



December 9, 2014

Al Hoffman  
Chief Inspector of Mines  
Ministry of Energy and Mines, BC

Al,

As requested, this letter should be attached to the BGC review of the KCB 2014 DSI of the QR Mine tailings dams.

My comments are in [blue](#). I propose that all items that require a PEng will be done by KCB during the 2015 DSI. Snow is off the dam slopes by end of May; hence I suggest a report date submitted by end of June 2015. Several of the issues have been addressed with the recent revisions of the OMS and DSI.

#### **Summary of BGC recommendations**

BGC recommends, based on our review/audit of the report, the following should be further addressed:

- As it appears there has not been a rigorous evaluation of the hazard classification of the dams between BGM and the EOR, we recommend this work be conducted.  
[KCB by June 30<sup>th</sup>, 2015](#)
- We recommend the alert levels be reviewed and that the OMS be updated with the appropriate piezometric alert levels. [Done. Reviewed by KCB and George Warnock and contained in the updated OMS Rev 4 dated 30 Aug 14.](#)
- The OMS and EERP should be updated for the noted deficiencies.  
[OMS updated \(above\) and EERP to be updated by 31 Mar 15.](#)
- The steeper than designed downstream slope of the north Tailings Dam (Reference Photos I-10 and I-20) should be assessed as KCB 2014 recommended. [KCB reassessed; 1.5 Safety Factor](#)  
Also in Photo I-6, portions of the upstream slope along the Cross Dyke also appeared to be steeper than design and should also be assessed. [KCB 2014 Construction Report; as built drawings, Cross Dyke built to design.](#)
- All 2014 construction activities should be confirmed by the EOR that they met required design criteria or note any variances and rationale from those. [KCB 2014 Construction Report submitted.](#)
- The existing freeboard should be confirmed by KCB. [KCB Final 2014 DSI Report.](#)
- Discharge volumes and quality should be explicitly stated. [No discharges since freshet of 2012. MOE reduced ammonia discharge spec. from 10 to 1 mg/L July 2012.](#)

- Consideration should be given to re-routing the return seepage line over the abutment rather than the dam. Reference Photo I-15 in KCB 2014. **Repaired 30 Jun 14, after the KCB DSI; inspected and documented daily.**
- Seepage related water quality should be explicitly stated. **KCB 2015 DSI; water quality data available. Samples are collected monthly. Water quality report sent to MOE quarterly.**
- The reasoning for observed seepage partway down the slope along the Cross Dyke should be assessed (Reference KCB 2014 Photo I-7). **Dried up after construction.**
- Clearing of the diversion ditches should be documented in the report and conducted, as necessary. Reference Photo I-21 in KCB 2014. **Diversion ditches cleared, after the 2014 KCB DSI.**
- The final DSI document should be signed and stamped by the P.Eng. who authored the report. **Done**

If you require further information, please contact me.

Regards,

Kevin

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