

Memorandum

Teck Coal Limited
Fording River Operations
P.O. Box 100
Elkford, BC Canada V0B 1H0

+1 250 865 2271 Tel
+1 250 865 5053 Fax
www.teck.com



To: Dean Runzer
From: Patrick Milan
Subject: **South Tailings Dam Table Top Exercise November 4, 2014**

Date: November 25, 2014
Cc: Kevin LeDrew, Jason Garwood

Location: General Office 2nd floor boardroom

Attendees: Robin Gold, Brad Hogg Morris Ettinger, Seth Kitt, Ryan Podrasky, Detlev van der Veen, John Thomas, Troy Tobin, Greg Sword, Dean Runzer, Mike Harrington.

Facilitators: Jason Garwood, Patrick Milan

Overview: South Tails Pond Incident

A table top exercise was conducted on November 4, 2014 regarding a fictional dredge piping leak on our South Tail pond. The leak has eroded the ponds face and has entered the Fording River. This occurred overnight and was not identified by the contractor as their employee went home sick. The replacement employee identified the spill. They then shut down the dredge and reported the incident to the plant. It is still dark so the full extent of the event is not fully understood.

Based on this information the plant has informed the manager of this significant incident. They have decided we will set up our Emergency Operations Center (EOC) following the guidelines of EP.008R0 Tailings System Emergency Preparedness Plan.

Preparation:

Senior staff has assembled in our EOC. Start time 0900 hours.

Safety Share: *Provided by Jason Garwood*

Fatal fall from ladder: Jason informed us of a family member finding their neighbor on the ground at the base of a ladder. They go to their neighbour's side. The person who fell expires while waiting for help with his neighbor listening to his final words.

What can we learn from this incident? Ladder awareness; cleaning eve's trough; putting up Christmas lights; & cleaning windows all present a risk of falling. Prepare for these infrequent tasks and identify the best way to complete them safely. If you can't complete the job safely stop and re-evaluate.

1) Participant review:

- Document of today's objectives passed out to all in attendance.
- Group to review EOC kit – *Discussed kit location and contents. Alternate EOC location Boivin room in Elkford.*
- EOC sign-in log completed
- Introduce of Facilitators: Jason Garwood & Patrick Milan –
 - Identified facilitators roles for the table top.
 - As facilitator, J Garwood's role is related to pond management and design.
 - As facilitator, P Milan's role is to monitor EOC member & EOC operations.
 - Facilitators are not to guide actions but provide insight for the EOC member duties and understanding of the event.
 - The EOC team will discuss and address activities presented to mitigate the event.
- Participant's are to review EOC roles & checklist for the role
- Participant's are to review paperwork that Sector's will complete for the exercise and files – Position Log

Activation of the EOC to address the South Tails pond incident:

The EOC Director for today's table top was assigned to Robin Gold. Robin assigned Sector Chiefs for other EOC support roles.

- Risk Management Officer – Greg Sword
- Information Officer – Morris Ettinger
- Liaison Officer – Troy Tobin
- Operations Section Chief – Detlev van der Veen
- Planning Sector Chief – Mike Harrington
- Logistics Sector Chief – John Thomas
- Finance/Administration Sector Chief – Ryan Podrasky

The EOC members were provided information about the history and incident of the event. Three specific diagrams were provided to attendees identifying the location and initial observations of the event. The diagrams identified a scoured erosion section near the elevated section of the Fording River dredge pipeline. The erosion has eliminated free board clearance within the pond.

Robin took charge of the EOC and asked each Sector to review their role checklists.

The EOC was informed that the entire minesite lost electrical power. (This impediment was in place until the second operational period.)

The lack of power, prevented process plant personnel from using the barge reclaim water system from lowering the water level in the tailings pond.

Each Sector was given roadblocks or information, at various times during the exercise, to document and/or share back to the Director in briefing meetings. The EOC used the site's tailings operational and emergency response plan documents to conduct activities associated with the managing the event to prevent further loss of infrastructure, damage to the environment, or impacting community stakeholders.

Key activities completed by EOC members:

- All water flow other than natural runoff was diverted from South Tails Pond.
- Downstream inundation area evacuated immediately. Following written guideline.
- Communication to inform our Teck Coal Business unit senior management team. Completed immediately.
- Business unit requested to set up Crisis team to help with communities of interest communication.
- Stakeholder calls made to inform communities other mines and regulators.
- Support engineering specialists were contacted to provide their skills in addressing the South Tails Pond structure.
- EOC members identified they hadn't created a specific mitigation plan for the pond water level and actions to stabilize dam erosion. This was discussed initially with barge pumping and when getting engineering specialist support. No action plan undertaken until later in exercise when logistics informed about pumps and riprap available off site.
- Action plans created for each of 2 operational periods.
- One Briefing meeting completed to communicate what was finalized or outstanding from the 1st operational period leading to action plan for 2nd operation period.
- Sector Chiefs used cue card information from facilitators to guide decision making activities. They also shared key notes across sectors to ensure responsible areas could address the specifics of the reported situation.

EOC Operations:

Specifics of what activities and times were documented by a scribe (Seth Kitt) to ensure documentation of the exercise and EOC activities/performance were recorded. Position Logs were filled in by each Sector. Planning Sector Chief conducted situational

awareness by setting out our first operational period on flip charts. Operational periods were updated twice during the table top exercise so each Sector could report out on actions taken within their role.

The drill was halted @ 1113 hours. This was to permit some discussion and completion of final notes.

Positive Observations identified by Facilitator's:

- The team remained composed through initial confusion early in the exercise
- Planning Sector Chief did a great job of gathering initial information such as: known/unknowns, securing the scene, addressing evacuation areas (getting the team together early on the process)
- Head office was phoned relatively quickly
- There was immediate communication with GHO personnel
- The de-brief sessions occurred often and yet were concise and informative
- Mitigation plans were confirmed to have adequate SWPs so as not to create new unnecessary risks to personnel.
- Established a safe and controlled rallying point by using the Boivin Room in Elkford. Our alternate EOC for Fording River.
- Assumed inundation event may go beyond the official inundation area as outline in older engineering study. Conservative and effective approach taken here.
- Regulatory agencies were phoned. PEP was identified as the only necessary one to phone to help with planning and coordinating efficiencies.
- The team remained constructive throughout the entire session
- Logistics Sector Chief identified if power not out we could immediately use our barge pumps to lower tail pond level to improve pond freeboard.
- Logistics Sector Chief identified that the piping for the dredge is double walled over the tails pond impoundment to prevent a dredge line leak even creating this scenario.
- Dean Runzer coached EOC participants on some of our actions to help improve team learning. Example: Section Chief should stay focused for larger picture assigning subordinates to action the specific details. Start large and shut things down right away until we know we are not going to have a more catastrophic event. We can always adjust our plan once we have secured a perimeter.
- Recommendations from previous table top were added to South Tails Pond. More activities for Sector chiefs – Cue cards were used to introduce situations that Section Chiefs were to address and report on. Action Plans put up in EOC for each operational period. These activities put more pressure on individuals within their roles. Yet made briefing and operational period priority discussions more effective in team gaining situational awareness of what everyone was doing to resolve this incident.

Key Learnings/Findings identified by Facilitator's:

- Mitigation activities to address the pond water level and structure erosion damage could have started earlier than identified within the EOC. During the 1st briefing we could have identified possible mitigation activities while downstream evacuation was underway.
- Completing additional mock exercises would be helpful for personnel getting more hands on practice with these EOC situations and processes.
- Creating a single page outline of the EOC structure may be helpful in understanding how the team should operate.
- Providing additional information to the Consultants may have helped in better understanding potential mitigations and/or evacuation requirements or suggestions earlier on in the exercise.

Teck Coal Fording River Operations South Tail Pond Table Top Exercise review:

In the format of an ICAM we have provided these observations regarding the EOC below:

Absent or Failed Defense:

EOC members may need to consider contacting absent Superintendents to keep them up to date of the events.

Not creating a mitigation plan for water level and erosion on pond structure delayed contingency response implementation

Individual or Team Actions:

Everyone involved was attentive and participative.

Everyone read their roles and referenced them through the exercise.

Task or Environmental Conditions:

Locating and maintaining all members in the Command Centre may have lead to confusion and much too much debate on communications and key information sharing

There was a great atmosphere for learning, open discussion and a desire for being involved.

Organizational Factors:

Procedural details require an update to contingency and support requirements

Some individuals in attendance have never participated in the EOC. Practise and review will need to continue to be part of every EOC drill conducted.

Does Teck Coal business unit know of all the pumping and electrical generator devices that could be requested to assist during a specific emergency? Facilitators were considering off site resources. This was done to create activities for sectors. FRO has significant resources on hand that could be mobilized as contingency support and with good mutual aid support across GHO and LCO, support could be mobilized within first hours of an event.

There was no apparent or readily available means to divert water to the Kilmarnock settling ponds in an immediate or emergency situation; no pipeline or spill way.

Recommendations:

Item:	Recommendations South Tails Pond Table Top:	Action by:	Completion Date:
1.	Consider installing backup Generator for the south barge. With power loss, a generator could support water control efforts within the pond.	Tailings Management Committee - Chair	March 31, 2015
2.	Review computer access to electronically filed phone lists. In this situation the GO & Engineering generators were supporting computer system. (We have a copy of our area phone book stored in the EOC kit.)	Patrick Milan	January 31, 2015
3.	Consider how Logistics Sector could find out what resources are available on site. Define options for integration into process.	Patrick Milan	January 31, 2015
4.	Business Unit may want to assemble a listing of support equipment by site and maintain a core list of contacts at each site knowledgeable in equipment and/or support resources available at each site.	Kevin LeDrew	March 31, 2015
5.	Section 2.1 of EP.008 requires an update to include details of the most recent inundation study to reflect the current status in the updated response plans.	R Gold	March 31, 2015

6.	<p>Section 2.2 of EP.008 requires an update to include;</p> <ul style="list-style-type: none"> • An update to the contingency response plan including the listing of key support equipment, suppliers and locations as well as onsite mobile equipment available • Referral to Kim Muller and Phil Rees to be removed • Minimize specifics on pipeline repair details 	J Garwood	March 31, 2015
7.	Section 3.0 to 3.2 refer to the emergency response plan, is this the general site EPP plan or the Tailings System Emergency Preparedness Plan; appears to be a continuous loop reference.	R Gold	March 31, 2015
8.	Section 3.3, Part 2 refers to the EPP, clarity required.	R Gold	March 31, 2015
9.	Section 3.3, Part 5 refers to the STP Risk Assessment, should this document, if it has not already, be appended to the OMS?	Included in section 3.0	NFAR
10.	The Emergency Response Plans should be revised to include various classifications or stages of an emergency (Class I, II, III, etc.) with the appropriate response requirements included for each stage.	Tailings Management Committee –Chair	March 31, 2015
11.	Prepare a plan and/or identify alternatives to install or have a standpipe, with sufficient pipeline to divert water from the STP to Kilmarnock settling ponds.	R Gold	March 31, 2015