KGHM

Emergency Response Procedure

Historic Afton TSF

Kamloops, British Columbia

EMERGENCY RESPONSE PROCEDURE
Operation, Maintenance, and Surveillance Plan

Historic Afton TSF
Kamloops, British Columbia

KGHM – Ajax Copper Gold Project
200-124 Seymour St
Kamloops, BC V2C 2E1

Original Draft: November 27, 2013

Latest Revision: June 29, 2015

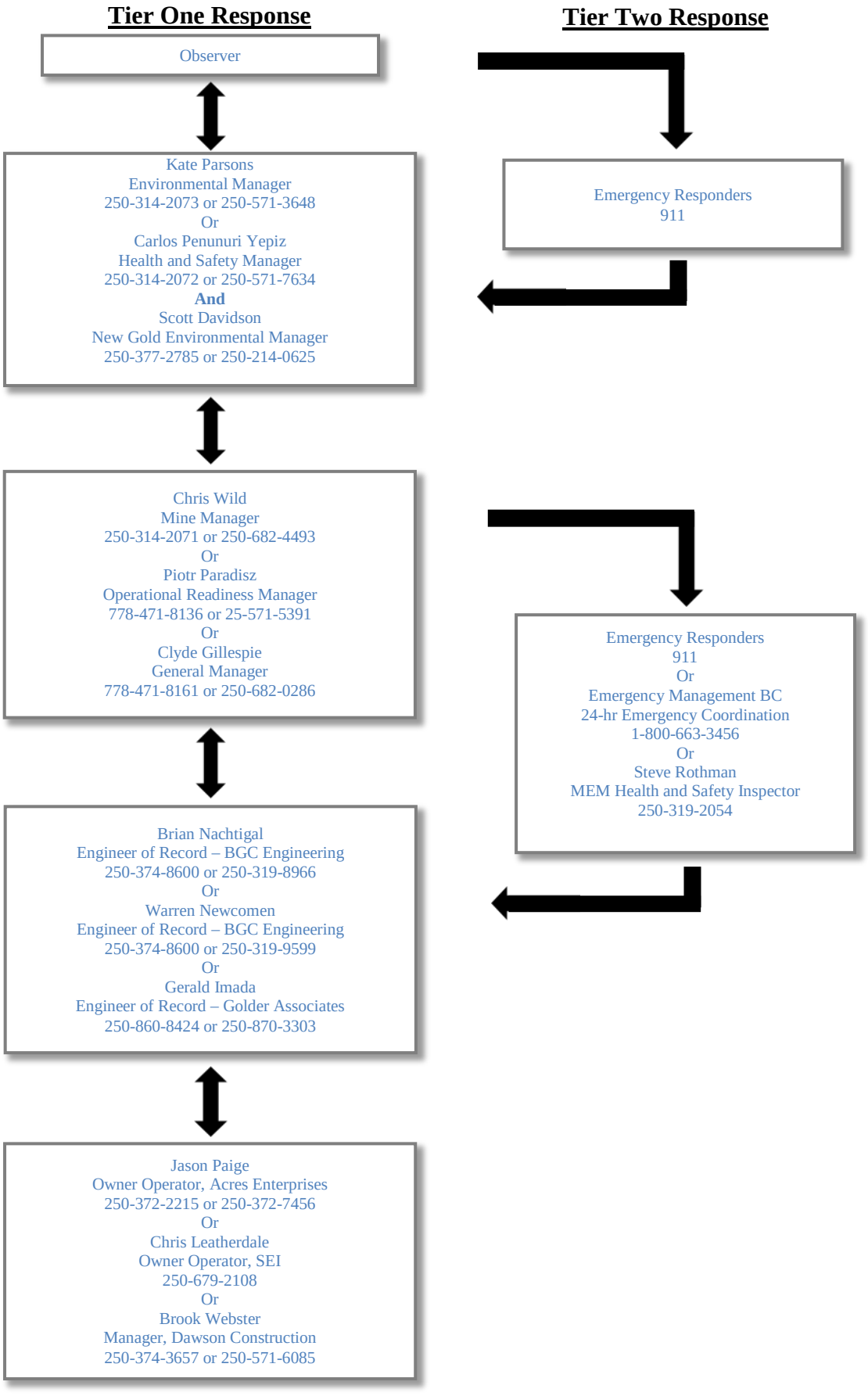
PLAN REVISIONS

Revision #	Date	Change	By
Rev-A	November 27, 2013	Original Draft	R. Maciak
Rev-01	December 02, 2013	Minor revisions based on feedback from Environment, Health, and Safety Teams	R. Maciak
Rev-02	December 16, 2013	Maps updated, tier 1 and 2 trigger levels revised based on new dam elev. info.	R. Maciak
Rev-03	February 20, 2014	Added New Gold-New Afton to ERP notification list.	R. Maciak
Rev-04	April 25, 2014	Updated information for General Manager and H&S Manager	R. Maciak
Rev-05	November 25, 2014	Updated mine manager info, piezometer monitoring schedule, weekly inspection procedure, comments received during the annual ERP OMS test, and secondary access map.	R. Maciak
Rev-06	June 29, 2015	Updated General Manager contact info, monitoring and surveillance sections based on Sec 3.6 of the CDA Dam Safety Guidelines, roles and responsibilities and inundation map.	R. Maciak

Revision 6 - Approved for Use By the Environmental Manager:

_____ _____ _____

Print Sign Date


Tier One Response
Observer
Kate Parsons
Environmental Manager
250-314-2073 or 250-571-3648
Or
Carlos Penunuri Yepiz
Health and Safety Manager
250-314-2072 or 250-571-7634
And
Scott Davidson
New Gold Environmental Manager
250-377-2785 or 250-214-0625
Chris Wild
Mine Manager
250-314-2071 or 250-682-4493
Or
Piotr Paradisz
Operational Readiness Manager
778-471-8136 or 25-571-5391
Or
Clyde Gillespie
General Manager
778-471-8161 or 250-682-0286
Brian Nachtigal
Engineer of Record – BGC Engineering
250-374-8600 or 250-319-8966
Or
Warren Newcomen
Engineer of Record – BGC Engineering
250-374-8600 or 250-319-9599
Or
Gerald Imada
Engineer of Record – Golder Associates
250-860-8424 or 250-870-3303
Jason Paige
Owner Operator, Acres Enterprises
250-372-2215 or 250-372-7456
Or
Chris Leatherdale
Owner Operator, SEI
250-679-2108
Or
Brook Webster
Manager, Dawson Construction
250-374-3657 or 250-571-6085
Tier Two Response
Emergency Responders
911
Emergency Responders
911
Or
Emergency Management BC
24-hr Emergency Coordination
1-800-663-3456
Or
Steve Rothman
MEM Health and Safety Inspector
250-319-2054

EMERGENCY RESPONSE SUPPORT CONTACT LIST			
Support/Service	**Agency or Company**	**Address and Tel**	**Contact**
Engineering	BGC Engineering	234 St. Paul Street Kamloops, BC V2C 6G4 Tel: 250-374-8600	Warren Newcomen, P.Eng., P.E. Brian Nachtigal, P.Eng.
	Golder Associates	220-1755 Springfield Rd., Kelowna, BC V1Y 5V5 Tel: 250-860-8424	Gerald Imada, P.Eng.
Earth Works Contractor	Acres Enterprises	971 Camosun Cres Kamloops, BC V2C 6G1 250-372-2215	Jason Paige Jim Laird
	Dawson Construction	1212 McGill Rd Kamloops, BC 250-374-3657	Brook Webster
	Sexqeltkemc Enterprises Inc (SEI)	102-440 Squilax-Anglemont Rd, Chase, BC, V0E 1M2	Chris Leatherdale
General Support	New Gold	Box 948 Stn Main Kamloops, BC V2C 5N4	Scott Davidson

Other Emergency Contact listed on page iv.

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1.0 INTRODUCTION

This Emergency Response Plan (ERP) has been developed in accordance with the Health Safety and Reclamation Code for Mines in British Columbia Section 10.6.8 regarding Emergency Preparedness for major impoundments classified as "high" and "very high" failure consequence. The Historic Afton Tailings Storage Facility West Dam is classified as an Extreme Consequence Dam under dam safety guidelines.

The Historic Afton Tailings Storage Facility (TSF) was decommissioned in 1997 by Teck Ltd. and Afton Operating Corporation. The official closure plan called for a dry closure approach that estimated a natural depletion of water levels in seven years based on a site water balance (Kala, 1997). Since 2012 the water level in the TSF has dropped significantly reducing the risk of storm water overtopping the West Dam, the level of risk posed to downstream residents in the event of a major structural failure of the West Dam, as well as inundation of the New Gold site via the East Dam Spillway.

The ERP defines individual responsibilities and procedures relating to:

1. Hazard Analysis of Operation;
2. Emergency Equipment;
3. Trained Personnel;
4. Implementation of the ERP and Incident Command;
5. Directions to the site;
6. Contact lists;
7. Training; and
8. Records.

Guidance for document preparation was obtained from the British Columbia Ministry of Energy and Mines guidance document (2013). The plan includes facility information, hazard analysis based on previous dam safety reports, evaluation and classification of an emergency, procedures to end the emergency, contact information for KGHMI staff, engineers on record, and regulatory offices, as well as the identification of Emergency Action responsibilities.

2.0 FACILITY INFORMATION

Figure 1 provides the location of the Afton TSF relative to the City of Kamloops, within British Columbia, Canada. **Figure 2** provides the layout of the Afton TSF and related facility elements and access roads.

General impoundment and embankment information is summarized below:

- Official Structure Name: Afton Tailings Storage Facility
- Located on: Trans-Canada Highway (Hwy 1) 11km West of Kamloops, BC
- Location: Sec 35 TP 19 R 19, Sec 26 TP 19 R 19,
- Embankment Owner and Operator: KGHM International
- Embankment: Low permeability compacted earth-rock fill dam to 705.8 masl
- Embankment Current Maximum Height: 30 – 50 m
- West Dam Embankment Crest Length: ~ 1,300 m
- West Dam Embankment Crest Width: ~ 35 m
- East Dam Embankment Crest Length: ~ 860 m
- East Dam Embankment Crest Width: ~ 20 m
- Spillway Invert Elevation: 705.5 masl
- Downstream Flood Path: The downstream flood path will proceed along the Cherry Creek channel to the West, and through a spillway that drains into the New Afton open pit to the East.
- Downstream Hazard Classification: Extreme
- Number of Homes in the Flood Path: ~ 30
- Downstream Property Description: A permanent population of up to 100 residents exists 1.4 km downstream of the TSF West Dam. The Trans-Canada Highway and Canadian Pacific Railway track are also located down gradient of the West dam. The New Gold-New Afton mine site is located directly adjacent to the East dam.
- Access: As shown of **Figure 1**, access to the site from Kamloops is via Highway 1 to approximately 11 km West of Kamloops. Access to the TSF from a locked gate on Highway 1 is illustrated in **Figure 2**.

Figure 1: Location Map

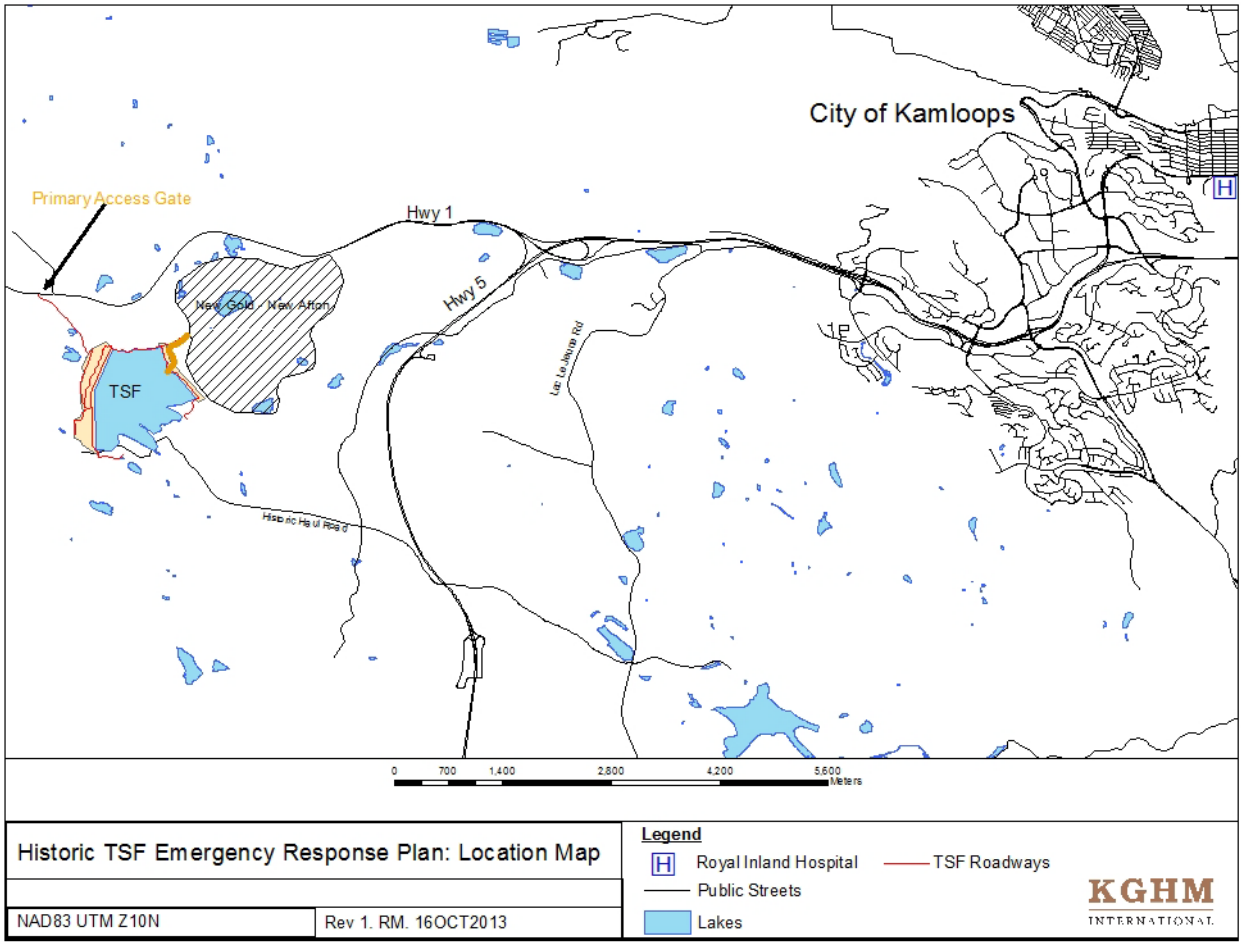


Figure 2: Access and Facilities

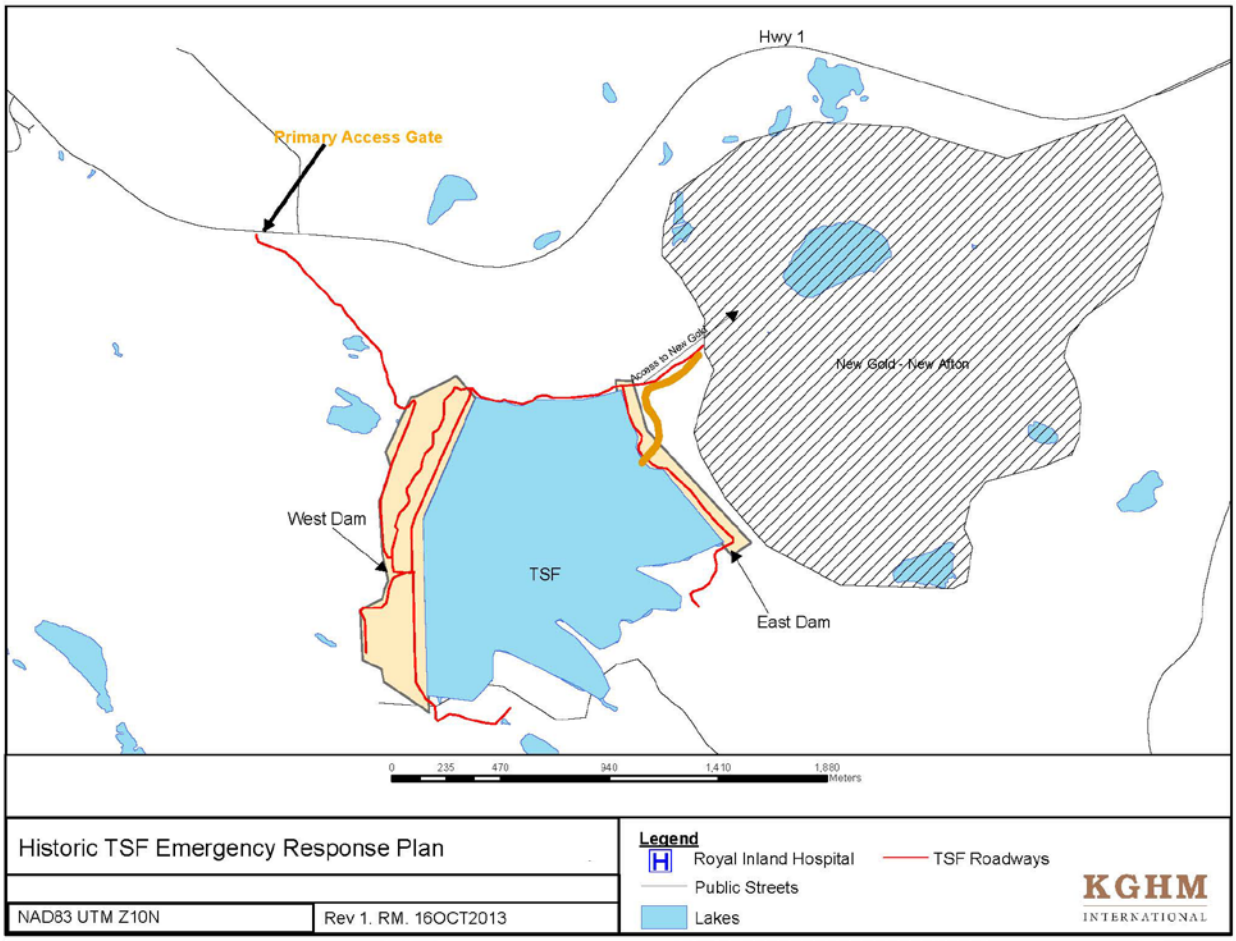
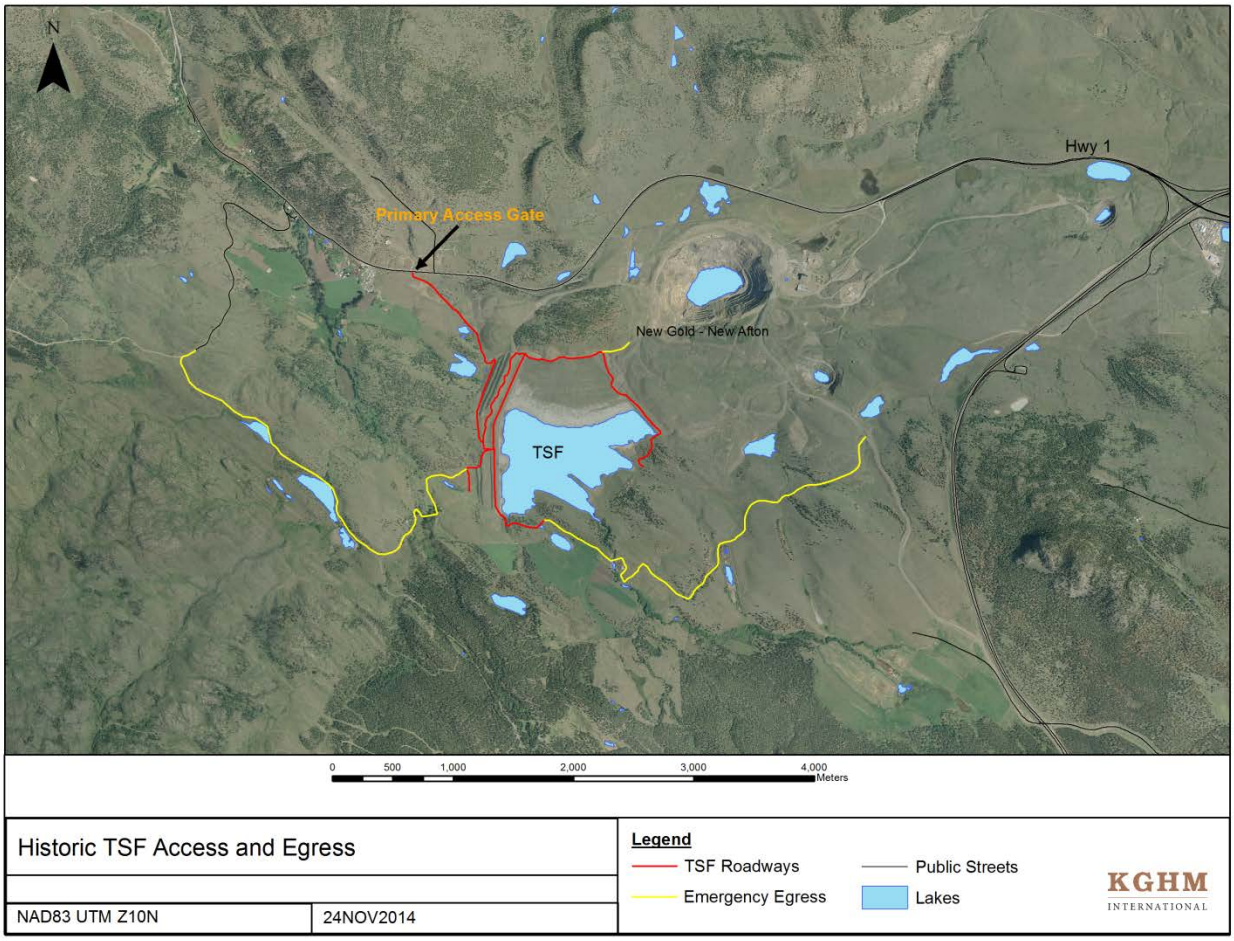


Figure 3: Site Layout with Aerial Imaging



3.0 OPERATION, MAINTENANCE, AND SURVEILLANCE

Operation

The historic Afton TSF is no longer an operating facility. Therefore, no pumps, piping networks, or spigots are currently in use, and no tailings material is currently being deposited at the facility. Details on pond elevation increases that will trigger an emergency response can be found in section 5.1.

Maintenance

Matters regarding dam erosion control, noxious weed control, diversion channel and spillway repairs, dust control, and road maintenance will be addressed as needed. Determining when maintenance is required is done by way of visual inspections, as well as recommendations put forth by third party qualified professionals in annual dam inspections, and five year dam safety reviews. Detail on the frequency of inspections is provided below.

Surveillance

Monitoring of the historic Afton TSF requires two forms of surveillance: (i) visual inspections for structural deficiencies; and (ii) monitoring via instrumentation.

Following Section 3.6 of the *Canadian Dam Association Dam Safety Guidelines* visual inspections will take place via *Routine Inspections, Engineering Inspections* and *Special Inspections* (Canadian Dam Association, 2007). Routine visual inspections for the Afton TSF will take place once a week from March 1 to October 31, and then decrease to bi-weekly from November 1 to February 28. Visual inspections will include an assessment of the pond levels and beach areas, East and West Dams, all seepage dams and associated ditches and ponds, the spillway, as well as the Alkali Creek Diversion Channel. Inspection details will be recorded on a *Weekly Inspection Checklist* (Appendix A). Maintenance issues noted on the inspection form will be immediately relayed to the Ajax Project Environmental Manager and will be addressed in a timely fashion based on the urgency of the maintenance concern. Signs of structural problems such as cracking or bulging of dam walls may trigger the implementation of the Emergency Response Procedure (Section 5).

Monitoring via instrumentation is completed by KGHMI Ajax staff as well as by the New Gold Environment group. Instrumentation monitoring will be done in accordance with Permit Requirements listed in the PE-3904 environmental monitoring and compliance permit. This includes peizometric, dust fall, and vegetation sampling.

Six vibrating wire piezometers (VWP) were installed in the East and West Dams in 2014. Data is downloaded once a month by KGHM field staff and recorded electronically on VWP data collection sheets. Data is then transmitted to the Engineer of Record (EOR) for quality assurance and review purposes. If the EOR recognizes deviations from known trends in the piezometer data KGHM is immediately notified. More frequent monitoring should occur if:

- Flooding causes the tailings impoundment water level to exceed elevation 701 masl;
- Unusual seepage develops at or near the dam;
- After a seismic event; and
- Any piezometers show sudden or unexplained changes in water level;
- **In the event that any erratic or unreasonable readings are identified, the response protocol outlined in the Emergency Response procedure should be implemented.**

In addition to routine visual inspections, the Afton TSF Embankments and ancillary structures will undergo a formal *Annual Dam Inspection* that will be carried out by a third party professional engineer registered and in good standing with the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC). A report will be produced based on the engineered inspection and submitted to the BC Ministry of Mines by March 31 each year. Twice per decade a *Five Year Dam Safety Review* will be carried out by a qualified professional in good standing with APEGBC. All Weekly Inspection Checklists, as well as *Annual Dam Inspection* and *Five Year Dam Safety Review* Reports will be stored indefinitely in hard and electronic copy in the Ajax Project Environmental Department filing system.

4.0 HAZARD ANALYSIS OF OPERATION

KGHM International has identified 11 potential hazard scenarios for the Historic Afton Tailings Impoundment that would constitute some level of emergency conditions and require declaration of an emergency.

1. Turning and merging with highway traffic at the primary entrance gate located on the shoulder of Highway 1;
2. Potentially hazardous driving conditions on the steep access road located 1.2km from primary entrance gate;
3. Dam failure causing flow of liquefied tailings into the natural environment;
4. Dam failure or overtopping due to extreme rainfall event;

5. New Gold underground operations experience a flow of tailings into their mine;
6. Injuries or incidents while conducting sampling of water, tailings, and vegetation;
7. Water from the tailings pond seeps through structures into the natural environment;
8. Fugitive dust emissions leave the site during high wind events;
9. Individuals trespass on the site and become injured;
10. Wildlife and or livestock become injured while traversing the site; and
11. Wildlife such as bears attack individuals working on site.

5.0 CONDITIONS AND RESPONSES

The section describes the detection and evaluation of site conditions which will result in an emergency condition, and includes discussion of procedures specific to timely and reliable detection, evaluation and classification of an existing or potential emergency condition.

A **Notification Flowchart** is provided at the front of this ERP to use for contacting companies and agencies as part of the response action. Also included at the front of this ERP is a **Response Support Contact List** that provides contact information for response support, including engineering, on-site services, materials, and equipment suppliers.

5.1 Tier 1 and 2 Conditions and Responses

Tier 1 Condition:

The Tier 1 condition is intended to provide a means of observing and evaluating the developing emergency in order to allow adequate pre-planning by all potentially involved parties. Tier 1 conditions are considered to exist if KGHM International is unable to control the rise in supernatant pond level due to precipitation intensity, and continued precipitation is likely. A Tier 1 response will be required if the supernatant pond level reaches an elevation of 702.5 masl.

Tier 1 Response Actions:

1. Implement requirements in **Notification Flowchart** (front of ERP) to appraise potentially involved parties of the current and developing situation.

2. Implement continuous (24–hour) monitoring of supernatant pond level and location along with piezometer download and data anlysis.
3. Suspend all work on and downstream of the embankment.
4. Notify downstream residents and businesses and request evacuation if overtopping of supernatant water is imminent.

Tier 1 response will be coordinated by KGHMI's Safety Superintendent and Mine Manager. KGHMI Staff will notify the Ministry of Energy, Mines, and Natural Gas Health and Safety Inspector, New Gold Mine, and the RCMP to notify each group of the developing situation and the preparation for road closures along Highway 1 (Trans-Canada Highway) between the TSF primary access gate and Greenstone Mountain Road as a precaution.

Tier 2 Condition:

The Tier 2 condition is intended to provide a plan for declaring an emergency to allow sufficient time for emergency actions. Tier 2 conditions are considered to have occurred when the supernatant pond elevations are expected to reach within 1.5m of the West Dam Embankment Crest. A Tier 2 response will be required if the supernatant pond level reaches a trigger elevation of 704 masl.

Tier 2 Response Actions:

1. Implement requirements in **Notification Flowchart** (front of ERP) to apprise potentially involved parties.
2. Suspend all monitoring activities on the embankment and evacuate mine personnel from the area.
3. Suspend all work downstream of the embankment.
4. Notify downstream residents and businesses and request that an evacuation order of all properties that may potentially be impacted.

A Tier 2 response will be coordinated by KGHMI's Safety Superintendent and Mine Manager. KGHMI Staff will notify the Ministry of Energy, Mines, and Natural Gas Health and Safety Inspector, New Gold Mine, and the RCMP to notify each group of the developing situation and the preparation for road closures along Highway 1 (Trans-Canada Highway) between the TSF primary access gate and Greenstone Mountain Road as a precaution.

5.2 Other Conditions

The emergency actions included above assume extreme precipitation is the cause of conditions that could induce the rise of supernatant pond levels to dangerous levels. If for any other reason (i.e. excluding precipitation), an emergency occurs at the TSF the Tier 1 **Notification Flowchart** (front of ERP) shall be evoked. Examples of other conditions or emergencies are noted in the Section 3 **Hazard Analysis**.

5.3 Emergency Stand Down

The Health and Safety Manager or Mine Manager will determine if and when an emergency condition no longer exists.

The Safety Superintendent or Mine Manager may declare the end to a developing emergency situation if the supernatant pond level stabilizes and starts decreasing prior to reaching Tier 2 trigger levels, precipitation has ceased, and monitoring and evaluation indicate no stability risk due to embankment piezometer elevations.

An emergency situation resulting from an embankment failure will be declared over when failure flow ceases into the Cherry Creek basin and a determination has been made that there is no potential for additional failure or flow from the impoundment.

5.4 Follow-up Procedures

Following emergency response and mitigation, the KGHMI Safety Superintendent and Mine Management team will conduct a formal Incident Investigation Meeting to review all conditions leading up to the emergency, response actions, and favorable and unfavorable results. The team will meet with all individuals that were directly involved with the emergency response, including local, provincial and federal agencies. The product of the meeting will be an Incident Investigation Report, which will describe the conditions that contributed to the emergency, how the emergency

team reacted in terms of actions and timing, and recommendations for improving response procedures and response times.

Depending on the recommendations from the Incident Investigation Meeting, the Mine Management Team may contact residents and business owners in the Cherry Creek area down gradient of the TSF to discuss how they were affected by the dam failure. Any recommendations that result from such meetings with residents or business owners will be included in the Incident Investigation Report.

6.0 NOTIFICATION

The Notification Flowchart, presented at the front of this ERP**,** identifies downstream persons potentially first affected by tailings/flood waters, and provides a notification flowchart to be used in the event of an emergency. In the case of a West Dam emergency the RCMP will notify residents of the downstream trailer park and barricade all appropriate roadways. The flowchart applies to all conditions, but the message conveyed for a Tier 1 condition must be different than for a Tier 2 condition. The intent of Tier 1 notifications is to warn all team members of the potential need for action in the short term, whereas Tier 2 notifications require immediate implementation of short term emergency actions. New Gold – New Afton shall be notified immediately in the event that a Tier 1 or Tier 2 response is triggered.

If Tier 1 conditions occur, notification will be initiated immediately in accordance with the **Notification Flowchart.** The primary goal of notification under Tier 1 conditions is to inform of a potential emergency condition.

If Tier 2 conditions occur, notification will be started immediately in accordance with the **Notification Flowchart.** The primary goal of notification under Tier 2 conditions is to prevent loss of life. The Notification Flowchart is intended as a guide to organize priorities in a response scenario. However, if one member of the emergency team is unavailable or cannot be reached, it is imperative that another response team member ensures the proper notifications are implemented.

7.0 ROLES AND RESPONSIBILITIES

In the event of an emergency or unusual situation the reporting procedure outlined on Page IV of this report shall be followed as quickly as possible. Once notifications have been made to KGHM Ajax Mining Management and emergency response personnel such as local fire and police, it is important that the dam owner's staff and community responders work to establish an Emergency Operations Centre (EOC) and Site Command Post (SCP) to coordinate efforts in an efficient and organized manner. Table 5 outlines an Incident Command Model and the typical roles for EOCs and SCP.

Table 1: Incident Command Model

Type of EOC	Typical Role
SCP	The SCP manages the emergency in the vicinity of the dam and reservoir. Dam owner staff and contractors attempt mitigation measures if required and also perform initial notifications and coordinate broader response activities until a KGHM EOC is set up to assist.
Dam owner EOC	The KGHM EOC will be located at 124 Seymour Office. Upon notification of a major dam emergency, the KGHM EOC will provide comprehensive support for site activities by coordinating site security, logistical requirements, ongoing communication with stakeholders and media, and technical and administrative support. The KGHM EOC team will be comprised of the Mine Manager, General Manager, Environmental Manager, and External Affairs Manager, as well as corporate level managers and other technical staff as required.
Provincial Government EOC	In a serious emergency, the British Columbia government may activate a Government EOC to manage the emergency at the provincial level upon notification from the KGHM EOC.
Municipal EOC	In a serious emergency, the City of Kamloops and TNRD may establish a municipal EOC upon notification from the KGM EOC.

8.0 INUNDATION MAPPING

In November 2014, KGHM Ajax Mining Inc. completed a dam breach inundation study of the historic Afton TSF. Figure 4 illustrates topographical cross sections used for inundation analysis as well as key infrastructure. Figures 5, 6, and 7 illustrate inundation areas for the East and West Dams, respectively. All inundation figures demonstrate the maximum modelled flow depth that would occur during a probable maximum flood (PMF) event (i.e. worst case scenario, also known as the "Rainy Day" scenario). The flow is estimated to take roughly one hour to reach Kamloops Lake and would potentially inundate sections of Highway 1, as well as the downstream trailer park and ranch properties.

In late 2014 KGHM Ajax Mining Inc. took steps to dry out the historic TSF by transferring approximately 500,000 m^3 of water to the New Gold – New Afton TSF. This measure is expected to improve overall long-term dam safety, as well as substantially reduce the probability of a "Rainy Day" scenario occurring.

Figure 4: Infrastructure impacted due to Dam Breach

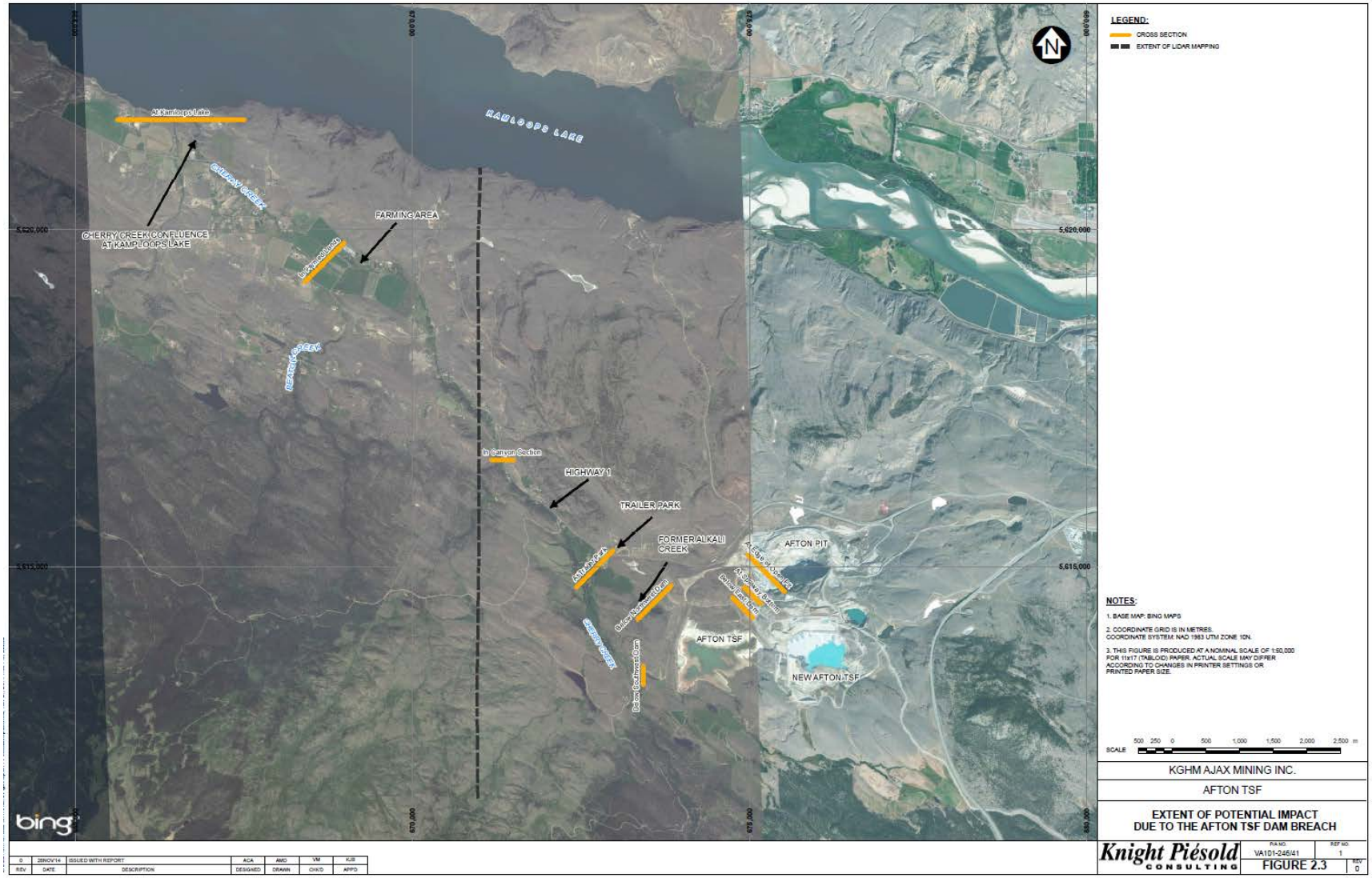


Figure 5: East Dam Inundation Map

Figure 6: West Dam Inundation Map No. 1

Figure 7: West Dam Inundation Map No. 2

9.0 PLAN DISTRIBUTION AND REVISION

Individuals or agencies that have been provided with a copy of this plan are listed in Table 6. A list of plan revisions, including dates and authorization signatures, is provided at the front of this ERP.

Table 2: Plan Distribution List

Agency or Company	**Address and Telephone**	**Recipients**	**EAP Copy Received**
Ministry of Energy and Mines	441 Columbia St, Kamloops, BC, V2C 2T3, 250.371.3780, 250.371.3714	Stephen Rothman, Mine Safety Officer Tom Charles, Inspector of Mines	#1 of 14 #2 of 14
KGHM International Ltd., Ajax Project	200-124 Seymour St, Kamloops, BC, V2C 2E1, 250.374.5446	Dan Ferriter Piotr Paradisz Clyde Gillespie Kate Parsons Chris Wild Jason Haller Carlos Penuniri Yepiz Trevor Fulcher Robert Maciak	#3 of 15 #4 of 15 #5 of 15 #6 of 15 #7 of 15 #8 of 15 #9 of 15 #10 of 15 #11 of 15
New Gold – New Afton	Box 948 Stn Main, Kamloops, BC, V2C 5N4, 250.214.0625	Scott Davidson	#12 of 15
BGC Engineering	234 St Paul St, Kamloops, BC, V2C 6G4, 250.319.9599	Warren Newcomen Brian Nachtigal	#13 of 15 #14 of 15
Golder Associates	220-1755 Springfield Rd., Kelowna, BC V1Y 5V5 Tel: 250-860-8424	Gerald Imada, P.Eng.	#15 of 15

This ERP will be reviewed by the Health and Safety Manager and Joint Occupational Health and Safety Committee. Any changes in the tailings impoundment and diversion system will be noted in the ERP. Components of the ERP will be reviewed and revised based on any new changes. A list of plan revisions, including dates and authorization signatures, is provided at the front of this ERP.

The Health and Safety Manager will also conduct an annual training session on emergency response, including a review of the ERP. Participants in the annual training will discuss procedures and responsibilities prior to and during an emergency, as described in the ERP.

10.0 REFERENCES

Kala, 1997. *Afton Mine Hughes Lake Restoration: Hydrogeologic Study (Water Balance)*

BCMEM, 2013. *Basics of an Emergency Response Plan.*

Canadian Dam Association, 2007. *Dam Safety Guidelines 2007 (2013 Edition)*. Section 3.6: Surveillance. Page 35 – 37.

APPENDIX A: WEEKLY INSPECTION FORM

Historic Afton TSF Visual Inspection Form

KGHM INTERNATIONAL

Date:_____

Inspector(s):_____

Weather Conditions:_____

Revision: A - Revised on: 11-AUG-2014

Owner: Enviromental Department

	WEST DAM	COMMENTS	MONITOR	INVESTIGATE	REPAIR
1	Surface Cracking				
2	Horizontal Alignment				
3	Erosion				
4	Warning Signs				
5	Vegetation Condition				

	EAST DAM AND SPILLWAY	COMMENTS	MONITOR	INVESTIGATE	REPAIR
1	Surface Cracking				
2	Horizontal Alignment				
3	Erosion				
4	Warning Signs				
5	Vegetation Condition				

	ALKAIL CREEK DIVERSION AND DAM	COMMENTS	MONITOR	INVESTIGATE	REPAIR
1	Surface Cracking				
2	Erosion				
3	Warning Signs				
4	Water Level				

	NW & SW SEEPAGE POND DAMS	COMMENTS	MONITOR	INVESTIGATE	REPAIR
1	Surface Cracking				
2	Horizontal Alignment				
3	Erosion				
4	Warning Signs				
5	Water levels				