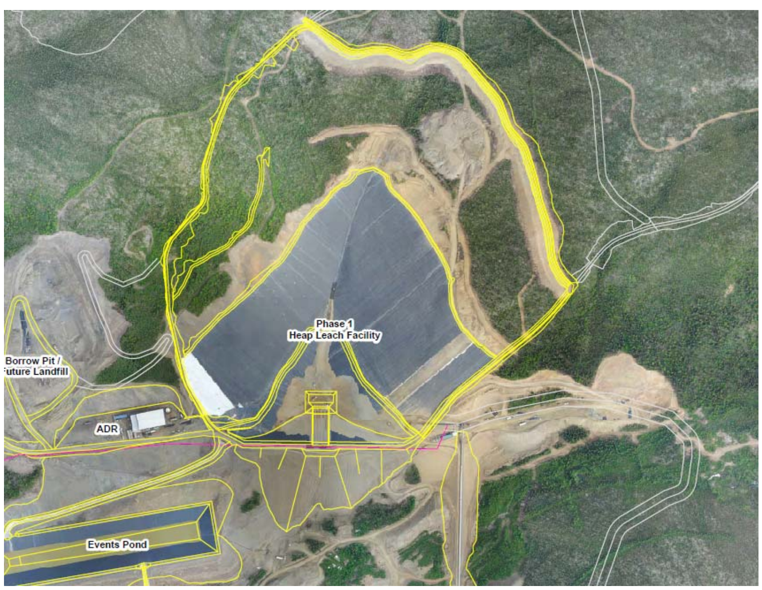

Figure 17: Heap Leach Facility Overview 2019

Figure 18: Heap Leach Facility Overview 2020

5.1 Toe Slope

1. Some scouring and rilling noted along the toe slope below the HLF and above the un-named stockpile area. See Figure 19 below for details.

Figure 19: Scouring and rilling along toe slope of HLF

5.2 Temporary Access Road above HLF

1. Noted sections of pooling water and or soft/deflecting areas on temporary access road above Phase 1B of the HLF. See Figures 20 – 22.

Figure 20: Pooling water above Phase 1B of the HLF

Figure 21: Soft road sections above Phase 1B of the HLF

Figure 22: Soft road sections above Phase 1B of the HLF

5.3 Phase 1B Interception Ditch

1. The phase 1B interception ditch appears to have been recently constructed. Rock armoring appears to be class 25kg to 50kg, and approximately 100mm to 150mm thick. Geotextile was visible in several locations (Figure 23).

Figure 23: Typical Phase 1B Ditch

2. 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, 25)

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

Figure 25: Material deposited in HLF Phase 1B Interceptor Ditch

3. A section of the interceptor ditch along the North edge of the HLF appeared to be unfinished, with geotextile installed but no rock armoring (Figure 26).

Figure 26: Unfinished section of Interceptor Ditch

4. Based on visual inspection it did not appear that the Phase 1B Interceptor Ditch was properly graded from the ditch origin (East) to the discharge point (West). This could lead to pooling water forming above the HLF and lead to slope stability issues. See Figure 27 for a view from the ditch origin above the East edge of the Phase 1B HLF expansion.

Figure 27: Phase 1B Interception Ditch sloping

6 OPEN PIT

1. The pit walls appear stable, and constructed in competent rock. See Figure 28 below for details.

Figure 28: Pit Walls

7 PLATINUM GULCH DUMP

1. Platinum Gulch Dump is currently operational, and the side slopes appear to be stable. See Figure 29 below.

Figure 29: Dump Fill Slope

8 PRIMARY CRUSHER

8.1 MSE Walls

1. No apparent damage or deterioration was noted during the inspection of the Primary Crusher MSE wall (Figure 30 - 32). No changes were visually identified from the 2019 inspection.

Figure 30: Primary Crusher

Figure 31: Northwest Face

Figure 32: Southeast Face

8.2 Cut and Fill slopes

1. Cut and fill slopes appear to be acceptable, no stability or erosion issues noted. (Figures 33 and 34).

Figure 33: Northwest fill slopes

Figure 34: Cut slopes above Primary Crusher

9 SECONDARY/TERTIARY CRUSHER

9.1 MSE Wall

1. No apparent damage or deterioration was noted during the inspection of the Secondary/Tertiary Crusher MSE wall (Figure 35 – 36). No changes were visually identified from the 2019 inspection.

Figure 35: South side of MSE wall

Figure 36: MSE wall behind secondary/tertiary crusher

9.2 Cut Slopes

1. Observed locations behind the secondary crusher showed no signs of stability or erosion issues (Figure 37). Some outcrops of rippable rock visible.

Figure 37: Cut slopes above Secondary/Tertiary Crusher

10 ADSORPTION, DESORPTION, AND RECOVERY PLANT (ADR)

10.1 Cut and Fill Slopes

1. Cut slopes behind the ADR area appear to be competent rock, and currently stable though some unraveling and rilling were noted (Figure 38). Minor accumulation of small debris was noted at the toe of the slope, collecting in the ditch, and was observed in the 2018 and 2019 inspections (Figures 39 and 40).

Figure 38: Slopes behind ADR (2020) with unraveling and rilling

Figure 39: Slopes behind ADR (2019)

Figure 40: Slopes behind ADR (2018)

10.2 North Toe Ditch

1. There is a small V ditch, referred to here as the North Toe Ditch (Figure 41), 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 41: Typical North Toe Ditch cross section

11 EVENTS POND

11.1 Cut/Fill Slopes

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

Figure 42: 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 Figures 43 – 45.

Figure 43: Rill erosion below HLF spillway

Figure 44: Rill erosion above HLF spillway

Figure 45: Scoured channel above Event Pond

11.2 Pooling Water

1. Pooling water was noted in various locations along the North side of the event pond as shown in Figures 46 – 48.

Figure 46: Pooling water above Event Pond

Figure 47: Pooling water above Event Pond

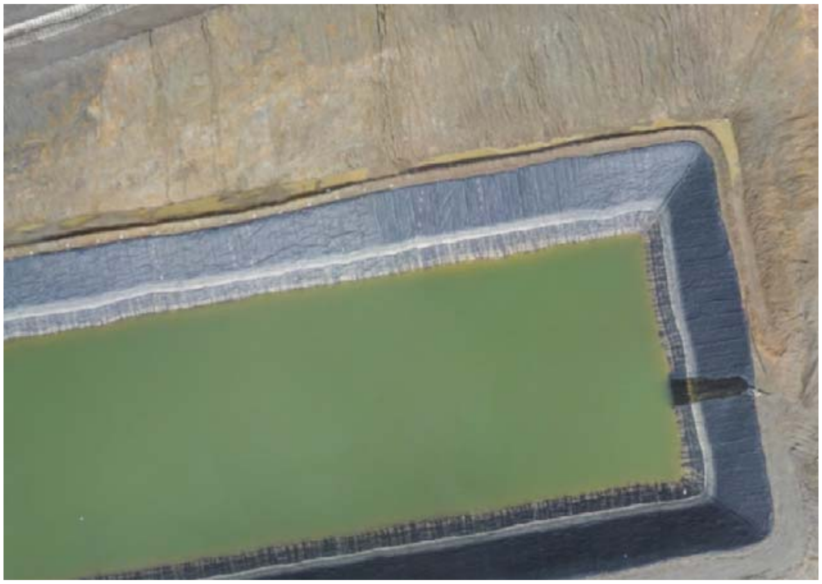

Figure 48: Pooling water above Event Pond

11.3 Silt Build-up

1. Silt build-up was noted at the discharge of the heap leach spillway into the event pond as shown in Figure 49. Material accumulation on the bottom of the pond was also observed from above as shown in Figure 50.

Figure 49: Silt build-up at HLF Spillway discharge

Figure 50: Material build-up on Event Pond bottom

11.4 Heap Leach Spillway

1. As noted in Section 11.1 scouring was observed upslope and downslope of the heap leach spillway. Material has begun to accumulate in the spillway as shown in Figure 51. The spillway is constructed with a concrete-filled fabric liner and appears stable.

Figure 51: Slopes from heap leach spillway

11.5 Events Pond Emergency Spillway

1. The emergency spillway is in place, constructed of similar material as the HLF spillway, and appears stable (Figure 52). The spillway is directed downslope towards Dublin Gulch. No concerns at this time.

Figure 52: Events Pond Emergency spillway

12 DITCH A

1. Ditch A carries flow from the Platinum Gulch Dump down to the Control Pond. The ditch formerly (2019) collected flow in a collection sump (Figure 53) which was then transferred in gravity drain HDPE piping down to the LDSP. The sump and all piping (other than sections acting as temporary culverts at road crossings) has since been removed and the ditch is being reconstructed with liner and armoring as seen in Figure 54 and 55.

Figure 53: Flow into collection sump (2019)

Figure 54: Ditch A under construction (2020)

Figure 55: Ditch A under construction (2020)

2. A culvert for a tie-in ditch from the Secondary Stockpile perimeter ditch was observed to be blocked with sediment/material just before the connection to Ditch A. The culvert outlet and inlet (buried) can be seen in Figures 56 and 57 respectively.

Figure 56: Secondary Stockpile drainage ditch culvert blocked (outlet)

Figure 57: Secondary Stockpile drainage ditch culvert blocked (inlet)

13 DITCH B

1. Ditch B begins at a small watercourse known as Suttles Gulch. The ditch flows West towards the Control Pond. The ditch is armored with approximately class 25kg rock. Some slope instability was noted near the control pond, with erosion carrying sediment down the cut slope (Figure 58). Site representatives are already aware of this issue, and sediment is being actively managed using silt fencing (Figure 59).

Figure 58: Erosion on South cut slope above Ditch B

Figure 59: Silt fencing constructed in areas of erosion on cut slopes

14 DITCH C

1. Diversion Ditch C (Figure 60) begins at the 1500mm outlet culvert for the Control Pond and terminates in Haggart Creek (Figure 61). 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. The ditch is armored with approximately class 10kg rock, and liner is visible in several locations. The ditch crosses several roads via culverts.

Figure 60: Ditch C typical section

Figure 61: Ditch C Outfall to Haggart Creek

2. Pooling water and sedimentation was observed on the North side of Ditch C immediately West of the culvert from the LDSP spillway to Ditch C (Figure 62). There appeared to be a lined ditch that provided a path for the pooled water to flow down to Ditch C though the discharge of this ditch was not controlled (Figure 63)

Figure 62: Pooled water above Ditch C

Figure 63: Pooled water ditch discharge into Ditch C

15 FORMER NUWAY CRUSHER PAD

1. This area is not currently being used, but a VGC representative indicated that it is within the Phase 3 footprint of the HLF and will eventually be regraded in preparation for ongoing HLF development. Observed some over steepened slopes (Figure 64), with material collecting at the toe of these slopes.

Figure 64: Over steepened slopes

16 ORICA LAYDOWN

1. One section of cut slope was noted as being over-steepened in the 2019 inspection (Figure 65). This appears to have been since rectified as slopes appeared acceptable during this years inspection (Figure 66).

Figure 65: Section of over-steepened slope (2019)

Figure 66: Section of corrected slope (2020)

2. An unlined, unarmored ditch from the portable structures (Figure 67) appears to have been constructed since the previous inspection. The ditch appears interrupted in places but flow generally leads to the Orica sump (Figure 68) before discharging to the woods.

Figure 67: Orica perimeter ditch

Figure 68: Orica sump

17 UN-NAMED STOCKPILE AREA

17.1 Stockpile Sloping

1. Several un-named overburden stockpiles have been placed to the south of the HLF and Event Pond (Figure 69). Some of the stockpiles have over-steepened sides, but there is little risk to other infrastructure. The area is currently mostly un-used.

Figure 69: Some stockpiles with steep side slopes

17.2 Water Management

1. There are some minor water management issues in the area, with rainfall run-off flowing down and around the stockpiles as apparent from the small gulley that formed at the base (Figure 70). Some ponding water is present in the laydown areas (Figure 71).

Figure 70: Small gulley forming adjacent to stockpiles

Figure 71: Ponded area adjacent to stockpiles

18 RECOMMENDATIONS

18.1 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.

18.2 LDSP (Control Pond)

1. Address erosion occurring on the southwest slope of the pond. This is likely due to water infiltration from Ditch A or the adjacent culvert outlet. This section of ditch may require further armoring or installation of a liner to properly direct water away from the Control Pond slope.

18.3 Secondary Stockpile

1. Tie the perimeter ditch into the collection sump.

18.4 HLF

1. Continue to monitor the cut slopes around the perimeter of the HLF for erosion. Maintain the upper bench and remove sloughing material as required.
2. Monitor the toe slope below the HLF for rill erosion and revegetate and stabilize the slopes as needed.
3. Consider re-grading temporary access road (slope towards interception ditch) above HLF to prevent pooling water forming.

4. Monitor soft/deflecting areas of temporary access road above HLF, particularly above HLF liner anchor trench.
5. Check Phase 1B Interception Ditch design and complete construction if needed for sections that are lined but not armored. Check design for sloping requirements to outfall and confirm whether installed ditch meets design and monitor ditch for potential of pooling water.

18.5 Open Pit

1. No specific recommendations at this time.

18.6 Platinum Gulch Dump

1. No specific recommendations at this time.

18.7 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.

18.8 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.

18.9 ADR

1. Review engineering requirements for the North Toe Ditch to confirm ditch size, and need for rock armoring. Toe ditch is currently tied into the roadside ditch, which should also be reviewed for engineering requirements. Recommend reviewing hydraulic design of both ditches to determine what is necessary.

18.10 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.

18.11 Ditch A

1. Un-block the feeder ditch/culvert which will carry flow from the Secondary Stockpile perimeter ditch to Ditch A.

18.12 Ditch B

1. Continue to manage sediment entering the ditch from the cut slopes on the downstream end. Silt fencing is currently in place to address this.
2. Monitor erosion above South side of Ditch B and consider re-sloping area as needed.

18.13 Ditch C

1. Monitor pooling water above LDSP outlet to Ditch C. Consider tieing in pooled water discharge ditch with Ditch C to prevent erosion and scouring on North side of Ditch C.

18.14 Former Nuway Crusher Pad

1. Pull back over-steepened slopes prior to utilizing this area. Flag over-steepened slopes in the meantime to protect site staff.

18.15 Orica Laydown

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

18.16 Un-Named Stockpile Area

1. Consider additional ditching and water management in the area to prevent scouring of the road surfaces and erosion around the stockpiles. Ditch water away from the laydown areas to prevent ponding.
2. Flag over-steepened slopes in area to protect site staff.

19 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 fact that some current infrastructure is currently incomplete and in construction leaves insufficient baseline data for comparison, but will improve with subsequent reviews. 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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Reviewed By:

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DEC 15 2020

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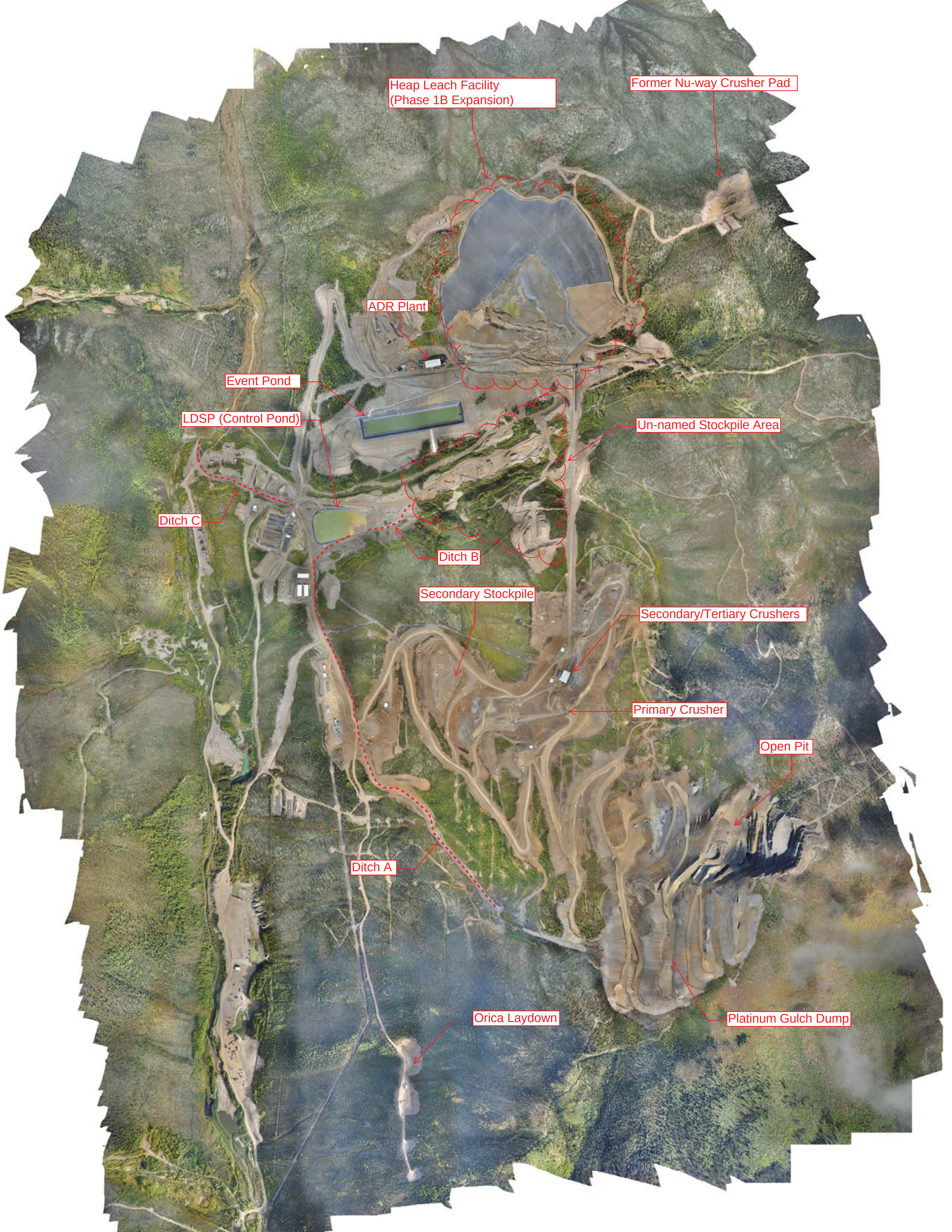
Appendix A Site Plan (2020 Inspection)


Heap Leach Facility
(Phase 1B Expansion)
Former Nu-way Crusher Pad
ADR Plant
Event Pond
LDSP (Control Pond)
Un-named Stockpile Area
Ditch C
Ditch B
Secondary Stockpile
Secondary/Tertiary Crushers
Primary Crusher
Open Pit
Ditch A
Platinum Gulch Dump
Orica Laydown

Appendix B Site Plan (2019 Inspection)

N
Phase 1 Interception Ditch
Upper Overburden Stockpile
Heap Leach Facility
Phase 1 Heap Leach Facility
Borrow Pit / Future Landfill
ADR Plant
ADR
Event Pond
Events Pond
Stockpile
Unnamed Stockpile Area
Ditch C
Control Pond
Camp
Ditch B
LDSP (Control) Pond
Septic Field
Warehouse
Stockpile
Stockpile
Conveyor
Future EP WRSA
90 Day Stockpile
Stockpile
Secondary and Tertiary Crusher
90 Day Storage
Camp Road
Power Plant Substation Waste Management
Crushing Circuit
Primary Crusher
Open Pit
Open Pit
Ditch A
Possible Future Ice Rich Material Storage
PG WRSA In Use
Platinum Gulch Dump
Explosives Storage
Orica Laydown
Transmission Line
0
250
500
1,000
Meters