

June 26, 2015

File No.:VA101-141/21-A.01
Cont. No.:VA15-02799



Mr. Ian Berzins
Vice President, General Manager
Thompson Creek Metals Company (Mt. Milligan, Fort St. James)
132 - 250 Stuart Drive
Fort St. James
Canada, V0J 1P0

Dear Ian,

Re: Mt. Milligan Mine Tailings Storage Facility Assessment – Response to Memorandum Issued by Ministry of Energy and Mines to Thompson Creek Metals Company on February 3, 2015

The Expert Panel convened to examine the Mt. Polley tailings dam breach concluded the failure was related to the presence of weak glaciolacustrine soils in the foundation, and the severity of the failure was in large part owing to the quantity of stored water and proximity of the water to the dam embankment (lack of beach). The Ministry of Energy and Mines (MEM) requested confirmation that the conditions that lead to the incident at Mt. Polley were not present at other mines in BC. Knight Piésold Ltd. (KP) completed an assessment to determine if the dam(s) at the Mt. Milligan Tailings Storage Facility (TSF) were at risk due to:

- Item 1: Undrained Shear Failure of Silt and Clay Foundations
- Item 2: Water Balance Adequacy
- Item 3: Filter Adequacy

A series of separate documents were compiled to address each of the above items through a review of existing historical information, understanding the relevant conditions at the site and the identification of gaps where follow-up action will be necessary to improve the conditions. These supporting documents are as follows:

- KP Report TSF Foundation Assessment (Ref. No VA101-141/24-1)
- KP Letter Report Tailings Storage Facility (TSF) Water Balance Adequacy (VA15-02743)
- KP Letter Report Tailings Storage Facility (TSF) Filter Adequacy (VA15-02704)

This letter provides a summary of the findings using the MEM requested numbering system to expedite the review process.

1. Undrained Shear Failure of Silt and Clay Foundations;

- a. *Including a determination with respect to whether or not similar foundation conditions exist below the dams on your site.*

KP Response: Silt and clay foundations (glaciolacustrine deposits) were identified at the Mt. Milligan Project during several geotechnical site investigation programs in 1991 and 2007, and during slope inclinometers installations in 2013. The glaciolacustrine deposits were identified on the glacial till plateau between Esker Lakes and King Richard Creek adjacent to the TSF Northeast Embankment. Glaciolacustrine deposits were consistently found in drill core samples between two glacial till deposits.

- b. *Whether or not sufficient site investigation (drill holes, etc.) has been completed to have confidence in this determination.*

KP Response: The requirement for additional site investigations was identified in the feasibility study, detailed design phase and during permitting to further evaluate the geotechnical characteristics of the glaciolacustrine deposits prior to expansion of the embankment out to the final downstream limit.

- c. *If present, whether or not the dam design properly accounts for these materials.*

KP Response: The dam design has accounted for these materials. The depth, density, low clay percentage, low plasticity index, low moisture content, absence of fine laminated clay layers indicate the foundation is not at risk for the current height of dam.

- d. *If any gaps have been identified, a plan and schedule for additional sub- surface investigation.*

KP Response: A site investigation program has been proposed to collect additional geotechnical parameters in the glaciolacustrine deposits. KP recommends a site investigation program to collect samples for specialized laboratory test work and to conduct Cone Penetration Testing (CPT). This site investigation program is planned to be completed by the end of 2015.

2. Water balance adequacy;

- a. *Including the total volume of surplus mine site water (if any) stored in the tailings storage facility.*

KP Response: No surplus water is stored in the TSF. The pond volume has been tracking well to date with the predicted water balance model results.

- b. *The volume of surplus mine water that has been added to the facility over each of the past five years.*

KP Response: None. All impounded water to date has been planned for; there is no additional surplus water being stored in the TSF at this time.

- c. *Any plans that are in place or that are under development to release surplus mine water to the environment.*

KP Response: No plans are in place or under development to release water to the environment.

- d. *Recommended beach width(s), and the ability of the mine to maintain these widths.*

KP Response: The recommended beach width targets as little as 30 metres initially followed by rapidly extending the beaches outwards over time to target between 100 and 600 metres. The 100 to 600 metre width has been maintained in areas where the deposition plan has been executed. Current beach widths around the TSF embankment vary within the target parameters listed.

- e. *The ability of the TSF embankments to undergo deformation without the release of water (i.e. the adequacy of the recommended beach width).*

KP Response: The TSF embankments have 2 metres of freeboard for storage of the Inflow Design Flood and for wave run-up. The TSF embankments have the ability to undergo up to 2 metres of deformation, assuming the water level is at its maximum operating level, prior to release of water.

- f. *Provisions and contingencies that are in place to account for wet years.*

KP Response: The water balance accounts for variability in precipitation. Each year the planned embankment raise is reviewed to verify the lift height meets the design objectives for waste storage, storm storage, and precipitation storage. This includes the evaluation of wet years that might result in a larger pond.

- g. *If any gaps have been identified, a plan and schedule for addressing these issues.*

KP Response: No gaps have been identified.

3. Filter adequacy;

- a. *Including the beach width and filter specifications necessary to prevent potential piping.*

KP Response: The beach width development is following the overall design schematic filling deposition plan starting with a target of as little as 30 metres initially and rapidly extending the beaches outwards over time to target between 100 and 600 metres. The filter design was completed using best engineering practices for designing filters which include preventing piping and internally stability considerations.

- b. *Whether or not the filter has been constructed in accordance with the design.*

KP Response: The filter has been constructed in accordance with the design.

c. *If any gaps have been identified, a plan and schedule for addressing these issues.*

KP Response: No gaps identified.

We trust this meets your requirements. Please do not hesitate to contact the undersigned if you have any questions.

Yours truly,
Knight Piésold Ltd.



Prepared:

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Reviewed:

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Les Galbraith, P.Eng.
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Approval that this document adheres to Knight Piésold Quality Systems:

[Signature]

Attachments:

KP Report Ref. No. VA101-141/24-1 - TSF Dam Foundation Assessment
KP Letter VA15-02743 - Water Balance Adequacy
KP Letter VA15-02794 - Filter Adequacy

Copy To: (Al Hoffman, Chief Inspector of Mines)

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