**Table 1.1**
**Comment and Response Table – Thurber Peer Review of GHD Response Letter – January 28, 2022**
**Clean Harbors Lambton Facility – Cell 20-1 Assessment**

| Identification Number | Peer Review Comment | Response |
|---|---|---|
| Section 1<br>1st Bullet | Instead of modelling the hydrostatic pressure through the permeable zone in the bedrock, GHD has applied it by subdividing the Black Shale Till layer and applying it to the lower subdivision. It is unclear why this was done or how it affects the modelling results, particularly since the Black Shale Till is not a water bearing soil. GHD should provide further description of this aspect of the model. | The updated models were produced using the SEEP/W module of the Geostudio software. This module allows for more precise modelling of the predicted stabilized piezometric surface after completion of excavation, using the updated piezometric data collected from the vibrating wire piezometers at VWP-1 and VWP-2 and hydraulic permeability estimates for the subsurface units. |
| Section 1<br>2nd Bullet | GHD should provide figures showing the hydrostatic pressures and pore pressures assumed throughout each modelled area. | Hydrostatic (piezomtric) pressures for each unit were determined using the SEEP/W module. |
| Section 1<br>3rd Bullet | Please provide a figure showing the full array of nodes used for modelling each section and the minimum FS calculated for each. | Figures 4, 5, and 6 provides the FS banding for north, east, and south slope models. |
| Section 1<br>4th Bullet | In Figure 7, GHD indicates that CKD has a unit weight of 21 kN/m3. Based on our past experience with CKD, this is a very high unit weight. We recommend that this value be confirmed through testing. | A representative sample of CKD was colledcted by GHD and analyzed. The bulk density of the CKD sample was 1820 kg/$m^3$ and a unit weight of 18 kN/$m^3$ has been used in the new models. |
| Section 2<br>General | In its initial Geotechnical Design Report, GHD identified a minimum Factor of Safety (FS) for slope design should be 1.3. This minimum FS was continued to be utilized by GHD in its two post slope movement reports, GHD Report and GHD Addendum.<br><br>In its recent response letter, GHD identifies slope FS that are below 1.3 and as low as 1.16. Given the Site history of slope movements, these low FS represent a significant risk that should be<br>mitigated through design and/or monitoring. | The new models show the required buttress stabilization and water flooding to meet the minimum FS of 1.3. These measures will be implemented by Clean Harbors as soon as site conditions allow this work to be completed safely. |
| Section 2.7, Item 1 | We recommend that Clean Harbors develop remedial plans to improve the FS during filling the open landfill cell as soon as possible, given site conditions and weather. | The north and south slopes require additional material to be added at the toe since the critical surface is located above the base of Cell 20-1. The buttress material being proposed is an existing stockpile of CKD material. If there is not sufficient quantity available in the CKD pile, on-site clay material will be used. The material will be installed once conditions at the Site allow for safe access to the bottom of the cell.<br><br>The eastern portion of Cell 20-1 is proposed to be filled in stages from the south to the north. This will allow the slopes or sections of the slopes to be filled to a level with waste that will provide a FS of 1.5 or greater. |
| Section 2.7, Item 2 | The proposed slope monitoring program should also be sufficiently robust to detect slope instability for safety and allow for remedial responses, as possible. Particular attention should be given to the potential impacts of the spring thaw, and the implementation of additional monitoring at that time. | The proposed monitoring program is provided in Section 3 of the letter. |