

November 28, 2014

Walter Energy Inc.
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ISSUED FOR USE

FILE: V15103099-01

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Attention: Nathan Scarbrough, P.E., Sr. Mine Engineer
Wayde Bosman, Mine Engineer

Subject: Review of the Wolverine Mine 2014 Tailings Facility Annual Inspection Report
Tumbler Ridge, BC

1.0 INTRODUCTION

Walter Energy Inc. (Walter Energy) retained Tetra Tech EBA Inc. (Tetra Tech EBA) to undertake this review of the Wolverine Mine 2014 Tailings Facility Annual Inspection Report. The review was undertaken to meet the requirements of the orders issued by the Chief Inspector of Mines of British Columbia on August 18, 2014. The orders include a requirement for Third Party Review of a Dam Safety Inspection (DSI) report and the dam consequence classification. The review is to be undertaken by an "independent qualified third party professional engineer from a firm that has not been associated with the tailings dam."

The intent of the review is to look for gaps in the DSI and assess whether the recommendations in the report are consistent with current engineering best-practice.

The Wolverine Coal Mine Tailings Storage Facility (TSF) is situated approximately 17 km southwest of Tumbler Ridge, BC.

2.0 SCOPE

The scope involved a 'desk top' review of a DSI report prepared by others (Norwest Corporation). The scope included review of the dam consequence classification undertaken as part of the DSI.

Specifically, the DSI was assessed in comparison to the requirements of the 2013 BC Ministry of Energy and Mines (MEM) guidelines and the 2007 Dam Safety Guidelines of the Canadian Dam Association (CDA).

A site visit was undertaken on October 22, 2014 to familiarise the reviewer with the layout and features of the TSF. The scope did not include engineering assessments such as geotechnical stability, or hydrological and hydraulic assessments.

3.0 INFORMATION PROVIDED

The following document was provided for review:

- *Wolverine Mine 2014 Tailings Facility Annual Inspection*. Report prepared by Norwest Corporation for Wolverine Coal Partnership, November 4, 2014, Project Number: 341-8.

A significant amount of background information was provided to Tetra Tech EBA to support the review process. The critical review of these documents was not in the scope of this review.

The following additional documents prepared by Norwest Corporation were provided:

- **Annual Inspections Reports**

- *2007 Dam Safety Review* letter dated November 19, 2007.
- *2008 Annual Dam Safety Inspection* letter dated October 28, 2008.
- *2009 Annual Dam Safety Inspection* letter dated November 6, 2009.
- *2010 Annual Dam Safety Inspection* letter dated November 10, 2010.
- *2011 Annual Dam Safety Inspection* letter dated December 16, 2011.
- *2012 Annual Dam Safety Inspection* letter Report dated February 28, 2013.
- *2013 Annual Inspection Report*, dated February 3, 2014.

- **Design Reports**

- *Wolverine Coal Project: Permit-Level Geotechnical Designs for the Tailing Facility and Course Coal Reject Pile*. Report January 27, 2005.
- *Wolverine Coal Project Mine Permit Amendment: Tailings and CCR Management Plan*. Report April 17, 2007.
- *Wolverine Tailings Dam Raise – Stability Analysis Evaluation*. Memorandum July 9, 2010.
- *Wolverine Tailings Dam – Design Revision Support Document*. Letter March 22, 2012.

- **Construction Reports**

- *Wolverine Tailings Facility Downstream Toe Drain As-Built Report*. November 2010.

- **Other Reports**

- *June 21, 2013 Site Visit Letter*. July 4, 2013.
- *Quarterly Instrumentation Monitoring Review (Q2 2014)*. July 2, 2014.
- *Quarterly Instrumentation Monitoring Review (Q3 2014)*. October 30, 2014.

4.0 DOCUMENT REVIEW

Table 1 provides a summary of the Wolverine 2014 Annual DSI report content in relation to the requirements of the 2013 BC MEM Guidelines for Annual Dam Safety Inspection Reports. The DSI report compliance with CDA guidelines is addressed in the text of this section of the letter report.

Table 1: Summary of Report Compliance with 2013 BC Guidelines for Annual DSI Reports

No	Item	Compliance (Yes/No/Partial)	Comment
1a	Dam Classification (CDA, 2007)	Yes	A review of the dam risk classification should be considered if there has been changes to downstream infrastructure since the last assessment and that includes assessment of potential loss of life and environment losses.
1b	Instrumentation/visual monitoring changes	Partial	Instrumentation results and quarterly inspections status included, however, a summary of Wolverine staff visual inspections not available. Norwest has recommended records of inspection be maintained by Walter Energy.
1c	Dam stability and/or surface water control changes	Yes	Embankment stability and capacity referenced and recommendations for updates provided as required.
1d	OMS Manual latest revision date	Yes	Not reviewed by Tetra Tech EBA. To be updated as per report recommendations.
1e	EPP Manual latest revision date	Yes	Not reviewed by Tetra Tech EBA. To be updated as per report recommendations.
1f	Date for next DSR	Yes	
2	Recent construction	Yes	Recommendations for modifications to embankment to meet design requirements were included.
3	Plan and cross-sections	Yes	
4	Photographs	Yes	
5	Climate data review	Partial	Climate data not referenced, but pond levels and capacity discussed in relation to previous levels.
6	Water balance review	Yes	No details available, but current status summarised.
7	Freeboard and storage availability	Partial	Estimate of available capacity provided, but this should be compared to the design inflow.
8	Water discharge system	Yes	
9	Seepage occurrence and water quality	Partial	Seepage observed and discussed, but no discussion of water quality provided.
10	Surface water control and surface erosion	Yes	
11a	Instrumentation review - piezometers	Yes	Report indicated that measurements were within design limits.
11b	Instrumentation review - settlement	Yes	Report indicated that measurements were within design limits, and recommendation for additional instrumentation provided.
11c	Instrumentation review - lateral movement	Yes	Report indicated that measurements were within design limits.

4.1 Tailings Storage Facility Description

The following description of the Wolverine TSF was obtained from the 2014 Annual Inspection Report and the additional supplied information.

The compacted clay starter dam for the tailings storage facility was constructed in 2006 as a side-hill type storage positioned in the Wolverine River Valley. Each end of the embankment is keyed into the valley wall. The

embankment was raised in stages by downstream methods using compacted Coarse Coal Reject (CCR) generated at the Wolverine plant. Design features include an upstream drain (identified as inactive), a blanket toe drain below the downstream zone of the embankment, and a drainage ditch at the toe. The embankment is approximately 1,400 m long and 24 m high at its highest point with a crest width of approximately 30 m to 35 m.

The facility is founded on the Wolverine River floodplain sediments and design settlement of between 1 m and 2 m were predicted due to consolidation of a clay unit below the TSF. To mitigate geotechnical risks associated with the foundation clay layers, the design incorporated embankment seepage control features, minimum tailings beach size as well as freeboard requirements, and a geotechnical instrumentation monitoring program that includes several instrument clusters with vibrating wire piezometers, inclinometers, an extensometer, and settlement monitoring points.

Seepage from within and below the TSF is collected in a ditch at the embankment toe and conveyed through culverts under the Wolverine Forestry Service Road (FSR) to the Wolverine River.

When operational, tailings was deposited from valved spigot points positioned around the inside crest of the embankment. Deposition has been managed to create a tailings beach grading at nominally 1% towards a water return decant structure in the middle of the west side (valley wall) of the TSF. Decanted supernatant water is pumped back to the plant via surface pipeline for re-use during operations.

A stockpile of CCR is positioned within the facility and against the south end of the western valley slope. This stockpile was identified as temporary storage for CCR when cold weather conditions prevent effective compaction as required for placement in the permanent CCR stockpile.

There is no spillway at the TSF, and the catchment area for rainfall inflow is within the embankments at the north, east and south of the storage and the west valley wall.

No information on tailings physical or chemical characteristics was provided in the inspection report. No water quality monitoring data or summary was included in the report.

4.2 Dam Status

The tailings storage facility is currently inactive and has been under care and maintenance since May 2014. Walter Energy is conducting periodic surveillance and emergency response is possible based on the facility proximity to mining operations and the community of Tumbler Ridge, BC.

4.3 CDA Dam Classification

The reported hazard classification of the tailings storage facility under the CDA Dam Safety Guidelines (2007) was 'high', which was due to potential impact to the Wolverine FSR, a BC Rail track, and a natural gas pipeline situated within 50 m of the eastern embankment. It is noted that an overhead power line also runs immediately downstream of the eastern embankment.

The identified downstream risks to infrastructure support the high consequence classification. The classification should be reviewed following completion of the dam break inundation study that has been required by the BC Chief Inspector of Mines for all facilities classified as 'high' and above. The potential for loss of life, environmental losses, and cost of impact to the downstream infrastructure should be examined as part of the classification review.

4.4 Inspection Standard of Care

The described site inspection scope was adequate and included observations of the accessible crests, toes, and abutments of the TSF. Weather conditions were suitable for inspection.

A small and shallow pond was noted at the western end of the tailings surface at the time of the inspection that had decreased in size since the previous annual inspection. There was over 7 m of freeboard (pond to crest) at the time of the inspection based on August 2014 survey data. The TSF as-built drawing included with the DSI report shows selected areas of the embankment that were constructed higher than the design geometry.

Clear seepage flow was observed in the collection ditch downstream of the eastern embankment at the time of the inspection that was reported as consistent with design expectations.

A summary of instrumentation measurements was provided and results indicate that there has been ongoing, though reduced, movement in the embankment foundation. The movement was identified at rates between 4 mm/yr and 8 mm/yr in four slope inclinometers and interpreted as an 'expected response' to loading of the embankment fill on a foundation clay layer. Pore pressures in the clay layer had increased when the embankment was constructed, and the recent trend has been continued dissipation. Norwest provided recommended measures to improve the embankment stability including placement of a toe buttress, removing overbuilt portions of the embankment, and maintaining effective drainage of the toe ditch.

Norwest recommended that the embankment stability be reviewed and updated as required to reflect the current CDA guideline. The 'high' consequence rating requires that the stability assessment incorporate a design earthquake motion associated with an Annual Exceedance Probability Earthquake of 1:2,475 year event.

Hydrotechnical considerations for a 'high' consequence rated facility include that the facility be designed to store and/or safely pass an event with an annual exceedance probability of 1/3 between 1/1,000 year event and the Probable Maximum Flood. While it is expected that the prescribed 2 m of freeboard would be adequate to contain the design storm, this should be confirmed as part of ongoing TSF assessments.

Records of inspection by Walter Energy operations staff were not summarised in the DSI. Norwest recommended weekly monitoring and offered a template for use in recording inspection observations. It is considered common practice to incorporate inspection of a tailings storage facility by operations staff in the 'operational' phase. An inactive facility typically requires less frequent inspection due to the typically slow rate of changes that may occur. There was no reference in the 2014 DSI to the results of routine visual inspections by Walter Energy. The requirement for recorded observations (either paper file or digital records) should be considered in the proposed update to the OMS and these should be reviewed by the mine operations staff and summaries or selected records reviewed as part of the Annual DSI.

No embankment raising construction was undertaken during the reporting period, but placement of reclamation material on the downstream slopes of the embankments was noted.

It was noted that the winter CCR stockpile in the TSF footprint was larger than anticipated in design and Norwest have recommended reducing the pile height by 8 m.

4.5 Review of Recommendations

The list of recommendations provided in the 2014 annual dam safety inspection are consistent with the gaps identified in the report and relevant guideline requirements.

Selected key recommendations in the report were:

- Weekly visual inspections and monthly records of tailings pond water level.
- Update OMS and EPP.
- Install settlement monitoring points and continue quarterly instrument monitoring program.
- Update embankment stability analysis to reflect current CDA guideline requirements.
- Construct a buttress at the downstream toe ditch (design by Norwest in progress).
- Reduce height of winter CCR stockpile.

Additional recommendations in the report for items to be addressed prior to resumption of tailings discharge were:

- Remove overbuilt portions of the tailings dam crest.
- Complete embankment construction to design elevation.
- Installation of additional inclinometers.

The following issues should be considered in conjunction with the recommendations included in the 2014 DSI:

- The current winter CCR stockpile should be considered in assessment of tailings facility storage capacity and the potential impact on TSF stability.
- The prescribed 2 m of freeboard should be confirmed as adequate to contain the design storm with consideration of the winter CCR stockpile.
- A review of the dam risk classification should be considered that includes assessment of potential loss of life and environment losses.
- The embankment stability analysis should incorporate current piezometer data.
- Measurement of seepage flow quantity should be considered as part of the monitoring program.
- Inclusion and review of time-displacement plots for selected inclinometer data should be considered to identify data trends.
- A summary of seepage water quality and recent climate data should be incorporated into future DSI.

4.6 Conclusions

A review of the provided documentation indicates that the Wolverine Mine 2014 Tailings Facility Annual Inspection was undertaken in general accordance with the requirements of the CDA Dam Safety Guidelines (2007) and the BC MEM Guidelines for Annual Dam Safety Inspection Reports (2013). In addition, the dam consequence classification undertaken as part of the DSI adequately reflects the potential impacts associated with a dam failure.

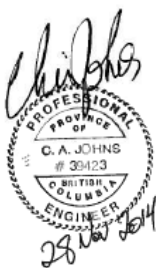
5.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Walter Energy Inc., and their agents. Tetra Tech EBA does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Walter Energy Inc., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in Tetra Tech EBA's Services Agreement. Tetra Tech EBA's General Conditions are provided in Appendix A of this report.

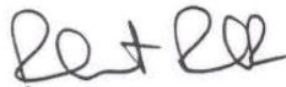
6.0 CLOSURE

We trust that this report meets your present requirements. Please contact the undersigned should you have questions or comments.

Respectfully submitted,
Tetra Tech EBA Inc.



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Attachments: Appendix A Tetra Tech EBA's General Conditions

APPENDIX A

TETRA TECH EBA'S GENERAL CONDITIONS

GENERAL CONDITIONS

GEOTECHNICAL REPORT

This report incorporates and is subject to these “General Conditions”.

1.0 USE OF REPORT AND OWNERSHIP

This geotechnical report pertains to a specific site, a specific development and a specific scope of work. It is not applicable to any other sites nor should it be relied upon for types of development other than that to which it refers. Any variation from the site or development would necessitate a supplementary geotechnical assessment.

This report and the recommendations contained in it are intended for the sole use of Tetra Tech EBA's Client. Tetra Tech EBA does not accept any responsibility for the accuracy of any of the data, the analyses or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than Tetra Tech EBA's Client unless otherwise authorized in writing by Tetra Tech EBA. Any unauthorized use of the report is at the sole risk of the user.

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2.0 ALTERNATE REPORT FORMAT

Where Tetra Tech EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed Tetra Tech EBA's instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by Tetra Tech EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of Tetra Tech EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except Tetra Tech EBA. Tetra Tech EBA's instruments of professional service will be used only and exactly as submitted by Tetra Tech EBA.

Electronic files submitted by Tetra Tech EBA have been prepared and submitted using specific software and hardware systems. Tetra Tech EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

3.0 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, Tetra Tech EBA has not been retained to investigate, address or consider and has not investigated, addressed or considered any environmental or regulatory issues associated with development on the subject site.

4.0 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems and methods employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. Tetra Tech EBA does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

5.0 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

6.0 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historic environment. Tetra Tech EBA does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional investigation and review may be necessary.

7.0 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

8.0 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

9.0 INFLUENCE OF CONSTRUCTION ACTIVITY

There is a direct correlation between construction activity and structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques are known.

10.0 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, as well as the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

11.0 DRAINAGE SYSTEMS

Where temporary or permanent drainage systems are installed within or around a structure, the systems which will be installed must protect the structure from loss of ground due to internal erosion and must be designed so as to assure continued performance of the drains. Specific design detail of such systems should be developed or reviewed by the geotechnical engineer. Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function.

12.0 BEARING CAPACITY

Design bearing capacities, loads and allowable stresses quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition assumed. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions assumed in this report in fact exist at the site.

13.0 SAMPLES

Tetra Tech EBA will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

14.0 INFORMATION PROVIDED TO TETRA TECH EBA BY OTHERS

During the performance of the work and the preparation of the report, Tetra Tech EBA may rely on information provided by persons other than the Client. While Tetra Tech EBA endeavours to verify the accuracy of such information when instructed to do so by the Client, Tetra Tech EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.