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December 7, 2022

File No. 19-1824

SENT VIA EMAIL

The Commissioner
Red Hill Valley Parkway Inquiry
Care of:

Commission Counsel
Paliare Roland Rosenberg Rothstein LLP
155 Wellington Street West, 35th Floor
Toronto, ON M5V 3H1

Your Honour;

Re: Golder Associates Ltd. re: Red Hill Valley Parkway Inquiry

Golder Associates Ltd. ("Golder") seeks leave to submit an expert report from Dr. Hassan Baaj of the University of Waterloo. Please find Dr. Baaj's *curriculum vitae* attached.

Anticipated Scope of Technical Report

Dr. Baaj's evidence will address the testing conducted on the Demix Varennes Quarry aggregate (the "Aggregate") indicating its quality and resistance to polishing. Golder anticipates that Dr. Baaj's technical report will largely supplement Dr. Flintsch's findings and analysis in Section 2.1.5 of his Report entitled "Analysis of Friction on the RHVP" dated November 2022 ("Report").

The quality of an aggregate in its ability to resist polishing is important to whether it will provide good and enduring frictional characteristics. In his Report, Dr. Flintsch addresses the data in relation to Polished Stone Value ("PSV") testing. In 2007, as part of the data provided to qualify the Aggregate as suitable for use in the asphalt for the Red Hill Valley Parkway, Dufferin provided a number of laboratory test results as well as results of Cpp testing. Dr. Flintsch does not consider other testing results provided by Dufferin relevant to an assessment of resistance to polishing, namely the laboratory testing (MicroDeval abrasion and Los Angeles abrasion) and the test used

in Quebec to measure resistance to friction identified as the Coefficient of Polishing by Projection ("Cpp") test.

We anticipate that Dr. Baaj's technical report will address:

1. The testing conducted on the Aggregate in 2007, particularly the MicroDeval abrasion and the Los Angeles abrasion data as well as the Cpp testing, and what that testing indicated about the quality of the Aggregate and its ability to resist polishing.

   Dr. Flintsch has identified one of the tests conducted on the Aggregate that is relevant to an assessment of its resistance to polishing. Dr. Baaj's technical report will address the gap in Dr. Flintsch's assessment of the available data. Golder submits that an explanation of what testing was done will supplement the description provided by Dr. Flintsch which focused on one form of testing but excluded others relevant to an assessment of resistance to polishing.

   Golder submits that an assessment of all of the testing in relation to its resistance to polishing is relevant and necessary to consider the quality of the Aggregate supplied in 2007.

2. Whether the testing conducted on the Aggregate indicated that it met the qualifications required of good aggregate necessary for a high volume and high speed highway.

   This issue is not specifically addressed by Dr. Flintsch. We anticipate that Dr. Baaj will find that the test results conducted in 2007 supported a reasonable expectation that the Aggregate would provide good characteristics in resisting polishing and therefore good frictional performance could be expected necessary for a high volume, high speed highway. Dr. Flintsch does not address all of the testing that was conducted on the Aggregate and he does not address what the testing meant in relation to its qualification for use on the RHVP. However, as discussed below, Dr. Flintsch does make a finding of a connection between the 2017 PSV testing of recovered aggregate and the decline in frictional properties of the asphalt. Golder submits that any evaluation of what the PSV value of the Aggregate might have been in 2007 should in fairness to the parties involved include an assessment of all of the data and what it meant in terms of an expectation for frictional performance of the asphalt on the RHVP.

3. Whether any of the test data in 2007 indicated that the Aggregate was susceptible to undue polishing.

Dr. Flintsch does not specifically address this question. We anticipate that this issue will be addressed as part of consideration of issues 1 and 2.

4. Whether data from testing conducted in 2017 of Aggregate recovered from the asphalt in service on the RHVP for ten years can be compared to virgin aggregate in a meaningful analysis.

   Dr. Flintsch states that the PSV testing of 45, which was obtained from the 2017 testing of aggregate recovered from the RHVP was relatively low compared to British standards and he then goes on to say: "This indicates that the aggregate is susceptible to polishing." PSV testing would typically be conducted on virgin aggregate. Dr. Baaj has not yet provided his analysis but we anticipate that he will not agree that such a comparison can be meaningfully made.

5. In particular, whether the testing data from 2017 could be an indicator of what the PSV test results might have been of the virgin Aggregate in 2007.

   By comparing the Aggregate recovered from the Stone Mastic Asphalt surface of the RHVP with that quarried in 1992 and 2008, Dr. Flintsch seems to suggest that the recovered Aggregate can be compared to virgin aggregate tested in 1992 and 2008. We anticipate that Dr. Baaj will disagree with Dr. Flintsch that PSV testing of recovered aggregate can be compared to virgin and will disagree that the 2017 testing of recovered Aggregate could indicate what PSV test results of the Aggregate might have been had it been tested in 2007.

6. Whether the data from PSV testing of recovered aggregate in 2017 might indicate a seam of aggregate from the Varennes quarry of quality more similar to that tested in 1992 rather than 2008.

   Dr. Flintsch refers to the PSV testing of the Aggregate conducted in 1992 and 2008 and the recovered Aggregate tested in 2017 and says: "The variation of PSV over time for a quarry is not uncommon as different rock seams are exploited over time.". This suggests that Dr. Flintsch holds the view that the Aggregate extracted in 2007 was more like that extracted in 1992 than 2008. We anticipate that Dr. Baaj will disagree. Dr. Baaj has significant experience in industry having worked for Lafarge and may be able to offer a response to Dr. Flintsch's statement about variation of aggregate from different rock seams within a quarry.

7. Whether the data from the PSV testing conducted in 2017 can be evaluated as an indicator of a decline in friction of the asphalt.

Dr. Flintsch states: "The relatively low PSV of 45 obtained from the samples taken in December 2017 is consistent with the significant drop in friction (approximately 20%) observed between 2008 and 2014 described above. An aggregate susceptible to polishing losses its macrotexture (we believe he means microtexture) because of the abrasive effect of traffic, and it contributes to a decrease in friction as observed in the RHVP and discussed in the previous sections."

Dr. Flintsch suggests a relationship between the relatively low PSV as reflective of the decline in friction on the RHVP between 2008 and 2014. It is an interesting question of whether the PSV testing of the recovered Aggregate indicates that the Aggregate has lost microtexture and in effect has 'polished' and could be considered as part of an explanation for a decline in friction. Dr. Baaj was not aware of research as to whether PSV testing of in service aggregate is an indicator of present frictional properties of the asphalt and we are not able to anticipate what his findings and opinion will be.

How the Anticipated Expert Evidence Relates to the Terms of Reference and would be helpful to the Commissioner

There is a close relationship between the quality of an aggregate to resist polishing and whether it will provide good frictional properties. Golder anticipates that Dr. Baaj's evidence will assist the Commission in understanding the testing conducted on the aggregate, what it indicates about the quality of the Aggregate in the asphalt surface of the RHVP and what could have been expected of its performance; as well the connection between data indicating resistance to polishing and frictional performance. We submit that Dr. Baaj's report will assist in addressing the Terms of Reference 2(xxiv) in understanding the relevance of aggregate testing in evaluating friction as a potential contributing factor in collisions along with other factors addressed in Mr. Russell Brownlee's "Highway Design and Assessment Report".

Length of Time Requested for Oral Submission on December 13, 2022

We anticipate that we will require about one hour for oral submissions.

Yours sincerely,

Gibbs & Associates

Jennifer A. Roberts
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