EAGLE GOLD PROJECT

WATER LICENCE QZ14-041-01

QUARTZ MINING LICENSE QML-0011

2019 ANNUAL REPORT

MAY 2020

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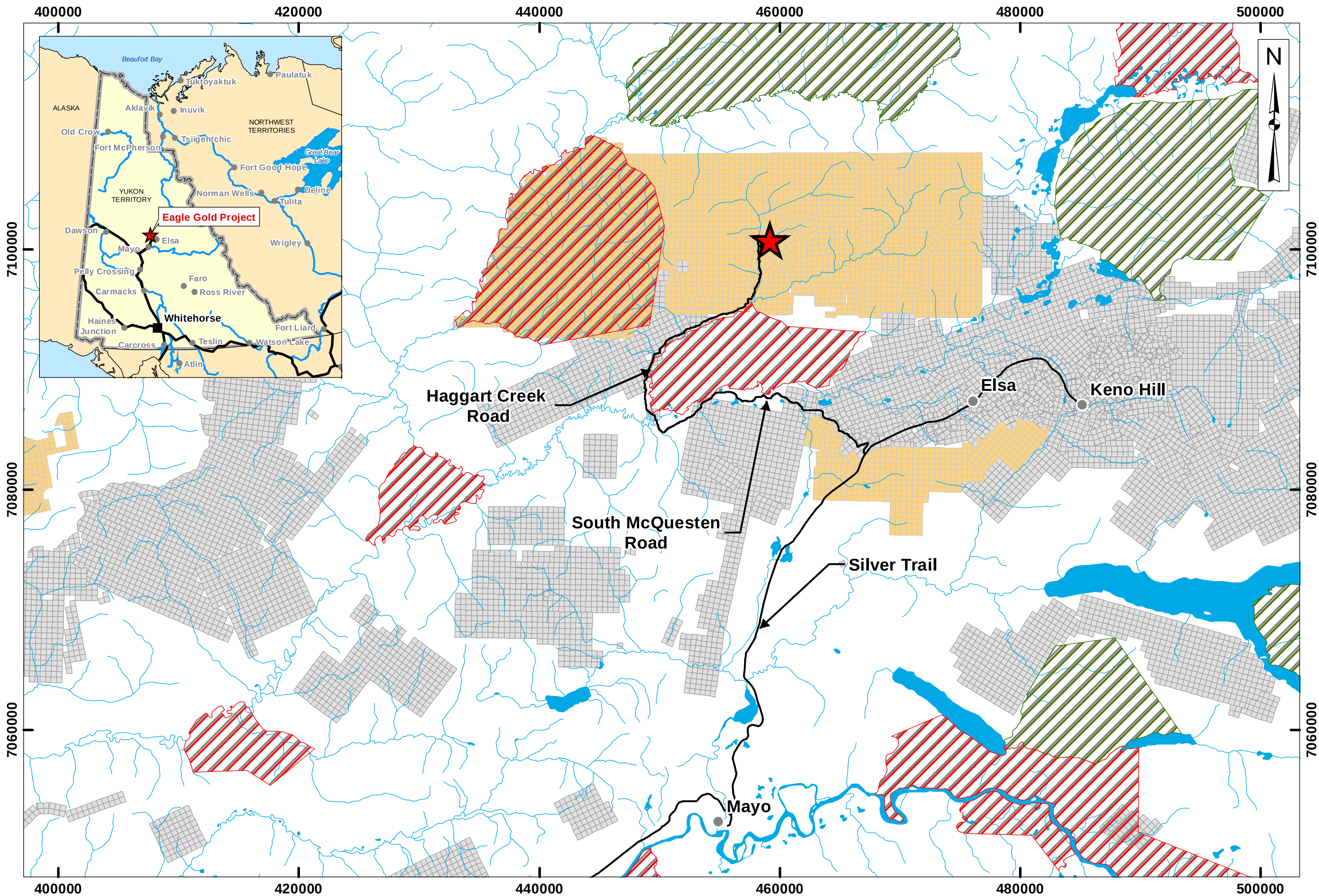
1 INTRODUCTION

During 2019, Victoria Gold (Yukon) Corp. (VGC) completed construction and began operating the Eagle Gold Mine in central Yukon. The Eagle Gold Mine (‘the Project’) is located 85 km from Mayo Yukon using existing highway and access roads (Figure 1.1-1). The Project involves open pit mining and gold extraction using a three-stage crushing process, heap leaching, and a carbon adsorption, desorption, and recovery system over the mine life (Figure 1.1-2).

The Project is being operated in accordance with the terms of the Type A Water Use Licence (WUL) QZ14-041-01 and the Quartz Mining License (QML) QML-0011. The reporting period for this Annual Report is from January 1 to December 31, 2019 and serves to report on both WUL and QML conditions and associated management plans.



Legend:

Eagle Gold Project	Town / Village	Category A Settlement Land
Victoria Gold Claims	Road	Category B Settlement Land
Other Claims	Watercourse	

VICTORIA GOLD CORP

0 3 6 12
Kilometres

Projection:	Drawn By:	EAGLE GOLD PROJECT YUKON TERRITORY
NAD 83 Zone 8N	HC	
Date:	Figure:	Project Location
2020/05/01	1.1-1	

Legend:

- Facility
- Site Power
- Reserved Area
- Watercourse - Perennial
- Watercourse - Ephemeral
- Watercourse - Intermittent
- Waterbody

VICTORIA GOLD CORP

0 125 250 500
Metres

Projection:	Drawn By:
NAD 83 UTM Zone 8N	HC
Date: 2020/04/17	Figure: 1.1-2

EAGLE GOLD PROJECT
YUKON TERRITORY

End of Mine Life General Arrangement

2 SITE ACTIVITIES

Work on the Project during 2019 included the completion of construction for major fixed facilities, commissioning of equipment, and the commencement of the Production Phase. The configuration of major Project facilities is provided in Figure 2.1-1 and Figure 2.1-2. Appendix A provides as built designs, status reports, and quality assurance and quality control records for certain relevant facilities discussed within Section 2.

2.1 Overview of Construction

2.1.1 Summary of Construction Activities

By the end of 2019 mine construction of fixed facilities was complete. Table 2.1-1 depicts specific construction activities conducted during each month of 2019.

Table 2.1-1: 2019 Construction Schedule

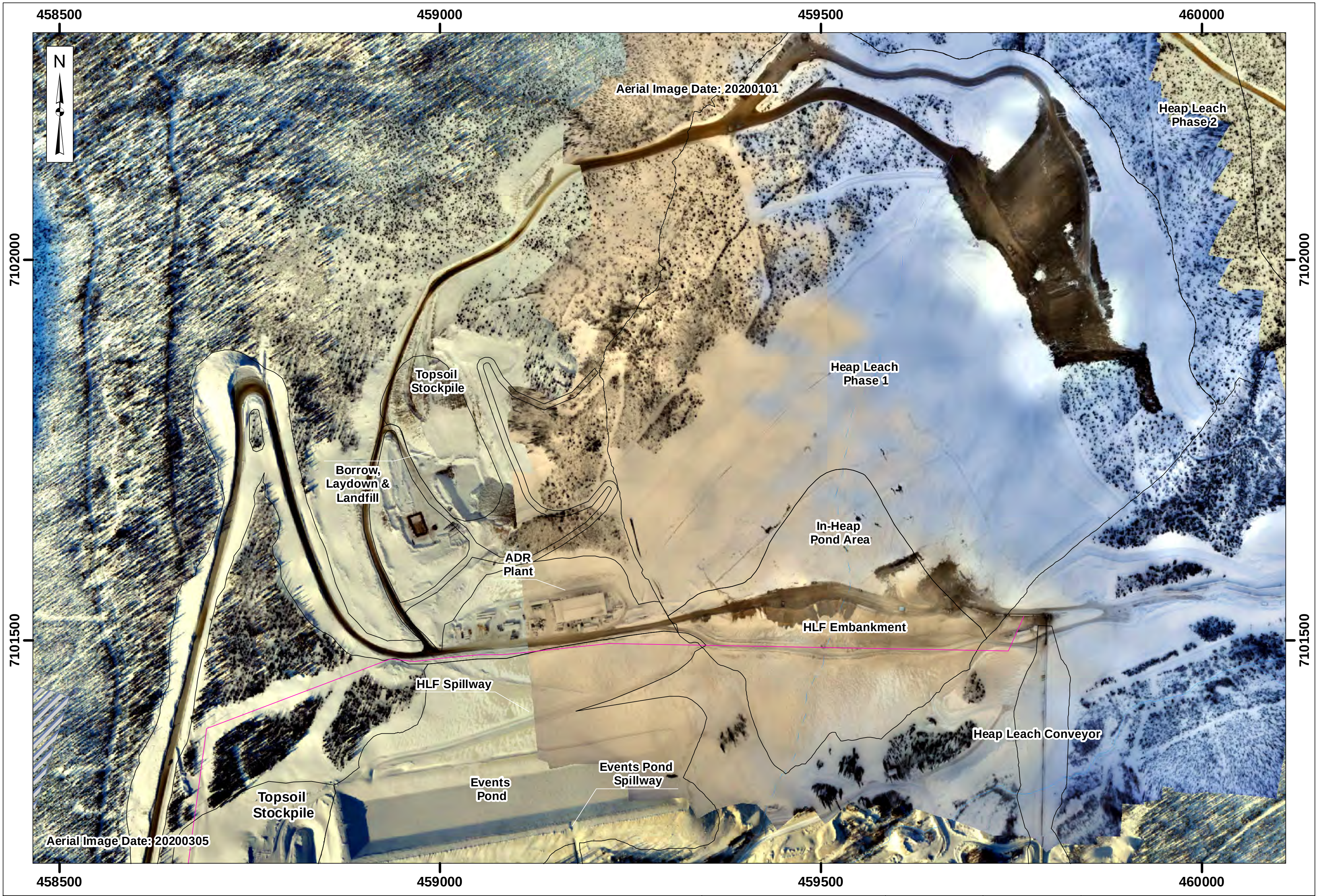
Activity	Start	Finish	2019											
			J	F	M	A	M	J	J	A	S	O	N	D
Mine Equipment Assembly & Commissioning	**Jan**	**Mar**												
16M Grader	Jan	Jan												
993K FE Loaders	Jan	Mar												
D10 Track Dozer	Feb	Feb												
Small Rock Drill	Mar	Mar												
Surface Water Ditches	**2018**	**Apr**												
Ditch A - Excavation & Rip-Rap	2018	Feb												
Ditch A - Pipe Fusing & Installation	Feb	Apr												
Ditch C - Excavation & Rip Rap	Feb	Mar												
ADR Plant	**2018**	**Aug**												
Building Envelope	2018	May												
Install Utility Supports	2018	Jan												
Interior Partitions & Finishes	Mar	May												
Building Utilities	Jan	Aug												
Install Air Compressors	Jan	Feb												
Place & Energize E-House	Jan	Mar												
Run FW Piping & Install Standpipes	Jan	May												
Run Compressed Air Piping	Feb	Mar												
Erect Process/FW Tank	Mar	May												
Install & Verify Fire Detection Devices	Jul	Aug												
Install Security Infrastructure	Aug	Aug												
Plant Control System	Feb	May												
Install Control Rooms	Mar	Mar												
PCS Installation	Feb	May												
Carbon Adsorption	2018	May												
Mechanical Installation	2018	May												
Install Piping	Jan	May												
Electrical	Jan	May												
Instrumentation	Mar	May												
Acid Wash, Elution & Carbon Regen	Jan	May												
Mechanical Installation	Jan	Mar												
Install Piping	Feb	May												

Activity	Start	Finish
Electrical	Mar	May
Instrumentation	Mar	May
Reagent Systems	Jan	May
Mechanical Installations	Jan	May
Electrical	Mar	May
Instrumentation	Mar	May
Electrowinning & Refining	Jan	Jun
Mechanical Installations	Jan	May
Electrical	Feb	May
Interior Architectural	May	Jun
Instrumentation	Mar	May
Barren Solution Storage & Distribution	2018	Aug
Structural Steel	2018	Jan
Install Barren Solution Pumps	Feb	Feb
Interior Piping	Feb	May
Barren Solution Boiler	May	Jul
Electrical	Jun	Jul
Overland Piping	Apr	Jul
Instrumentation	Jul	Aug
Crushing & Conveying	**2018**	**Sep**
Primary Crushing	2018	Aug
Structural Steel & Mechanical Rough Set	2018	Mar
Place E-House & 13.8kV Transformers	Feb	Feb
Cladding & Architectural	Feb	Feb
Install CV-001 (Primary Crusher Discharge)	2018	Apr
Install Fire Protection Systems	Feb	Sep
Interior Mechanical & Piping Installations	2018	Apr
Electrical & Instrumentation Installations	Feb	Jun
MSE Wall Installation	Mar	May
Coarse Ore Handling & Reclaim	Jan	May
Install CV-002 (Stockpile Feed)	Jan	Mar
Transfer Tower #1 - Structural Steel Installation	Jan	Feb
Install CV-003 (Winter Feed)	Feb	Mar
Mechanical Installations	Feb	Mar
Reclaim Tunnel - Structural Steel & Mechanical	Jan	Feb
Install CV-013 (Secondary Feed)	Jan	May
Reclaim Tunnel - Structural Backfill	May	May
Secondary & Tertiary Crushing	2018	Jul
Columns & Girts	Jan	Mar
Place Overhead Crane	Feb	Mar
Pre-Assemble & Erect Roof	Feb	Mar
Wall & Roof Cladding	Feb	Jun
Place E-Houses & Transformers	Mar	Mar
Erect Fire Water Tank	Apr	May
Building Services (Lights, Heat, FW)	Mar	Jul
Interior Steel, Mech Install, Electrical & Instrument	2018	Jul
Transfer Conveyors	2018	Jun
Erect Transfer Towers #2 & #3	Feb	Apr

Activity	Start	Finish	2019											
			J	F	M	A	M	J	J	A	S	O	N	D
Install CV-016, CV-017 & CV-019	2018	Jun	■	■	■	■	■	■						
Electrical & Instrumentation	Apr	Jun				■	■	■						
Tertiary Stockpile	Mar	Apr												
Erect Stockpile Cover	Mar	Apr			■	■								
Fine Ore Conveying	**Jan**	**Jul**												
Install Lime Silo	Jan	Jan	■											
Place Transformers & E-House	Mar	Mar			■									
Erect Transfer Tower #4	Mar	Mar			■									
Install CV-022 (Overland) & CV-023 (HLF Feed)	Jan	May	■	■	■	■	■							
Electrical & Instrumentation	Apr	May				■	■							
Assemble & Test Grasshopper Components	Jun	Aug						■	■	■				
Heap Leach Facility	**2018**	**-**												
Embankment	2018	Jun												
HLF Monitoring Vault	May	Jun					■	■						
In-Heap Pond	2018	Jun												
Install Liner	2018	Jan	■											
Install PLS Sump Piping	May	May					■							
Install LDRS & PLS Pump Casings to 940 masl	May	Jul					■	■	■					
Install PLS Collection Piping & Place ODF	May	Jul					■	■	■					
Pad Construction (EL 995m)	2018	Sep												
Stripping & Shaping to 990 masl	2018	Jan	■											
Construct Interceptor Ditch	Jan	Feb	■	■										
Complete Underdrain System	Jan	Mar	■	■	■									
Install Liner System	Apr	Jun				■	■	■						
Install Solution Collection Piping	Jul	Sep							■	■	■			
Place ODF	Jul	Sep							■	■	■			
Events Pond	Apr	May												
Install LDRS Pump Casings & Backfill	Apr	Apr				■								
Install Liner System	Apr	Apr				■								
Install Spillway Revetment	May	May					■							
Pregnant Solution Pumping	Jun	Aug												
Install PLS Pumps & Header	Jun	Aug						■	■	■				
Install Overland Piping	Jun	Aug						■	■	■				
Power Supply	**2018**	**Apr**												
69 kV Transmission Line	2018	Jan												
Foundations & Civil Work	2018	Jan	■											
Assemble & Install Structures	2018	Jan	■											
String 69 kV Conductor	2018	Jan	■											
String Fibre	2018	Jan	■											
13.8 kV On-Site Power Distribution	Jan	Feb												
Substation Feeders to OH Crossing	Jan	Feb	■	■										
Overhead Line to ADR	Jan	Feb	■	■										
Overhead Line to Crushers	Jan	Feb	■	■										
69 kV On-Site Substation	Feb	Apr												
Assemble & Oil Transformers	Feb	Feb		■										
Place Balance of Equipment	Feb	Mar		■	■									
Electrical Installations	Mar	Apr			■	■								
Install Yard Fencing	Apr	Apr				■								
13.8 kV On-Site Power Generation	Feb	Apr												

Activity	Start	Finish	2019											
			J	F	M	A	M	J	J	A	S	O	N	D
Place Generators & E-House	Feb	Mar		■	■									
Mechanical tie-Ins	Feb	Apr		■	■	■								
Electrical & Control Tie-Ins	Mar	Apr			■	■								
69 KV McQuesten Substation	Jan	May												
Install & Test Apparatus	Jan	Apr	■	■	■	■								
Telecom & Controls	Mar	Apr			■	■								
Tie in Power Lines	Apr	May				■	■							
Ancillary Facilities	**Jan**	**Apr**												
Bulk Fuel Storage - Fuel Farm liner	Jan	Jan	■											
Bulk Fuel Store - Install Tanks & Fuel Distribution	Mar	Mar			■									
AN Storage Facility - Foundation Preparation	Jan	Feb	■	■										
AN Storage Facility - Building & Equipment Installation	Feb	Mar		■	■									
Assay Laboratory	Mar	May			■	■	■							
Waste Management Area Fencing	Apr	Apr				■								
Mine Pre-Production Development	**Jan**	**Jul**												
Eagle Pit Haul Road	Jan	Mar	■	■	■									
Eagle Pit - Clearing & Topsoil Stripping	Feb	Mar		■	■									
Platinum Gulch WRSA - Clearing & Topsoil Stripping	Apr	Apr				■								
Eagle Pit Haul Road Phase 2	Mar	Apr			■	■								
90-Day Storage Pad - Bulk Fill	Apr	May				■	■							
Eagle Pit - Waste Stripping	Mar	Jul			■	■	■	■	■					
Eagle Pit - ODF Production	Apr	Jul				■	■	■	■					

As required by QZ14-041-1, construction reports for completed Engineered Structures as defined in QZ14-041-1 (which for 2019 includes the HLF and the primary water management ditches) are provided in Appendix A. Certifications by a Professional Engineer for completed works are provided as Appendix B.



Legend:

Facility Outline
Reserved Area
Site Power
Watercourse - Perennial
Watercourse - Ephemeral
Watercourse - Intermittent

VICTORIA GOLD CORP

0 50 100 200
Metres

Projection: NAD 83 UTM Zone 8N

Drawn By: HC

Date: 2020/05/04

Figure: 2.1-1

EAGLE GOLD PROJECT
YUKON TERRITORY

Heap Leach Facility Area at January 1, 2020

Legend:

Facility Outline | Watercourse - Perennial | Watercourse - Intermittent
Site Power | Watercourse - Ephemeral

VICTORIA GOLD CORP

Projection: NAD 83 UTM Zone 8N

Drawn By: HC

0 75 150 300 Metres

Date: 2020/05/08

Figure: 2.1-2

EAGLE GOLD PROJECT
YUKON TERRITORY

Pit, PG WRSA & Crusher Area at October 19, 2019

2.1.1.1 Mine Equipment Assembly

The remaining primary mobile mining equipment required for the Production Phase of the Project (i.e., 16M Grader, 993K Loaders, D10 Dozer and a Small Rock Drill) that was not made operational in 2018 was fully assembled, commissioned and utilized in 2019.

2.1.1.2 Camp Complex

All major components of the camp complex required for the operations team were completed in 2018 and no significant construction was undertaken in 2019.

2.1.1.3 Water Management Infrastructure

Construction activities related to major water management infrastructure continued in 2019.

Excavation and rip rap armoring installation for Ditches A and C, HDPE pipe fusing and installation for Ditch A and inlets for Ditches A and B into the LDSP were all completed in 2019.

Construction of Ditch A and C is depicted in Photos 2.1-1 to 2.1-3.

Photo 2.1-1: Ditch A Rip Rap and HDPE Pipe Installations - March 28, 2019

Photo 2.1-2: Ditch C Rip Rap Installation - March 17, 2019

Photo 2.1-3: Ditch C Construction Complete - April 20, 2019

2.1.1.4 Process Plant

The ADR plant construction was fully completed, commissioned and operational in 2019 (Photos 2.1-4 to 2.1-7)

Photo 2.1-4: ADR Steel Erection - January 15, 2019

Photo 2.1-5: ADR to HLF Road Construction - February 19, 2019

Photo 2.1-6: ADR to HLF Pipe Installation - May 28, 2019

Photo 2.1-7: ADR Furnace Installation - April 6, 2019

2.1.1.5 Crushing Circuit

Construction and commissioning of the crushing facilities was completed in 2019 and operations commenced in August (Photos 2.1-9 to 2.1-12).

Photo 2.1-8: Secondary and Tertiary Crushing Facility - March 31, 2019

Photo 2.1-9: Primary Crusher MSE Wall Construction - April 24, 2019

Photo 2.1-10: Secondary and Tertiary Crusher Conveyor Circuit - May 27, 2019

Photo 2.1-11: Primary Crusher Feed to Reclaim Stockpile - June 11, 2019

2.1.1.6 Overland Conveyor

Construction and commissioning of the overland conveyor was completed in 2019 and the facility became operational in June (Photos 2.1-12 to 2.1-14).

Photo 2.1-12: Overland Conveyor Grading Completion - February 1, 2019

Photo 2.1-13: Overland Conveyor Structure Installation - February 28, 2019

Photo 2.1-14: Overland Conveyor Operational and Conveying ODF - June 20, 2019

2.1.1.7 Explosives Storage Area

Final grading and pad preparation in the explosives storage area was completed in 2019; storage facilities were erected and are now operational.

Photo 2.1-15: Explosives Area Pad Grading - January 24, 2019

Photo 2.1-16: Erecting Explosives Silo Frame - March 5, 2019

2.1.1.8 Heap Leach Facility

Foundation works and fill placement for the embankment of the HLF and the Events Pond was completed in 2019 and the Phase 1A area (including the In-Heap Pond) was graded and lined in preparation for ore placement and leaching operations (Photos 2.1-17 to 2.1-29).

Photo 2.1-17: Events Pond Earthworks - March 28, 2019

Photo 2.1-18: Events Pond Liner Installation - April 3, 2019

Photo 2.1-19: HLF Liner Deployment in Phase 1A Area - May 2, 2019

Photo 2.1-20: In-Heap Pond Area ODF Placement - May 10, 2019

Photo 2.1-21: HLF PLS Piping Installation - May 10, 2019

Photo 2.1-22: HLF Spillway Lining Construction - May 13, 2019

2.1.1.9 Power Supply

Construction of the transmission line, substations and site power facilities was completed in 2019 with the line connection to the Yukon Energy Corporation grid completed and energized (Photos 2.1-23 to 2.1-25).

Photo 2.1-23: Powerline Installation at Project Site - January 21, 2019

Photo 2.1-24: South McQuesten Substation - March 29, 2019

Photo 2.1-25: Site Substation - April 9, 2019

2.1.1.10 Ancillary Facilities

The majority of ancillary facilities were completed in 2018 with a land treatment facility (Photos 2.1-26) and site landfill representing the only other areas of significant construction during 2019.

Photo 2.1-26: Land Treatment Facility Liner Installation - April 6, 2019

2.2 Overview of Mining

In July of 2019, the Project officially transitioned from construction to operations, supported by a formal handover process from the construction team to the operations team. The handover included the completion of construction area turnover packages that included all QA/QC, verification and testing documents developed to date. The handover from construction to commissioning followed a certification process as listed below:

- Construction release (C1 Certification);
- System testing of equipment (C2 Certification);
- Wet commissioning (C3 Certification Process Systems Only);
- Site wide integration test run with ore/leach solution (C4 - all Systems); and
- Ramp up to sustainable operation (C5).

Production activities in the Eagle Pit commenced in 2019. The 1305-1215 benches were developed with waste rock deposited on the 1255 and 1185 lifts of the Platinum Gulch WRSA, and ore was delivered to the primary crusher.

The pit was developed using standard drill and blast technology. Ore was transported from the open pit and delivered to the primary crusher by haul truck.

Approximately 2.5 Mt of ore was crushed to a passing 80 percent (P80) particle size of 6.4 mm in a 3-stage crushing process. Ore was then conveyed between the primary crushing station and the secondary and tertiary crushing stations by covered conveyor systems. After the tertiary crushing stage, ore was transported by covered conveyor to the HLF area where the ore was stacked on the heap leach pad using trucks and dozers or via a system of portable conveyors.

Gold extraction utilized cyanide heap leaching technology. Process solution containing cyanide was applied and leached through the ore to extract gold; the leached solution was then be collected by the HLF leachate collection and recovery system in the In-Heap Pond.

Gold-bearing “pregnant” solution (pregnant leach solution [PLS]) was pumped from the In-Heap Pond to the gold recovery plant. Approximately 17,200 ounces of gold and 3,000 ounces of silver were recovered from the PLS by activated carbon adsorption and desorption, followed by electro-winning onto steel cathodes, and on-site smelting to gold doré. This process is referred to as the adsorption, desorption, and recovery (ADR) process. The gold-barren leach solution that remained after passing through the carbon columns was re-circulated back to the HLF after amendment with cyanide to attain a sufficient concentration for leaching.

2.2.1 Ore, Waste and Gold Production

For the reporting period, material has been removed from the Phase 1 pit area and gold production has occurred. The total amount of ore and waste mined in the reporting period that was not utilized for construction purposes was 4.8 Mt, of which 2.5 Mt was ore and 2.4 Mt was classified as waste.

Ore was delivered to the primary crusher and waste rock was sent to the 1255 and 1185 lifts of the Platinum Gulch WRSA. Waste rock material deposited into the PG WRSA was classified by the following six different lithologies:

- Oxidized granodiorite: Pervasive oxidation, relatively continuous throughout the whole rock. Granodiorite may also be altered by sericite/clay but is within the oxide zone. Rock may be friable.
- Altered granodiorite: Dominantly sericite/clay altered granodiorite. Original texture may be obliterated. May see zones of sheared or faulted granodiorite with intense sericitization and few remnant granodiorite particles.
- Unaltered fresh granodiorite: Oxidation weak and restricted to fractures or weakly in vein selvages. Rock is competent and not wholly altered.
- Oxidized metasediments: Hornfelsed Hyland Group metasediments with whole rock oxidation.
- Fresh metasediments: Hornfelsed Hyland Group metasediments with no oxidation, may be altered (likely silicified).
- Overburden: Generally colluvium.

The mass and volume of waste rock by lithology delivered to the PG WRSA in 2019 is depicted in Figures 2.2-1 and 2.2-2.

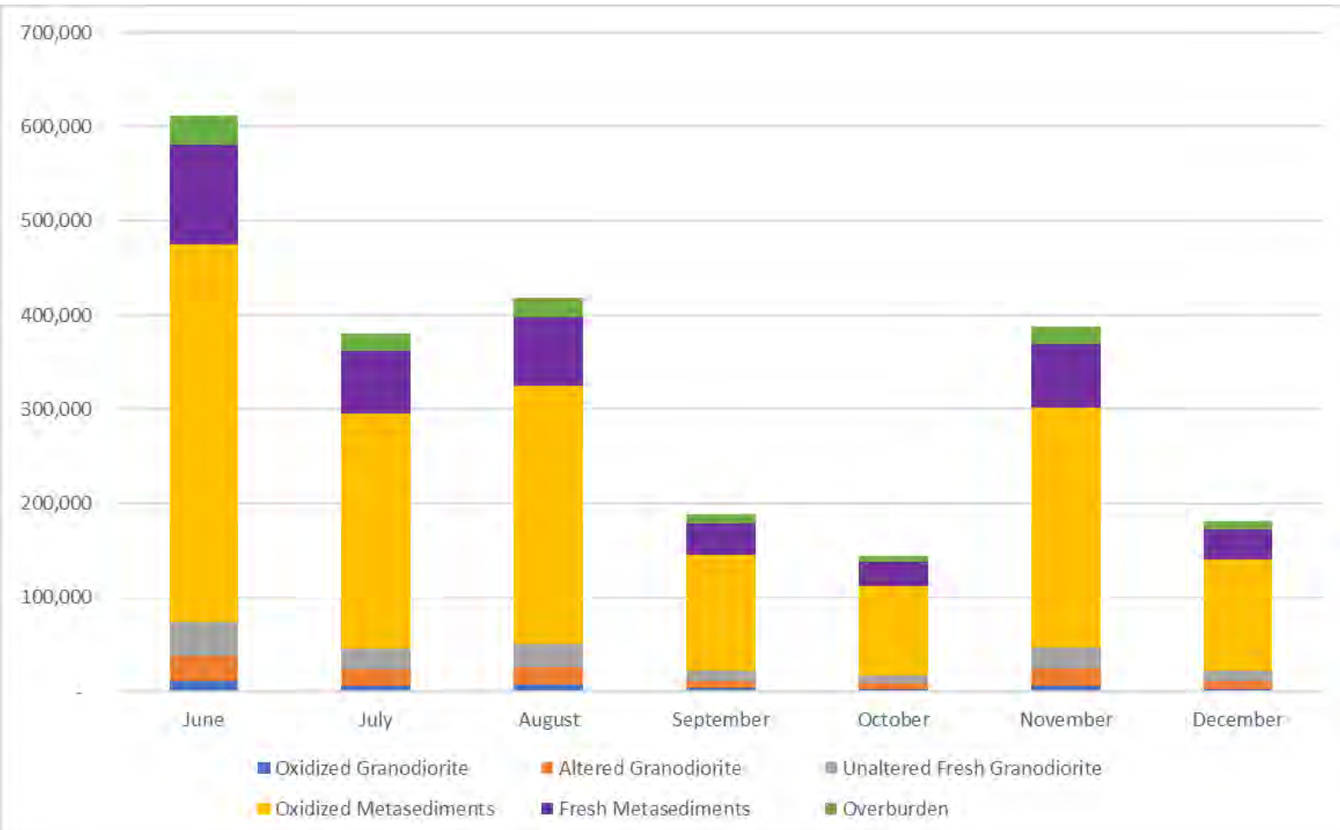


Figure 2.2-1: Mass of Waste Rock Deposited in the PG WRSA by Lithology in 2019

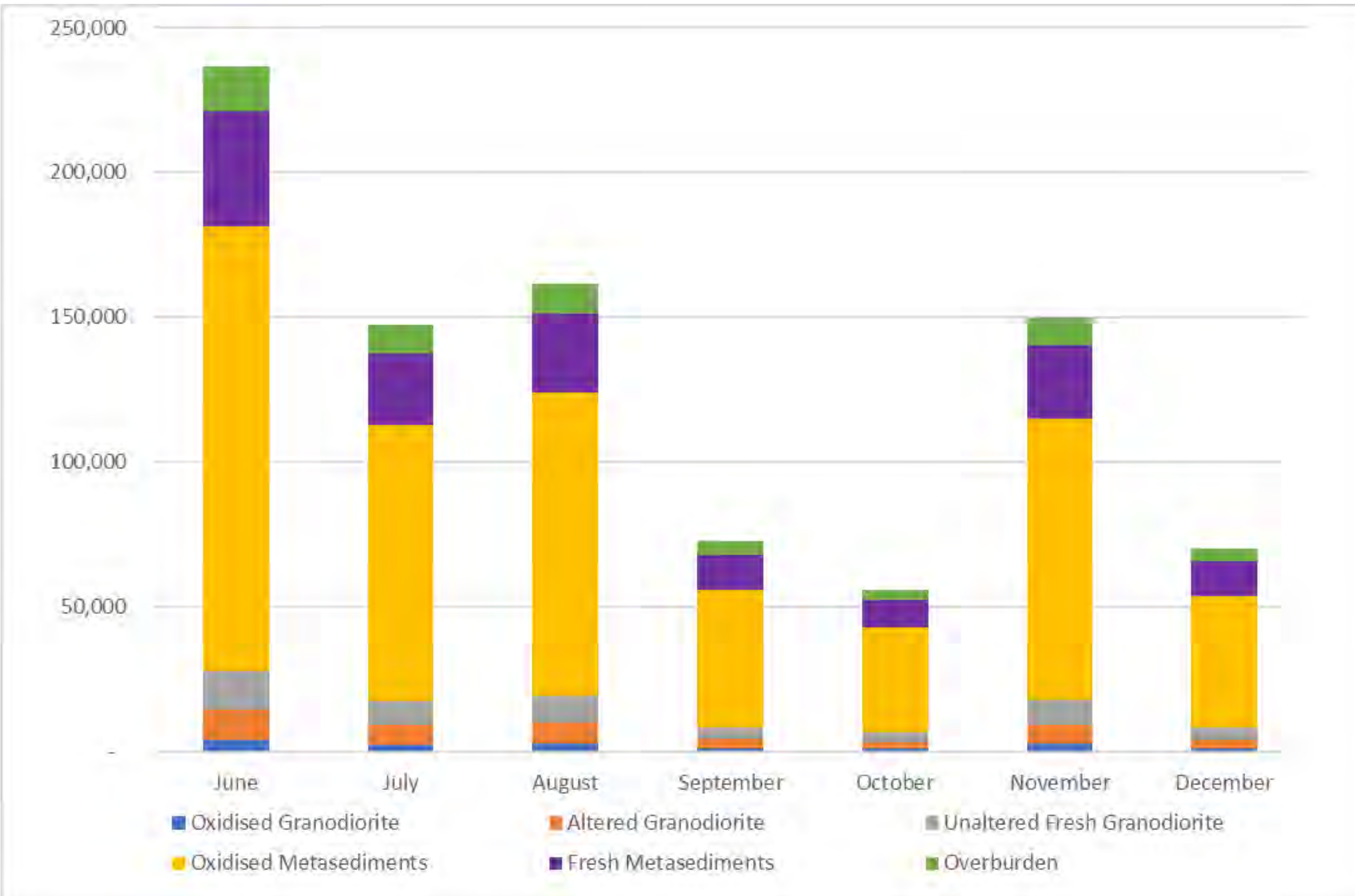


Figure 2.2-2: Volume of Waste Rock Deposited in the PG WRSA by Lithology in 2019

Over the life of the Eagle pit, based on the current mine plan and regulatory approvals, 86 Mt of ore will be processed and 101 Mt of waste will be placed in waste rock storage areas. Table 2.2-1 provides annual tonnages for ore and waste rock, while Figure 2.2-3 depicts the mass of ore and waste scheduled to be removed from the open pit by year.

Table 2.2-1: Mine Production Schedule[1]

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total
ORE MINED										
Ore Crushed to HLF (kt)	2,482	10,732	10,528	10,556	10,556	10,556	10,556	10,556	7,646	**84,168**
ROM MINED										
ROM placed in EP WRSA (kt)	0	0	436	1,723	2,626	2,329	2,910	2,695	2,174	14,892
Total Material Placed on EP WRSA (kt)	0	0	9,958	16,959	17,438	15,461	11,849	12,125	9,153	92,943
ROM placed on 90 day (kt)	0	214	322	390	322	390	322	390	0	2,349
ROM removed from 90 day to HLF (kt)	0	36	240	212	212	212	212	212	500	1,833
WASTE MINED										
Eagle Pup Waste (kt)[2]	0	0	9,522	15,236	14,812	13,132	8,939	9,430	6,979	78,050
Platinum Gulch Waste (kt)	2,442	13,274	7,424	2,442	0	0	0	0	0	23,140
Total Waste Mined (kt)	2,442	13,274	16,946	15,236	14,812	13,132	8,939	9,430	6,979	**101,190**
TOTAL MATERIAL MINED (kt)	**4,924**	**24,220**	**28,232**	**27,904**	**28,316**	**26,406**	**22,727**	**23,070**	**16,799**	**202,598**

NOTE: 1 - Desitnation and production rate for run of mine material is based on current mine planning assumptions (e.g., equipment availability, gold price, etc.) and may vary during each production year.
2 - Waste does not include ROM total to the EP WRSA that is reported separtely in the table.

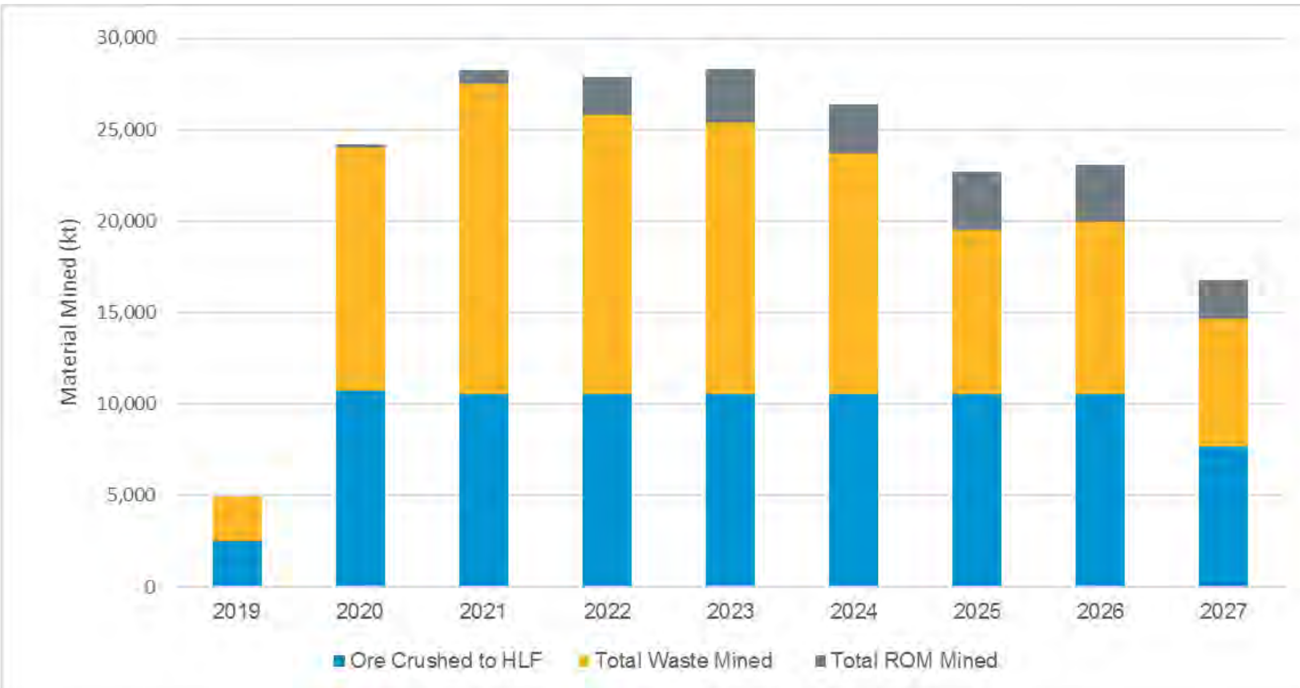


Figure 2.2-3: Ore, Run of Mine Material and Waste Mined by Year

2.2.2 Reserve and Mine Life Update

An updated mineral resource and reserve estimate for the Eagle Gold Mine was prepared in 2019 and publicly disclosed in the "Technical Report for the Eagle Gold Mine, Yukon Territory, Canada" prepared by JDS Energy & Mining Inc. (JDS), published December 9, 2019.

The Eagle Mineral Resource update within an updated resource pit constraint resulted in a 21.1% increase in Measured and Indicated ("M+I") gold ounces as well as a 0.6% increase in gold grade. The resource update included all Eagle and Eagle proximal drilling completed post the 2016 Feasibility Study ("FS").

Table 2.2-2: Pre-Production Mineral Resource Estimate - Eagle Pit Eagle

Eagle Constrained In-Pit Mineral Resource				
Classification	Cut-off Grade (g/t Au)	Tonnes (Mt)	Grade (gt/ Au)	Contained Au (koz)
Measured	0.15	37	0.71	850
Indicated	0.15	180	0.61	3,547
Meas. + Ind.	**0.15**	**217**	**0.63**	**4,397**
Inferred	0.15	21	0.52	361

Source: JDS 2019.

NOTES:

1. The effective date for the Eagle Pit Mineral Resource is July 1, 2019.
2. Mineral Resources which are not mineral reserves do not have demonstrated economic viability. The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, sociopolitical, marketing, or other relevant issues.

3. The quantity and grade of reported Inferred Resources in this estimation are uncertain in nature and there has been insufficient exploration to define these Inferred Resources as an Indicated or Measured Mineral Resource; it is uncertain at this time whether further exploration will result in upgrading them to an Indicated or Measured Mineral Resource category.
4. This resource has not been depleted for production in 2019. Pre-Production Resource is based on original topo with no depletion from the preproduction/ramp up period up.
5. The mineral resource estimate is constrained by a Lerchs-Grossman pit shell using a gold price of US$1,700/oz.

Table 2.2-3: Pre-Production Mineral Resource Estimate - Olive Pit

Olive Constrained In-Pit Mineral Resource				
Classification	**Cut-off Grade (g/t Au)**	**Tonnes (Mt)**	**Grade (gt/ Au)**	**Contained Au (koz)**
Measured	0.4	2	1.19	75
Indicated	0.4	8	1.05	254
Meas. + Ind.	**0.4**	**10**	**1.07**	**329**
Inferred	0.4	7	0.89	210

Source: JDS 2019.

NOTES:

1. The effective date for the Olive Pit Mineral Resource is September 12, 2016.
2. Mineral Resources which are not mineral reserves do not have demonstrated economic viability. The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, sociopolitical, marketing, or other relevant issues.
3. The quantity and grade of reported Inferred Resources in this estimation are uncertain in nature and there has been insufficient exploration to define these Inferred Resources as an Indicated or Measured Mineral Resource; it is uncertain at this time whether further exploration will result in upgrading them to an Indicated or Measured Mineral Resource category.
4. Gold price used for this estimate was US$1,700/oz.

2.2.2.1 Updated Eagle Resource Model Discussion

The Eagle Resource was updated with the additional drilling performed post the 2016 Eagle Feasibility Study. The drillhole database of the Eagle Gold Mine used for the Resource update has a cut-off date of October 8, 2017. It is comprised of 1,078 holes with 178,490m of drilling and 112,949 assays for gold.

The geology model of the Eagle Zone was built as a mineralized envelope with a cut-off grade of 0.15 g/t Au. This model was built from first principles without influence of previous modelling, and utilized the drillhole database of gold grades. Interpretations of gold mineralization limits were performed on north-south sections spaced at 25m intervals. From the interpretation and the modelling of the mineralized zone, it was observed that the orebody has a consistent geometry that is continuous from one section to the next.

The estimation of gold grades was performed with the ordinary kriging technique on capped composites. The block model structure consists of an orthogonal model (no rotation) with block dimensions of 10m (X) x 10m (Y) x 5m (Z) with specific gravity (SG) values based on lithology, and reduced oxidation state. A minimum of 2 and maximum of 12 samples were required to calculate a block estimate. The search ellipsoid was dimensioned and oriented according to the variogram models. The grade estimation process consisted of a 3-pass approach with the parameters of the first pass (long axis 80°/0° at 56.0m; short axis 170°/0° at 25.0m; vertical axis 80°/-90° at 75.0m). The estimation parameters of the second and third passes are the same with the exception of an enlarged search ellipsoid by 1.5 times and 3 times the dimensions from the first pass, respectively. Only blocks within the modeled mineralized zone were estimated.

The mineral resource was classified as Measured, Indicated, and Inferred based on the variogram ranges of the second structures. The average distance of samples from the block center was utilized as the classification criterion. Measured, Indicated, and Inferred Resources were assigned to the estimates of the Eagle Zone. The distances to categorize the resources into the different classes were Measured (≤ 17.0m), Indicated (> 17.0m and ≤ 52.0m) and Inferred (>52.0m).

2.2.2.2 Mineral Reserves

The Proven and Probable Mineral Reserve Estimate is the economically mineable portions of the Measured and Indicated in-pit Mineral Resource as demonstrated by the updated Technical Report.

The Mineral Reserves were developed by examining each deposit to determine the optimal and practical mining method. Cut-off grades were then determined based on appropriate mine design criteria and the adopted mining method. A shovel and truck open pit mining method was selected for the two deposits.

The mineral reserve estimations take into consideration on-site operating costs (mining, processing, site services, freight, general and administration), geotechnical analysis for open pit wall angles, metallurgical recoveries, and selling costs. In addition, the Mineral Reserves incorporate allowances for mining recovery and dilution and overall economic viability.

The estimated Proven and Probable Mineral Reserves is shown in Table 2.2-4.

Table 2.2-4: Pre-Production Mineral Reserve Estimate - Eagle Gold Mine

Type	Area	Ore (Mt)	Diluted Grade (g/t)	Contained gold (koz)
Crushed Ore	Eagle	114	0.77	2,818
	Olive	7	0.95	200
	Total	**121**	**0.78**	**3,018**
Run of Mine Ore	Eagle	35	0.22	**243**
	Olive	-	-	**-**
	Total	**35**	**0.22**	**343**
Crushed + ROM	**Total**	**155**	**0.65**	**3,261**

Source: JDS 2019.

NOTES:

1. The effective date for the Mineral Reserve is July 1, 2019
2. Mineral Reserves are included within Mineral Resources
3. A gold price of US$1,275/oz is assumed.
4. A US$:C$ exchange rate of 0.75
5. Cut-off grades, dilution and recovery factors are applied as per open pit mining method
6. This resource has not been depleted for production in 2019. Pre-Production Resource is based on original topo with no depletion from the preproduction/ramp up period.

The estimated contained gold provided in Table 2.2-4 does not reflect the depletion in the resource estimate based on mining from July to December 2019. Based on the 17,200 ounces of gold produced from the Eagle pit during 2019, the reserve block model is in excellent agreement with the production data (Figure 2.2-4).

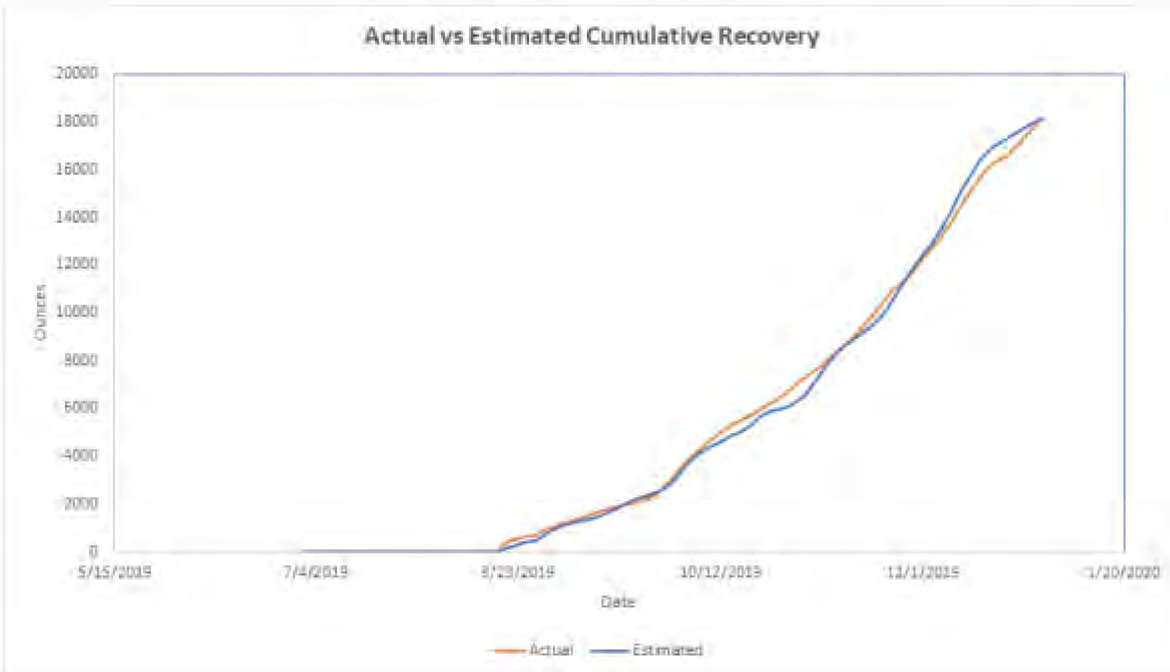


Figure 2.2-4: Actual Versus Modeled Cumulative Recovery of Gold Produced During 2019

Eagle (and Olive is proposed) as an open pit mine and operate as drill, blast, shovel and haul operation. Eagle plus Olive will be mined over a combined mine life of 11 years. The combined mine plan is still in development at this time.

2.3 Quality Assurance and Quality Control Program for Mine Operations

Samples are collected from each blast hole associated with each blast pattern at the open pit. Blast holes are spaced approximately six to seven meters on average.

Each blast hole pattern is composed of ~100 blast holes for which there is one sample per blast hole collected from rock chip cones. Samples are collected, described, matched and geo-referenced to a blast hole pattern map and subsequently entered into a database which is updated and reviewed on a daily basis.

Eagle Gold QA/QC current protocol includes Blanks (three per 100 samples), Certified Standard material (three per 100 samples), Field Duplicates (two per 100 samples) and pulp/prep duplicates (2 per 100 samples) prepared by the onsite assay laboratory. In total, QA/QC samples represent 10% of the total blast hole sample program.

2.3.1 QA/QC Failure Investigation and Correction Program

QA/QC failures are associated with standards and blanks reporting values outside of the parameters expected for each sample, and in this case, values above or below three standard deviations. These are investigated on a case by case basis. In general, when a standard or blank fail, the whole batch is analyzed and the leg before and after (5-10 samples) the failed QC sample is then analyzed. If necessary, the laboratory is requested to reanalyze the whole sample batch and report assay results again. QC failures as well as actions taken for correction are logged into a datasheet for recording assay certificate number, sample number and a brief description of problem and actions.

2.3.2 External QA/QC Program

Currently, 10% of sample pulps are resubmitted from the onsite laboratory to an external laboratory (Bureau Veritas), where pulps are analyzed for gold with fire assay and multi-elements. These results are compared with onsite laboratory results to determine linear correlations, variance and the coefficient of determination (or R squared value).

2.4 Proposed Development & Production in 2020

2.4.1 Additional Construction Activities

As considered in the regulatory approvals for the Project, the HLF will be progressively developed over the life of mine. In 2020, construction activities for the HLF will involve the complete construction of Phase 1B. At the time of this report, the Issued for Construction (IFC) design for Phase 1B had been submitted pursuant to both QZ14-041-1 and QML-0011. The Phase 1B IFC design prepared by Forte Dynamics Inc. utilizes all applicable design criteria applied for the construction and operation of Phase 1A of the HLF and essentially provides the construction team with detailed design drawings for the continuation of sub-grade preparation, underdrain installation, and liner PLS piping deployment from the Phase 1A boundary to the existing Phase 1 Interceptor ditch, which represents the transition point from Phase 1 to Phase 2 of the HLF.

Construction work on water management infrastructure is also planned for 2020, including phased construction of the PG WRSA rock drain system with associated completion of the ditch and pipe configuration from the toe of the rock drain. Additional construction is also planned for extending Ditch B up to the proposed toe of the EP WRSA and rock drain prior to any loading of waste rock into the EP WRSA. The sump and toe ditch related to the 90-day stockpile will be completed with the installation of the HDPE pipe that will ultimately connect to the pipe in Ditch A so that any captured runoff from the 90-day pad reports to the LDSP.

Table 2.4-1 provides the current schedule, subject to contractor and material availability, for the activities described above and other minor site works to either complete construction or upgrade facilities based on the results of the ongoing commissioning program and operational experience.

Table 2.4-1: 2020 Construction Schedule

Activity	Start	Finish	2020											
			J	F	M	A	M	J	J	A	S	O	N	D
Weightometer installations on conveyors	2019	Mar												
Camera installations in crusher facilities	Feb	Mar												
90-Day HDPE pipe installation	Mar	Apr												
Upgrade of shop ventilation system		Apr												
Upgrade secondary dust collection		Apr												
Crusher feed chute enhancement		Apr												
PG WRSA Rock Drain including access for construction	Feb	July												
HLF Phase 1B	Feb	Sep												
Ditch B - Shaping, rip rap install, pipe fuse and install	Aug	Oct												
Completion of Process permanent office		Aug												

2.4.2 Production Activities

Mining rates for 2020 are as shown above in Table 2.2-1 with an estimated 10.5 Mt of crushed ore to be sent to the HLF, 214 kt of ROM placed on the 90-day stockpile, and 13.3 Mt of waste rock placed in the PG WRSA.

The planned development of the open pit and the PG WRSA for each quarter in 2020 are depicted in Figures 2.4-1 to 2.4-4.

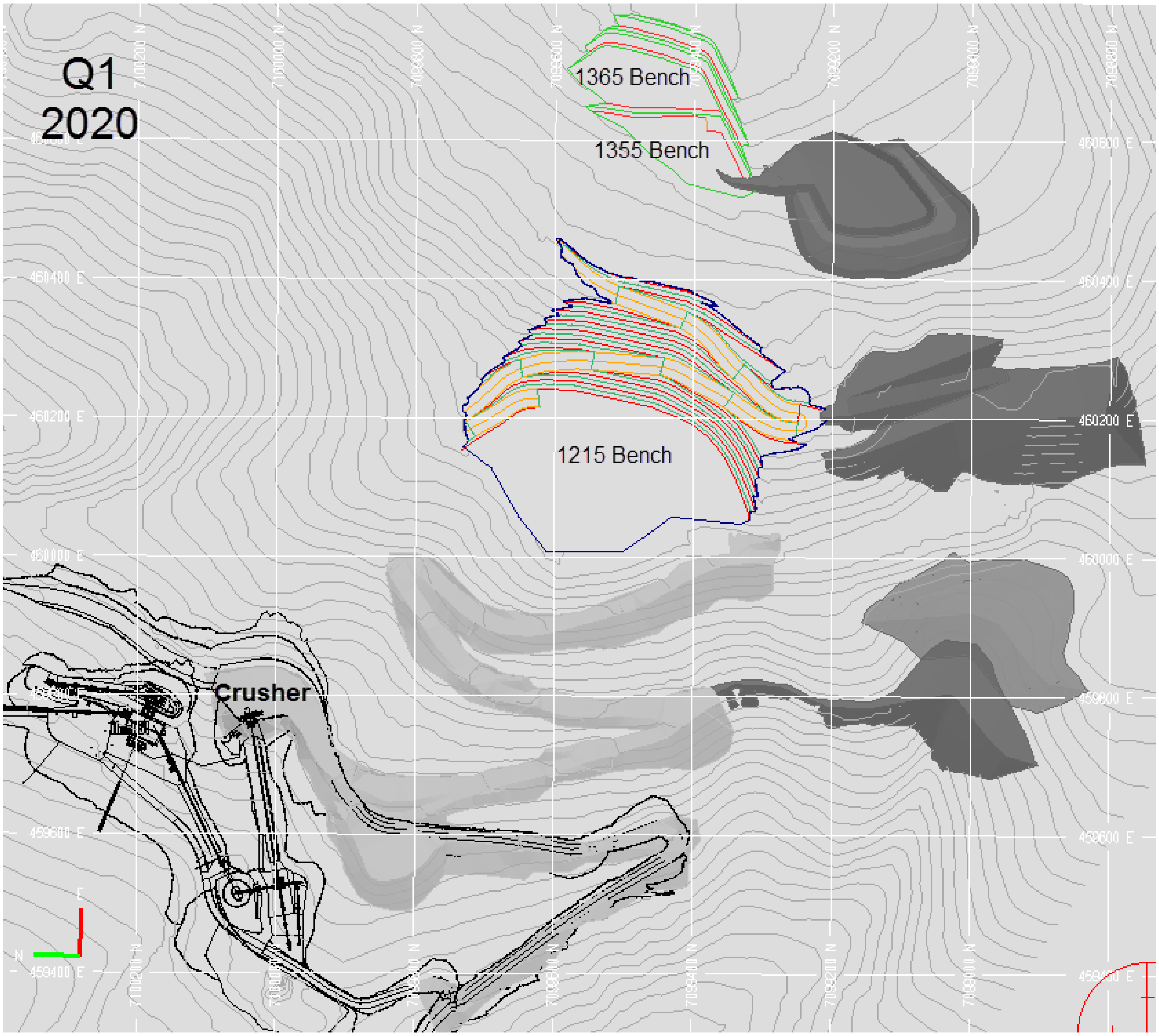


Figure 2.4-1: Q1 2020 Planned Eagle Pit and PG WRSA Development

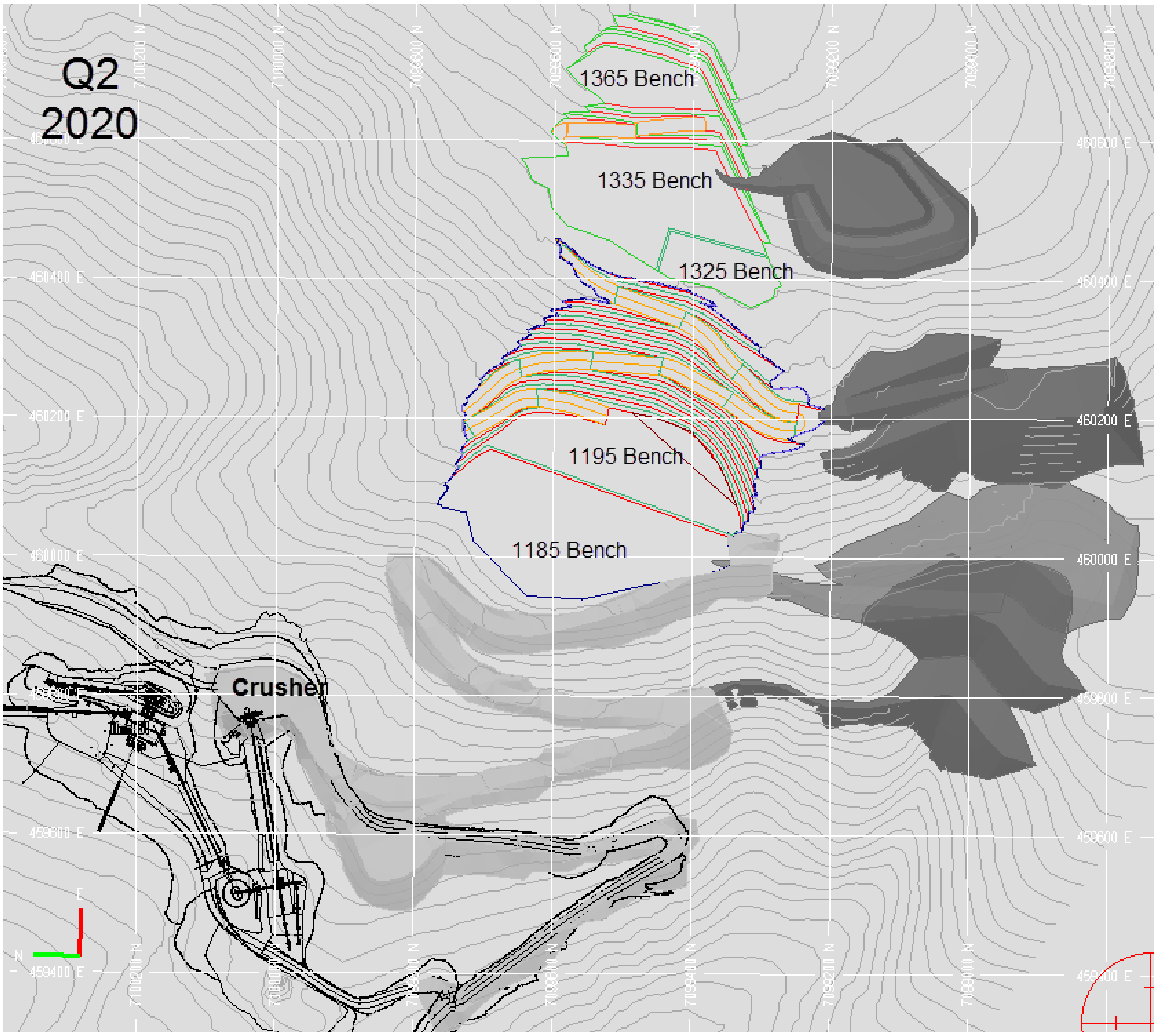


Figure 2.4-2: Q2 2020 Planned Eagle Pit and PG WRSA Development

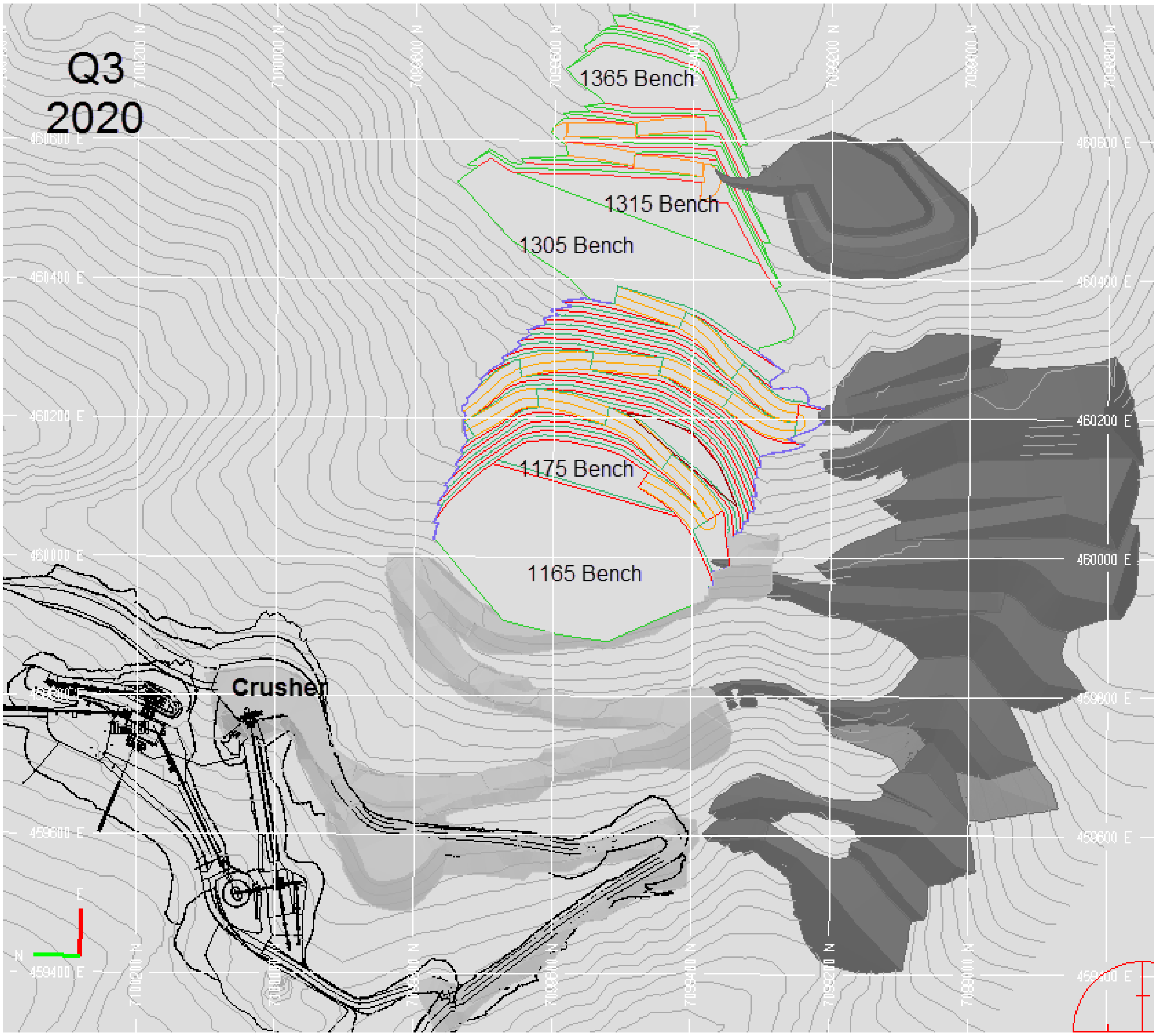


Figure 2.4-3: Q3 2020 Planned Eagle Pit and PG WRSA Development

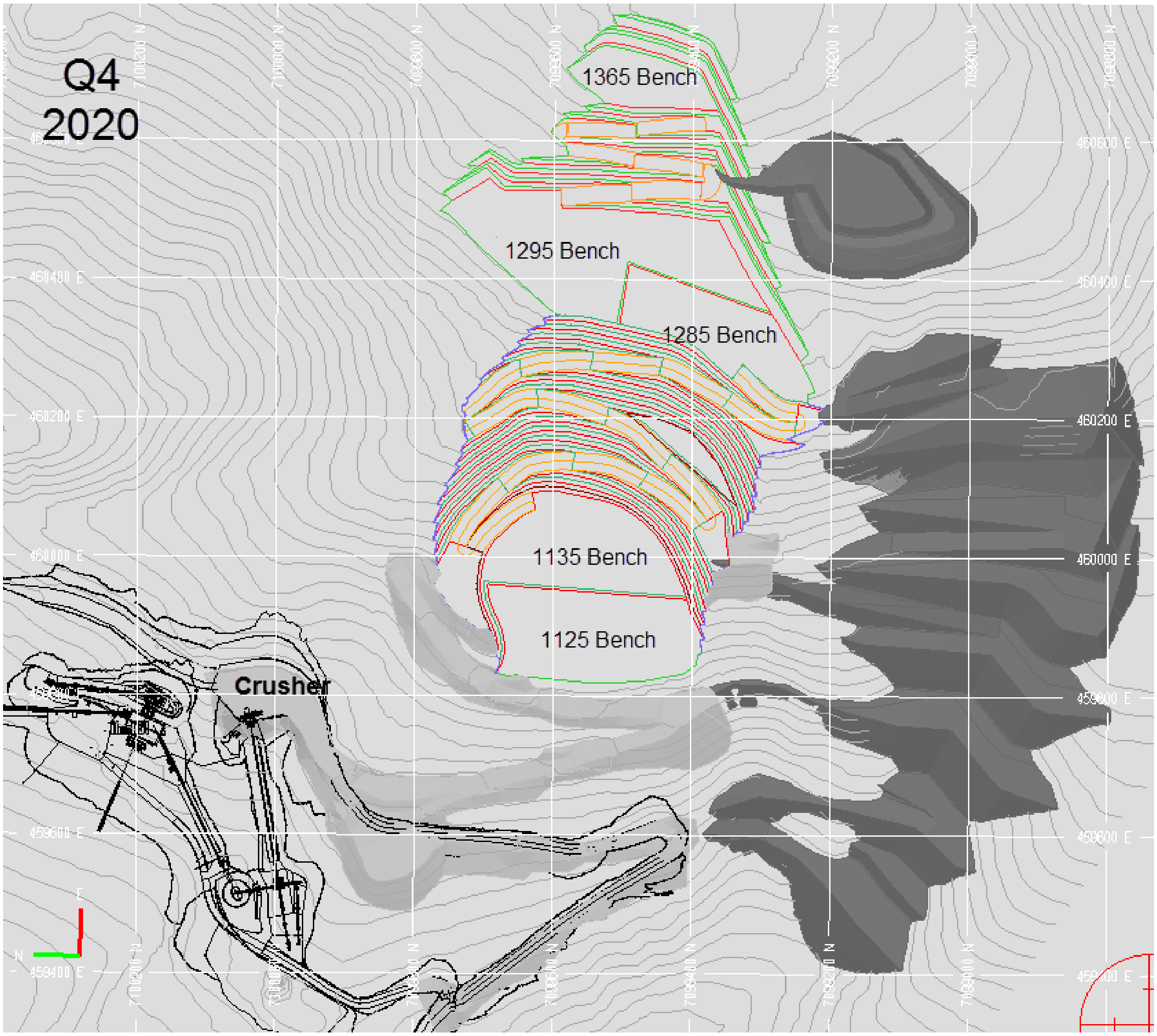


Figure 2.4-4: Q4 2020 Planned Eagle Pit and PG WRSA Development

2.5 Description of Water Use and Deposit of Waste

2.5.1 Description of Water Use

2.5.1.1 Water Use

During 2019, water to supply the camp was sourced from the groundwater well located to the north of the main camp (MW10-DG07). The daily volume of water withdrawn from the camp supply well is shown in Figures 2.5-1 and 2.5-2, and remained well below the QZ16-016 daily limit of 157 m^3/day. The average daily water use for camp operations, including wash cars outside of main camp facilities, was 38 m^3/day in 2019, while the maximum daily water use recorded for camp operations remained below 90 m^3/day in 2019. In January, a total of 260 m^3 of groundwater was used for concrete production. Concrete production for the year ceased after the January withdrawal.

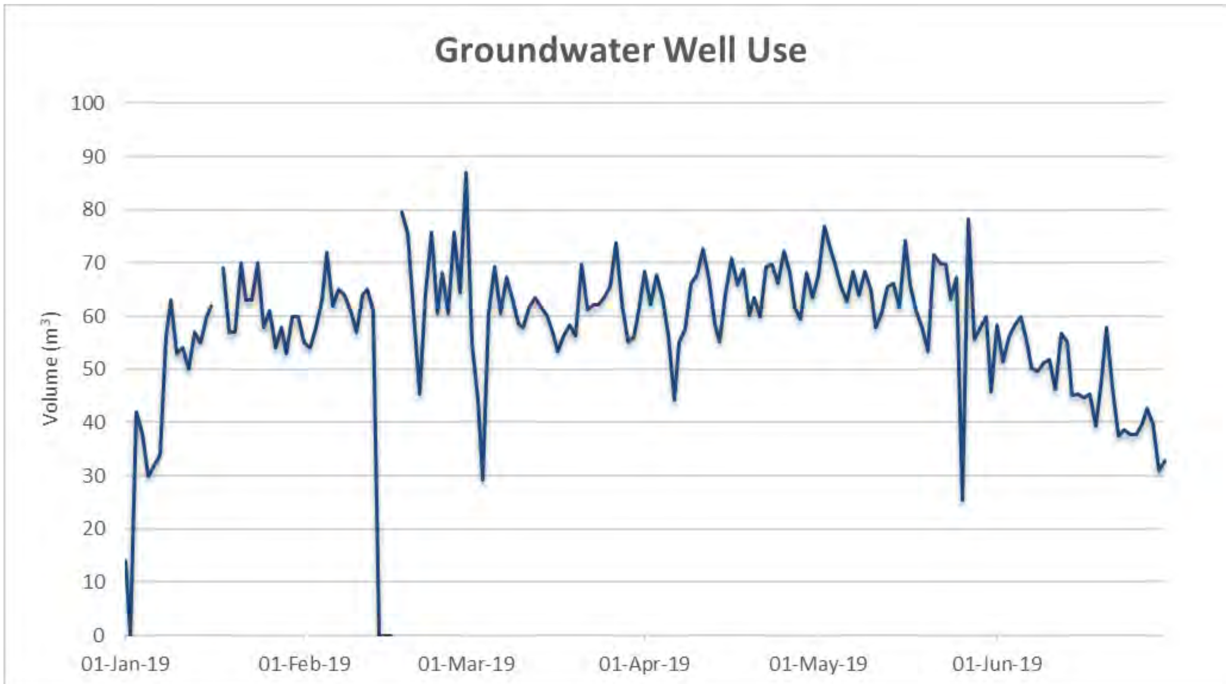


Figure 2.5-1: Daily Camp Water Usage (m^3/day) - January to June 2019

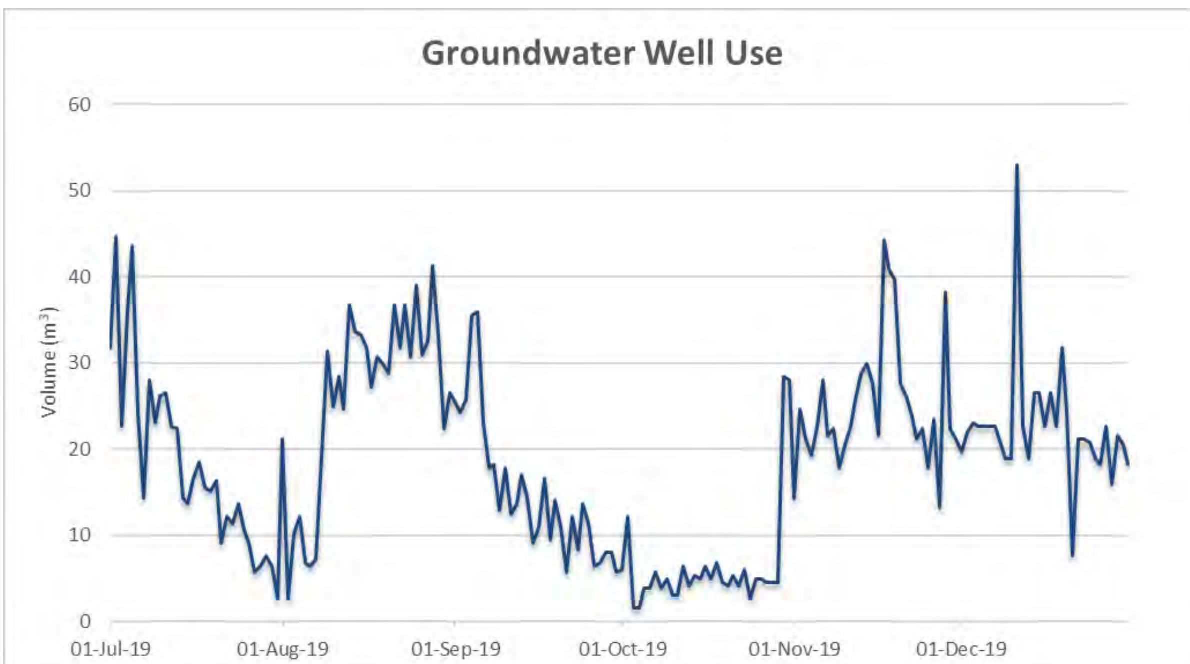


Figure 2.5-2: Daily Camp Water Usage (m^3/day) - July to December 2019

Water was also used for dust suppression and occasionally to supply the Heap Leach lime silo with water (Figure 2.5-3). Water for dust suppression was sourced from the LDSP between May 1 and September 28 as necessary. A Total of 21,346 m^3 of water, sourced from the LDSP, was applied to site access roads to reduce dust generation from Project activities. The maximum daily dust suppression water withdrawal in 2019 was 529 m^3 well below the daily limit of 908 m^3 defined in QZ14-041-1. Water use for gold processing is provided in the section 2.6 under the HLF Solution Monitoring Program.

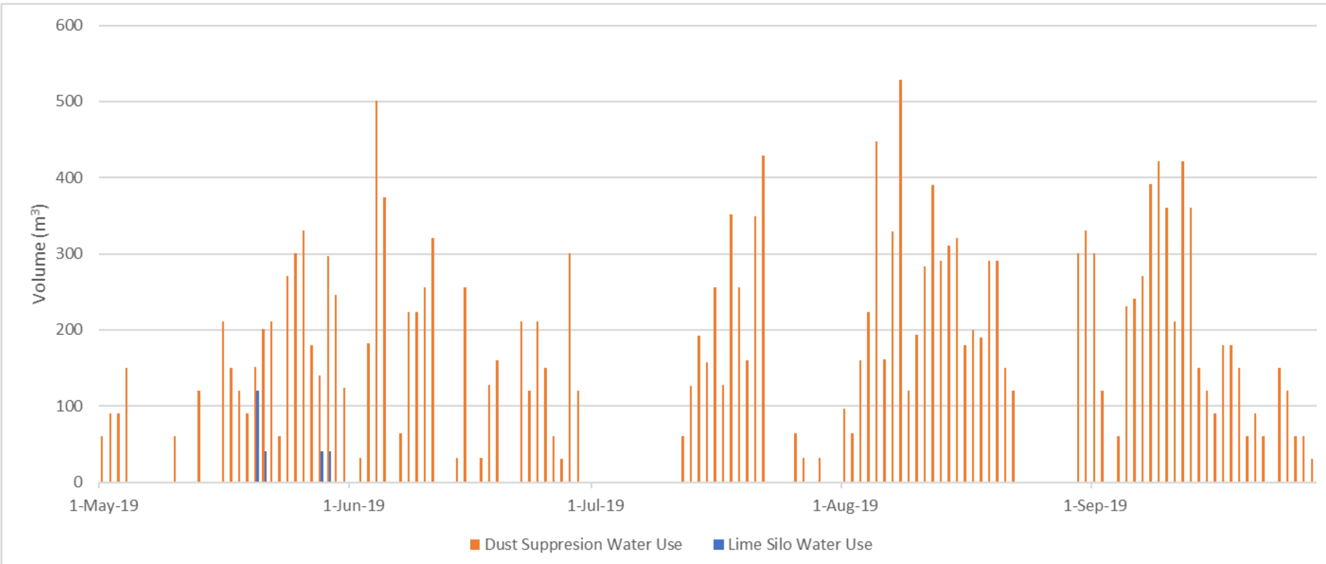


Figure 2.5-3: Daily Dust Suppression and Lime Silo Water Usage (m^3/day)

2.5.1.2 Water Storage

As shown in Table 2.5-1, the maximum measured volume of water stored within the Events Pond during the period of this report was 82,064 m^3 in December. This peak measured storage volume provided an available storage of 217,836 m^3, well within the minimum desired available storage for Phase 1 of the HLF which is 198,340 m^3.

Natural precipitation, water transfers from the LDSP for liner testing and the ongoing conveyance of groundwater captured in the HLF underdrain contributed to the volume held within the Events Pond. The LDSP held a maximum of 43,485 m^3 in 2019 during the month of May leaving an available storage of 25,036 m^3 within the pond. To reduce the LDSP volume in May and September water was transferred to the Events Pond (Table 2.5-2). The maximum month-end volume of 31,105 m3 occurred at the end of June (Table 2.5-1). Freshet flows into the LDSP during the spring was the main driver of volume stored within the pond. The maximum water stored within the In-Heap Pond above field retention was 11,120 m^3 during the month of July. Water stored within the In-Heap pond was recirculated continuously to the ADR plant for gold recovery and subsequent reuse as barren solution for the heap leaching process. Natural precipitation and water transfers from groundwater and the LDSP contributed to the volume stored within the In- Heap Pond.

Table 2.5-1: 2019 Water Storage Volumes

End of Month	Month End Volume of Water Stored in Events Pond (m^3)	Month End Volume of Water Stored in LDSP (m^3)	Month End Volume of Water Stored in the In-Heap Pond (m^3)
January	0	22,307	0
February	0	23,167	0
March	0	28,137	0
April	7,846	14,871	5,541
May	35,827	22,659	5,541
June	43,000	31,105	10,239
July	44,000	29,882	11,120
August	44,316	29,448	10,846
September	71,188	17,099	10,582
October	74,732	21,121	2,351
November	78,338	23,367	7,803
December	82,064	25,688	6,067

2.5.1.3 Water Transfers

Section 2.6 provides specific details on the volumes and rates of water and solution management for the HLF as required under the Solution Inventory Monitoring Program specified in QZ14-041-1. Additional water transfer required for the Project are provided below in Table 2.5-2. 93,702 m^3 was transferred and used from the onsite groundwater production well and the LDSP to satisfy water requirements for irrigating ore on the HLF. The daily limit of 3,387 m^3/day of water use for irrigating was not exceeded during the period of this report.

Table 2.5-2: 2019 Water Transfers not SIMP Related

End of Month	Total Volume from HLF Underdrain to Events Pond (m^3)	Total Volume from LDSP to Events Pond (m^3)	Total Volume of Water Transferred from Production Well to HLP/ADR (m^3)	Total Volume of Water Transferred from Control Pond to HLF/ADR (m^3)
January	NC	NC	NC	NC
February	NC	NC	NC	NC
March	NC	NC	NC	NC
April [a]	0	0	0	5,541
May	0	28,489	NC	0
June	0	0	NC	0
July [b]	0	0	5,722	0
August	0	0	17,845	0
September	1,968	24,202	16,056	0
October	3,720	0	20,823	0
November	3,600	0	17,549	0
December	3,720	0	10,166	0

NOTES:

NC - not commissioned; barren and pregnant flows with cyanide began August 17, 2019.

a) - Defined as total water stored in In-Heap Pond minus field capacity, plus the draindown volume stored above the In-Heap Pond at optimum moisture minus residual by volume, plus water stored in the Events Pond, plus snow (as SWE) stored within the In-Heap Pond and Events Pond catchments.
b) - Water transfers were conducted to perform leak testing on the ponds during commissioning of these facilities.

2.5.2 Deposit of Waste

In April 2019, controlled discharge from the LDSP to the receiving environment of Haggart Creek via Ditch C occurred. Two separate discharge events were undertaken, one on April 20 and one from April 27 to April 29. Approximately 15,415 m^3 of water was discharged in total during these two events.

Results from samples taken prior to the discharge events indicated that the water within the LDSP was within the effluent discharge limits, set out in QZ14-041 (the active version of the WUL at that time, QZ14-041-1 however has not changed these limits) and thus the decision to undertake the controlled discharge, and test the functionality of the LDSP discharge system, was made. Due to the turnaround time for external laboratory results, onsite analysis for TSS was utilized to inform the ongoing discharge decisions due to the TSS discharge limits and the correlation between TSS and arsenic which is the other parameter that is naturally elevated in site contact and non-contact waters. When onsite analysis suggested that TSS had the potential to exceed QZ14-041 limits the discharge events were ceased to allow for additional settling time.

Subsequent offsite laboratory analysis, when received, indicated that QZ14-041 limits were achieved with the exception of TSS and arsenic. Samples from April 20th and 28th indicated exceedances to TSS criteria of 15mg/l. The samples taken on April 20 and April 28 had TSS concentrations of 66.4 mg/l and 47.2mg/l respectively. Arsenic exceeded QZ14-041-1 criteria, however not MDMER deleterious substance criteria, on Aril 27th and April 28th with results 0.0752mg/l and 0.0984 mg/l respectively. A report, including the lab results, is provided as Appendix C. Sediment and erosion control measures such as silt fences, silt curtains, sumps were implemented to mitigate and manage sediment laden water throughout the 2019 season.

2.6 HLF Solution Monitoring Program

Stacking of ore on the Heap Leach Pad began July 1 2019, water was first introduced to the pad on July 23, and cyanide was first introduced into the barren flow on August 17, 2019. First gold was poured on September 17, 2019.

2.6.1 HLF Solution Inventory Monitoring program

The WUL condition #117 requires eleven specific data requirements be recorded as part of the HLF Solution Inventory Monitoring Program (SIMP). Conditions 117a) and 117j) require daily reporting while the remaining conditions require monthly reporting. The following summarizes the data for each sub-condition of WUL #117:

117a) The daily average available storage volume in the In-Heap Pond is provided in Appendix D. The data record begins on April 11, 2019, when the first water was added as part of leak detection tests during commissioning of the liner. In general, no additional water (aside from precipitation infiltration) was added to the system until July 23, 2019.

117b) The month-end volumes of water stored in the HLF beginning in April 2019 are provided in Table 2.6-1. These volumes include the snow water equivalent of any snow cover on the Heap Pad, the Event Pond, and the Events Pond catchment below the ADR Plant; it also includes the month end volumes of water stored in the Events

Pond and the In-Heap Pond plus the month-end volume of draindown water stored in ore above the residual moisture content. The steady increase in moisture stored reflect ramp up in operations as well as the increasing tonnage of stacked ore.

117c) The total monthly volumes and the average pumping rates of barren solution pumped to the heap leach pad for leaching are provided in Table 2.6-1. The use of cyanide in make-up water, and thus barren solution flow did not begin until August 17. The steady increase in the average barren flow rate from August to December reflect ramping up of the process leaching system.

117d) The total monthly volumes and the average pumping rates of pregnant solution pumped from the In-heap Pond to the ADR are provided in Table 2.6-1. The use of cyanide in make-up water, and thus pregnant solution flow did not begin until sometime after August 17. The steady increase in the average pregnant flow rate from August to December reflect ramping up of the process leaching system.

117e) The total monthly volumes of water flowing or pumped from the In-Heap Pond to the Events Pond is provided in Table 2.6-1. The only time water was transferred from the In-Heap Pond to the Events Pond was for leak detection tests in April 2019 during the initial commissioning of the facility.

117f) The total monthly volumes of water pumped from the Events Pond to the ADR and the In-Heap Pond are provided in Table 2.6-1. No water was transferred from the Events Pond to the ADR or from the Events Pond to the HLF during 2019.

117g) The total monthly volumes of precipitation falling on the HLF and the Events Pond catchments are provided in Table 2.6-1. These values reflect the catchments below diversions and include the volumes of snow as snow water equivalents.

117h) The total monthly volumes of Water Transfers into the HLF are provided in Table 2.6-1. The April 2019 volume represents the total water left in the In-Heap Pond after leak detection tests during commissioning of the facility. The July through December values reflect groundwater input from the main production well.

117i) The total monthly volumes and average treatment rates of any solution treated in the MWTP and released to the environment are provided in Table 2.6-1. No HLF solution water was released to the environment and the MWTP has not yet been constructed.

117j) The daily average moisture volumes of ore delivered to the HLF is provided in Appendix D.

117k) The monthly volumes of water added to the HLF as ore moisture content are provided in Table 2.6-1. These values are based on the daily moisture volumes in Appendix D.

Table 2.6-1: Heap Leach Solution Inventory Monitoring Program - Monthly Volumes and Flow Rates

End of Month	117b) Month-end Volume of Water Stored in the HLF (m^3)[a]	117c) Total Volume of Barren Solution Pumped to HLF (m^3)	117c) Average Barren Flow Rate (m^3/hr)	117d) Total Pregnant Volume Pumped to HLF (m^3)	117d) Average Pregnant Return Flow Rate (m^3/hr)	117e) Total Volume from In-Heap Pond to Events Pond (m^3)	117f) Total Volume from Events Pond to ADR (m^3)	117f) Total Volume from Events Pond to HLF (m^3)	117g) Total Precipitation Falling on HLF and Event Pond Catchments (m^3)	117h) Total Volume of Water Transfers Pumped into HLF/ADR (m^3)	117i) Total Volume of HLF Solution Treated and Released (m^3)	117k) Total Volume of Water Added to HLF as Ore Moisture (m^3)
April [b]	13,387	NC	NC	NC	NC	8,122	0	0	3,986	5,541	0	0
May	41,368	NC	NC	NC	NC	0	0	0	3,847	0	0	0
June	53,239	NC	NC	NC	NC	0	0	0	16,960	0	0	0
July [c]	54,283	0	0	0	0	0	0	0	9,931	5,722	0	1,229
August	59,263	181,123	503	181,123	503	0	0	0	3,497	17,845	0	3,812
September	91,575	479,035	665	479,035	665	0	0	0	9,441	16,056	0	3,429
October	124,350	462,105	621	461,681	621	0	0	0	9,597	20,823	0	4,701
November	166,676	458,564	637	432,712	601	0	0	0	19,782	18,134	0	6,404
December	188,893	586,656	789	586,656	789	0	0	0	13,202	22,153	0	2,286

NOTES:

NC - not commissioned; barren and pregnant flows with cyanide began August 17, 2019.

a) - Defined as total water stored in In-Heap Pond minus field capacity, plus the draindown volume stored above the In-Heap Pond at optimum moisture minus residual by volume, plus water stored in the Events Pond, plus snow (as SWE) stored within the In-Heap Pond and Events Pond catchments.

b) - Water transfers were conducted to perform leak testing on the ponds during commissioning of these facilities.

c) - Began circulating water onto HLP on July 23.

2.6.2 HLF Foundation Drainage System Monitoring

The WUL condition #134a requires that the annual report include a description of the water use and also a description of any deposit of waste carried out during the year associated with leakage into the Leak Detection and Recovery System (LDRS) of the HLF. There was no deposit of waste associated with the LDRS. All leakage was recovered in the LDRS and pumped back into the process solution circuit. The following describes the operation of the LDRS during 2019.

The Leak Detection and Recovery System (LDRS) within the In-Heap Pond has a sump that is located at the bottom of the In-Heap Pond. The sump sits between the closure sump and the PLS sump, with a bottom elevation of 908.5 m sealed with an 80-mil (2.0mm) LLDPE primary liner. The top of the sump lies at 911.5 m and is sealed with a 60-mil (1.5 mm) LLDPE secondary liner. The leak detection layer of the liner system (i.e., geonet material located between the two geomembranes) under the In-Heap Pond drains into the LDRS sump. The LDRS pump casings consist of steel 600-mm pipes which ends in a perforated hammer head configuration at the bottom of the sump. A grid of corrugated, perforated 250-mm N-12 pipes collect and direct seepage towards the LDRS pump casings and LDRS pump. The pump is sized to sufficiently remove fluids to minimize head on the bottom liner. The LDRS sump is filled with crushed overliner drain fill material. The LDRS sump is also equipped with an instrument casing that houses a vibrating wire piezometer (VWP), which is used to monitor fluid levels in the LDRS sump.

Based on 2019 VWP data, LRDS sump fluid levels fluctuated between 10 and 60m cm above the top of the pump casing in response to frequent periodic pumping (no less frequent than every seven days) and subsequent slow recharge (or leakage). In many cases the pumped fluid would surge or pulse indicating that the sump ODF was not saturated and fluid levels were near the bottom of the sump during pumping. Thus, fluid levels in the LDRS sump were always in the lower portions of the sump and sufficiently low enough to limit any hydraulic head on the bottom of the secondary liner. Based on the piezometer data leakage rates were estimated to range from 3,800 L/day when In-Heap Pond levels were at their lowest and up to 10,800 L/day when pond levels were near the highest.

In general, these rates were below Alert Level 1 (AL1) leakage rates (Figure 2.6-1), which are the expected leakage rates based on design criteria and reflect the as-built conditions. The AL1 is based on a small defect leakage rate, which is intended to represent the leakage rate expected from geomembranes installed with strict construction quality assurance. As depicted in Figure 2.6-1, AL rates vary with the pond level since the hydraulic head dictates the rate of leakage through a hole or seam defect.

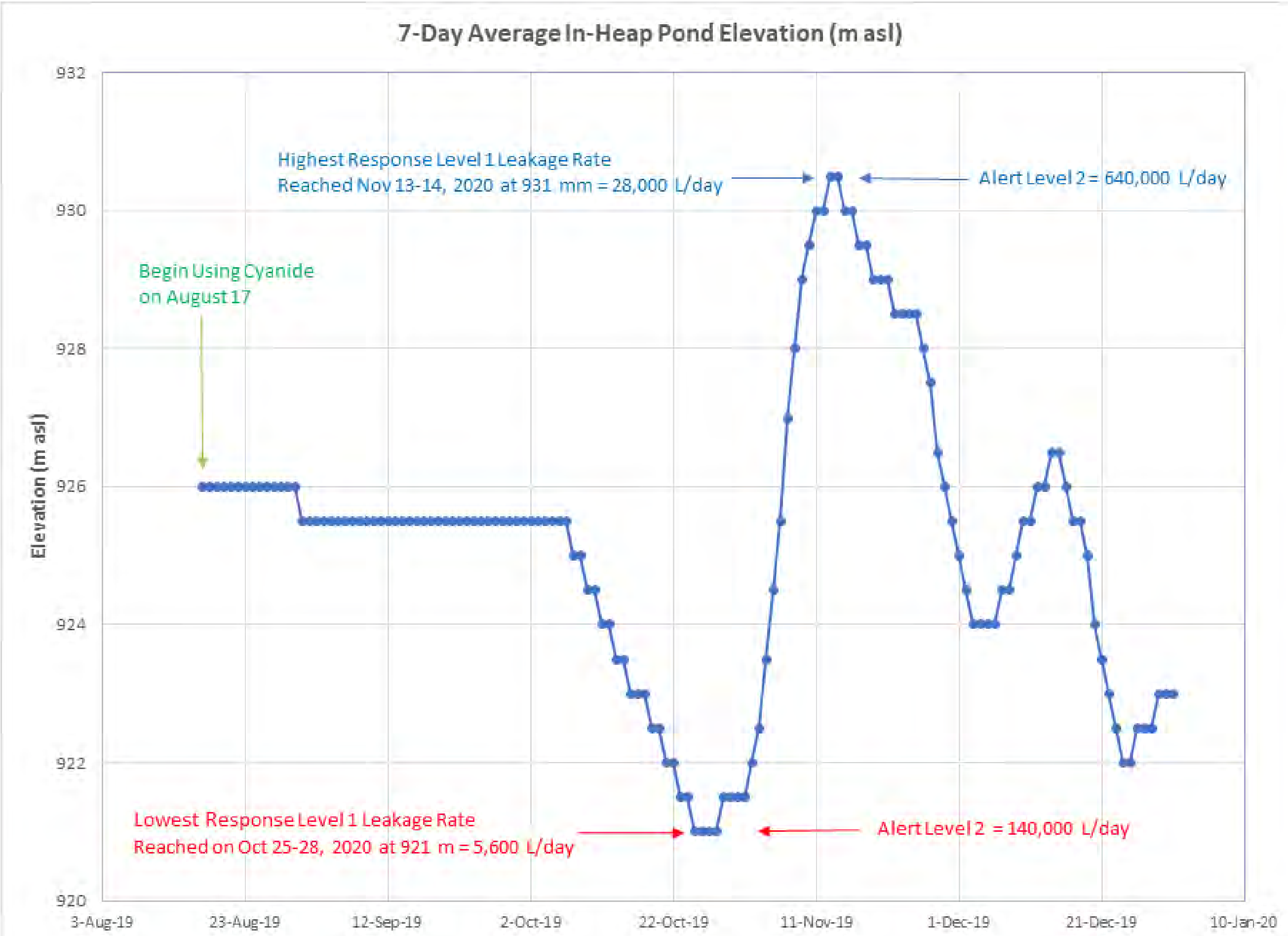


Figure 2.6-1: 2019 LDRS Leakage Recovery Rates and Response (Alert) Levels Associated with In-Heap Pond Levels

3 ENVIRONMENTAL MONITORING

3.1 Surface Water Hydrology

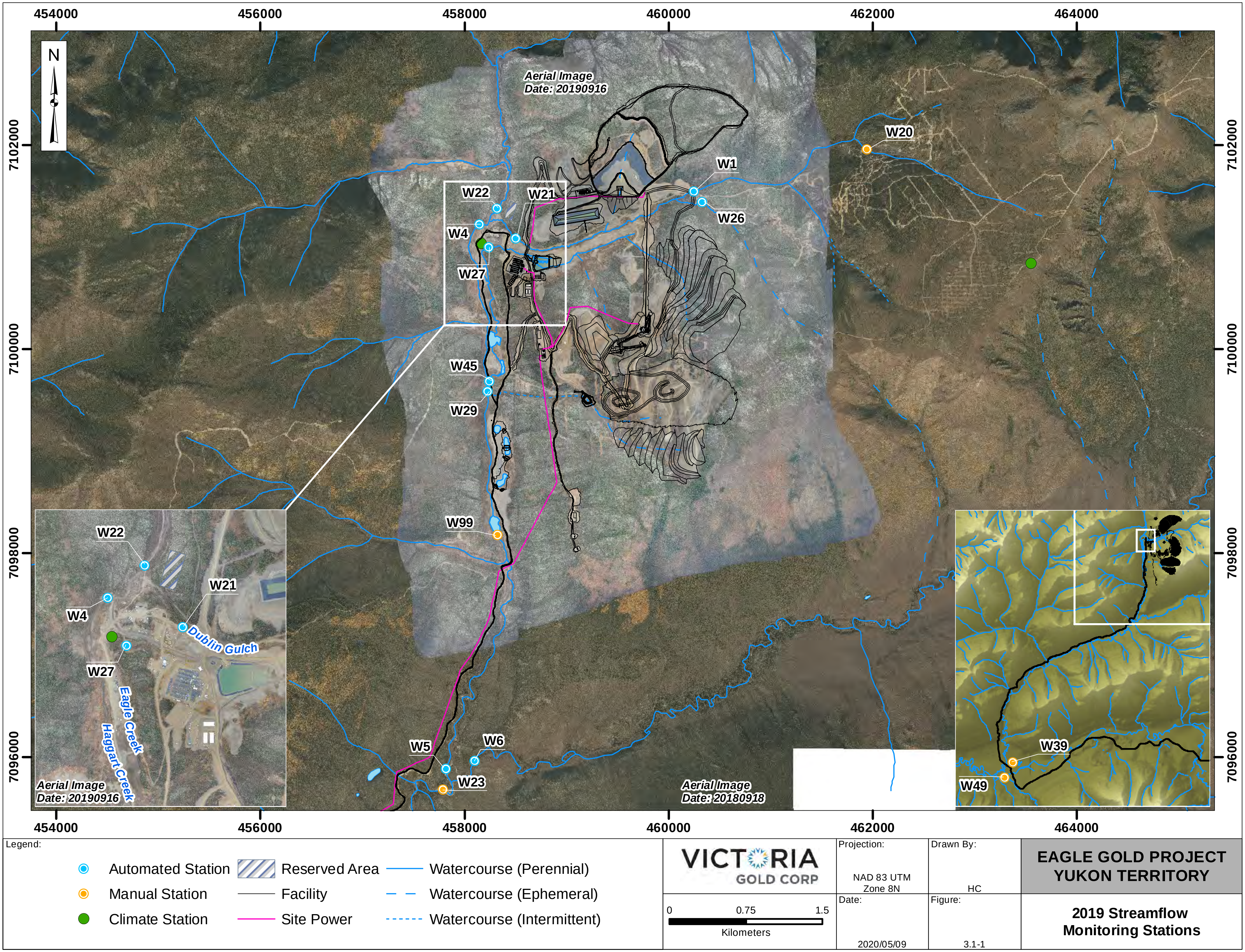
The *Streamflow Monitoring Report - 2019 Update* included as Appendix E presents a summary of baseline streamflow data collected for the Project since August 2007, including hydrometric information summarized in previous reports (Stantec 2012a; Knight Piésold 2013 and Lorax 2016 and 2019) and data collected in 2019. Figure 3.1-1 shows the locations of Project hydrometric stations monitored and Table 3.1-1 presents station monitoring records and drainage information for automated stations (stations collecting continuous water level data).

Table 3.1-1: Project Hydrology Stations

Station	Station Name	Record Period	Northing	Easting	Drainage Area (km^2)	Median Basin Elevation (m)	Notes
W1	Dublin Gulch above Stewart Gulch	2007 - 2019	7101545	460249	6.8	1,303	Continuous discharge time-series
W4	Haggart Creek below Dublin Gulch	2007 - 2019	7101223	458144	76.9	1,125	Continuous discharge time-series
W5	Haggart Creek above Lynx Creek	2007 - 2019	7095888	457815	97.5	1,091	Continuous discharge time-series
W6	Lynx Creek above Haggart Creek	2007 - 2019	7095964	458099	100.9	1,049	Continuous discharge time-series
W21[2]	Dublin Gulch below Event Ponds	2018 - 2019	7101261	458359	10.1	1,216	Continuous discharge time-series
W22	Haggart Creek above Dublin Gulch	2007 - 2019	7101377	458319	66.8	1,113	Continuous discharge time-series
W26	Stewart Gulch	2007 - 2019	7101443	460331	1.3	1,183	Continuous discharge time-series, manual data only for 2007-2009, 2011
W27	Eagle Creek near Camp	2007 - 2019	7100997	458235	2.7	1,037	Continuous discharge time-series, manual data only for 2007 and 2018
W29[3]	Haggart Creek below Eagle Creek	2010 - 2015	7099583	458225	86.1	1,112	Manual measurements for 2010, 2016-2019. Continuous data from 2011 to 2015
W45	Eagle Creek at Mouth	2018 - 2019	7099740	458243	86.1	1,112	Continuous discharge time-series
W99	Haggart Creek above 15 Pup	2019	7098180	458322	90.1	1,116	Continuous discharge time-series

NOTES:

1. Source of UTM co-ordinates, drainage area and median basin elevation (Knight-Piesold, 2013)
2. Water level sensor malfunctioned in 2019, therefore no continuous water level data are available for the year
3. No continuous water level data are available for this station for 2016-2019, however manual measurements continue (see Lorax, 2020)



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W39
W49
Dublin Gulch
Eagle Creek
Haggart Creek
Legend:
Automated Station
Manual Station
Climate Station
Reserved Area
Facility
Site Power
Watercourse (Perennial)
Watercourse (Ephemeral)
Watercourse (Intermittent)
VICTORIA GOLD CORP
0 0.75 1.5
Kilometers
Projection: NAD 83 UTM Zone 8N
Drawn By: HC
Date: 2020/05/09
Figure: 3.1-1
EAGLE GOLD PROJECT
YUKON TERRITORY
2019 Streamflow Monitoring Stations

3.1.1 Surface Water Hydrology Monitoring

Streamflow data for the eleven stations listed in Table 3.1-1 are presented in Appendix E in the following formats:

- Monthly tables showing average, maximum and minimum 15-minute discharge values (m^3/s);
- Monthly tables showing average discharge (m^3/s), average unit yields ($L/s/km^2$) and total runoff (mm);
- Time-series plots of continuous average daily discharge (m^3/s) and spot flow measurements (m^3/s), and;
- Time series plots of average daily unit yields ($L/s/km^2$), by year.

Station W45 only has manual flows reported, as no clear rating curve has yet been developed for this station due to changes that occurred in the vicinity of the station which affected the stage/discharge relationship. The station will be re-evaluated in 2020.

Issues were encountered with the stage records for 2019 at the following stations:

- W1 - Continuous logging data was not collected from May 21 to August due to logger memory failure;
- W21 - Continuous logging data was not collected in 2019 as the water level logger experienced a malfunction;
- W27 - Continuous logging data was not collected from July 23 to August 31 when the flume was under repair; and,
- W29 - The stilling well and datalogger at W29 were decommissioned due to channel instability in the area and manual measurements were subsequently taken as this station was replaced by W99 (which is further downstream).

Tables 3.1-2 to 3.1-9 below compare the complied streamflow summary statistics (average, minimum and maximum flows) for 2019 to the same statistics compiled over the full period of baseline record. All values are in m^3/s using 15-minute continuous discharge records.

Table 3.1-2: W1 Comparison of 2019 Summary Statistics to Baseline Record

Year	Variable	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	Average	--	--	--	--	--	--	--	0.029	0.039	--	--	--
	Maximum	--	--	--	--	--	--	--	0.045	0.166	--	--	--
	Minimum	--	--	--	--	--	--	--	0.020	0.021	--	--	--
All Years	Average	--	--	--	0.024	0.235	0.097	0.087	0.083	0.087	0.101	0.069	--
	Maximum	--	--	--	0.104	1.304	0.474	0.346	0.311	0.557	0.719	0.091	--
	Minimum	--	--	--	0.004	0.012	0.006	0.005	0.048	0.054	0.004	0.004	--

Table 3.1-3: W4 Comparison of 2019 Summary Statistics to Baseline Record

Year	Variable	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	Average	--	--	--	--	1.814	0.645	0.319	0.267	0.472	0.366	--	--
	Maximum	--	--	--	--	4.105	3.468	0.424	0.329	2.905	0.504	--	--
	Minimum	--	--	--	--	0.190	0.304	0.239	0.224	0.220	0.219	--	--

Year	Variable	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
All Years	Average	--	--	--	0.237	1.993	0.985	0.773	0.818	0.856	0.773	0.847	--
	Maximum	--	--	--	0.592	7.034	5.411	4.834	6.649	2.905	5.001	1.145	--
	Minimum	--	--	--	0.150	0.060	0.304	0.090	0.159	0.021	0.021	0.565	--

Table 3.1-4: W5 Comparison of 2019 Summary Statistics to Baseline Record

Year	Variable	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	Average	--	--	--	--	3.299	1.102	0.381	0.283	0.685	0.701	--	--
	Maximum	--	--	--	--	6.205	5.798	0.594	0.434	4.118	1.664	--	--
	Minimum	--	--	--	--	1.026	0.324	0.153	0.132	0.170	0.315	--	--
All Years	Average	--	--	--	--	3.082	1.357	0.975	0.970	0.995	1.000	--	--
	Maximum	--	--	--	--	17.273	6.140	6.883	6.815	4.196	4.904	--	--
	Minimum	--	--	--	--	0.819	0.264	0.153	0.132	0.124	0.081	--	--

Table 3.1-5: W6 Comparison of 2019 Summary Statistics to Baseline Record

Year	Variable	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	Average	--	--	--	--	2.108	0.487	0.263	0.209	0.418	0.311	--	--
	Maximum	--	--	--	--	5.138	1.077	0.370	0.272	2.821	0.452	--	--
	Minimum	--	--	--	--	0.280	0.247	0.181	0.166	0.162	0.161	--	--
All Years	Average	--	--	--	--	2.976	1.121	0.918	1.060	1.133	0.950	0.903	--
	Maximum	--	--	--	--	17.947	6.767	7.120	5.348	4.249	5.172	1.788	--
	Minimum	--	--	--	--	0.280	0.136	0.038	0.166	0.162	0.112	0.385	--

Table 3.1-6: W22 Comparison of 2019 Summary Statistics to Baseline Record

Year	Variable	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	Average	--	--	--	--	1.473	0.687	0.368	0.319	0.560	0.433	--	--
	Maximum	--	--	--	--	2.680	3.371	0.524	0.398	2.951	1.129	--	--
	Minimum	--	--	--	--	0.015	0.289	0.275	0.254	0.248	0.169	--	--
All Years	Average	--	--	--	0.613	1.847	0.864	0.655	0.761	0.766	0.693	0.937	--
	Maximum	--	--	--	1.455	20.630	5.287	3.198	3.928	2.951	3.330	1.342	--
	Minimum	--	--	--	0.125	0.015	0.105	0.002	0.186	0.106	0.060	0.558	--

Table 3.1-7: W26 Comparison of 2019 Summary Statistics to Baseline Record

Year	Variable	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	Average	--	--	--	--	--	0.003	0.002	0.001	0.001	0.002	--	--
	Maximum	--	--	--	--	--	0.005	0.003	0.003	0.005	0.003	--	--
	Minimum	--	--	--	--	--	0.002	0.001	0.000	0.000	0.001	--	--
All Years	Average	--	--	--	--	0.018	0.016	0.013	0.014	0.012	0.008	--	--
	Maximum	--	--	--	--	0.060	0.094	0.143	0.054	0.063	0.058	--	--
	Minimum	--	--	--	--	0.012	0.001	0.001	0.004	0.004	0.002	--	--

Table 3.1-8: W27 Comparison of 2019 Summary Statistics to Baseline Record

Year	Variable	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	Average	--	--	--	--	--	0.010	0.008	--	0.006	0.006	--	--
	Maximum	--	--	--	--	--	0.013	0.011	--	0.012	0.007	--	--
	Minimum	--	--	--	--	--	0.007	0.006	--	0.004	0.004	--	--
All Years	Average	--	--	--	--	0.086	0.031	0.024	0.021	0.020	0.025	--	--
	Maximum	--	--	--	--	0.335	0.144	0.315	0.138	0.123	0.105	--	--
	Minimum	--	--	--	--	0.002	0.0005	0.0004	0.015	0.017	0.005	--	--

Table 3.1-9: W99 Comparison of 2019 Summary Statistics to Baseline Record

Year	Variable	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	Average	--	--	--	--	--	0.571	0.321	0.270	0.470	0.401	--	--
	Maximum	--	--	--	--	--	1.084	0.421	0.332	2.164	0.888	--	--
	Minimum	--	--	--	--	--	0.314	0.230	0.208	0.201	0.070	--	--

NOTE:
W99 station was installed in 2019, so there is no comparison to a longer record.

3.1.2 Site QA/QC Programs

3.1.2.1 Stage Measurements and Corrections

All automated stations were instrumented with metric staff gauges, mounted to vertical angle iron in the stream channel, and regularly surveyed to nearby benchmarks. Continuously recording HOBO pressure transducers were installed in stilling wells and set to record water level every 15 minutes. These readings were corrected for fluctuations in barometric pressure in a post-processing step. During each site visit, water level was noted on the staff gauge. These readings form the basis for the continuous water level records, which were adjusted to match the manual stage readings. Level surveys determined the staff gauge zero datum and water level, and were used to correct the station records for changes due to shifts in the channel bed (i.e., aggradation or scour), frost-jacking or station relocation following a high-magnitude flood event.

3.1.2.2 Rating Curve Error

The overall quality of the discharge record was assessed by reviewing the average and standard errors calculated from the differences between the measured discharges, and those estimated from the rating equation. A positive rating curve error is defined where the discharge calculated from the rating curve overestimates the value when compared to the measured discharge, and vice-versa for a negative error.

A summary of the error metrics for all stations and rating curve control percentages are presented in Table 3.1-10. Rating curve control values indicate the percent of time that a continuously recorded observation (15-minute intervals) falls between the highest and lowest manually recorded measurements for each monitoring station.

Overall, the rating curves provided reasonable estimates of discharge across a wide range of flows at most of the Project stations. The rating curve errors presented in Table 3.1-10 indicate that the average errors were relatively low, ranging from -4% to 1%. The standard error, or the degree of variability about the average error values varied more between stations, from a high of 24% for station W1, to a low of 9% for station W6. Note that the W21 and

W99 curves are currently comprised of less than ten paired stage: discharge measurements. Accordingly, these curves are considered preliminary and subject to change.

Rating curves for the site hydrometric stations are presented Appendix E. For the 2017 update (Lorax 2018), the rating equations were compared to those previously developed for each station to ensure that the coefficients and exponents were consistent through time. After examining the 2018 data, no further updates to the rating curves developed in 2017 were necessary, and the same curves were applied to the 2018 continuous water level data (Lorax 2019). A similar conclusion was drawn based on inclusion of field data collected in 2019 within the rating relations per monitoring station (Lorax 2020). Note that because stations W26 and W27 are instrumented with Parshall flumes, rating curves were not developed for these stations. The rating curve plot and error table for the relatively new hydrometric station W99, are provided in Appendix E.

Table 3.1-10: Rating Curve Error Summary for Project Hydrometric Stations

Station	Measurements (n)	Average Error (%)	Standard Error (%)	Rating Curve Control
W1	41	-4%	24%	98%
W4	47	-1%	14%	98%
W5	40	1%	15%	97%
W6	34	-1%	9%	96%
W21	6	-4%	12%	79%
W22	40	1%	15%	100%
W26	32	--	--	100%
W27	48	--	--	100%
W29	18	-2%	10%	95%
W99	5	0%	9%	85%
Average	**34**	**-1%**	**13%**	**95%**

NOTES:
Stations W26 and W27 currently have Parshall flumes installed, and therefore rating curves were not developed for these sites as part of this baseline streamflow update

3.1.3 Adaptive Management

Specific adaptive management thresholds for surface water flows were not developed for the construction phase of the Project due to the lack of significant water withdrawals required for that phase (i.e., no makeup water withdrawal was necessary for leaching operations).

During the operations phase of the Project in 2019, flows in all streams either within the Project footprint or utilized as reference sites were observed to be below baseline averages. Due to the reduced flows observed in all monitored streams upstream and downstream of project activities (as shown in Table 3.1-11) and the low volumes of water required for the startup of operations, these conditions are assumed to be related to the low precipitation experienced throughout the year.

Table 3.1-11: Streamflow Adaptive Management Summary

Month	Station	2019 Measured Average Streamflow (m^3/s)	2007-2019 Average Streamflow[1] (m^3/s)	Variance	Average Monthly Variance	2007-2018 Recorded Minimum[1] (m^3/s)	2007-2018 Recorded Maximum[1] (m^3/s)
May	W1	N/A	0.235	-95%	-43%	0.012	1.30
	W4	1.534	2.064	-26%		0.150	7.03
	W22	1.387	2.170	-36%		0.015	20.63
	W5	2.806	3.125	-10%		0.819	17.27
	W6	2.093	3.656	-43%		0.280	17.94
June	W1	0.061	0.097	-37%	-31%	0.006	0.47
	W4	0.645	0.976	-34%		0.06	5.41
	W22	0.687	0.851	-19%		0.105	5.29
	W5	1.102	1.292	-15%		0.264	6.14
	W6	0.487	1.024	-52%		0.136	6.77
July	W1	0.037	0.086	-57%	-61%	0.005	0.34
	W4	0.319	0.819	-61%		0.304	4.83
	W22	0.368	0.773	-52%		0.002	3.20
	W5	0.381	0.975	-61%		0.153	6.88
	W6	0.263	0.919	-71%		0.038	7.12
August	W1	0.029	0.083	-65%	-68%	0.048	0.31
	W4	0.267	0.813	-67%		0.090	6.65
	W22	0.319	0.752	-58%		0.186	3.93
	W5	0.283	0.957	-70%		0.132	6.82
	W6	0.209	1.044	-80%		0.166	5.34
September	W1	0.039	0.087	-55%	-44%	0.054	0.56
	W4	0.472	0.856	-45%		0.159	2.91
	W22	0.560	0.766	-27%		0.106	2.95
	W5	0.685	0.995	-31%		0.124	4.20
	W6	0.418	1.131	-63%		0.162	4.24
October	W1	0.039	0.098	-60%	-54%	0.004	0.72
	W4	0.306	0.778	-61%		0.021	5.00
	W22	0.374	0.723	-48%		0.060	3.30
	W5	0.723	1.059	-32%		0.081	4.90
	W6	0.306	0.965	-68%		0.112	5.17

NOTES:

1 - Taken from Lorax (2020). Eagle Gold Streamflow Monitoring report - 2019 Update. March 19, 2020.
2 - Taken from Lorax (2019). Eagle Gold Streamflow Monitoring report - 2018 Update. March 12, 2019.
3 - Grey cells represent reference monitoring locations that are unimpacted by the Project.

4 - November and December baseline dataset insufficient for comparative analysis.

3.2 Surface Water Quality

3.2.1 Surface Water Quality Monitoring

Surface water quality monitoring programs are outlined in the Environmental Monitoring, Surveillance and Adaptive Management Plan (EMSAMP). Surface water quality monitoring in 2019 consisted of monitoring those sites as identified for both the construction and operations phase monitoring in the EMSAMP (Table 3.2-1) which includes all receiving environment locations specified in the regulatory approvals for the Project.

3.2.1.1 2019 Monitoring Program

The 2019 surface water quality monitoring program included continuing the surveillance of watercourses monitored during baseline studies, and included those locations downstream of the Project where water quality objectives must be met. The 2019 program was designed to meet the following objectives:

- Collected water quality data in the receiving environment as the Project transitioned from construction to operations at stations upstream and downstream of Project influences.
- Collected water quality data at compliance discharge stations as specified in QZ14-041.
- Provided a comprehensive water quality database that supported adaptive management strategies developed to meet water quality objectives and compliance criteria, while protecting aquatic life.

Surface water quality monitoring had two main focuses: effluent quality monitoring during two brief discharge events and environmental effects monitoring. Effluent quality monitoring was focused on sampling compliance (or discharge) points to compare with effluent criteria. Environmental effects monitoring focused on collecting data to evaluate whether water quality objectives were being achieved in the following watersheds:

- Haggart Creek
- Dublin Gulch
- Eagle Creek
- Lynx Creek and
- South McQuesten (at the confluence of Haggart Creek).

The water quality monitoring program is not intended to be a static program; stations will be added or removed according to the conditions and adaptive management as required. During the first half of 2019 (January to June), surface water quality monitoring followed the plan developed for construction (Table 3.2-1). Then in July, operational monitoring began. The water use licence amendment was granted in Aug 2019; it included some changes to the EMSAMP, including additional locations, and changes to the frequency and analytes required, which is provided in Table 3.2-2. Results of the surface water quality monitoring program are described in Lorax (2020), which is included as Appendix F. A summary of the results is provided below.

Eleven monthly and three quarterly surface water quality monitoring stations were monitored in 2019 in accordance with the EMSAMP and the regulatory approvals for the Project. Further, six internal stations were monitored in accordance with the EMSAMP (see Appendix B of Appendix F). An attempt to sample was made each month or quarter at each station as per the licence schedule outlined in Table 3.2-1 and Table 3.2-2, however due to frozen conditions or unsafe ice conditions it was not always possible to obtain a sample. These instances were noted and recorded. Complete analytical datasets for all sampled locations for the reporting period were provided as part of monthly reporting responsibilities (are not included here). During the reporting period there were two discharges of contact water to surface water from the LDSP during April 2019. No other effluent discharge points were established.

Table 3.2-1: Surface Water Quality Monitoring Locations and Frequency – Construction and Operations (January through July)

Station	Location Description	Coordinates (Zone 8)		Sampling Frequency***			
				Field Measurements		Laboratory Analysis	
		North	East	Turbidity	pH, Temperature, Dissolved Oxygen, Turbidity and Conductivity	Turbidity and Total Suspended Solids	Full Analytical Suite
W1	Dublin Gulch above Stewart	7101545	460249	-	M	-	M
W21	Dublin Gulch at mouth	7101261	458359	-	M	-	M
W4	Haggart Creek below Dublin	7101223	458144	-	M	-	M
W22	Haggart Creek above Project Influence	7101378	458319	-	M	-	M
W5	Haggart Creek above Lynx Creek	7095888	457814	-	M	-	M
W6	Lynx Creek above Haggart Creek	7095964	458099	-	Q	-	Q
W20	Bawn Boy Gulch	7101961	461945	-	M	-	M
W23	Haggart Creek below Lynx Creek	7095682	457790	-	M	-	M
W26	Stewart Gulch	7101443	460331	-	M	-	M
W27	Eagle Creek near Camp	7100997	458235	-	M	-	M
W29	Haggart Creek below Eagle Creek and Platinum Gulch	7099583	458225	-	M	-	M
W39	Haggart Creek above South McQuesten River	7086504	449780	-	Q	-	Q
W45	Eagle Creek above Haggart Creek	7099684	458243	-	M	-	M
W49	South McQuesten River below Haggart Creek	7085495	449221	-	Q	-	Q
EPS	Eagle Pup WRSA Seepage*	7100909	459834	D	Md	Wd	Md
PDI	Platinum Gulch Ditch into Lower Dublin South Pond*	7099523	459184	D	Md	Wd	Md
LDSPI	Lower Dublin South Pond Inflow*	7100824	458926	D	Md	Wd	Md
LDSPO	Lower Dublin South Pond Outflow**	7100857	458672	D	Md	Wd	Md
CS-01	Sediment Basin - below Lower Process Access Road**	7101146	458528	D	Md	Wd	Md
CS-02	Sediment Basin – below Truck Shop**	7101146	458476	D	Md	Wd	Md
CS-03	Sediment Basin - below south infrastructure**	7098410	458407	D	Md	Wd	Md

Station	Location Description	Coordinates (Zone 8)		Sampling Frequency***			
				Field Measurements		Laboratory Analysis	
		North	East	Turbidity	pH, Temperature, Dissolved Oxygen, Turbidity and Conductivity	Turbidity and Total Suspended Solids	Full Analytical Suite
CS-04	SB-G4 – below Ice Rich Overburden Storage Area**	7098627	458268	D	Md	Wd	Md

NOTES:
* Internal transfer points between engineered structures to be monitored as they become active, none became active during the reporting period;

** Effluent discharge points to be monitored as they become active, none were developed during the reporting period.

***D - Daily when discharging; M – Monthly; Md - Monthly when discharging; Q – Quarterly; Wd - Weekly when discharging

Table 3.2-2: Surface Water Quality Monitoring Locations and Frequency - Operations (August through December 2019)

Site	Location Description	Coordinates (Zone 8)		Sampling Frequency		
				Field Measurements	Laboratory Analysis	
		North	East	pH, Temperature, Dissolved Oxygen and Specific Conductance	Analytical Suite	48-Hour and 96-Hour LT50
W1	Dublin Gulch above Stewart	7101545	460249	M	M	-
W21	Dublin Gulch below Event Ponds	7101261	458359	M	M	-
W4	Haggart Creek below Dublin	7101223	458144	D, M	D[1], M[1]	-
W22	Haggart Creek above Project Influence	7101378	458319	M	M[2]	-
W5	Haggart Creek above Lynx Creek	7095888	457814	M	M[2]	-
W6	Lynx Creek above Haggart Creek	7095964	458099	M	M[2]	-
W20	Bawn Boy Gulch	7101961	461945	M	M	-
W23	Haggart Creek below Lynx Creek	7095682	457790	M	M[2]	-
W27	Eagle Creek near Camp below LDSP	7100997	458235	M	M	-
W26	Stewart Gulch	7101443	460331	M	M	-
W29	Haggart Creek below Eagle Creek & Platinum Gulch	7099583	458225	D, M	D[1], M[2]	-
W39	Haggart Creek above South McQuesten River	7086504	449780	Q	Q[2]	-
W45	Eagle Creek above Haggart Creek	7099684	458243	M	M	-
W49	South McQuesten River below Haggart Creek	7085495	449221	Q	Q[2]	-
W99	Haggart Creek above 15 Pup	7098180	458322	M	M[2]	-
EPS	Eagle Pup WRSA Seepage	7100909	459834	M	M	-
PDI & PG_PTS[5]	Platinum Gulch Ditch into Lower Dublin South Pond	7099523	459184	M	M	-
PGS	Platinum Gulch WRSA Seepage	7099436	459281	M	M	-

Site	Location Description	Coordinates (Zone 8)		Sampling Frequency		
				Field Measurements	Laboratory Analysis	
		North	East	pH, Temperature, Dissolved Oxygen and Specific Conductance	Analytical Suite	48-Hour and 96-Hour LT50
PS	Open Pit Sump	7099574	459536	M	M	-
LDSPI	Lower Dublin South Pond Inflow	7100824	458926	D, M	D[2], M	M
LDSP	Lower Dublin South Pond Outflow	7100857	458672	D, W	D[2], W[2,3]	Md
CS-07	SG-G4 – below Ice Rich Overburden Storage Area	7098627	458268	Md	Md	-
LDSP-UND	LDSP Underdrain Outflow	7100937	458570	M	M[3]	-
HLFUMV	Heap Leach Facility Underdrain Monitoring Vault	7101298	459445	C, D, W	D[4], M[2,3]	M
ADR Pad Ditch	ADR Pad Ditch Outlet	7101471	459043	D, M	D[2], M[2,3]	

NOTES:
1 – Laboratory analysis includes WAD, Total CN, Thiocyanate and Cyanate.
2 – Laboratory analysis includes WAD and Total CN.
3 – Calculation of un-ionized ammonia
4 - Laboratory analysis only includes WAD and Total CN - no other parameters required.
5 – Platinum ditch intake converted to Platinum Gulch PTS when PG WRSA is progressively reclaimed
6 – Closure phase only
C – Continuous monitoring for specific conductance; D – Daily when discharging; W – Weekly when discharging; M – Monthly; Md – Monthly when discharging; Q – Quarterly

3.2.2 Water Quality Results

The following section focuses on surface water quality monitoring results for locations in Haggart Creek at W4, W29, W99 and W23. To add additional context to the discussion where appropriate, monitoring results from background water quality station W22 in Haggart Creek are also presented. Further for additional context to the Haggart Creek results, the results for Dublin Gulch (W1 upstream from project, and W21 at mouth of creek) are summarized.

Based on monitoring results for 2019, dissolved Al, total As, total Cu and total Fe were observed to exceed Schedule 3 QZ14-041-1 WQOs at the four receiving water monitoring stations in Haggart Creek during the early spring period. Table 3.2-3 summarizes the number of times WQOs were exceeded at the key monitoring locations in Haggart Creek for each water quality parameter stipulated in Schedule 3. The summary below focuses on TSS and arsenic as the two key parameters that characterize seasonal variability with respect to achieving WQOs. More detailed summary discussions for Al, Cu, Fe as well as sulphate, selenium and uranium are provided in Appendix F.

Table 3.2-3: Number of Sampling Occasions where WQOs were Exceeded in Haggart Creek in 2019

Parameter List		WQOs W4, W29, W99, W23	W4	W29	W99	W23
Dissolved Parameters	SO_4	309	0	0	0	0
	Cl	150	0	0	0	0

Parameter List		WQOs W4, W29, W99, W23	W4	W29	W99	W23
	Nitrate-N	3	0	0	0	0
	Nitrite-N	0.02	0	0	0	0
	NH_3-N	1.13	0	0	0	0
	CN_{WAD}	0.005	0	0	0	0
	Al	0.1	**3**	**3**	**3**	**2**
Total Metalloids and Metals	Sb	0.02	0	0	0	0
	As	0.0085	**7**	**8**	**10**	**5**
	Cd	0.000197	0	0	0	0
	Cu	0.005	0	**2**	0	0
	Co	0.004	0	0	0	0
	Fe	1.0	**6**	**4**	**5**	**4**
	Pb	0.0077	0	0	0	0
	Hg	0.00002	0	0	0	0
	Mn	1.17	0	0	0	0
	Mo	0.073	0	0	0	0
	Ni	0.116	0	0	0	0
	Se	0.002	0	0	0	0
	Ag	0.0015	0	0	0	0
	U	0.015	0	0	0	0
	Zn	0.038	0	0	0	0

As presented, most parameters were measured at concentrations below their respective WQO at all locations and at all sampling periods in Haggart Creek (Appendix A-1 in Appendix F); only dissolved Al, total As, total Cu and total Fe were measured at concentrations above their respective WQO. As discussed below, these were limited to the early spring period and Table 3.2-4 provides a summary of the sampling dates where WQOs were exceeded.

Table 3.2-4: Dates that WQOs were Exceeded at Haggart Creek Monitoring Stations in 2019

Parameter List	W4	W29	W99	W23
Al (dissolved) Number	**3**	**3**	**3**	**2**
Dates	May 12 May 17 May 20	May 12 May 17 May 20	May 12 May 17 May 20	May 12 May 20
As (total) Number	**7**	**8**	**10**	**5**
Dates	April 27 April 28 April 29 May 12 May 17 May 20 September 11*	April 15 April 20 April 26 April 27 April 28 April 29 May 12 May 17	April 14 April 26 April 27 April 28 April 29 May 4 May 12 May 17	May 3 May 8 May 12 May 20 June 2

Parameter List	W4	W29	W99	W23
			May 20 May 27	
Cu (total) Number	**0**	**2**	**0**	**0**
Dates		April 20 May 17		
Fe (total) Number	**6**	**4**	**5**	**4**
Dates	April 27 April 28 April 29 May 12 May 17 May 20	April 20 April 27 May 12 May 17	April 27 May 12 May 17 May 20 May 27	May 8 May 12 May 20 June 2

NOTES:
* Results from September 11 is currently considered potentially erroneous as mot other measured metals or metalloid parameters were not highly elevated in the W4 September 11 sample.

As illustrated, except for one day in September, WQOs for aluminum, arsenic, copper and iron were not met at various times during the period from April 14 to June 2, 2019. Most notably for April 20 and April 26 to April 29, WQOs were not met during two brief discharge events from the LDSP; the details of the LDSP discharges are described in Appendix G. Specifically, during two separate events, and after on-site TSS lab results met discharge criteria, effluent was discharged from the final discharge point of the LDSP (FDP) on April 20, and during the period of April 27 to April 29. Subsequent sampling and later off-site lab analyses indicated that the quality of water deposited through the FDP at some point during the discharge exceeded MDMER Schedule 4 Authorized Limits of Deleterious Substances for TSS of 30 mg/L. While all other MDMER authorized discharge limits were met during the discharges, the total As concentrations exceeded the EQS of 0.053 mg/L. No subsequent discharges from the LDSP occurred after April 29, 2019.

3.2.2.1 Total Suspended Solids

Figure 2-3 in Appendix F illustrates the downstream TSS profile during 2019 and the effect of the natural freshet process and two brief discharge events on TSS concentrations in Haggart Creek. Increases in TSS at background station W22, upstream of the Eagle project, occurred with the onset of freshet in May 2019. Based on TSS values at W22, a clear freshet signature for Haggart Creek appears to have occurred around May 6, 2019; TSS concentrations on May 5 and May 7, 2019 were 3 mg/L and 70 mg/L, respectively (Figure 2-3 in Appendix F).

However, increases in TSS at downstream locations in Haggart Creek, primarily at W4 and W29 and to a much lesser extent at W99, were observed during late April and generally coincident with the FDP discharges described above. Additional TSS loadings can also be attributed to naturally elevated TSS values in Dublin Gulch during April and May, with values observed at W21 in the range of 200 to 500 mg/L (Figure 2-4 in Appendix F). Elevated TSS levels were also observed throughout monitoring locations in Haggart Creek in May and were associated with natural freshet-related increases in TSS in Haggart Creek as well as increased natural TSS loadings from Dublin Gulch (Figure 2-4 in Appendix F).

Sampling at W23 occurred once in April (i.e., April 14) and coincided with low TSS conditions throughout Haggart Creek, unlike the other upstream stations and did not occur later in the month during the FDP discharge. As such, increases in TSS at W23 were only observed during May and were similar in magnitude and concentration (e.g. peak TSS concentrations ranging between roughly 40 mg/L to 80 mg/L) to the upstream locations, including background location W22 (Figure 2-3 in Appendix F). Peak TSS concentrations were measured at station W29 on May 7, 2019 of 186 mg/L (Table 3.2-5). As described above, the elevated TSS concentrations in May were a direct result of freshet conditions and contributions of naturally elevated TSS entering Haggart Creek from Dublin Gulch (Figure 2-4 in Appendix F).

Table 3.2-5: Summary of Measured Total Suspended Solids Concentrations (mg/L) Statistics for Haggart Creek Stations 2019

Station	April			May			June			July - December		
	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min
W22	7	3	1	72	17	1	7	3	1	3	3	1
W4	58	29	3	126	43	1	12	6	3	7	3	1
W29	76	16	2	186	41	10	15	6	1	9	3	1
W99	25	13	2	53	29	6	21	3	1	5	3	1
W23	3	2	1	41	31	10	75[a]	3	2	3	3	1

NOTES:
a: Elevated TSS at W23 on June 2 result of 65 mg/L TSS input from Lynx Creek (W6) on June 2, 2019.

Upon cessation of freshet, TSS concentrations decreased at all stations within Haggart Creek as well as those in Dublin Gulch. For the month of June 2019, maximum TSS concentrations were generally less than 20 mg/L at all stations in Haggart Creek, with the exception of W23. Elevated TSS concentrations (75 mg/L) at W23 on June 2 likely reflect the input of high TSS loadings from Lynx Creek (a watercourse unaffected by Project activity) during that time. Station W6 in lower Lynx Creek, immediately upstream of the confluence with Haggart Creek and just upstream of W23, measured 65 mg/L TSS on June 2, 2019.

For the period of July to December 2019 the maximum observed TSS concentrations in all the monitoring stations in Haggart Creek did not exceed 10 mg/L, and the median concentrations for all stations were approximately 3 mg/L (Table 3.2-5).

Elevated total metal and metalloid concentrations including As, Al, Fe and to a lesser extent, Cu typically coincided with elevated TSS concentrations in Haggart Creek. As previously indicated, elevated TSS concentrations were observed during late April to very early June and coincident with both the limited LDSP discharge and naturally elevated TSS during freshet conditions. The following provides brief summaries of the effect of high TSS concentrations on arsenic concentrations.

3.2.2.2 Arsenic

Figure 2-5 in Appendix F illustrates the downstream profile of total and dissolved concentrations of As at W22, W4, W29, W99 and W23. Table 3.2-6 also provides a statistical summary of As measurements at each of the monitoring locations for 2019.

Table 3.2-6: Summary of Totals As Concentrations (mg/L) Statistics for Haggart Creek Stations - 2019

Station	April			May			June			July - December		
	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min
W22	0.0019	0.0010	0.0010	0.0068	0.0038	0.0008	0.0014	0.0011	0.0008	0.0025	0.0008	0.0007

Station	April			May			June			July - December		
	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min
W4	0.0501	0.0377	0.0338	0.0415	0.0116	0.0028	0.0032	0.0030	0.0030	0.0420[b]	0.0020	0.0019
W29	0.0625	0.0217	0.0097	0.0238	0.0067	0.0044	0.0037	0.0031	0.0026	0.0034	0.0026	0.0024
W99	0.0213	0.0158	0.0117	0.0203	0.0110	0.0067	0.0042	0.0039	0.0036	0.0038	0.0033	0.0029
W23	0.0078[a]			0.0184	0.0120	0.0094	0.0110	0.0078	0.0046	0.0048	0.0043	0.0039

NOTES:
Values in red highlight exceed the WQO of 0.0085 mg/L
a: n = 1 in that month therefore no statistics calculable.
b: reflects measurement on Sept 11 that is considered an outlier

Stations W4, W29 and W99 recorded the highest total As concentrations in April, with values ranging between approximately 0.021 mg/L (W99) to approximately 0.062 mg/L (W29), well above the WQO of 0.0085 mg/L. The elevated total As concentrations at these locations coincided with discharge periods from the LDSP (April 20 and April 27 – April 29; Figure 2-5 in Appendix F). Dissolved As concentrations during this same period were much lower, with maximum measured concentrations ranging between 0.007 mg/L and 0.013 mg/L (Table 2-4 in Appendix F, suggesting that the majority of the As loading in Haggart Creek at that time was associated with less bioavailable solid-phase As in suspended solids.

Elevated As concentrations at W4, W29, W99 and W23 were also observed in May with maximum total As concentrations ranging from 0.018 mg/L (W23) to 0.041 mg/L (W4) and well above the WQO. Conversely, corresponding maximum dissolved As concentrations ranged from 0.005 mg/L to 0.014 mg/L. No LDSP discharges occurred to Haggart Creek after the end of April and the increased As concentrations can be attributed to naturally elevated As loadings emanating from Dublin Gulch during this period (Figure 2-6 in Appendix F). Naturally elevated As concentrations occur in upper Dublin Gulch with total and dissolved As concentrations typically between 0.05 mg/L and 0.08 mg/L in Bawn Boy (station W20; Figure 2-6 in Appendix F). During the May freshet period, total As concentrations in lower Dublin Gulch ranged between approximately 0.1 mg/L to 0.35 mg/L and can account for the significant increase in As concentrations measured at W4.

In June, total As concentrations were lower at stations throughout Haggart Creek with the exception of very early June for station W23. On June 2 total As concentrations were approximately 0.011 mg/L at W23. Upstream stations were not sampled on that same date. However, W4 and W99 were sampled on June 3, one day later, and total As values were lower (0.0032 mg/L and 0.0042 mg/L, respectively) suggesting that the elevated concentrations in W23 emanated from Lynx Creek as noted above for TSS.

For the remainder of the 2019 monitoring period of July to December, maximum total As concentrations were less than 0.005 mg/L and below the WQO. Moreover, total and dissolved As values were very similar. Total and dissolved As concentrations at stations W4, W29 and W99 were typically between 0.002 mg/L and 0.003 mg/L. Total and dissolved As concentrations increased to values between 0.004 mg/L and 0.005 mg/L at W23 and reflect naturally elevated As loadings from Lynx Creek as measured at station W6 (Figure 2-5 in Appendix F). Total and dissolved As concentrations during 2019 in Lynx Creek typically ranged between 0.004 mg/L and 0.008 mg/L and values measured in 2019 are consistent with historical monitoring results for the period of 2007 to 2019 (Figure

2-6 in Appendix F). One sampling event on September 11, 2019 returned results indicating elevated total and dissolved As concentrations at station W4 between 0.040 and 0.050 mg/L (Figure 2-4 in Appendix F). Most other measured metals or metalloid parameters were not highly elevated in the W4 September 11 sample (e.g., TSS = 3.0 mg/L; total Al = 0.0084 m/L). At this time, the results for total and dissolved As are considered potentially erroneous.

3.2.2.3 Mine Site Monitoring Results

Mine site monitoring in 2019 occurred primarily at the Lower Dublin South Pond (also referred to as the Control Pond) and Ditches A and B (or the contact water collection ditches that drain into the Control Pond) for TSS. Appendix B in Appendix F provides graphical summaries of water quality data for each mine site monitoring location for 2019.

Control Pond (LDSP)

Water quality of the Control Pond is measured at several locations (Figure 3.2-1):

- LDSPs – Along shore of Control Pond (pre-discharge location);
- LLO – Low-level outlet in a perforated pipe (pre-discharge location); and
- LDSP – Outflow discharge sampling location of Control Pond.

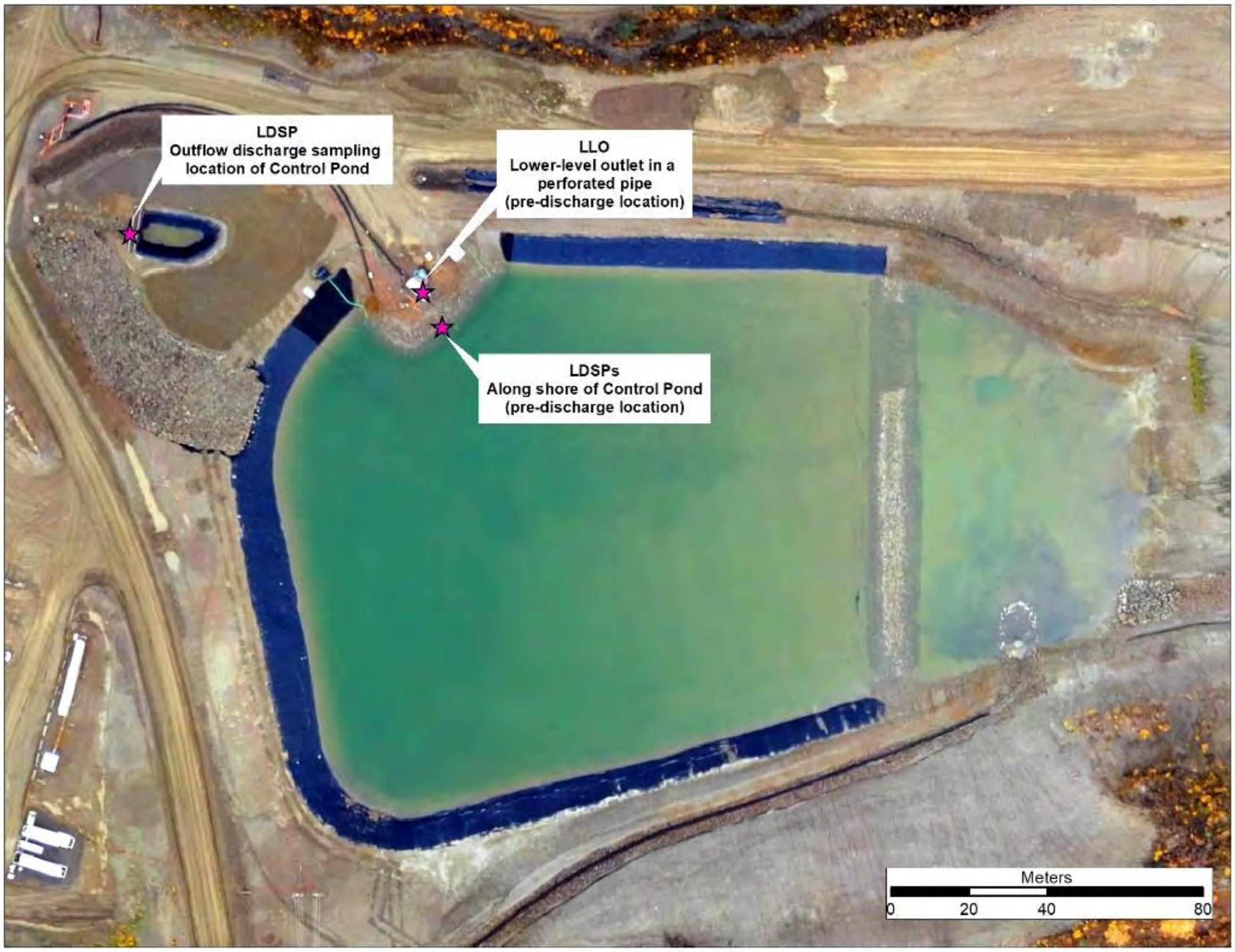


Figure 3.2-1: Lower Dublin South Pond (LDSP or Control Pond) Sampling Locations

Pre-Discharge LDSP Water Quality

Water quality within the Control Pond (or LDSP) was measured throughout 2019 at stations LDSPs and LLO. Table 3.2-7 summarizes the number of full analytical suite sampling events for LDSPs and LLO, by month, for 2019. As indicated, a total of 20 and 16 full suite sampling events occurred at LDSPs and LLO, respectively. The highest frequency of sampling occurred in the spring period in April and May, most notably at LDSPs.

Table 3.2-7: Number of Full Suite Analytical Sampling Events for LDSPs and LLO by Month in 2019

Month	LDSPs	LLO
April	5	2
May	5	5
June	2	2
July	3	3
August	2	2

Month	LDSPs	LLO
September	2	1
October	1	1
Total	20	16

While LDSPs and LLO sampling locations characterize water chemistry in the LDSP overall, these are pre-discharge sampling locations and direct application of EQS is only for purposes of reference. Most parameters analyzed were present at LDSPs and LLO at concentrations well below their respective EQS limits. The only exceptions were for TSS and total arsenic.

Figure 3.2-2 illustrates TSS concentrations at the LDSPs and in the LLO and provides the EQS limit of 15 mg/L only for comparative purposes. The highest TSS concentrations were measured at the LDSPs in May with values of 80 mg/L to approximately 100 mg/L being observed. Conversely, maximum measured TSS concentrations in the LLO in May were lower and approximately 30 mg/L (Figure 3.2-2). The observed same day differences in TSS concentrations likely reflect that the LLO is not in direct connection to the Control Pond, as the water from the pond has to filter through the gravel filter between the pond and the perforated LLO riser pipe.

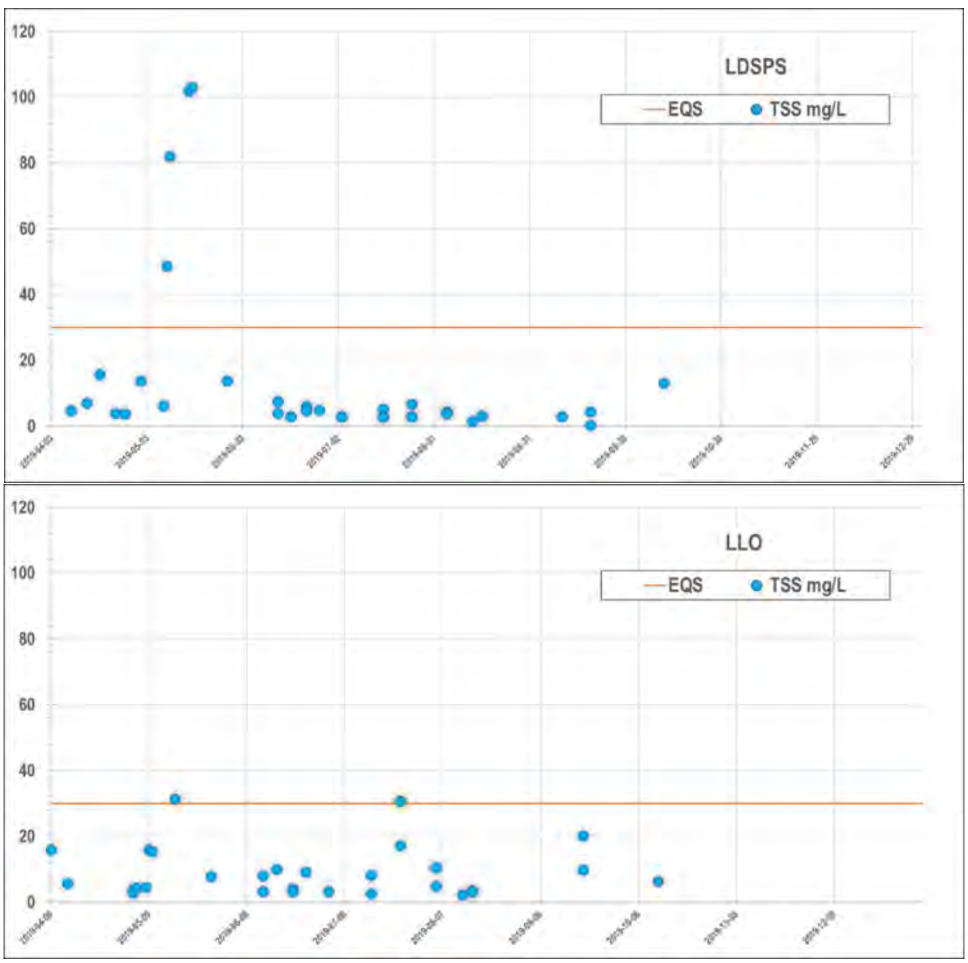


Figure 3.2-2: Time-series of TSS Concentrations in LDSPs and LLO Compared to EQS for 2019

For station LDSPs, TSS concentrations above 15 mg/L were not observed in any other sampling months in 2019 and most measured concentrations were below 5 mg/L. A few measured TSS concentrations in the LLO greater than 15 mg/L were observed in July and September 2019 (Figure 3.2-2).

Total and dissolved As concentrations at the LDSPs and in the LLO are summarized in Figure 3.2-3 for 2019. Sampling collected in April and early May, and spanning (although not directly coincident with) the discharge events from the Control Pond on April 20 and April 27 – April 29, indicated total and dissolved As concentrations below the EQS of 0.053 mg/L. The range in measured total As concentrations at the LDSPs for the period of April 9 to May 8, 2019 was 0.023 mg/L to 0.050 mg/L (Figure 3.2-3). Similarly, the range in total As concentrations observed at LLO for the same period was 0.025 mg/L to 0.040 mg/L, both below the EQS.

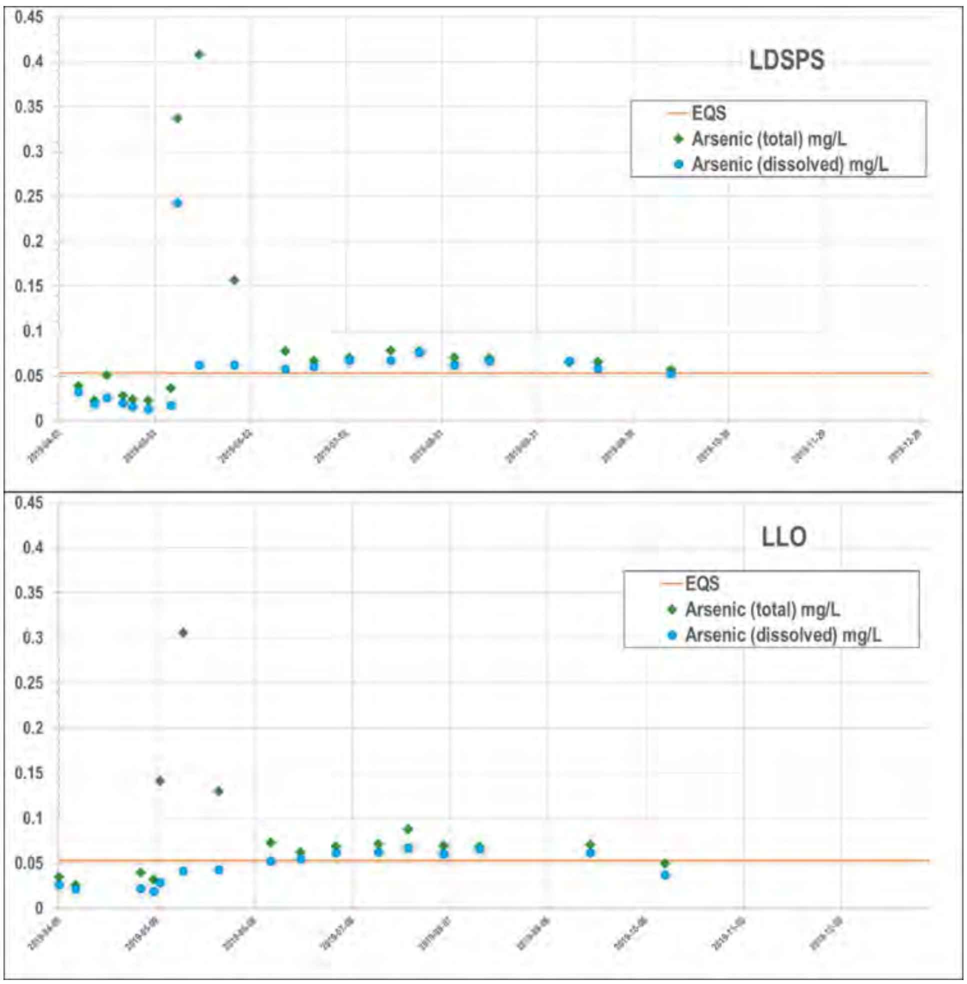


Figure 3.2-3: Time-series of Total and Dissolved Arsenic Concentrations in LDSPs and LLO Compared to EQS for 2019

After May 8, total and dissolved As concentrations were highest in LDSPs and LLO samples and remained above the EQS of 0.053 mg/L through to September 2019. Peak total As concentrations at LDSPs and LLO were approximately 0.4 mg/L and 0.3 mg/L, respectively and occurred on May 17, 2019, and reflect the freshet inflow into the pond. Since June, total and dissolved As concentrations at both locations were consistently measured at approximately 0.06 mg/L to 0.08 mg/L reflecting very little additional inflow and likely some settling of the pond solids from the freshet inflow (i.e., the difference between total and dissolved solids was greater during late May than during most of the summer). Measurements in October indicated concentrations decreased to values closer to 0.05 mg/L (Figure 3.2-3).

As previously stated, all other parameters analyzed were present in Control Pond stations LDSPs and LLO at low concentrations and below their respective EQS limit (Appendix B in Appendix F).

Discharge LDSP Water Quality

There were two brief discharge events from the LDSP in 2019, for five hours on April 20 and intermittently between April 27 and April 29. Full suite analyses were conducted on LDSP discharge samples on April 20, April 27, 28 and 29, 2019. As described in detail in Appendix C and Appendix G, TSS concentrations measured (by the laboratory) at LDSP during these discharge events exceeded the MDMER TSS discharge limit of 30 mg/L for a grab sample at some point after discharge began (Figure 3.2-4). Discharge from the LDSP did not occur again in 2019.

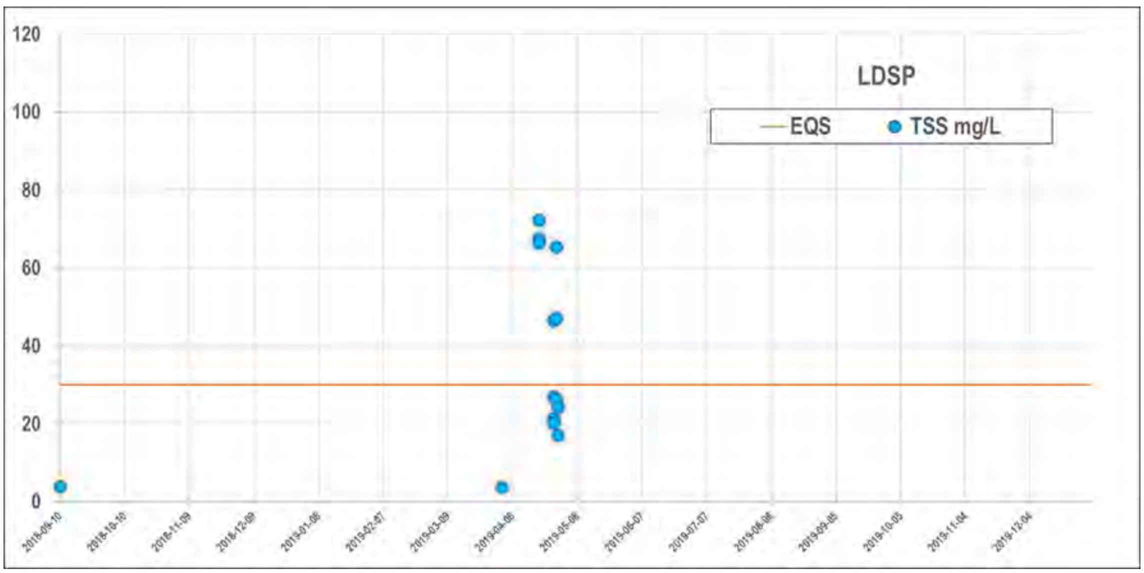


Figure 3.2-4: Time-series of TSS Concentrations in LDSP Compared to MDMER (orange line) for 2019

As with the other LDSP sampling stations, the only other parameter that was measured at concentrations above the EQS in the LDSP discharge was total As. For the discharge periods, total As was measured in lab samples consistently between 0.075 mg/L to 0.098 mg/L (Figure 3.2-5). The elevated concentrations are related to the elevated TSS concentrations present, as dissolved As concentrations were lower and ranged more narrowly between 0.027 mg/L and 0.030 mg/L. Importantly, as noted above in Figure 3.2-3, pre-discharge samples collected at LDSPs and LLO indicated that total As was below the EQS, and the time period between collecting a water sample during discharge and receiving laboratory analytical results was (and is) several days due to transport time and analytical time. Discharges were ceased when on-site TSS lab data indicated the TSS exceeded the EQS.

No other parameters were present at elevated concentrations in the LDSP discharge (Appendix B in Appendix F).

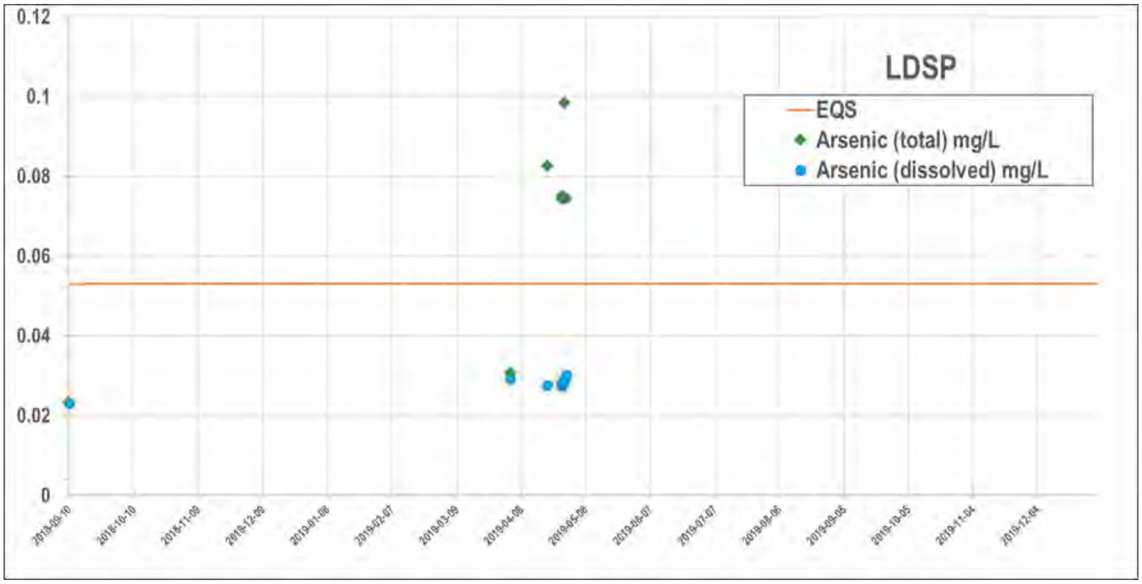


Figure 3.2-5: Time-series of Total and Dissolved Arsenic Concentrations in LDSP Compared to EQS for 2019

3.2.3 Quality Assurance and Quality Control Program

Since 2007, a well-established quality assurance/quality control (QA/QC) program has been in place to ensure the surface water quality program for the Eagle Gold Project is reliable, representative of the water quality conditions throughout the project area and of the highest quality. This program is intended to validate the monitoring data, and to identify any potential methodological and/or analytical errors in the data set that might require modifications to the program and or laboratory analyses. The following provides a summary of the QA/QC program with respect to field quality, analytical data processing and internal laboratory procedures for 2019.

The QA/QC program was designed to provide reliable data by preventing sampling error and cross contamination of the collected samples. Nitrile gloves were used during sample collection and replaced at each new site, samples were collected from downstream to upstream to avoid substrate disturbance and sample contamination. Field, travel blanks and laboratory duplicates were also included in the elemental analysis. Laboratory results were reviewed upon arrival to evaluate compliance with laboratory data quality objectives (DQO). Overall, reported data are considered of good quality and met laboratory DQO. All generated tables, summary statistics and graphs were checked for unit conversions, formulas and transcription errors with original data files.

This section summarizes the results of the QA/QC program. The program included an evaluation of field blanks, duplicate samples, and total vs. dissolved metal concentrations. The QA/QC results for the surface water quality sampling program for 2019 provided a reasonable level of confidence in the water quality data set. More importantly, the minor issues noted during the QA/QC assessment do not alter the interpretation of the reported data. Based on the results of field duplicates, field blanks, travel blanks, and dissolved vs total metal concentrations, the reported analytical data are considered reproducible, of good quality and representative of current water chemistry in the Project area. A description of QA/QC methods and results is provided below.

3.2.3.1 Field Blanks

Field blank samples are analyte-free reagent water samples used to assess the purity of chemical preservatives and potential contamination sources at the sampling location due to the collection method, handling, preservation, and exposure to the environment. Blank samples were generated by pouring de-ionized (DI) water into clean sample bottles in the same environment in which actual samples were collected, and then elemental analyses were conducted as was routinely performed in the remaining collected samples. Detected values in blanks higher than the proposed criterion were flagged as a sample that may require further investigation.

Field blanks were collected and analyzed to assess purity of chemical preservatives and potential contamination sources at the sampling location. Several parameters exceeded the detection limit for a blank collected in February 2019. However, results were only slightly above DLs and therefore not expected to be reflective of faulty methodologies used for sample collection. The remaining field blanks have parameters occasionally exceeding DLs. The concentrations of exceeding parameters rarely occurred at the levels observed in the collected water samples at the monitoring stations with detected values are slightly above detection limits. These suggests that results in the field blanks may be due to matrix interferences within blank sample and the consequently adjustments of DLs by the analytical laboratory (e.g., barium) Appendix C to Appendix F (provided electronically).

3.2.3.2 Travel Blanks

Travel blanks were provided by the analytical laboratory and were used during field surveys to identify potential contamination during storage and transport. These blanks were kept sealed and transported with water collected samples. Concentrations in these blanks were generally below detection limits, however if any measured parameter was detected above the detection limit, it suggests that some potential contamination may have occurred during sample handling and transport.

Travel blank results are also provided in Appendix C to Appendix F (provided electronically). The majority of measured parameters were below DL. These results indicate that good protocols of sample handling and transporting were applied in the field, given all values were reported as non-detects (< DL). Parameters such as ammonia, barium, chromium, phosphorus, manganese and mercury show detected values in travel blanks. For barium, some matrix interferences were detected and thus, these results are indicative of DL adjustment. Results for ammonia, phosphorus, manganese and mercury maybe indicative of cross contamination occurring at sample collection. However, these results are not expected to compromise the quality of the collected samples because the concentrations of detected parameters in blank samples rarely occurred at the levels observed in samples collected at monitoring stations.

3.2.3.3 Field Duplicates

The British Columbia Field Sampling Manual (Clark 2013) specifies that a relative percent difference (RPD) greater than 20 percent indicates a possible sample contamination. An RPD greater than 50 percent indicates a definite sample integrity problem; however, it is not unusual to find high variability for the field duplicates, especially if the water is turbid (total suspended solids [TSS] greater than 25 mg/L). Field duplicate samples were generally collected at the same location and time at a site sample to assess the natural variability of the site. For the purpose of this analysis, originals and duplicates are considered paired replicates collected from the same location sequentially in time and were used to calculate the RPD.

3.2.3.4 Analytical QA/QC - Elemental Analysis Quality

All analytical analyses were performed by ALS laboratories (Burnaby, BC) a member of the Canadian Association for Laboratory Accreditation Inc. (CALA). The laboratory QA/QC program included analysis of certified reference materials, laboratory control samples, laboratory duplicates, method blanks and matrix spikes to determine accuracy and precision of instrumentation and methods. The majority of reported data met the laboratory data quality objectives (DQOs). However, in some instances, method recovery was not accurately calculated due to matrix interferences; thus, detection limits were adjusted to prevent any influence on analytical results. Overall, reported data were of good quality and met the laboratory QA/QC objective.

For this QA/QC program, a dissolved metal concentration that was higher than the corresponding total metal concentration was considered an indicator of potential sample contamination and/or analytical error. Samples for total and dissolved metals were collected in separate bottles and were handled differently. For example, samples for dissolved metal analysis were filtered through a 45 µm filter and the filtering process can introduce error or contamination into the sample.

Dissolved metal concentrations were flagged as a potential QA/QC issue if the concentration was >20% higher than the corresponding total metal value in the same sample. Variability of less than 20% was excluded because it falls within the analytical margin of uncertainty (or error). Dissolved and total metal pairs were included in this analysis if the dissolved value was greater than five-times its RDL (Clark 2013).

Dissolved vs total metal concentrations are presented in Appendix D to Appendix F (provided electronically). Ideally, dissolved concentrations are 100% or less of the corresponding total concentration. The number of analyte pairs with dissolved metal values greater than 120 and 150% of the corresponding total were uncommon (< 3 occurrences of the total collected samples). Parameters such as cadmium, cobalt, copper, mercury, manganese, molybdenum, selenium, silver and sodium showed > 120% exceedances in more than 3 total collected samples representative of matrix interferences, cross contamination or mislabeling of bottles that may have occurred during sample collection or at the laboratory. However, the number of recorded incidents in metal concentrations were generally below the 120% acceptability criteria in most of the analyzed samples and parameters, which reflects reasonable confidence in the reported results.

3.2.4 Discharge Compliance - Water Quality

Discharge compliance points, as identified in QZ14-041-1, are shown below in Table 3.2-8. The discharge compliance points CS-07 and MWTP are not active and at the date of this report had not been constructed. No runoff entered the ADR Pad Ditch during 2019.

Table 3.2-8: QZ14-041-1 Compliance Monitoring Points

Monitoring Station	Description	Northing	Easting
LDSP	Lower Dublin South Pond (LDSP) Outflow	7,100,857	458,672
LDSP-UND	LDSP Underdrain Outlet	7,100,928	458,547
CS-07	SG-G4 - below Ice Rich Overburden Storage Area	7,098,627	458,268
MWTP	Mine Water Treatment Plant Discharge	TBD	TBD
HLFUMV	Heap Leach Facility Underdrain Monitoring Vault	7,101,298	459,445

Monitoring Station	Description	Northing	Easting
ADR Pad Ditch	ADR Pad Ditch Outlet	TBD	TBD

The LDSP-UND is monitored on a monthly basis to satisfy QZ14-04-1 requirements and continues to pass natural groundwater flow underneath the LDSP to lower Eagle Creek. Water quality monitoring of the LDSP-UND began in July 2019 and no exceedances of the effluent quality standards (EQS) were observed in 2019.

The HLFUMV is a discharge compliance monitoring point that captures natural groundwater flow passing underneath the HLF. Water Quality monitoring of the HLFUMV began in September 2019. Arsenic and pH were above EQS in September, which is consistent with groundwater chemistry observed in Ann Gulch prior to any Project activity, however all flow from the HLFUMV was recirculated back to the Events Pond and was not discharged to the receiving environment.

Sampling and monitoring of the LDSP discharge station as defined in QZ14-041-1 can only occur when a discharge is occurring to the receiving environment; however, monitoring points within the LDSP are sampled and analyzed on a regular basis to inform ongoing operational decisions. Discharge from the LDSP occurred on April 20 and April 27-29, 2019. As discussed in Sections 2.5.2 and 3.2.2.3minor exceedances of the EQS for TSS and arsenic were identified in external laboratory results for these discharges. Arsenic concentrations exceeded QZ14-041-1 criteria of 0.053 mg/l however the concentrations did not exceed MDMER deleterious substance criteria of 0.2 mg/l. Pre-discharge samples and on site analytical testing indicated water contained within the sedimentation pond was compliant with discharge criteria and these exceedances are suspected to have been influenced by the first flush of components of the LDSP that had not been put into operation since their construction had been completed. It is noteworthy that the quality of the discharged water was compliant with the construction phase arsenic standard provided in QZ14-041-1 and that all of the water within the pond was captured from activities that were undertaken during the construction phase.

3.2.5 Adaptive Management

Adaptive management of surface waters is addressed on an on-going basis and relies on implementing best practices for keeping clean water clean (as suspended solids are by and large the single major parameter that effects the ability to meet WQOs), and on maintaining routine inspections of ponds, ditching, diversions and erosion control measures (e.g., silt fencing, sediment sumps) to minimize sediment mobility. The water quality results described in the previous sections for both receiving waters, mine-site waters and the discharge compliance demonstrate that the main challenge for managing TSS occurs during freshet, when snowmelt and runoff are high and sediment is easily entrained from streambanks, stream bars, unvegetated slopes and roadways. After the freshet runoff effect has passed, the streams (both on-site and offsite) return to a condition of generally low TSS and consequently lower total metal concentrations, indicating that the effect is short term.

3.3 Water Balance and Water Quality Modeling

The Eagle Gold Mine water balance and water quality model (WBQM) was updated following changes to the water management plan and water management assumptions around the heap leach facility (Appendix H).

The WBQM fully integrates the following:

- Description of the water management plan as described in: Eagle Gold Project Construction and Operations Water Management Plan (Ver 2020-01);
- Revisions to the heap leach facility water balance modeling as described in the HLF Water Balance Modeling Report prepared by Forte Dynamics, Inc. April 30, 2020 (Appendix I);
- Baseline climate and hydrology data collected since 2007 and inclusive of data collected in 2019;
- Updated baseline surface water quality monitoring data collected from 2007 to 2017 prior to initiation of construction in August 2017;
- Surface water quality monitoring data collected from August 2017 to December 2019 and reflective of construction and operations, and
- Geochemical source term data collected from active field bins of waste rock and leached ore materials, with consideration of data collected up through September 2019 ice-free season.

The revisions to the operations water management plan and site-wide water balance model are reflected in the updated schematic (Figure 3.3-1). Water quality from mine discharge during operations is driven by the contact water reporting to the Lower Dublin South Pond. Contact water from Platinum Gulch WRSA, the temporary (or 90-Day) ore stockpile, and any drainage from the open pit all report to the LDSP through Ditch A. Suttles Gulch, catchment for the crusher area, drains to the LDSP via Ditch B. The Eagle Pup WRSA has not been utilized to date, such that Eagle Pup currently drains to Dublin Gulch. During 2019, any excess water from the LDSP was transferred to the Events Pond for use as process make-up water. The MWTP was not constructed during 2019.

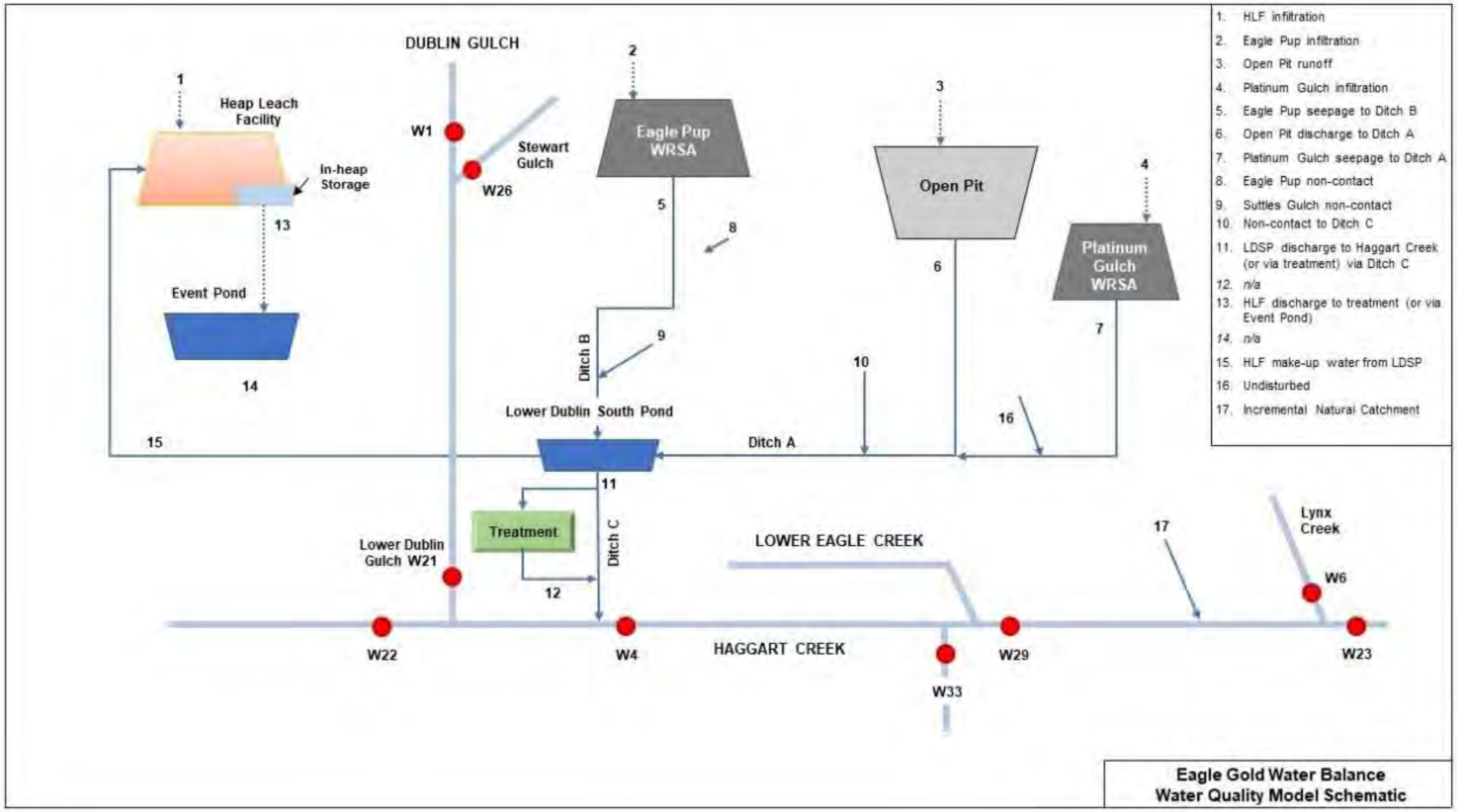


Figure 3.3-1 Water Balance Model Schematic - Overview

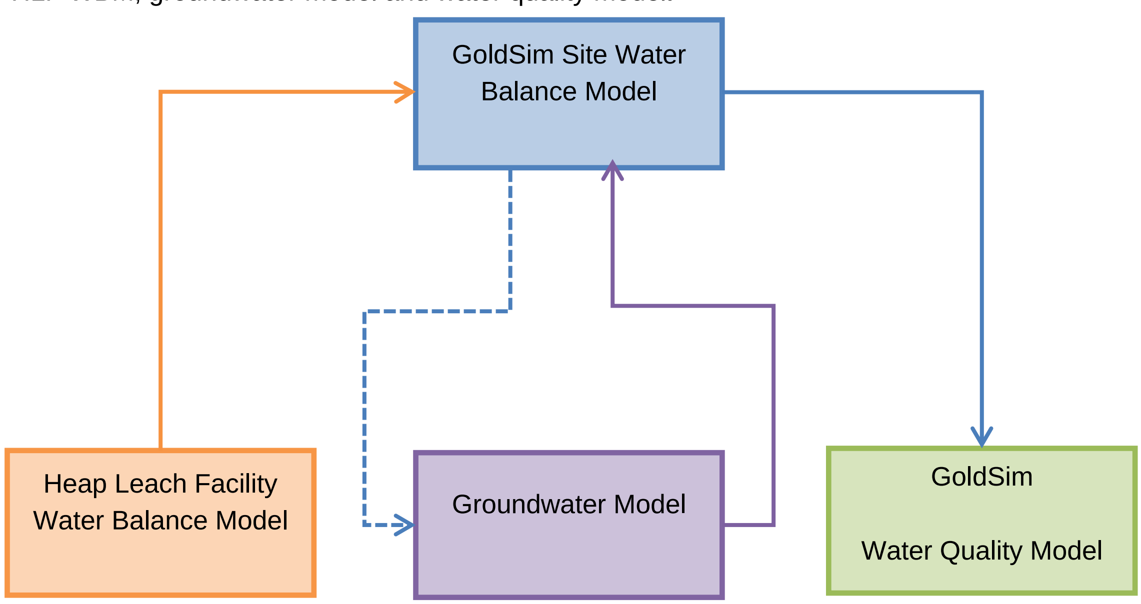
3.3.1.1 HLF Water Balance Model Integration

The Eagle Gold WBWQM is a GoldSim-based integrated water balance and quality model that was developed in two parts. The water quality component was developed by Lorax Environmental Services Ltd. (Lorax) and integrated within the WBM to combine source concentrations of potential contaminants of concern with contact and non-contact flows to track contaminant loading throughout the mine site and into the receiving waters of Haggart Creek. The WBQM integrates logic and assumptions from Forte's HLF Water Balance Model for the Heap Leach Pad Facility.

The Forte HLF Water Balance Model is used for daily operations. Inputs include measured meteorological and site operational data for the period in which such data are available (e.g., assumes July 1, 2019 start date of the simulations to a March 1st, 2020 forecasting date). This distinction in measured and forecasted data, described in the report, effects the Deterministic and Stochastic model simulations in slightly different ways.

The Forte Model makes use of a large array of operational, meteorological, geotechnical, and metallurgical input data. The inputs include updated values from the previous heap water balance model developed by the Mines Group (2019) to provide site with an operational model as the mine site transitioned into production. Additional ore samples were collected, and further testing was conducted to characterize ore properties which have been used in the updated model. Additionally, as the site moved into operations, site operators required a model that could incorporate the daily data recorded at site, including climatic conditions, measured flows, and tonnage placed on the HLF. The updated heap water balance model incorporates an increasing detail surrounding the HLF while providing operations with the ability to utilize more recorded inputs and better understand solution and pond level management.

The SWBM also incorporates groundwater baseflow and recharge rates estimated by the groundwater model, as well as provides inputs to the water quality model. Figure 3.3-2 illustrates the integration of the water balance with the HLF WBM, groundwater model and water quality model.



Notes: 1. - - -> Transfer of baseline data

2. ——> Transfer of operation data (predicted or modelled)

Figure 3.3-2 Water Balance Model Integration

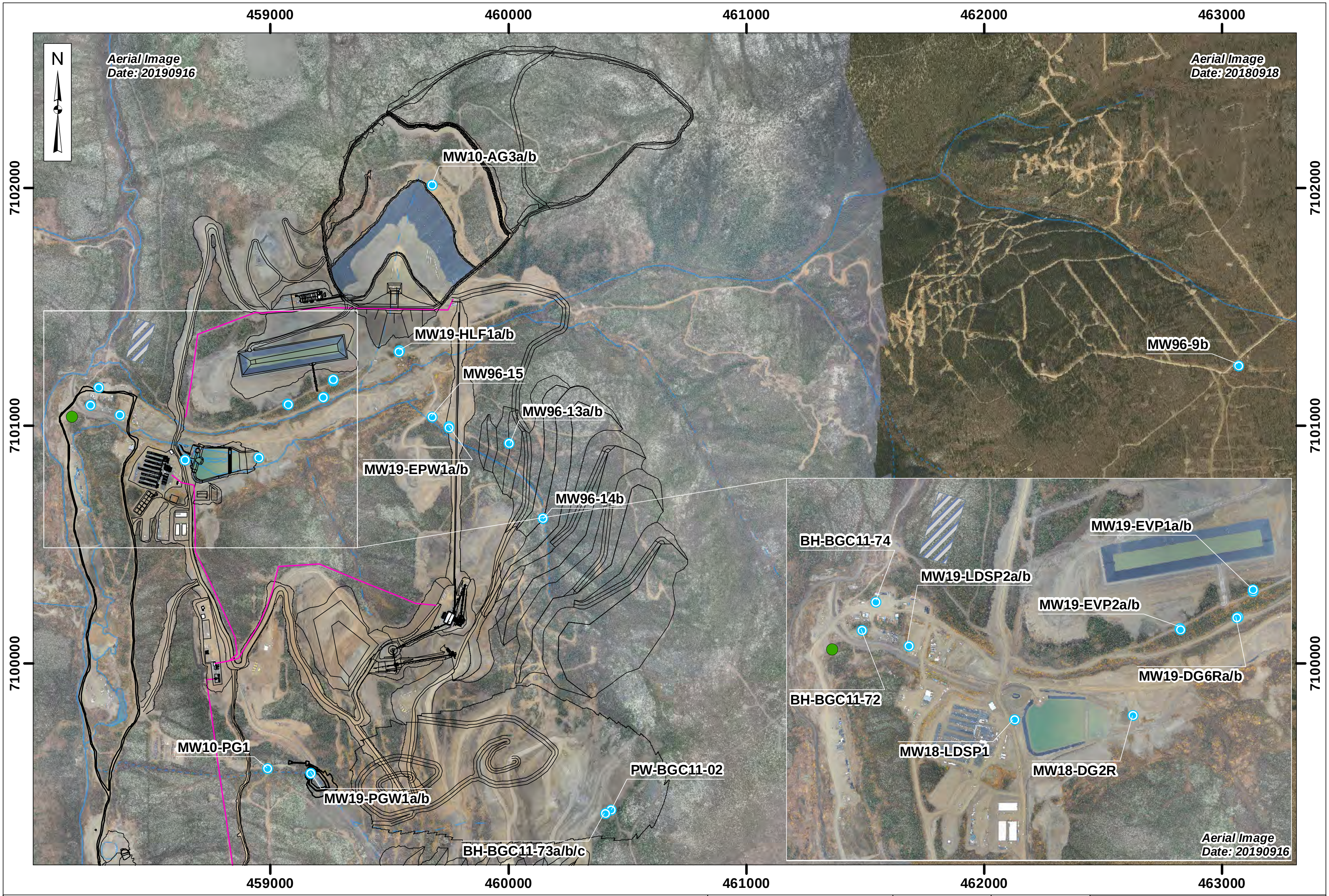
3.3.1.2 Results

The results of the updated models are provided in the Eagle Gold Project 2019 Water Balance and Water Quality Model Update Report provided as Appendix H. The model utilizes the active mine plan and considers the receiving environment WQOs developed for the QZ14-041-01, the effluent quality standards mandated by QZ14-041-01, and updated data collected under the Environmental Monitoring, Surveillance and Adaptive Management Plan.

3.4 Groundwater

The majority of the Project is situated within the Dublin Gulch basin, which is part of the Haggart Creek basin. The hydrogeologic zones used to characterize groundwater in the Project area include Eagle Pup and the Ann, Suttles, Olive, Bawn Boy, Platinum and Dublin Gulches. The groundwater monitoring program in 2019 during construction and operations consisted of continuing the general data collection program that has focused on specific spatial zones and where facilities were constructed to help monitor potential Project effects on the groundwater flow system. The wells monitored during 2019 are depicted in Figure 3.4-1 and include the following zones:

- Heap Leach Facility (Ann Gulch catchment) and the Events Pond,
- Eagle Pup Waste Rock Storage Area (Eagle Pup catchment),
- Platinum Gulch Waste Rock Storage Area (Platinum Gulch catchment),
- Open Pit (Upper Suttles and Platinum Gulch catchments)
- Olive and Bawn Boy Gulches (Upper Dublin Gulch catchment), and
- Lower Dublin South Pond (Lower Dublin Gulch valley).



Legend:

Groundwater Monitoring Location	Reserved Area	Watercourse (Perennial)
Climate Station	Facility	Watercourse (Ephemeral)
	Site Power	Watercourse (Intermittent)

VICTORIA GOLD CORP

0 300 600
Meters

Projection:	Drawn By:	EAGLE GOLD PROJECT YUKON TERRITORY
NAD 83 UTM Zone 8N	HC	
Date: 2020/05/09	Figure: 3.4-1	2019 Groundwater Monitoring Locations

3.4.1 Groundwater Quantity Monitoring

The objectives of the groundwater quantity monitoring program during 2019 were to provide continuous and spot level groundwater level measurements to monitor potential Project effects on the occurrence and quantity of groundwater as the project moved from construction into production.

Due to construction activities, many of the pre-construction baseline monitoring wells were decommissioned (using ASTM 529999 decommissioning guidelines). Seven new groundwater well locations were established in 2019 as couplet wells consisting of a deep and shallow well. From the 14 wells installed, 10 were successfully developed, three wells contained insufficient water and one well developed freezing conditions later in the year. These 14 new groundwater wells were installed to increase monitoring of infrastructure associated with new construction, and in some cases, to replace damaged or compromised wells.

Groundwater level data have been collected since 2009 from the wells/piezometers installed throughout the project footprint. Continuous recording data loggers have been used at various locations on site to provide a better understanding of baseline seasonal variability in areas of planned infrastructure. 2019 continuous data logger information was compiled and includes all logger information collected from 2009 to present. Data compilation and analytical methods for processing the groundwater level data are described in Appendix J. As outlined in the EMSAMP, quarterly monitoring (sampling and water level measurements) was conducted during 2019 at the locations listed in Table 3.4-1 and shown in Figure 3.4-1.

Table 3.4-1: Groundwater Quantity Monitoring 2019 - Production

Well ID	Datalogger Installed?	Rationale
Heap Leach Facility and Events Pond (Ann Gulch catchment and adjacent area)		
MW19-EVP1a	No	Below Events Pond
MW19-EVP1b	No	
MW19-EVP2a	No	
MW19-EVP2b	No	
MW19-HLF1a	May-19 to Oct-19	Below HLF
MW19-HLF1b	No	
MW10-AG3a	May-10 to Dec-19	Baseline for Phase HLF Phase 1B
MW10-AG3b	No	
MW19-DG6R a	Jun-19 to Oct-19	Replaced MW10-DG6 - Below Events Pond
MW19-DG6R b	No	
Lower Dublin South Pond (Lower Dublin Gulch valley)		
BH-BGC11-72	Nov-17 to April-19, Sept-19 to Dec-19	Below LDSP
BH-BGC11-74	Oct-17 to Nov-19	
MW19-LDSP2a	May-19 to Nov-19	
MW19-LDSP2b	May-19 to Nov-19	
MW18-LDSP1	No	
MW18-DG2R	May-19 to Oct-19	Replaced MW09-DG2 - Above LDSP
Eagle Pup Waste Rock Storage Area (Eagle Pup catchment)		

Well ID	Datalogger Installed?	Rationale
MW96-13a	May-11 to Dec-19	Mid-Eagle Pup
MW96-13b	May-11 to Dec-19	
MW96-14b	No	
MW96-15	July-13 to Dec-18	Lower Eagle Pup
MW19-EPW1a	May-19 to Nov-19	
MW19-EPW1b	May-19 to Nov-19	
Platinum Gulch Waste Rock Storage Area (Platinum Gulch catchment)		
MW10-PG1	May-11 to Nov-19	Below PG WRSA and Ditch A
MW19-PGW1a	Jun-19 to Nov-19	Below PG WRSA and Top of Ditch A
MW19-PGW1b	No	Below PG WRSA and Top of Ditch A
Eagle Pit Area (Suttles and Platinum Gulch catchments)		
PW-BHC11-02	No	Top of Pit
BH-BGC11-73a,b,c	Nov-11 to Nov-19	Top of Pit - VWP
Upper Dublin Gulch (Bawnboy catchment)		
MW96-9B	May-10 to Dec-19	Baseline in Upper DG catchment for modeling purposes

Appendix J includes a compilation of hydrograph plots produced for monitoring wells installed from 2009 and they depict groundwater elevation, air temperature and precipitation through time for each of the monitoring locations.

As described in previous reports (BGC 2014, BGC 2013 and Stantec 2012b), and for the 2018 Annual Report the hydrographs have demonstrated a large range in seasonal variability (since 2009) throughout the well network, with some wells (e.g., in the Ann Gulch area) experiencing small changes over the period of record (i.e., 1 to 2 m), while others in the Eagle pit area historically showed much larger ranges (over 10 meters).

Groundwater levels recorded in 2019 reflect similar trends to previous years; however, for almost all the wells, groundwater levels (i.e., peaks associated with freshet melt and summer baseline) were measurably lower in 2019 than previously measured. This likely reflects the lower snow volumes recorded in early 2019, and the lack of summer rainfall.

3.4.2 Groundwater Quality Monitoring

Figure 3.4-1 depicts the locations of the six representative groundwater monitoring wells that were sampled for water quality in 2019. These wells represent Ann Gulch and the HLF area (MW10-AG3a and MW10-AG6), Dublin Gulch valley (MW10-OBS1, MW10-DG6) and Eagle Pup (MW96-13a and MW96-15). Five of these wells have a long-term data records extending back to either 2009 (MW96-13a, MW96-15) or 2010 (MW10-AG3a, MW10-AG6, MW10-DG6). Sampling in MW10-OBS1 began in 2017. Figures 3.4-2 to Figure 3.4-9 depict concentrations for eight parameters (aluminum, arsenic, iron, selenium, copper, lead, zinc and pH) over time for the six wells.

During 2018 MW10-DG6 was damaged and was subsequently replaced in 2019 with the couplet wells MW19-DG6RA and MW19-DG6RB; the figures depict MW19-DG6RA in 2019 to replace MW10-DG6. Similarly, the figures depict that for most of 2019MW19-LDSP2A is a replacement for MW10-OBS1, and MW19-HLF1B is a replacement for MW10-AG6. For continuity, replacement stations have been represented under the historic station name. Data used to create these plots is included as Appendix K.

Figure 3.4-2a depicts the concentrations of total aluminum observed in the six wells since 2009, and indicates that a wide range in concentration (between two and three orders of magnitude) is evident when considering each of the six wells. Also, there is quite a large range in variability in each well. Of the five wells with longer term records, data from three wells (MW10-AG3a, MW10-DG6 and MW96-15) suggest an increase in total aluminum over time. The increasing trends were evident prior to construction activities.

Figure 3.4-2b depicts the concentrations of dissolved aluminum in the six wells since 2009. In general, except for MW10-DG6, dissolved aluminum concentrations are relatively low (less than 1.0 mg/L), and depending on the well as much as two orders of magnitude lower than total aluminum concentrations. Except for a slight increase over time with MW10-AG3A, there were no discernible increasing or decreasing trends over time. Further, there is no discernible effect from 2019 construction and operation activities on dissolved aluminum concentrations.

Figure 3.4-3a depicts the concentrations of total arsenic observed in the six wells since 2009, and indicates that a wide range in concentration is evident when considering all six wells (about four orders of magnitude from 0.0085 mg/L in MW10-AG3A to 83 mg/L in MW96-15), while except for MW96-15, each well has a fairly confined range (within one order of magnitude). Of the five wells with longer term records, only one well (in MW96-15 in Eagle Pup) exhibits an increase in total arsenic concentrations over time. The increasing trend was evident prior to construction activities.

Figure 3.4-3b depicts the concentrations of dissolved arsenic in the six wells since 2009. In general, and similar to total arsenic, there is a wide range in concentrations evident when considering all six wells (about four orders of magnitude from 0.00034 mg/L in MW10-OBS1 to 3.9 in MW10-DG6), while all but one well (MW96-13a), varies within about one order of magnitude. In some cases, variability is much less than one order of magnitude (MW10-DG6, MW10-AG3A and MW96-15). When considering total versus dissolved arsenic concentration for each well, some wells exhibit very similar concentrations (MW10-DG6), while others (MW96-15, MW96-13a, MW10-OBS1) exhibit up to three orders of magnitude difference between total and dissolved. These characteristics reflect baseline conditions prior to and after construction began. However, for two of the substitution wells (MW19-LDSP2A for MW10-OBS1 and MW19-HLF1B for MW10-AG), dissolved arsenic concentrations were markedly different (up to an order of magnitude).

Figure 3.4-4a depicts the concentrations of total iron observed in the six wells since 2009, and indicates that a wide range in concentration (over three orders of magnitude) is evident when considering all six wells, but there is less overall variability in each well. Of the five wells with longer term records, two wells (MW10-AG3a and MW96-15) also suggest an increase in iron over time. The increasing trends were evident prior to construction activities. In contrast MW96-13A demonstrates a decreasing trend over time, and one that appears to be more pronounced since 2017 and temporally associated with construction and operations.

Figure 3.4-4b depicts the concentrations of dissolved iron observed in the six wells since 2009. In general, dissolved iron ranges over three orders of magnitude when considering all the wells, but varies less than two orders of magnitude per well. In one case (MW10-DG6), dissolved iron remained relatively high and constant over time (~10 mg/L), while the other six wells vary considerably more, and there were no discernible increasing or decreasing trends over time.

Figure 3.4-5a depicts the concentrations of total selenium observed in the six wells since 2009, and indicates that a relatively small range in concentration (less than two orders of magnitude) is evident when considering all six wells, and each well has an even smaller confined range (within one order of magnitude), often at the method detection limits. There are no long term increasing or decreasing trends evident with selenium. The two that suggest a decrease (MW10-DG6 and MW96-13a) are due to lowered detection limits.

Figure 3.4-5b depicts the concentrations of dissolved selenium observed in the six wells since 2009. In general, total and dissolved selenium concentrations are very similar for all the wells, and no increasing or decreasing trends are evident.

Figure 3.4-6 depicts the pH of water observed in the six wells since 2009. In general, pH remains relatively neutral to slightly basic. The average and median pH of all six wells combined is 7.93 and 8.01, respectively, with a range from 7.00 in MW10-AG3A to 8.53 in MW96-13A. There are no measurable increases or decreases in pH over time at any of the stations.

Figure 3.3-7a depicts the concentrations of total copper observed in the six wells since 2009. In general, total copper concentrations range over three orders of magnitude when considering all the wells, but varies less than two orders of magnitude per well. In two cases (MW10-AG3A and MW96-15), total copper has a range over two orders of magnitude with an increasing trend over time

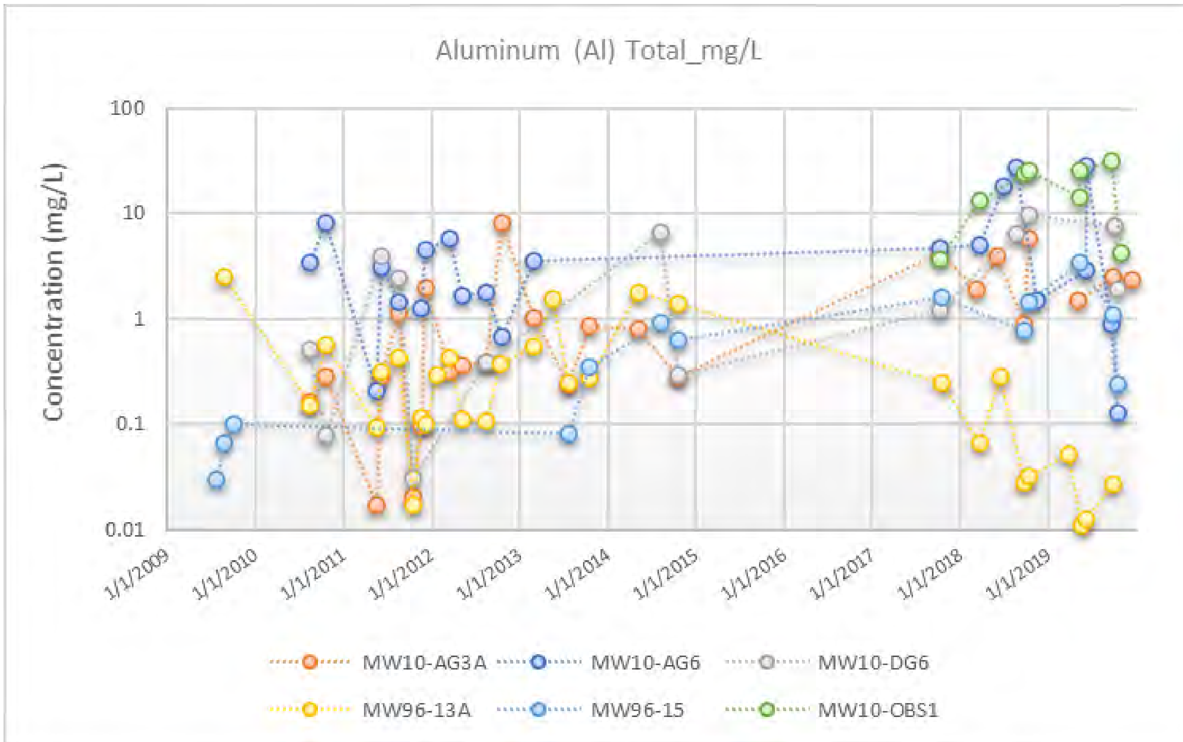
Figure 3.4-7b depicts the concentrations of dissolved copper observed in the six wells since 2009. In general, dissolved copper ranges over two orders of magnitude when considering all the wells, but varies around one order of magnitude per well. In one case (MW10-AG3A), dissolved copper has an outlier which occurred during a sampling May 8 2014 prior to any construction on site.

Figure 3.3-8a depicts the concentrations of total zinc observed in the six wells since 2009, and indicates that a relatively small range in concentration (two orders of magnitude) is evident when considering all six wells, and each well has an even smaller confined range (within one order of magnitude). MW96-15 shows a slight increase over time and MW96-13A shows a decrease over time. The other stations observed show little change since 2009.

Figure 3.4-8b depicts the concentration of dissolved zinc observed in the six well since 2009, and indicates a relatively small range in concentration is evident when considering all six wells, with most wells having an even smaller confined range. There is no overall apparent decreasing trend over time with dissolved zinc observed at each station that is due to a reduction in laboratory detection limits and not due to the natural variability in groundwater chemistry.

Figure 3.4-9a depicts the concentrations of total lead observed in the six wells since 2009, and indicates that a wide range in concentration (over four orders of magnitude) is evident when considering all six wells, while each well has a fairly confined range (within two orders of magnitude). There are no discernible increasing or decreasing trends over time associated with total lead.

Figure 3.4-9b depicts the concentrations of dissolved lead observed in the six wells since 2009, and indicates that a narrow range in concentration (less than two orders of magnitude) is evident when considering all six wells, while the majority of concentrations are at or near the method detection limit since 2009.



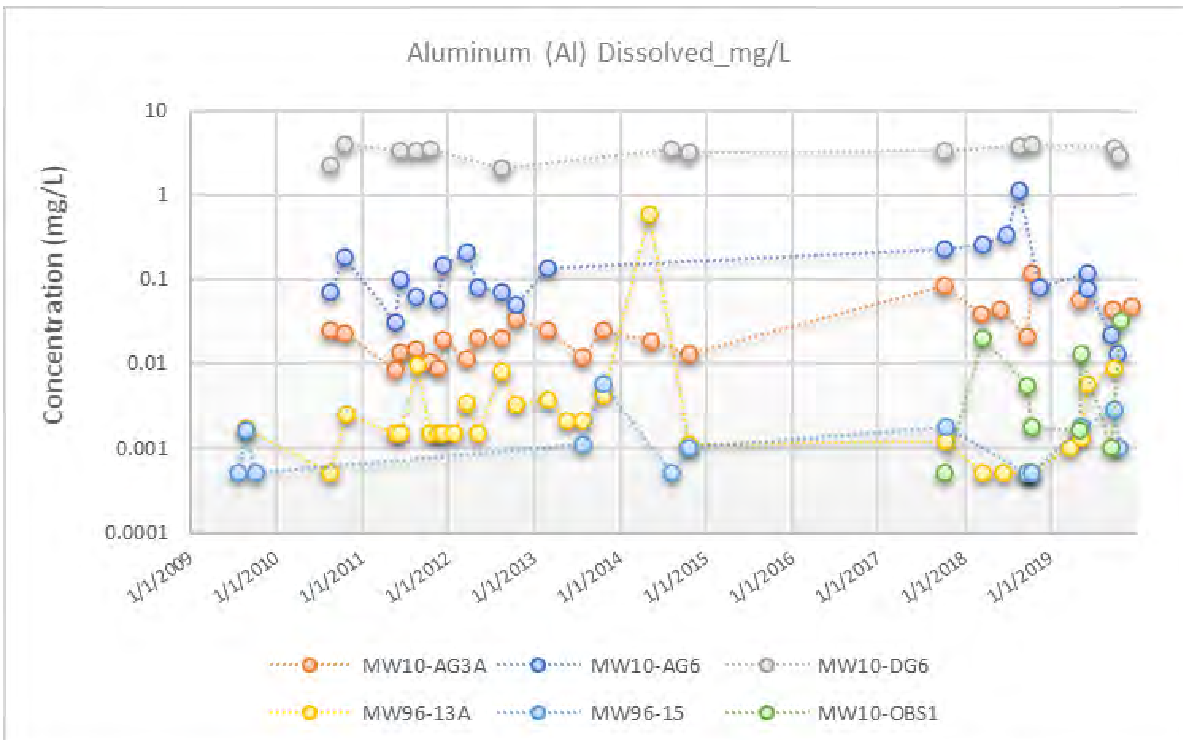
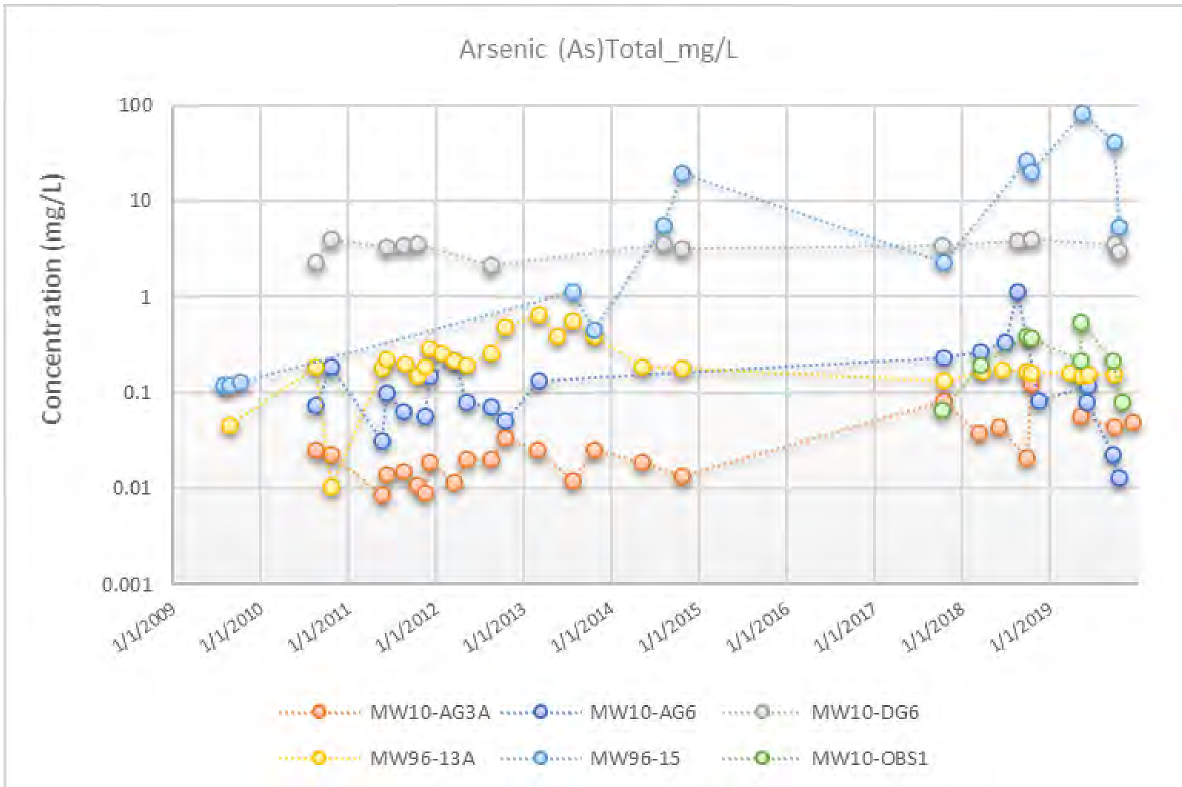


Figure 3.4-2: Concentrations of Total (a) and Dissolved (b) Aluminum Since 2009



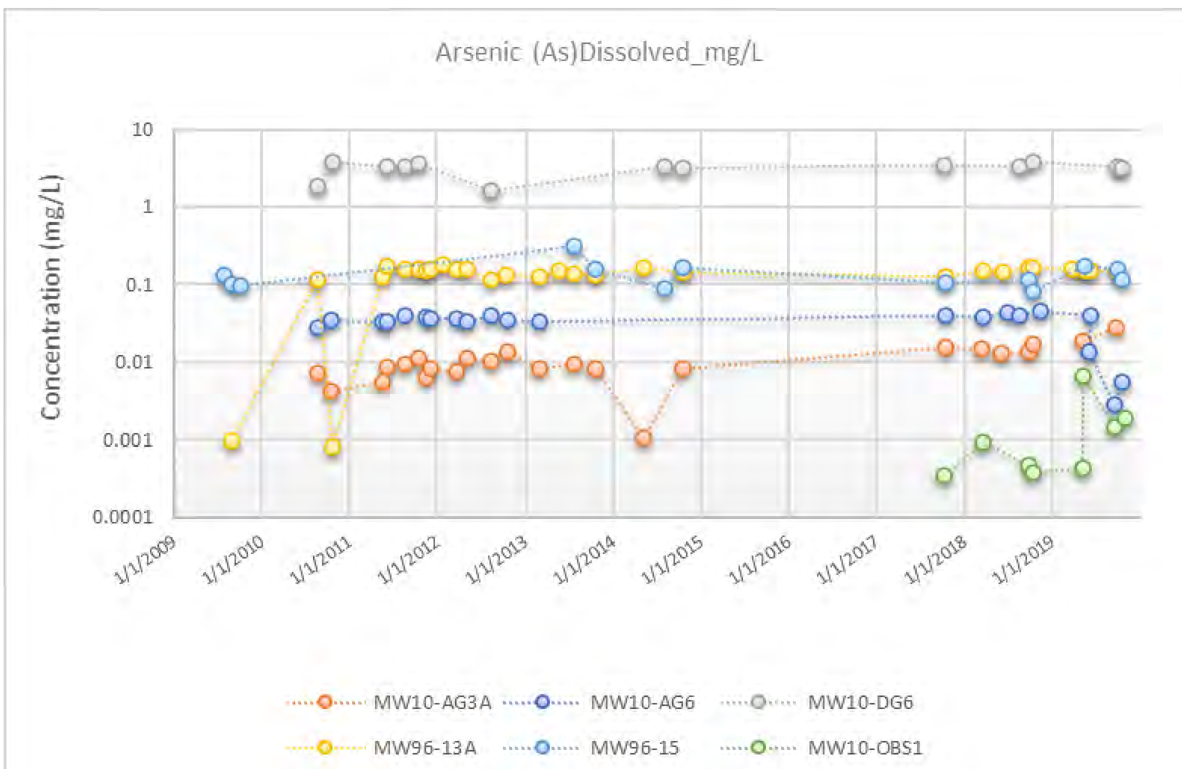
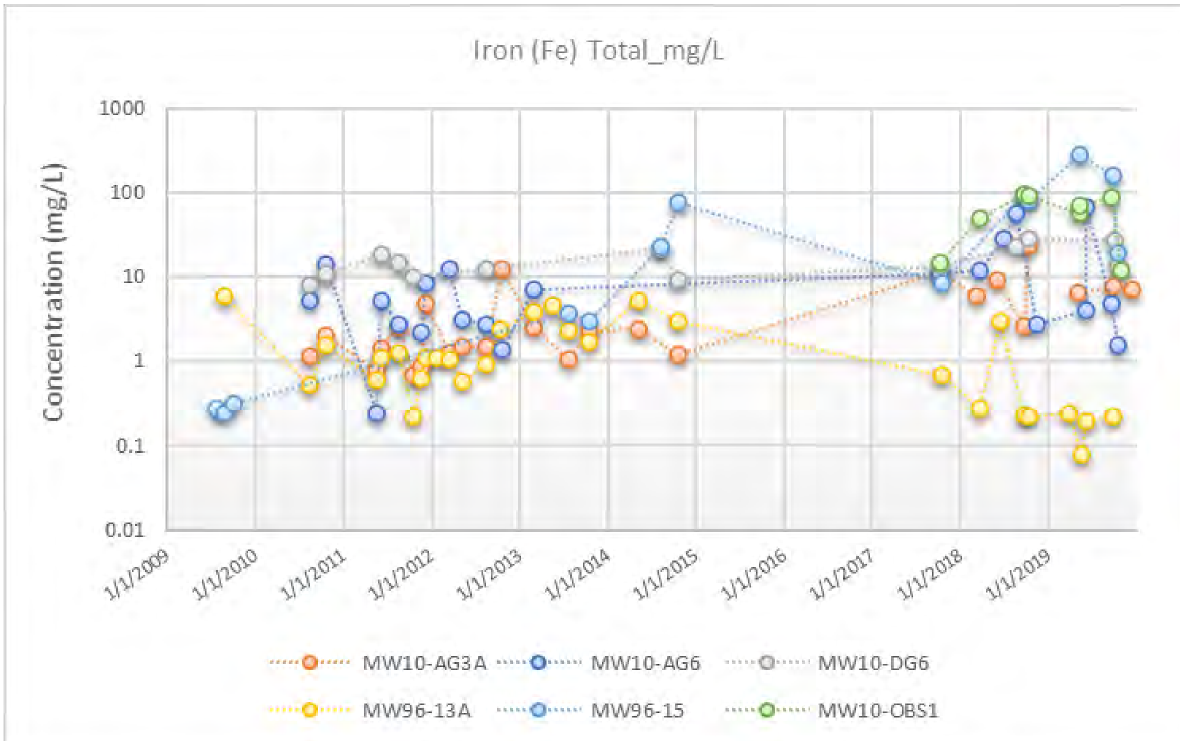


Figure 3.4-3: Concentrations of Total (a) and Dissolved (b) Arsenic Since 2009



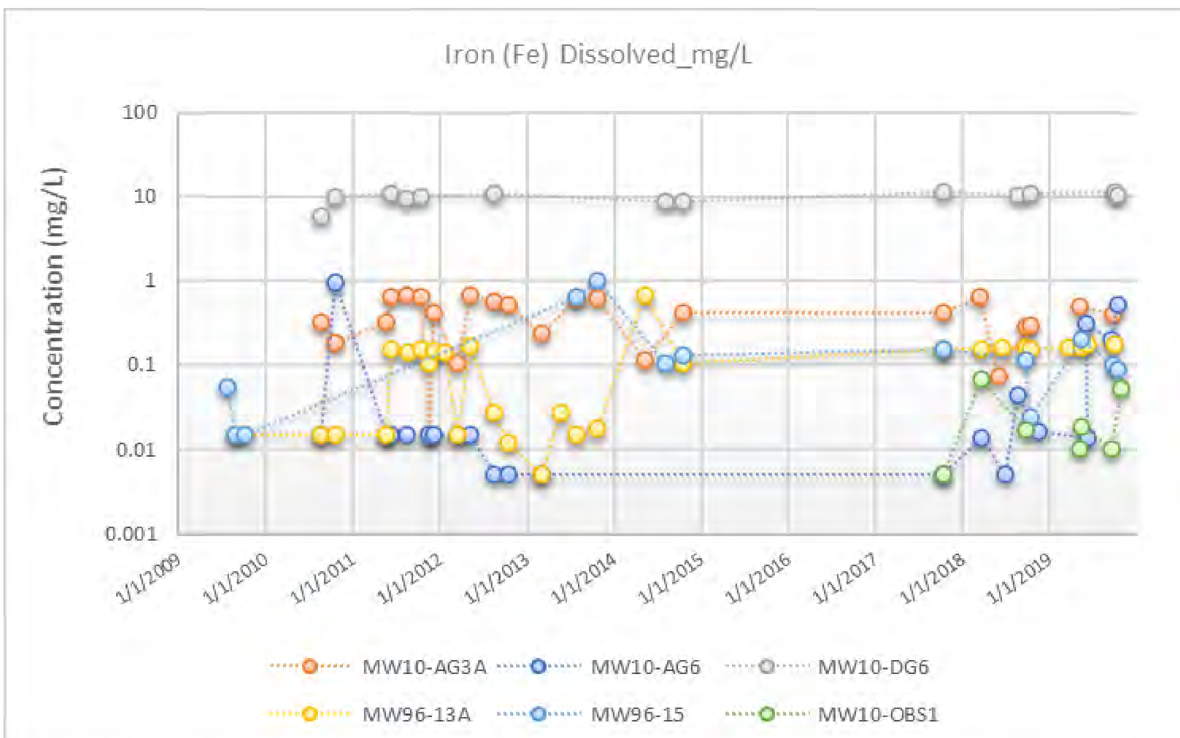
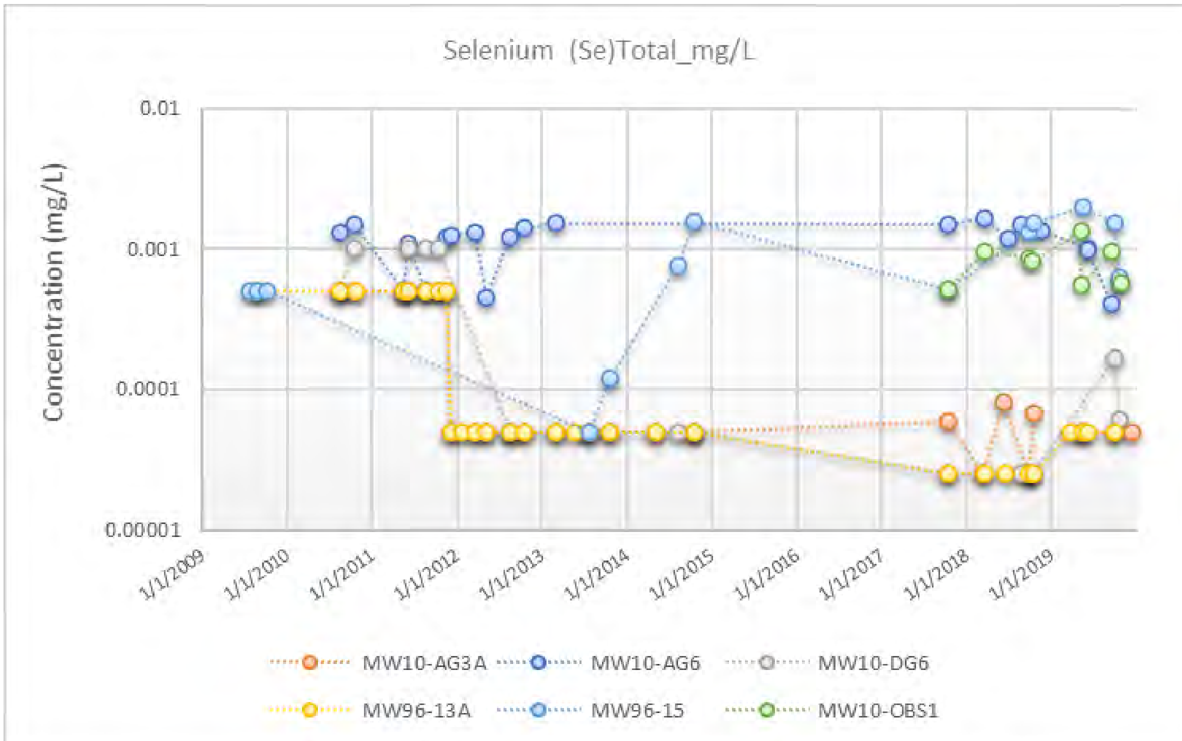


Figure 3.4-4: Concentrations of Total (a) and Dissolved (b) Iron Since 2009



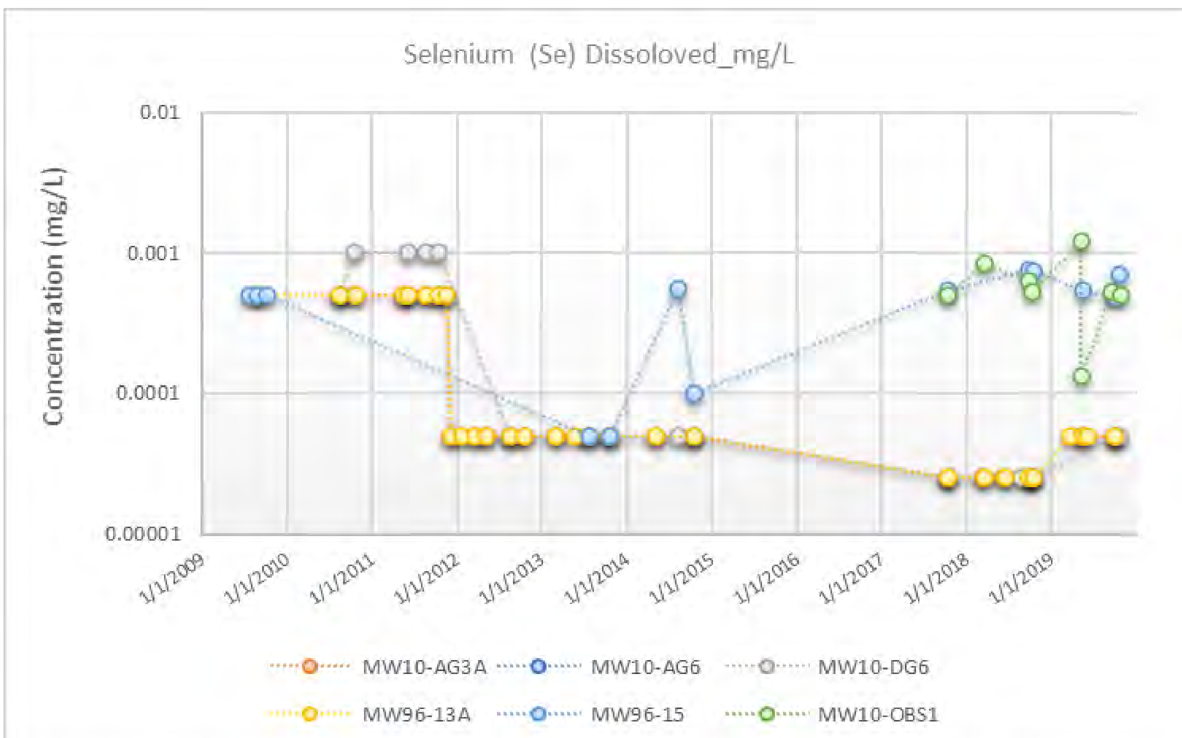


Figure 3.4-5: Concentrations of Total (a) and Dissolved (b)Selenium Since 2009

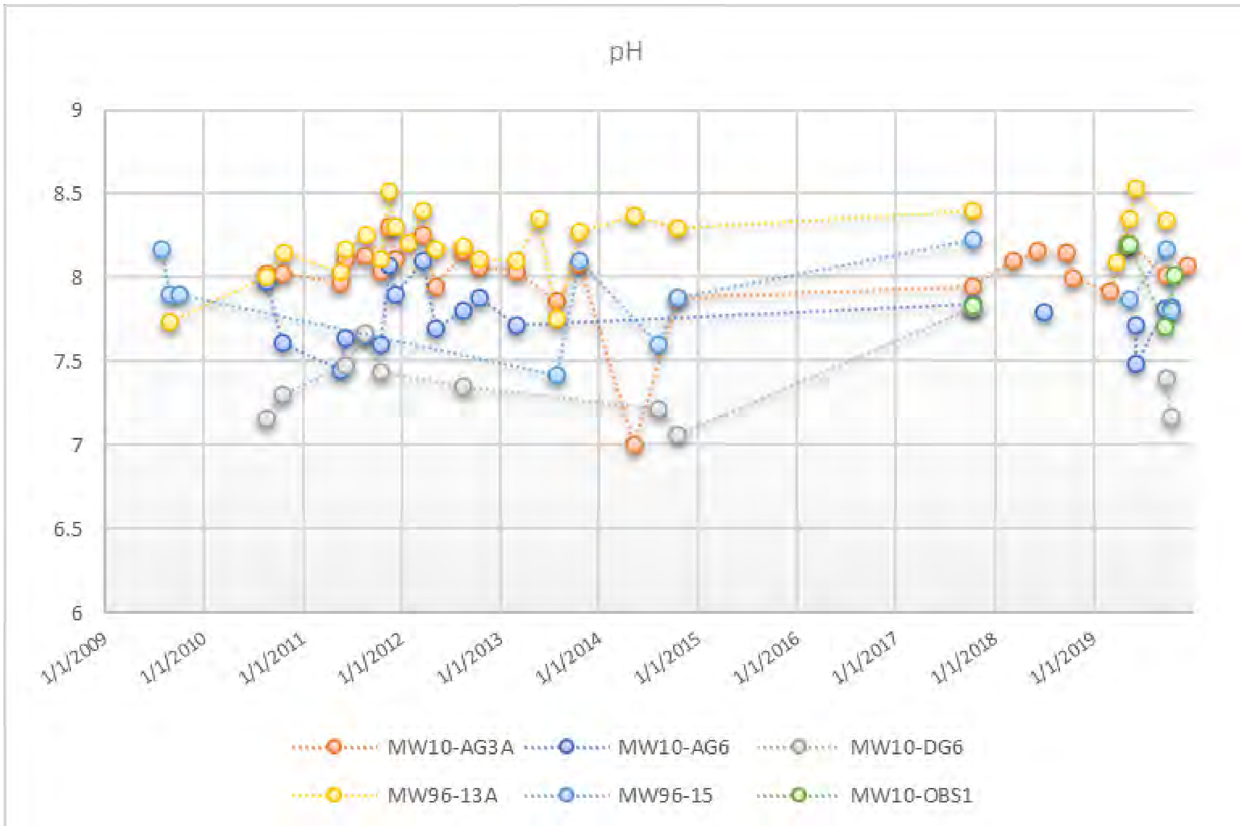
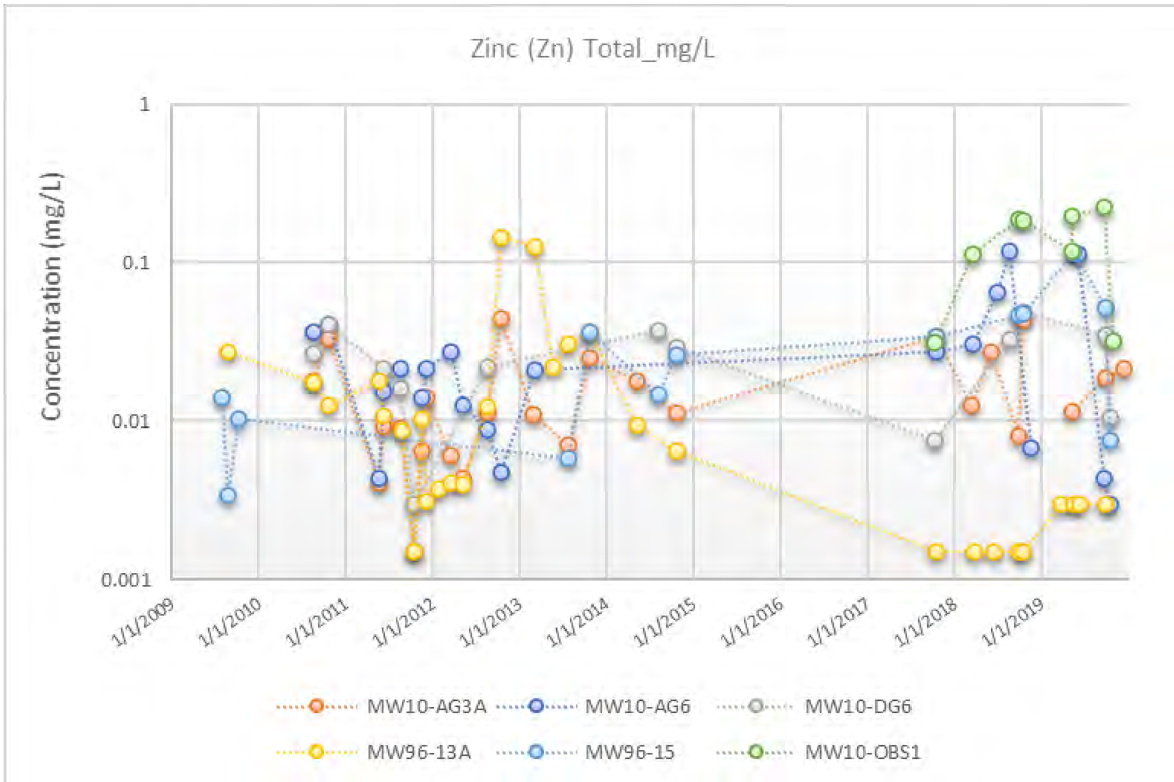


Figure 3.4-6: pH Since 2009

Figure 3.4-7: Concentrations of Total (a) and Dissolved (b) Copper Since 2009



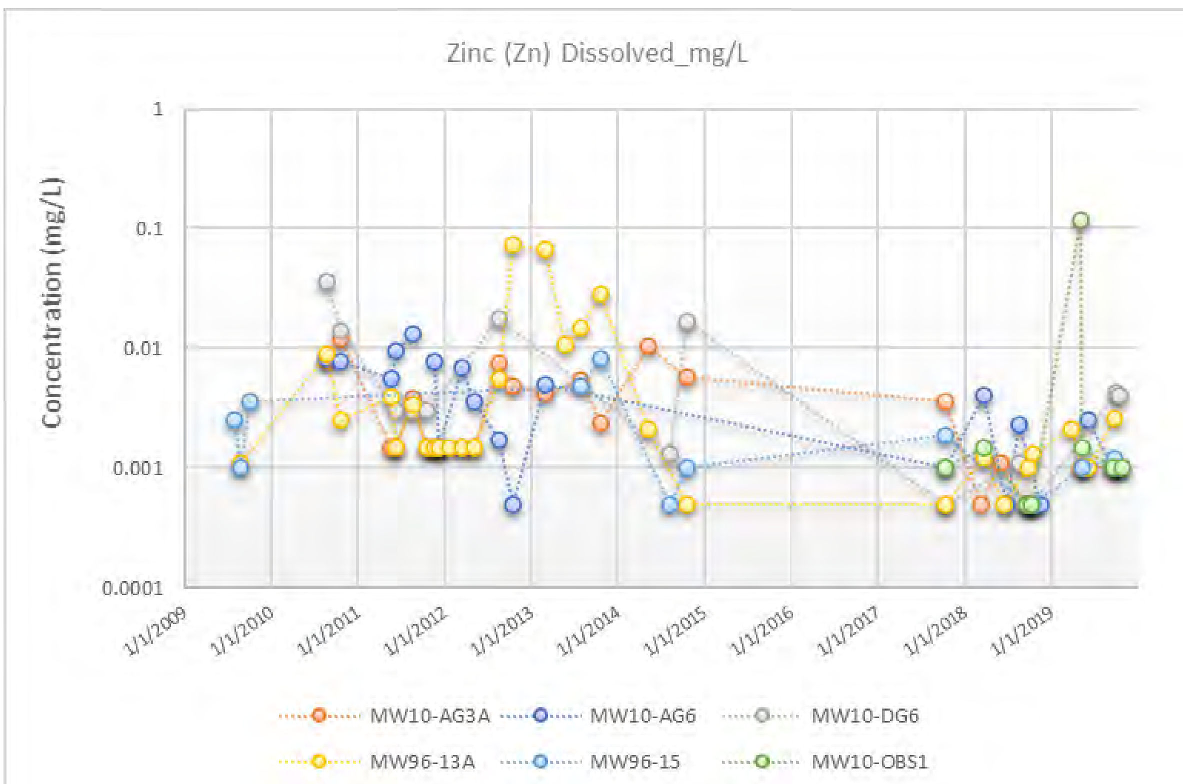
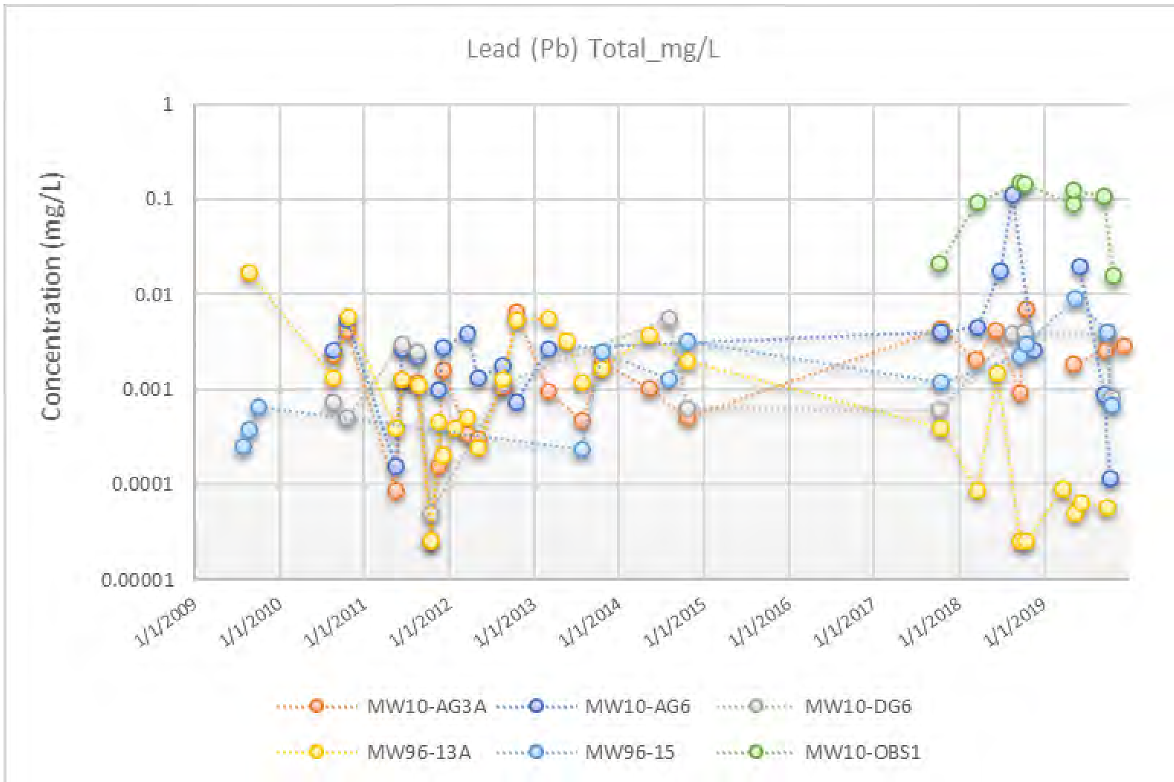


Figure 3.4-8: Concentrations of Total (a) and Dissolved (b) Zinc Since 2009



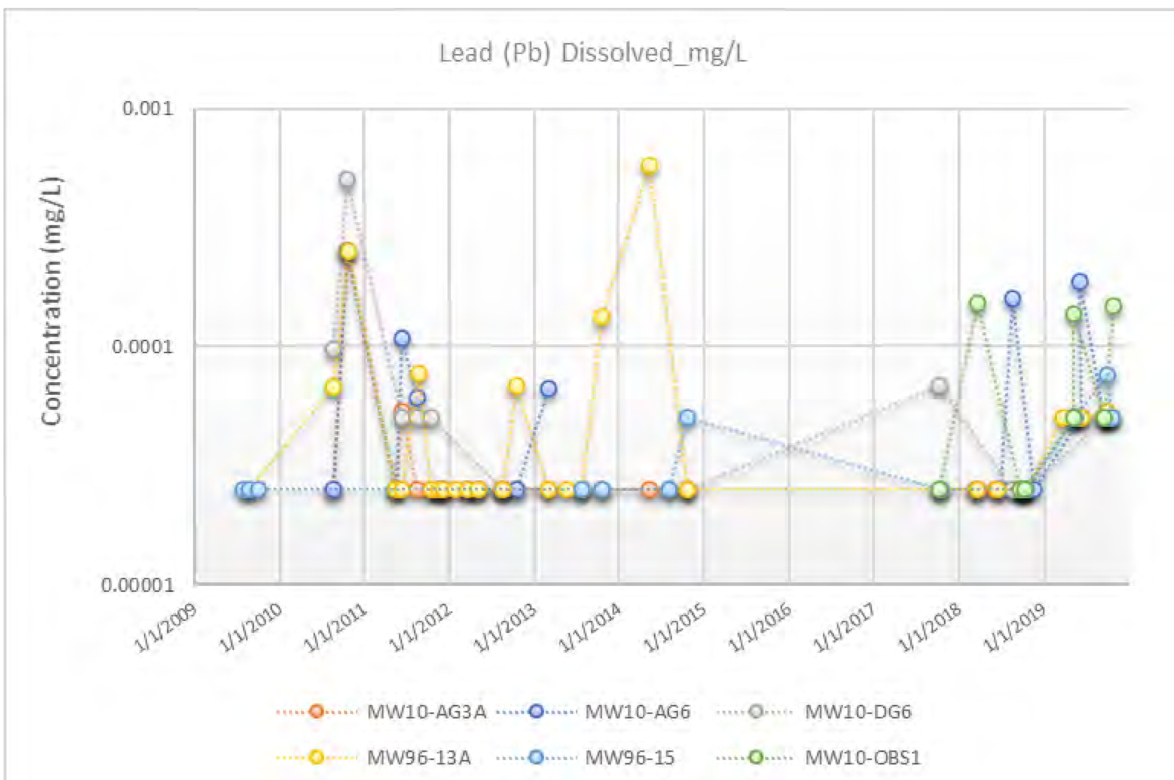


Figure 3.4-9: Concentrations of Total (a) and Dissolved (b) Lead Since 2009

3.4.3 Adaptive Management

3.4.3.1 Groundwater Quantity

2019 is the first year that some of the measurable changes in groundwater levels can be attributed to mining activities. For the wells monitored, the construction and operational activities had some effect on wells within the active mine footprint. For example, as expected due to construction of the lined heap leach pad, up to one meter declines from baseline levels were recorded in wells associated with the HLF (e.g., MW10AG3A, MW10-AG6, MW10-DG6/6R). Further, declines in the lower Dublin Gulch valley aquifer (BH-BGC11-74, MW10-OBS1) likely reflect the capture of groundwater by the LDSP underdrains and the usage of groundwater (from MW10-DG7) for potable water. In contrast, there was no measurable effect on wells outside the mine footprint (i.e., those in Eagle Pup, and the upper basin of Dublin Gulch valley. Further, significant declines (over 5 m) were recorded in BH-BGC-11-73, a tri-nested VWP located above the Eagle Pit. The declines began at the onset of pre-stripping and continued with the deepening of the Eagle pit throughout the year, indicating that some depressurization has occurred.

When comparing groundwater level data collected during the baseline period (up to August 2017) to the last two years since mine construction began and the mine became operational, the observed downward trends in a few wells adjacent to certain facilities were expected and consistent with dewatering activities in the area of the HLF, Eagle Pit and the LDSP. No adaptive management mitigations were necessary.

3.4.3.2 Groundwater Quality

When considering each well, and total and dissolved concentrations for all eight parameters, it is clear that some of the wells exhibit higher overall concentrations and higher overall ranges in concentrations than other wells. For example, MW96-15 exhibits relatively high total concentrations of arsenic, selenium and iron, MW10-DG6 exhibits relatively high dissolved concentrations of arsenic, iron and aluminum, MW96-13a exhibits relatively higher pH than the other wells, and MW10-OBS1 exhibits relatively high total concentrations of iron, aluminum, copper, zinc and lead. Nevertheless, there does not appear to be any obvious or consistent spatial connection or temporal association to explain these characteristics, and, except for the apparent decreasing trend in total iron concentrations in MW96-13A, there are no discernible changes associated with the 2017 to 2019 construction and operations phases. All observed increasing or decreasing trends were apparent before construction and operations began. Thus no adaptive management measures were needed.

3.5 Geochemical Monitoring

The geochemical monitoring program is intended to provide on-going characterization of rock encountered during the construction and operation of the Project. The geochemical monitoring program for construction rock has been designed to:

- Assess the level of weathering-driven reaction products and their potential to migrate;
- Verify geochemical predictions made during the mine planning phase;
- Assess the potential for metal leaching and acidic drainage from excavated rock to determine if it is suitable for construction material and;
- Evaluate the effectiveness of measures to prevent and control metal leaching and acidic drainage (if applicable).

3.5.1 Geochemical Barrel Testing

In 2012, a field kinetic test program consisting of eight, 120L field barrels (Photo 3.5-1), each containing ~225 kg of core cuttings representative of the Project, were initiated to support the development of water quality predictions that reflects meso-scale field-kinetic tests. Natural precipitation percolates through the barrels and is captured in collection jugs that are connected to the bottom of the barrels. Field staff collect samples several times throughout non-freezing conditions and samples are process through an accredited laboratory.

The geochemistry of field barrel leachates collected during 2019 were used in conjunction with analytical results from previous years, lab based kinetic tests (i.e., humidity cells), scaling factors, and mass and volume of ore and waste rock (realized in 2019 and in future years as considered in the mine plan) to inform predictive modeling for seepage chemistry for the WRSAs, ore stockpile and pit walls.

In summary, pH has remained stable over the duration of the barrel testing program (7.5 - 8.5), dissolved sulphate and selenium concentrations display a decreasing trend with occasional spikes and arsenic and antimony concentrations remain relatively constant over the 8-year project with some seasonal variability. The only exception to these trends is the increase in As concentration in the oxide granodiorite (OGD) field barrel (as discussed in the 2018 annual report). The OGD material in the field bin has shown high solid phase As concentrations (1065 mg As/kg) which compares to the 90th percentile solid phase As of 607mg/kg for all waste rock material. Variability in concentration that is consistent across field barrel leachates (e.g., drop in As concentration in October 2013) is most likely due to infiltration rates, where increased or decreased flushing directly affected the leachate concentrations. Conversely, the more systematic increase in arsenic seen in the oxide granodiorite barrel over the last four years may be explained by either the accumulation and flushing of stored loads or saturation within the field bins due to blockage resulting in reductive dissolution of arsenic (Lorax 2020 - Appendix H). Additional investigations of the barrels will be undertaken in 2020, which may include the de-construction of the barrels to allow placement of mesh over the drainage port in order to avoid future clogging. Alternatively, the program may be terminated as the commencement of mining will provide actual field data (i.e., actual drainage chemistry from the pit and WRSAs) to inform future water quality modelling efforts.

The results obtained from the 2019 field barrel program (in addition to other model inputs) were used to update the geochemical source term model that is described in Appendix H.

Photo 3.5-1: Geochemical Field Barrel Test Site

3.5.2 Material Testing

Major construction activities requiring borrow or fill material were largely completed in early 2019, while all the waste rock excavated from the Eagle Pit during 2019was deposited in the PG WRSA. Grab samples were taken at the start of material being used for construction or deposited in the PG WRSA and then analyzed following the Sobek Method for Modified Acid Base Accounting.

In 2019, 14 grab samples were collected from various locations to assess whether the materials met the geochemical criteria established by the regulatory approvals for construction grade rock or to characterize material in the waste rock storage area. Samples were sent to ALS Laboratories for analysis and the results are included in Appendix L.

All samples collected met the criteria required for construction or fill purposes, with a pH of at least 5.0, an NP:AP ratio of at least 3:1, and a total sulphide sulphur content of no greater than 0.3%. Samples ranged in pH from 6.6 to 9.2, with a median of 8.4, with Sulphur content ranging from non-detect at < 0.01% to 0.04% and a median of 0.025 (Table 3.5-1). In all but one cases, the NP:AP ratio was greater than 3. The one sample with a NP:AP ratio of 2.4 had a paste pH of 7.9 and a total sulfur percentage of only 0.08%, thus this sample is not acid generating and still met criteria.

Table 3.5-1: 2019 Geochemical Sampling Results Summary

ALS ID	Sample ID	Date Sampled	Paste pH	Sulfur (%)	NP:AP Ratio
Construction Testing					
L2235637-1	VICEAG-GCM-33	25-Jan-19	7.4	0.03	3:0.9 (3.3)
L2235637-2	VICEAG-GCM-34	25-Jan-19	7.6	0.02	3:0.6 (5.0)
L2235637-3	VICEAG-GCM-35	25-Jan-19	9.2	0.01	12:0.3 (40.0)
L2235637-4	VICEAG-GCM-36	25-Jan-19	9.1	0.02	13:0.6 (21.6)
L2235637-5	VICEAG-GCM-37	25-Jan-19	9.1	0.01	8:0.3 (26.7)
L2235637-6	VICEAG-GCM-38	25-Jan-19	8.9	0.01	6:0.3 (20.0)
L2235637-7	VICEAG-GCM-39	25-Jan-19	7.9	0.08	6:2.5 (2.4)
Operations Testing					
L2318194-1	VICEAG-GCM-40	20-Jul-19	8.4	0.03	18:0.9 (20.0)
L2318194-2	VICEAG-GCM-41	20-Jul-19	8.5	0.03	17:0.9 (18.9)
L2318194-3	VICEAG-GCM-42	20-Jul-19	8.4	0.03	15:0.9 (16.7)
L2318194-4	VICEAG-GCM-43	20-Jul-19	8.4	0.04	27:1.3 (20.8)
L2318194-5	VICEAG-GCM-44	20-Jul-19	8.5	0.03	18:0.9 (20.0)
L2400667-1	VICEAG-GCM-47	15-Dec-19	7.0	0.01	1:0.3 (3.3)
L2400667-2	VICEAG-GCM-48	15-Dec-19	6.6	0.01	1:0.3 (3.3)

At the time of reporting, 2019 blast hole sample results for carbon, sulfur and arsenic were still being compiled from the lab database and are being reviewed for completeness and representativeness of blast rounds, and to confirm the specific geo-spatial link for the samples. Additional sampling requirements for total carbon were identified, and these are being collected from the assay lab sample inventory. They will be sent to an accredited laboratory and reported on later.

3.6 Aquatic Environment

This section describes the stream sediment, benthic macroinvertebrate and fish and fish habitat monitoring conducted on the Project site in 2019. Sample sites for all programs are included in Figure 3.6-1. Benthic macroinvertebrate, stream sediment and water quality programs were performed concurrently to support a more robust characterization of the existing conditions.

3.6.1 Stream Sediment

The stream sediment monitoring program is designed to obtain data on the stream sediment quality in watercourses of the study area to help evaluate possible effects associated with the project. Annual sampling for stream sediment was conducted at eight sites in September 2019 (Table 3.6-1) representing the four principal drainages (Eagle Creek, Dublin Gulch, Haggart Creek and Lynx Creek) in the Project area. For the 2019 program, sampling was not conducted at one of the nine planned sites (W26) due to very low water (less than three centimeters) and a lack of depositional areas to collect a sediment sample at the time the site was visited. A detailed report is included as Appendix M.

Samples were analyzed for soil pH, total organic carbon and a suite of 32 metals. These parameters are relevant to toxicity and physical habitat requirements for benthos, fish eggs and juvenile fish. The average result of ten selected metals at each site is presented in Table 3.6-1. These elements were chosen for closer examination as they may be present locally in the Project area. Since there are no Canadian Environmental Quality Guidelines established for nickel, selenium and silver, Table 3.6-1 lists the British Columbia Working Sediment Quality

Guidelines (BCWSG) instead. Concentrations that exceeded the Interim Sediment Quality Guidelines (ISQG) are displayed in bold and gray highlighted. The ISQG guideline represents where adverse biological effects may only rarely occur. Concentrations that exceeded the Probable Effects Level (PEL) are displayed in bold and highlighted in orange. While the PELs are based on studies in other regions that show a 50% incidence of creating adverse biological effects, they are used here for reference only as they may not be representative of actual effects levels in the local Project region.

Table 3.6-1: Summary of Mean Stream Sediment Concentrations, September 2019

Drainage	Haggart Creek					Dublin Gulch	Eagle Creek	Lynx Creek	CEQG Guidelines	
Site	**W22**	**W4**	**W29**	**W5**	**W23**	**W1**	**W27**	**W6**	**ISQG**	**PEL**
pH	7.72	7.82	7.78	8.19	7.91	7.52	8.12	7.54	N/A	N/A
Arsenic (mg/kg)	**106**	**303**	**71**	**161**	**128**	**444**	**253**	**96**	5.9	17
Cadmium (mg/kg)	**0.921**	0.443	0.432	0.554	**0.747**	0.443	0.345	**1.094**	0.6	3.5
Chromium (mg/kg)	30.7	27.6	22.1	34.3	31.4	27.8	18.9	37.3	37.3	90
Copper (mg/kg)	29.3	32.2	24.0	30.6	27.4	24.6	**36.2**	27.4	35.7	197
Lead (mg/kg)	26.4	34.1	25.2	**36.1**	27.8	32.6	**41.2**	17.8	35.0	91.3
Mercury (mg/kg)	0.0844	0.0489	0.0459	0.0652	0.0580	0.0323	0.0449	0.0742	0.170	0.486
Nickel* (mg/kg)	**50.0**	**39.6**	**26.3**	**42.4**	**39.7**	**36.1**	**29.7**	**39.6**	16	75
Selenium* (mg/kg)	0.53	0.42	0.32	0.53	0.54	0.34	0.30	0.95	5	N/A
Silver* (mg/kg)	0.18	ND	ND	ND	ND	0.22	ND	ND	0.5	N/A
Zinc	**137.7**	116.9	89.1	119.5	107.2	89.0	97.8	121.7	123	315

NOTES:

Source: Appendix M
* British Columbia Working Sediment Quality Guidelines
- Not sampled
N/A = not applicable
ND = not detected
bold and gray highlight = concentrations that exceeded the Interim Sediment Quality Guidelines (ISQG)
bold and orange highlight = concentrations that exceeded the Probable Effects Level (PEL)

As demonstrated in baseline studies from previous years prior to construction, samples from 2019 also had concentrations that exceeded several guidelines for the protection of freshwater aquatic life. The PEL for arsenic, 17 mg/kg, was exceeded by substantial amounts at all of the sites, and ranged from 71 mg/kg at W29 to 444.0 mg/kg at W1. The concentrations of nickel exceeded the BCWSQG low level effect guideline (16 mg/kg) in the stream sediments at all of the sites and ranged from 26.3 mg/kg at W29 to 50.0 mg/kg at W22. The ISQG was exceeded for cadmium at W23, W22 and W6. The ISQG for copper was slightly exceeded at W27. Concentrations of lead in the stream sediments at W5 and W27 slightly exceeded the ISQG. Zinc concentrations slightly exceeded the ISQG in the stream sediments at W22. Guidelines were met in the study area for chromium, mercury, selenium and silver.

Arsenic is prevalent in the stream sediments throughout the study area and has been previously reported above the PEL on all sampling occasions. Arsenic is typically associated with the mineralogy of gold. As demonstrated in the baseline characterization work, the high concentrations documented upstream of Project activities (W1, W26 and W22) and an undisturbed reference site (W6) indicate that arsenic levels are naturally elevated throughout the Project area (Table 3.6-2).

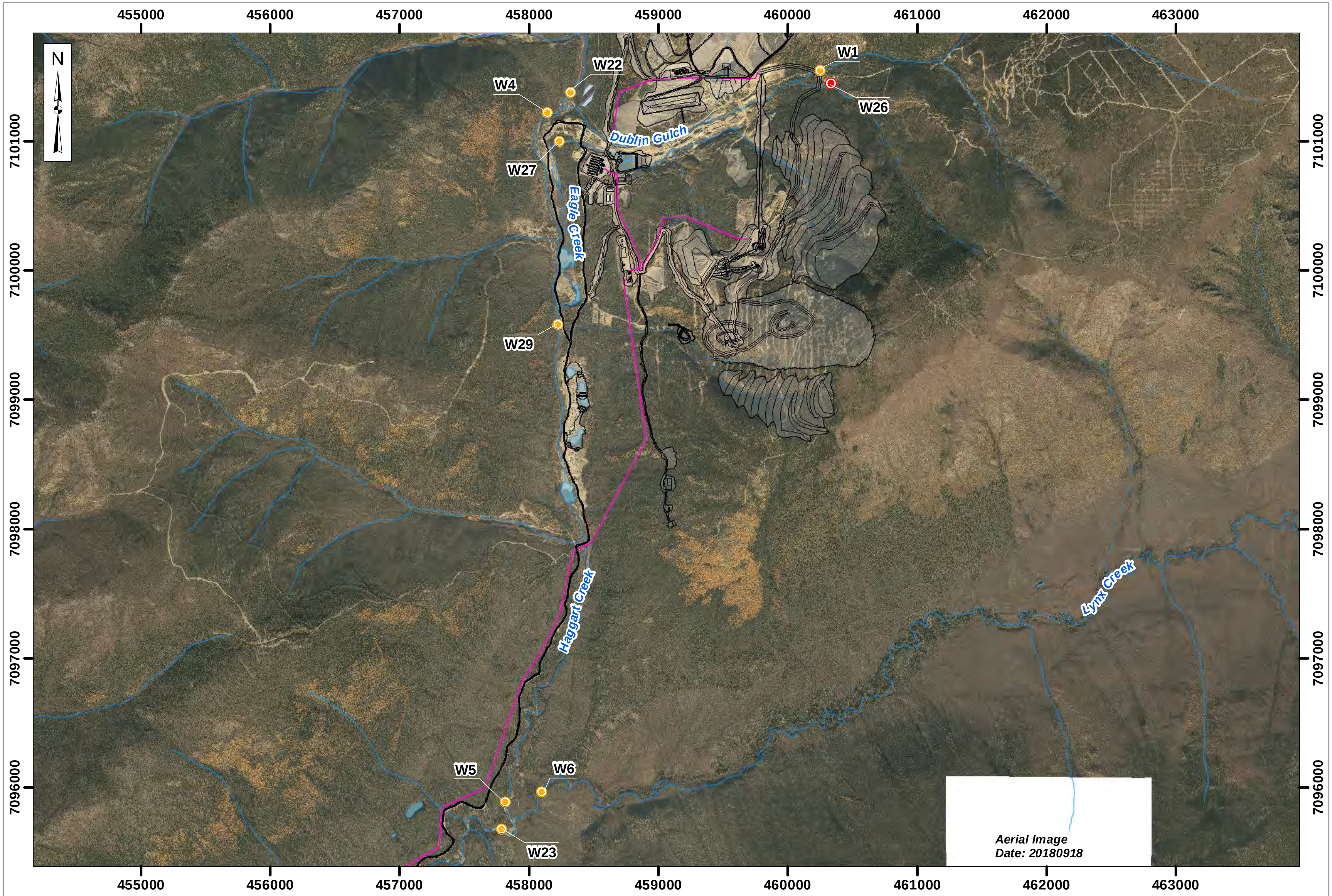
As with arsenic, nickel concentrations are naturally elevated in the Project area including at upstream and undisturbed reference sites (Table 3.6-2). Nickel exceeded the BCWSQG low level effect guidelines (16 mg/kg) in the stream sediments at all of the site. Concentrations ranged from 26.3 mg/kg at W29 to 50.0 mg/kg at W22 (located upstream of the Project). Nickel concentrations remained relatively similar across the study area in 2019, similar to previous studies.

Table 3.6-2: Mean Concentrations of As and Ni in Stream Sediments, 1995 - 2019

Drainage	Site	ARSENIC (mg/kg)							NICKEL* (mg/kg)						
		1995 n=5	2007 n=3	2009 n=3	2010 n=3	2017 n=3	2018 n=3	2019 n=3	1995 n=5	2007 n=3	2009 n=3	2010 n=3	2017 n=3	2018 n=3	2019 n=3
Haggart Creek	W22	**70.0**	**40.1**	**129.2**		**55.5**	**115.6**	**106**	**27.0**	**27.4**	**25.0**		**31.3**	**53.2**	**50.0**
	W4	**152.7**	**91.5**		**165.0**	**109.6**	**202.3**	**303**	**21.0**	**24.5**		**35.2**	**28.0**	**28.5**	**39.6**
	W29			**63.6**	**142.4**	**127.2**	**126.3**	**71**			**25.3**	**25.7**	**31.7**	**25.0**	**26.3**
	W5	**128.5**	**92.7**	**118.3**		**76.8**	**114.0**	**161**	**22.4**	**25.6**	**26.8**		**26.9**	**29.8**	**42.4**
	W23		**93.4**			**88.8**	**105.6**	**128**		**28.8**			**25.9**	**26.7**	**39.7**
Dublin Gulch	W1		**300.0**	**156.0**	**360.4**	**458.0**	**383.0**	**444**		**65.5**	13.3	**39.3**	**57.2**	**41.7**	**36.1**
	W26		**89.1**	**342.0**		**209.0**	**269.7**			15.7	**17.0**		**28.7**	**34.6**	
Eagle Cr	W27		**175.0**	**173.7**	**77.9**	**200.3**	**252.7**	**253**		**25.3**	**20.6**	**21.1**	**31.0**	**28.4**	**29.7**
Lynx Cr	W6		**65.9**			**85.8**	**79.5**	**96**		**23.6**			**27.5**	**29.7**	**39.6**
CEQG Guidelines	**ISQG**	5.9							16*						
	PEL	17							75*						

NOTES:

*BCWSQG upper and lower guidelines used



Legend:

- Stream Sediment and Benthic Invertebrate Monitoring Location
- Benthic Invertebrate Monitoring Location
- Reserved
- Facility
- Site Power
- Watercourse (Perennial)
- Watercourse (Ephemeral)
- Watercourse (Intermittent)

VICTORIA GOLD CORP

0 500 1,000
Meters

Projection:	Drawn By:	EAGLE GOLD PROJECT YUKON TERRITORY
NAD 83 UTM Zone 8N	HC	
Date: 2020/05/10	Figure: 3.6-1	Sediment & Benthic Monitoring Locations

3.6.2 Benthic Macroinvertebrates

Annual sampling for benthic invertebrates was conducted in September 2019. Benthic samples and water quality samples were collected at sites shown in Figure 3.6-1. A detailed report is included as Appendix N.

Data from the survey was subjected to several metrics and indices to describe the benthic populations. Table 3.6-3 provides a summary of benthic community statistics.

Table 3.6-3: Summary of General Statistics on Benthic Communities, September 2019

Drainage	Site	Abundance (organisms/site)	Density (organisms/m^3)	Taxonomic Richness/site	Simpson's Index of Diversity/site
Haggart Creek	W22	3156	11324	44	0.80
	W4	2779	9971	55	0.81
	W29	5156	18500	43	0.85
	W5	3810	13670	50	0.89
	W23	5170	18550	47	0.88
Dublin Gulch	W1	3251	11665	42	0.88
	W26	247	2685	26	0.85
Eagle Creek	W27	2508	8999	36	0.80
Lynx Creek	W6	4051	14535	40	0.81

Abundance was determined by summing all of the individuals present in a known sample area. Abundance per site was calculated as density (organisms/m^3) to allow comparisons with previous surveys. Taxonomic richness is a measure of diversity where each type of invertebrate is counted per site. The Simpson's Diversity Index was also applied as a measure of diversity. This index takes into account the number of species present as well as the relative abundance of each species, and ranges from 0 to 1, with numbers approaching 1 representing greater diversity. This method shows that communities at all sites were very diverse ranging from 36 different taxonomic groups at W27 (Eagle Creek below the LDSP) to 55 different taxonomic groups at W4 (Haggart Creek below Dublin Gulch) as shown above in Table 3.6-3.

When comparing, for example, a site on Haggart Creek upstream of the project and almost all historic (since the early 1900's on Haggart Creek) placer operations (W22) with a site downstream of the project (W23), the density and diversity are greater at W23, suggesting that little if any, impact to Haggart Creek benthic populations has occurred despite over 100 years of human activities within the study area. Further discussion is provided in Appendix N.

When examined against previous surveys, the 2019 data indicate habitat conditions continue to support stable and healthy benthic populations at all sites with good representation of the major groups of organisms that are typically present in lotic waters. When comparing the most upstream site (W22) with all sample sites in Haggart Creek downstream of Project influence, the densities and diversities are very similar. This data suggests that there is little, if any, impact to Haggart Creek from activities at the Project.

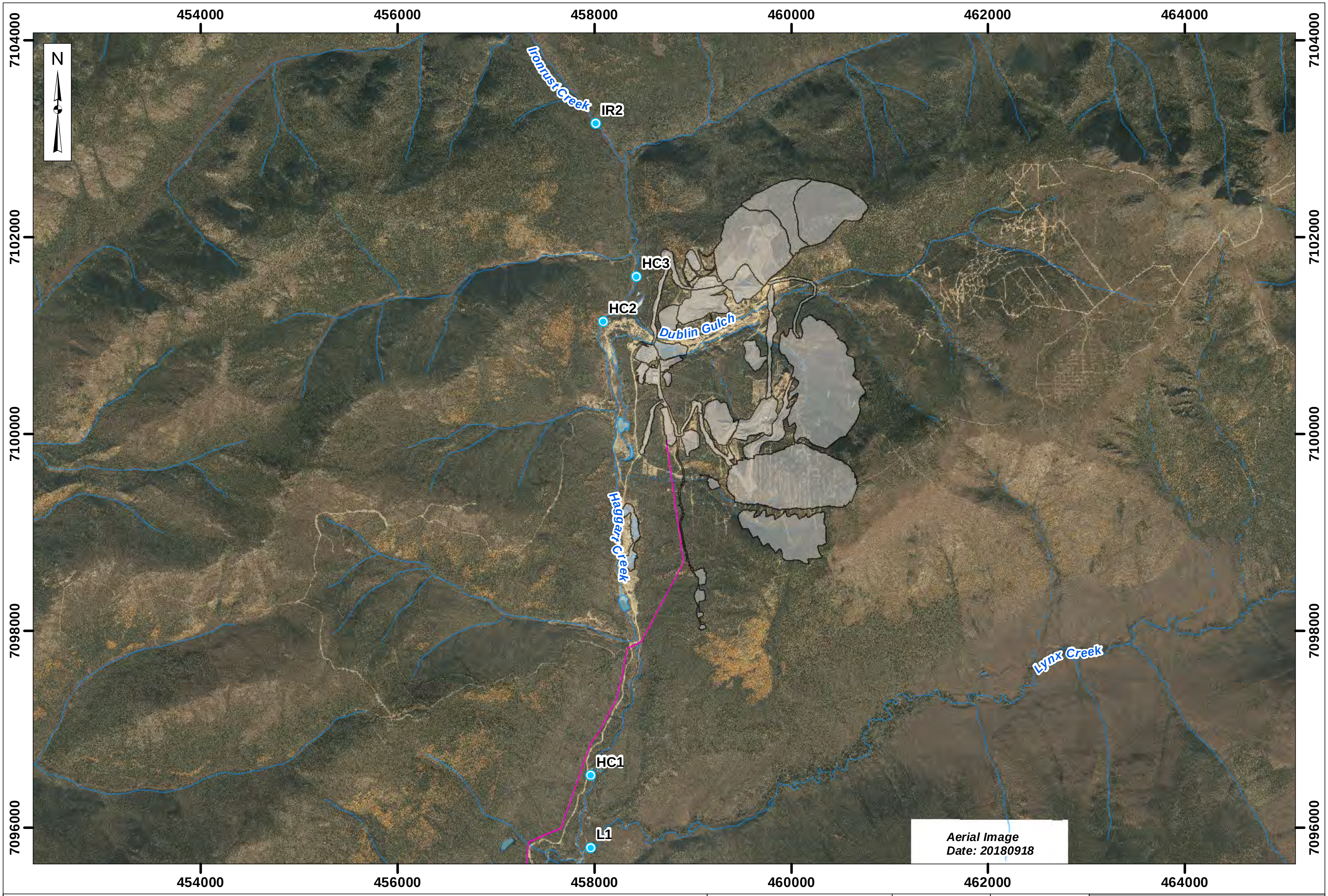
3.6.3 Fish and Fish Habitat

Annual inventory, sampling and documenting of fish and fish habitat was conducted in September 2019 at the five established monitoring locations (on Ironrust, Haggart, and Lynx Creeks) shown in Figure 3.6-2. A detailed report is provided as Appendix O.

Four fish species represented the majority of captured fish in the 2019 annual study: slimy sculpin (35), Arctic grayling (24), Chinook salmon (10) and burbot (1) (Table 3.6-4). Biophysical characteristics observed and fish species found at each of the five monitoring sites in September 2019 were similar to previous surveys. Species composition showed consistency and was indicative of a stable fish community.

Table 3.6-4: 2019 Fish Capture Methods and Results

Site	Capture Method	Catch				Observed
		Artic Grayling	Burbot	Chinook Salmon	Slimy Sculpin	
Haggart Creek Drainage Basin						
HC1	Angling	0	0	0	0	1 Adult and 1 Juvenile Grayling
	Electrofishing	9	0	3	12	2 Juvenile Grayling and 2 Sculpin
	Minnow trapping	8	1	3	1	-
HC2	Electrofishing	3	0	0	1	A1 Adult Grayling
	Minnow trapping	0	0	0	0	-
HC3	Electrofishing	2	0	3	13	2 Subadult and 15-20 Juvenile Grayling
	Minnow trapping	0	0	0	2	-
Ironrust Creek Drainage Basin						
IR2	Electrofishing	0	0	1	1	-
	Minnow trapping	0	0	0	0	-
Lynx Creek Drainage Basin						
L1	Angling	1	0	0	0	-
	Electrofishing	1	0	0	5	2 Sculpin
	Minnow trapping	0	0	0	0	-



Legend:

Monitoring Location
Transmission Line
Watercourse (Perennial)
Project Footprint
Reserved Area
Watercourse (Ephemeral)
Watercourse (Intermittent)

VICTORIA GOLD CORP

0 750 1,500
Meters

Projection: NAD 83 UTM Zone 8N

Drawn By: HC

Date: 2020/05/10

Figure: 3.6-2

EAGLE GOLD PROJECT
YUKON TERRITORY

Fish and Fish Habitat Monitoring Locations

3.7 Metal and Diamond Mining Effluent Regulations Monitoring Program

The Metal and Diamond Mine Effluent Regulations (MDMER) require monitoring and reporting of discharged effluent volume and quality under the MDMER to Environment and Climate Change Canada (ECCC). Details of registered Final Discharge Points (FDPs) and the associated required monitoring results are submitted on a quarterly and annual basis to ECCC through the online electronic Mine Effluent Reporting System (MERS) and the Environmental Effects Monitoring Reporter (EEMR).

The MDMER requires effluent monitoring and sampling at FDPs if discharge occurs. Deleterious substance samples are collected at least 24 hours apart and not more than 7 days apart if discharge is occurring. Effluent Characterization, and Reference and Exposure Water Quality sample are collected on a quarterly basis if discharge is occurring. Acute lethality tests are performed on a monthly basis if discharge occurs, while sublethal testing occurs on an annual basis if 30 days or less of discharge occurs.

Details with respect to the registered FDPs for the Project are provided in Appendix P. No water was discharged from the registered FDPs in 2019 with the exception of the two brief LDSP FDP discharge events on April 20 and April 27-29. Discharge from the LDSP in April met Schedule 4 deleterious substance criteria with the exception of TSS which exceeded schedule 4 criteria for grab and monthly mean concentrations (discussed in Appendix G). Water from the HLFUMV FDP was captured and recirculated back to the Events Pond. No water was discharged from the Events Pond FDP Emergency spillway.

The Annual Effluent Monitoring Program results are presented in Appendix Q.

At the time of this report, in accordance with the MDMER, the Eagle Gold Mine Phase 1 Environmental Effect Monitoring Study Design was being finalized for submission to ECCC in April, 2020.

3.8 Meteorology and Air Quality Monitoring

3.8.1 Climate Monitoring

Climate monitoring continued at the Project throughout 2019 from two onsite climate stations; the Potato Hills station, an ONSET Hobo operating system (1,420 meters above sea level (masl)), and the Camp station, a Campbell Scientific CR800 datalogger (782 masl) (Table 3.8-1 and Figure 3.8-2).

The Potato Hills climate station experienced repeated failures in 2019 and was decommissioned in October. A replacement station will be installed in the first quarter of 2020. While the Camp station recorded continuous snow depth, the records for precipitation were not usable from January to December 2019. The Camp station will be repaired in the first quarter of 2020.

Snow course surveys as considered in the EMSAMP were completed in 2019 at Potato Hills, the Camp station and within the HLF catchment.

Appendix R provides an updated climate data report based on all data compiled for the Project.

Table 3.8-1: Climate Station Locations

Site	Elevation (m asl)	UTM E	UTM N	Station Type
Potato Hills	1420	463,544	7,100,833	Automated
Camp	782	458,164	7,101,036	Automated

3.8.2 Air Quality Monitoring

Visual daily air quality monitoring throughout the site took place during periods when the roadways and active work areas were not frozen or wetted. The goal of the visual monitoring program was to identify areas where fugitive dust emissions from roadways and work sites were prevalent. Fugitive dust events observed during the reporting period were minor and addressed through the application of water in heavy traffic areas.

Three Beta-Attenuation Particulate Monitors (EBAMs) are installed west of the camp (Figure 3.8-2). The EBAM system includes real time data transmission that can be monitored remotely with daily summaries automatically generated by the associated software platform. In addition, site personnel complete routine checks and monthly maintenance. Routine measurements are taken on 15-minute intervals for Total Suspended Particulates (TSPs), Fine Particulate Matter ($PM_{2.5}$) and Coarse Particulate Matter (PM_{10}).

Annual averages are calculated from the data covering the time period January 1 to December 31, 2019. All measured air quality particulates were below the annual average outlined by the YAAQS. Daily recorded air quality results are summarized and compared to the Yukon Ambient Air Quality Standards (YAAQS) in Table 3.8-2 and shown Figure 3.8-1. There were three short-lived occurrences in May and June of TSP exceeding the 24hr standard. There were also six short-lived exceedances of the 24hr YAAQS for $PM_{2.5}$, once each in May and July, and then for a short stretch of multiple days in September. PM_{10} results displayed five short-lived occurrences of 24hr YAAQS exceedances, once in May (the same day that measured an exceedance of TSP), then the same days in September that measured exceedances in $PM_{2.5}$. The May and July exceedances were associated with construction activities during exceptionally dry periods and the September exceedances were related to forest fires in the Project area.

Table 3.8-2: Daily Air Quality Results Compared to the Yukon Ambient Air Quality Standards

Contaminant	Annual Ambient Air Quality Objectives (µg/m^3)	Results			24hr Ambient Air (µg/m^3)	No. of Exceedances
		Min	Max	Mean		
TSP	60	0	273.4	21.36	120	6
$PM_{2.5}$	10	0	12.71	1.19	28	0
PM_{10}	*	4.99	174.48	7.91	50	4

NOTE: *No Annual Ambient Air Quality Objectives outlined in the Yukon Standard.

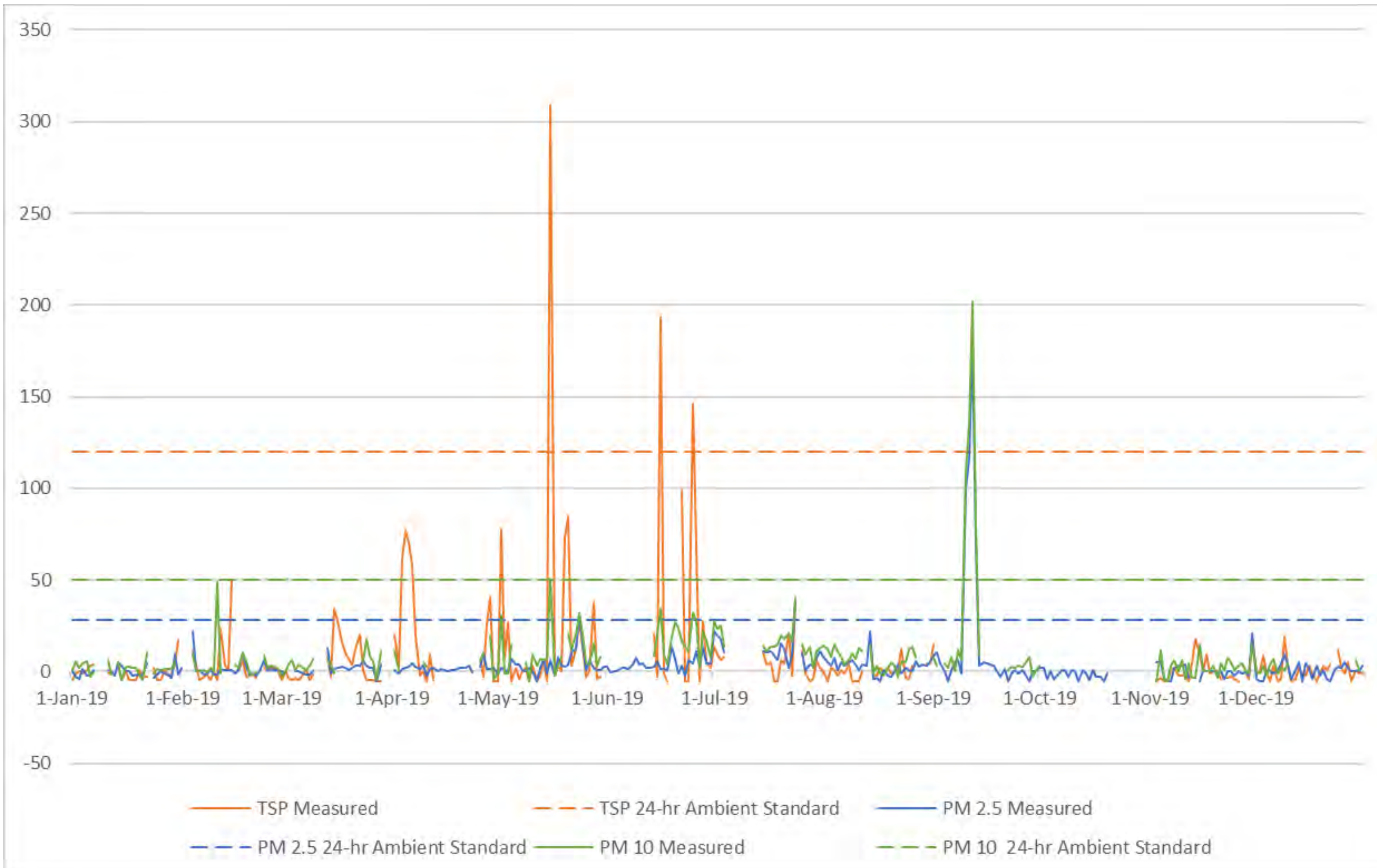


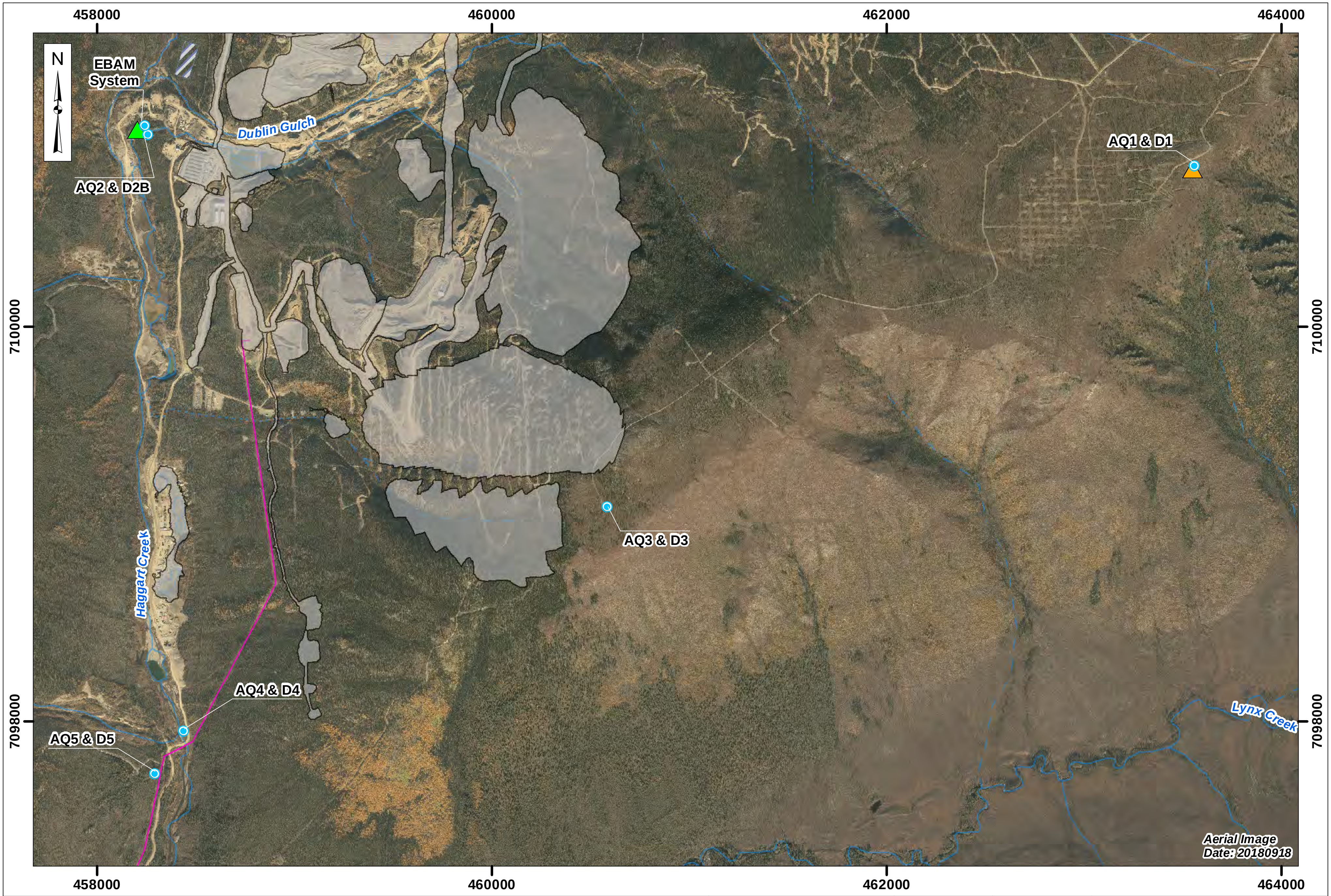
Figure 3.8-1: TSP, $PM_{2.5}$ and PM_{10} Monitoring Results 2019 in ug/m^3

Additionally, dustfall stations are located around the Project site at the locations provided in Table 3.8-3 and Figure 3.8-2. The dustfall stations are located adjacent to the vegetation plots described in Section 3.7. Dustfall container samples are collected and submitted for laboratory analysis on a monthly basis.

Passive Air Sampling Systems capable of testing nitrogen dioxide (NO_2) sulfur dioxide (SO_2) and Ammonia (NH_3) was installed adjacent to each existing dustfall stations during the first quarter of 2020.

Table 3.8-3: Dustfall Monitoring Locations

Dustfall	Coordinates		Location
	UTM E	UTM N	
D1	463,559	7,100,818	Potato Hills near climate station
D2B	458,254	7,100,976	Near W27
D3	460,583	7,099,088	Above Eagle Pit and PG WRSA
D4	458,436	7,097,951	Km 42 on the access rd.
D5	458,290	7,097,734	At entrance to Rex Road
EBAM System	458,237	7,101,021	West of camp, near climate station



Legend:

- Camp Climate Station
- Potato Hills Climate Station
- Air Quality Monitoring Locations
- Project Footprint
- Reserved
- Transmission Line
- Watercourse (Perennial)
- Watercourse (Ephemeral)
- Watercourse (Intermittent)

VICTORIA GOLD CORP

0 400 800 Meters

Projection: NAD 83 UTM Zone 8N

Drawn By: HC

Date: 2020/05/10

Figure: 3.8-2

EAGLE GOLD PROJECT YUKON TERRITORY

Meteorological and Air Quality Monitoring Locations

3.8.3 Air Quality Modelling Assessment

To support an application for an Air Emissions Permit pursuant to the Yukon *Air Emissions Regulations,* an updated air quality model assessment was completed in 2019. The application sought authorization for the release of emissions related to the operation of ancillary mine infrastructure and mining actvities (i.e., onsite backup power generating facilities, operation of the the mine fleet, fugitive emissions related to standard mine development activities) and the gold recovery process. Environment Yukon subsequently issued Air Emissions Permit 60-060 authorizing the activities contemplated in the application and the updated air quality model assessment.

For the purposes of the assessment, the modelled scenario considered Year 4 of mining operations as it was deemed a “worst case” period based on an analysis of the full mine plan mining rates and equipment operation (primarily based on haul distances and number of pieces of equipment). Air emissions were evaluated in two parts:

- The short-term emissions inventory captured the maximum 1-hour or 24-hour operating conditions and production rates of the various site activities; and
- The average annual emissions inventory reflected the operating and production rates of the various site activities over the full year and corresponds to the annual production rates listed in the mine plan schedule.

The Year 4 activities evaluated as part of the assessment included:

- **Extraction:** Gold-bearing ore extracted from the pit using a traditional drill/blast method. Blasting of ore and waste rock within the pit will employ ammonium nitrate fuel oil (ANFO) Blasted ore and waste rock will be extracted by mechanical shovel and loaded into haul trucks.
- **Hauling:** Waste rock hauled directly to the EP WRSA (as the PG WRSA will not be active after Year 3) and it is assumed that revegetation of the PG WRSA will begin in Year 4. Most ore from the pit will be hauled to the primary crusher, although some ore may be hauled directly to the HLF and stacked on the heap.
- **Crushing:** The primary crusher will operate at a maximum hourly throughput of 1,848 tonnes of ore per hour (t/h). Ore will undergo secondary and tertiary crushing before being conveyed to the HLF.
- **Heap leach:** Ore will be conveyed by a network of transfer towers and covered conveyors and then stacked on the heap. Process solution will be applied to the heap and gold-bearing pregnant solution will be collected at the base of the heap via a system of sump pumps. From the HLF, the pregnant solution will be pumped to the process plant where the gold will be extracted from solution and refined.
- **Refining:** The gold-containing sludge will be smelted into doré bars and the barren solution will be recycled to the HLF.
- **Power Generation:** Standby diesel generators will be used to provide power to the Project site in the event of a power outage or a reduction of power supply from Yukon Energy Corp. To evaluate the potential effects of power generation, it was assumed that all three main generators will operate concurrently at 100% load and the explosives storage facility generator will operate at 50% load. To determine the worst-case short-term effects, the generators were assumed to operate 24 hours per day, 365 days per year. However, to determine the worst-case long term (i.e., annual) effects, the generators were assumed to

operate 24 hours per day during the months of December, January and February only. It is during these months that the power supply from YEC is most likely to be less reliable.

Table 3.8-4 summarizes the type and quantity of contaminants that may be released into the air as a result of the Project, considering the worst-case operations scenario. The results have been generated by dispersion modelling as described in Appendix S and show the maximum predicted concentration for each pollutant. Where a pollutant was predicted to be over its respective criteria, a frequency analysis was conducted to examine the nature of the exceedance. As described in Appendix S, the worst case scenario considered within the model includes peak mining operations, on a material movement basis, and full operation of the backup power generating facilities, i.e., assuming that grid power is not available, for the short term effects case and full operation of the backup power generating facilities for December, January and February (when grid power could potentially be unreliable) for the long term effects case.

Table 3.8-4: Predicted Air Emissions from Worst-case Operations

Pollutant	Averaging Period	Criteria (µg/m³)	Worker's Camp	Fenceline Maximum Location				
			Max Predicted Conc. (µg/m³)	Max Predicted Conc. (µg/m³)	% of Criteria	Predicted No. of Elevated Conc.	Location of Max	
							UTM E	UTM N
TSP	24-hr (max)	120	46.1	367.9	**307%**	**29 days per year**	460,746	7,101,438
	Annual (average)	60	13.3	32.3	54%	NA	460,824	7,101,361
PM_{10}	24-hr (max)	50	21.1	210.5	**421%**	**34 days per year**	459,653	7,098,308
$PM_{2.5}$	24-hr (98th percentile)	27	4.7	20.6	76%	0 days per year	459,653	7,098,308
	Annual (average)	8.8	1.2	2.7	31%	NA	459,653	7,098,308
CO	1-hr (max)	14,885	856.6	2,115.9	14%	0 hours per year	461,165	7,099,578
	8-hr (max)	5,725	591.8	959.9	17%	0 hours per year	461,168	7,099,482
SO_2	1-hr (99th percentile)	183	1.0	19.0	10%	0 hours per year	459,653	7,098,308
	24-hour (max)	149	0.6	13.4	9%	0 days per year	459,653	7,098,308
	Annual (average)	13	0.03	0.28	2%	NA	459,653	7,098,308
NO_2	1-hr (98th percentile)	113	38.4	115.9	**103%**	**49 hours per year**	459,653	7,098,308
	24-hr (max)	199	24.1	104.4	52%	0 days per year	459,653	7,098,308
	Annual (average)	32	2.3	11.8	37%	NA	457,742	7,099,001
As	24-hr (max)	0.3	0.0140	0.1372	46%	0 days per year	459,653	7,098,308
Cd	24-hr (max)	0.025	0.00002	0.00021	1%	0 days per year	459,653	7,098,308
Cr	24-hr (max)	0.5	0.0057	0.0515	10%	0 days per year	460,757	7,101,425
Cu	24-hr (max)	50	0.0011	0.0120	0%	0 days per year	459,653	7,098,308
Hg	24-hr (max)	2	0.000001	0.000007	0%	0 days per year	460,757	7,101,425
Ni	24-hr (max)	0.2	0.0010	0.0096	5%	0 days per year	459,653	7,098,308
	Annual (average)	0.04	0.0003	0.0008	2%	NA	460,824	7,101,361
Pb	24-hr (max)	0.5	0.0011	0.0111	2%	0 days per year	459,653	7,098,308
Zn	24-hr (max)	120	0.0035	0.0392	0%	0 days per year	459,653	7,098,308
NH_3	24-hr (max)	100	0.0007	0.0045	0%	0 days per year	460,206	7,103,060

NOTES:
1 - **Bold** and yellow highlighted values indicate predicted concentrations that are above the Project AQC.
2 - Predicted concentrations are presented after removal of meteorological anomalies as per the *Alberta Air Quality Model Guideline*.
3 - Results for TSP, PM_{10} and $PM_{2.5}$ include the addition of background air concentrations; results for other COPC do not include background.

To support the application for an Air Emissions Permit, a standalone Air Quality Monitoring Plan was developed that was relied upon by Environment Yukon for the development of specific monitoring requirements under permit 60-060.

3.9 Terrestrial

3.9.1 Vegetation Monitoring Program

As outlined in the EMSAMP, four vegetation plots were established in 2018 to monitor changes in vegetation during the life of the Project. The vegetation monitoring plots consist of two sites in the Subalpine Zone with elevations greater than 1225 masl and two sites at lower elevation in Forested areas. These vegetation plots are monitored once a year during the growing season to provide data to determine if there are potential changes associated with metals in and on plant tissue due to Project activities.

In 2019, due to construction and operational considerations, alternate sites for two of the original locations were required. D2B (re-established D2 site, approximately 70 m from original site) and D4B (re-established as D4 site, approximately 300 m south of the original site) are the new vegetation monitoring plots as shown in Table 3.9-1.

Table 3.9-1: Location and Description of Vegetation Monitoring Plots

Plot #	NAD 83 Zone 8N		Aspect	Elevation (m)	Site Description
	Easting	Northing			
D1	463550	7100803	Level	1417	Potato Hills near climate station
D2B	458251	7101150	West	834	Upslope of the air quality station and the camp climate station
D3	460598	7099079	South west	1356	Top of Eagle Pup near the over-the-top road
D4B	458450	7097945	Level	757	On the west side of the access road just upstream of the Haggart Creek culverts.

NOTE: Source Laberge 2019 (Appendix T)

The coordinates of each site represent the center point of that site. Four corner points were then established in cardinal directions 10 meters from the center.

Vegetation samples were collected for species found within each of the four plots, Table 3.9-2 lists the species and sites where the sample biomass was large enough to run analyses. Samples were analyzed for a suite of 34 metals including mercury. The focus of the analysis was on metals related to potential emissions of the gold recovery process (arsenic, cadmium, chromium, lead, and mercury) as outlined in Table 3.9-2

Table 3.9-2: Results of Vegetation Monitoring Metal Analysis

Plot	Tissue Type	N	Selected Metal Concentrations (mg/kg) per Tissue Type				
			Arsenic	Cadmium	Chromium	Lead	Mercury
D1	Dwarf Birch	5	0.136	0.174	0.101	0.070	0.0053
D2B	Dwarf Birch	1	1.28	0.123	0.200	0.262	0.0055
D3	Dwarf Birch	5	0.835	0.149	0.178	0.297	0.0056
D4B	Dwarf Birch	3	1.035	0.137	0.182	0.234	0.0061
D2B	Equisetum	1	0.583	1.03	0.135	0.107	0.0053
D4B	Equisetum	2	0.545	0.803	0.147	0.086	0.0070
D1	Fescue	1	0.104	0.0770	0.173	0.143	ND
D2B	Fescue	1	1.28	0.0779	0.292	0.208	ND
D3	Fescue	1	0.669	0.0390	0.474	0.334	ND
D2B	Paper Birch leaves	1	1.88	0.464	0.394	0.464	0.0058

Plot	Tissue Type	N	Selected Metal Concentrations (mg/kg) per Tissue Type				
			Arsenic	Cadmium	Chromium	Lead	Mercury
D2B	Paper Birch twigs	1	0.514	0.771	0.155	0.174	ND
D1	Willow leaves	5	0.167	2.066	0.105	0.113	0.0067
D2B	Willow Leaves	4	1.65	3.56	0.208	0.324	0.0064
D3	Willow leaves	5	1.267	1.761	0.259	0.377	0.0071
D4B	Willow leaves	4	1.00	1.61	0.173	0.171	0.0058
D1	Willow twigs	5	0.132	2.406	0.255	0.194	ND
D2B	Willow twigs	3	1.00	2.74	0.393	0.213	ND
D3	Willow twigs	3	1.03	1.05	0.392	0.347	ND
D4B	Willow twigs	2	0.876	0.852	0.242	0.155	ND
Toxicity thresholds for beef cattle (Puls, 1994):			>10	50 - 500	>40	>100	N/A

NOTE: Source Laberge 2019 (Appendix T); ND=not detected.

The 2019 data can only be compared to 2018 data from the sites D-1 and D-3 as the other two sites were re-established in 2019. Concentrations were similar between the two years for arsenic, cadmium and mercury (Table 4). Levels of chromium and lead were consistently higher in the various tissues in 2019 than in 2018, although not by a great deal.

There was no visible sign of stress in any of the vegetation in the plots. Full results of the 2019 Vegetation Monitoring program can be found in Appendix T.

3.9.2 Invasive Plants Management Program

The Invasive Plant Management Program is used to develop strategies that help prevent the introduction and spread of invasive species and noxious weeds on the Project site. VGC has taken measures that help reduce the likelihood of plant infestations from occurring. If any significant infestations are identified they will be actively managed, including removals within mine operations areas. This section provides a summary of monitoring and measures taken on site to control invasive plants.

The Yukon Invasive Species Council (YISC) defines invasive species as:

"…an organism (plant, animal, fungus, or bacterium) that is introduced and has effects on our economy, our environment, or our health. Not all introduced species are invasive. The term "invasive" is reserved for the most aggressive species that reproduce rapidly and cause major changes to the areas where they become established."

The YISC has documented approximately 160 introduced plant species in the Yukon, with 18 species as highly invasive based on abundance, aggressiveness, and persistence, detailed in Table 3.9-3 (YISC 2020). This categorization is used as a guide by VGC in prioritizing its management efforts to control invasive plants. Management activities will focus on the highest ranked plant species for invasiveness; however, activities also include other species if they become established on the Project footprint.

Table 3.9-3: Highly Invasive Plant Species Documented in Yukon

Family	Genus	Species	Common Name	Abundance	Persistence
Grass	Agropyron	cristatum	Crested Wheat Grass	C	1

Family	Genus	Species	Common Name	Abundance	Persistence
Grass	Bromus	inermis	Smooth Brome	C	1
Sunflower	Centaurea	stoebe	Spotted Knapweed	X	3
Sunflower	Cirsium	arvense	Creeping (Canada) Thistle	R	2
Sunflower	Crepis	tectorum	Narrow-leaved Hawksbeard	C	1
Euphorbia	Euphorbia	esula	Leafy Spurge	R	2
Sunflower	Hieracium	caespitosum	Field Hawkweed	R	2
Sunflower	Leucanthemum	vulgare	Oxeye daisy	R	1
Grass	Leymus	angustus	Narrow-leaved (Altai) Lyme Grass	R	2
Figwort	Linaria	dalmatica	Dalmatian Toadflax	X	3
Figwort	Linaria	vulgaris	Butter-and-Eggs	C	1
Pea	Medicago	falcata	Lucerne	C	1
Pea	Melilotus	alba	White Sweetclover	C	1
Pea	Melilotus	officinalis	Yellow Sweetclover	C	1
Sunflower	Sonchus	arvensis ssp. uliginosus	Field Sow-thistle	C	1
Sunflower	Tanacetum	vulgare	Common Tansy	U	2
Sunflower	Tripleurospermum	inodoratum	Scentless Chamomile	R	1
Pea	Vicia	cracca	Tufted Vetch	C	2

General Abundance: C – common widespread established, R – rare known from only 1 or two localities, X – possibly not persistent, U – unknown. Persistence: 1 – widespread, 2 – local, 3 – not persistent.

3.9.2.1 Prevention

The main objective in managing invasive plant infestations on the Project footprint is to conduct mining activities in a manner that prevents the introduction or spread of invasive plants. Prevention is the most effective means of controlling invasive species, and helps to avoid significant long-term economic, environmental, and social costs (YISC, 2020). Invasive species are opportunistic in nature, taking advantage of a lack of competition from other species. Thus, in natural conditions with biodiversity and a dense population of native species, invasive species are less likely to establish.

VGC's ongoing prevention strategies include the following:

- Minimizing soil disturbance during construction and operations to limit availability of exposed soils to invasive plant seeding.
- Establishing a vegetation cover as soon as possible after ground disturbance, by seeding areas that will be inactive with interim reclamation indigenous seed mixtures.
- Minimizing invasive plant seed introduction to disturbed sites by:
    - Keeping equipment clean on site and ensuring contractors are bringing clean equipment into the Project site.
    - Keeping equipment laydowns and storage areas free of invasive plants.

- o Retaining vegetated areas along the site access and haul roads during maintenance where possible.

During the period considered in this report, vegetation removal and soil disturbance was minimized to the extent practicable by adhering closely to construction plans, and leaving vegetation strips where possible. When clearing was required, the humus layer and vegetation root mat was retained and stored in predetermined soil stockpile areas.

A combination of revegetation and bioengineering of exposed slopes was conducted in the fall of 2019 to control runoff, stabilize slopes, and prevent establishment of invasive species. Revegetation focused on seeding native plant species that were selected based upon the baseline vegetation survey inventory, suitability for site characteristics and commercial availability (Appendix U). Bioengineering techniques also sourced local willow (*Salix*) species from the Project site. These efforts are detailed in Section 6.

Construction contractors on site were expected to keep their equipment clean and in good working order, particularly prior to mobilizing to site. The majority of construction contractor-maintained equipment was sourced from within the Yukon for the duration of construction, thus reducing the risk of invasive transmission across provincial and territorial boundaries.

3.9.2.2 Control

During the report period of 2019, no control or removal methods was required to manage invasive plants on the Project site.

3.9.2.3 Assessment and Monitoring

Disturbed lands in the Project footprint will continue to be monitored to detect the establishment of invasive plant and noxious weed species on both revegetated and unvegetated areas. The surveys are conducted in late spring/early summer so that plant control measures can be undertaken prior to seed dispersal in late summer/early fall.

In the event that invasive plant populations do become established on the mine site or associated disturbances, VGC will utilize one or a combination of the listed methods to control these infestations. VGC will undertake control efforts on species that are listed for Yukon as noxious weeds or invasive plant species that pose a threat to humans, animals or ecosystems.

3.9.3 Soils

The soils monitoring program was designed to provide data to assess whether there are changes to metal and nutrient levels in soils adjacent to the mine as a result of dust deposition occurring during Project activities. Soil sampling locations were picked in conjunction with the vegetation monitoring program (see Table 3.8-1, above).

The current version of the EMSAMP contemplates annual collection of soil (and vegetation) samples; however, based on the timeline for vegetation uptake of metals, the frequency of this program is being reconsidered. For the 2019 program, soil samples were only collected for the relocated sites (D2B and D4B) to establish an initial soil characterization that future programs and results can be compared against.

The soil sample analysis at D2B and D4B indicate that, consistent with prior characterization programs, the soils at the Project are relatively nutrient poor. The soil samples were also analyzed for pH and a suite of 36 metals. The soil at was alkaline (8.23) at D2B and slightly acidic at D-4B (6.00). Of the 36 elements analyzed, boron and tin were not detected. With the exception of arsenic (and only at D2B) all metals were below CCME guidelines and Yukon Contaminated Sites Regulations (Table 3.9-4). Arsenic is often associated with gold bearing anomalies in the region and these baseline concentrations reflect the natural mineralization of the Project area.

Table 3.9-4: Results of Soil Monitoring Compared to CCME and Yukon CSR

Element	CCME (mg/kg)		Yukon CSR (mg/kg)		D2B	D4B
	Agriculture	Parkland	Agriculture	Parkland		
Antimony (Sb)	20	20	20	20	2.32	3.44
Arsenic (As)	12	12	15	15	32.8	5.17
Barium (Ba)	750	500	750	500	348	327
Beryllium (Be)	4	4	4	4	0.31	0.30
Cadmium (Cd)	1.4	10	1.5	1.5	0.380	0.418
Chromium (Cr)	64	64	50	60	18.8	6.18
Cobalt (Co)	40	50	40	50	8.81	3.86
Copper (Cu)	63	63	90	90	27.9	25.9
Lead (Pb)	70	140	100	100	12.6	8.43
Mercury (Hg)	6.6	6.6	0.6	15	0.0329	0.146
Molybdenum (Mo)	5	10	5	10	1.01	0.66
Nickel (Ni)	45	45	150	150	24.3	12.8
Selenium (Se)	1	1	2	1	0.32	0.86
Silver (Ag)	20	20	20	20	0.15	0.58
Thallium (Ti)	1	1	2	-	0.088	0.054
Tin (Sn)	5	50	5	50	<2.0	<2.0
Uranium (U)	23	23	-	-	0.600	0.998
Vanadium (V)	130	130	200	200	33.8	8.55
Zinc (Zn)	250	250	150	150	66.8	20.3

NOTE: Source Laberge 2019 (Appendix T); ND=not detected.

The full report can be found in Appendix T.

3.9.4 Wildlife

Wildlife mitigation measures are implemented through mandatory Project site orientation, traffic control policies, and training and implementation of the Project's management plans including bear awareness and the wildlife observation reporting program.

Personnel record wildlife sightings and encounters on wildlife observation cards available at a variety of locations throughout the site. The use of wildlife observation cards is a tool used to track and evaluate the frequency of animal encounters; these cards help monitor species at risk, nuisance wildlife and to notify site personnel of potentially dangerous animals around work areas. Observations of wildlife and indicators of wildlife such as tracks, scat or auditory observations are also recorded (even in the absence of visual confirmation). Wildlife observations recorded through 2019 are compiled on a quarterly basis and submitted to the Department of Energy, Mines and Resources in accordance with QML-0011.

3.9.4.1 Nesting Songbird Surveys

Nesting songbird bird surveys were completed for clearing activities that took place within the breeding bird window (May 1-late summer). A total of twelve nesting songbird pre-clearing surveys took place from May to July 2019; no nests were identified.

3.9.4.2 Wildlife Incidents

During the fall of 2019 there were observations of several animals in close proximity to the camp and areas of mining activity. The Environmental Department collaborated with the Mayo Conservation Officer to facilitate three events of live trap and release of nuisance animals away from the Project area. No further incidents occurred.

The Environmental Department provides ongoing education for site personnel through site-wide bulletins, collaborations with department heads, and presentations in toolbox meetings.

3.9.4.3 Annual Moose Survey

A late-winter moose distribution survey was conducted to monitor Project effects on moose distribution. The survey included a 10 km radius around the Project area and Haggart Creek and South McQuesten access roads. The survey was completed by VGC Employees, Environmental Dynamics Inc, and a First Nation of Na-Cho Nyak Dun (FNNND) representative. The annual moose survey report is provided in Appendix V.

Three surveys were completed during pre-construction and are considered as a baseline (2011-2013). A survey was conducted in 2018 and represented the first survey during the construction phase. The 2019 survey is the second to be conducted during the construction phase and a final survey will be completed in the operations phase. Depending on results from the late-winter surveys, the frequency of subsequent aerial surveys will be reassessed in collaboration with the Yukon Governments Northern Tutchone Regional Biologist.

The 2019 aerial survey was conducted from March 4 to 6. The primary objective was to document the distribution and abundance of moose during the late-winter season. Survey data is used to inform adaptive management strategies designed to mitigate any effects from the Project on moose in the region. The conditions in 2019 were generally good; however, while the total number of moose observed was greater than in all previous surveys, the lack of fresh snow diminished the opportunity for accurate tracking of fresh moose tracks and in locating moose. Winds were calm to light, clear skies, and light conditions were bright (Table 3.9-5).

Table 3.9-5: Survey Conditions during Late-Winter Moose Distribution

Survey Conditions	2011	2012	2013	2018	2019
Date	7-9 March	7-8 March	4-6 March	5-6 March	5-7 March
Snow Conditions	Old (>2 weeks)	Lots of fresh snow prior to survey	10 days old	Some fresh snow prior to survey and on morning of March 6	Old (>3 weeks)
Cloud Cover	Clear in morning changing to overcast by late afternoon on all days	Clear to slightly overcast on 8 March	Clear	Clear on 5 March; clear in morning changing to slightly overcast by mid-afternoon on 6 March	Clear, light high-altitude have on Mar 7
Light	Bright in the morning to flat by late afternoon	Bright	Bright	Bright	Bright
Wind	Light to moderate	Calm	Calm	Calm	Calm to light
Temperature	-35°C to -17°C	-30°C to -10°C	-27°C to -10°C	-20°C to -10°C	-31°C to -25°C
Comment	Old snow and flat afternoon light made it difficult to sight moose	Considerable snowfall in days prior to survey	Delayed both mornings due to low fog	Light snow and low ceiling delayed start of survey on second day	Very old snow made recording fresh tracks unfeasible. Could not survey the afternoon of 6 March due to observer fatigue

Moose observations within the Project area during the 2019 survey were slightly higher than the 2018 survey year (Table 3.9-6). The majority of moose observed in 2018 were found on moderate and higher elevation burned plateaus on the eastern side of the survey area. In 2019, the majority of moose were again observed in high-density clusters on the eastern side of the survey area within the burned plateaus.

Table 3.9-6: Survey Intensity and Moose Observations within the Study Area

Year	Survey Intensity (min/km^2)	Moose Observations within the Study Area (10 km buffer)
2011	0.53	26
2012	0.52	48
2013	0.50	39
2018	0.49	75
2019	0.52	82

Overall moose distribution throughout all surveys has been variable between years, an association exists between moose distribution and the moderate elevation burns. While moose densities during 2019 construction within 1 km of the Project footprint were moderate, so were densities observed in 2018 during a cessation of construction activities. This suggests a natural variability in distributions, as well as expected variability in survey results given the methodology. It is likely that moose distribution is more associated with annual snow depths, winter habitat distribution, and predation risk than Project activities.

3.10 Permafrost

Permafrost monitoring at the project site in 2019 consisted of quarterly subsurface temperature monitoring via thermistors at the locations in Figure 3.10-1 and Table 3.10-1. A total of thirteen thermistor strings were installed in test holes around the site between 2009 and 2012. Additionally, in April 2018 thirteen more thermistors were installed in or near the footprints of the waste rock and 90-day storage areas. During 2017 construction activities, five thermistors were decommissioned from the monitoring program. Thermistor BH-BGC11-51 was decommissioned in May 2018, GT18-11 was decommissioned from the monitoring program in May 2019 and GT18-17 was decommissioned in August due to development in those areas.

Table 3.10-1: Active 2019 Thermistor Locations for Physical Monitoring Program

Thermistor	Facility	Coordinates (Zone 8)	
		North	East
BH-BGC10-7	Eagle Pup WRSA	7,100,585	459,547
BH-BGC11-42	Eagle Pup WRSA	7,100,150	460,272
BH-BGC11-44	Camp Facilities	7,100,547	458,690
BH-BGC11-63	Eagle Pup WRSA	7,100,114	460,303
BH-BGC12-81	Reclamation Material stockpile	7,100,838	459,527
DH-BGC09-STU-3	Above camp and LDSP facilities	7,100,691	459,083
DH-BGC09-STU-4	Above camp and LDSP facilities	7,100,720	459,050
GT18-01	Eagle Pup WRSA	7,100,952	459,831
GT18-02	Eagle Pup WRSA	7,100,945	459,925
GT18-04	Eagle Pup WRSA	7,100,787	459,854
GT18-05	Eagle Pup WRSA	7,100,814	460,006
GT18-06	Eagle Pup WRSA	7,100,852	460,088
GT18-07	Eagle Pup WRSA	7,100,709	460,088
GT18-08	Platinum Gulch WRSA	7,099,141	459,517
GT18-09	Platinum Gulch WRSA	7,098,851	459,968
GT18-10	Platinum Gulch WRSA	7,098,964	460,080
GT18-11	Platinum Gulch WRSA	7,100,583	459,597
GT18-15	Overland Conveyor	7,100,583	459,597
GT18-16	Below crushing facilities	7,100,308	459,607
GT18-17	90 Day Storage Area	7,100,290	459,263

3.10.1 Data Analysis

3.10.1.1 Eagle Pup WRSA Multi Bead Thermistors

Six multi bead thermistors were monitored in the area of the future Eagle Pup WRSA, as shown in Table 3.10-2. Multi bead thermistors documented subsurface temperatures up to 20m below the surface. Temperatures registered above zero degrees with the exception of shallow depths or first and fourth quarter winter conditions. The two thermistors that recorded consistent subzero temperatures were BH-BGC11-42 and BH-BGC11-63, which are installed in the interior of the proposed Eagle Pup waste rock storage area. The presence of only two thermistors with consistent subzero temperatures throughout multiple bead depths supports the presence of a local discontinuous permafrost zone.

Table 3.10-2: Eagle Pup WRSA Area Multi Bead Thermistor Temperatures

Thermistor	Date	Bead Temperature ºC															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
GT18-01	January	-3.79	-0.99	-0.13	0.16	0.50	0.68	0.93	1.04	1.38	1.37	1.41	1.43	1.43	1.44	1.35	1.35
	February	-3.82	-1.51	-0.49	0.30	0.31	0.51	0.73	0.84	1.18	1.23	1.30	1.36	1.37	1.42	1.34	1.35
	March	-3.2	-1.6	-0.7	0.0	0.3	0.5	0.7	0.8	1.1	1.2	1.3	1.3	1.4	1.4	1.3	1.3
	April	0.04	-0.08	-0.10	-0.04	0.22	0.38	0.60	0.73	1.05	1.14	1.24	1.31	1.32	1.39	1.33	1.35
	May	0.35	-0.02	-0.11	-0.04	0.22	0.36	0.57	0.67	0.98	1.09	1.20	1.29	1.30	1.37	1.31	1.35
	June	6.75	1.23	-0.09	-0.03	0.20	0.32	0.52	0.62	0.98	1.07	1.18	1.25	1.27	1.34	1.29	1.34
	July	13.5	7.5	4.3	1.7	0.5	0.6	0.7	0.7	1.0	1.1	1.2	1.2	1.2	1.3	1.3	1.3
	August	12.1	10.0	8.6	6.5	4.4	3.0	2.1	1.6	1.3	1.2	1.2	1.2	1.2	1.3	1.3	1.3
	4th Quarter	0.2	2.4	3.0	3.5	3.7	3.5	3.3	2.8	2.1	1.8	1.6	1.5	1.4	1.4	1.3	1.3
GT18-05	January	-1.53	-0.27	0.07	0.20	0.28	0.38	0.47	0.58	0.64	0.71	0.76	0.80	0.87	0.90	0.99	1.11
	February	-2.08	0.64	0.01	0.12	0.20	0.27	0.33	0.41	0.51	0.64	0.69	0.75	0.83	0.88	0.99	1.12
	March	-1.8	-0.7	0.0	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.8	0.9	0.9	0.7
	April	-0.66	-0.39	-0.03	0.07	0.12	0.17	0.23	0.29	0.40	0.56	0.64	0.73	0.81	0.88	0.99	1.12
	May	-0.05	-0.13	-0.01	0.06	0.09	0.15	0.20	0.25	0.35	0.54	0.62	0.70	0.79	0.86	0.99	1.12
	June	4.07	0.34	-0.02	0.04	0.08	0.14	0.20	0.27	0.37	0.48	0.56	0.65	0.74	0.83	0.98	1.12
	July	10.1	4.8	1.2	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.6	0.7	0.8	1.0	1.1
	August	11.0	8.6	6.4	3.9	2.3	1.5	1.1	0.9	0.7	0.6	0.6	0.7	0.7	0.8	1.0	1.1
	4th Quarter	0.4	1.6	1.0	2.7	2.8	2.7	2.3	1.7	1.5	1.3	1.1	1.0	1.0	0.9	1.0	1.1
GT18-07	January	-1.68	-0.44	-0.01	0.17	0.34	0.48	0.60	0.68	0.75	0.73	0.77	0.89	1.07	1.17	1.22	1.30
	February	-2.25	-1.18	-0.33	0.05	0.19	0.32	0.44	0.54	0.65	0.71	0.77	0.90	1.07	1.17	1.22	1.30
	March	-2.2	-1.3	-0.5	0.0	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.2	1.3
	April	-1.08	-0.73	-3.54	0.00	0.12	0.25	0.37	0.47	0.61	0.68	0.77	0.92	1.08	1.17	1.22	1.30
	May	-0.38	-0.30	-0.20	-0.01	0.11	0.23	0.33	0.44	0.58	0.67	0.77	0.90	1.08	1.17	1.24	1.31
	June	3.59	1.93	0.52	0.02	0.02	0.08	0.16	0.26	0.47	0.67	0.77	0.89	1.04	1.16	1.22	1.30
	July	7.9	5.2	2.6	1.1	0.5	0.3	0.3	0.4	0.5	0.6	0.7	0.8	1.0	1.2	1.2	1.3
	August	8.7	7.0	5.6	3.8	2.4	1.5	1.0	0.7	0.6	0.6	0.7	0.8	1.0	1.1	1.2	1.3
	4th Quarter	1.0	1.8	2.2	2.6	2.6	2.3	1.8	1.4	0.9	0.6	0.7	0.8	1.0	1.1	1.2	1.3
BH-BGC11-42	1st Quarter	-3.6	-2.8	-1.5	-0.1	-0.1	-0.2	-0.3	-0.2								
	2nd Quarter	6.8	0.7	-0.2	0.0	0.1	-0.1	-0.2	-0.1								
	3rd Quarter	19.8	14.9	6.9	0.5	0.1	-0.1	NR	0.0								
	4th Quarter	-3.6	-1.9	0.0	-0.4	-0.1	-0.2	-0.3	-0.2								
BH-BGC11-63	1st Quarter	-2.6	-3.1	-0.7	-2.1	-0.7	-0.4	-0.2	0.0								
	2nd Quarter	12.2	0.8	-0.1	-2.3	-0.5	-0.4	-0.1	0.1								
	3rd Quarter	21.4	16.6	2.8	-2.3	-0.4	-0.2	0.1	0.2								

Thermistor	Date	Bead Temperature ºC															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	4th Quarter	-1.1	-3.3	-0.2	-2.7	-0.8	-0.6	-0.2	0.0								
BH-BGC10-7	1st Quarter	-3.00	-1.60	0.00	0.30	0.60	0.00										
	2nd Quarter	0.0	-0.1	0.0	0.0	0.2	0.0										
	3rd Quarter	15.1	9.2	4.5	0.9	0.1	0.0										
	4th Quarter	1.20	2.80	4.00	4.20	2.00	-0.10										

3.10.1.2 Platinum Gulch WRSA Multi Bead Thermistors

Two multi bead thermistors are installed in the area of the Platinum Gulch WRSA. Temperatures readings in GT18-08, with the exception of the May and fourth quarter results, were subzero through much of the total depths and indicate a relatively thick but warm permafrost zone, although the May and 4th quarter results appear spurious. Conversely, February, March and April readings from GT18-09 suggest an active zone overlying non-permafrosted material, although the 4th quarter results again are inconsistent with the earlier readings. Further monitoring to ensure Platinum Gulch WRSA stability is described in Section 4.

Table 3.10-3: Platinum Gulch WRSA Area Multi Bead Thermistor Temperatures

Thermistor	Date	Bead Temperature ºC															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
GT18-08	January							-7.60	-1.92	0.04	0.24	-0.22	-0.35	-0.44	-0.53	-0.60	-0.64
	February							-9.89	-3.05	0.00	0.24	-0.22	-0.35	-0.44	-0.53	-0.59	-0.64
	March							4.0	-1.1	0.0	0.2	-0.2	0.9	-0.4	-0.5	-0.6	-2.8
	April								-0.72	0.00	0.23	-0.23	-0.36	-0.44	-0.52	-0.58	-0.64
	May							0.52	0.66	0.96	1.37	1.14	1.22	1.32	1.30	1.29	1.38
	June								3.72	0.00	0.23	-0.24	-0.38	-0.47	-0.54	-0.59	-0.63
	July							15.1	9.1	0.0	0.2	-0.3	-0.4	-0.5	-0.6	-0.6	-0.6
	August							13.5	9.0	0.3	0.2	-0.3	-0.4	-0.5	-0.6	-0.7	-0.6
	4th Quarter							1.7	1.4	0.9	0.9	0.4	0.2	0.3	0.4	0.3	0.6
GT18-09	January																
	February	-3.35	-2.22	-1.22	-0.18	0.03	0.13	0.20	0.26	0.32	0.34	0.36	0.34	0.37	0.42	0.46	0.60
	March	-0.7	-0.8	-0.6	-0.2	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.6
	April	-0.49	-0.65	-0.47	-0.16	0.00	0.05	0.11	0.16	0.22	0.26	0.28	0.30	0.35	0.42	0.47	0.61
	May																
	June																
	July																
	August																
	4th Quarter	-2.1	-2.1	-2.0	-2.0	-2.2	-1.9	-2.9	0.0	0.2	0.0	-0.2	-0.2	-0.5	-0.6	-0.5	-0.7

3.10.1.3 Overland Conveyor Multi Bead Thermistor

GT18-15 is installed to the west of the future Eagle Pup WRSA and the overland conveyor. The thermistor documented subzero (but greater than -0.1) temperatures throughout all seasons at depths below 11.5 meters (bead 12) and indicates warm permafrost at depth. Temperatures were mostly above zero for the remainder of documented temperatures with the exception of near-surface depths (in the active zone) during winter months.

Table 3.10-4: Overland Conveyor Multi Bead Thermistor Temperatures

Thermistor	Date	Bead Temperature ºC															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
GT18-15	January	-2.06	-0.60	-0.06	0.14	0.27	0.39	0.44	0.44	0.24	0.01	-0.04	-0.06	-0.10	-0.10	-0.10	-0.09
	February	-3.21	-2.19	1.29	-0.10	0.03	0.10	0.15	0.18	0.11	0.01	-0.02	-0.06	-0.08	-0.08	-0.09	-0.08
	March	-3.2	-2.5	-1.7	-0.3	0.0	0.1	0.1	0.1	0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1
	April																
	May	-0.18	-0.39	-0.41	-0.28	-0.08	0.00	0.00	0.04	0.02	0.00	-0.04	-0.06	-0.09	-0.09	-0.09	-0.09
	June	5.59	2.71	0.15	-0.14	-0.06	0.00	-0.01	0.02	0.01	0.01	-0.04	-0.06	-0.09	-0.09	-0.09	-0.09
	July	11.7	8.7	6.2	2.9	0.8	0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1
	August	11.8	11.2	9.1	6.6	4.5	2.8	1.6	0.8	0.2	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1
	4th Quarter	1.8	2.8	3.5	4.1	4.1	3.7	3.0	2.1	0.8	0.0	0.0	-0.1	-0.1	0.0	-0.1	-0.1

3.10.1.4 Upgradient of LDSP Facility Multi Bead Thermistor

DH-BGC09-STU-3 and DH-BGC-STU-4 are multi bead thermistors installed upgradient of the LDSP. Both datasets documented zero or subzero temperatures below near-surface depths indicating the presence of permafrost. Temperatures were consistent across all seasons suggesting stable permafrost.

Table 3.10-5: LDSP Multi Bead Thermistor Temperatures

Thermistor	Date	Bead Temperature ºC															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DH-BGC09-STU-3	1st Quarter	-0.4	0.0	-3.4	0.0	-0.9	-2.5										
	2nd Quarter	-0.1	0.0	-3.5	0.0	-1.0	-0.1										
	3rd Quarter	3.4	0.4	-3.5	0.0	-1.0	-0.1										
	4th Quarter	3.3	3.5	-2.0	1.5	-1.1	-0.1										
DH-BGC09-STU-4	1st Quarter	-2.8	-0.9	0.0	-3.6	0.0	-0.1										
	2nd Quarter	0.2	-0.2	0.0	-3.6	0.0	-0.1										
	3rd Quarter	10.4	2.1	0.0	-3.6	0.0	-0.1										
	4th Quarter	0.3	2.1	2.3	-3.5	0.0	-0.1										

3.10.1.5 Camp Facility Multi Bead Thermistor

BH-BGC11-44 is a multi-bead thermistor installed near camp support facilities and just above Ditch A. The documented temperatures in Bead 8 suggest the presence of permafrost at depth, while the near-surface beads registered temperatures consistent with seasonal temperatures changes.

Table 3.10-6: Camp Area Multi Bead Thermistor Temperatures

Thermistor	Date	Bead Temperature ºC															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
BH-BGC11-44	1st Quarter	-3.6	-2.6	-2.0	-0.6	0.0	0.0	0.0	-0.2								

Thermistor	Date	Bead Temperature ºC															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	2nd Quarter	4.7	0.1	-0.4	-0.5	0.0	0.0	0.0	-0.2								
	3rd Quarter	20.0	10.5	5.3	0.5	0.0	0.0	0.0	-0.2								
	4th Quarter	-0.5	0.3	1.2	1.7	1.9	0.9	0.0	-0.2								

3.10.1.6 Reclamation Material Stockpile Multi Bead Thermistor

BH-BGC12-81 is a multi-bead thermistor that is installed west of the main ore conveyor to the Heap Leach, situated near reclamation material stockpiles. The dataset showed subzero temperatures beginning at bead depth 6 supporting the presence of permafrost at depth. The temperatures in Beads 6 and 7 were consistent across seasonal changes indicating stable permafrost.

Table 3.10-7: Reclamation Material Stockpile Multi Bead Thermistor Temperatures

Thermistor	Date	Temperature ºC															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
BH-BGC12-81	1st Quarter		-0.3	0.0	0.0	0.0	-0.2	-0.3									
	2nd Quarter		0.0	0.0	0.0	0.0	-0.2	-0.3									
	3rd Quarter		8.7	3.9	1.8	0.0	-0.2	-0.3									
	4th Quarter		0.2	0.5	0.5	0.2	-0.2	-0.3									

3.10.1.7 Ground Temperatures of Single Bead Thermistors

Ground temperature data collected at the single bead thermistors installed across the Eagle Gold site are provided below in Table 3.10-8. Thermistors documented subzero conditions within GT18-10, GT18-11, GT18-17. GT18-10 and GT18-11 are installed in the Platinum Gulch WRSA and document subzero temperatures at depths between 8.5 m and 9 m in the early months of spring. No measurements were taken after April to confirm continued subzero temperatures throughout the year. GT18-17 is installed at the 90Day Stockpile and documented subzero temperatures 8.5m below the ground surface throughout winter and summer months, indicating the presence of permafrost below the stockpile area. The design utilized for the pad of the stockpile location was based on the assumed presence of frozen ground and frozen material was excavated from the toe of this facility as a stability measure.

Table 3.10-8: Ground Temperatures at Single Bead Thermistors

Thermistor	Bead Depth	January	February	March	April	May	June	July	August	Q4
GT18-02	7.9	1.58	1.41	1.0	1.3	1.3	1.2	1.2	1.2	1.6
GT18-04	8.5	1.58	1.41	1.0	1.3	1.3	1.2	1.2	1.2	1.6
GT18-06	9	0.21	0.21	0.2	0.21	0.2	0.2	0.2	0.2	0.3
GT18-10	8.5	NR	-0.22	-0.2	-0.21	NR	NR	NR	NR	NR
GT18-11	8.5	NR	-0.16	-0.1	-0.14	NR	NR	NR	NR	NR
GT18-16	8.2	1.31	1.2	1.1	NR	1.0	0.9	0.9	0.8	1.4
GT18-17	8.5	-0.13	-0.12	-0.1	-0.12	-0.1	-0.1	-0.1	Decom	Decom

NOTES:

NR – no result available

Decom- decommissioned

Legend:

Thermistor Location	Project Footprint	Watercourse (Perennial)
Thermistor Location - Decommissioned 2019	Reserved	Watercourse (Ephemeral)
	Transmission Line	Watercourse (Intermittent)

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Scale: 0 – 250 – 500 Meters

Projection: NAD 83 UTM Zone 8N	Drawn By: HC	**EAGLE GOLD PROJECT YUKON TERRITORY**
Date: 2020/05/10	Figure: 3.10-1	**2019 Thermistor Locations**

3.11 Noise

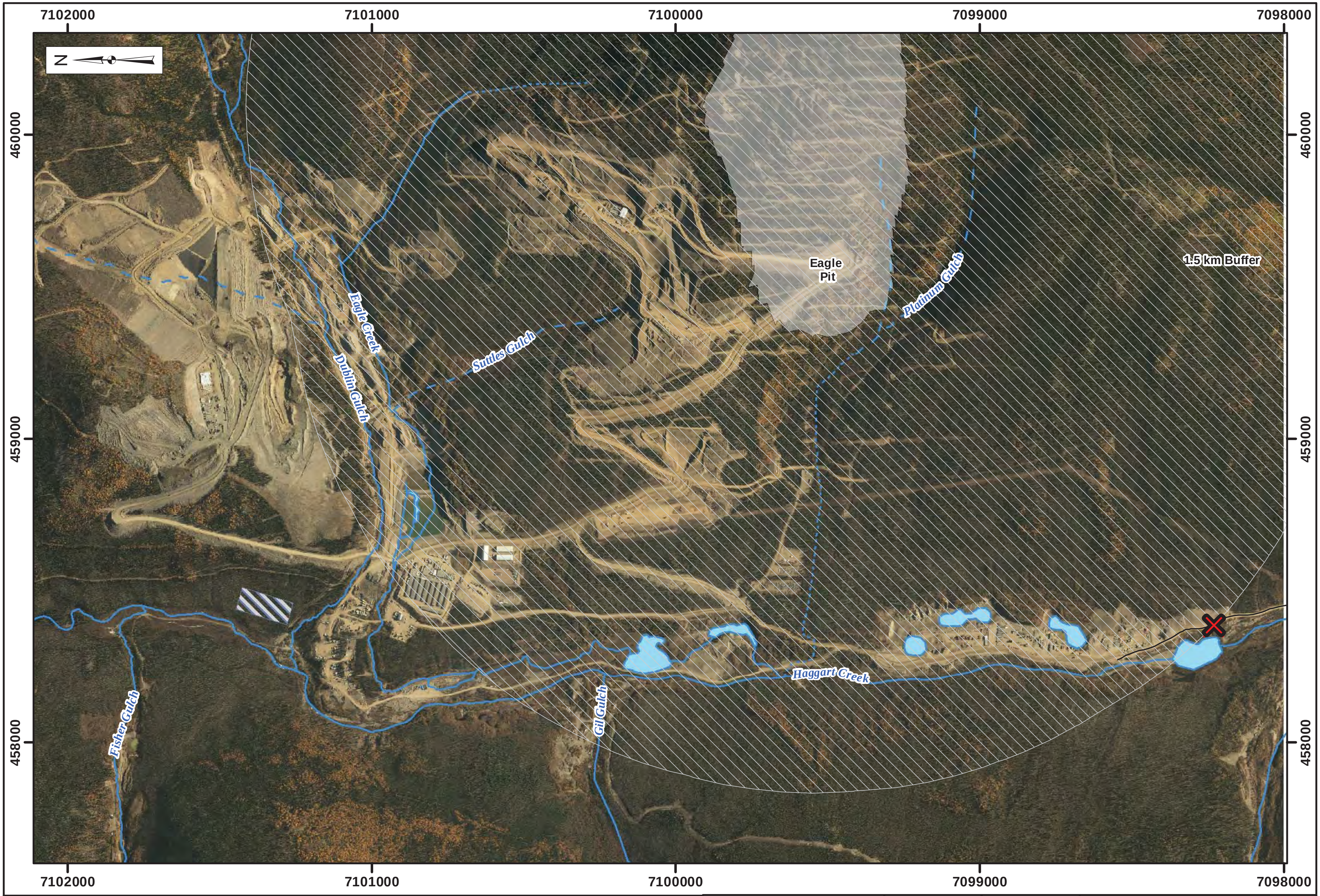
3.11.1 Sounds Levels Related to Blasting

Blasting activities related to construction and mining activities took place at the Project throughout 2019. Monitoring of noise levels associated with these blasting activities was conducted in accordance with the proposed methods, frequencies and the location considered in the EMSAMP.

The objective of the noise monitoring program was to ensure that public users of the Haggart Creek/South McQuesten Road adjacent to the Project site were not at risk of exposure to high sound levels associated with blasting. Sound monitoring equipment was used to measure peak sound levels on the Haggart Creek/South McQuesten Road at the location shown in Figure 3.11-1 during blasting on May 20 and June 11, 2019. This was in addition to noise monitoring conducted on July 20, 2018 during construction (reported in the 2018 annual report).

Noise levels were below thresholds set out in the EMSAMP and continued monitoring was not necessary as per guidelines described in the EMSAMP. The need for further monitoring will be evaluated based on whether significant changes in mining activity occur or in the event that a noise complaint related to Project activities is received.

Results of the sound levels monitoring is provided in Appendix W.



Legend:

- Open Pit
- 1.5 km Radius from Open Pit
- Noise Monitoring Location
- Perennial
- Ephemeral
- Intermittent
- Waterbody

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0 225 450
Metres

Projection: NAD 83 UTM Zone 8N

Drawn By: HC

Date: 20200510

Figure: 3.11-1

EAGLE GOLD PROJECT YUKON TERRITORY

Noise Monitoring Location

3.12 Spills and Accidents

3.12.1 Spill Contingency Overview

The Spill Response program was implemented throughout the reporting period through ongoing site orientation training on spill response and reporting procedures, spill prevention education provided in crew toolbox talks and incorporated into daily pre-work planning in Field Level Risk Assessments (FLRAs), routine vehicle and equipment maintenance and pre-operation inspections, and consistent use of spill trays or secondary containment and deployment and restocking of spill kits on site.

The VGC Spill Response Plan version 2019-01 (effective from March 2019) was utilized throughout the reporting period to guide spill response actions on the site. With the transition to active mine operations, large spill kits that had been temporarily deployed to construction work fronts were relocated to their planned final locations at operational areas as considered in version 2019-01. The redeployment of spill kits will continue as final commissioning of certain facilities is undertaken and further re-evaluation of the Spill Response Plan is ongoing at the time of this report.

Equipment and machinery laydowns established during construction were inspected by VGC Environmental staff after the removal of all non-essential items and closed out from regular compliance monitoring as appropriate. In addition, regular monitoring of major work areas was reviewed by VGC Environmental staff to ensure proactive measures were being implemented according to the Spill Response Plan, such as having adequate equipment available and proper management of hazardous waste. Any deviation from established best management practices that were identified through regular site monitoring were logged in a tracking spreadsheet to ensure follow up by responsible departments.

A lined, bermed Land Treatment Facility (LTF) was constructed during the summer of 2019 for progressive treatment and remediation of hydrocarbon contaminated soils in accordance with LTF Permit No. 24 -047. Contaminated soils are stored and remediated within the LTF through regular aeration and sampled prior to reallocation around the site on mine roads or as fill. Contaminated soils are tested for hydrocarbons prior to treatment and post treatment as prescribed in the Yukon Contaminated Sites Regulations (CSR) standards.

3.12.2 Reportable Summary

During the period of this report, nine (9) reportable spills occurred at the Project site (Table 3.12-1). Spills described in Table 3.12-1 were reported to the Yukon Spill Report Line, as required by the *Spills Regulations* of the *Yukon Environment Act*, and final reports for each event were uploaded to the Yukon Water Board's electronic platform Waterline and provided to the EMR Senior Natural Resource Officer. Spill remediation occurred as per CSR standards. Non-reportable spills were tracked internally and also remediated in accordance with industry standard practice. Spill Response Forms and photos for each of the reportable spills is provided in Appendix X.

Table 3.12-1: Reportable Spills

Date	Volume (L)	Substance	Location	Cause and Remediation Measures Taken
7-Jan-19	350.0	Diesel	Access Road KM 42	Traffic accident resulted in diesel spill adjacent to Haggart Creek. Area was excavated of contaminated soils; soil samples were collected throughout remediation efforts to confirm collection of all contaminated material.

Date	Volume (L)	Substance	Location	Cause and Remediation Measures Taken
30-Jan-19	8.0	Coolant	Camp main parking area	Radiator leak bypassed deployed spill tray; leak was identified during the vehicle pre-inspection. Spill was cleaned up using absorbent pads and contaminated material was collected and delivered to the LTF for remediation.
26-Apr-19	60.0	Waste Oil	Lower camp road	Leakage from a temporary contaminated soils/snow storage location assigned to hold materials prior to the construction of the planned LTF. Confirmation samples were completed to ensure no residue contamination and contaminated material was moved to the LTF.
24-May-19	165.0	Coolant	Pit haul road	Radiator hose broke on a moving haul truck and leaked coolant. A spill tray was deployed and free product was absorbed with spill pads and a vacuum truck.
14-Jul-19	20.0	Coolant	Camp warehouse	An unsecured bucket of coolant fell off a truck at the warehouse parking lot. Free product was soaked up using absorbent pads and contaminated soil was scrapped up using an excavator. Contaminated material was placed in super sacs and brought to the LTF.
31-Jul-19	1000.0	Hydraulic	Pit near 1255 bench	A hydraulic hose failure caused 1000 L of hydraulic fluid to be spilled on the 1255 bench. Free hydraulic fluid was absorbed using spill pads and placed in mega bag for disposal off site. The remaining contaminated material was scraped with an excavator and moved to the LTF for remediation.
24-Aug-19	135.0	Coolant	90-day stockpile	Rock truck was being loaded when operator noticed smoke from the engine. The vehicle was turned off and a broken hose was identified. A berm was formed to contain the spill and absorbent pads were used to absorb free coolant. Contaminated soil was excavated and loaded into super sacs for disposal at the LTF.
31-Aug-19	500.0	Hydraulic	Pit near 1245 bench	Shovel 6040 made contact with the box of a haul truck causing hydraulic spill. Free product absorbed using spill pads and gator applied and mixed into the contaminated area. Material contained large boulders and was unsuitable for LTF so it is being stored on 1255 bench until a suitable location can be sought.
24-Oct-19	500.0	Hydraulic	Pit near 1235 bench	Equipment failure caused a spill to occur on Shovel 6040. The spill was contained by creating; oil gator was sprinkled in the area to aid in remediation. The contaminated material was scraped up, and moved to the LTF for final disposal.

3.13 Traffic and Access, Upcoming Maintenance

3.13.1 Level of Traffic

The Project site is accessed from Mayo along approximately 85 km of existing paved and gravel roads. Roads from Mayo to the site include the Silver Trail (Highway 11), the existing South McQuesten Road and the Haggart Creek Road. All but the Haggart Creek Road are government-maintained roads. During the period of this report, one-way trips along the access roads are estimated at approximately 1,986 heavy vehicle trips and approximately 1,894 light vehicle trips.

Light vehicle trips were significantly lower than those identified in 2018, primarily attributed to the completion of construction in July and the subsequent reduction in the site workforce and movement of construction materials; however, data collection issues were experienced for the months of September to December.

3.13.2 Access Control Issues

No access control issues were experienced during the period of this report.

3.13.3 Incidents

In 2019, the Project experienced 6 incidents along the access road. Incidents did not result in injury or lost time, however minor property damage occurred. One incident (on January 7, 2019) resulted in a fuel spill into a watercourse which is discussed in greater detail in section 3.9.

- January 7, 2019 – The driver of a light vehicle slid off access road onto its side at km 41.5. A secondary incident resulted in a fuel spill of approximately 350 L of diesel fuel.
- January 15, 2019 - At km 26.5, a tractor trailer struck a light vehicle which was in a pullout as it attempted to pass the light vehicle causing minor damage to the rear panel.
- February 13, 2019 – Zoom boom slid down embankment on access road and flipped on side - Operator sustained minor laceration on forehead
- November 19, 2019 - Lime delivery truck became stuck on the access road during a period of heavy snow fall.
- November 30, 2019 - A light truck failed to negotiate a corner on the access road damaging the front end.
- December 12, 2019 - Truck and sea container failed to negotiate a corner at 2 km on access road resulting in sea can rolling onto its side

To respond to incidents on site and along the access roads, the Project maintains a current Emergency Response Plan supported by a complement of emergency response personnel trained and certified in advanced first aid, firefighting and mine rescue along with equipment required for all response types. In addition, reporting and investigation of incidents is standard practice at the site.

During the reporting period, there were no access road or on-site traffic-related wildlife incidents reported. Wildlife observations, including those made along the access roads, are included in the quarterly reports submitted pursuant to QML-0011.

3.13.4 Planned Access Road Work

To ensure the continued safety of visitors, employees and contractors to the site through 2019, Victoria Gold completed routine snow clearing along the South McQuesten and Haggart Creek Roads from the Silver Trail (Yukon Highway 11) to the Eagle Gold camp. Snow clearing efforts included installing wildlife escape routes into the banks at regular intervals. Routine maintenance conducted along the Haggart Creek Road included maintaining culverts and ditches, and repairing pot holes and adding fill as necessary. Ongoing maintenance and roadway improvements will be in accordance with current Work within a Right of Way Permits issued by the Department of Highways and Public Works and Land Use Permits issued by the Department of Energy, Mines and Resources.

3.14 Water Management & Sediment and Erosion Control

The primary objective of site water management is to protect and conserve water resources from impairment caused by the Project. The primary strategies instituted on site for achieving this objective include:

- Separating waters of different quality so that water quality deterioration is minimized (i.e., diverting noncontact water away from disturbed areas).

- Minimizing the contact between water and potential contaminants, such as chemicals, petroleum products, or waste products.
- Erosion and pollution source control (i.e., minimizing total suspended solid levels in runoff from disturbed areas),
- Capture of contact water so that it can be used for process make-up supply or treated, as necessary, prior to reuse or discharge back into the environment.
- Ongoing maintenance of water management infrastructure to minimize the chance of release of contact waters to receiving watersheds.

3.14.1 Major Water Management Infrastructure

As described in Section 2.1, the following key water management infrastructure was completed and made operational in 2019:

- HLF Phase 1A including the embankment, In-Heap Pond and overflow spillway.
- Events Pond and Events Pond spillway were completed in 2019.
- Inlet structures for Ditch A and B into the Lower Dublin South Pond (LDSP) and recontouring the east slopes of the forebay.
- Ditch A including rip rap lining, HDPE pipe and inlet sump at the future toe of the PG WRSA.
- Ditch C full construction.
- Ditch B shaping and rip rap lining to the Suttles Gulch drainage.
- 90-day stockpile collection sump and toe ditch.

The completed infrastructure are regularly inspected by site personnel, maintenance was performed as needed and no significant issues were identified with their operation in 2019.

3.14.2 Erosion and Sediment Control Infrastructure

Erosion and sediment control was ongoing throughout the reporting period to support the overall water management objectives and to ensure compliance with the regulatory approvals issued for the Project.

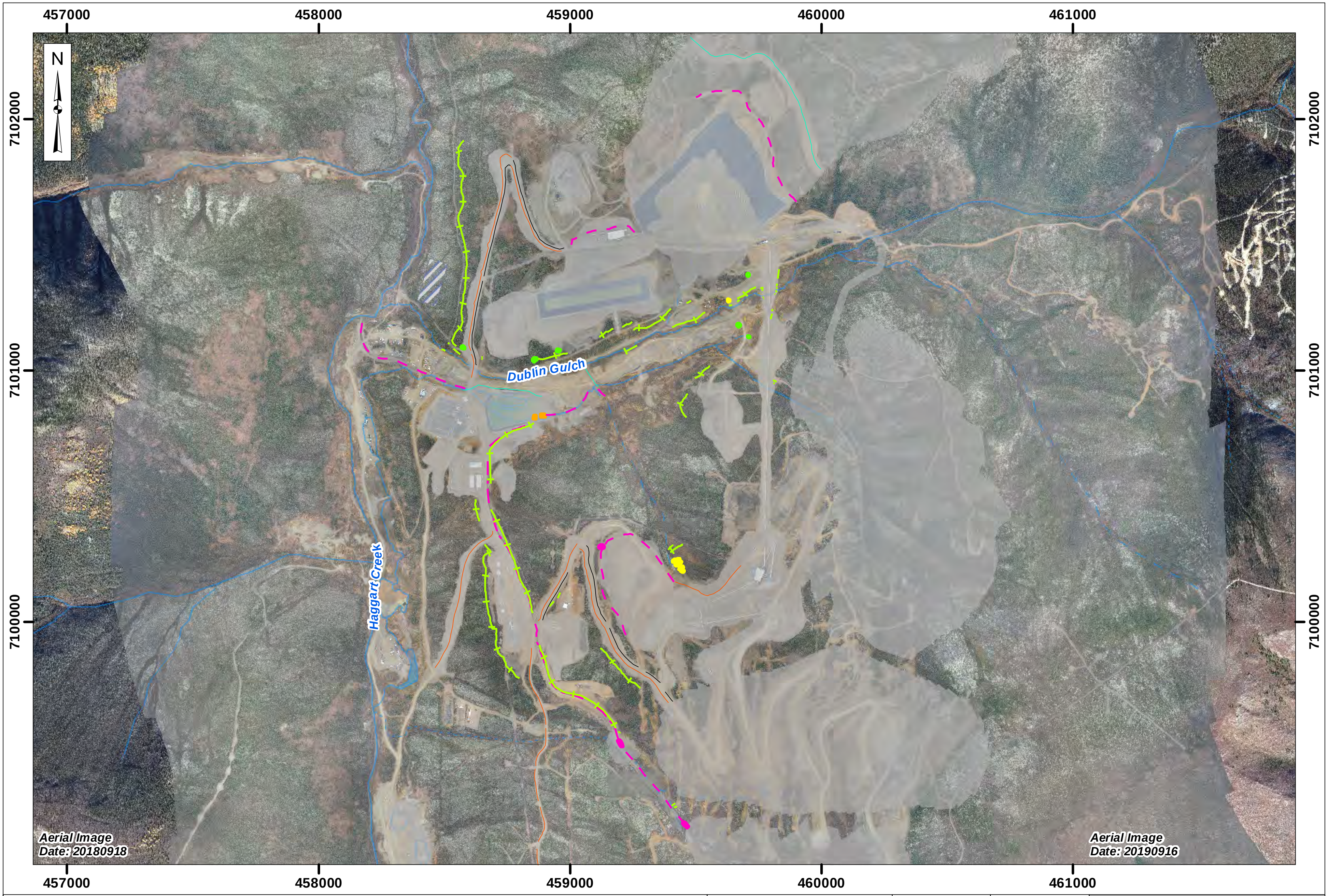
To mitigate against potential erosion and sediment release areas, revegetation and reseeding work was undertaken during September 2019 in the areas adjacent to the LDSP, Ditches A, B and C, the overland conveyor and the HLF embankment.

Additionally, installation of various erosion and sediment control measures will continue to be added or removed as necessary during the Operations phase of the Project. Table 3.14-1 and Figure 3.14-1 provides details on the erosion and sediment control measures that are currently in place to stabilize work areas and/or protect the receiving environment from potentially sediment laden runoff.

Table 3.14-1: Erosion and Sediment Control Implementation Measures

Erosion and Sediment Control Measures	Implementation Locations
Silt Fencing	Ditch A

Erosion and Sediment Control Measures	Implementation Locations
	Lower Dublin South Pond Crusher Service Road ADR Process Plant Access Road Substation, gensets, and fuel storage area Waste management facility area Crushing and screening areas Topsoil stockpiles A and B HLF embankment area Events Pond and ADR Plant area Overland conveyor
Sediment Basins	Coarse Ore Stockpile 90 Day Stockpile
Exfiltration Areas	ADR Process Plant Access Road Events Pond Topsoil Stockpile B
Diversion Ditches (non-contact water diversion)	Upgradient of Phase 1B of the HLF Upgradient of Suttles Gulch Adjacent to the LDSP to intercept unimpacted groundwater seeps
Collection Ditches (contact water collection)	ADR Pad Upgradient of Phase 1A of the HLF
Rock Energy Dissipators	Ditches A, B and C
Vegetation Windrows	ADR Process Plant Access Road Events Pond 90 Day Stockpile Open Pit access road Camp access road Crusher Pad Substation, gensets, and fuel storage area Waste management facility



Legend:

Road Ditch	Diversion Ditch	Project Footprint	Inlet Basin	Watercourse (Perennial)
Collection Ditch	Road Berm	Energy Dissipator	Sediment Basin	Watercourse (Ephemeral)
Collection Ditch & Pipe	Silt Fence	Exfiltration Basin	Reserved Area	Watercourse (Intermittent)

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0 300 600
Meters

Projection: NAD 83 UTM Zone 8N

Drawn By: HC

Date: 2020/05/10

Figure: 3.14-1

EAGLE GOLD PROJECT
YUKON TERRITORY

Installed Erosion and Sediment Control Measures

4 PHYSICAL MONITORING

4.1 Eagle Pit

Initial pre-stripping of the Eagle Pit began in early 2019, and then pit development ramped up throughout the year. During 2019 pit development, visual monitoring of the pit walls and WRSA was actively conducted during regular pit inspections. All pit walls developed in 2019 are single benched with 10m bench heights and 6m wide berms. The lithologies exposed by end of the year were predominantly hornfels, with subordinate granodiorite, and were generally oxidized weathered and blocky.

Pit walls and dumps are surveyed on a bi weekly basis using an unmanned aerial vehicle (UAV) or drone (Figure 4.1-1) to support geotechnical stability monitoring.

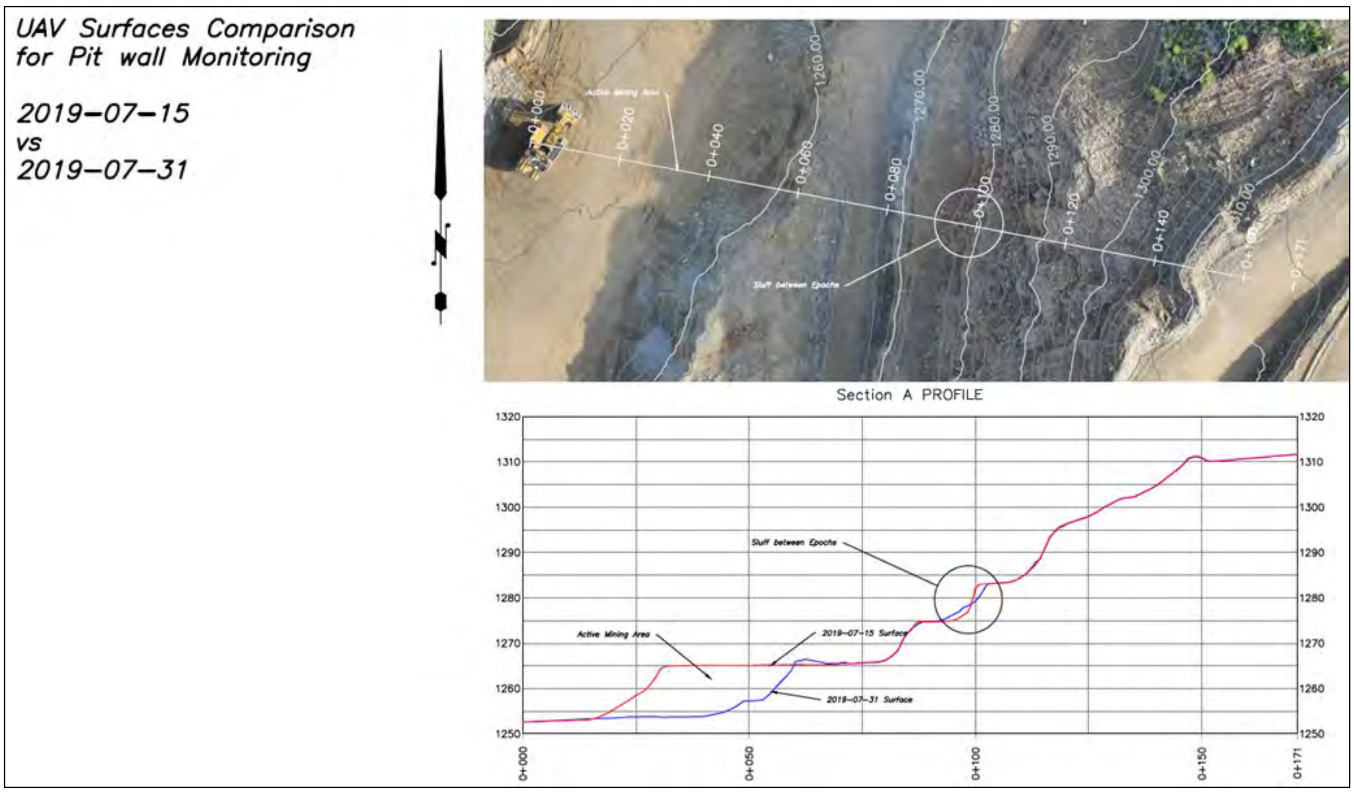


Figure 4.1-1: Example of UAV Data Using Surfaces Developed to Monitor Wall Movement

4.1.1 Stability Incidents

The majority of the pit wall developed was still within the upper highly weathered rock mass (Figure 4.1-2). While there have been localized wedge failures in the upper benches associated with a broad shear zone and steeply dipping faults (Figure 4.1-3 and Photos 4.1-1 and 4.1-2), overall, the wall stability is performing as per design. These localized failures were remediated and stabilized as they were encountered with the use of excavators and dozers.

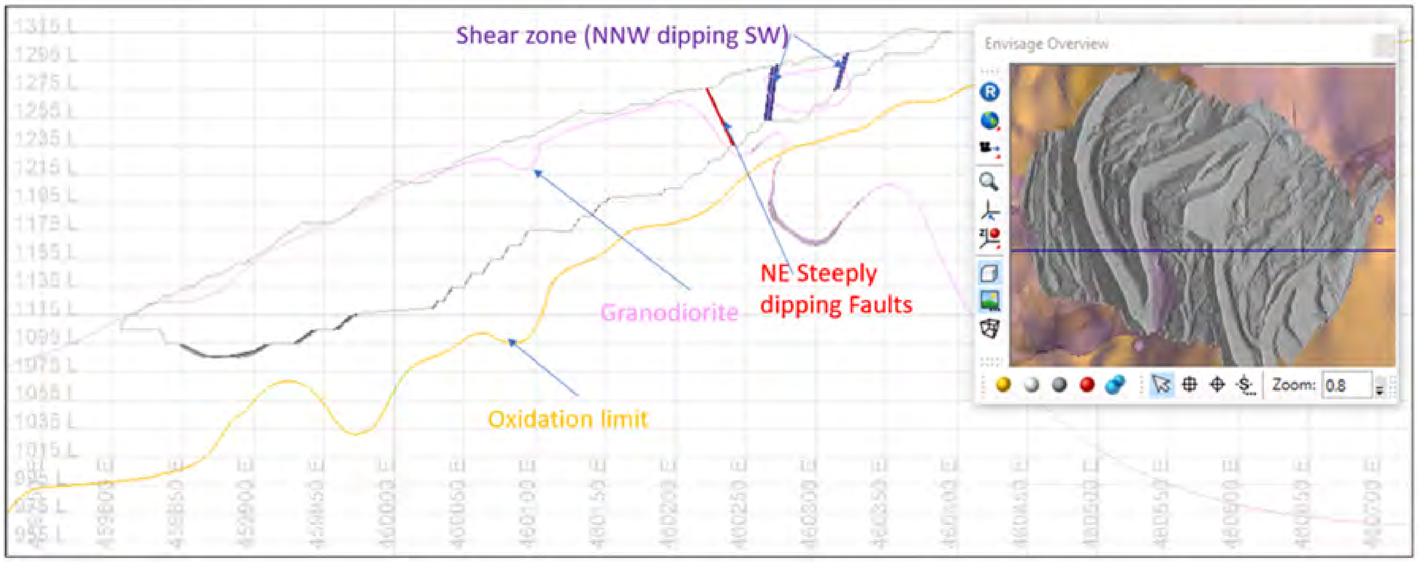


Figure 4.1-2: Eagle Pit Phase 1 - East-West Vertical Section Looking North

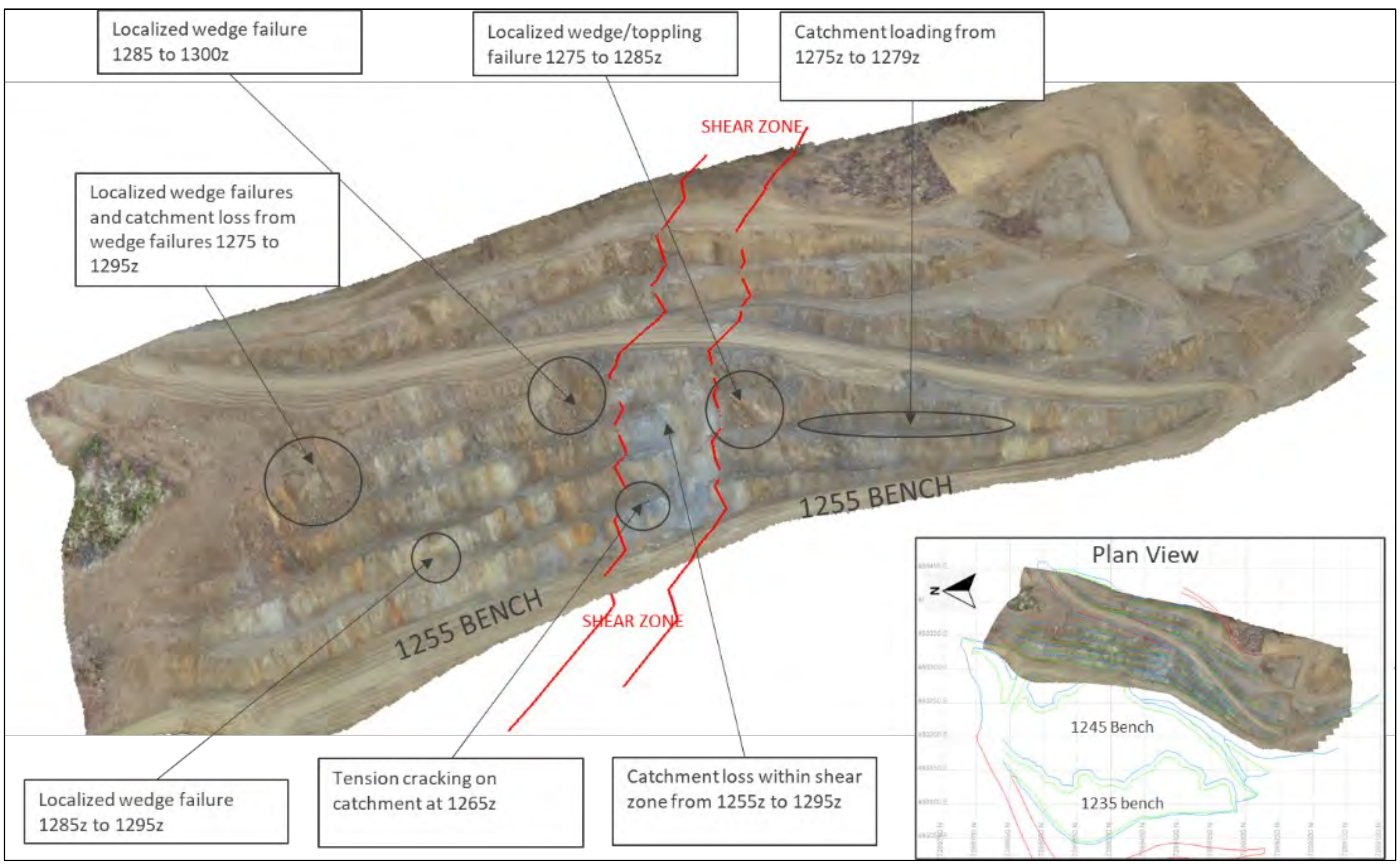


Figure 4.1-3: Eagle Pit Phase 1 - Localized Wedge Failures Relative to Shear Zone

Photo 4.1-1: Localized Wedge Failures on the 1285 Bench - June 9, 2019

Photo 4.1-2: Remediation Activities on Localized Wedge Failures on the 1275 and 1285 Benches - June 18, 2019

4.2 Waste Rock Storage Areas

Active lifts of the WRSA were monitored for movement using extensometers on a regular basis and results were recorded. Calculations on these measurements were conducted on a regular basis to determine the rate the structure is moving. Figure 4.2-1 provides examples of how the extensometer data is being used.

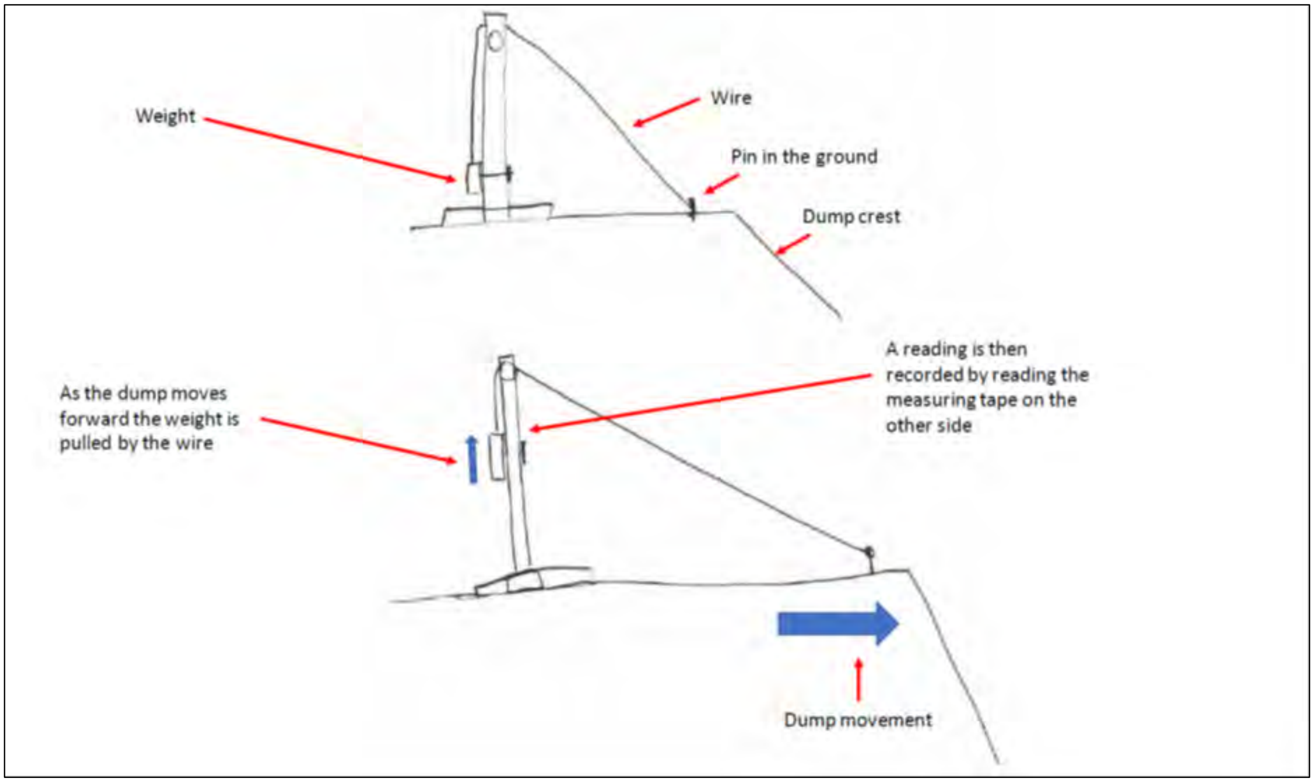


Figure 4.2-1: Diagram of Extensometer Deployed on an Active WRSA Lift

Table 4.2-1 provides the movement rate thresholds for guiding the monitoring activities. Figure 4.2-2 and Figure 4.2-3 illustrate the locations of extensometer monitoring pin lines on the 1255 and 1155 dump lifts, respectively.

Table 4.2-1: Movement Rate Threshold for Extensometer Monitoring

Type	Movement Rate Threshold (m/day)	
	Normal	Stop Work
WRSA without containment	0 – 0.10	>0.10
WRSA with containment	0 – 0.20	>0.20

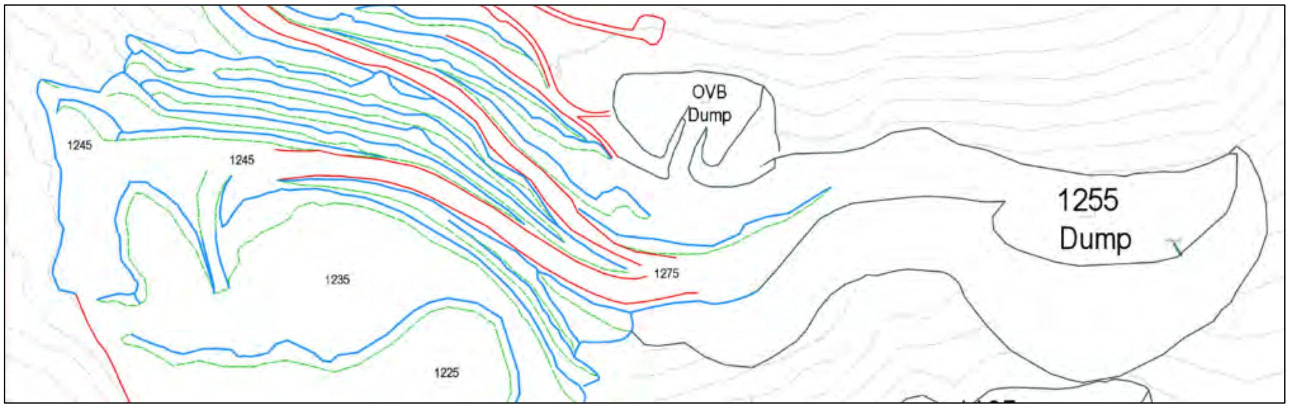


Figure 4.2-2: Location of 1255 Pin Line 1 Extensometer on PGWRSA 1255 Lift

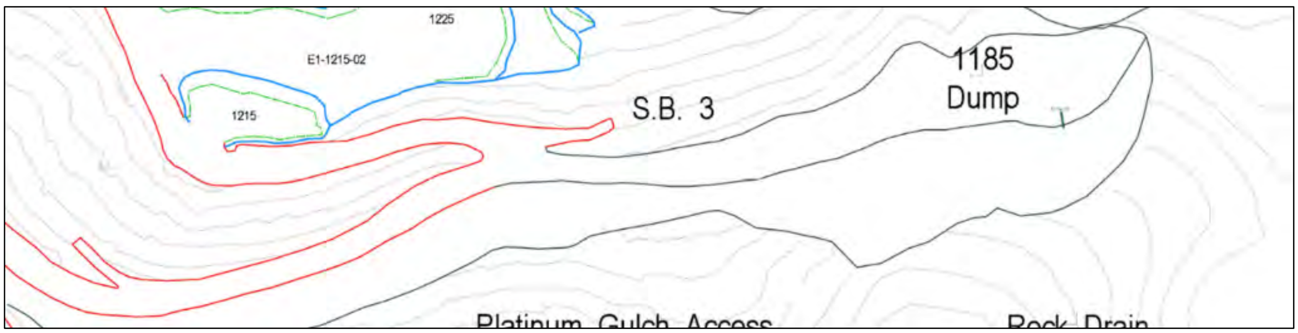


Figure 4.2-3: Location of 1185 Pin Line 1 Extensometer on PG WRSA 1185 Lift

Figure 4.2-4 through Figure 4.2-7 illustrate the results of extensometer monitoring for the 1255 and 1185 lifts of the PG WRSA. Movement rates are well below the thresholds listed in Table 4.2-1. The Platinum Gulch WRSA is performing as per design.

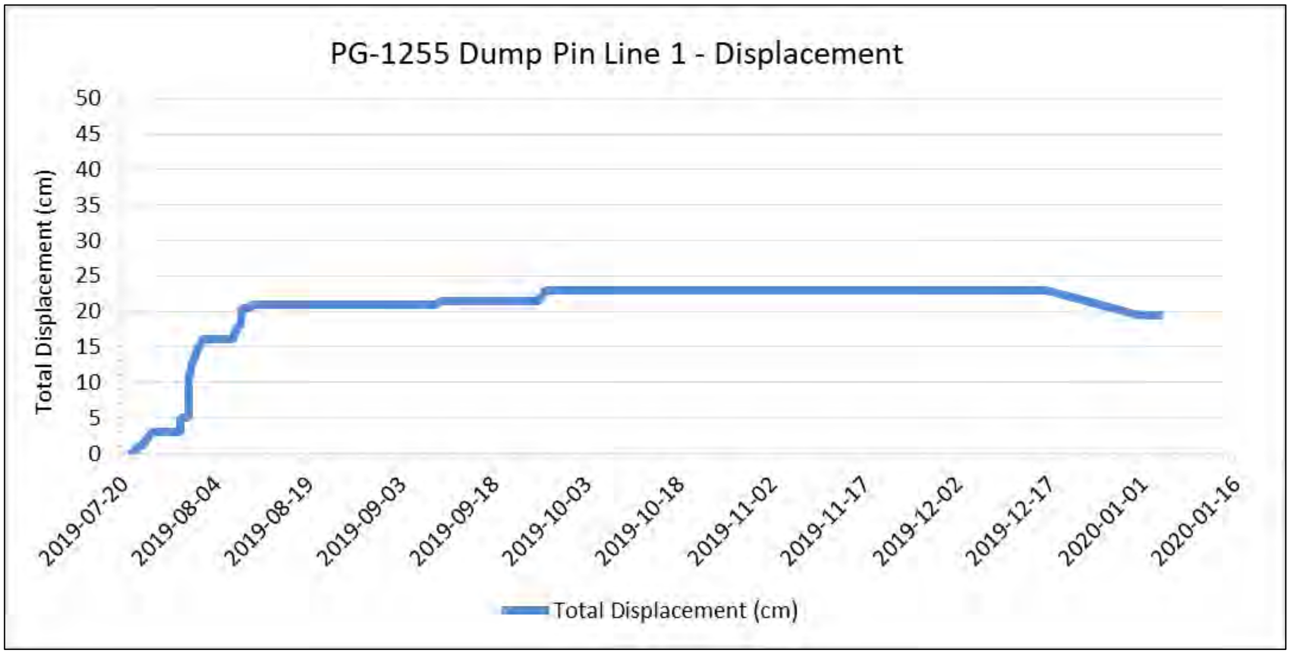


Figure 4.2-4: Total Displacement for the 1255 Pin Line 1 During 2019

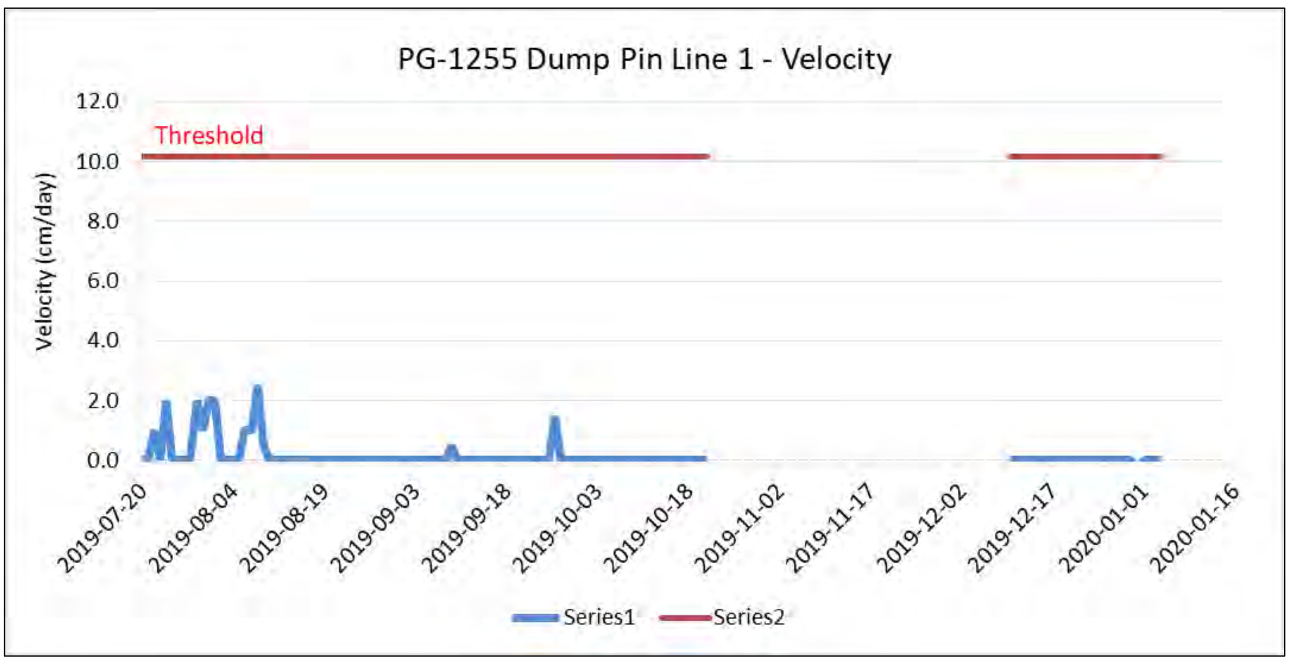


Figure 4.2-5: Movement Rates for the 1255 Pin Line 1 During 2019

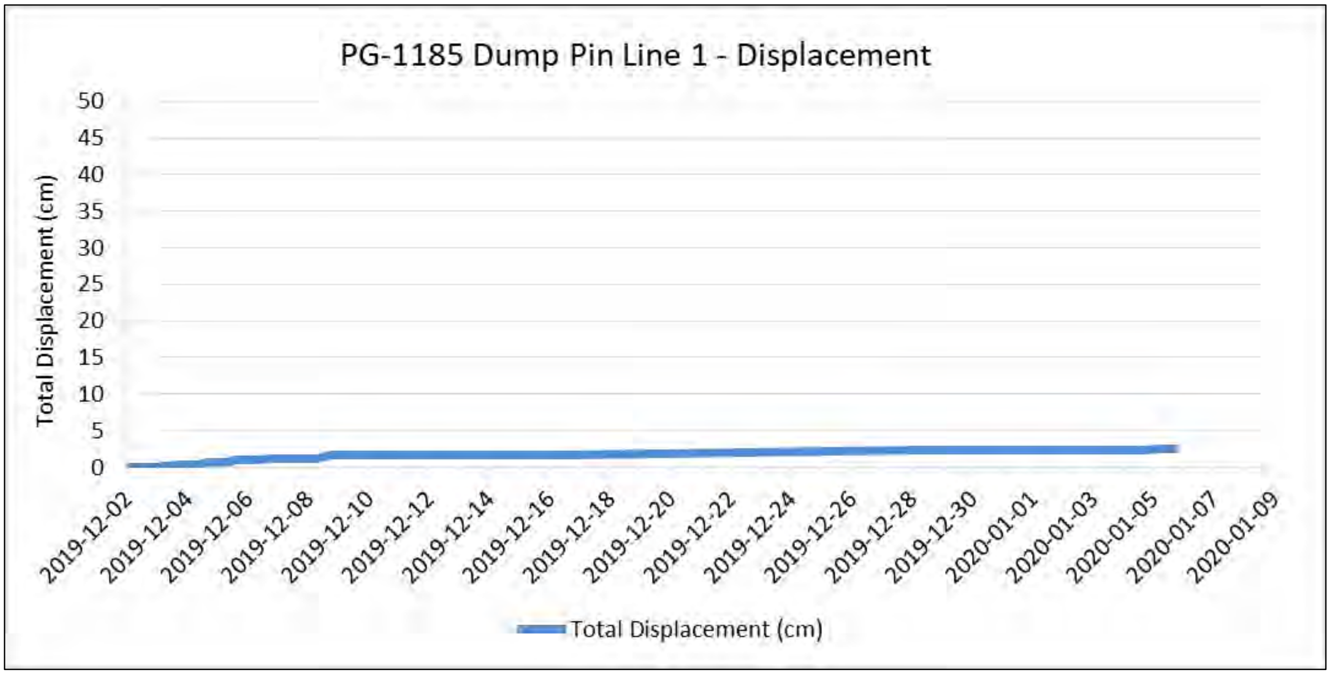


Figure 4.2-6: Total Displacement for the 1185 Pin Line 1 During 2019

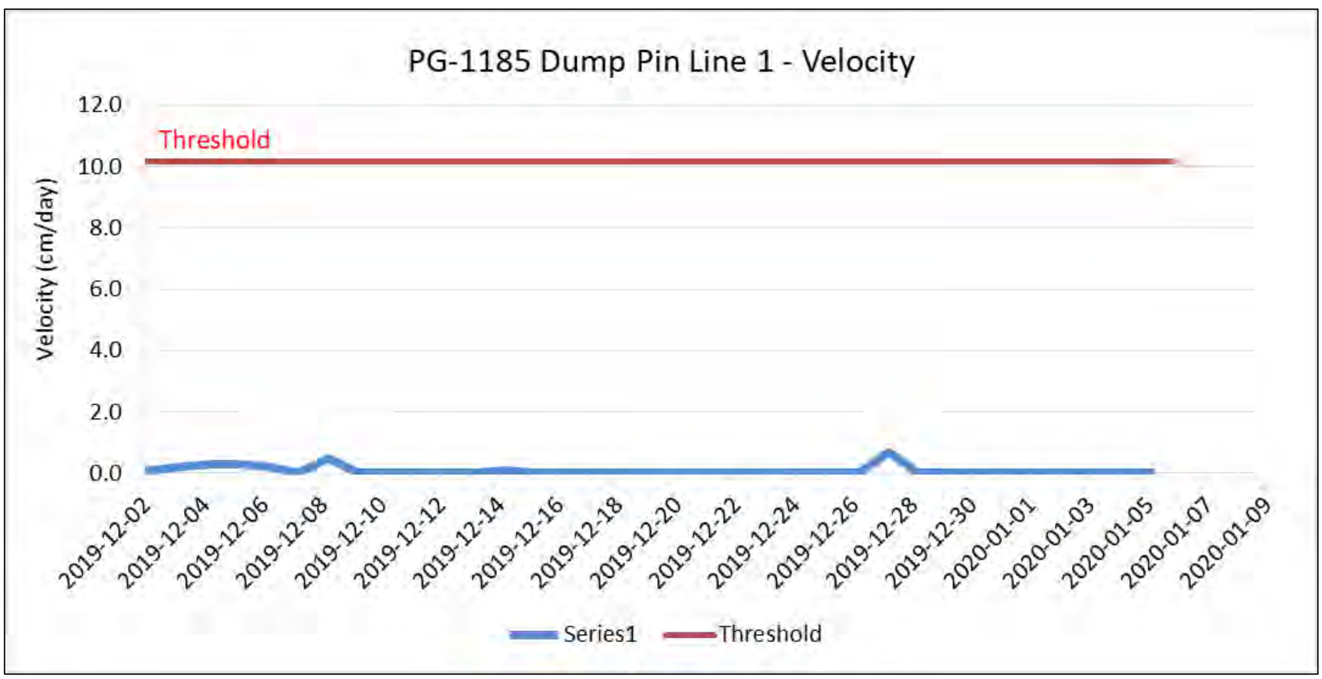


Figure 4.2-7: Movement Rates for the 1185 Pin Line 1 During 2019

4.3 Heap Leach Facility and Process Facilities

Construction of Phase 1A of the HLF was completed by September 2019. Prior to completion, initial stacking was started in July 2019 followed by initial leaching of ore in the lower pad area in August while the upper pad area was completed. During 2020, Phase 1B will extend the pad liner from the current limit of 990m elevation to the Phase 1 interceptor ditch at an approximate elevation of 1050m.

The major HLF design components completed by July 2019 include the following: the embankment; a composite liner system; the In-Heap Pond; solution recovery wells; associated piping network for solution collection and distribution; a leak detection and recovery system (LDRS); and a downstream Events Pond to contain excess solution overflow during extreme precipitation or emergency events. An overflow spillway connects the HLF In-Heap Pond to the Events Pond and an emergency spillway allows overflow from the Events Pond to the environment. Figure 4.3-1 presents a September 16, 2019 composited drone shot that is representative of the site during the Engineer of Records site inspection in early October (see Section 4.3.1).

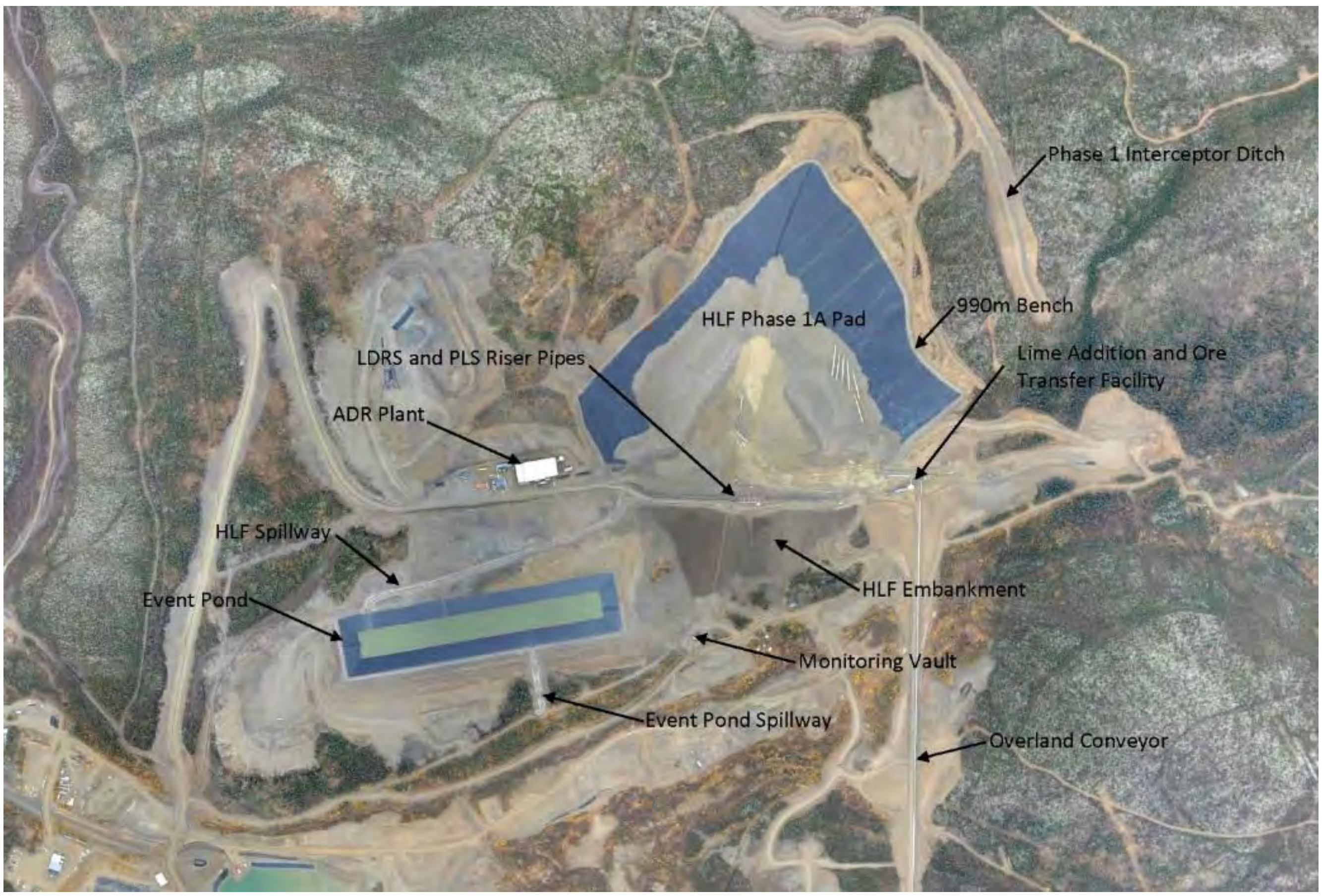


Figure 4.3-1: Drone Photo Map of HLF and Process Facilities - September 16, 2019

Three standpipe piezometers were installed through the HLF dam crest in 2018 (BGC 2018), and then were later installed with vibrating wire piezometers in early August 2019. Table 4.3-1 presents the most recent readings converted to water level elevation for each piezometer. Piezometer P1 was installed into the dam foundation bedrock and Piezometers P2 and P3 were installed in the dam fill just above the western and eastern underdrains, respectively. Piezometers P2 and P3 have been reportedly dry since installation. The water level in P1 reflects groundwater in the fractured and weathered bedrock foundation. The well log for P1 indicates a bedrock contact elevation of about 899.5 m asl. The water level readings since mid-August for P1 are presented in Figure 4.3-2 and reflect a general downward trend.

Table 4.3-1: HLF Embankment Piezometer Readings

ID	Water Depth (m)	Piezo Tip Elevation (m)	Water Elevation (m)
P1	6.66	885.0	891.7
P2	0.0	905.0	DRY
P3	0.0	915.0	DRY

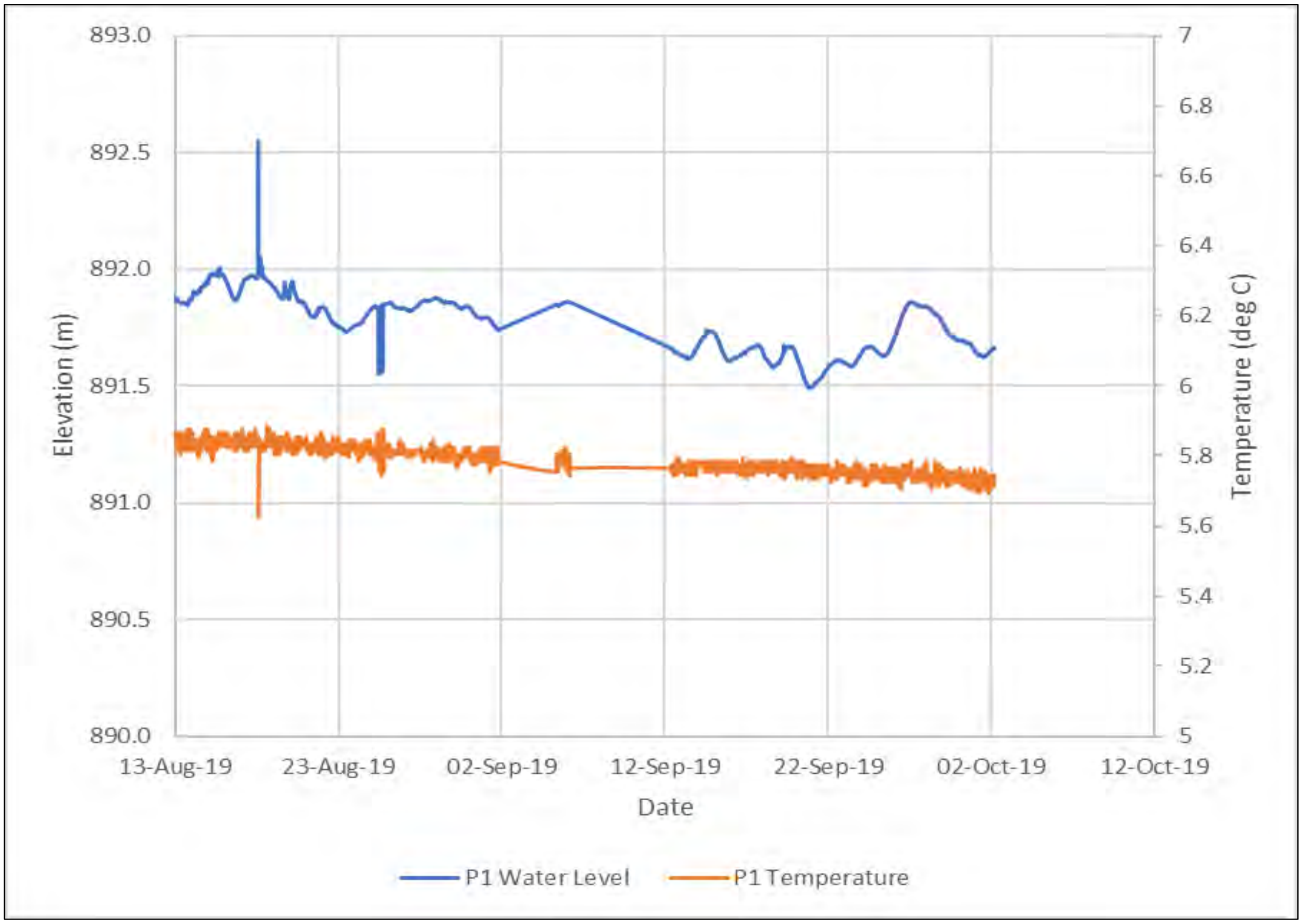


Figure 4.3-2: Piezometer P1 Readings

An inclinometer casing was also installed through the HLF dam crest and installation details are presented in BGC (2018).

There were no stability incidents anywhere on the HLF, including the embankment, events pond embankment, or stacked ore or in any of the adjoining areas and access roads.

4.3.1 Stability Inspection

4.3.1.1 Engineer of Record Physical Stability Inspection

Heap Leach Facility

The 2019 inspection was completed by Mr. Troy Meyer, P.Eng. of BGC as the HLF Engineer of Record on October 2 and 3, 2019. The full inspection report is provided as Appendix B and the general site layout of the HLF facility is shown in Figure 4.3-1.

At the time of the inspection, the downstream slope of the dam had been smoothed and covered with a layer of growth medium in preparation for reclamation. The upstream slope was double-lined with geomembrane with a leak detection layer between the liners, which is designed to convey any leakage through the top liner to the LDRS sump. The top liner was covered with drainage gravel and the ore had been stacked to the elevation of the spillway invert (approximately 937.5 m asl), with an additional lift of ore being stacked to 945 m asl. A crushed ore transport system consisting of mobile “grasshopper” conveyors and a radial stacker was being utilized for the stacking operations. Some limited truck haulage and placement of Run-of-Mine (ROM) ore with 40-ton articulated trucks was being performed along the western portion of the Phase 1A pad at the time of the inspection.

The site inspection included walking along the HLF embankment crest, downstream toe, and portions of the upstream pad area, as well as observing the respective abutments, spillway, diversion channel and outlets of the underdrain pipelines. The Events Pond was inspected by walking along the south embankment toe, up the emergency spillway and around the pond crest.

At the time of the visual inspection, water was not being discharged to the environment from the HLF underdrain flows but was being pumped back into the process circuit. Flows were apparent in underdrains #1, 2 and 5 which collect seepage under the Phase 1 HLF. No discharge was observed from underdrains #3 and 4, which are blank pipes installed in reserve for future phases of the HLF. The underdrain pipes are numbered from east to west (Figure 4.3-3 and see Photo 11 in Appendix B).

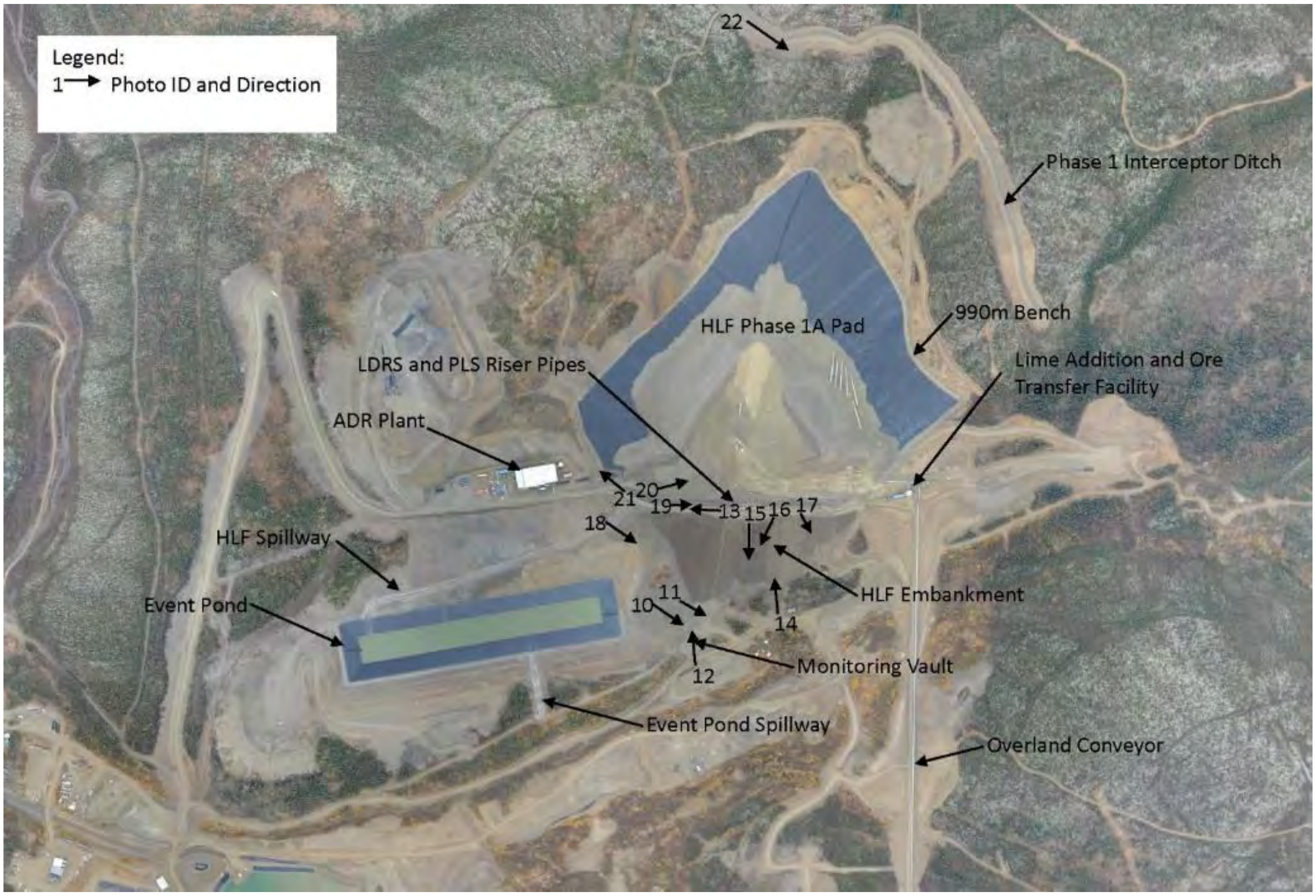


Figure 4.3-3: Inspection Photo Map for HLF

At the time of the EOR inspection, In-Heap Pond elevation was at an approximate elevation of 923.6 m asl. Readings were obtained using an instrument installed in the inclined Pregnant Leach Solution (PLS) riser pipe. This elevation was approximately 13.9 m below the HLF spillway invert and approximately 12.1 m above the bottom of the PLS sump, and so was within recommended operating levels. Refer to Section 2.6.1 for more details on 2019 In-Heap Pond water levels, which summarizes daily and monthly data collected for the solution inventory monitoring plan (SIMP).

At the time of the EOR inspection, the water level in the Leak Detection and Recovery System (LDRS) sump was approximately 909.7 m. This elevation is approximately 1.2 m above the bottom of the LDRS sump, and so was within recommended operating levels. Readings were obtained using a sounding tape in the inclined PLS and LDRS riser pipes.

At the time of the EOR inspection, the water level in the Events Pond elevation was approximately 886.5 m asl. This elevation was approximately 8.0 m below the Events Pond emergency spillway invert, and approximately 1.7 m below the action level for maintaining the available emergency storage volume in the pond. Refer to Section 2.5 for more details on 2019 Events Pond water levels. The water level in the LDRS sump was approximately 879.4 m asl. This elevation is approximately 0.4 m above the bottom of the LDRS sump. Readings were obtained using a vibrating wire piezometer in the inclined LDRS riser pipe.

During 2019, the HLF and Events Pond LDRS sumps were pumped out once per week regardless of readings. Generally, sumps were pumped prior to the water level reaching 0.5 m above the bottom of the LDRS end of pipe elevation. This limits the hydraulic head on the bottom liner.

Some unevenness, most likely caused by vehicle traffic, was visible on the dam's crest near the PLS risers, with ponding apparent (Photo 4.3-1 - Photo 13 in Appendix B). A few minor surface erosion gullies (Photo 4.3-2 - Photo 11 in Appendix B), which appear to be caused by rainfall runoff, were observed on the downstream slope of the underdrain containment area. The EOR recommended (see Table 4.3-2) that additional coarse fill be placed on the dam crest to limit ponding. The additional fill was placed after the inspection and the area is being monitored. The EOR also recommended that a small berm be constructed along the crest of the underdrain containment area to direct surface water flows to the west edge of the monitoring vault area. This area is being monitored and will be re-evaluated after freshet 2020.

Photo 4.3-1: HLF Dam Crest Looking West

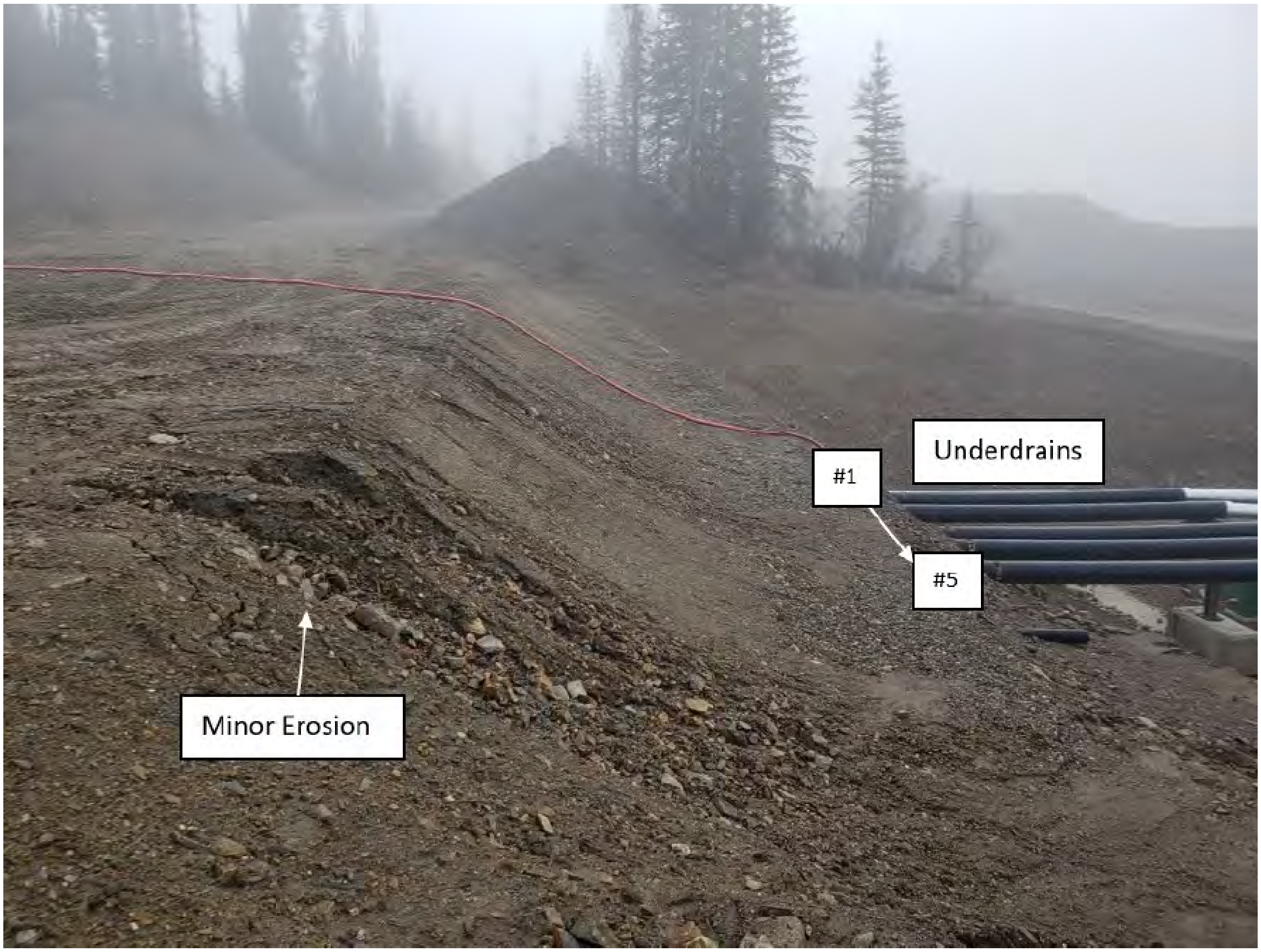


Photo 4.3-2: HLF Underdrain Outlet Between Dam and Monitoring Vault Looking East

The EOR recommended that the PLS pipeline, which was positioned on the HLF dam crest (Photo 4.3-3 - Photo 19 in Appendix B), be repositioned down onto the ore at elevation 937.5 m to provide better containment and protection of the dam in case of a spill. This move is scheduled for after freshet 2020.

Photo 4.3-3: HLF Phase 1 Pad Looking East from Dam Crest

Moderate cracking was observed on the HLF spillway access road (Photo 4.3-4 - Photo 3 in Appendix B). These cracks were not apparent in June 2019 during routine construction inspection. The cracks were up to 2 cm wide and about 10 m long. The cracks did not pose a threat to the HLF embankment at the time but were deemed that they could affect the access road and possibly the HLF spillway if not mitigated. The EOR recommended mitigation of this area by excavating a trench along the toe of the access road fill down to competent frost-free material and then the placement of imported fill (structural or rock fill) into the trench and onto at least the bottom half of the access road slope to form a buttress. This area is being monitored to evaluate the need for mitigation.

Photo 4.3-4: Upper Portion of HLF Spillway Access Road

Other than the observations indicated above, the dam, emergency spillway, and the outlets of the discharge pipelines, based on the visual inspection, were observed to be functional and in good condition. A summary of recommended maintenance and monitoring action items is presented in Table 4.3-2.

Table 4.3-2: Recommended Maintenance and Monitoring Action Items from 2019 EOR Inspection and Site Response

Structure	Maintenance/Monitoring Actions			Site Response
	Routine Monitoring/ Maintenance	Remediation and Engineering Review Necessary	Recommendations	
Heap Leach Facility	Continue	No	• Continue the routine inspection and monitoring of the dam, abutments, emergency spillway, discharge outlet areas, LDRS sump, PLS sump, pad liner, PLS and barren pipes, monitoring wells (P-1, P-2, P-3), and pond level as per the current OMS manual. • Document all unusual/adverse conditions observed, as well as maintenance work undertaken. • Install pad cell piezometers per BGC (January 8, 2018) Drawing EGHLF-XD-09-02. • Install barometer and remaining Geokon sensor nodes and set up system for automatic data collection. • Collect initial inclinometer reading in casing INC-1. • Evacuate the LDRS sump based on water level readings (no greater than 0.5m above bottom end of LDRS pipe should be allowed). • Place additional coarse fill on the dam crest to limit ponding and construct a small berm along the crest of the underdrain containment area to direct surface water flows to the west edge of the monitoring vault area. • Install signage to clearly mark the HLF east underdrain outlet.	Routine inspections and monitoring of the HLF are on-going The pad cell piezometers will be installed as part of the Phase 1B build out. The Geokon sensor nodes are on order LDRS sump management based on the EOR recommendations is on-going Additional coarse fill has been placed along the dam crest. The underdrain area is being monitored. Signage will be placed after snowmelt
Event Ponds	Continue	No	• Continue the routine inspection and monitoring of the embankment, abutments, pond liner, LDRS sump, and pond level as per the current OMS manual. • Document all unusual/adverse conditions observed, as well as maintenance work undertaken.	Routine inspections and monitoring of the Events Pond are on-going The use of wind ballast would be considered once the pond is dewatered; selection and placement would then be scheduled when the need arises

Structure	Maintenance/Monitoring Actions			Site Response
	Routine Monitoring/ Maintenance	Remediation and Engineering Review Necessary	Recommendations	
			• Select and install wind ballast per BGC (January 8, 2018) Drawing EGHLF-XD-07-0. • Evacuate the LDRS sump based on water level readings (no greater than 0.5m above bottom end of LDRS pipe should be allowed). • Install signage to clearly mark the Event Pond underdrain outlet.	LDRS sump management based on the EOR recommendations is on-going Signage will be placed after snowmelt
HLF Spillway	Continue	Yes	• Continue the routine inspection and monitoring of the spillway armoring, adjacent access road, seepage collection pipe outlet as per the current OMS manual. • Document all unusual/adverse conditions observed, as well as maintenance work undertaken. • Remediation of the apparent slope creep at the upper HLF spillway access road.	Routine inspections and monitoring of the spillway are on-going Spillway access road creep is being monitored
Emergency Spillway	Continue	Yes	• Continue the routine inspection and monitoring of the spillway armoring, adjacent access road, seepage collection pipe outlet as per the current OMS manual. • Document all unusual/adverse conditions observed, as well as maintenance work undertaken. • Remediation of the settlement and cracking along the access road adjacent to the spillway outfall area.	Routine inspections and monitoring of the spillway are on-going Access road cracking was mitigated during access road improvements after the inspections

Events Pond

The visual inspection of the Events Pond and associated HLF Spillway and Emergency Spillway was conducted on October 3, 2019.

Minor cracking was observed along the crest of the south embankment of the Events Pond (Photo 4.3-5 - Photo 6 in Appendix B). The cracking was first observed in June 2019, and did not appear to have expanded in width or length over that time period. The EOR recommends continued monitoring of these cracks.

Photo 4.3-5: Event Pond South Embankment Crest Looking West

Minor cracking and settlement was observed along the Events Pond access road adjacent to the emergency spillway outfall (Photo 4.3-6 - Photo 8 in Appendix B). The affected area is located well outside the toe limits of the Events Pond embankment but could affect the access road and emergency spillway outfall. The EOR recommended placement of additional fill to bring the area back to design grade. This area is being monitored.

Photo 4.3-6: Berm and Access Road Adjacent to Bottom Portion of Event Pond Spillway

The perforated pipe drain that collects seepage along the HLF spillway was not flowing at the time of the inspection. Flow was not observed at the assumed location of the Events Pond underdrain outlet. This outlet should be located by survey and clearly marked with signage. Signage will be placed after freshet 2020.

The EOR recommended that wind uplift ballast be installed on Events Pond liner. The pond is currently being used for temporary water storage, which provides sufficient ballast. The EOR recommends that if the Event Pond is to be kept empty after start-up operations are complete, ballast should be installed according to the design documents as soon as the pond is emptied to prevent liner damage from wind. These recommendations will be considered later in the project based on how the pond is utilized.

4.3.2 Status Report on Backup Equipment and Supplies for Emergency Management

A range of backup equipment and supplies are maintained on the Project to ensure that solution within the HLF can be effectively in the event of an emergency. At the time of this report, equipment necessary for the emergency management of the HLF was available and operational.

The key backup equipment for management of solution for the HLF are all related to the pumping system (i.e., the pump components and equipment to power the pump components).

4.3.2.1 PLS Pumps

The HLF includes five inclined steel casings (Photo 4.3-7) that terminate in the In-Heap Pond PLS Sump. The casings house the PLS pumps for transferring PLS to the ADR Plant. There are currently five SAER Elettropompe 6S-302 pumps installed within the casings which includes an installed spare as only 4 pumps are operated are once (to provide installed n+1 redundancy). The installed pumps are all operating as intended. An unused spare pump is also available on the site as a specific replacement for any of the installed pumps.

Photo 4.3-7: PLS Steel Casings Installation - June 14, 2019

4.3.2.2 Barren Solution Pumps

PLS is pumped from the In-Heap Pond to the ADR Plant for gold recovery and amendment of cyanide and then recycled to the HLF as barren solution by the barren solution pumps. Under an emergency scenario, solution pumped from the In-Heap Pond would only need to be recirculated back to the HLF thus the barren solution pumps represent a critical component for emergency management. The ADR Plant includes five barren solution pumps (Photo 4.3-8) that are operated in an n+1 configuration.

Photo 4.3-8: Barren Solution Pumps - May 7, 2019

Maintenance and cleaning of the barren solution pumps are tracked through the Pronto Enterprise Resource Planning (ERP) software platform. The ERP allows for software for the management of maintenance work orders and work flows, planning, scheduling through completion, close-out and record keeping. Records of any routine or follow-up maintenance activities for the barren solution pumps are kept by the ERP software on the Project site.

4.3.2.3 Power Supply

Primary power for operations on the site is provided by the Yukon Energy Corporation electrical grid. There are also three newly installed diesel generators on the site, each rated for 1650 KW output (Photo 4.3-9). Each generator has weekly work orders inputted in the ERP software that details the daily checks to be conducted to complete the weekly work order. The daily checks, conducted by qualified maintenance staff, include logging engine hours, checking oil, coolant and other fluid levels, and general observations (including inspection for leaks). In addition to the daily checks required to complete the weekly work orders, routine service is conducted in accordance with manufacturer's instructions and the maintenance department standards. During the period of this report, Generator 101 and 102 had not yet reached 500 hours of operation which would trigger the 500 hour service. Generator 103 had a 500 hour service in August, 2019 with all maintenance and testing records retained by the maintenance department

Photo 4.3-9: Project Substation and Back-Up Generators - April 11, 2019

4.4 Material Storage and Stockpile Management Areas

During construction and operational activities to date, various material types have been encountered that have not met construction specifications but would likely prove suitable for cover materials for facility closure. These materials have been either relocated to dedicated topsoil and overburden storage areas or have been stored locally to support future reclamation activities. The location and volumes of these materials are depicted in Figure 4.4-1.

Legend:

- Material Stockpile
- Facility
- Site Power
- Watercourse - Perennial
- Watercourse - Ephemeral
- Watercourse - Intermittent

VICTORIA GOLD CORP

Projection: NAD 83 UTM Zone 8N	Drawn By: HC	EAGLE GOLD PROJECT YUKON TERRITORY	
0 125 250 500 Metres	Date: 2020/05/10	Figure: 4.4-1	Volume and Location of Material Stockpiles

4.5 Engineer's Physical Stability Annual Inspection

As required by Section 13.2 of QML-0011, a physical stability assessment of all engineered structures, works and installations at the Project was undertaken by an independent engineer between September 24h and 25th, 2019. The findings of the assessment are provided in Appendix Y.

The assessment undertaken in 2019 included the following facilities and structures:

- Open Pit
- Platinum Gulch Dump
- Lower Dublin South (Control) Pond and Area
- Secondary Crusher
- Primary Crusher
- 90 Day Stockpile
- Absorption, Desorption and Recovery Plant Area
- Heap Leach Facility, Embankment and Area
- Event Pond
- Ditches A, B, and C
- Former Nuway Crusher Pad
- Orica Laydown
- Various Un-named Stockpiles

The Engineer's report included nineteen recommendations for the thirteen specific areas that were observed, and in the opinion of the independent engineer required further consideration. Table 4.5-1 provides the recommendations per area, VGC's response and the schedule to complete the response.

Table 4.5-1: Recommendations from Independent Engineer and Site Response

AllNorth Report – Observations in the Areas of Facilities and Structures	AllNorth Recommendations	VGC Response	Schedule to Complete
General report comments	**18.1 -** 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.	Monitoring of structures is done by the Technical Services department working closely with the EOR for the areas and while following standard operating procedures.	On-going
	18.1 - VGC should continue to assign individuals to document and be responsible for the monitoring and construction review to determine if such structures are constructed in accordance with design. Any variations between design documents and final construction should be included in final record drawings.	Monitoring of structures including construction review to meet design specs is done by the Technical Services department working closely with the EOR for the areas. Construction reports and as-built drawings document variations or minor modification from IFC designs.	On-going
	18.1 - 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.	As per both the QML and WUL, the EOR will provide a final construction report, which includes requirements for maintenance as needed, once the structures are complete.	On-going
	18.1 - 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.	Monitoring programs have been developed, are in use and undergoing further refinement by the technical services department with the oversight of a qualified professional.	Q2 2020

AllNorth Report – Observations in the Areas of Facilities and Structures	AllNorth Recommendations	VGC Response	Schedule to Complete
3.3 – LDSP - 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. 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.	**18.2** 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.	The area of concern will be monitored beginning at the onset of freshet (circa April 2020), and the need for armoring or a liner will be assessed. This ditch system is still under construction. Ditch A and the culvert will be maintained in working order, and will require ongoing maintenance.	Q3 2020 / on-going
4.1 – 90 Day Stockpile - The 90 Day Stockpile is currently under construction. During the time of inspection, some over-steepened cut slopes were observed, however they are currently being cut back with material being hauled to a stockpile in another area of the mine site.	**18.3** 1) Pull back over-steepened walls along the perimeter ditch which are sloughing into the ditch. This ditch may require a liner and/or rock armoring, and final grading to attain physical stability and prevent pooling.	Oversteepened slopes were temporary in nature, and have been reduced since observation in Sept 2019. Pad construction will continue after freshet 2020, and so will require ongoing monitoring and maintenance	Q3 2020 / on-going
4.2 – 90 Day Stockpile - A perimeter interception ditch extends around the downhill toe of the 90 Day Stockpile area. The construction of this ditch is not yet complete, as it is currently unlined with no rock armoring, and is founded on native soils, and over-steepened and sloughing in places. In one location some pooling of water has occurred as it appears that the final grade has not been completed. The outlet of one side of the perimeter ditch does not currently tie into the collection sump, such that a large flow of runoff could be directed down towards the access road until the tie in is completed. Site representatives indicated that this ditch will eventually be tied into the collection sump.	**18.3** 2) Tie perimeter ditch into the collection sump, directing water away from the road.	This ditch /sump system will be completed as per engineering specifications and will be tied into the Ditch A pipeline.	Q2 2020
5.1 – HLF - Some minor erosion issues noted along the cut slopes adjacent to the upper access road. Small amount of material is collecting at the toe of the cut slope. In locations measured, slopes are cut back to less than a 50% grade. Minor sloughing noted along the length of the bench above the HLF pad, as shown below in Figure 15. Site representatives indicated that these slopes will be further cut back during the Phase 1B HLF expansion.	**18.4** 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. 3) Consider re-shaping the temporary upper overburden stockpile to reduce risk of material sloughing down towards the access road.	This area will be monitored and repaired with the Phase 1B Expansion	Q2/Q3 2020

AllNorth Report – Observations in the Areas of Facilities and Structures	AllNorth Recommendations	VGC Response	Schedule to Complete
5.2 – HLF - Scouring associated with rainfall runoff was noted on the access road that leads to the upper overburden stockpile and interception ditch. The upper overburden stockpile is located adjacent to the HLF access road / upper bench. Some erosion on the sides of the stockpile has occurred (Figure 17) and material being carried down the slope was noted. This temporary stockpile appears to be over-steepened in places. Site representatives indicated that this stockpile will be moved during Phase 1B pad expansion.	**18.4** 2) Install further ditching at the top of the temporary upper overburden stockpile area to control water flow and address scouring issue on the access road.	This area will be regraded and grubbed as part of the Phase 1 B Expansion	Q2/Q3 2020
5.3 – HLF - The interceptor ditch west end appears incomplete and outfalls to an un-vegetated area that slopes into the surrounding forest. Some minor scour and slope instability was noted on the uphill cut slope adjacent to the ditch. Some material has been deposited into the ditch. Settlement and movement was noted in one section of the temporary access road, which extends along the south and down gradient side of the ditch (approximate 0+650 along the ditch alignment). Tension cracking in the soil is present. This is likely due to settlement after road construction, which occurred during winter and likely incorporated snow/ice when building up the fill section. Movement or failure of the fill section could impact the functionality of the interception ditch, however, fill slopes were measured to be less than 50%, and the consequences of further movement are likely low, as there is moderate setback from the toe of the downhill slope to the closest access road. This deteriorated temporary road only accesses a short section of the interception ditch.	**18.4** 4) Review requirements of the Phase 1 Interception ditch outfall. Currently the ditch terminates at the top of an un-vegetated slope, and would be more stable with an armored exfiltration outfall/sediment sump. 5) Monitor road settlement around 0+650 of the interceptor ditch alignment. Currently this section requires some additional fill to facilitate truck traffic. Additional settlement could impact the functionality of the interception ditch. Additional settlement or failure is unlikely to impact other infrastructure, due to adequate setback from the toe of the slope.	Most of this area will be grubbed and regraded in preparation for the Phase 1 B Expansion. The outfall for the interceptor ditch will be constructed in Q2/Q3.	Q2/Q3 2020

AllNorth Report – Observations in the Areas of Facilities and Structures	AllNorth Recommendations	VGC Response	Schedule to Complete
8.1 – Primary Crusher and MSE Wall - No apparent damage or deterioration was noted during the inspection of the Primary Crusher MSE wall. Most of the construction in this area was completed after the previous inspection in 2018, and no baseline data is available for comparison. The structure is now complete and operational.	**18.7** 1) A monitoring program should be established using regular survey of the MSE walls, to detect any potential movement.	Instrumentation will be installed in Q2 of 2020. A no-go line will be added to maps to prevent over-piling behind the crusher.	Q2 2020
8.2 – Secondary/Tertiary Crusher and MSE Wall - No apparent damage or deterioration was noted during the inspection of the Primary Crusher MSE wall. Most of the construction in this area was completed after the previous inspection in 2018, and no baseline data is available for comparison. The structure is now complete and operational.	**18.8** 1) A monitoring program should be established using regular survey of the MSE walls, to detect any potential movement.	Instrumentation will be installed in Q2 of 2020. A no-go line will be added to maps to prevent over-piling behind the crusher.	Q2 2020
10.2 – ADR - There is a small V ditch, referred to here as the North Toe Ditch, 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, possibly to widen the laydown area. Currently the north toe ditch is directed through the culvert and into a smaller roadside ditch, which runs along the uphill side of the ADR access road. This ditch is also not armored and contains loose gravel and fines.	**18.9** 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.	Review of design to be done and if necessary ditch system will be modified	Q2 2020
11.2 – Event Pond - Some minor scouring of the cut slopes along the heap leach spillway bench/access was noted. Some material has accumulated on the bench and into the spillway. The spillway is constructed with a concrete-filled fabric liner and appears stable. Five plastic culverts have been installed under the embankment access road at the head of the HLF spillway. Minor sloughing is occurring from the fill overlying the culvert outlets. Otherwise the engineered structure appears stable	**18.10** 1) Monitor minor erosion of cut slopes and maintain as required.	Design changed for outflow from HLP to the Event Pond. Cut slopes will be maintained as required for spillway capacity.	On-going

AllNorth Report – Observations in the Areas of Facilities and Structures	AllNorth Recommendations	VGC Response	Schedule to Complete
12 – Ditch A - Sediment flow into the ditch was noted near the truck shops. Site representative indicated that this took place over the previous week following heavy rains. As per the site representative, this flow is coming primarily from thawing permafrost uphill from the ditch, and may also have received flow from the 90-day stockpile perimeter ditch outlet, which as noted in Section 4, is still under construction. Future plans include construction of a ditch/pipe structure to carry water from the 90-day stockpile sump to Ditch A in a controlled manner. Site conditions have been too wet and unstable in the permafrost terrain to complete this work, and are planned for the winter season. Fill along portions of the access road adjacent to Ditch A appears to have been pushed onto trees and debris in the subgrade.	**18.11** 1) Complete construction of the feeder ditch which will carry flow from the 90-day Stockpile perimeter ditch to Ditch A. This work is currently planned for this winter as per the site representative.	Ditch/Sump system to be tied into A Ditch system via HDPE pipe. Ditches will be maintained in working order, and will require ongoing maintenance	Q2/Q3 2020 on-going
13 – Ditch B - Ditch B begins at a small watercourse known as Suttles Gulch. A small stream, known as Eagle Creek, is currently captured by a small berm and then directed into Ditch B under the berm via a small diameter HDPE pipe. 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. Site representatives are already aware of this issue, and sediment is being actively managed using silt fencing.	**18.12** 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.	This ditch system is still under construction, and will require ongoing maintenance	On-going
15 – Former NUWAY Crusher Pad - This area is not currently being used, but the site representative indicated that it may be used in the future as a stockpiling area. Observed some over steepened slopes, with material collecting at the toe of these slopes.	**18.14** 1) Pull back over-steepened slopes prior to utilizing this area.	This is an active stockpile area and will require ongoiing maintenance	On-going

AllNorth Report – Observations in the Areas of Facilities and Structures	AllNorth Recommendations	VGC Response	Schedule to Complete
16 – ORICA Laydown - One section of cut slope has been over-steepened while expanding the laydown. Sloughing of material and some undercutting present. Site representative indicated that this area will be addressed prior to placing new buildings in their final location. Lower section of the laydown appears to have some wet material on the slope. Some water is ponding around the base of the slope in a sediment control sump apparently installed in this area to manage runoff. No visible water flow is evident. Water may be percolating through the subsurface at the base of the slope. The remainder of the cut slopes appear to be competent material.	**18.15** 1) Material used to construct a sediment sump on the lower laydown cut slope may not be stable if slopes become saturated. Water should be managed in this area to minimize ponding to prevent the saturation of the fill material in the laydown. 2) Pull back over-steepened slopes prior to utilizing this area.	The area is still under construction. The oversteepened slope will be addressed when construction is complete	Q1 2020
17.1 – Un-named Stockpile Area - 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, but there is little risk to other infrastructure. The area is currently mostly un-used. There are some minor water management issues in the area, with water flowing down and around the stockpiles as apparent from the small gulley forming at the base. Some ponding water and saturated material is present in the laydown areas. The bottom of the area appears to be trenched out towards the Control Pond, although there is ponding water in this area.	**18.16** 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.	Continual monitoring of stockpiles underway and will address water management on an as needed basis.	Ongoing

5 CYANIDE MANAGEMENT

The VGC Eagle Gold Project follows practices and procedures described in the *Cyanide Management Plan* and the associated Standard Operating Procedures (SOPs) which govern the procurement, delivery, storage handling, and use of sodium cyanide for mineral extraction purposes. The practices comply with the *International Cyanide Management Code* (ICMC), a globally accepted set of practices applied at international gold mining projects involving cyanide-based mineral extraction (ICMI 2016 and 2018).

5.1 Pre-Operational

5.1.1 Transport

VGC established a long-term cyanide supply contract with Cyanco Canada Inc. (Cyanco), an experienced ICMC-certified North American supplier. Cyanide supplied to the Project is manufactured at Cyanco's ICMC certified plant at Alvin Texas. VGC established contractual conditions under which Cyanco assumes responsibility for management of the entire supply chain pursuant to ICMC requirements. For incidents in proximity to the mine VGC will, on request from the transporter, assist with responding to a transportation related incident. Transportation to the Project by Cyanco is supported by Cyanco's Global Transportation Emergency Response Plan (GTERP), which includes the Emergency Response Assistance Plan for Canada. The emergency response capability and preparedness of the transporter is clearly set out in the ICMI Cyanide Transportation Verification Protocol (ICMI, 2016).

Cyanco, as part of the western supply chain re-certification process under the ICMC, included the transportation route to the Project as part of their audit. The process included auditing the operations and planning processes for Alaska Marine Lines, Alaska Marine Trucking and Canadian Lynden. At the time of this report, the final completeness review and certification under the ICMC was ongoing.

VGC received its first shipment of cyanide at the Project site in June of 2019; cyanide application to HLF operations was not initiated until August 2019. During the reporting period there were no spills of cyanide documented during transportation.

5.1.2 Receipt, Handling, and Storage

Cyanide is delivered to the Project in solid briquette form, delivered in one tonne nylon "supersacks", overpacked in polyethylene-lined plywood pallet crates (known as Intermediate Bulk Containers or IBCs) and transported to the Project site in standard steel intermodal containers.

VGC is responsible for unloading intermodal containers of cyanide upon receipt, and takes formal ownership of the product at that point. The product is received at a designated unloading and storage area adjacent to the ADR plant building. When product is required for barren solution amendment, a single steel intermodal container is moved to the concrete unloading area immediately outside of the ADR Plant. The delivery area is marked with warning signs and visual barriers to prevent unauthorised passage of personnel and equipment while the cyanide intermodal containers are being offloaded.

The internal IBC storage area provides warning signage at all entry doors, along with an audible and visual hydrogen cyanide (HCN) alarm and monitoring systems.

5.2 Operational Controls

5.2.1 Facilities Monitoring and Inspections

The HLF infrastructure is monitored regularly according to SGC-CMP-SOP-007, "*Cyanide Facility Inspections"* and the VGC *HLF Operation, Maintenance and Surveillance Manual* (HLF OMS). Physical stability and integrity inspections of the Heap Pad and associated infrastructure are completed and recorded through supervisor and operator checklists, records are then filed on site by VGC Process department staff. Specific focus areas for inspections of cyanide related facilities are listed in Table 5.2-1.

Table 5.2-1: Cyanide Related Infrastructure Routine Inspections 2019

Facilities	Inspection Focus Area
Cyanide unloading and storage area	• Maintenance of general housekeeping practices, presence of water or debris • Proper segregated storage of incompatible materials • Integrity and proper positioning and stacking of stored intermodal containers and IBCs; according to or exceeding that specified by manufacture specifications and best management practices. • Presence of properly rated fire extinguishers (non-carbon monoxide detectors) • Functionality of fixed HCN alarms and video monitors • Legibility of hazard warning signage • Availability of Material Safety Data Sheets (MSDSs) for cyanide briquettes • Cordoning of container unloading area during unloading operations, and restriction of access by unauthorized personnel • Use of appropriate operator PPE during unloading operations • Functionality of eyewashes/emergency showers and water supply line pressure • Condition of emergency response equipment and first aid storage cabinets
Cyanide bag cutter arrangement, mixing and storage tanks, and secondary containments	• Structural integrity, signs of corrosion, buildup of cyanide salts, or leakage (tanks, valves, pumps, and other piping system components) • Structural integrity, cracks, spalling, or deterioration of concrete impoundments • Functionality of fixed HCN alarms and video monitors • Functionality of tank level indicators • Condition of chain hoist and bag lifting bridle • Functionality of eyewashes/emergency showers and water supply line pressure • Temperature, cleanliness, and condition of cyanide antidote kits and first aid storage cabinets • Condition of emergency response equipment and PPE • Use of appropriate operator PPE during mixing operations • Legibility of hazard warning and direction flow signage • Integrity of lockout/tag-out mechanisms on major solution or containment drain valves • Maintenance of physical separation from chemically incompatible materials • Maintenance of general housekeeping practices, presence of spilled solution or debris
Incineration of cyanide packaging materials	• Legibility of hazard warning signage • Adequacy and integrity of security fencing, gate, and lock • Completeness of combustion of packaging residues • Control of windblown debris outside of fenced area • Evidence of animal intrusion

Facilities	Inspection Focus Area
ADR plant and secondary containments	• Structural integrity, signs of corrosion, buildup of cyanide salts, or leakage involving process solution storage tanks, valves, pumps, and other piping system components • Structural integrity, cracks, spalling, or deterioration of concrete impoundments • Management of fluids in impoundments • Functionality of fixed HCN alarms and video monitors • Functionality of tank level indicators • functionality of eyewashes/emergency showers and water supply line pressure • Temperature and condition of cyanide antidote kits • Condition of emergency response equipment and PPE • Legibility of hazard warning and direction flow signage • Integrity of lockout/tag-out mechanisms on major solution or containment drain valves • Maintenance of physical separation from chemically incompatible materials • Maintenance of good general housekeeping practices, including routine cleanup of spilled or leaked solution or debris
Pregnant and barren solution pipelines and pumping stations/ containments	• Structural integrity, signs of corrosion, buildup of cyanide salts, or leakage (pipelines, valves, pumps, and other components) • Structural integrity, cracks, spalling, or deterioration of concrete impoundments • Functionality of eyewashes/emergency showers • Temperature and condition of cyanide antidote kits • Condition of emergency response equipment and PPE • Legibility of hazard warning and direction flow signage • Integrity of lockout/tag-out mechanisms on major solution or containment drain valves
HLF earthworks, risers, distribution lines, emitters, internal pond(s), and leak detection system	• Signs of erosion, slumps, or cracks in earthworks or the ore pile • Signs of pipeline/flange leakage, and associated ponding • Signs of ponding on HLF surface; if present, adequacy of screening or other appropriate avian exclusion devices • Signs of animal trails or intrusion • Management of fluids in impoundments • Functionality of leak detection system and maintenance of associated detection logs • Legibility of hazard warning and direction flow signage
External Events Pond and leak detection systems	• Adequacy of available freeboard (comparison to surveyed markers) • Tears or holes in liner material or signs of erosion or slumps in underlying earthworks • Signs of pipeline/flange leakage, and associated ponding • Adequacy of wildlife monitoring. fencing and/or avian exclusion devices • Signs of animal trails or intrusion • Functionality of leak detection system and maintenance of associated detection logs • Legibility of hazard warning and direction flow signage
Surface water interceptor ditches	• Tears or holes in liner material (if lined) or signs of erosion, slumps, or cracks in earthworks • Signs of animal trails or intrusion • Signs of blockage or other surface runoff impediments

5.2.2 Wildlife Monitoring

The documentation and monitoring of wildlife related to cyanide management is conducted according to VGC's *Wildlife Protection Plan* and SOP SGC-CMP-SOP-011 "*Wildlife Mortality Reporting/Investigation"*. Wildlife mitigation measures require that all VGC employees report wildlife observations throughout the Project site and main access road.

The HLF and Events Pond were monitored regularly throughout the late fall and winter of 2019, to focus in particular on moose activity, and there were no reports of wildlife incidents.

The Events Pond has not received any overflow from the In-Heap Pond (via the spillway) and there has been no detection of cyanide in any laboratory sample for groundwater flow circulated to the Events Pond from the HLF underdrain monitoring vault and thus no solution containing cyanide has been introduced to the pond.

5.2.3 Surface and Ground Water Monitoring

In addition to facility monitoring, surface water and ground water in the vicinity of the HLF, Events Pond and ADR plant are routinely undertaken to determine if process solution has escaped from these facilities.

The sites monitored, and the frequency of water quality monitoring, to determine if process solution has reached the receiving environment are provided in Table 5.2-2.

Table 5.2-2: Surface Water and Groundwater Monitoring for Presence of Cyanide 2019

Site	Frequency	Coordinates (Zone 8)		Site Type
		North	East	
LDSP	D & W	7100857	458672	Surface Water - Compliance
ADR Pad Ditch	D & M	7101471	459043	Surface Water - Compliance
HLF-UMV	M	7101298	459445	Groundwater - Compliance
W4	D & M	7101223	458144	Surface Water - Receiving Environment
W22	M	7101378	458319	Surface Water - Receiving Environment
W5	M	7095888	457814	Surface Water - Receiving Environment
W6	M	7095964	458099	Surface Water - Receiving Environment
W23	M	7095682	457790	Surface Water - Receiving Environment
W29	D & M	7099583	458225	Surface Water - Receiving Environment
W39	Q	7086504	449780	Surface Water - Receiving Environment
W49	Q	7085495	449221	Surface Water - Receiving Environment
W99	M	7098180	458322	Surface Water - Receiving Environment
MW19-DG6R	Q	7101121	459225	Groundwater - Receiving Environment
MW19-EVP1a/b	Q	7101188	459264	Groundwater - Receiving Environment
MW19-EVP2a/b	Q	7101091	459073	Groundwater - Receiving Environment
MW19-HLF1a/b	Q	7101316	459542	Groundwater - Receiving Environment

NOTES:
D – Daily when discharging; W – Weekly when discharging; M – Monthly; Q – Quarterly

During the period of this report, cyanide solution was not detected at any of the monitoring locations in the receiving environment and no discharge to the receiving environment was undertaken when cyanide was present on the site.

5.2.4 Worker Safety

VGC has developed multiple operating procedures for managing its facilities to limit worker exposure to Hydrogen Cyanide (HCN) gas and sodium cyanide salts. Operational monitoring of cyanide facility worker health and safety is based on managing pH throughout the facilities to mitigate the risk of HCN gas production, use of ambient/personal monitoring devices when working directly with cyanide-related tasks, and ensuring timely investigation and evaluation of exposure incidents.

During the period of this report there were not first aid, medical aid, or lost time incidents related to an exposure to HCN gas or sodium cyanide salts.

5.2.5 General Signage Requirements

As recommended in the ICMC, warning signs are placed to alert workers that cyanide is present, that smoking, open flames, eating and drinking are not allowed and that the necessary cyanide-specific personal protective equipment must be worn. Tanks and piping containing cyanide are identified by color code, signs, labels, tags, decals or other means to alert workers of their contents. The direction of cyanide flow in pipes are also labeled, marked or otherwise designated according to the American National Standards Institute (ANSI) guidelines *"Scheme for the Identification of Piping Systems"* (ANSI/ASME 2007). Special signage is also placed to identify emergency exits and the location of emergency equipment stations including emergency shower/eyewash stations, dry chemical fire extinguishers, cyanide antidote kits, and first aid stations. These measures were reviewed during a site audit by the EoR and detailed in Section 5.4.

5.2.6 Emergency Response

During the reporting period no cyanide release or exposure occurred at the Project site or with Project-related cyanide activities, nor did cyanide exceed limits in water quality monitoring outlined in WUL QZ14-041-01.

5.2.7 Emergency Equipment

VGC maintains emergency equipment and supplies at strategic locations to allow rapid response to emergencies involving cyanide exposure. In addition to the shower/eyewash stations, cyanide first aid kits are maintained that include medical oxygen equipment with resuscitator, activated carbon, and antidote. The Project currently utilizes the Cyanokit® containing hydroxocobalamin as the antidote for cyanide exposure with six (6) kits present at site at all times.

All employees that work with cyanide, and are able to respond to a cyanide exposures emergency, are trained in cyanide exposure recognition, first response and basic first aid procedures; a portion of employees are trained in application of medical oxygen, and antidote, as available and as suitably qualified.

5.2.8 Medical Emergency Response

A first aid room is established at the Project site, with the equipment and staff to handle first response of all readily foreseeable types of medical emergencies. The first aid room is staffed 24 hours a day, 7 days a week and able to provide advanced emergency first aid, including first aid to respond to cyanide poisoned patients. On site medical staff include a Primary Care Paramedic (PCP) position, that is qualified for the administration of the Cyanokit®. which is an intravenous (IV) medication.

5.2.9 Emergency Response Team

In addition, the Project retains an Emergency Response Team (ERT). ERT members are site personnel that receive training and certification as emergency responders. The ERT are trained in fire, highwall, and hazardous materials emergency response and include members trained to Occupational First Aid (OFA) Level 3 medical first aid.

The Project maintains and updates an *Emergency Response Plan* that details the following:

- primary and alternate emergency response coordinators who have authority to commit the resources necessary to implement the Plan;
- current members of the ERT;
- minimum training requirements for emergency responders;
- mustering procedures and 24-hour contact information for emergency coordinators and ERT members;
- duties and responsibilities of the emergency coordinators and ERT members;
- procedures for periodic inspection of emergency response equipment to ensure its functionality and availability; and,
- specific roles of external responders, medical facilities, or community organisations in the emergency response process.

5.2.10 Mock Emergency Drills

Mock cyanide exposure drills will be undertaken by the ERT as part of regular training sessions throughout 2020. The drills will be designed to test each of the potential cyanide emergencies scenarios appropriate for the site as considered in the *Heap Leach Facility Emergency Response Plan.* Should the evaluation of a mock drill identify deficiencies in the methods and effectiveness of the response, the adequacy of emergency response training will be reviewed, and additional or revised training may be recommended to hone the knowledge and skills of the responders.

5.2.11 Cyanide Emergency Destruction

A supply of hydrogen peroxide is maintained on site as part of the emergency response for neutralizing and decontaminating areas impacted by potential cyanide spills. SGC-CMP-SOP-020 "*Cyanide Emergency Response Procedures*" describes the method for preparing neutralization chemicals for safe use and application to ensure that treatment chemicals and by-products of the neutralization process do not unduly impact surface waters. Additionally, cyanide destruction can be accomplished with the use of lime, soda ash, copper sulphate, sodium hypochlorite, or high pH water for neutralization response to spills on site where the neutralization agents will not come into contact with aquatic systems.

There has been no release of any cyanide on the Project site and thus emergency cyanide destruction has not been required.

5.3 Training

Training programs (as outlined in SGC-CMP-SOP-002, "*Eagle Gold Project Training Program*") are implemented to ensure that employees work in compliance with regulations, approved policies, and procedures.

All site employees are required to receive Cyanide Hazard Recognition Training in accordance with the guidance provided in the ICMC. Cyanide specific training is currently tracked through the VGC Training department and all training records are retained on site. Annual refresher training is required and will be tracked through the training department. Cyanide workplace safety meetings are ongoing through daily toolboxes to discuss risks and potential issues related to cyanide-related tasks. Additional on-site training includes the following:

- WHMIS
- Lime Hazard Recognition Training
- Cyanide Exposure Symptoms
- First Aid

To ensure relevant and up to date training programs, and in keeping with the VGC Occupational Health and Safety Policy and with maintaining a safe working environment, workers are encouraged to provide input on occupational health and safety issues. VGC considers this input in developing, evaluating and reviewing operating procedures and during formal safety meetings and informal pre-work safety toolbox sessions. Monthly JOHSC meetings and mandatory all staff monthly safety meetings allow for the review of incidents and provision of employee feedback on health and safety issues.

5.4 Annual Audit

The annual independent third-party audit of the Cyanide Management Plan and its execution will be undertaken within a year of cyanide being introduced to the Project site (i.e., undertaken prior to June 2020) as required. As the annual audit was not required for the period considered in this report, the Engineer of Record for the Project HLF, Forte Dynamics, performed a review and audit of process operational procedures, metallurgical accounting, and lab operations in October 2019, including several procedures involving cyanide management.

5.4.1 General Safety/Cyanide Code

The audit focused on operational aspects related to general safety considered by the ICMC:

- Safety meetings
- General ADR plant housekeeping
- Labelling and signage
- HCN alarms and personal detectors
- Refinery housekeep, safety equipment and PPE
- Fire protection
- Furnace operations

- ADR PPE (safety shower/eyewash station, fire extinguisher audit, medical response equipment, worker safety gates, etc.)

5.4.2 General Operations

The audit reviewed operational features including the following:

- Carbon elution/boiler system operating temperature and pressure review
- Electrowinning cell cleaning and sludge drying procedures
- ADR plant operational flows verses design
- Refinery security access and PPE

All aspects raised during the 2019 audit/review were addressed throughout the remainder of 2019 and completed by the first quarter of 2020.

6 RECLAMATION & CLOSURE

VGC submitted an updated Reclamation and Closure Plan (RCP) for review and approval as required by QML-0011 and QZ14-041 on October 1, 2018.

Throughout 2019, EMR and VGC were engaged in a review process of the RCP which ultimately led to the approval of Version 2018-03 on June 19, 2019. The approval of RCP Version 2018-03 was subject to additional review of the security estimate provided by VGC and, as an interim measure to ensure adequate security was maintained for the Project, VGC was required to furnish and maintain security in the amount of $21,565,134.89 by July 1, 2019. On July 1, 2019, VGC replaced Bond #962-018554 (that was in the amount of $17,131,052.00) with Bond# 962-019824 in the amount of $21,565,134.89. On December 20, 2019, upon completion of additional detailed review by EMR, with input from a third-party expert, and further discussions with VGC regarding the security estimate for the Project, VGC was required to furnish and maintain a total of $27,406,539 of security no later than January 20, 2020. On January 14, 2020, VGC provided updated Bond #962-019824 in the amount of $27,406,539.00 to EMR. VGC considers the currently held security amount to be sufficient to reclaim the Project in accordance with the RCP as the assumed current actual liability for closure to be less than the security held.

On November 14, 2019, the YWB provided Security Review Information Request 1 to VGC with a directive for VGC to provide a response by December 16, 2019. On December 6, 2019, the YWB provided a notice to VGC and Interveners on the Water Use Licence application for the Project, details on the process to determine security for the Project for QZ14-04-1. VGC and the interested Interveners subsequently complied with the process timelines provided by the YWB and at the time of this report the YWB was continuing their deliberations and determination with respect to the amount of security required pursuant to the *Waters Act.*

Under QML-0011 and QZ14-041-1, VGC is required to provide an updated RCP on or before October 1, 2020.

6.1 Reclamation Research

6.1.1 Peso Revegetation Trials

As described in previous annual reports, revegetation trials were established at the Peso Mine site to help inform reclamation planning for the Project. The Peso Mine site had last been actively mined in the 1960's and at that time there was no evidence of an active revegetation program being undertaken and it exhibited limited natural revegetation. The objective of the revegetation program was to test the viability of incorporating biochar and other soil amendments to support vegetation growth in a location with a similar climate and physiographic conditions. The study area chosen was within the larger Dublin Gulch claim block, which the Project site is also situated within, and is approximately six kilometers from the Eagle open pit.

Laberge Environmental Services completed the field portion of the Peso revegetation project on July 31st, 2018; however, at the time of the 2018 annual report a final report related to this work was not complete. Appendix Z provides the final report for the revegetation project.

In summary, in 2012 two sites (an un-reclaimed trench and a waste rock pile) were selected for the establishment of three blocks of trial plots each on relatively level ground with the same aspect at each block. Each block measured 5 m by 2 m and contained 10 one-meter square plots. Within the blocks, every over trial plot site was used to allow unseeded/untreated plots to represent buffer zones to ensure that each active test plot was isolated and would not influence neighboring plots receiving different preparation methods. Soil samples were taken from the two sites to inform amendment and seed application rates.

Laboratory analysis of the soil samples taken from both sites showed them to be strongly acidic (pH 2.6 for the waste rock and pH 5.2 for the trench site) with high concentrations of antimony, arsenic and lead with extremely low available nutrient levels. Other than nutrient levels, these conditions are unlikely to be representative of the soil conditions for the Project; however, the focus of the trials was on establishment of vegetation using soil amendments rather than metals uptake by plant species (i.e., phytoremediation) to decontaminate soils and water. One of the soil amendments chosen for the trials, biochar, does have the ability to immobilize metals and thus reduce their bioavailability for plant update so does

Plots subject to the trials were first scarified with a hand-cultivator and then raked with a fine-toothed rake. Soil amendments were then well mixed into the prepared plot and seeds were hand broadcast through the plot. Each plot was then tamped with the back of a rake to achieve good seed placement. The amendments and seed mix utilized for each plot is provided below in Table 6.1-1

Table 6.1-1: Peso Revegetation Trial Configuration

Site	Seed Mix	Block	Plot	Soil Amendment
Waste Rock Pile	Sheep fescue - 0.4 g Tufted hairgrass - 0.14 g Glaucous bluegrass - 0.19 g Tickle grass - 0.04 g Bear root - 20 seeds Alder - small hand full	1, 2 and 3	1	None
			2	Biochar (6 L) and compost (15 L)
			3	Biochar (6 L), compost (15 L) and leonardite (0.15 kg/m^2)
			4	Biochar (6 L), compost (15 L) and dolomite lime (3.3 kg/m^2)
			5	Biochar (6 L), compost (15 L), leonardite (0.15 kg/m^2) and dolomite lime (3.3 kg/m^2)
Trench	Sheep fescue - 0.4 g Tufted hairgrass - 0.14 g Alpine bluegrass - 0.21 g Spike trisetum - 0.9 g Bear root - 20 seeds Alder - small hand full	1	1A and 1B	None
			2A and 2B	Biochar (3 L) and compost (15 L)
			3	Biochar (3 L), compost (15 L) and leonardite (0.15 kg/m^2)
		2	1A and 1B	None
			2	Biochar (3 L) and compost (15 L)
			3A and 3B	Biochar (3 L), compost (15 L) and leonardite (0.15 kg/m^2)
		3	1	None
			2A and 2B	Biochar (3 L) and compost (15 L)
			3A and 3B	Biochar (3 L), compost (15 L) and leonardite (0.15 kg/m^2)

The revegetation plots were assessed annually for species present, number of individuals and overall health of the vegetation within each plot. 2018 was the final year of this program and the work undertaken at that time included additional analysis of soil conditions, metals concentrations of plant tissues, height of above ground growth and rooting depth.

The soil conditions upon completion of the trials where compared to those during the initial site characterization in 2012; however, the specific sampling locations in 2012 were not based on final plot locations used throughout the trial thus the 2018 results were averaged as shown in Table 6.1-2.

Table 6.1-2: Peso Revegetation Trial Soil Concentrations, 2012 and 2018

Parameter	MDL	Units	No Treatment			
			Waste Rock		Trench	
			2018	2012	2018	2012
			N=3	N=1	N=3	N=1
Loss on Ignition @ 375 C	1.0	%	1.7	6.1	1.6	4.0
Organic Matter	1.0	%	1.6	0.6	1.5	<0.35
pH (1:2 soil:water)	0.10	pH	2.70	2.62	5.8	5.15
Total Carbon by Combustion	0.05	%	0.50	0.37	0.4	<0.20
Available Phosphate-P	2.0	mg/kg	2.2	2.9	2.9	1.8
Available Potassium	20	mg/kg	27.0	<2.0	28.3	8.5
Aluminum (Al)	50	mg/kg	5,030	2,690	3,230	2,350
Antimony (Sb)	0	mg/kg	1,777	3,680	3,567	3,580
Arsenic (As)	0	mg/kg	2,743	6,150	7,863	9,810
Cadmium (Cd)	0.020	mg/kg	1.3	4.88	4.7	4.28
Chromium (Cr)	0.50	mg/kg	11.7	6.7	11.7	12.2
Cobalt (Co)	0.10	mg/kg	6.04	3.54	5.31	5.33
Copper (Cu)	0.50	mg/kg	161.0	210	125.4	75.9
Iron (Fe)	50	mg/kg	40,700	57,500	50,300	46,300
Lead (Pb)	1	mg/kg	2,427	9,070	7,057	7,330
Mercury (Hg)	0.005	mg/kg	0.131	0.796	0.428	0.410
Nickel (Ni)	0.50	mg/kg	17.6	9.1	11.7	12.0
Selenium (Se)	0.20	mg/kg	5.4	19.30	7.9	12.70
Silver (Ag)	0.10	mg/kg	23.2	89.4	44.4	103.0
Zinc (Zn)	2.0	mg/kg	133.3	252.0	194.3	129.0

At the completion of the program, it was found that the plots that were seeded but received no amendments support very little, if any growth over the six-year trial. This was consistent with observations of the general area.

Although grasses are not the dominant growth form in the nearby local environment, native grasses were initially planted as they germinate quickly, assist in retaining moisture and helping to build up the soil. By year two most of the treated plots supported relatively healthy growth of various grass species. Hedysarum germinated in some plots during year one but was absent in the following years. Alder seeds that were also added to the plots began noticeably growing in years two and three. In year four grasses were gradually dying back and shrubs, mainly alder, were taking over. Willow, dwarf birch, Labrador tea, blueberry and Alaska birch were also beginning to colonize some of the plots, all of which are present in the neighboring forest. Grasses were also dying back in the plots where alder was not prevalent.

In the absence of a suitable growth media or a soil amendment, all nontreated seeded plots produced no to very little growth. The acidic soil conditions at the Peso trench and the waste rock sites present a challenging scenario in relation to the site conditions at the majority of other disturbed sites in the Dublin Gulch area. However, the success of using compost and biochar to achieve robust plant growth on these highly mineralized and acidic soils, especially on the waste rock dump, indicates that revegetation can be successful with minimal effort and resources. Native plants were able to grow on the majority of the treated plots, including on the highly acidic (pH 2.6) Peso mine waste rock dump.

In summary, these trials have proven successful. By using appropriate species and soil amendments, healthy plants have grown, propagated and even thrived on acidic, highly mineralized soils.

6.1.2 Pilot Bioreactor Program

A pilot bioreactor program was established on the Project site in 2019. The program is considered the next step in the reclamation research program for the passive treatment systems that will be used at mine closure. The program, being conducted with guidance from the Yukon Industrial Research Chair - Northern Mine Remediation at the Yukon College Research Centre, expands upon earlier lab scale trials on the removal rates for arsenic, selenium, antimony and other metals under site conditions. The lab scale program and results were described in the 2015 Yukon Research Centre report entitled Arsenic, Antimony and Selenium Removal from Mine Water by Anaerobic Bioreactors at Laboratory Scale. The pilot program includes trial components exposed to ambient freeze-thaw stresses to evaluate the effect of the site climate regime on removal rates. More specifically, the primary objective of the research program is to study freeze-thaw cycles on sulfate reducing bacteria and to assess their efficiency to remove heavy metals (particularly arsenic, selenium and antimony) from mine influenced water (MIW), and in this case MIW originating from Platinum Gulch catchment and the PG WRSA.

The program utilizes mine influenced waters (captured at site collection points along Ditch A or the LDSP pond water, which is then transferred to the trial area) pumped into a 1,000L tank filled (Photo 6.1-1) once per week though the summer and twice per week during winter. The MIW is then transferred to 200L drums both inside and outside of the bioreactor program shack (Photo 6.1-2). The MIW solution is fed with a specified dosage of molasses, which helps to feed the bacteria and allow the bioreactor to work. The bioreactors are monitored weekly and sampled on a periodic basis (weekly to monthly depending on field conditions). VGC continues to work with the YIRC to support the implementation and further development of the program.

Photo 6.1-1: MIW Holding Tank for Bioreactor Program

Photo 6.1-2: Bioreactor Inlet and Outlet Drums

6.2 Revegetation Program

In June 2019, Laberge Environmental Services was engaged to develop a field program to proactively manage areas that had been identified as having the potential for erosion and sediment release. The objective of the program was to design and implements erosion control measures using revegetation and bioengineering techniques that would act as interim methods to control potential erosion and inform final reclamation decisions with respect to appropriate seed mixes and revegetation methods.

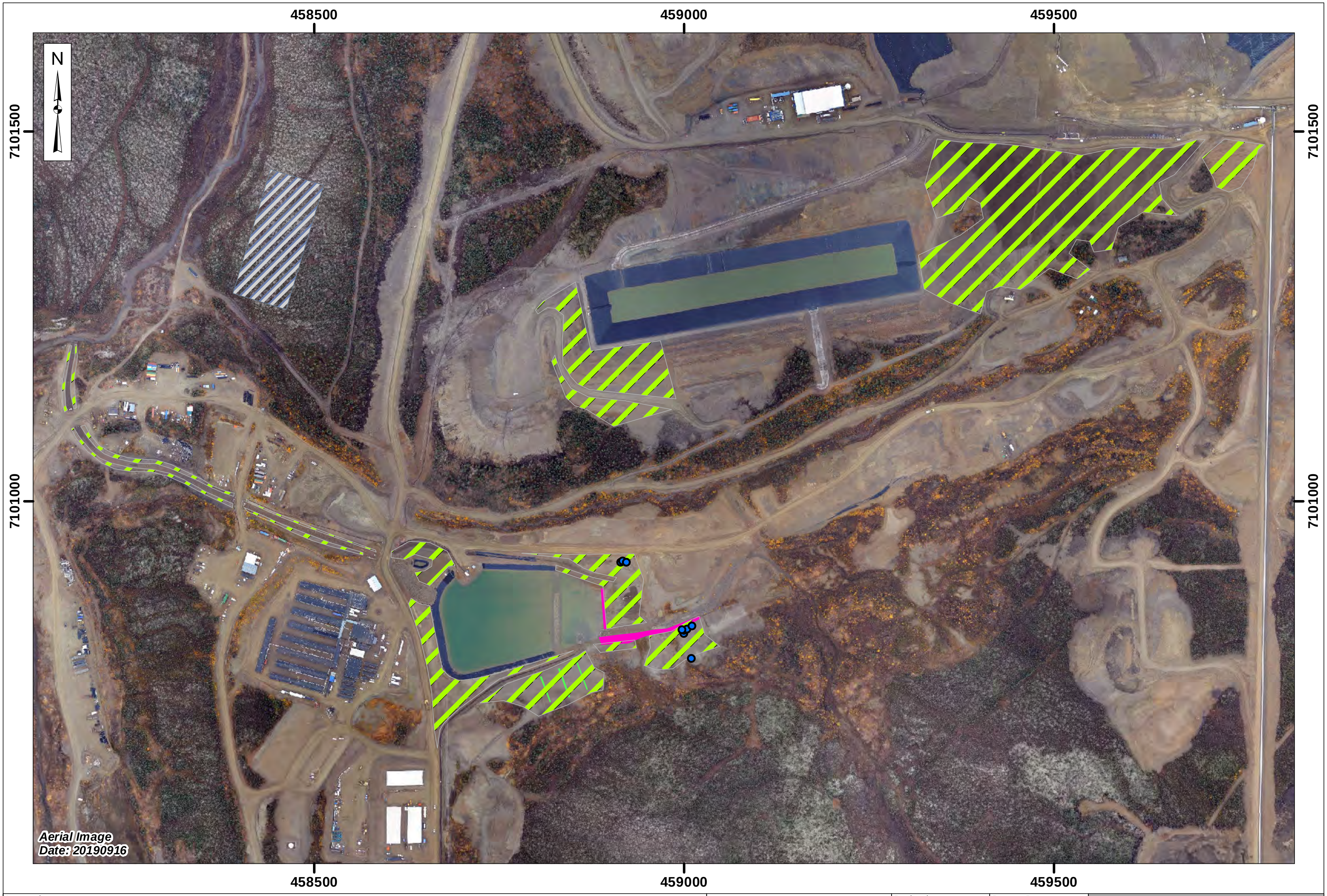
In September and October 2019, a revegetation program was led by Laberge Environmental Services with support from Yukon College students enrolled in the Environmental Certification Program and VGC environmental staff. Five areas were targeted for the 2019 program (Figure 6.2-1) by utilizing the methods shown in Table 6.2-1.

Table 6.2-1: Revegetation and Bioengineering Treated Areas

Location	Method / Installation	Notes
LDSP slopes	Hand seeding	Application of commercially available fowl bluegrass, ticklegrass, tufted hairgrass and wheatgrass Test plots with wheatgrass, fescue and bluejoint seeds harvested from Keno area and bluejoint and yarrow seeds harvested from the Project site
	Willow staking	Eastern shore of the LDSP
	Pole drains	Two pole drains installed in erosion channels
	Wattle fence	Installed upslope of other bioengineering works to support erosion control

Location	Method / Installation	Notes
	Coco-matting	Geotextile installed upslope of wattle fence to help control any undercutting
	Jute mats	Test location to determine effectiveness of product for slope stabilization and vegetation growth
Ditch C	Hand seeding	Application of commercially available fowl bluegrass, ticklegrass, tufted hairgrass and wheatgrass
HLF Embankment	Hand seeding	Application of commercially available fowl bluegrass, ticklegrass, tufted hairgrass and wheatgrass
Events Pond western fill slope	Hand seeding	Application of commercially available fowl bluegrass, ticklegrass, tufted hairgrass and wheatgrass
Overland Conveyor drainage ditch	Willow staking	Willows were harvested from donor site but field conditions did not allow installation in 2019.

The success of this initial program will be evaluated during summer 2020; it is intended to continue similar practices in 2020 with an assessment of seeded areas, and the completion of seeding and willow staking in areas that were not conducive to completing the activities in 2019.



Legend:

- Seeding and Erosion Control Trial
- Jute Mat
- Seeded
- Willow Staking
- Reserved Area

VICTORIA GOLD CORP

0 100 200
Meters

Projection:	Drawn By:	EAGLE GOLD PROJECT YUKON TERRITORY
NAD 83 UTM Zone 8N	HC	
Date: 2020/05/10	Figure: 6.2-1	2019 Revegetation Program Areas

7 SOCIO-ECONOMIC MONITORING

The focus of socio-economic work in 2019 was primarily on ensuring that contracts for the construction and operation of the Project were right scaled to allow for the involvement of Yukon and First Nations businesses to the greatest extent practicable.

VGC is committed to procuring goods and services from registered FNNND and Yukon based companies whenever possible. To help identify Yukon businesses, in conjunction to the NND Business Registry, a Victoria Gold Yukon Business Registry is currently being developed.

Both registries will be used by VGC as part of contract tendering and procurement procedures for contracts related to the operation of the Project.

To date, contracts with a total value of approximately $200,000,000 have been with Yukon companies. VGC is now the largest private sector employer in Yukon with a workforce of over 350 people, 50% of whom are Yukoners.

In 2019, under the Victoria Gold NND CBA Scholarship Program, 10 students were awarded funds to continue their education. Since the establishment of this program, 105 scholarships have been awarded to FNNND students for a total disbursement totaling over $100,000.

The company also continued its community involvement and was a proud supporter of the following local organizations and events in 2019:

- 2019 Competitions Yukon Firefit, Yukon, BC, Alberta
- NND Spring Culture Camp, Ethel Lake YT
- Yukon Native Hockey Tournament
- JV Clark Career Fair, Mayo YT
- Larriken Entertainment, Whitehorse
- First Light Image Festival, Whitehorse
- Yukon Mining Days Presented by Yukon Women in Mining
- National Aboriginal Hockey Championships,
- Yukon Association of Communities AGM
- Yukon Chamber of Commerce AGM, Keno
- Victoria Gold 2nd Annual Golf Tournament in support of Every Student, Every Day
- APTN – Indigenous Day Live Celebration
- Annual Canada Day Community BBQ Mayo
- Every Student, Every Day Gala

8 REFERENCES

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APPENDIX A

As-Built Drawings and Construction QA/QC Reports

APPENDIX B

Certifications by Engineer of Record

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LDSP Exceedance Report April 20 and April 28, 2019

APPENDIX D

In-Heap Pond Daily Available Storage Volume

APPENDIX E

Streamflow Monitoring Report - 2019 Update

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Water Quality Summary in Support of QZ14-041-1 Annual Report

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LDSP MDMER Exceedance Report April 20 and April 28, 2019

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2019 Water Balance and Water Quality Model Update Report

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HLF Water Balance Modeling Report

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2020 Numerical Hydrogeological Model Update

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Eagle Gold 2019 Groundwater Quality Data (provided electronically)

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2019 Geochemical Sampling Results

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Stream Sediment Monitoring at the Eagle Gold Project September 2019

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2019 Benthic Invertebrate Monitoring

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Fish and Fish Habitat Monitoring Report 2019

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Notifications Pursuant to the MDMER

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Annual MDMER Effluent Monitoring Report 2019

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Air Quality Modelling Assessment

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Vegetation Monitoring at the Eagle Gold Project Including Soil Sampling

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Erosion Control Installations at Specific Sites, Eagle Gold Project

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2019 Late-Winter Moose Distribution Survey

APPENDIX W

Noise Monitoring Results

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2019 Reportable Spills

APPENDIX Y

Eagle Gold Project Annual Physical Stability Assessment Report

APPENDIX Z

Revegetation Trials Peso Site on the Dublin Gulch Property