Memorandum

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To: All Listed **Date:** 7 & 8 May 2014
From: Sarah Cooke, Casey Bates

Subject: Meeting Minutes from EPRP Tabletop Exercises for HVC Tailings/Water Storage Facilities

Present: Dave Falcon, Chris Fleming, Ian Haskell, Nick Elynuik, Jamie Verheyen, Ross Billy, Chris Anderson, Steve Hippisley, Brett Gulliver, Kirby Humphrey, Sarah Cooke, Casey Bates (ERM – facilitator), Andy Small (AMEC), Farhat Shah (Klohn Crippen Berger)

Location: Coast Hotel, Kamloops, 8am to 4pm.

Meeting Safety Share

Home fire alarms, home fire escape plans

- Day 1: Three of five home fire deaths between 2007 and 2011 resulted from fires in properties without working smoke alarms.
- Day 2: Make a home escape plan. Know at least two ways out of every room, if possible. Teach children to escape on their own.

Purpose

- To perform a Tabletop Exercise for each dam with a consequence classification of High or above. This will lead to discussions on potential inundation effects in the event of a catastrophic dam breach, evaluation of the ERPs for each dam and any improvements that could be made, and will help determine how well the HVC emergency response/crisis management program prepares personnel to respond to dam-related emergencies.

- *How can we leverage HVC's overall Emergency Response Plan (ERP) Structure for TSFs/WSFs to streamline the planning process for each dam individually?*

Summary

- Tabletop Exercise: A tabletop exercise involves key personnel discussing simulated scenarios in an informal setting. Tabletop exercises can be used to assess plans, policies, and procedures (*FEMA Federal Guidelines for Dam Safety - Emergency Action Planning for Dams, July 2013).*

- According to CDA Dam Safety Guidelines (2007), ERP tests are an integral part of emergency preparedness, ensure that the documents and training are adequate, range from limited tabletop exercises to full-scale simulations, should involve operations staff/downstream agencies/and stakeholders, and requires that each responding agency has adequate plans and trained staff to deal with any emergency in their jurisdiction.

Agenda - Overall

- Introductions
- Overview and Purpose
- Review of Previous Tabletop Exercises & 2012 Functional Test
- Overview of HVC Emergency Response Plan (ERP) Structure for Tailings and Water Storage Facilities
    - Tabletop Exercises (one dam at a time)
- Review of Draft Findings and Corrective Actions
    - Dam-specific findings
    - Findings applicable to all dams/ERPs

Agenda – For each dam

- Document Review
    - Emergency Preparedness and Response Plan (ERP) from applicable OMS Manual (Section 8)
    - Overview Maps
    - Inundation Maps (when available)

All corrective actions and recommendations for improvement recorded during this session will be considered DRAFT until reviewed by HVC senior management.

Complete agenda and list of dams reviewed available in the associated presentation: "*Tabletop Exercise of HVC Emergency Response Plans (ERPs). For HVC Dams Classified as High, Very High, or Extreme May 7-8, 2014"*

Draft Findings and Corrective Actions:

Facility	Finding	Potential Corrective Action
Raw Water Reservoir	Drop in water levels at Raw Water Reservoir could go unnoticed for some time.	Consider installation of surveillance cameras at Raw Water Reservoir when wireless mesh has been installed onsite.
Raw Water Reservoir	Raw Water Reservoir is a bottleneck for the copper production process at HVC and is critical for the operation of the mine.	Consider developing a risk assessment/contingency plan for Raw Water Reservoir.
Raw Water Reservoir	Raw Water Reservoir is a bottleneck for the copper production process at HVC and is critical for the operation of the mine.	Evaluate the need to perform a Failure Mode and Effect Analysis (FMEA) for the Raw Water Reservoir.
Raw Water Reservoir	Access to North Dyke or East Dyke of Raw Water Reservoir may not be possible under current conditions or during a rainy-day scenario.	Perform a feasibility assessment to create access to toe of North Dyke or East Dyke of Raw Water Reservoir under normal and rainy-day conditions. Also consider creating permanent stockpile of materials in the vicinity of the North Dyke or East Dyke in the event that repairs are needed on the dykes.
Raw Water Reservoir	Reservoir line is vulnerable to damage by equipment.	Consider mandating inspections of vulnerable areas of the reservoir pipeline and include description of activities in the OMS manual. Improve signage in higher-risk areas to notify operators of pipelines in the area.

Facility	Finding	Potential Corrective Action
H-H Dam	Highland TSF OMS Manual does not include information about evacuation of the H-H pumphouse and activation of the alarms.	Formalize a muster point for the H-H Pumphouse uphill from H-H Dam, off of Highway 97C near the H-H gate. Place appropriate signage at the muster location. Include relevant information in the Highland TSF OMS Manual. Also formalize location of muster area at south end of H-H Dam.
H-H Dam	Highland TSF OMS Manual does not include information about evacuation of the H-H pumphouse and activation of the alarms.	Include in the Highland TSF OMS Manual information about activation of the H-H Pumphouse alarm system in the event of an emergency at the H-H Dam.
H-H Dam	Recent event at H-H Dam resulted in water levels that approached minimum freeboard requirement.	Consider installation of surveillance cameras around H-H Dam and H-H Pumphouse when wireless mesh has been installed onsite.
Calling Lake and Laura Lake	OMS Manual could be improved to better reflect how HVC would respond to an emergency at Laura Lake or Calling Lake.	Update OMS manual to clarify that Emergency Response Team response to Calling Lake would be limited due to its remote location. Include in OMS manual that HVC crisis management response would be activated to handle media inquiries, internal/external communications, etc.
Calling Lake and Laura Lake	Description of site access in the event of an emergency at Laura Lake or Calling Lake should be improved in OMS Manual. Access would be from Calling Lake direction because road from L-L Dam area could be impacted.	Include in OMS Manual a description of how to access Laura Lake and Calling Lake in the event of a dam breach at either dam.
Bethlehem TSF	Evacuation of the Valley Pit is not currently considered in the ERP for the Trojan Dam or Beth Main Dam.	Integrate the Valley Pit evacuation procedure into the ERP for the Bethlehem TSF OMS Manual as appropriate and consider other areas where HVC personnel work that could be within the inundation zone (e.g. Lubeland).
Bethlehem TSF	OMS Manual could be improved to better reflect how HVC would respond to an emergency at Trojan Dam or Beth Main Dam that could have an effect on Highway 97C.	Update ERP description of response to include blocking of the Highway from the west by Cantex or HVC personnel at the Dam. Verify with RCMP that Highway 97C could be blocked at Logan Lake and Ashcroft.
Bose Lake	OMS Manual could be improved to better reflect how HVC would respond to an emergency at Bose Lake Dam.	Include in OMS Manual ERP a description of ERT response that would be required because of the public campsite below the dam.
Bose Lake	An unusual condition or emergency situation at the Bose Lake Dam could go unnoticed for a long period of time.	Consider adding signage at the Bose Lake Dam with contact information for HVC Protective Services. Evaluate feasibility of installation a surveillance camera at the Bose Lake Dam.
Highmont S1 & S3	OMS Manual could be improved to better reflect how HVC would respond to an emergency at Highmont S1 & S3 Ponds.	Include in OMS Manual ERP information specific to Highmont S1 & S3 and consider describing that crisis management would be initiated, but ERT would likely not because consequence rating relates to potential environmental damage rather than loss of life.
Highmont S3	Effects of dam breach on Billy Lake not known.	Consider performing an evaluation of Billy Lake to determine if adequate freeboard is maintained to contain water from S3 in the unlikely event of a dam breach.
Highmont TSF Dams	OMS Manual could be improved to better reflect preventive actions that could be taken in the event of	Consider including in the Highmont TSF OMS manual ERP the potential preventive action of lowering water level in Mamit Lake in the unlikely

Facility	Finding	Potential Corrective Action
	an emergency at the Highmont TSF.	event that a failure of the Highmont TSF looks imminent.
Highmont TSF	OMS Manual could be improved to better reflect numerous impoundments in the area and the appropriate response for each.	Include in Highmont TSF OMS Manual ERP a complete description of impoundments at the facility and describe and response requirements unique to each facility.
All High-consequence or Above Dams	Many ERT members may not know how to access many of HVC's dams.	Consider integrating site visits to dams into the regular training for the HVC Emergency Response Team (ERT).
All Significant-consequence or Above Dams	Many ERT members may not know how to access many of HVC's dams.	Develop a site-wide map for use by HVC ERT that shows all HVC dams and potential inundation zones for each dam.
All Significant-consequence or Above Dams	Many HVC personnel may not know how to access nearest muster location.	Safety and Loss Control Department to complete site-wide map of named muster locations to be included in all HVC vehicles.
All Significant-consequence or Above Dams	Not all OMS manuals include detailed maps that outline location and access to HVC dams.	Add to each OMS manual an overview map that details access to the site and improve supporting text in OMS manuals.
All HVC Dams	Currently not well understood which HVC dams would be a priority for ongoing monitoring or remedial action in a triage situation.	Consider developing a triage plan for HVC dams to determine response priorities in the event of a site-wide emergency (e.g. seismic event or heavy flooding).
Annual Tailings Management Training Course	Current Dam Safety course structure focuses only on emergency response at the L-L Dam.	Consider breaking the audience into two groups and perform simple tabletop exercises for the Raw Water Reservoir and Trojan Dam.
All OMS Manuals	Emergency Reporting Procedure (call-out) for Tailings Storage Facilities and Water Storage Facilities is too detailed for the general user.	Consider isolating the Emergency Reporting Procedure to the ERP within the OMS Manuals and develop a simple call-out approach applicable to general personnel (i.e. notify supervisor, Protective Services or the Superintendent Tailings and Water Management in the event of an unusual condition at a dam).
Emergency Response Plan for TSFs and WSFs	Opportunity may exist to streamline ERP planning process by developing a single site-wide ERP for all HVC TSFs and WSFs.	Evaluate the opportunities and challenges associated with the development of a single site-wide ERP and determine next steps.
Tailings Lines	Standard operating procedures may not exist for performing work around tailings lines.	Evaluate the need for SOPs for performing work around tailings lines and refer to SOPs in HVC OMS manuals.