GSS ENGINEERING CONSULTANTS LTD

25-029

September 25, 2025

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

Attention: David Smith
Manager of Planning

Re: **GEI Consultants September 11, 2025 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,

This letter provides our comments on the September 11, 2025 response from GEI Consultants Canada Ltd. (GEI) to peer review comments made by GSS Engineering Consultants Ltd. (GSS) in a July 23, 2025 letter to the Municipality of West Grey. GSS was originally retained by the Municipality to provide peer review comments on the November 2023 (revised) maximum predicted water table and hydrogeological assessment report prepared by GM BluePlan Engineering Limited 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. Our initial peer review comments were provided in a May 20, 2025 letter to the Municipality. Follow-up peer review comments to response letters from GEI on June 6 and June 16 were provided in letters from GSS to the Municipality dated June 12 and July 23, respectively.

COMMENTS

The May 20, 2025 letter from GSS provided five comments, numbered 1 to 5. The June 12 letter from GSS indicated that no further response to comments 1, 2, and 5 was necessary, although it was understood that Comment 5 would be addressed in conjunction with the response to Comment 4. Provided below for context is an abbreviated version of the June 12 comment from GSS with respect to comments 3 and 4, the June 16 response from GEI (in bold), the July 23 comment from GSS, the September 11 response from GEI (in bold), and current comments from GSS. A summary of our current comments is provided at the end of this letter.

3. GSS June 12 Abbreviated Comment: 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.

   GEI June 16 Response: A note will be added to the site plans as noted above.

   GSS July 23 Comment: The substance of the note should be provided.

   GEI September 11 Response: In response to the comments received on both June 13, 2025, and July 23, 2025, the wording of the note to be added to the site plan with respect to surface water monitoring is as follows:

   > **A shallow piezometer will be installed in the on-site surface water feature to measure surface water and groundwater levels, coincident with groundwater levels in the existing monitoring wells. Water levels will be monitored on at least three occasions, at least 2 weeks apart during the period of seasonal high-water levels.**

   GSS Current Comment: Consistent with our previous comment, the note should indicate the timing for installing the piezometer and measuring water levels and what will be done with the water level data.

4. GSS June 12 Abbreviated Comment: 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.

   GEI June 16 Response: The June 16, 2025 GEI letter provided a summary of a water balance prepared for the site that equated precipitation on the subject property to evapotranspiration/evaporation (ET), surface water runoff (R), and infiltration (I). A pre- and post-development water balance was prepared for the 41.2 ha subject property. The pre-development assessment identified an estimated 90,193 m^3 of runoff from the property on an annual basis and 119,520 m^3 of infiltration on the property. The post-development assessment identified a reduction in the estimated runoff of 886 m^3 (i.e., a 1% reduction) and an increase in infiltration of 356 m^3 (a 0.3% increase). The change was shown to be associated with a 1,990 m^2 area that contained an existing farmhouse and was estimated to be 64% impermeable. The site

plans indicated that the area of the building was located within the proposed pit. The comment concluded that based on the water balance calculations, the impact to the surface water features is that surface runoff to the surface water bodies will not increase.

GSS July 23 Comment: The GEI response did not address the substance of the GSS comment, which was that the site plans identified the development of two separate pits on the property with a combined area of 17.38 ha from which there will be no post-development runoff. As indicated in our previous comments, Note 8. on the Operations Plan and Note 12. on the Progressive Rehabilitation Plan stated that surface water drainage from the pits will be by percolation and evaporation. No drainage outlets from the completed pits were identified. Our interpretation was that there will be no surface runoff from the completed pits unless the runoff temporarily ponds to a sufficient height to overtop the rehabilitated pit walls on the down-slope side, which we estimated from the site plans to be a depth greater than 1 m. We considered the conversion of existing runoff to post-development infiltration over an area of approximately 17.4 ha to represent a substantial change to the water balance for the property. The potential implications of that change to the local ecosystem should be identified and assessed, particularly with respect to the potential for impacts to surface water features both on and near the property. That would include the on-site central ravine and wetland feature, possibly the Saugeen River to the west, and the unnamed watercourse located on the south side of Concession 4 NDR opposite the subject property, as described below.

The presence of the watercourse on the south side of the road was not indicated in the hydrogeological assessment report or on the site plans but was shown on Ministry of Natural Resources topographic and natural heritage mapping. The watercourse was shown to flow through an unevaluated wetland on an adjacent property located south of the gravel pit site. A drainage area for the watercourse generated by GSS using the MNR Ontario Watershed Information Tool (OWIT) indicated that runoff from most of the area of the proposed pit in the south half of the site currently flows to that watercourse and represents a substantial portion of the drainage area. That suggested to us that a culvert beneath Concession 4 NDR could be located in that area, although none was shown on the site plans.

The following additional specific comments are provided with respect to the GEI response:

- The total annual precipitation and estimated evapotranspiration used in the water balance should be identified.
- The method (e.g., Thornthwaite) that was used to estimate the evapotranspiration should be identified.
- The component values for soil type, topography, and surface cover used to estimate the infiltration factors should be identified.
- The response indicated that the direction of surface water runoff shown on the Operations and Progressive Rehabilitation plans was south-southeast. Those plans showed the direction of surface flow within the pits to be west-southwest.

- Note 25a Hydrogeological Study Notes on the Operations Plan specified that sloping of the restored grades to maintain similar catchment areas (pre- and post-development) shall be conducted to maintain surface water flows to the same low-lying locations. Consistent with our previous comments, it is not apparent how that recommendation will be implemented considering that the site plans indicated that there will be no runoff from the rehabilitated pit.

GEI September 11 Response: The GEI response to the GSS comment was provided under five separate headings. Our comments are provided separately under each of those headings after first repeating the GEI response (shown in bold).

Groundwater Fed Surface Water Feature

It is the opinion of GEI that the surface water feature at 382048 Concession 4 is groundwater fed rather than the result of surface water runoff. Monitoring well MW3 on the JT Pit property indicates that the groundwater table ranges from 287.18 masl at the driest times of the year to 288.01 masl at the wettest time of the year. Based on the water levels obtained on the JT Pit at MW3 and a review of the publicly available information such as Grey and Bruce County Groundwater Study and aerial photographs, a portion of the surface water feature at 382048 Concession 4 is groundwater fed especially during times of seasonally high groundwater elevations.

The response initially indicated that the surface water feature is groundwater fed rather than the result of surface water runoff, but went on to note that a portion of the surface water feature is groundwater fed especially during times of seasonally high groundwater elevations. We interpreted that to mean that GEI's position is that a portion of the flow in the watercourse is derived from groundwater discharge. We have no disagreement with that position. If GEI was suggesting that all of the flow in the watercourse is derived from groundwater discharge, then that should be supported with additional information.

Direction of Surface Water Runoff Catchment Area

Based on discussions on June 21, 2025 and August 25, 2025, it is GEI's understanding that there is a concern that the property to the south of the pit property (382048 Concession 4 NDR) will no longer receive surface water run off discharging from the pit property. Surface water run off from the pit property currently travels southwest across the site to the perimeter ditching between the roadway and the property and ultimately to the Saugeen River. Storm water drainage patterns pre and post development are illustrated in enclosed Figures 1 and 2. A 600 mm culvert at a elevation of 288.0 masl is present on the JT Pit Property to discharge surface water runoff under circumstances where pooling occurs, such as during large storm events. The current surface water runoff in the catchment area is west to southwest towards the perimeter ditching and the Saugeen River. These figures demonstrate that surface water drainage from the pit property is not currently proportionally contributing to the surface water feature on

382048 Concession 4 and therefore the development and rehabilitation of the pit property will not negatively impact this property, or the surface water run off that it receives.

The previous comment from GSS was related to the potential impacts to the watercourse on the adjacent property south of the pit property as a result of existing runoff flowing to that watercourse being retained within the proposed pit. Our concern was not that there will be reduced runoff to the adjacent property as a whole.

In their response, GEI indicated the presence of a 600-mm diameter culvert beneath Concession 4 NDR at a location south of the proposed pit property and opposite the mapped watercourse that flows in a southerly direction on the adjacent property to the south. As noted in our previous comment, no culvert or watercourse in that area were identified on the site plans or in the hydrogeological assessment report. Further, Figures 1 and 2 of the September 11 GEI letter also showed the presence of twin 1,000-mm diameter culverts beneath Concession 4 NDR at a location approximately 20 m west of the southwest corner of the proposed licence area. The locations and invert elevations of the culverts and the location of the watercourse should be shown on the site plans.

With respect to the last sentence in the above response, it was not clear to us what was meant by "proportionally", but the drainage arrows shown in catchment 103 on Figure 1 indicated that under existing conditions overland runoff from that catchment area would flow to the 600-mm diameter culvert beneath Concession 4 NDR, where it would presumably discharge to the watercourse. The post-development drainage conditions shown on Figure 2 indicated that the area of catchment 103 would be reduced by the presence of the pit, which would presumably reduce the volume of runoff that would flow to the watercourse.

Site Visit and Site Observations of Surface Water Runoff

A site visit was conducted on August 25, 2025, to determine predevelopment conditions, photos have been included as Appendix A. The site visit occurred following a period of rain events that took place on August 24 and August 25, 2025. It is noted that a culvert was observed on site at the time of the site visit. Photos of the site visit demonstrate that the field appeared to be damp, however, the culvert was dry, and no pooling water was observed. It is noted that the soil at the site has a high hydraulic conductivity which would result in limited surface runoff. Based on field observations, the culvert is present on site to allow drainage of surface water run off during large storm events (100-year storms).

Available precipitation data for the Environment Canada Mount Forest (Aut) station, the closest identified station to the site with current precipitation data, indicated that there was 3.5 mm of rainfall on August 24 and 1.1 mm on August 25. In our opinion, the conditions observed at the site in August, which is generally a period of the year when groundwater and surface water levels are near seasonal lows, would not necessarily provide a reliable indication of typical year-round flow conditions for the culvert. We agree that the relatively high permeability soils identified at the site would tend to promote infiltration and thereby reduce runoff, provided that

the ground surface is not frozen and/or the water table is not near the ground surface. The inferred groundwater contours from April 2023 water level measurements shown on Figure 3 of the hydrogeological assessment report indicated that the water table in the southwest portion of the property was near ground surface at that time and implied that there would be more than 0.5 m of standing water in the low area adjacent to the culvert if the culvert was not there. If it is being suggested that the culvert would only flow during a 100-year storm event, then additional information should be provided to support that.

Surface Water Runoff Onto 382048 Concession 4 NDR

It is acknowledged that there are proportional contributions of surface water runoff based on limited water flow in the above noted culvert; however larger contributions originate from the properties adjacent to the east. The local topography of the properties adjacent to the east of 382048 Concession 4 NDR suggest that the surface run off in the immediate area of 382048 Concession 4 would travel west to the river. The properties immediately adjacent to 382048 Concession Road 4 are approximately 292 masl compared to the approximate elevation of 382048 Concession Road 4 in the wet area of 288 masl. 382048 Concession 4 is also mapped in a floodplain area of the Saugeen River. During times of high-water levels of the Saugeen River, the river is also a likely source of surface water on 382048 Concession 4.

The response acknowledged that there would be a contribution from surface water runoff on the site to the watercourse on the adjacent property to the south via flow through the culvert beneath Concession 4 NDR. We agree that topographical mapping indicates that there is likely to be a contribution to that watercourse via surface runoff from the higher ground to the east. From the information provided in the response, it was not apparent what the magnitude of that contribution would be relative to the contribution from the pit property. The comment related to flood flows in the Saugeen River may have been intended to relate to the property in general, but it was not apparent to us that the river would contribute to flow in the watercourse.

Catchment Area Runoff and Infiltration

While the direction of surface run off will continue to be in a southwesterly direction, it is acknowledged that there will be some change to the overall runoff associated with the pit property. The post rehabilitation grading will maintain the overall direction of runoff; however, some amount of runoff will not discharge off site and will infiltrate on the property due to a "basin" effect from the final contours. There is a volume of water that will be captured in this small "basin" that will not run off the site. This volume of water was calculated to be 376,850 m^3 per year based on the area of the excavation areas multiplied by annual precipitation and accounting for a portion of the water to evaporate. While this volume will no longer run off the site, it will infiltrate into the soil on the JT Pit property. The local groundwater flows towards the Saugeen River, the infiltrated water will travel as groundwater to the Saugeen River. It is our opinion that the water balance

of the overall catchment area will not be impacted as the surface water in this area also ultimately travels to the Saugeen River.

The GEI response acknowledged that there will be a reduction in runoff from the site and a corresponding increase in infiltration as a result of water leaving the site as runoff under existing conditions being contained within the completed pits where it will infiltrate. The area of the catchments from which there would be no post-development runoff was identified on Figure 2 as 9.54 ha for the north pit (catchment 200) and 14.54 ha for the south pit (catchment 204). The estimated volume of water that would be captured by the pits was 376,850 m^3 per year, based on the area of the excavation areas multiplied by annual precipitation and accounting for a portion of the water to evaporate. That would be a considerable volume of water, equivalent to an average of 1,032 m^3/day. Based on the total identified catchment area of 24.08 ha (240,800 m^2) that was associated with the pits, the estimated infiltration volume of 376,850 m^3 would equate to 1,565 mm of infiltration per year. That does not seem reasonable. For comparison, the 30-year normal (1981-2010) precipitation data for the Environment Canada Durham station was identified as 1,119 mm per year. GEI should review the analysis to confirm that it is appropriate, and the total annual precipitation and estimated evapotranspiration values should be identified, as requested in our previous comments. In addition, we inferred that the estimate provided was for total post-development infiltration associated with the pits. In our view, the increase in post-development infiltration relative to existing conditions would be more relevant for an assessment of the related implications. That would require an estimate of the pre-development infiltration in the affected area, with supporting information.

The response indicated that local groundwater flows to the Saugeen River, and that water that infiltrates in the pits will travel as groundwater to the Saugeen River. Under the heading of Groundwater Fed Surface Water Feature, GEI indicated that the watercourse on the adjacent property to the south was fed by groundwater. We inferred that a portion of that groundwater would originate on the property to be licensed. We also inferred that shallow groundwater on the site would seasonally discharge to the central ravine and wetland feature located between the proposed pits and evaluated in the NETR. Consistent with our previous comments, the potential implications of decreased runoff and increased infiltration on the site should be identified and assessed with respect to the potential for impacts to surface water features on and near the property, including the central ravine and wetland feature, the Saugeen River to the west, and the watercourse located south of Concession 4 NDR opposite the subject property.

SUMMARY OF COMMENTS

The following is a summary of the additional response considered necessary to adequately address our comments.

- The note to be added to the site plans to address our previous Comment 3 should indicate the timing for installing the piezometer and measuring water levels and what will be done with the water level data, consistent with our previous comment.

- The locations and invert elevations of the three culverts beneath Concession 4 NDR that were identified in the most recent response from GEI at locations immediately south and southwest of the pit property, as well as the identified watercourse on the adjacent property south of the pit property, should be shown on the site plans for the area within 120 m of the licence boundary.
- The estimate of the post-development infiltration in the area of the proposed pits should be reviewed to confirm that it is appropriate and relevant input parameters should be provided.
- Based on GEI's evaluation, specific comments on the potential for impacts to the on-site central ravine and wetland feature and the watercourse on the adjacent property to the south of the site as a result of the identified decreased runoff and increased infiltration in the area of the proposed pits should be provided, together with reasoning that is consistent with the comments provided in this letter.

We trust that these comments are sufficient for the Municipality's current requirements.

Yours truly,

GSS Engineering Consultants Ltd.

W. Brad Benson, P.Eng.
Senior Hydrogeologist