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ESP Reference: 7234e.05.4516 – Godre'r Graig Monitoring Review **Date:** 5th June 2026

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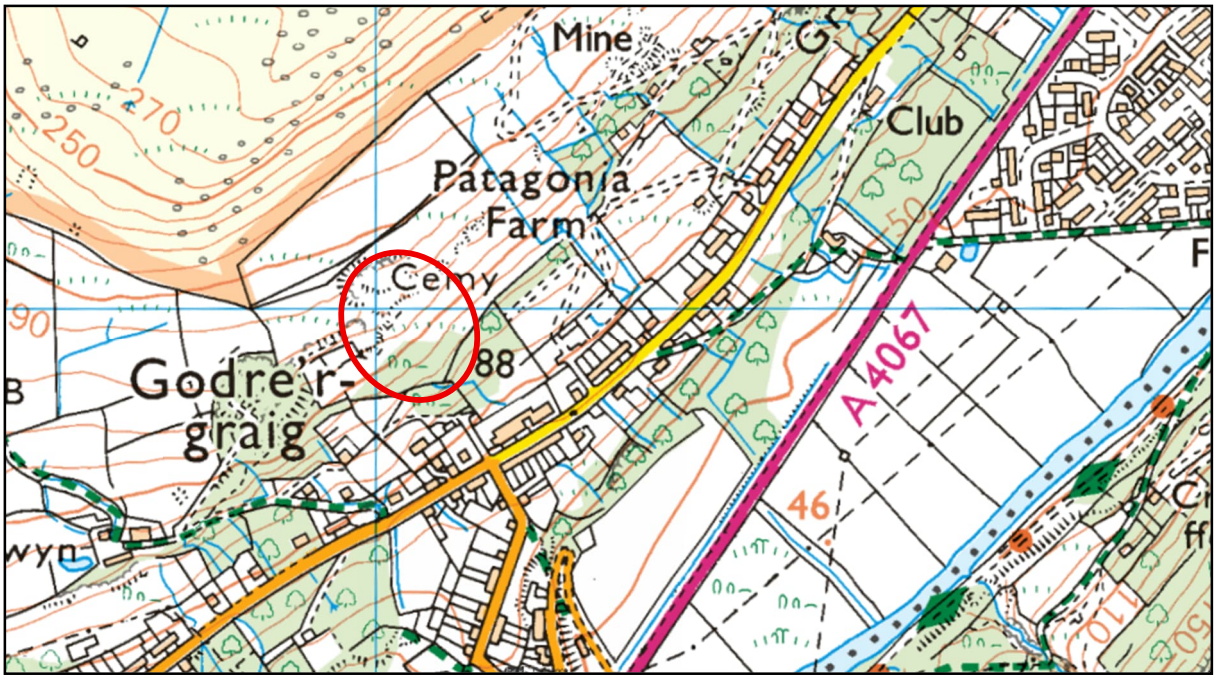
GODRE'R GRAIG MONITORING REVIEW

1. Introduction & Background

Neath Port Talbot County Borough Council (NPTCBC), hereafter known as the Client, have instructed Earth Science Partnership Ltd (ESP) to provide a data review of the ongoing monitoring at the Tip on the slopes above Godre'r Graig.

The Tip is located on the eastern flank of Mynydd Allt-y-grug, between Pontardawe and Ystalyfera, highlighted below in Insert 1.

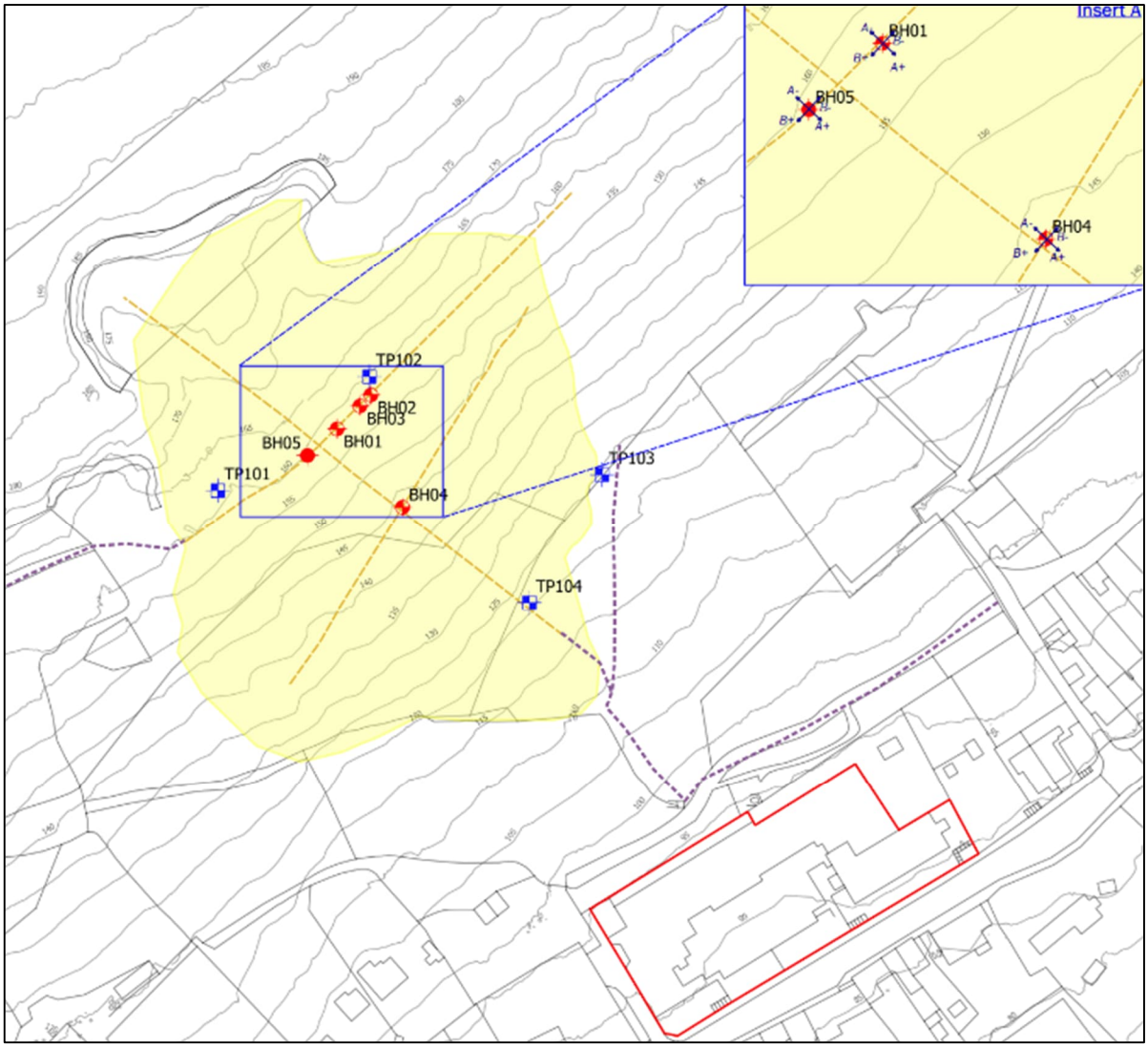


Insert 1:Approximate Location of Godre'r Graig Tip.

ESP have undertaken a series of previous investigation and assessments at the site, the findings from those assessments is not included in this review but further information can be provided if required.

2. Previous Ground and Groundwater Conditions Summary

Five boreholes (BH01 to BH05) were drilled in accessible parts of the Tip, as shown on Insert 2 below and in Figure 1 which is included as Enclosures A.



Insert 2: Borehole location plan and inclinometer orientation.

Three of these boreholes (BH01, BH04 and BH05) were installed with monitoring equipment. Inclinometers enable the accurate measurement of ground movement in set orientations, as shown within Insert 2. A summary of the ground conditioned encountered in BH01, BH04 and BH05 is provided in Table 1 below, and the full borehole records are presented in Enclosure B.

Table 1: Summary of Ground Conditions

Borehole ID	Total Depth (m)	Ground and Groundwater Conditions Summary
BH01	5.30	Made Ground to 4.00m, whereupon weathered soils of bedrock encountered. Groundwater strike not encountered but soils saturated between 3 and 4m.
BH04	7.20	Made Ground to 6.00m, whereupon weathered soils of bedrock encountered. Groundwater strike not encountered but soils saturated between 4 and 5m.
BH05	11.10	Made Ground to 5.25m, over bedrock, Mudstone and Sandstone. Groundwater encountered between 5.0m and 5.3m.

The Made Ground of the Tip was found to comprise two main materials, categorised as Made Ground – Coarse Discard and Made Ground - Coarse Discard (finer). The Made Ground - Coarse Discard comprised clayey sandy gravel with cobbles and boulders. The Made Ground – Coarse Discard (finer) comprised soft to firm sandy very gravelly clay with cobbles and contained coal fragments.

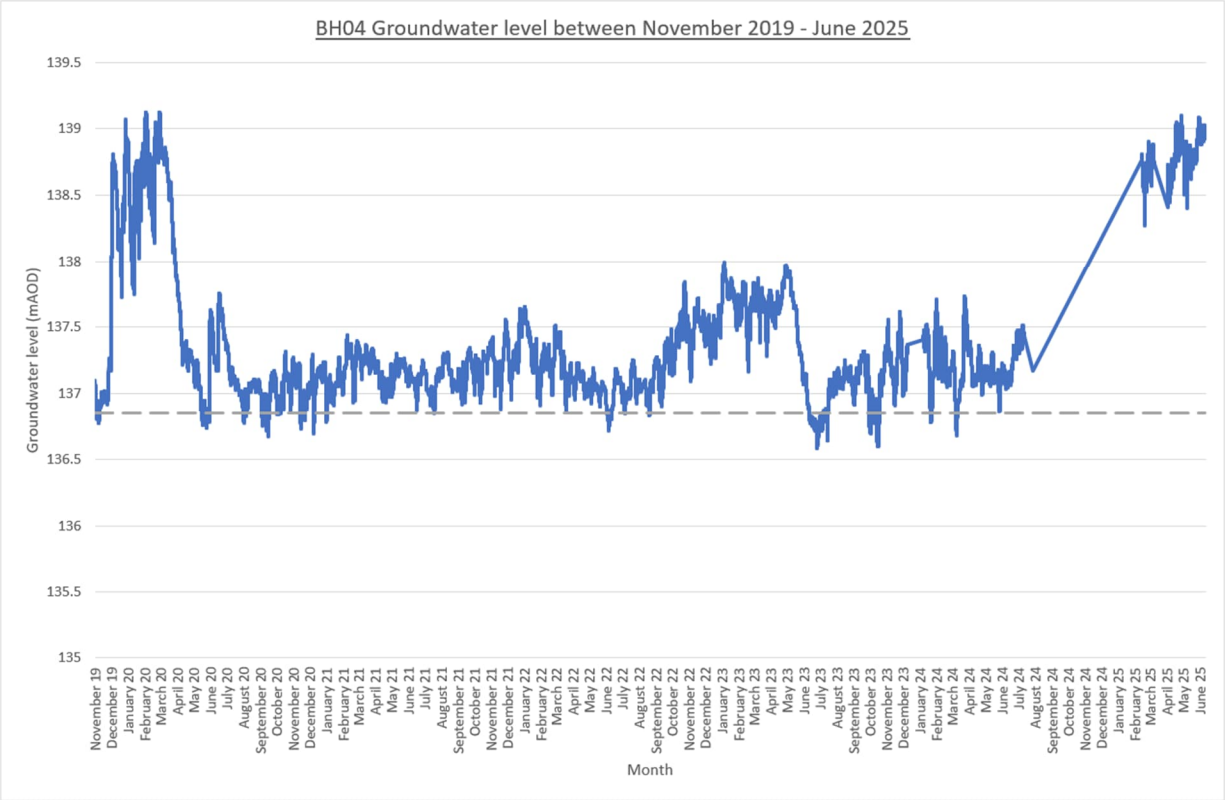
3. Groundwater Monitoring Data

3.1. Introduction

Two vibrating wire piezometers were installed on the site in BH04 and BH05, data is logged every three hours. Logging of data commenced in November 2019, a period where monitoring was not required was between late 2020 and early 2021 and some data is therefore not available (BH05).

The graphs for this data are presented in Enclosure C and discussed below.

3.2. BH04 Groundwater levels



Insert 3 BH04 Groundwater level between November 2019 and June 2025.

The vibrating wire piezometer (vwp) in BH04 was installed at 7.2m depth, at an elevation of 136.6mAOD. The ground level of BH04 is 143.8mAOD and the base of the Tip is at 137.8mAOD.

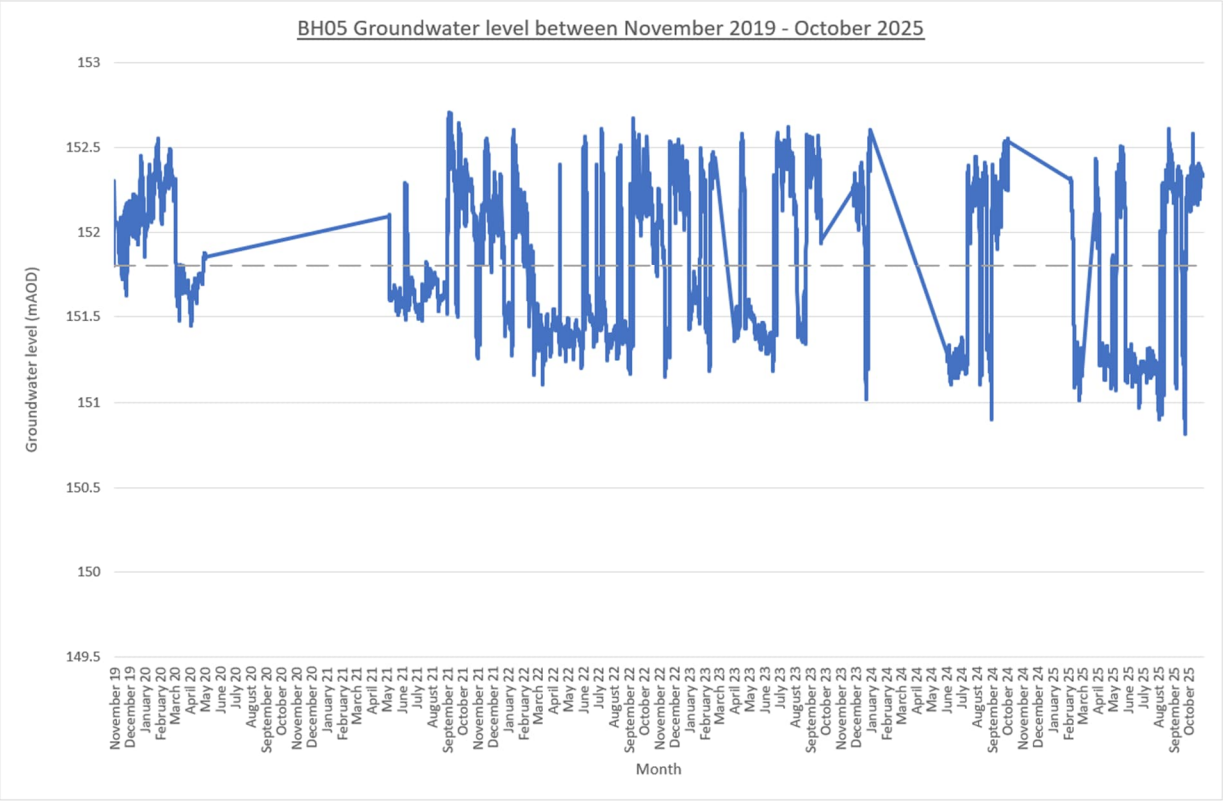
The groundwater level is relatively high in the early part of the monitoring; between December 2019 and May 2020 it fluctuated between 138mAOD and 139mAOD. The groundwater levels then decrease and remain steady, fluctuating between approximately 137mAOD and 137.5mAOD between May 2020 to September 2022. From September 2022, groundwater levels begin to increase to around 138mAOD until June 2023, before dropping down to previous levels, at approximately 137mAOD.

Instrumentation issues impeded data collection between July 2024 and February 2025. Groundwater levels fluctuate between 138.5mAOD and 139mAOD in the first half of 2025.

Since July 2025, the vibrating wire piezometer measured a significant increase in water pressure, from a level of approximately 139mAOD to near 200mAOD.

The data beyond July 2025 is likely to be erroneous, as the water level measured is some 55m above ground level and no visual evidence of changes in surface or groundwater were noted. It is possible that this reading is an instrument error or sensor reading error, as it does not align with expectation, the ground model or visual observations on site.

3.3. BH05 Groundwater levels



Insert 5 BH05 Groundwater level between November 2019 and October 2025.

The vibrating wire piezometer (VWP) in BH05 was installed at 5.7m depth, at an elevation of 151.8mAOD. The VWP is represented by the grey dashed line on the graph above. The ground level of BH04 is 157.5mAOD.

The groundwater monitoring shows a variable groundwater profile, measured between elevations of 151mAOD and 152.5mAOD. The measured pressure suggests that the water level drops below the VWP and rises above it. Season variations can be seen, with the winter months generally indicating higher groundwater levels.

The levels measured suggests that groundwater is present at the base of the Tip.

4. Inclinometer Monitoring Data

4.1. Introduction

Three inclinometers were installed in the Tip in BH01, BH04 and BH05; these are monitored using a digital biaxial inclinometer system, typically monthly. There have been gaps in the monthly monitoring, mainly due to a period where monitoring was not required but also occasionally due to poor weather delays.

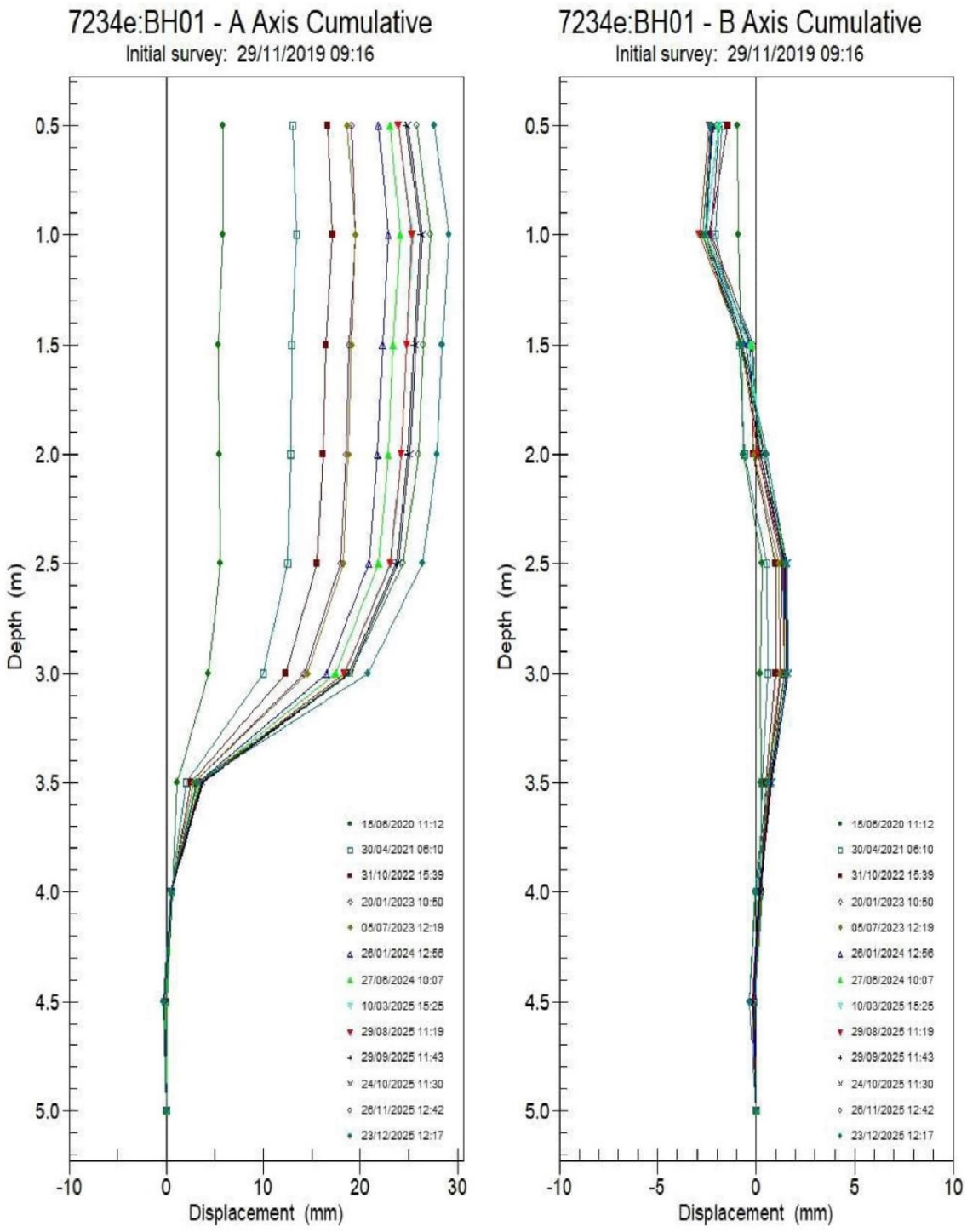
Typically, the base of the inclinometers are anchored into rock (or strata that is 'stable') to provide a suitable base for the upper portions of the pipe to bend as required. Difficult access to parts of the Tip limited what investigation equipment could be used safely, and for that reason the installation in BH04 may not be fully secured in a stable strata as a cable percussion rig was used, rather than a rotary rig. Whilst the data from BH04 is therefore not as intended, useful information is still being gathered and is discussed below in more detail.

The individual graphs are presented below and display the data for 2025. These are available in Enclosure D. The data on the graphs has been filtered to show the trends and total movement recorded.

For information, the inclinometer system accuracy is typically +/-2mm over a 30m length (vertical in borehole) and it is considered that the inclinometer pipes are serviceable at present.

4.2. BH01 Inclinometer

The inclinometer graph for data from BH01 is presented in Insert 6.



Insert 6 BH01 Inclinometer displacement graphs.

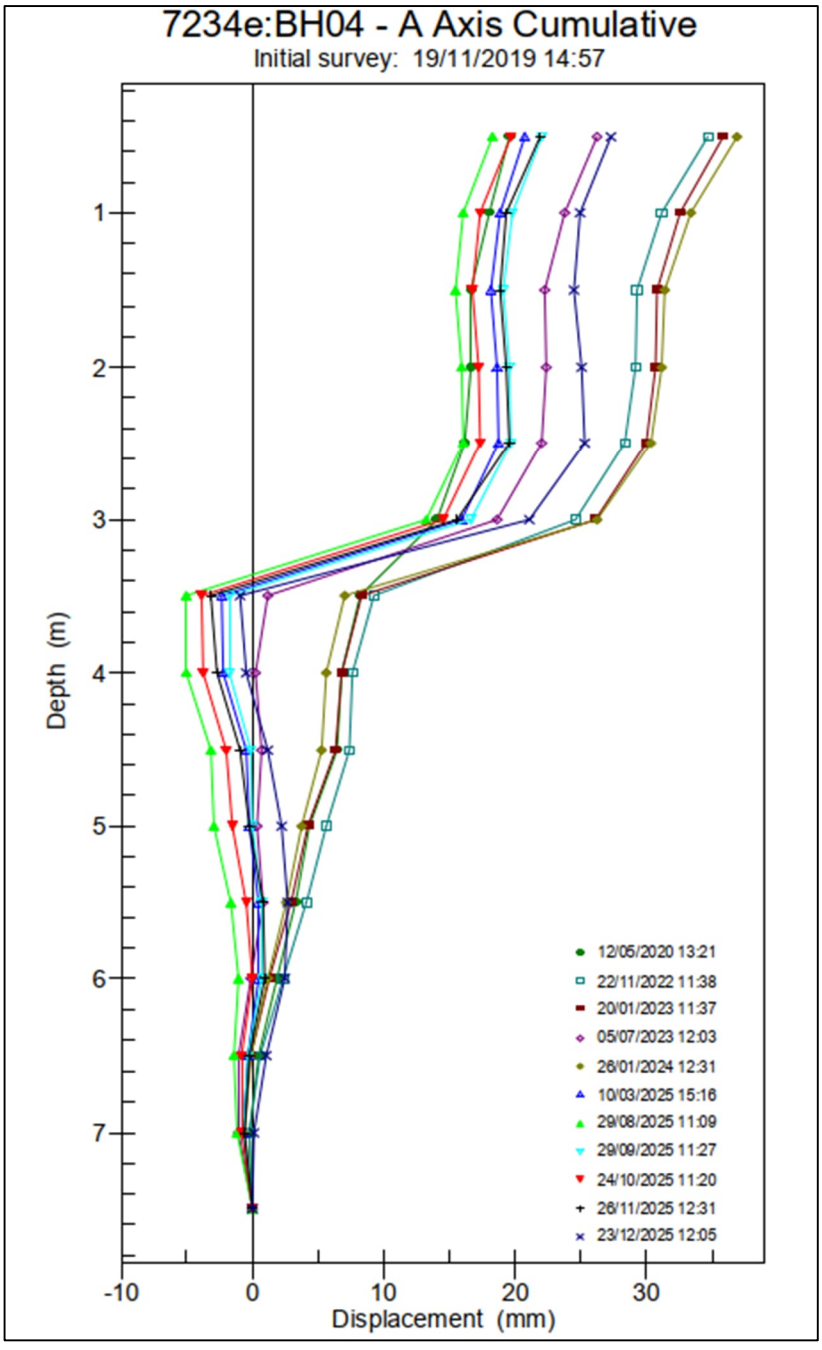
The above graphs show displacement of the pipe in millimetres; with the initial reading taken on the 29th of November 2019. This reading acts as the baseline in which displacement and ground movement is measured. Based on the initial ground investigation, the inclinometer was anchored approximately 1.3m into the underlying strata, which was encountered at 4.0m bgl.

Monitoring has showed the continued downhill movement of the inclinometer pipe; this movement is noted in the pipe in the upper 3m to 3.5m, thus within the Tip. The total movement of the pipe is in the region of 25 to 30mm. Monitoring suggests that the base of the pipe has not moved.

Seasonal fluctuations are evident within the readings, with the recent winter months of November and December recording larger displacements. From month to month, the movement of material is approximately 0.5 – 1.0mm, except for November and December 2025, which saw displacement of 4.0mm between data collection visits.

4.3. BH04 Inclinometer

The inclinometer graph for data from BH04 is presented below in Insert 7.



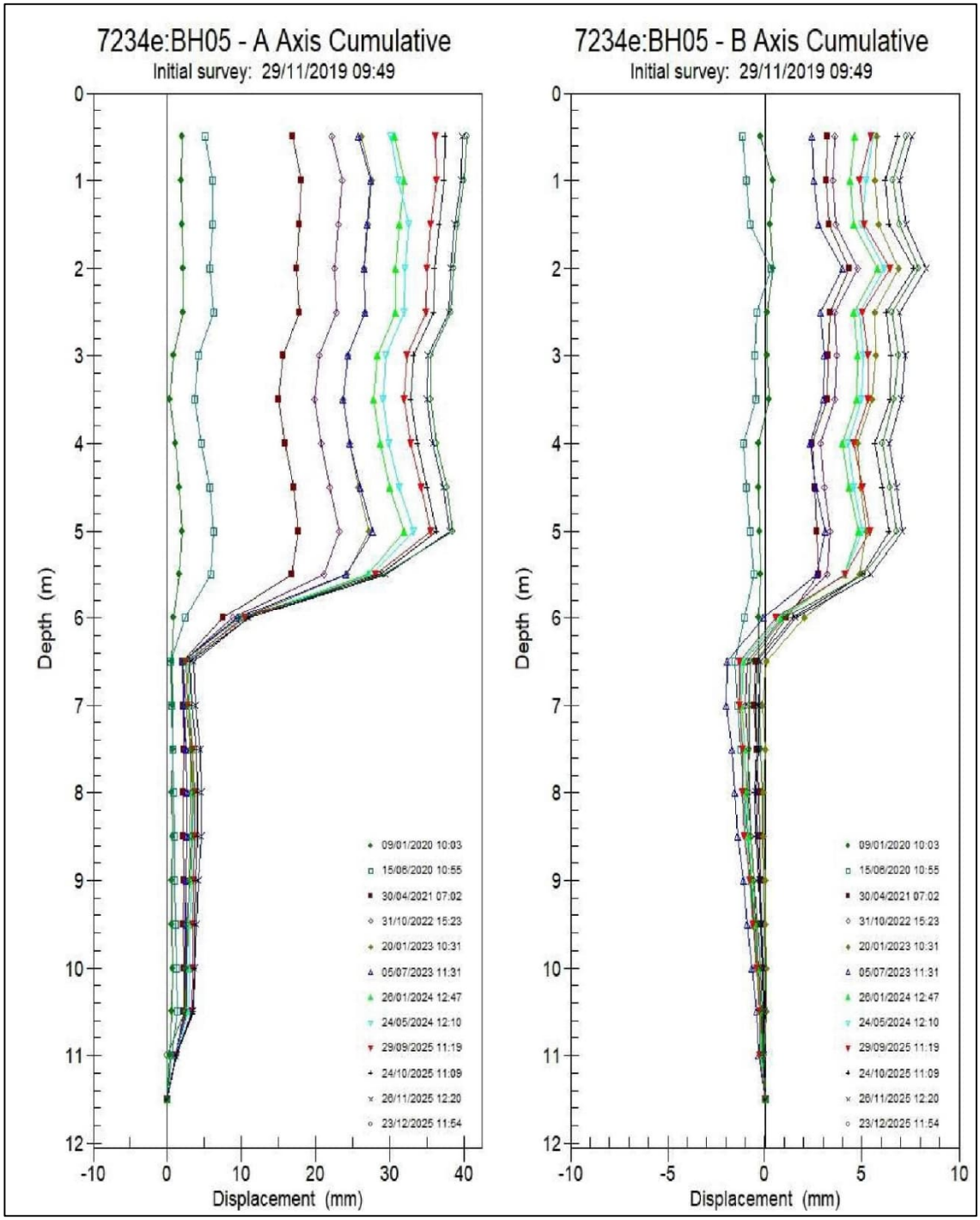
Insert 7 BH04 Inclinometer displacement graphs.

As discussed above, the base of BH04 is likely not secured in a 'solid' strata and as such the inclinometer graph shows movement of the pipe from the base, at 7.2m. Importantly, the monitoring shows a relative movement of the pipe at a depth between 3m and 4m with the upper soils moving downhill.

Whilst the integrity of the data is uncertain, the relative movement in the pipe is useful information. The relative movement noted in the pipe, suggests that the upper 3m of Tip is moving downhill, and movement in the region of 30mm has been recorded.

4.4. BH05 Inclinometer

The inclinometer graph for data from BH05 is presented below in Insert 8.



Insert 8 BH05 Inclinometer displacement graphs.

The above graphs show the displacement of material in millimetres, with the initial reading taken on the 29th of November 2019. This reading acts as the baseline in which displacement and

ground movement is measured. Based on the initial ground investigation, the inclinometer was anchored approximately 6m into the underlying rock.

The inclinometer graph shows the continued downhill movement of the inclinometer pipe; this movement is noted in the pipe in the upper 6m, thus within the Tip and the upper portions of the bedrock. The total movement of the pipe is in the region of 40mm. Monitoring suggests that the base of the pipe is stable.

Seasonal fluctuations are evident within the readings, with the winter months of October, November, and December recording larger displacements. From month to month, the movement of material is less than 0.5mm, except for October to November, which saw displacement of 3.0mm between data collection visits. It can be seen that movement of material begins at 6.5m depth.

5. Summary

The groundwater monitoring data collected has shown that a groundwater body is located within the Made Ground forming the Tip, its presence has been noted to be seasonal. This data generally aligns with the groundwater ranges gathered from the previous work undertaken.

The inclinometer data collected from BH01, BH04, and BH05 show the Made Ground within the Tip to continue to move downhill, with total movements in the region of 30 to 40mm.

We trust that the above and attached is clear and provides sufficient information for your present requirements. However, should you have any queries, or require further clarification, please do not hesitate to contact us.

Yours sincerely,

Earth Science Partnership

Enc. Enclosure A: Investigation Point Plan
Enclosure B: Borehole Records
Enclosure C: Groundwater Monitoring Graphs
Enclosure D: Inclinometer Data