Report of the Skagafjörður Archaeological Settlement Survey 2008:

GPR at Stóra Seyla

By Brian Damiata, John Steinberg, & Douglas Bolender

With the help of
Amélie Allard, Colin Connors, Emily Button, Pete Gangemi, Kelly Goldberg , Emily Hopkins, Kate Johnson, David Landon, Jennifer Landon, Ann Mrozowski, Stephen Mrowoski, Marisa Patalano, Dennis Piechota, Greta Piechota, Jane Piechota, John Schoenfelder, Rita Shepard, Sarah Staats, William Steinberg, Rosie Taylor, Heather Trigg, Josiah Wagener, & David White

Funded by
United States National Science Foundation
BCS 0731371 (Archaeology & Arctic Social Sciences)

With the institutional assistance of
Hólaskóli
Byggðasafn Skagfirðinga Glaumbæ
Árskóli Sauðárkróki
CH2M HILL Polar Services

Permit issued by
Kristín Huld Sigurðardóttir, **Forstöðumaður Fornleifaverndar ríkisins**

Under the guidance of
Þór Hjaltalín, **Fornleifavernd ríkisins**

In collaboration with
Ragnheiður Traustadóttir, **Hólarannsóknin**
Sigríður Sigurðardóttir, **Byggðasafn Skagfirðinga Glaumbæ**

Additional copies of this report and other reports, as well as much of the raw data can be downloaded from http://www.fiskecenter.umb.edu/SASS.htm

Location

Three hundred twenty-two GPR lines were walked for each of three antennas (250, 500, & 800 MHz) both N-S and E-. The 250 & 800 MHz antennas was not nearly as productive and the 500 and therefore only the 500 MHz data is reported here. Lines were taken with 20 cm interval. The GPR cm slices are from a prepared surface. The first 10-15 cm were removed by backhoe and then shovel scraped smooth. We have found that grass dissipates a substantial amount of radar energy and therefore removing the grass layer and having a smooth surface is critical for good GPR work.

500 MHz

The 500 MHz antenna was operated with a sampling frequency of 7616 MHz, a time window of 67. The lines were staked out using a total station and walked by following a tape on every line. Lines were walked in the same direction to reduce line noise (Figure 10). The samples were then processed with GPR-Slice software. The slices are representations of the squared amplitude of about 7 cm of radar waves binned every 6.5 cm.

Interpretation

Interpreting GPR with the aid of excavated features allows us to understand how GPR reflects off of turf walls (Figure 1. It must be remembered that there is not uniform signal or color of a GPR slice map. The same feature can have different electromagnetic properties depending of its context. In this case, the tops of turf walls can be strong reflectors while the base can be a weaker reflection than the trampled areas around. Stones are usually strong reflectors, especially when oriented horizontally. Jagged or angled rocks can disperse radar waves making them difficult to identify. These are horizontal slices below ground surface. Because the site is sloping (Figure 11), this is not without its problems. The next stage will be to identify surfaces and follow them through the site, whatever depth.

Given these caveats, with the excavated contexts, it is possible to interpret with some degree of correctness, what some of the GPR slices represent. The 35 cm slice (Figure 2) shows large rocks (red) gives some idea of the distribution of substantial aeolian fill (blue). The 60 cm slice (Figure 3) shows the tops of the upper turf walls. The 70 m Slice (Figure 4) shows broadly trampled floors. The 80 cm slice (Figure 5) shows the areas of floors and extramural deposits with the heaviest trampling. The 90 cm slice (Figure 6) also shows the central areas of walking and activity. Below this, level, interpretations are much more difficult. It would appear that the 120 cm slice (Figure 7) might be showing earlier buildings. The 140 cm slice (Figure 8) may show a possible path to lower midden and the fjord. The 160 cm slice (Figure 9) is just above the limit of the 500Mhz Antenna and it is difficult to interpret.

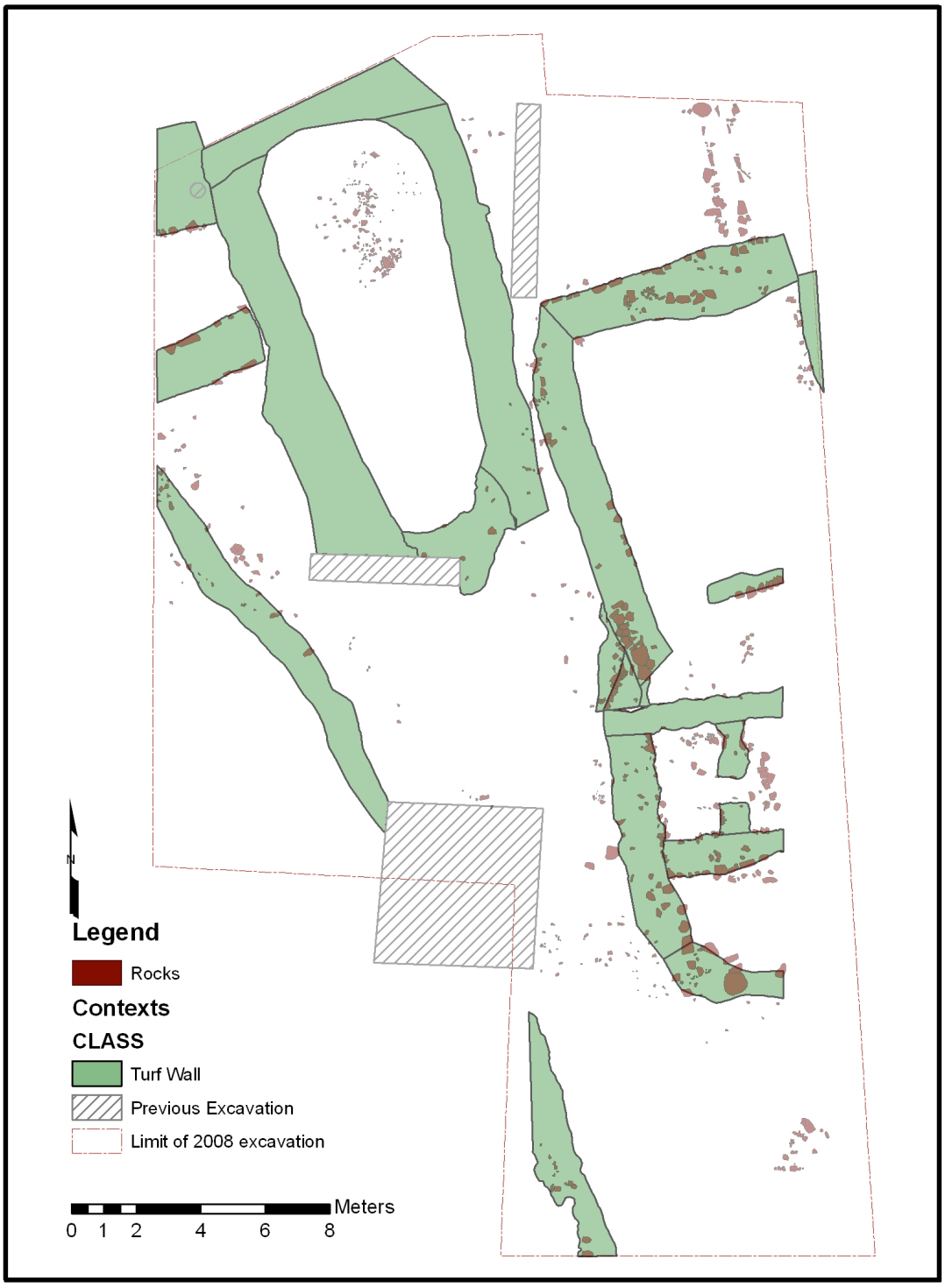

Figure 1. Excavated features

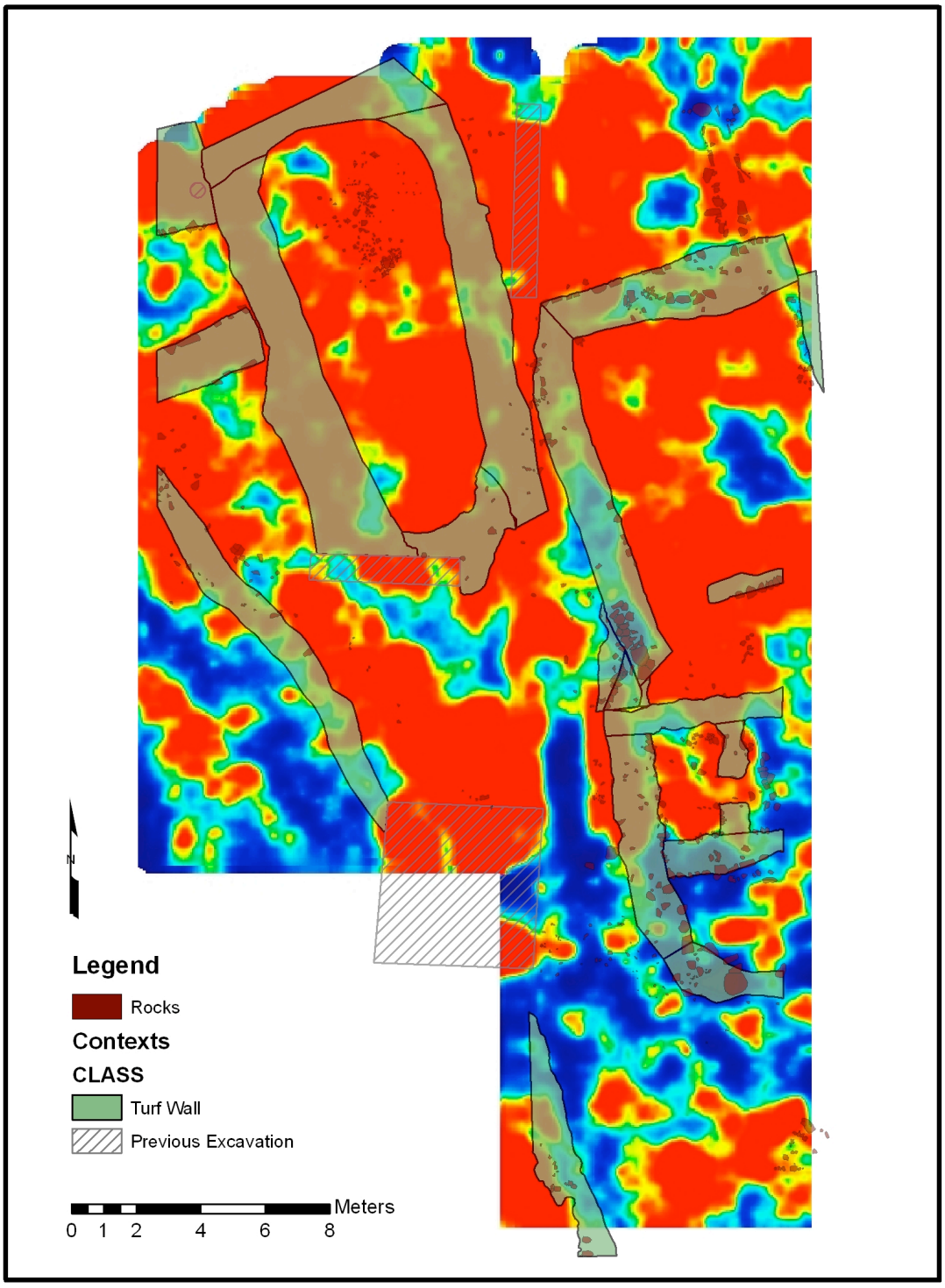

Figure 2. 35 cm Slice with excavated features.

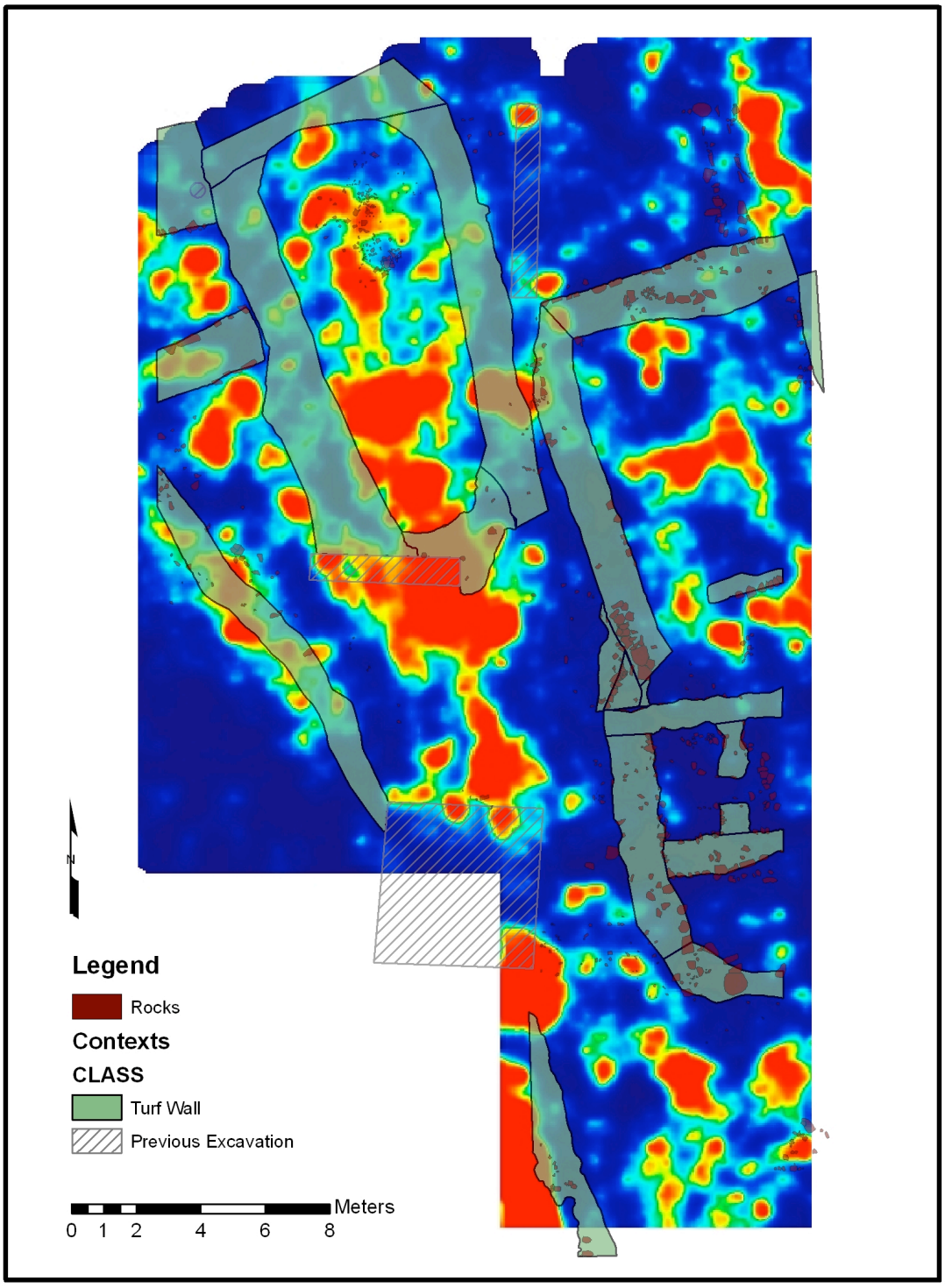

Figure 3. 60 cm Slice with excavated features.

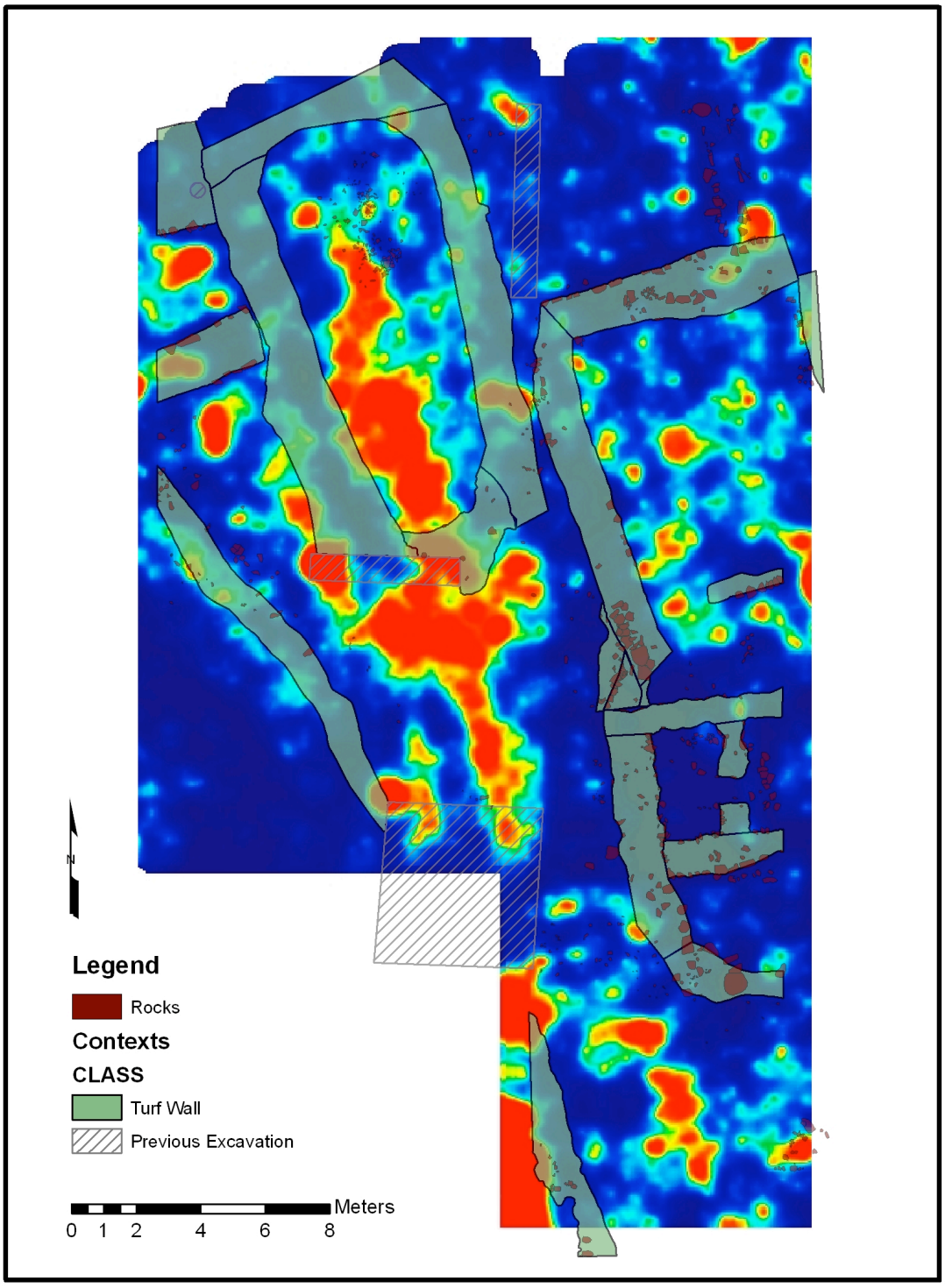

Figure 4. 70 cm Slice with excavated features.

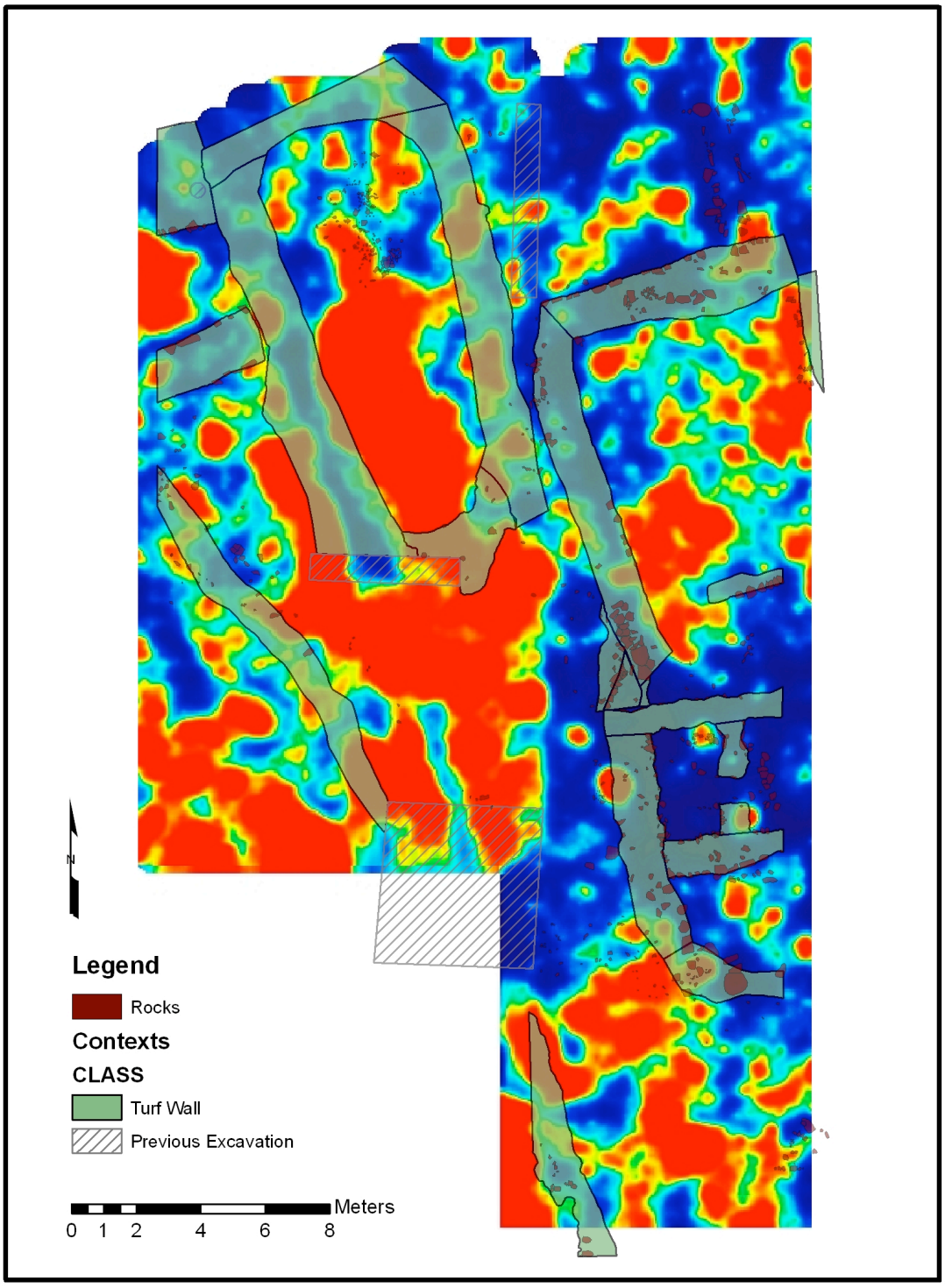

Figure 5. 80 cm Slice with excavated features.

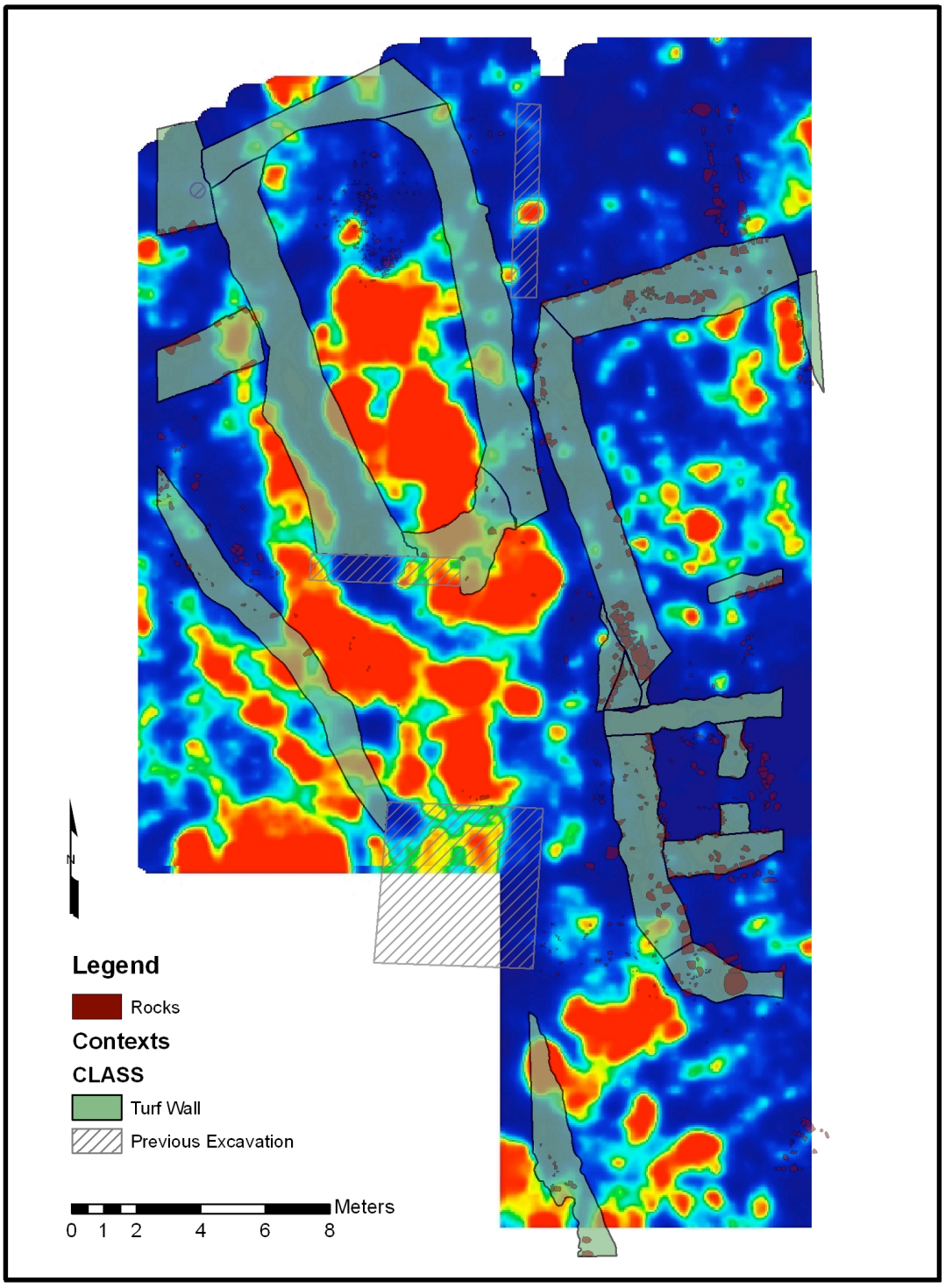

Figure 6. 90 cm Slice with excavated features.

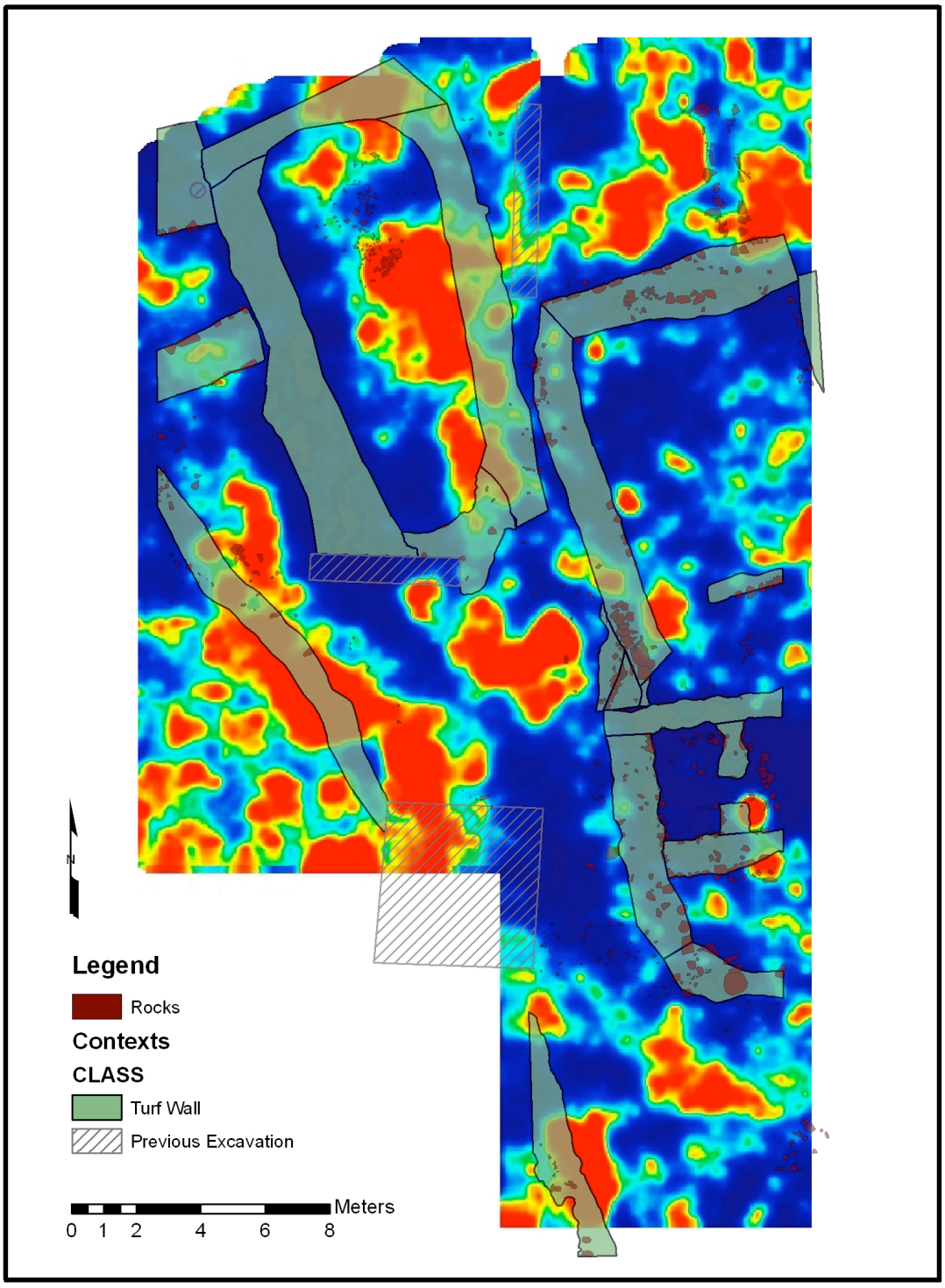

Figure 7. 120 cm Slice with excavated features.

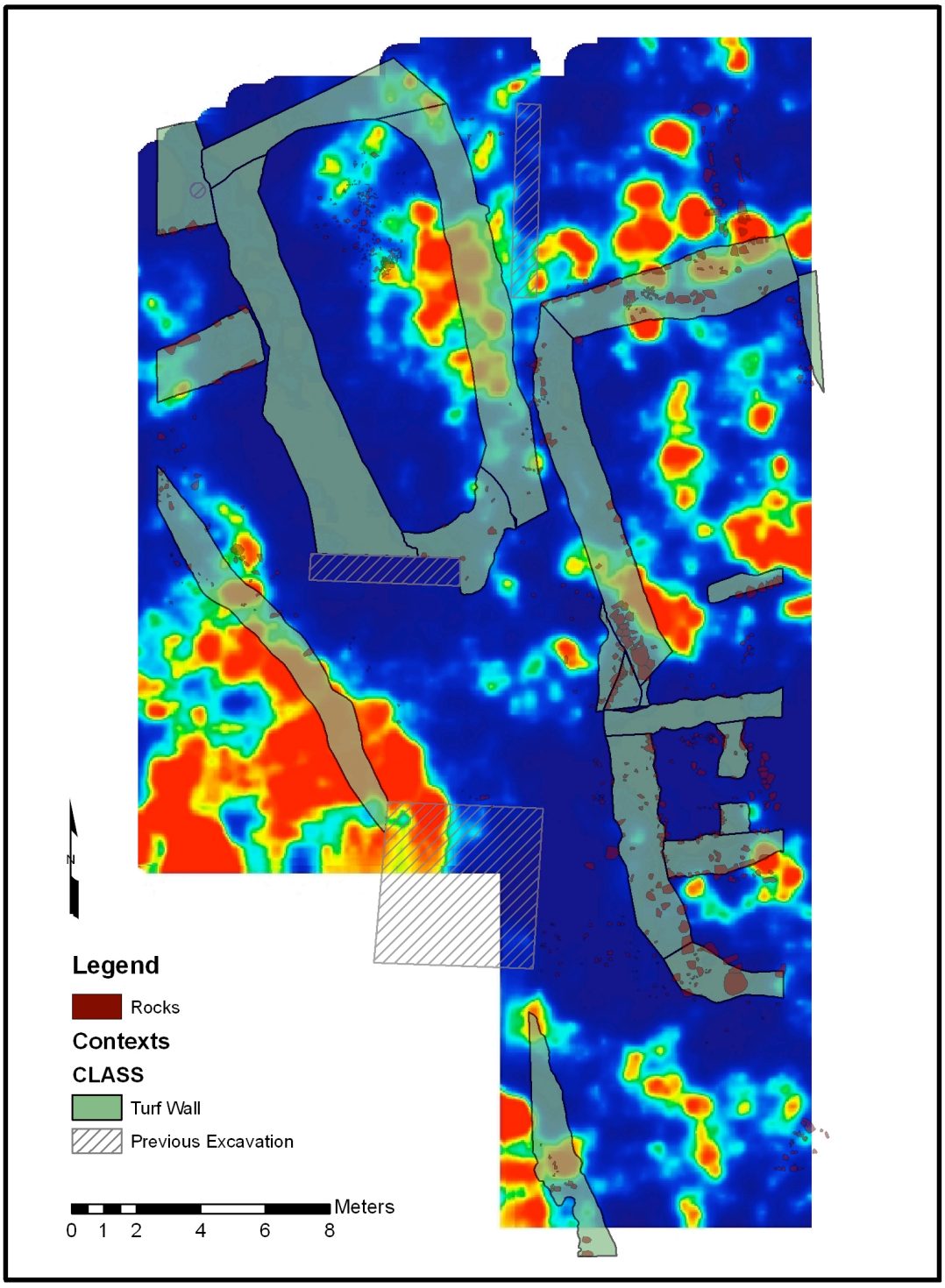

Figure 8. 140 cm Slice with excavated features.

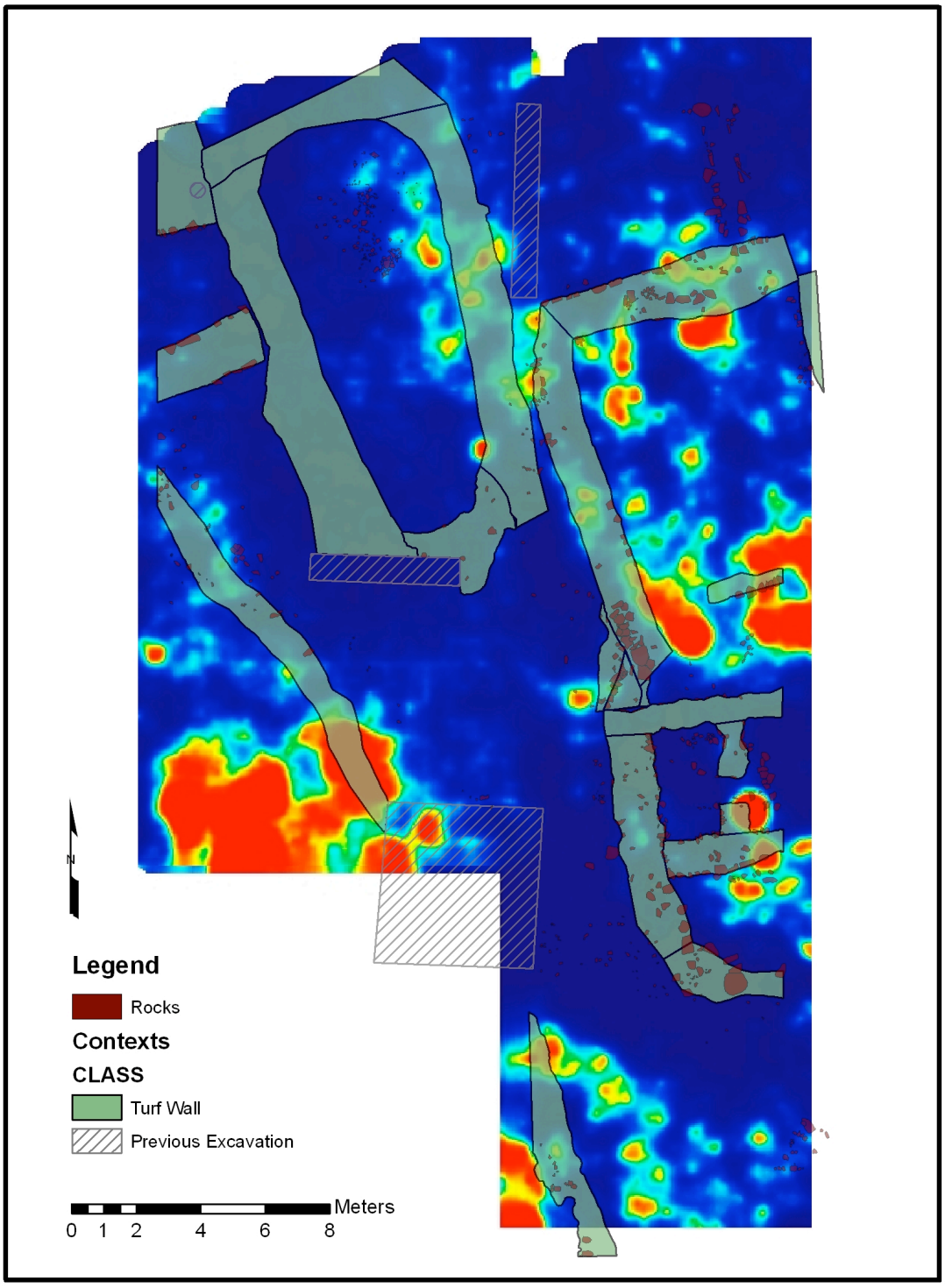

Figure 9. 160 cm Slice with excavated features.

Figure 10. GPR at Stóra Seyla

Figure 11. GPR at Stóra Seyla