December 18, 2025
Project No. 2402308

GSS Engineering Consultants Ltd.
945 3rd Avenue East, Suite 230
Owen Sound, ON
N4K 2K8

Attention: W. Brad Benson

Re: Peer Review Comments
Maximum Predicted Water Table and Hydrogeological Assessment Report
Proposed Class 'A' Pit Above Water (Watson Pit), Teeswater Concrete Ltd.
311804 Highway 6, Mt. Forest
Municipality of West Grey, Grey County

Dear Brad:

GEI Consultants Canada Inc (GEI) has been retained by Teeswater Concrete Ltd. (the Client) to provide a response to the Peer Review comments issued to the Municipality of West Grey by GSS Consultants Ltd, dated November 17, 2025.

The following outlines the comments received from GSS Consultants Ltd and GEI's response.

Peer Review Comment May 2025

1. Section 2.2.1 of the report indicated that ten monitoring wells were installed to depths between 7 and 18.8 meters at six locations March 9, 10, and 21, 2023 by London Soil Test Limited. The borehole logs were reportedly provided in Appendix B. In the report provided to GSS, Appendix B contained logs for eight test holes advances at the site by Choice Sonic Drilling on February 2 and 3, 2023 and logs for twenty-two (22) test holes excavated at the site on February 2 and 3, 2023. No associated monitoring well installations were shown on those logs. Borehole logs for the monitoring wells utilized for the hydrogeological assessment were not included. Copies of those logs should be provided to GSS for us to properly complete our review.

GEI Response

Borehole logs for the monitoring wells utilized for the hydrogeological assessment have been enclosed as an appendix to this response letter. GEI confirms that 10 monitoring wells were installed on the property as noted in the hydrogeological report.

Peer Review Comment November 2025

No further response is necessary.

Peer Review Comment May 2025

2. Groundwater levels at the site were reportedly measured on three occasions: March 22, July 18 and October 23, 2023. The report indicated that the high groundwater table elevation was expected to be consistent with the water levels measured on March 22, 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 the direct measurement of the high water level could be made and the pit floor elevation updated accordingly. No additional water level data were provided. The high water elevations shown of the April 2024 site plans (revised March 2025) were based on the March 2023 groundwater level data. For reference, the MNRF August 2020 Aggregate resources of Ontario (ARO) standards for a maximum predicted water table report (updated in August 2023) indicated that the maximum predicted water table shall be determined by monitoring the groundwater table at the site for a minimum of one (1) year to account for seasonal variations and influences from precipitation, unless alternative information already exists (e.g. previous studies, existing well data) to support a determination of the maximum predicted water table by a qualified person. As no supporting alternative information was provided, the monitoring data presented were less than what was specified in the ARO standards. For the purpose of our peer review for the Municipality, we would not consider one year of data to be necessary provided that it could be demonstrated that the data obtained reasonably represented the typical high water conditions for the site.

GEI Response

Groundwater levels have been monitored since 2023 and continue to be monitored at the pit property, with dataloggers being installed in the fall of 2025. The most recent water level data that has been obtained is enclosed with this letter. The results of the groundwater level monitoring noted that the highest water levels were observed in June of 2024 for all wells with the exception of MW2, MW3 and MW6s. These monitoring wells experienced their highest water levels in March of 2023.

Continued discussion regarding the maximum groundwater elevations and bottom contours are provided in the following responses.

Peer Review Comment November 2025

Water level data were provided for three additional monitoring events at the site on June 21, August 30, and December 10, 2024. Comments on the utility of the data for identifying the seasonal high water table are provided in Comments 4 and 5.

GEI Response

A response will be provided to comment 4 and 5.

Peer Review Comment May 2025

3. Table 2 in the report indicated that the groundwater elevations measured on March 22, 2023 were considered to be the annual maximum groundwater table elevation for the site. However, the water level data presented in Table 2 indicated that the groundwater levels measured in MW-1S, MW-4S and MW-5S on July 18, 2023 were approximately 0.5 m higher than the recorded water levels on March 22. Conversely, the recorded water level in MW-2 declined by 2.7 m over the same period. The recorded October 2023 water levels for MW-1S, MW-4S and MW-5S were also higher than the March 2023 levels. The data indicated that the annual high water table elevation identified in the report and shown on the site plans were not consistent with the conditions at the site. Additional data should be provided as necessary to adequately demonstrate the typical seasonal high water table for the site has been identified.

GEI Response

To provide more certainty regarding maximum groundwater elevations, groundwater levels continue to be monitored at the pit property, with dataloggers being installed in the fall of 2025.

Peer Review Comment November 2025

Water level data were provided for three additional monitoring events at the site on June 21, August 30, and December 10, 2024. Comments on the utility of the data for identifying the seasonal high water table are provided in Comments 4 and 5.

GEI Response

A response will be provided to comment 4 and 5.

Peer Review Comment May 2025

4. Available water level data for the Environment Canada gauge on the Beatty-Saugeen River at Holstein, approximately 3 km east-northeast of the site, suggested that the shallow groundwater levels on the Site on March 22, 2023 were less than average for that month and that the seasonal high levels for shallow groundwater likely occurred in the first week of April 2023. Additional information should be provided to support the finding that the seasonal high water table identified for the site is reasonably representative of typical site conditions. That information is commonly obtained from placement of data loggers in selected monitors to continuously record the water level and/or reference to relevant provincial or federal data for the vicinity of the site.

GEI Response

While surface water gauges can provide an indicator of local groundwater levels there is often a delayed response, and direct correlation is site dependent. Our experience for this type of site is that the highest groundwater elevations are most typically associated with the spring freshet.

Regardless, to provide direct measurement of onsite groundwater elevations, groundwater levels continue to be monitored at the pit property, with dataloggers being installed in the fall of 2025. This groundwater monitoring program is proposed to continue during pit operations. Consequently, spring water levels will be captured every year.

Peer Review Comment November 2025

We agree that the highest groundwater elevations are most typically associated with the spring freshet. Available surface water level and discharge monitoring data for the Environment Canada guage on the Beatty-Saugeen River at Holstein, approximately 3 km east-northeast of the site, indicated that in 2023 the spring freshet in the vicinity of the site occurred in the first week of April and in 2024 the spring freshet occurred in mid-April. No April water level monitoring data were provided for the site.

GEI Response

Dataloggers have been installed in the fall of 2025 and will collect data in addition to on going manual groundwater level monitoring. April data will be obtained in 2026.

Peer Review Comment May 2025

5. There was no comparison between available precipitation data for the period of monitoring and typical precipitation levels for the area of the site. The August 2020 ARO standards (updated in August 2023) defined the maximum predicated water table as the maximum groundwater elevation predicated by a qualified person who has considered conditions at the site and mean annual precipitation levels. Local Environment Canada precipitation data and available 30-year normal suggested that 2022 and the beginning of 2023 through March 22 were drier than normal. Conditions for the water level monitoring period should be compared to relevant precipitation data to support the finding that the identified seasonal high water table is reasonably representative of typical conditions.

GEI Response

GEI has reviewed the climate normal data from a nearby weather station which is available through the Environment Canada website. A copy of the Temperature and Precipitation Graph for 1981 to 2010 Canadian Climate Normals for the Hanover weather station is provided below.

The cumulative effect of melting snow and precipitation in the form of rainfall would result in the seasonal high groundwater level typically in the spring. Through many decades of experience and documentation, it is known that the spring condition yields the “high” groundwater elevation. Therefore, it is expected that the high groundwater elevations that were observed in most monitoring wells in June 2024 would be indicative of seasonal high groundwater.

As discussed previously, we are proposing to provide groundwater level monitoring over the life of the pit which will provide certainty regarding the maximum groundwater table.

Peer Review Comment November 2025

We agree with GEI's position that spring conditions typically yield the "high" groundwater elevation. We do not agree that the groundwater levels measured on March 22, 2023 and June 21, 2024 were indicative of the seasonal high water table at the site. Water level data for Provincial Groundwater Monitoring Network (PGMN) well W0000276-2, available from the MECP, indicated that the groundwater level in that well on June 24, 2021 was 0.4 m lower than the high groundwater levels recorded in mid-April 2025. That PGMN well was reportedly screened in sand and gravel at a depth of 4.0 to 5.2 m in a former gravel pit site, similar to the reported soil conditions at the site and at a location south of Mount Forest approximately 17km south-southeast of the site.

We understand that the objective of the MNR 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. In our experience, that would typically be done by comparing recorded daily precipitation in the vicinity of the site for the period of monitoring with established normal precipitation values for the same period.

The Environment Canada Mount Forest meteorological station was shown to be located 8 km from the site. Our comparison of the recorded 2023 and 2024 monthly and annual precipitation for that station to the 30 year climate normal (1991 – 2020) for the same station indicated that the total precipitation in 2023 was 10% less than normal, and the 2024 precipitation through June 30 was 9% less than normal. The recorded precipitation in June 2024 was approximately 70% less than normal, which indicated to us that the June 21, 2024 water level data were unlikely to be indicative of the seasonal high groundwater levels at the site. GEI indicated that groundwater level monitoring at the site will continue to identify the seasonal high groundwater level. In accordance with ARO standards, the results should be considered relative to local precipitation data to confirm that the conditions when the high water level was identified were typical with respect to normal precipitation.

GEI Response

Once the spring data has been collected in 2026, appropriate comparisons will be made to the local precipitation data. In addition, with dataloggers capturing ongoing groundwater elevations, the data should reveal a clear peak at the maximum groundwater table to confirm that the high water level has been identified.

Peer Review Comment May 2025

6. Although it is seemingly subject to change, Drawings 2A and 2B Operations Plan showed an excavation elevation of 393.00 m at the location of MW-6S in the proposed extraction area, where the high water table was shown at elevation 391.69 m, indicating a separation distance of 1.3 m.

GMBP should confirm that the design pit floor elevations are consistent with the ARO standard for an above water pit.

GEI Response

The updated plans, which include an adjustment for the most recent water level information, will follow in the days after this submission.

More importantly, and as noted previously, to maintain the 1.5 m separation, groundwater elevations will continue to be monitored throughout the duration of extraction and overseen by a qualified professional. Groundwater elevations will be compared to proposed bottom contours and bottom contours will be adjusted to maintain a 1.5 separation above to the maximum expected groundwater table, as necessary.

Peer Review Comment November 2025

Similar to the above response, on Page 1 of the October 31, letter GEI proposed to add the following note to the site plans. Groundwater elevations will continue to be monitored manually as well as with the installation of dataloggers throughout the duration of extraction and overseen by a qualified professional. Groundwater elevations will be compared to proposed bottom contours and bottom contours will be adjusted to maintain a 1.5 m separation above the maximum expected groundwater table as necessary.

We consider that this proposal could potentially be suitably protective of water resources provided that it is appropriately implemented and adhered to, although it is unclear what mitigative measures will be implemented in the event that future groundwater monitoring indicates that extraction has occurred within 1.5 m of the water table. We would also expect that this proposal will require one or more future applications to the MNR to amend the site plans by revising the approved bottom elevations for the pit. While we have reservations about the workability of the approach, we will not take issue with the GEI proposal, provided that the MNR considers this approach to be reasonable and consistent with the ARO standards, and provides their approval. However, as a minimum, the proposed note to be added to the site plans should be revised to identify the monitoring wells and piezometers that will be included in the monitoring program, the minimum frequency of monitoring, and that an annual report on the monitoring data with a comparison of the recorded high water level elevations and the existing pit bottom contours, as well as relevant precipitation data, will be prepared by a qualified professional and submitted to the MNR for review.

GEI Response

The monitoring wells that will be monitored will be added to the note on the site plan.

There is no requirement to submit an application to the MNRF to raise the bottom contours to maintain the 1.5 m separation distance from the maximum groundwater table. Regardless of the proposed bottom contours, no extraction below the encountered water table is permitted. It is our understanding that the 1.5 m separation has been developed to account for local and seasonal variability in the actual water table. It is known that water table elevations can vary from year to year. It is not uncommon for pits to have to

adjust operations when unexpected conditions are encountered. This is mitigated through drawing notes that prohibit extraction below the water table.

We are making best efforts to determine the 1.5 m separation and it is understood that adjustments to bottom contours may be necessary. It is our understanding that changes to extraction areas that result in a smaller footprint (vertical and horizontal) do not need approval (ie. the limits of extraction are the maximum allowable under the permit).

Peer Review Comment May 2025

7. The report noted that the seasonal ponding areas in the central portion of the site were inferred to be associated with the shallow water table elevation. The report further noted that the estimated high water table on the site was consistent with the topography, water level elevations from the monitoring wells, and surface water elevations measured on the site. The surface water level data obtained for the site should be provided. It would be useful to also show that data with the groundwater elevation data on the figure(s) depicting the estimated water table contours for the site. It was not apparent that the surface water levels were monitored in the provincially significant Letterbreen Bog in the south portion of the site, as the report noted that it was inferred that the surface water elevation in the bog was generally consistent with the water table elevation. Surface water and shallow groundwater level monitoring with a piezometer(s) in the on-site bog for comparison to nearby groundwater level data would confirm that. If representative surface water level data for the bog were not collected and can't be obtained within the timeframe of the application process, then a suitable recommendation should be included on the site plans for shallow piezometer(s) to be installed in the bog and monitored for a period of at least one year, with the data reviewed by GMBP for consistency with the conclusions presented in the report.

GEI Response

The wording of the note to be added to the site plan with respect to surface water monitoring is as follows:

Surface water and shallow groundwater level will be monitored with a piezometer(s) in the on-site bog for comparison to nearby groundwater level data. A shallow piezometer will be installed (within one year of issuance of the pit license) in the on-site bog 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. The data will be reviewed by a qualified consultant for consistency with the conclusions presented in the hydrogeological report.

Peer Review Comment November 2025

Our May 9 comment indicated that a note should be added to the site plan in the event that representative surface water level data for the bog were not collected or could not be obtained within the timeframe of the application process. The October 31 GEI letter indicated that groundwater level monitoring at the site with data loggers is currently ongoing and will continue over the duration of the extraction in order to

identify the expected high water table at the site. GEI also indicated in their letter that revisions to the hydrogeological assessment will be completed after the peer review process is concluded satisfactorily. Under those circumstances, the shallow piezometer(s) should be installed at a suitable location(s) in the bog now and water levels should be monitored in conjunction with the other monitoring wells. The water level data for the piezometer(s) should be used in identifying the expected high water table for the site and for evaluating the potential for impacts to the bog from the proposed extraction.

GEI Response

A piezometer will be installed in a suitable location to be monitored in conjunction with the monitoring wells on site.

Peer Review Comment May 2025

MNRF mapping showed an unevaluated wetland in the wooded area in the northwest corner of the proposed extraction area and MNRF and Grey County mapping and imagery showed a small pond in the north-central portion of the extraction area. A comment should be provided on why those were not shown in the report as existing surface water features and were not considered to be indicative of the seasonal water table elevation at those locations. The summary statement indicated that the area of the property proposed for licensing was the elevated portion of the property set back from ponds/seasonally wet areas.

GEI Response

Air photos taken by GEI on September 1, 2023, included below show that the pond that is noted in the peer review comments now appears to be a small depression that is currently farmed as part of the agricultural operations. This area appears to have been filled as part of agricultural operations and does not appear to be consistent with an unevaluated wetland.

Dance Environmental Inc, completed an EIS in February 2024 and after reviewing the EIS report, it is noted that neither an unevaluated wetland nor a pond is not identified as a surface water feature in this area. A figure indicating the features found on the pit property has been enclosed as an appendix to this letter.

Monitoring wells MW4s and MW4d are in close proximity to the area and are at a depth that would intersect the bottom of this wet area. These monitoring wells monitor the actual groundwater elevation at the pit property in this area.

Based on this information, GEI is of the opinion that the historic depression was likely surface water fed and that the local nested monitoring wells provide a more certain elevation for the water table elevation.

Peer Review Comment November 2025

The appended ecological land classification (ELC) figure dated February 2024 from the natural environment report identified the area in the northwest portion of the site shown as a wetland on MNR mapping as a “dry-fresh Scotch pine naturalized conifer plantation” and did not indicate the presence of a

surface water feature in the cultivated field in the north-central portion of the extraction area. No further response is necessary.

GEI Response

Acknowledged.

Peer Review Comment May 2025

8. 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-, 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 progressive rehabilitation plan (Drawing 3) indicated that the completed pit floor will slope towards the north and be 9 m below the existing ground at the north limit of extraction. The notes on that plan indicated that the surface water drainage will be by percolation or evaporation. Under those conditions, the expected run off from the completed area of extraction would be zero. From the information provided in the report and site plans, it was not apparent that there is currently no runoff from that area. 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. It is not apparent that increased infiltration would negatively affect the on-set wetland to the south, but there would be a potential for an increase in the elevation of the seasonal high water table on the site.

GEI Response

A technical memo has been prepared (enclosed) outlining the impact to infiltration from the pit property.

Peer Review Comment November 2025

Appendix D to the October 31 GEI response letter contained October 28 GEI technical memo with detailed water balance calculations that compared the estimated pre-and post-development conditions. The approach was based on a water balance example described in Section 3.2.3 and shown in Table 3.1 of the 2003 MOE Stormwater Management Planning and Design Manual. In our experience, that approach is commonly used for water balance assessments. The memo indicated that GEI used input parameters for the water balance, including annual precipitation and evapotranspiration values, which were taken directly from the Table 3.1 example calculation. In our experience that practice is not typical. Section 3.2.3. of the MOE manual noted that the water balances should be on a site by site basis.

GEI indicated that given their study focused on comparing pre-development and post-development conditions, specifically runoff volume changes resulting from development of the pit, generic parameters

were used instead of site specific data. GEI further noted that as site-specific data could not feasibility be generated within the limited timeframe of this project, the generic parameters were considered to be appropriate for the purpose of pre- and post-development comparison.

In our opinion, it would have been more appropriate to identify and use representative, site specific input parameters for the water balance calculation in accordance with standard practice. Had site specific parameters been used, we would expect the magnitude of the estimated runoff and infiltration volumes shown in Table 1 of the memo to be different. However, because the assessment was based on a comparison of pre-and post-development conditions and because the same input parameters were used for both sets of calculations we would not expect the overall findings of the assessment to materially change with respect to the potential for impacts on local surface water features.

The October 28 GEI technical memo compared the pre-and post-development average surface runoff volume and infiltration for the environmental feature north of the proposed basin (North Feature). The North Feature was not specifically identified and it was not apparent to GSS what was meant by the North Feature. The memo noted that ecology data for the North Feature was not available at this moment and it was not feasible to determine the sensitivity of these features.

The memo indicated that creation of the proposed pit would reduce the drainage area draining to the North Feature, however, the south to north shallow groundwater flow would not be impacted by the pit. The memo further noted that the proposed basin associated with the pit will promote the annual infiltration significantly and that the increased infiltration volume to the North Feature will compensate for the decrease of the surface runoff volume. For the post-development condition, the proposed pit was assumed to act as an infiltration pit which would infiltrate all surplus precipitation with no runoff to nearby features. The results of the evaluation were shown in Table 1 of the memo for the pre and post development annual surplus volume draining north. A 41% increase in surplus volume to the north was estimated as a result of enhanced infiltration capacity of the proposed pit. The memo concluded that the proposed pit will not pose a significant adverse impact to the ecology functions of the North Feature.

The water balance assessment did not discuss potential impacts from the proposed pit on the provincially significant Letterbreen Bog, located in the southern portion of the site and extending off-site to the south. Figures 1 and 2 of the memo indicated that the drainage area to the bog would be substantially reduced by the proposed pit and the attached calculations indicated to us that there would be an estimated reduction in runoff to the Letterbreen Bog of approximately 103,000 m^3 per year, with no corresponding input from infiltration. Watershed mapping prepard by the SVCA and drainage areas generated by GSS using MNR OWIT indicated that approximately the southern three-quarters of the proposed licensed area is currently located in the drainage area for the South Saugeen River, while the northern portion of the licensed area was located in the Beatty-Saugeen River watershed. The post development drainage plan shown on Figure 2 of the memo indicated that almost all of the licensed area would be located in the drainage area for the Beatty-Saugeen River. GEI should comment on potential impacts to Letterbreen Bog indicated by the water balance assessment and identify appropriate mitigative measures as necessary.

The surface drainage conditions shown on the March 2025 Existing Features Plan (drawing 1) for the site indicated that surface flow in the proposed licensed area was in a northerly direction. That was not consistent with Figure 1 of the October 28 technical memo which showed pre-development overland flow

in most of that area was in a southerly direction. The Existing Features Plan should be revised as appropriate.

GEI Response

A revised technical memo is enclosed.

Peer Review Comment May 2025

The report and site plan notes 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 area would be maintained for the proposed area of extraction. Additional information should be provided to indicated how that recommendation would be implemented.

GEI Response

A technical memo has been prepared (enclosed) outlining the impact to infiltration from the pit property.

Peer Review Comment November 2025

Figure 1 and 2 of the October 28 technical memo indicated that similar pre and post development catchment areas will not be maintained. If the above-noted recommended mitigative measure from the hydrogeological report will remain on the site plans, then details should be provide on how that recommendation will be achieved. If the recommendation will be removed from the site plans, then we have no further comment.

GEI Response

The hydrogeological report and site plans will be revised based on the peer review process. Once the peer review process is completed the appropriate revisions will be made.

Summary and Conclusion

The following summary of comments was provided by GSS. In addition to the comment responses provided in the table above; GEI offers a comment response below the comment bullet.

- Based on the information provided, we consider it unlikely that the seasonal high water elevation at the site has been adequately identified to date. To address this shortcoming, GEI is proposing to monitor water levels throughout the duration of extraction and to adjust the bottom contours of the proposed pit as necessary to maintain a minimum separation of 1.5 m from the identified high water table. We have reservations about the workability of this

approach but will not take issue with the proposal provided that the MNR considers that approach to be reasonable and consistent with the ARO standards, and provides their approval. However, as a minimum, the proposed note to be added to the site plans should be revised to identify the monitoring wells and piezometers that will be included in the monitoring program, the minimum frequency of monitoring and that an annual report on the monitoring data with a comparison of the recorded high water level elevations and the existing pit bottom contours, as well as relevant precipitation data, will be prepared by a qualified professional and submitted to the MNR for review.

GEI Response

The monitoring wells that will be monitored will be added to the note on the site plan. Any revisions needed to bottom contours will be submitted to the MNRF as required.

- In response to our previous comment that the water level monitoring should be carried out in the provincially significant Letterbreen Bog located in the south portion of the site, GEI indicated that a note will be added to the site plans that a shallow piezometer must be installed in the on-site bog within one year of issuance of the pit license. In light of the current proposal for identifying the expected high water table at the site, one or more piezometers as necessary should be installed in the bog now to adequately identify the water table in that area. The piezometer(s) should be incorporated into the proposed ongoing water level monitoring program for the site and the water level data for the piezometer(s) should be used in identifying the expected high water table and for evaluating the potential for impacts to the bog from the proposed extraction.

GEI Response

A piezometer will be installed in a suitable location to be monitored in conjunction with the monitoring wells on site.

- A water balance assessment carried out by GEI in October 2025 to compare pre- and post-development conditions indicated that the proposed pit would increase the overall surplus volume of water draining to the north and will not pose a significant adverse impact on the ecology functions of the “North Feature”. The nature of the North Feature was not apparent. The assessment did not comment on the potential for impacts to features located south of the proposed pit. The calculations provided suggested to us that the proposed pit would result in a reduction in runoff to the Letterbreen Bog of approximately 103,000 m^3 per year with no corresponding increased input from infiltration. Available information indicated that the Letterbreen Bog was located in a different subwatershed than the north portion of the proposed pit, and that the drainage boundary would be changed by the proposed pit. GEI should comment on potential impacts to Letterbreen Bog indicated by the water balance assessment and identify appropriate mitigative measures as necessary. The surface drainage conditions shown on the March 2025 Existing Features Plan (Drawing 1) indicated that surface flow in the proposed licensed area was in a northerly direction. This was not consistent with Figure 1 of the October 28 water balance technical memo which showed that the pre-development overland flow in

most of that area was in a southerly direction, toward Letterbreen Bog. The Existing Features Plan should be revised as appropriate.

GEI Response

A revised Technical Memo is enclosed.

- A recommended mitigative measure from the hydrogeological assessment report indicated that restored grades shall be sloped to maintain similar pre- and post-development catchment areas was inconsistent with the findings of the October 28 water balance assessment. If that recommendation will remain on the site plans, then details should be provided on how that recommendation will be achieved.

GEI Response

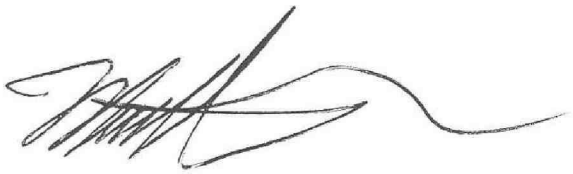
The hydrogeological report and site plans will be revised based on the peer review process. Once the peer review process is completed the appropriate revisions will be made.

Any revisions that are required to the hydrogeological assessment as a result of these comments and responses will be completed once the peer review process is concluded satisfactorily. If you have any questions, please feel free to contact me via email at kpickett@geiconsultants.com.

Sincerely,

GEI Consultants Canada Ltd.

Kim Pickett, C.E.T, LET, QP_{ESA}
Project Geoscientist



Matthew Nelson, P. Eng., P. Geo
Vice President, Senior Project Manager, ENV
Practice Lead

Enclosures:

Appendix A: Revised Technical Memo

Appendix A

Technical Memo

GEI Consultants

To: Brad Benson, P.Eng. Senior Hydrogeologist
GSS Engineering Consultants Ltd

From: Chaodong Sheng, M.Sc., P.Eng.
Senior Engineer and Project Manager, GEI Consultants Ltd.

Date: December 4, 2025

Re: Hydrogeology Assessment of Proposed Class "A" Pit
311804 Highway 6, Mt Forest
Municipality of West Grey, Grey County
GEI Project No. 2402308

1.0 – Background

Based on the Peer Review letter (May 2025) and the response to peer review comments provided by GSS Engineering Consultants Ltd. (GSS) dated **November 17, 2025**, this Technical Memorandum (Tech Memo) has been prepared to outline the **Terms of Reference** for completing the required water balance assessment. This Memo summarizes the overall water balance assessment approach, including methodology and parameters.

2.0 – Water Balance Assessment Approach

The Thornthwaite and Mather (1957) method, as defined in the Ministry of the Environment Ontario (MOE) "Stormwater Management Planning and Design Manual" (2003), was applied for this analysis. Specifically, Table 3.1 of the 2003 MOE Manual—which provides generic precipitation, evapotranspiration, and surplus (runoff + infiltration) depths for various combinations of soil types, land use, land cover (LCLU), and land slope—was used for the water balance (WB) volume calculations.

To address recent comments, a modified version of Table 3.1 was derived using site-specific precipitation data obtained from the nearest weather station in Hanover, based on Environment Canada's climate normals (1981–2010). Other parameters, including evapotranspiration and surplus depths for various combinations, were proportioned according to the values in the original MOE Manual Table 3.1. The modified MOE Manual Table 3.1 was provided in **Attachment 1**.

This modified Thornthwaite and Mather (1957) approach can provide a conceptual estimate of the annual average surplus or deficit volume for the target site's water balance, while maintaining the overall framework of

the MOE method.

With this approach, the annual average surface runoff volume and infiltration for the environmental features north and south of the proposed basin under both pre-development and post-development conditions, were calculated and compared. The feature immediately south of the site is the Letterbreen Bog and is part of the South Saugeen River watershed. Since the nearest watercourse north of the site is the Beatty Saugeen River, approximately 2km in distance from the site, hydrological changes to the site will not have immediate disruptive changes to this watercourse. However, the north drainage area is a part of the watershed contributing to tributaries joining the Beatty Saugeen River – changes to this drainage area may have gradual marginal effects on the River. Therefore, this drainage area will be analyzed and is henceforth known as the North Feature.

With the proposed drainage alteration due to the proposed basin, the drainage area draining to north feature will be reduced. However, as per the groundwater contour map, the groundwater is flowing from south to north, which will not be impacted by the surface drainage alteration due to the proposed basin. Furthermore, the proposed basin will promote the annual infiltration capacity significantly. The increased filtration volume to the North Feature will compensate for the decrease of the surface runoff volume. The calculations will quantify the overall annual surplus volume, which is the sum of surface runoff plus infiltration, under both pre-dev and post-dev conditions and compare these differences.

The ecological community identified to the north of the site are Dry-Fresh Graminoid Meadow (MEGM3) and Dry-Fresh Scotch Pine Naturalized Conifer Plantation (FOCM6-3), as per *Natural Environment Level 1 & 2 Reports and E.I.S.* (Feb, 2024), prepared by Dance Environmental Inc. The FOCM6-3 community is dominated by mid-aged Scotch Pine. Overall, very minimal diversity of species was present below the canopy of Scotch Pine. The MEGM3 community is dominated by Awnless Brome and Orchard Grass with other species like Timothy, Giant Crabgrass, Brown Knapweed, Wild Carrot, and Early Goldenrod also being present. Common Milkweed with some Monarch presence was observed in MEGM3. Due to this observation, based on the TRCA approach, 10% decrease is the threshold for the water features categorized as “sensitive”, meaning if the overall reduction for surface runoff volume is less than 10%, the ecological functions for these water features, even the most sensitive ones, can be maintained. In this case, we focus on the annual surplus volume, meaning, if the annual surplus will not decrease by more than 10%, the ecological function for the North Feature will not be impacted.

3.0 – Summary of the Calculation Results

As mentioned previously, the average annual precipitation, evapotranspiration, runoff and infiltration depth for different land uses and covers and soil types are based on Hanover Climate Normals and Table 3.1 in the Manual 2003. The results shown in **Table 3.1** were computed using average annual monthly values per the Thornthwaite and Mather (1957) method.

The drainage areas of the site draining north to the Saugeen, and the drainage areas draining south to the Letterbreen Bog, were delineated for pre-and post- conditions. The water balance assessment was conducted for each drainage area to determine the difference between pre- and post- runoff and infiltration levels for each feature. Land use and land cover was determined from the Site survey data and Google Earth. The majority of the drainage areas consist of agriculture and sparse woodlands, with a small existing farmhouse classified as low-density residential. The Slope of the existing land was determined from existing survey data of the site and from Ontario GeoHub Contour open data. The soil of the site and surrounding areas was referenced from Ontario Soil Survey and the majority of the site was determined to be well-draining loam, which is classified as

a hydrologic soil type ‘A’. The soil at the southeastern section of the site located at the bog was determined to be poorly draining clay, which is classified as hydrologic soil type ‘B’.

In the post-development condition, the proposed pit areas were assumed to act as infiltration pits which will infiltrate all surplus precipitation without any runoff to the nearby features. The existing farmhouse area is replaced with ‘lawn’ land use. All other parameters remained consistent in the post-development condition. Please see the documents attached to the back of this memo for the pre-development and post-development figures and detailed calculations.

According to Figure No. 3 from the Hydrogeological Study, dated November 2023, the shallow groundwater is flowing in a general northerly direction. The additional infiltration from the extracted pits in the post-development condition are added to the total surplus of volume contributing to the north. With this approach, the annual average surplus volume, consisting of both surface and groundwater flow, draining north under both pre-development and post-development conditions, were calculated and compared. The results are shown in **Table 1** below.

Table 1 Pre- and Post- annual surplus volume draining north

Condition	Infiltration Volume (m^3/yr)	Runoff to North (m^3/yr)	Total Surplus to North (m^3/yr)
Pre-Development	399,082	42,100	441,183
Post-Development	600,111	31,372	631,483

As shown in **Table 1**, there is an increase of 43% in surplus volume to the north, from 441,18 3m^3 to 631,483 m^3 to the north. Based on the analysis above, the average annual surplus is expected to increase by 43% due to the enhanced infiltration capacity of the proposed basin, even though the surface runoff volume will be slightly reduced due to drainage alterations. The increased surface surplus will not affect the ecological functions of the North Feature.

The infiltrated volume was not included in this analysis for the south catchment due to the direction of the shallow groundwater flowing to the north. The results for annual runoff volume to the south feature are shown in **Table 2** below.

Table 2 Pre- and Post- annual surplus volume draining south

Condition	Runoff to South (m^3/yr)
Pre-Development	181,629
Post-Development	62,450

As shown in **Table 2**, there is a decrease in 66% in runoff volume, from 181,629 m^3 to 62,450 m^3 to the south.

To address concerns regarding runoff volume decreases to the south, four (4) 300 mm balancing pipes will be installed under the basin berm along the southern boundary. These balancing pipes will convey flow to the south during precipitation events – 5mm or above which generate runoff and cause basin ponding.

Based on Environment Canada weather normal data from the Hanover station, the average number of rainfall events exceeding 5 mm is 112 events per year (see the **Attachment 2** for details). This means that approximately 30% of days in an average year will experience surface runoff spilling into the southern area, helping to compensate for runoff losses and maintain the ecological function of the southern features.

4.0 – Conclusions and Recommendations

Per the calculations summarized above, it is concluded that:

- The proposed basin functions to promote infiltration, so the overall annual average infiltration capacity has been increased.
- The annual average surplus volume conveyed to the north feature has increased by 43% due to the overall increase in infiltration. The annual surplus volume from the site increased from 441,183 m^3 to 631,483 m^3.
- The runoff volume decrease to the south feature will be compensated using four (4) 300mm pipes installed along the southern boundary of the basin as a mitigation measure.
- As the results, the proposed Class ‘A’ Pits will increase the overall surplus volume and will not pose a significant adverse impact on the river ecology functions.

Attachments

Project Info	
Project Number:	2401284
Project Name:	ARA Pit Application
Date:	11/26/2025
Project Location (Municipality):	Ontario
Project Location (UTM Coordinates):	m N m E
Closest Climate Station:	Hanover
Latitude	44.047 degrees N -80.7993
Closest Weather Station:	
Type of Water Balance:	Preliminary Pre-to-Post De (No FBWB)
Quaternary Watershed:	
Tertiary Watershed:	
Secondary Watershed:	
Overall Pre-Dev Soil Type	Well-draining Loam (Hydrologic Type A)
Overall Pre-Dev Vegetation Cover	Moderately Rooted Crops

Pre-Development Conditions

Catchment	Land Cover	Land Use Type	Area (ha)	% Impervious	Soil Type	IF	Cover	IF	Slope %	IF	Overall Infiltration Factor
Letterbreen Bog Drainage Area (Catchment 101)	Agriculture fields	Agriculture	77.96	0%	Open Sandy Loam	0.40	Cultivated Land/AGR/ANTH/CGL	0.10	Steeply Rolling Land - Average Slope 3.8 m/km to 28 m/k	0.15	0.65
	Woodland	Woodland/Forest	1.09	0%	Open Sandy Loam	0.40	Woodland/FOM/FOD/FOC/SWM/SW	0.20	Steeply Rolling Land - Average Slope 3.8 m/km to 28 m/k	0.15	0.75
	Farmhouse	Single / Semi	2.16	64%	Open Sandy Loam	0.40	Cultivated Land/AGR/ANTH/CGL	0.10	Steeply Rolling Land - Average Slope 3.8 m/km to 28 m/k	0.15	0.65
	Wetland	Woodland/Forest	8.69	0%	Open Sandy Loam	0.40	Woodland/FOM/FOD/FOC/SWM/SW	0.20	Steeply Rolling Land - Average Slope 3.8 m/km to 28 m/k	0.15	0.75
	Wetland	Wetland	15.20	0%	Tight Impervious Clay	0.10	Wetland/Meadow/MAS/MEM/CUM	0.15	Flat Land - Average Slope Less Than 0.6 m/km	0.3	0.55
North and West Drainage Areas to Saugeen River (Catchment 102)	Agriculture fields	Agriculture	24.52	0%	Open Sandy Loam	0.40	Cultivated Land/AGR/ANTH/CGL	0.10	Steeply Rolling Land - Average Slope 3.8 m/km to 28 m/k	0.15	0.65
	Naturalized treed and vegetated areas	Woodland/Forest	2.50	0%	Open Sandy Loam	0.40	Woodland/FOM/FOD/FOC/SWM/SW	0.20	Steeply Rolling Land - Average Slope 3.8 m/km to 28 m/k	0.15	0.75

Post-Development Conditions

Catchment	Land Cover	Land Use Type	Area (ha)	% Impervious	Soil Type	IF	Cover	IF	Slope %	IF	Overall Infiltration Factor
Letterbreen Bog Drainage Area (Catchment 201)	Lawn	Lawn	12.78	0%	Open Sandy Loam	0.40	Cultivated Land/AGR/ANTH/CGL	0.10	Steeply Rolling Land - Average Slope 3.8 m/km to 28 m/k	0.15	0.65
	Wetland	Woodland/Forest	8.69	0%	Open Sandy Loam	0.40	Woodland/FOM/FOD/FOC/SWM/SW	0.20	Steeply Rolling Land - Average Slope 3.8 m/km to 28 m/k	0.15	0.75
	Wetland	Wetland	15.20	0%	Tight Impervious Clay	0.10	Wetland/Meadow/MAS/MEM/CUM	0.15	Flat Land - Average Slope Less Than 0.6 m/km	0.3	0.55
North and West Drainage Areas to Saugeen River (Catchment 202)	Lawn	Lawn	5.77	0%	Open Sandy Loam	0.40	Cultivated Land/AGR/ANTH/CGL	0.10	Steeply Rolling Land - Average Slope 3.8 m/km to 28 m/k	0.15	0.65
	Naturalized treed and vegetated areas	Woodland/Forest	0.99	0%	Open Sandy Loam	0.40	Woodland/FOM/FOD/FOC/SWM/SW	0.20	Steeply Rolling Land - Average Slope 3.8 m/km to 28 m/k	0.15	0.75
Extraction Basin Catchments (200)	Basin	Lawn	87.08	0%	Open Sandy Loam	0.40	Cultivated Land/AGR/ANTH/CGL	0.10	Flat Land - Average Slope Less Than 0.6 m/km	0.3	0.80
	Lawn	Lawn	1.61	0%	Open Sandy Loam	0.40	Cultivated Land/AGR/ANTH/CGL	0.10	Steeply Rolling Land - Average Slope 3.8 m/km to 28 m/k	0.15	0.65

Hydrologic Cycle Component Values (Hanover Station Climate Normals)

Urban Lawns/Shallow Rooted Crops (spinach, beans, beets, carrots)						
Soil group	**Water Holding Capacity(mm)**	**Hydrologic Soil Group**	**Precipitation* (mm)**	**Evapo-transpiration (mm)**	**Runoff (mm)**	**Infiltration (mm)**
Fine Sand	50	A	1087.1	595.6	172.3	319.2
Fine Sandy Loam	75	B	1087.1	607.2	216.3	263.7
Silt Loam	125	C	1087.1	619.9	256.7	210.5
Clay Loam	100	CD	1087.1	614.1	283.3	189.7
Clay	75	D	1087.1	607.2	312.3	167.7
Moderately Rooted Crops (corn and cereal grains)						
Soil group	**Water Holding Capacity(mm)**	**Hydrologic Soil Group**	**Precipitation (mm)**	**Evapo-transpiration (mm)**	**Runoff (mm)**	**Infiltration (mm)**
Fine Sand	75	A	1087.1	607.2	144.6	336.5
Fine Sandy Loam	150	B	1087.1	623.3	185.0	278.7
Silt Loam	200	C	1087.1	628.0	230.1	230.1
Clay Loam	200	CD	1087.1	628.0	252.1	207.0
Clay	150	D	1087.1	623.3	278.7	185.0
Pasture and Shrubs						
Soil group	**Water Holding Capacity(mm)**	**Hydrologic Soil Group**	**Precipitation (mm)**	**Evapo-transpiration (mm)**	**Runoff (mm)**	**Infiltration (mm)**
Fine Sand	100	A	1087.1	614.1	118.0	355.0
Fine Sandy Loam	150	B	1087.1	623.3	161.9	301.8
Silt Loam	250	C	1087.1	631.4	204.7	251.0
Clay Loam	250	CD	1087.1	631.4	227.8	227.8
Clay	200	D	1087.1	628.0	252.1	207.0
Mature Forests						
Soil group	**Water Holding Capacity(mm)**	**Hydrologic Soil Group**	**Precipitation (mm)**	**Evapo-transpiration (mm)**	**Runoff (mm)**	**Infiltration (mm)**
Fine Sand	250	A	1087.1	631.4	118.0	355.0
Fine Sandy Loam	300	B	1087.1	633.8	161.9	301.8
Silt Loam	400	C	1087.1	636.1	204.7	251.0
Clay Loam	400	CD	1087.1	636.1	227.8	227.8
Clay	350	D	1087.1	634.9	252.1	207.0

*Hanover (1981 - 2010) average precipitation

PRE-DEVELOPMENT WATER BALANCE															
		Total Land Area (m^2)	Impervious Factor	Pervious Area (m^2)	Impervious Area (m2)	Infiltration Factor	Precipitation* (mm)	Hydrologic Soil Group	Evapo-Transpiration* (mm)	Surplus (mm)	Infiltration of Pervious Area (mm)	Runoff From Pervious Area (mm/annum)	Runoff from Impervious Area (mm/annum)	Total Infiltration (m^3/annum)	Total Runoff (m3/annum)
Letterbreen Bog Drainage Area (Catchment 101)	Agriculture fields	779553.0	0%	779553.00	0.00	0.65	1087.1	A	607	480	312.0	168.0	0.0	243191.7	130949.4
	Woodland	10900.0	0%	10900.00	0.00	0.75	1087	A	631	456	341.7	113.9	0.0	3725.0	1241.7
	Farmhouse	21624.0	64%	7784.64	13839.36	0.65	1087	A	596	492	319.5	172.0	491.5	2487.0	8141.3
	Wetland	86929.0	0%	86929.00	0.00	0.75	1087	A	631	456	341.7	113.9	0.0	29707.3	9902.4
	Wetland	151950.0	0%	151950.00	0.00	0.55	1087	D	628	459	252.5	206.6	0.0	38370.3	31393.9
	TOTAL	1050956.0	1%	1,037,117	13,839	0.64	1087	A	612	475	306	169	10.1	**317,481**	**181,629**
North and West Drainage Areas to Saugeen River (Catchment 102)	Agriculture fields	245249.0	0%	245249.00	0.00	0.65	1087	A	631	456	296.2	159.5	0.0	72637.1	39112.3
	Naturalized treed and vegetated areas	25020.0	0%	25020.00	0.00	0.75	1087	A	609	478	358.3	119.4	0.0	8963.9	2988.0
	TOTAL	270,269	0%	270,269	0	0.66	1087	A	629	458	302	156	0.0	**81,601**	**42,100**

POST-DEVELOPMENT WATER BALANCE															
		Total Land Area (m^2)	Impervious Factor	Pervious Area (m^2)	Impervious Area (m2)	Infiltration Factor	Precipitation* (mm)	Hydrologic Soil Group	Evapo-Transpiration* (mm)	Surplus (mm)	Infiltration of Pervious Area (mm)	Runoff From Pervious Area (mm/annum)	Runoff from Impervious Area (mm/annum)	Total Infiltration (m^3/annum)	Total Runoff (m3/annum)
Letterbreen Bog Drainage Area (Catchment 201)	Lawn	127,813	0%	127813	0	0.65	1087	A	607	480	312.0	168.0	0.0	39872.9	21470.0
	Wetland	86,929	0%	86929	0	0.75	1087	A	631	456	341.7	113.9	0.0	29707.3	9902.4
	Wetland	151,950	0%	151950	0	0.55	1087	D	633	455	250.0	204.5	0.0	37983.7	31077.6
	TOTAL	366,692	0%	366692	0	0.63	1087	A	623	464	293	170	0.0	**107,564**	**62,450**
North and West Drainage Areas to Saugeen River (Catchment 202)	Lawn	127,813	0%	127813	0	0.65	1087	A	607	480	312.0	168.0	0.0	39872.9	21470.0
	Naturalized treed and vegetat	86,929	0%	86929	0	0.75	1087	A	631	456	341.7	113.9	0.0	29707.3	9902.4
	TOTAL	214,742	0%	214742	0	0.69	1087	A	617	470	324	146	0.0	**69,580**	**31,372**
Extraction Basin Catchments (200)	Basin (Lawn)	870813.0	0%	870813	0	1.00	1087	A	607	480	479.9	0.0	0.0	417940.7	0.0
	Lawn	16111.0	0%	16111	0	0.65	1087	A	607	480	312.0	168.0	0.0	5026.0	2706.3
	TOTAL	886,924	0%	886924	0	0.99	1087	A	607	480	477	3	0.0	**422,967**	2,706

*Based on MOE Table 3.1

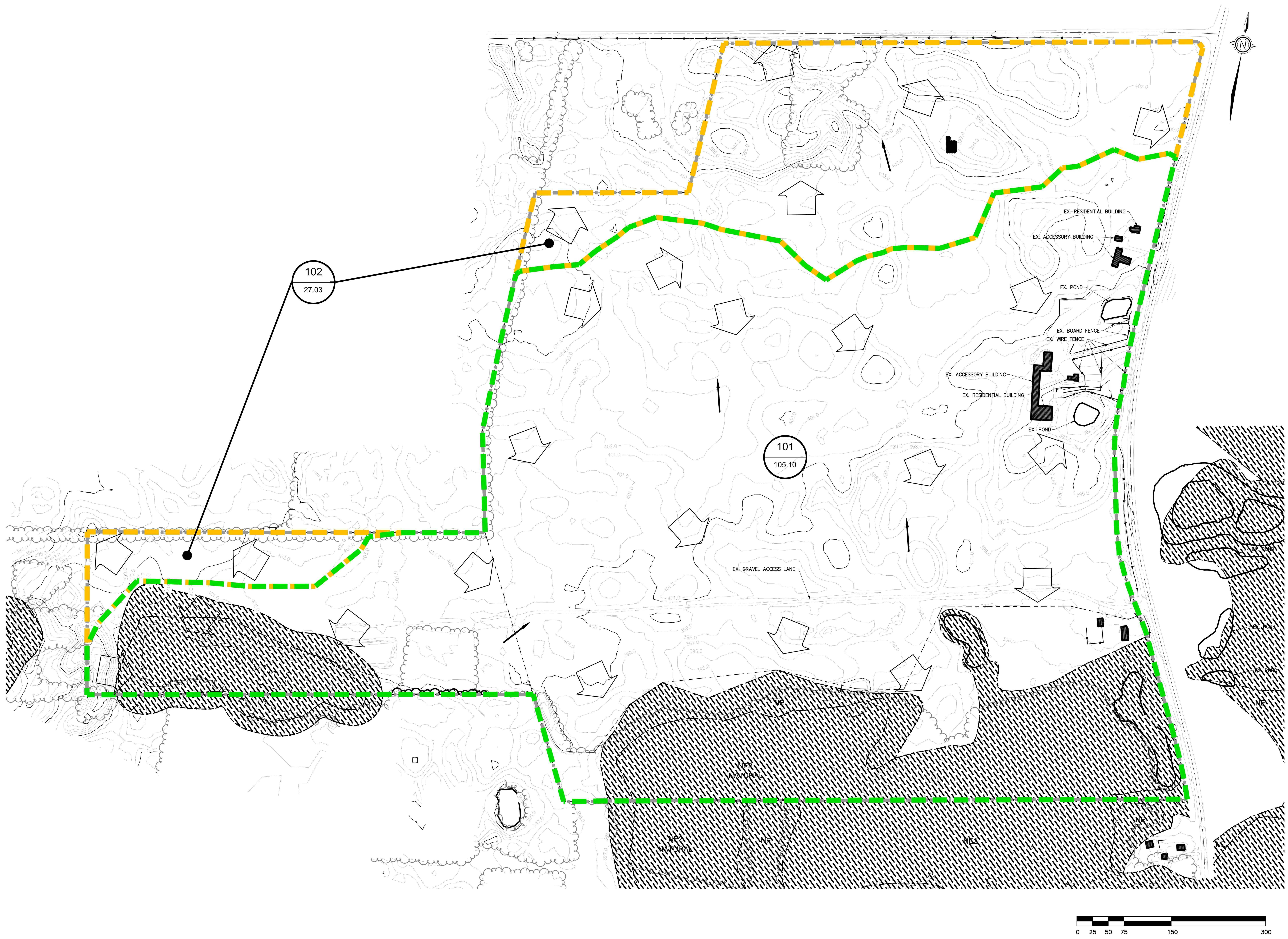
North Feature Post-to-Pre Summary

Catchment	Pre-Development Runoff (m3)	Pre-Development Site Infiltration (m3)	Total Pre-Development Surplus Volume (m3)	Post-Development Runoff (m3)	Post Development Infiltration (m3)	Total Post-Development Surplus Volume (m3)	% Difference
North and West Drainage Areas to North feature	42,100	399,082	**441,183**	31,372	600,111	**631,483**	43.1%

Precipitation Events

CLIMATIC WATER BUDGET: CLIMATE NORMAL 1981-2010 (HANOVER, ON)

	Days with Precipitation			
Month	≥ 0.2mm	≥ 5mm	≥ 10mm	≥ 25mm
Jan	18.6	7.8	3.7	0.46
Feb	15	6.1	2.2	0.32
Mar	13.5	5.1	2.3	0.27
Apr	13.8	5.1	1.9	0.32
May	13.5	5.1	2.4	0.5
Jun	12.4	4.3	2.7	0.58
Jul	10.8	4.3	2.8	0.69
Aug	12.8	5.7	3.3	0.73
Sept	14.2	6.4	3.5	0.85
Oct	16.7	6.4	2.9	0.19
Nov	16.5	7.2	3.6	0.42
Dec	17.7	8	3.4	0.32
Total Annual Events	176	72	35	6
Total Annual Events Above 5 mm	= 71.5 + 34.7 + 5.65 = 111.85			



PROPOSED AGGREGATE PIT MUNICIPALITY OF WEST GREY

LEGEND

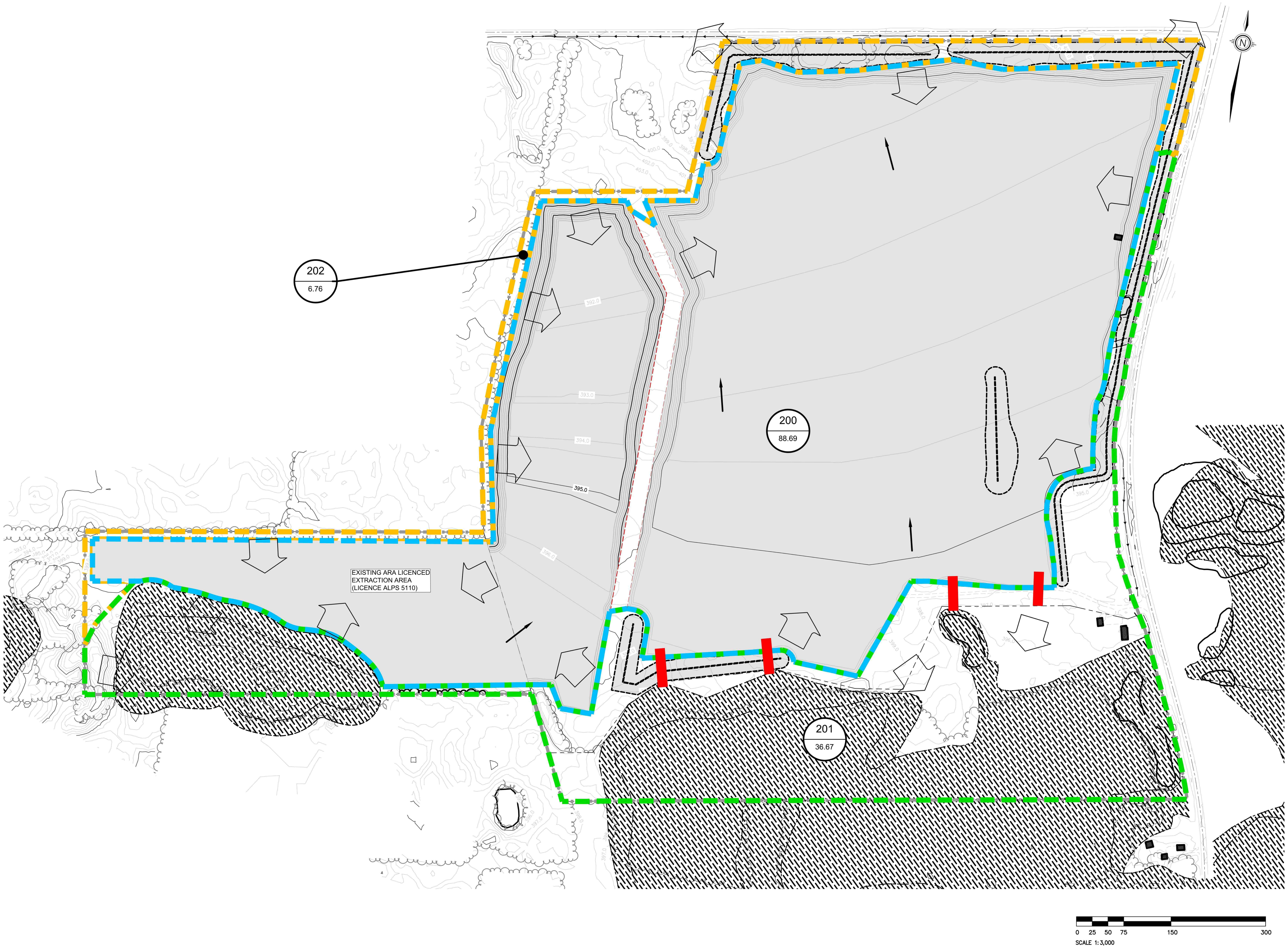
- SITE BOUNDARY
- 100 / 105.10 — CATCHMENT NUMBER / CATCHMENT AREA (ha)
- OVERLAND FLOW DIRECTION
- DIRECTION OF GROUNDWATER FLOW
- DRAINAGE AREA NORTH TO SAUGEEN RIVER
- DRAINAGE AREA SOUTH TO LETTERBREEN BOG
- SAUGEEN VALLEY CONSERVATION AUTHORITY REGULATED AREA

PRE - DEVELOPMENT DRAINAGE PLAN

Figure No. 1

GEI Consultants

2402308
OCTOBER 2025
Scale: 1:3000



PROPOSED AGGREGATE PIT MUNICIPALITY OF WEST GREY

LEGEND

- SITE BOUNDARY
- 100 / 105.10 — CATCHMENT NUMBER / CATCHMENT AREA (ha)
- OVERLAND FLOW DIRECTION
- DIRECTION OF GROUNDWATER FLOW
- DRAINAGE AREA NORTH TO SAUGEEN RIVER
- DRAINAGE AREA SOUTH TO LETTERBREEN BOG
- PROPOSED PIT DRAINAGE AREA
- SAUGEEN VALLEY CONSERVATION AUTHORITY REGULATED AREA
- PROPOSED PIPE

POST - DEVELOPMENT DRAINAGE PLAN

Figure No. 2

GEI Consultants

2402308
OCTOBER 2025
Scale: 1:3000