

**IN THE MATTER OF THE ENGINEERS AND GEOSCIENTISTS ACT
R.S.B.C. 1996, CHAPTER 116**

and

IN THE MATTER OF Todd Martin, P.Eng., P.Geo.

File No. T15-048 (B)

AMENDED NOTICE OF INQUIRY

TO: Todd Martin, P.Eng., P.Geo.
c/o McEwan Cooper Dennis LLP
900-980 Howe Street
Vancouver, BC V6Z 0C8
Attention: Craig P. Dennis, QC

TAKE NOTICE that a Panel of the Discipline Committee of the Association of Professional Engineers and Geoscientists of the Province of British Columbia (the "Association"), doing business as Engineers and Geoscientists BC, will meet at Charest Reporting, 16th Floor – 885 West Georgia Street, in the City of Vancouver, in the Province of British Columbia, on June 8-12, and June 15-19, 2020, at the hour of 9:30 a.m. for the purpose of taking evidence or otherwise causing an inquiry to be made with respect to the allegations herein pursuant to the *Engineers and Geoscientists Act*, R.S.B.C. 1996, Chapter 116 (the "Act").

AND TAKE NOTICE that the allegations against you are that:

1. Between January 2011 and December 2012, as the design engineer for the Mount Polley Tailings Storage Facility (the "TSF") at the Mount Polley Mine located near Likely, British Columbia, you demonstrated negligence or unprofessional conduct, particulars of which are as follows:
 - a. You adopted an overly steep downstream design slope for the TSF Perimeter Embankment of 1.3H:1V, at stages 8/8A and 9, which slope was not in accordance with prudent engineering or industry norms for a rockfill dam on soil foundation built by the centreline method, in circumstances where there was significant uncertainty as to the subsurface geological conditions beneath the Perimeter Embankment and uncertainty as to whether parts of the soil foundation were not competent;

- b. A downstream embankment slope of 1.3H:1V was inappropriate in the circumstances for each of the following further reasons, independently or together:
- (i) there was insufficient observation and monitoring of the embankment, resulting from the use of unskilled students as Field Inspectors during construction of the embankment raises, from the low level of attendance of senior geotechnical engineers at the TSF, and from the low number of piezometers in the foundation of the Perimeter Embankment;
 - (ii) you, as the Engineer of Record, had little or no control over the TSF water balance, the level and volume of water in the TSF impoundment, and fluctuations in the size of the tailings beaches, and did not take steps to ensure you were regularly receiving current information on these matters while Engineer of Record;
 - (iii) additional investigation of subsurface geological conditions in the vicinity of the Perimeter Embankment was not performed as the embankment got bigger and higher and as the geometry of the downstream slope changed at stages 8/8A and 9;
 - (iv) the areal extent of the upper glaciolacustrine soil unit found in groundwater monitoring well GW96-1A was unknown, as was the potential presence of other similar soil layers beneath the Perimeter Embankment;
- c. Alternatively, having designed the downstream Perimeter Embankment to a slope of 1.3H:1V at stages 8/8A and 9, you should have required that each of the following occur:
- (i) additional investigation of subsurface geological conditions be undertaken in the vicinity of the Perimeter Embankment through a program of drilling;
 - (ii) that there was a high level of observation and monitoring of the embankment, which was not the case due to the use of unskilled students as Field Inspectors during construction of the raises, from the low level of attendance of senior geotechnical engineers at the TSF, and from the

low number of piezometers in the foundation of the Perimeter Embankment; and

- (iii) there was more frequent monitoring of the water level and volume in the embankment, and the fluctuating size of the tailings beaches, and reporting on these subjects to you;
- d. The wide spacing and small number of deep drill holes in the vicinity of the Perimeter Embankment in the years 2011 and 2012 was not consistent with prudent engineering practice, including when having regard to the changing size and downstream geometry of the Perimeter Embankment and the uncertainty as to subsurface geological conditions;
- e. You were aware of the drill hole log for groundwater monitoring well GW96-1A (“Hole GW96-1A”), which showed the presence of an upper glaciolacustrine soil unit (“upper GLU”) downstream of the Perimeter Embankment, but you unreasonably discounted the drill log data from Hole GW96-1A and ignored it for the purposes of your stability analyses in respect of the Perimeter Embankment and more generally for the purposes of creating your geological model of the area under the embankment, particulars of which are, either independently or together:
- (i) you did not take steps to determine the areal extent of the upper GLU found in Hole GW96-1A, including through a program of additional drilling;
 - (ii) you did not undertake a program of drilling to confirm that the upper GLU found in Hole GW96-1A was anomalous and that it or a similar soil unit was not found beneath the Perimeter Embankment;
 - (iii) you did not subject a sample of the upper GLU to appropriate triaxial testing under drained and undrained conditions to determine the shear strength of the material;
 - (iv) you did not subject a sample of the upper GLU to permeability and oedometer testing to assess pore pressure generation under the embankment construction loads for inclusion in the stability analyses;
 - (v) you discounted the drill hole log data from Hole GW96-1A on account of a theory that you did not sufficiently investigate: i.e. that Hole GW96-1A was located in a

different geological or depositional environment than exists along the axis of the Perimeter Embankment. There was insufficient data to draw a conclusion that Hole GW96-1A was in a different depositional or geological environment than was found along the axis of the Perimeter Embankment;

- (vi) you assumed that because you had observed heavily over-consolidated surficial tills along the axis of the Perimeter Embankment, that all materials beneath those tills would be heavily over-consolidated, when you ought to have known that there can be exceptions to this pattern, and when there was insufficient data to assume this pattern was uniformly the case along the axis of the Perimeter Embankment;
- f. The conduct set out above at paragraph 1(e) was not sufficiently careful for the additional reason that you had adopted an unusually steep downstream design slope for the Perimeter Embankment as set out above at paragraph 1(a), meaning that it was particularly important to undertake additional drilling to better understand the sub-surface geology in the vicinity of the Perimeter Embankment, or alternatively to make conservative assumptions in your geological modelling. In this case, the conservative assumption would have been, in the absence of additional drilling, that the upper GLU found in Hole GW96-1A, or a similar soft layer, could be found in locations beneath the Perimeter Embankment;
- g. You discounted the drill hole log data from Hole GW96-1A in part on account of your theory that Hole GW96-1A was located in a different geological or depositional environment than exists along the axis of the Perimeter Embankment, but you failed to make any record of this theory, or your observations supporting this theory, in any memorandum or report, such that your client and future engineers involved with the project, including future Engineers of Record, would have the benefit of your observations and thinking and would be able to assess for themselves whether to approach the problem in the same way;
- h. You failed to ensure sufficient observation and monitoring of the TSF embankment, particulars of which are, either independently or together:
 - i. senior geotechnical engineers visited the site too infrequently. As EOR and the most senior geotechnical engineer involved with the project in 2011 and 2012, you

visited the TSF only once over those two years, and AMEC's Project Manager for the TSF only visited the site twice;

- ii. you relied upon insufficiently trained and insufficiently experienced personnel, including students, to perform construction monitoring and to alert you to issues of non-compliance with design or generally to issues that could impact the safety of the structure. Alternatively, if the use of such personnel was imposed upon you by the mine operator, you failed to advise the mine operator of the risks associated with using such personnel for construction monitoring;
 - iii. you relied upon an insufficient number of piezometers in the Perimeter Embankment foundation and did not advise the mine operator that additional piezometers should be installed in the Perimeter Embankment foundation;
- i. Following construction of the Stage 7, 8 and 8A embankment raises, you failed to take appropriate steps to address the fact that embankment construction took place in a manner that was not in accordance with design. In that regard, you failed to notify the mine operator that there was crest overbuilding and lack of compaction of fill placed on the downstream embankment slope during construction of those stages and that this could have an adverse effect on the stability of the embankment;
 - j. In addition, you did not ensure that the facts set out in paragraph 1(i) above were reflected in the As-Built Report for Stage 7 which in turn would have resulted in the Chief Inspector's Office receiving notification that construction was not undertaken in conformity with design. Nor did you determine the impact, if any, of these deviations from design on the stability analysis for the embankment.
2. The conduct set out above at paragraph 1 is contrary to Principle 1 of the Association's *Code of Ethics* which requires that all members and licensees shall hold paramount the safety, health and welfare of the public, the protection of the environment and promote health and safety within the workplace.

AND FURTHER TAKE NOTICE that you, Todd Martin, P.Eng., P.Geo., have the right, at your own expense, to be represented by counsel at the inquiry by the Panel of the Discipline Committee and you or your counsel shall have the full right to cross-examine all witnesses called and to call evidence in defence and reply in answer to the allegations.

AND FURTHER TAKE NOTICE that in the event of your non-attendance at the inquiry, the Panel of the Discipline Committee may, upon proof of service of this Notice of Hearing upon you, proceed with the taking of evidence or otherwise ascertaining the facts concerning the allegation, despite your absence, and may make its findings on the facts and its decision without further notice to you.

DATED this 23rd day of January, 2020.

The Discipline Committee of Engineers and
Geoscientists British Columbia

<original signed by>

Per: Paul Adams, P.Eng., FEC
Chair, Discipline Committee