5.2.3 Terrace 1 grid 1 and terrace 1 transect 2 (T1G1 and T1T2)

The T1T2 and T1G1 surveys on terrace 1 used a 200MMHz antenna. The T1T2 survey was a single transect with gouge core data. The T1G1 survey used a 5m transect interval collecting 20 transects of data. Each GPR depth slice has a thickness of 0.2m, sliced at 0.5m intervals. The dielectric constant was set at 19 through calibration with the gouge core data. The GPR reflectance values ranged from –4 to +100. On each GPR depth slice the LiDAR intensity plot is shown as 70% transparent overlay. This area of terrace 1 has been eroded into by a palaeochannel, as shown by the LiDAR last pulse DTM, also used to show the position of T1T2 (Fig. 5.21). The LiDAR intensity shows this area of terrace 1 (T1H1) as having a different value to the palaeochannel labelled T1C6 (Fig. 5.22). A flood map produced by merging a picture of the Trent/Soar confluence in flood in 1954 combined with the LiDAR last Pulse DTM model shows that this area of terrace 1 was at the very extreme of recent major flood events (Fig. 5.23).

The transect shows the gravel deposits T1H2, with a lack of penetration into the palaeochannel T1C6 (Fig. 5.24). The unit T1H2 has a series of reflecting layers, indicating a heterogeneous structure. The GPR section defines a substantial covering of alluvium over the terrace gravels, reaching 1.5m at its maximum depth similar to the level seen in the T1QT transect. The depth to the gravel is confirmed by the gouge core transect. A palaeochannel is obvious as T1C6, but the difference between the gouge core data and the GPR transect over T1C6 is substantial, indicating rapid attenuation of the GPR signal within T1C6. The GPR interpretation also identifies T1H1 within T1C1. The composition of this unit is uncertain. GPR penetration was poor within T1C6 and T1H1 lies below the suspected depth of maximum penetration. Therefore, T1H1 is a suggested anomaly that requires further investigation to resolve its nature.

The T1G1 produced a series of depths slices that added further data to the model put forward through the interpretation of T1T2. The 0.9m – 1.1m depth slice shows T1C6 with two distinct areas of higher reflectance, with terrace 1 being visible as an area of lower reflection (Fig. 5.25). At this depth the gravels on terrace 1 are not visible, being below the alluvium. The T1T2 transect revealed a unit (T1H1) within the palaeochannel, which could be reason for the high reflectance values seen in the T1C6 at this depth slice. However, the composition of T1H2 is not known and this is a speculative interpretation.

At the 1.4m – 1.6m depth slice the gravel unit T1H2 starts to become evident on the terrace, with clear differentiation from T1C6 and also at the 1.9m – 2.1m depth slice (Fig. 5.26 and Fig. 5.27). At 2.4m - 2.6m the gravel unit T1H2 is clearly defined (Fig. 5.28). The areas of higher reflectance within T1C6 at the 2.4m – 2.6m depth slice are not interpreted as basal gravels due to their depth at between 2.4m and 2.6m. This was below the depth of penetration within T1C6. The T1T2 survey revealed that sand/gravel depth within this channel was only at 1m and 1.3m below the ground and these reflections are not interpreted as gravels. Significant penetration deeper than 2.6m was not achieved.

From the T1T2 survey and the T1G1 survey combined with the LiDAR results it is clear that the T1C6 channel has eroded into T1H2 and thus post dates the gravels in this terrace. The depth of alluvium overlying the T1H2 gravel unit is substantial and is a product of sediment deposition from large channel flooding events. This level of alluvium overlying the gravels on terrace 1 is similar to the T1QT but different to the T1T1 survey. This again highlights that there is significant differences in alluvial deposition across terrace 1, having important consequences for the archaeological resource.

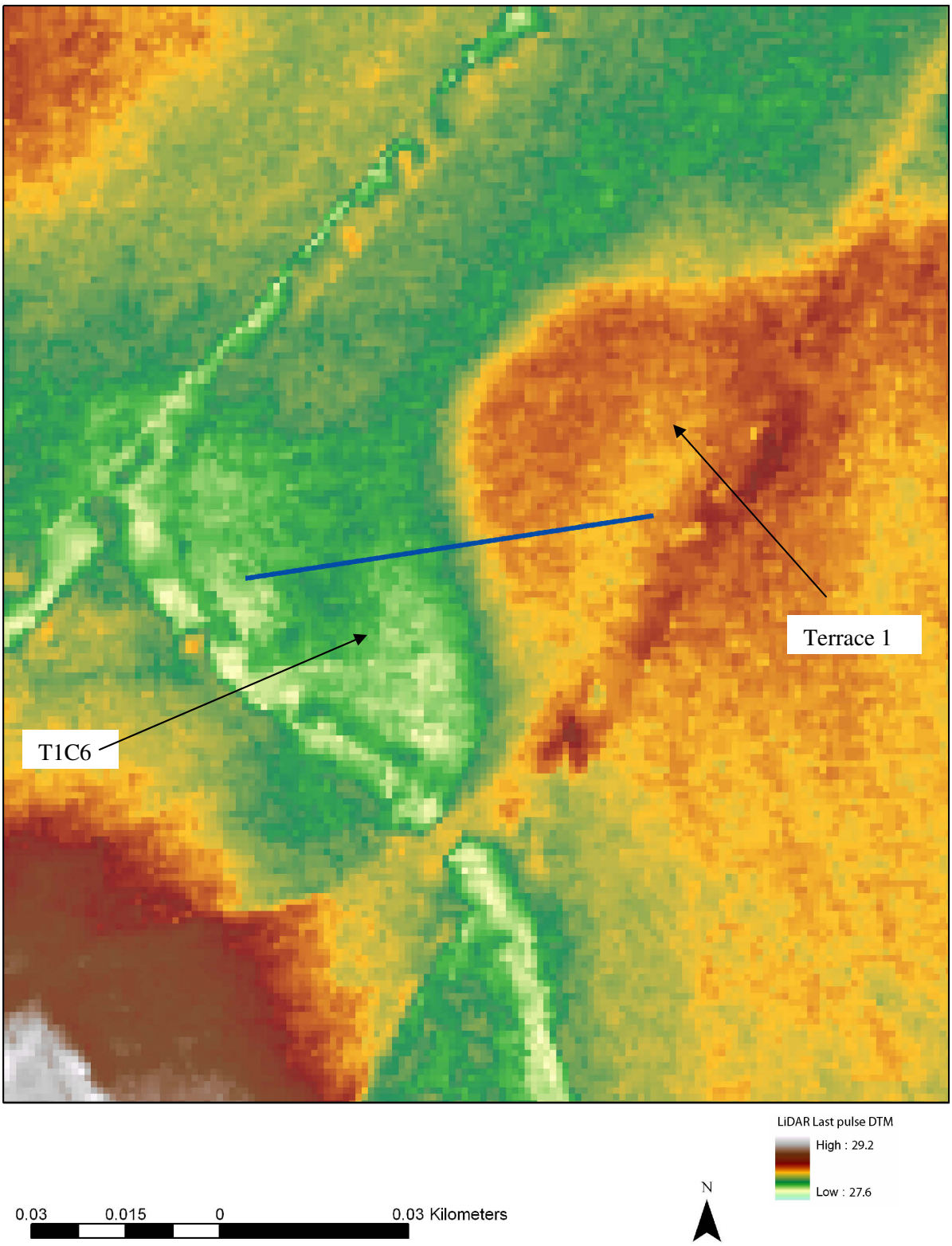

Fig 5.21: The LiDAR last pulse DTM, showing terrace 1 and the palaeochannel T1C6. The location of T1T1 is also shown.

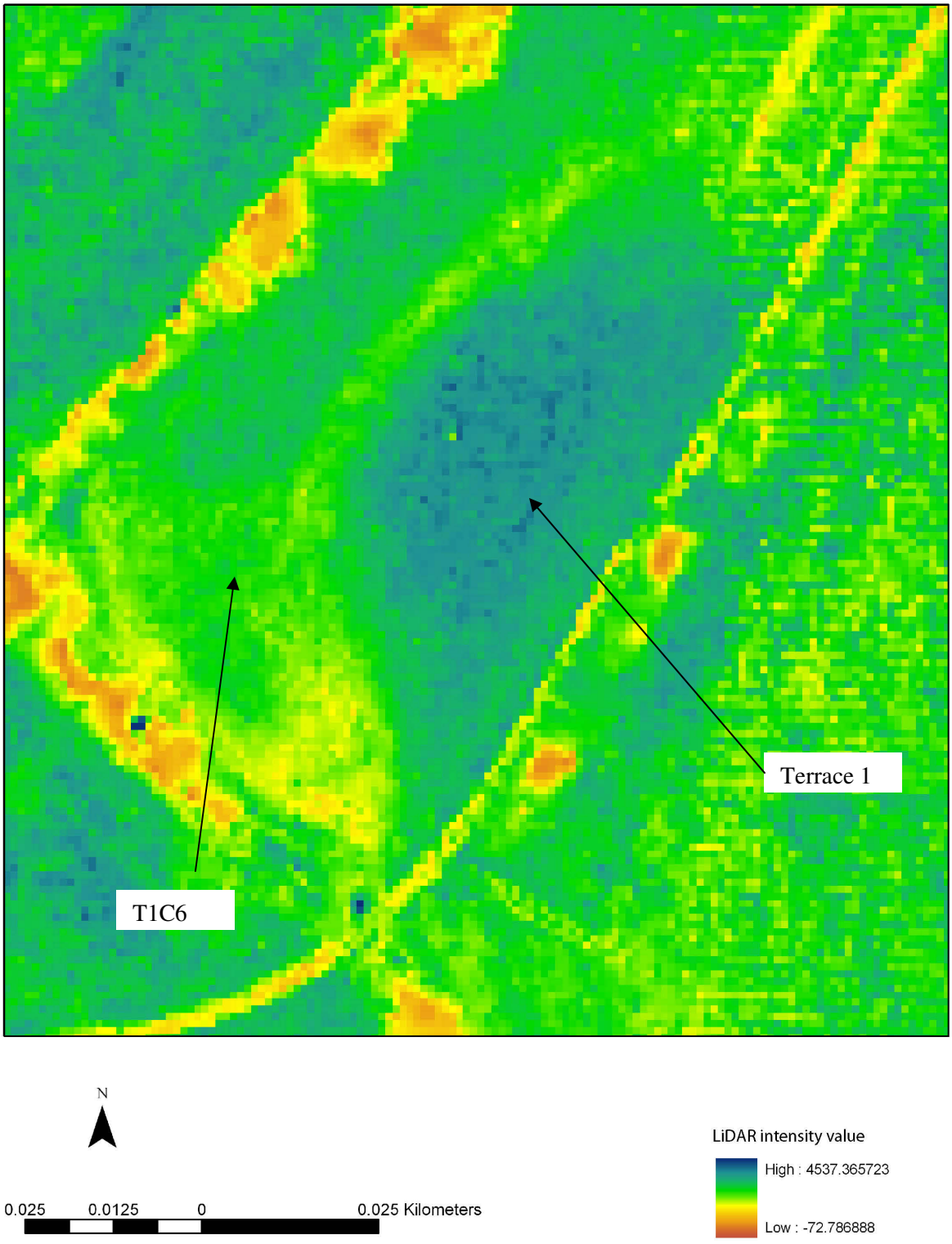

Fig 5.22: The LiDAR intensity plot, also showing a difference between terrace 1 and T1C6.

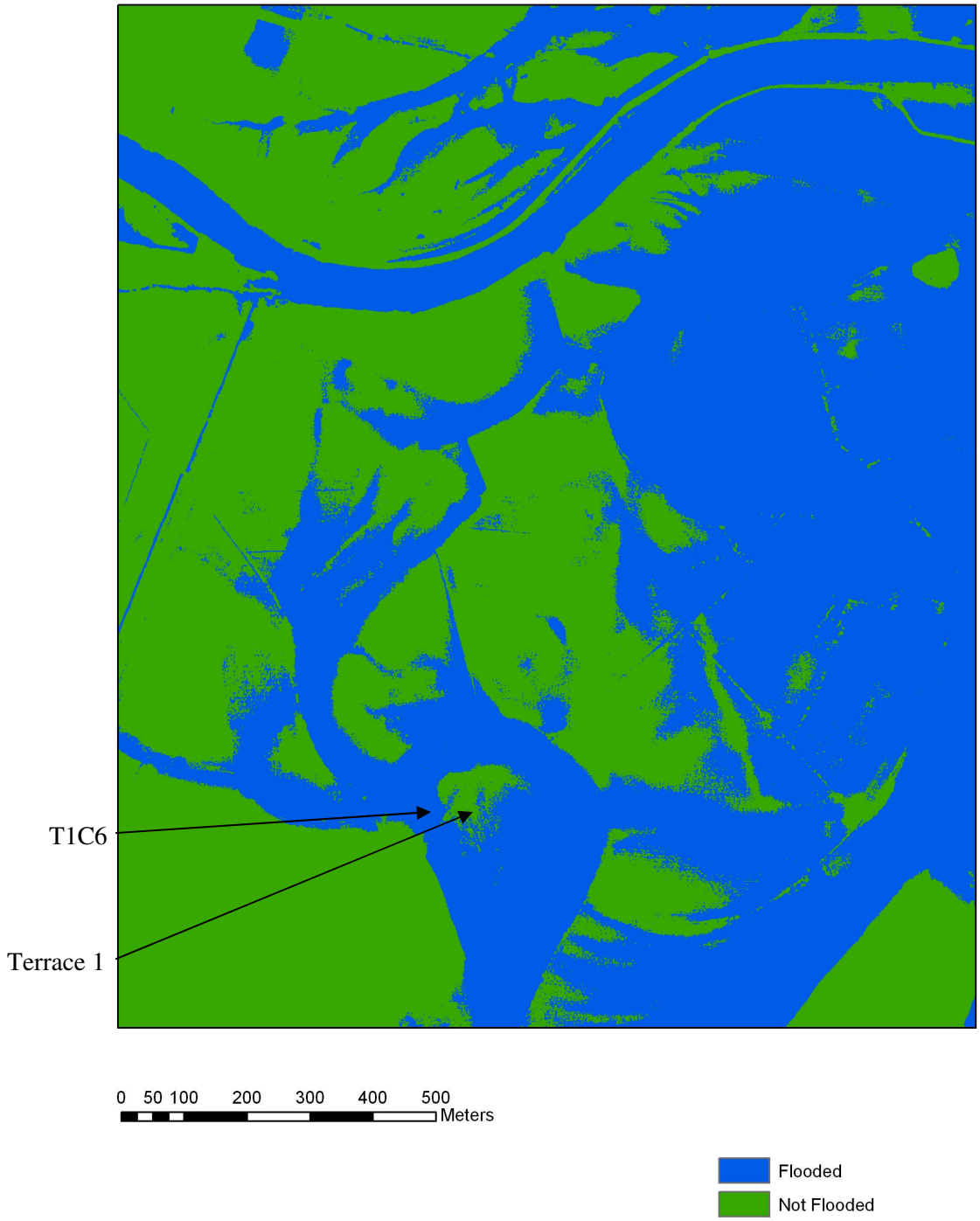

Fig 5.23: A flood map produced through combining an aerial photograph of the 1954 flood with the LiDAR last pulse DTM. Terrace 1 is shown as not flooded by the channel T1C6, although it is at the very edge of the flood boundary.

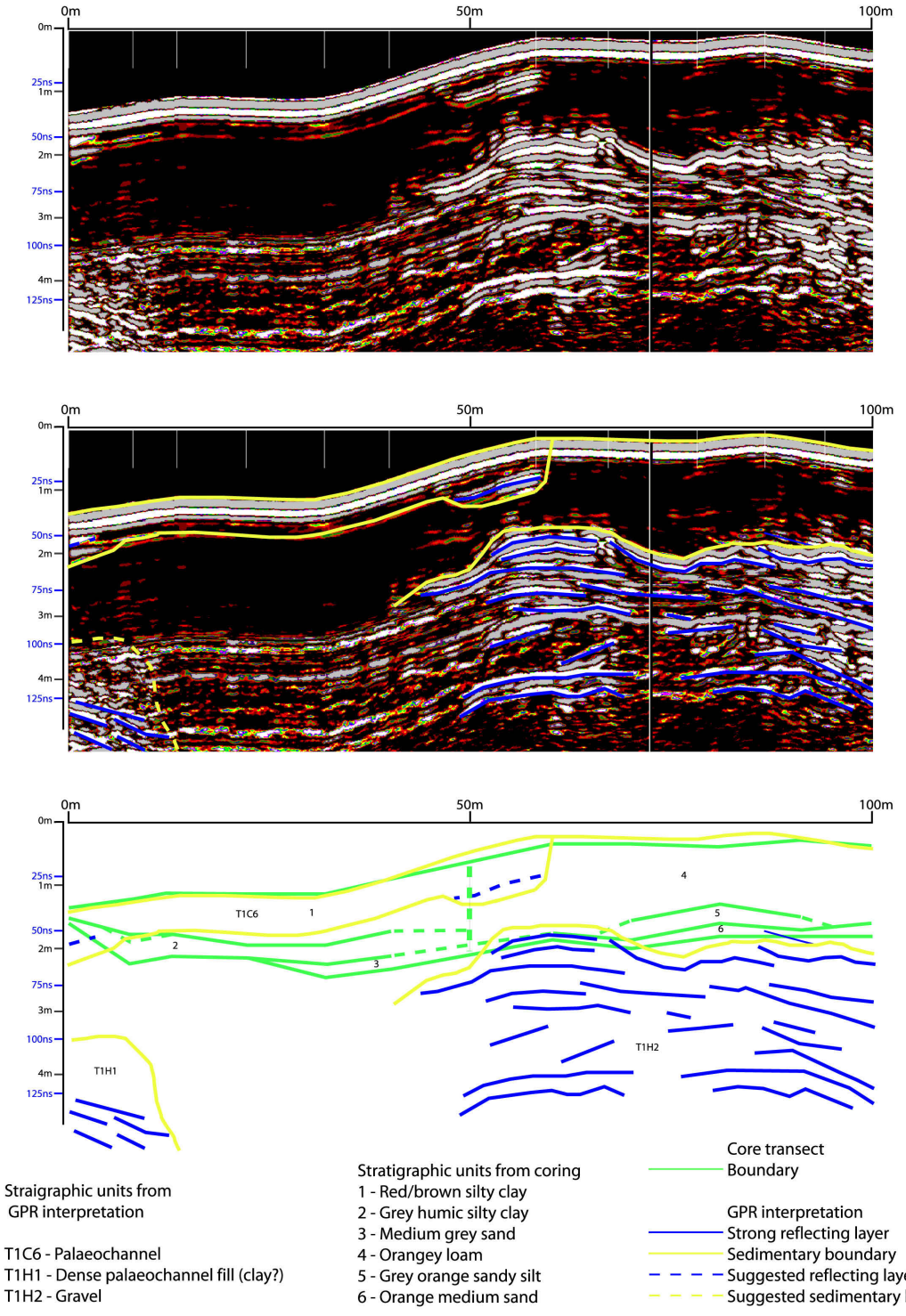

Fig 5.24: The T1T2 transect survey, shown with an interpretation and against gouge core data.

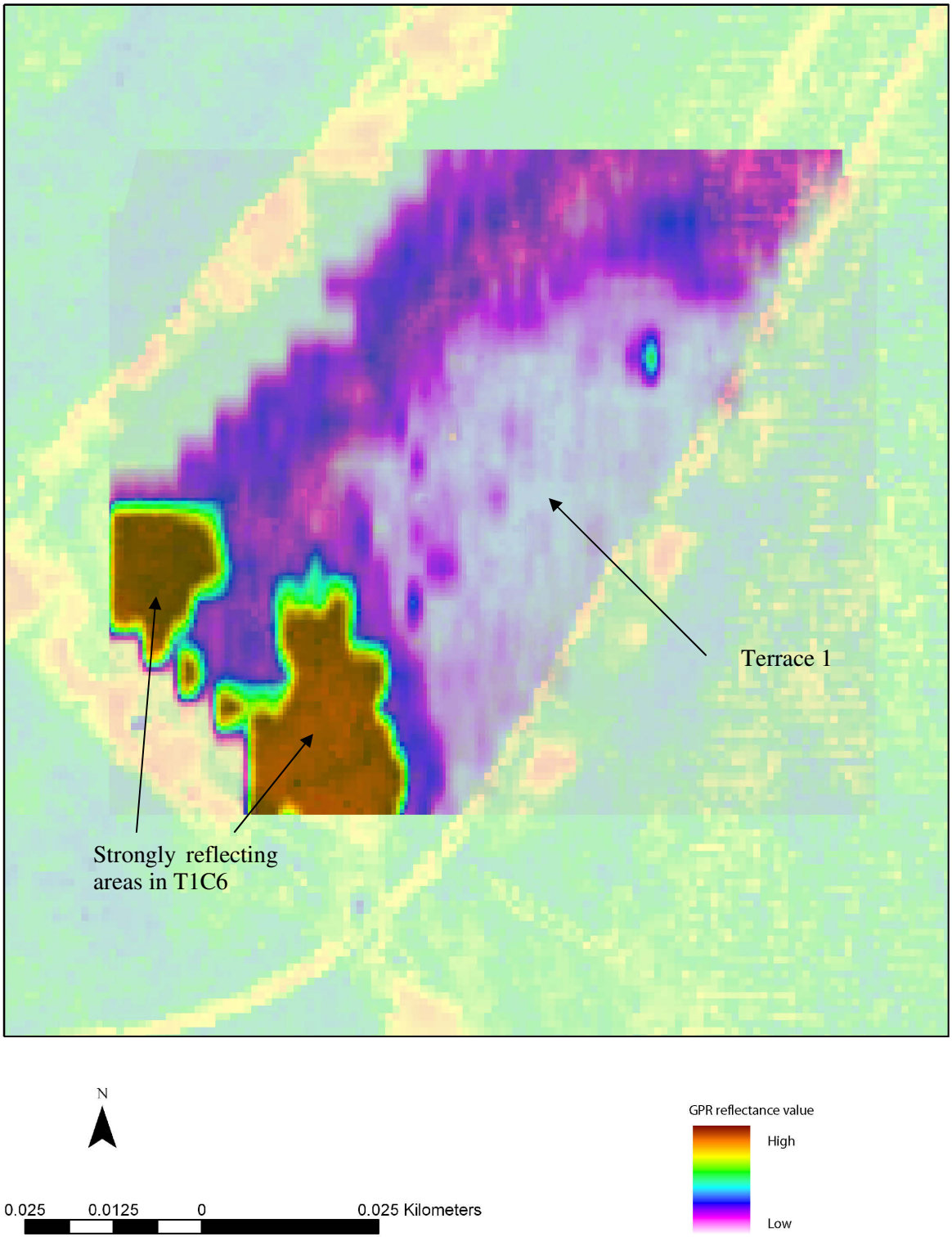

Fig 5.25: The T1G1 survey, 0.9m – 1.1m depth slice. The area of terrace 1 is still as a low reflecting unit, due to it the gravels still being under alluvium at this depth. Two strongly reflecting features are evident in T1C6.

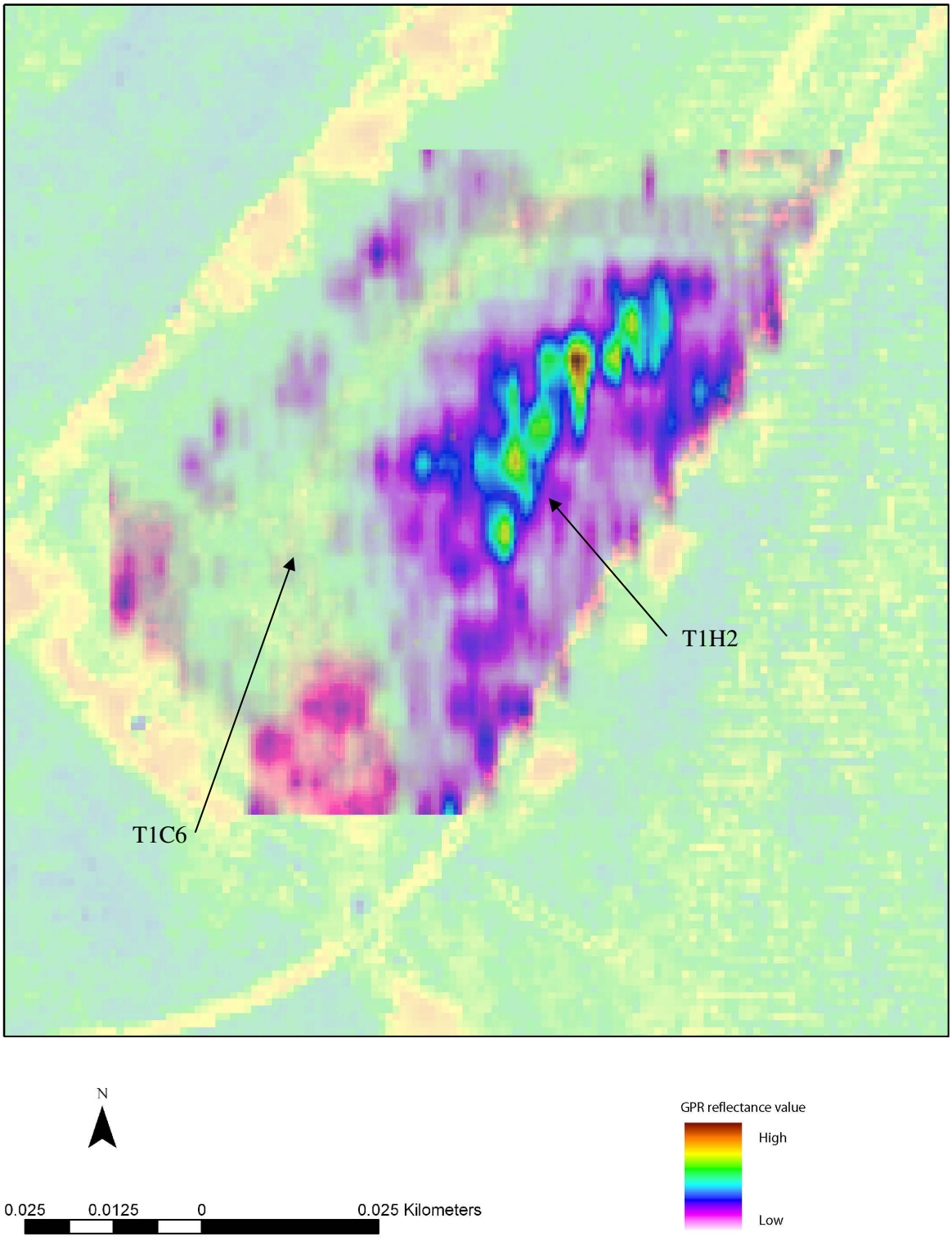

Fig 5.26: The T1G1 survey, 1.4m – 1.6m depth slice. The gravels under the alluvium on terrace 1 are becoming visible (gravel unit labelled T1H2). T1C6 is evident as a feature but it this is due to lack of penetration at shallower depths.

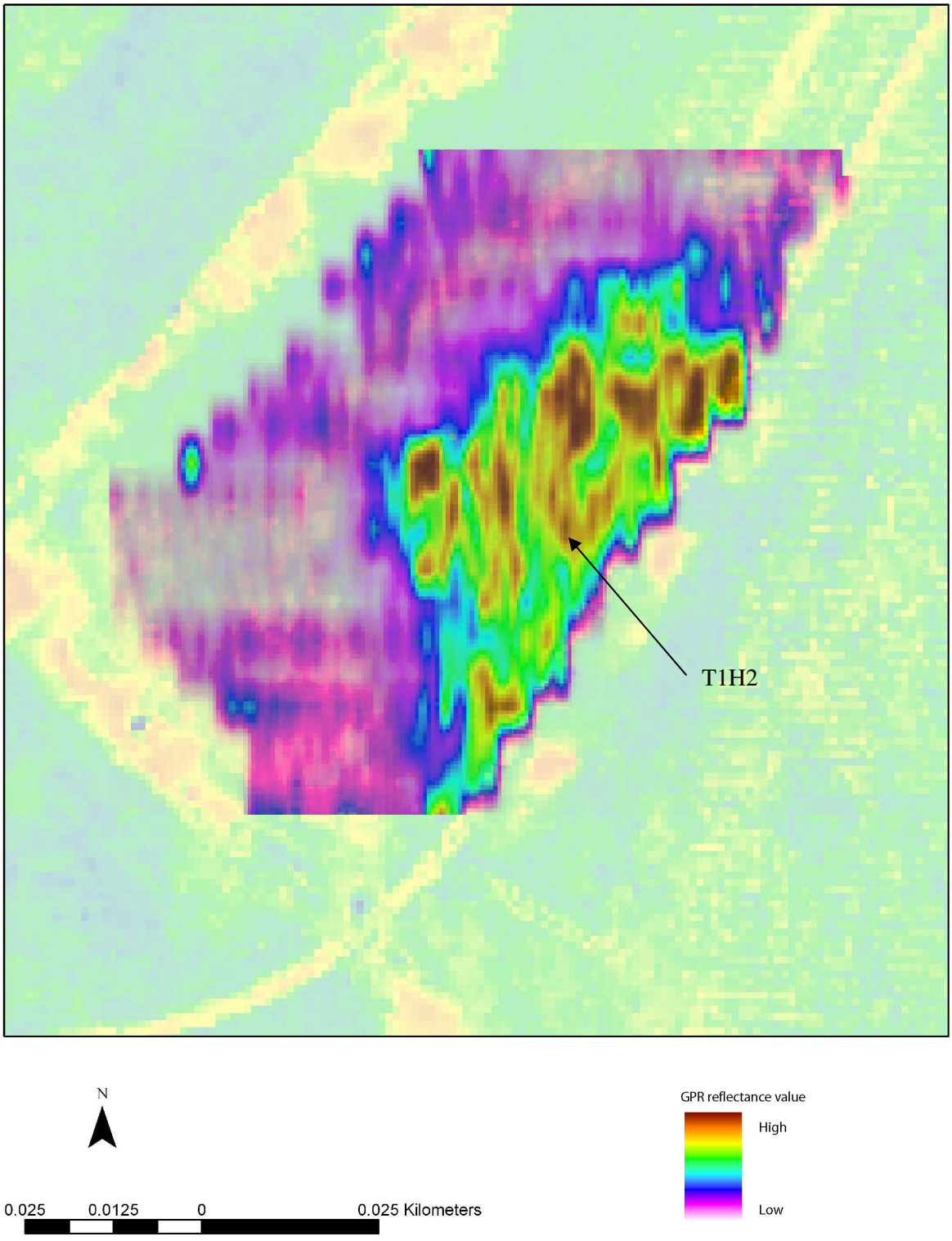

Fig 5.27: The T1G1 survey, 1.9m – 21.m depth slice, with the gravel unit T1H2 clearly visible.

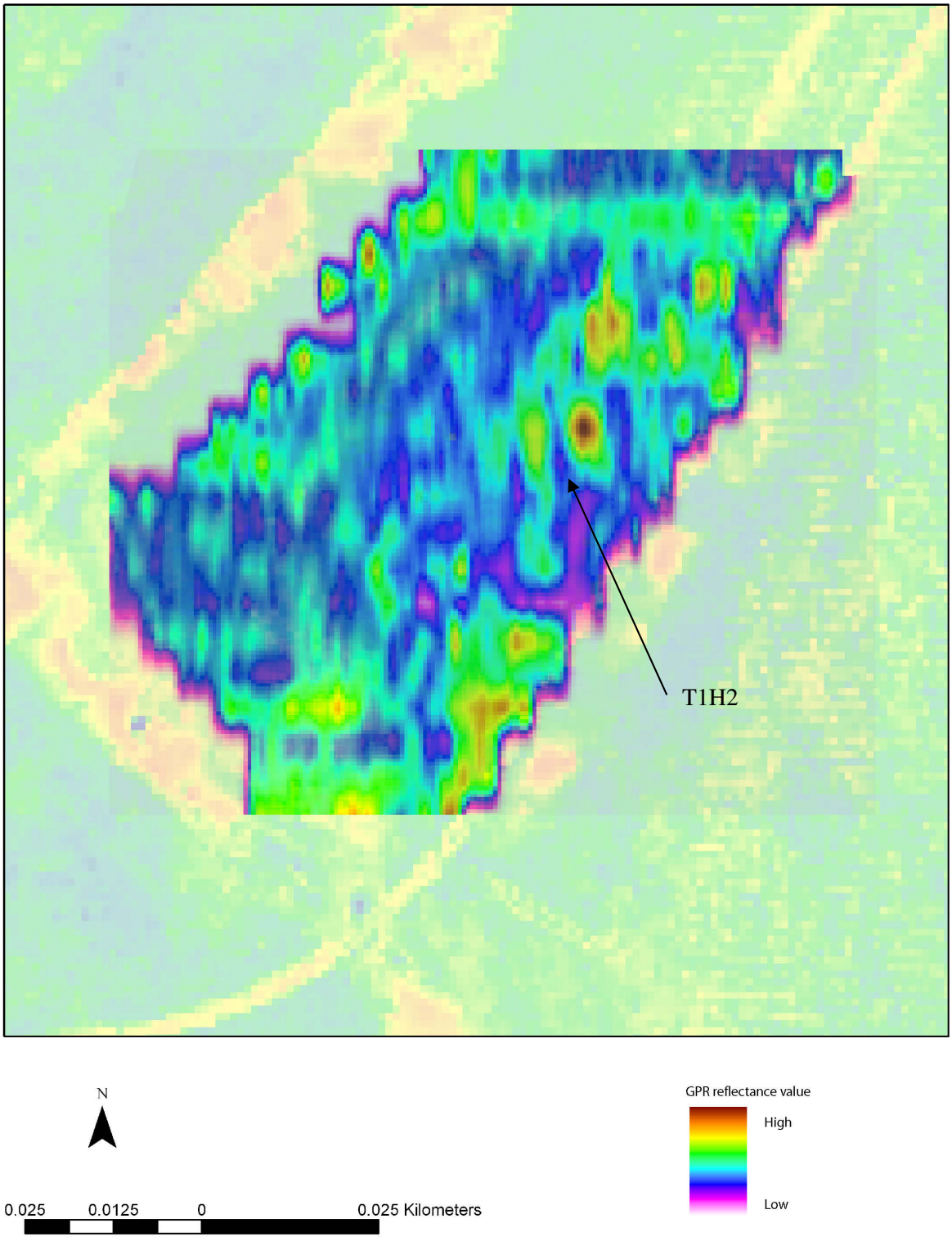

Fig 5.28: The T1G1 survey, 2.4m – 2.6m depth slice. The maximum depth of penetration is being reached but T1H2 is still identifiable.