GSS ENGINEERING CONSULTANTS LTD

25-029

June 12, 2025

Municipality of West Grey
402813 Grey Road 4
Durham, Ontario
N0G 1R0

Attention: David Smith
Manager of Planning

Re: **GEI Consultants Response to Peer Review Comments on**
Maximum Predicted Water Table and Hydrogeological Assessment Report
Proposed Class 'A' Pit Above Water (JT Pit), JT Excavating Ltd.
Municipality of West Grey, Grey County

Dear Sir,

As requested, this letter provides our comments on the June 6, 2025 response from GEI Consultants Canada Ltd. (GEI) to peer review comments made by GSS Engineering Consultants Ltd. (GSS) on the November 2023 (revised) maximum predicted water table and hydrogeological assessment report prepared by GM BluePlan Engineering Limited (GMBP) for JT Excavating Ltd. for a proposed above the water table pit to be located at 382063 Concession 4 NDR in the Municipality of West Grey. The peer review comments were provided in a May 20, 2025 letter from GSS to the Municipality of West Grey.

Comments

Provided below are the original comments from GSS, the June 6, 2025 response from GEI, and an additional comment from GSS on the GEI response.

1. Original Comment: Groundwater levels at the site were reportedly measured on seven occasions in the period from February 23, 2021 to June 25, 2023, including measurements on April 7, 2021, March 24, 2022, and April 10, 2023. The report indicated that the high groundwater table elevation was expected to be consistent with the water levels measured on April 10, 2023, which were made following a period of significant snow melt and precipitation. The report recommended that the monitoring wells continue to be monitored during the pit application process so that direct measurement of the high water level could

be confirmed and the pit floor elevation updated accordingly. We considered it likely that single-day measurements in late March/early April over three consecutive years were adequate to indicate the typical high water level at the site. However, a comparison between available precipitation data for the period of monitoring and typical precipitation levels for the area of the site should be provided to support the finding that the identified seasonal high water table was reasonably representative of typical conditions. The MNRF August 2020 Aggregate Resources of Ontario (ARO) standards for a maximum predicted water table report (updated in August 2023) defined the maximum predicted water table as the maximum groundwater elevation predicted by a qualified person who has considered conditions at the site and mean annual precipitation levels.

GEI Response: GEI has compared the climate normal at a nearby weather station which is available through the Environment Canada website to the precipitation data for March and April 2021, 2022, and 2023. The Environment Canada Climate Normals for Hanover (1981–2010), and the precipitation records for the monitoring years (2021, 2022, and 2023) indicate that total precipitation during March and April in those years was broadly consistent with, or in some cases slightly above, the 1981–2010 normals. This is demonstrated in the table below:

Date	30-year Climate Normal (mm)	Recorded Precipitation Value (mm)
March 2021	72mm	54.6 mm
April 2021	73.1 mm	50.9 mm
March 2022	72mm	81.5 mm
April 2022	73.1 mm	69.0 mm
March 2023	72mm	85.2 mm
April 2023	73.1 mm	106.2 mm

Specifically, the period preceding the April 10, 2023, measurement was characterized by both above average snowfall accumulation and subsequent melt, which is consistent with the expected seasonal high groundwater recharge pattern. In order to further demonstrate that the cumulative effect of melting snow and precipitation in the form of rainfall would result in the seasonal high groundwater level being in April, the graph below of the climate normal for each month of the year indicates that the highest snow melt and rainfall combined is typical in March and April (i.e., the spring freshet).

In conclusion, through many decades of experience and documentation, it is known that the spring condition yields the "high" groundwater elevation. Based on the higher-than-normal precipitation in April 2023 combined with the spring freshet, it is reasonable to expect that this will provide a representative value for the "high" groundwater elevation.

GSS Comment: Our interpretation was that the objective of the MNRF requirement to consider conditions at the site and mean annual precipitation levels when identifying the maximum predicted water table was to confirm that the monitoring was not conducted during a prolonged dry period when measured water levels would not be indicative of typical seasonal high water levels for the site. The comment was not intended to suggest that seasonal high water levels do not typically occur in the spring. We were not convinced that objective was achieved by reviewing recorded precipitation values for a 1-month period prior to the date of the water level measurement.

We inferred that the recorded precipitation values included in the response were for the Environment Canada Mount Forest station, as daily precipitation data for the Hanover station are not available for the period after 2008. Our comparison of recorded monthly and annual precipitation data for the Mount Forest station and the closer Markdale station to the monthly normals and average annual precipitation of 1087 mm for the Hanover station indicated to us that the April 10, 2023 water levels measurements were not conducted during a prolonged period of lower than normal precipitation. No further response is necessary.

2. The approximate boundary of proposed extraction was shown on Figure 3 in the report, together with inferred contours for the surface of the estimated high water table. Two separate, irregularly shaped extraction areas were shown north and south of the central divide. The limits of extraction and the property boundaries were not shown on the cross-sections on Figures 4A and 4B; the only references were two monitoring wells. In the last paragraph in Section 5. and a similar section in the Section 7. summary, approximate high water elevations were identified for the northeastern and southwestern portions of the property, whereas the corresponding minimum pit elevations, based on a 1.5 m separation from the high water table, were identified for the northeast portion of the area of extraction and the expected southwestern-most portion of the proposed extraction area. The water table surface defined by the contours shown on Figure 3 indicated a high water elevation of 292.4 m at the northeast corner of the proposed extraction area in the north half of the site, and a high water elevation of 289.3 m or higher along the western limit of the proposed extraction area in the south half of the site. Based on the minimum 1.5 m separation from the high water table identified in the report, the corresponding minimum pit floor elevations would be 0.4 and 0.3 m higher, respectively, than the minimum elevations indicated in the report. GMBP should explain that variance and confirm that the minimum separation distance identified in the ARO standards for an above water pit will be maintained for the water table surface defined by the contours shown on Figure 3 and depicted on the sections on Figures 4A and 4B over the entire extraction area as shown on the site plans.

GEI Response: The April water levels – as referenced in Figures 3 and 4 were utilized to maintain a 1.5 m separation. The waterlevels utilized are shown on the Pit Drawings enclosed. To maintain the 1.5 m separation, based on the proposed limits of onsite extraction, the maximum depth of the pit would be approximately 293.5 masl in the northeast portion of the extraction area and sloping to approximately 290.5 masl in the expected southwestern-most portion of the proposed extraction area.

We have reviewed the information and confirm that a 1.5 m separation is provided from the WT surface.

GSS Comment: The GEI response indicated that the minimum pit floor elevation would be approximately 293.5 m in the northeast portion of the extraction area and 290.5 m in the expected southwestern-most portion of the proposed extraction area. That was consistent with information provided in the November 2023 hydrogeological assessment report and the February 2025 summary statement. The November 2023 (revised February 2025) site plans included with the response indicated that the maximum pit floor elevation along the southwestern-most margin of the extraction area was higher than 290.5 m, ranging from 290.70 to 290.80 m. That would potentially account for the variance noted in the GSS comment with respect to the southwest portion of the proposed extraction area.

GEI confirmed in their response that the site plans were reviewed for consistency with the high water table surface identified in the hydrogeological assessment report and that the minimum separation distance identified in the ARO standards was maintained. No further response is necessary.

3. The report noted that based on field observations and groundwater elevation data collected, the occurrence of surface water on the site (i.e., in the central saturated area) was expected to be consistent with the occurrence of the groundwater elevation. Surface water level monitoring data collected for the central ravine and wetland feature should be provided.

   GEI Response: Surface water field observations made during site visits to conduct groundwater level monitoring noted that the surface water appears to be present in this area during relatively high groundwater conditions or during surface run-off flooding events. Further, evidence of the surface water feature was not present during dry seasons.

   The proposed on site pit operations are required to have a setback from the areas of the property designated as Hazard Lands as part of the Grey County Official Plan. It is our understanding that development within the area designated as an SVCA screening area is not prohibited as long as suitable consultation with the SVCA has been conducted. SVCA has provided their sign off on the proposed pit.

   As noted during the field observations made during site visits, the surface water appears to be seasonal in nature and does not need specific monitoring.

   GSS Comment: The GEI response indicated that surface water level measurements were not carried out in the on-site surface water feature. In our opinion, water level monitoring in that wetland should have been carried out for the purpose of identifying the high water table elevation on the site and to provide base-line data for the wetland. The report indicated that the seasonal ponding areas in the central portion of the Site were inferred to be associated with the shallow water table elevation. That could have been readily confirmed with installation and monitoring of a shallow piezometer. We disagree with the suggestion that surface water monitoring was not needed because the occurrence of surface water was

seasonal. The intent of the study was to identify the seasonal high water table on the site, which would coincide with the period when water was present in the wetland.

In this instance, it was not apparent that the absence of water level monitoring in the on-site wetland materially diminished the findings of the hydrogeological study. Nevertheless, a suitable recommendation should be added to the site plans for a shallow piezometer to be installed in the on-site surface water feature within one year of issuance of the licence for measurement of surface water and groundwater levels, coincident with groundwater levels in the existing monitoring wells. Water levels should be measured on at least three occasions at least 2 weeks apart during the period of seasonal high water levels. The data should be reviewed by a qualified consultant for consistency with the conclusions presented in the report.

4. The report noted that since there are no proposed interactions with the water table or surface water features, the overall water budget, pre- to post-development, is expected to remain unchanged, and stated that equal infiltration to the subsurface will continue post-development. A water budget for the site was not presented. The main components of a water budget are precipitation, losses from evapotranspiration, runoff, and infiltration. The proposed limits of extraction were not shown on the cross-sections in the report, and we did not see the site plans. However, the information provided in the report suggested to us that there would be no surface runoff from the pit created in the north half of the site and reduced or no runoff from the pit created in the south half of the site. A reduction in the existing runoff would change the water budget and result in a corresponding increase in infiltration. GMBP should provide additional information to support the conclusion that the water budget for the site will not be changed by the proposed development. If there is a potential for a change in the water budget, then the associated implications should be evaluated.

   GEI Response: The existing infiltration rates at the site are not expected to change due to the proposed aggregate extraction. The proposal is for an above water gravel pit which requires the bottom elevation to be 1.5 m above the maximum predicted groundwater table. Given the high permeability of the soil, which will remain after extraction, surface water will continue to infiltrate at a similar rate to pre-development.

   Water budgets are designed for land development that includes changes to land use, especially the creation of impermeable surfaces. In our experience, water budgets are not typically applied to greenfield type works that result in temporary land use and localized changes to grading. Our comments regarding water budget relate to the large-scale and long-term considerations which includes the maintenance of open fields and vegetated lands that will continue to slope towards the same features.

   As noted on Drawing No. 3 Progressive Rehabilitation Plan, the surface flow direction (indicated by surface flow direction arrows on the drawing) will continue to be northeast pre and post development.

   GSS Comment: The rate of post-development infiltration may be similar to the pre-development rate based on the consistency of soil type, but the volume of infiltration on an

annual basis will change. The site plans indicated that two enclosed pits will be created in the north and south halves of the site. Notes on both the Operations Plan and the Progressive Rehabilitation Plan indicated that surface water drainage from those pits will be by percolation or evaporation, meaning there will be no runoff from those areas. The existing ground profiles shown on Sections B-B, C-C, and D-D on Drawing No. 4 indicated that there would be surface runoff to the west at the section locations under existing conditions. The proposed rehabilitation ground profiles shown on the same sections indicated that there would be no runoff beyond the western limit of the completed pits. Presumably, most of the volume of the current run-off from the 17.4-ha extraction area will become infiltration, with some potential for increased evapotranspiration. It is not conceivable to us that equal infiltration to the subsurface will continue post-development. We would consider the creation of a gravel pit on the site to be a change in land use and the alterations to the drainage conditions on the site to be permanent.

We assumed that the GEI comment that the surface flow direction indicated by the arrows on Drawing No. 3 Progressive Rehabilitation Plan will continue to be northeast was intended to mean west-southwest. The direction of surface water runoff within the completed pit may be consistent with the pre-development direction, but the site plans indicated that there will be no runoff at the western limit of the pits, as there is under existing conditions, unless the runoff ponds to a sufficient depth in the pit to flow over the top of the completed slopes.

Consistent with our original comment, we cannot agree with the conclusion that the water budget for the site will not be changed by the proposed development, and we recommend that the potential changes to the water budget on the site be identified and evaluated for potential effects on nearby surface water features. This is not to suggest that the implications will necessarily be negative. Increased infiltration and reduced runoff on the site could potentially be considered favourable with respect to local surface water features.

5. The report indicated that to maintain surface water flows to the same low-lying locations, the restored grades shall be sloped to maintain similar pre- and post-development catchment areas. The pre-development catchment areas were not identified, and it was not apparent how similar post-development catchment areas would be maintained for the proposed area of extraction. Additional information should be provided to indicate how that recommendation would be implemented.

   GEI Response: The catchment area of the pit and surrounding lands is the watershed of the Saugeen River. The catchment area can be seen in Appendix D and Appendix E. The restored grading of the property following completion of the extraction area will be sloped to maintain the pre-development catchment areas as provided in Drawing 3 and 4. The existing drainage patterns will be restored following completion of the extraction activities and infiltration the subsurface will be promoted.

   GSS Comment: The GEI response indicated that the catchment area referred to in the recommended mitigative measure in Section 6.3.4 Surface Water – Quantity of the hydrogeological assessment report and included on the site plan was the Saugeen River watershed. The site is located within a loop of the Saugeen River. We agree that the

proposed alteration to the site will not change the watershed area for the Saugeen River. However, the recommendation and the GEI response also indicated that the existing drainage patterns will be restored following completion of the extraction activities. As noted in Comment 4 above, the site plans indicated that there would be no surface runoff from the completed pit; therefore, it appeared to us that the recommendation to restore existing drainage patterns cannot reasonably be implemented. We anticipate that the implications of potential changes in surface runoff from creation of the pit will be evaluated in conjunction with the response to Comment 4. No additional response to Comment 5 is necessary.

We trust that these comments adequately respond to the Municipality's request.

Yours truly,

GSS Engineering Consultants Ltd.

W. Brad Benson, P.Eng.
Senior Hydrogeologist

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