



APPENDIX 6

YORK ARCHAEOLOGICAL TRUST CONSERVATION RECORD SHEET		Sheet 1	Of 1
Site name: Wykeham Quarry, North Yorkshire		Site code:	
Material: Copper alloy		X-ray no: N/A	
Small find no: 1		Context number: 81007	
Simple name: Brooch			
Work required: Corrosion removal for publication/display			
Conservator: M Felter		Conservation report number: 2009/72	

Condition: The object was found to be in fair to poor condition. The surfaces are covered with powdery and soft light green corrosion products which are very fragile. There is only a very small portion of the pin present. The interior surface of the bow has a more crusty corroded layer. The edges are fragile and broken in some areas. The brooch is very similar to Aucissa type brooches of the 1st Century, as catalogued by Hattat (1989, 317-318).



Treatment: Corrosion was removed from the surfaces using a scalpel under magnification. The surface was consolidated using 5% Paraloid B72 (methyl methacrylate co-polymer) w/v in acetone, with Santocel fumed silica added to reduce shine. The object was packaged in a crystal box with plastazote support.



Reference: Hattat R, 1989, *Ancient Brooches and Other Artefacts*, Oxbow Books, Oxford.

Care Guide:	RH: <35%	Maximum Lux: 300	Temperature: Stable
-------------	----------	------------------	---------------------

APPENDIX 7
Andrew Josephs
Environmental Consultant
Specialist in Archaeology and EIA

Lucie Hawkins
Development Control Archaeologist
North Yorkshire County Council
Racecourse Lane
Northallerton
North Yorks

June 21st 2009

via e:mail

Dear Lucie

Proposed Extension to Wykeham Quarry

Hanson Ltd has commissioned us to manage pre-planning application archaeological work at Wykeham Quarry (NGR SE 990 825). Hanson intend to submit an application accompanied by an EIA for the extension of this quarry during 2010. The proposed extensions are shown on **Figure 1**: the northern area measures about 25ha, the southern 27.5ha.

We recognise that the site lies in an area of high archaeological potential and that pre-determination field-based evaluation will be required, and we would therefore plan to carry out these works post-harvest this year in order to have the information available to shape the planning application and EIA.

The aim of this letter is therefore to propose the scope of that field evaluation either for your approval or refinement. First, however, we set out the background information necessary for you to consider the scope of evaluation required.

Review of information

Excavation and fieldwork have demonstrated that at Star Carr, Flixton Carr and Seamer Carr (Sites 15 and 16 on **Figure 1**) a Later Upper Palaeolithic and extensive Mesolithic landscape survives partially buried beneath accumulated peat deposits. All of these sites were located along the former shoreline of the lake close to the 24m to 25m OD subsurface contour where dry land provided an excellent base from which to exploit the rich wetland resource of the swamps, carr and open water.

Records of stray Palaeolithic, Neolithic and Bronze Age finds within the Vale (Sites 18 to 24) indicate that the area supported a population throughout earlier prehistory and that occupation and settlement was not just confined to the Mesolithic period. The nomadic nature of this

Andrew Josephs ♦ Environmental Consultant

population, however, makes it difficult to identify their settlement or occupation sites although it is considered that camp-sites may have favoured the slightly elevated sand hills around the margins of the lakes.

Within 1km of the proposed extensions, cropmark evidence from aerial photography record several enclosure, field system and trackway complexes (Sites 2 - 7). These complexes appear to be concentrated on the higher ground associated with the Wykeham moraine and the higher glacial ridges extending into the Vale. They probably have their origins in the Iron Age and Roman period, but as excavations at Wykeham (Site 11) and Crossgates (Site 12) have demonstrated these sites could also incorporate Anglo-Saxon remains. Site 6 lies 250m north-east of the northern extension area and this may be part of a ladder settlement extending southwards along defined ridges of glacial deposits from more extensive ladder settlement running east to west along the northern edge of the Vale (Sites 3, 4, 5 and 9). The ridge on which Site 6 is situated is at 30.25m AOD.

The proposed extensions lie within the former township of West Ayton that formed part of the Manor of Hutton Bushel. There is no cartographic or documentary evidence to suggest any settlement within the proposed extensions during either the Medieval or post-Medieval periods. A Plan of the Manor of Hutton Bushel dated 1838 (NYCRO ZDS M 3/3) suggests the land was probably owned at this date by Lady Hewley's Trustees and shows the extensions being unenclosed. Some fields are shown to the west and east of the northern extension, but none near the southern extension. This suggests that the areas were marginal, boggy carr in the Medieval and post-Medieval periods, and prone to seasonal flooding.

Work within the existing quarry

Desk-based assessment, geophysical survey, fieldwalking and auger surveys were undertaken during 2003 as part of an EIA for the currently permitted working area (which extends to 19ha).

The geophysical survey did not identify any definitive archaeological targets, but anomalies indicative of palaeochannels indicate that the technique was effective when using a 1m gradiometer. Fieldwalking recovered two flint artefacts at about 26.60m AOD: an end scraper and a serrated edge blade. Both implements could be found in later Mesolithic assemblages but an early to middle Neolithic date was considered most probable. The results of the auger survey showed that the deposits at Wykeham are very different from those at the eastern end of the Vale, and that the site was periodically covered by deep water associated with a former lake. No areas of outcropping gravels were identified and there were no thick deposits of post-glacial peat. The assessment showed that the deposit was laid down in varying depths of open water between about 10,000 bc and 8,000 bc and that although the lake water level fluctuated, there were periods when it exceeded 26m OD, considerably higher than that recorded to the east around Seamer.

The results of the above evaluation techniques accurately predicted the findings of post-consent investigations. No archaeological features have yet been discovered, but the palaeoenvironmental work funded by Hanson has already made a significant contribution to the palaeoenvironmental reconstruction of the Vale providing a high-resolution record of environmental change, as summarised below.

Since consent Northern Archaeological Associates have been co-ordinating the recording of quarry sections as part of each phase of development in fulfillment of the planning conditions. This has involved a multi-disciplinary approach to sampling using a combination of sediment physical properties, assessment for pollen, plant and insect remains and C14 dating.

Andrew Josephs ♦ Environmental Consultant

The depositional sequence reflects a complex sequence of palaeoenvironmental change during the later Late glacial into the early Holocene. The work done to date clearly demonstrates that this is an important palaeoenvironmental site both regionally and nationally.

In general terms the interpretation of the sediment sequence is as follows:

- It commences with diamict/gravel deposition in association with deglaciation and meltwater discharge through the Forge Valley. This material could have been deposited in a lake or outwash fan.
- The lower organic clays/peat above this layer indicates wetland conditions dating to the Windermere Interstadial (Zone II). In some parts of the quarry the preservation of these deposits has been excellent and is showing two bands of shallow organic sediments separated by a shallow layer of silts. They indicate marginal lake deposits with the presence of fresh straps of *Phragmites* and plenty of seeds indicating that hydroseral development was occurring in Zone II. The pollen, plant and insect remains indicate warm climatic conditions much like today. This is probably the earliest hydroseral development sequence found in the Vale.
- The overlying thick laminated clays date to the Loch Lomond Stadial (Zone III). They indicate deposition in standing water conditions, most likely a lake with a considerable extent and depth. These deposits were laid down in a periglacial environment over a period of about 1,000 years.
- As the Loch Lomond Stadial came to an end, the deposits indicate that climatic warming led to the re-establishment of vegetation across the catchment with the formation of peat across the wetland. During this period lake levels fell and by the Mesolithic period this was an area of active river channel activity as the Derwent established itself across the floodplain. The river appears to have crossed the current quarry several times, some of the ancient channels also being visible in both aerial photographs and the geophysical survey results.
- Unfortunately, the post-glacial deposits within the current quarry have been heavily eroded through the effects of drainage and agriculture and only survive as a fragmentary, very thin layer overlying the Late-glacial deposit.

Assessment of topography and archaeological potential

The results of desk-based research and field-based investigations within the currently permitted quarry provide a useful model for predicting zones of archaeological potential within the proposed extensions.

Earlier prehistoric remains

The proposed extensions lies within the former Lake Pickering, although (unlike at the eastern end of the Vale) within an area where the depth of water did not remain static. Within the eastern end of the Vale, Late Palaeolithic and Mesolithic sites have been located on slightly elevated areas of dry land along the former shoreline of the lake marked roughly by the 25m OD contour. During investigations in the Vale this contour has been used as a means of successfully predicting the likely location of settlement during these periods. Within the current quarry the site has been covered by a Late-glacial deposit of clay and silt reaching an OD height in excess of 26m.

Thus, although it is difficult to draw conclusions at this stage about where the exact shoreline of the lake lay with respect to the proposed extensions during both the Late Palaeolithic and early Mesolithic periods, it can be stated with some confidence that the potential for preserved

Andrew Josephs ♦ Environmental Consultant

archaeological sites will lie above 26m AOD. Some artefacts of the period may be found in the ploughsoil at lower levels AOD.

All but c.3ha of the northern extension lie above 26m AOD suggesting that the potential for earlier prehistoric archaeology in this area is high. The area rises gently from 25.62m in the south to 27.60m on the northern boundary and similar heights to the north-east boundary. Within the northern area the land is gently undulating and a high point of 27.95m is reached towards the northern boundary. The southern extension is almost flat with less than c.1.5m difference in elevation across the whole area. The highest point is 25.72m on the north-eastern boundary; the lowest 24.30m on the western boundary. As all land lies below the 26m contour, the potential for earlier prehistoric archaeological sites is considered very low.

It is conceivable, although investigations in the current quarry suggest it is extremely unlikely, that during the Later Upper Palaeolithic water levels of the lake may have been low enough for there to have been a dry shoreline along the interface between the mineral deposit and the basal moss peats around the 23.5m to 24.5m OD contour. Such a shoreline might have been attractive for Late Palaeolithic occupation, although given the amount of re-working and erosion this surface has been degraded during the period of deposition of the later clay and silt. The potential for extensive archaeological remains to have survived on this surface is extremely limited and unlikely to be located by evaluation techniques.

Later Mesolithic, Neolithic or Bronze Age remains could be located close to the interface between the late-glacial silt and the early post-glacial deposits which averages 25.25m AOD in the current quarry, although the surface of the late-glacial deposits above the water margin probably remained waterlogged making access either for temporary occupation or exploitation at best seasonal. These layers within the current quarry have been shown to be degraded through drainage and agriculture, and it is likely that this will be repeated within the proposed extensions.

The whole of the northern extension therefore has potential to contain sites of these periods, and in the higher parts of the area these may be less disturbed by ploughing and drainage and could be well preserved.

The southern area lies right on the topographical limit for later Mesolithic, Neolithic or Bronze Age remains, and the interface at which archaeology could be found would most probably now lie within the ploughzone. Given the location of this area in the heart of the former lake it is extremely likely that it would have remained boggy and unattractive in comparison to drier and better drained land nearby.

Later prehistoric, Roman and post-Roman remains

Although there is extensive evidence within the broader area for later prehistoric, Roman and post-Roman settlements and agriculture, such sites are located on the higher glacial moraines to the north, west and east. The proposed extension areas are lower lying and would have been boggy carr land until at least the post-medieval.

However, 250m north-east of the proposed northern extension, a cropmark site suggestive of an Iron Age/Romano-British ladder settlement has been identified. This is located above the 30m contour and provides a useful pointer to the height at which later prehistoric, Roman and post-Roman archaeology may be sited.

The northern extension is therefore considered unlikely to contain settlement remains of these periods, although it is possible that field systems associated with the settlement to the north east may have extended southwards onto the lower ground and within the proposed extension.

Andrew Josephs ♦ Environmental Consultant

It is considered extremely unlikely that any archaeology from this period will be found in the southern extension.

Proposed evaluation

It is proposed to follow a similar evaluation exercise that has successfully predicted the potential for archaeological deposits within the current quarry. Here desk-based assessment, auger survey, fieldwalking and targeted geophysics were used to predict or identify zones where archaeology could survive, although the results of the evaluation have been subsequently enhanced by archaeological monitoring of soil stripping and the recording of quarry face sections.

The topographical models (**Figures 2 and 3**) show that only the northern area has clear archaeological potential, and that this may be considered to be potentially high. It is recognised that both proposed extensions have palaeoenvironmental importance, but it is not considered necessary to evaluate this in detail prior to determination. Subject to consent, it would be proposed to continue the multi-disciplinary approach that has provided one of the most important palaeoenvironmental studies in the region.

Augering

Auger transects will be undertaken across the proposed extensions by Dr E Cloutman. This will aim to identify the sub-surface topography that could highlight areas of archaeological potential and provide targets for large test pits. The study will be based on hand corings, using a 10cm diameter post hole auger, along a series of transects. Corings will generally be taken at 50m centres, reduced to 30m where finer detail is required. The number of transects required will be determined on site and based upon results, but it is likely to be in the region of 8 for the northern area and 4 in the south where the sub-surface topography is likely to be more uniform.

Geophysical survey

Evidence from the current quarry (and the evaluation that was undertaken prior to determination) shows that the Derwent meandered across the general area on several occasions. This is likely to be identified again by geophysics, but should not be an aim of the survey. It is proposed that the whole of the northern extension will be scanned, with detailed gradiometry based upon the results of the scanning. As a guide, on the current quarry 40% of the scanned areas were examined in detail.

Test pitting and trenching

The extent and number of test pits and trenches cannot be determined until the results of the auger survey and geophysics have been obtained. Machine-dug test pits would be required to confirm the results of the auger survey where stratigraphy suggests the possibility of more deeply buried zones of archaeological potential. Trial-trenches would target less deeply buried stratigraphy.

Fieldwalking

The only evidence for archaeology within the current quarry came from two late Mesolithic-early Neolithic flints recovered during fieldwalking from an area of higher ground (c.26.61m) within Phase 1 of the quarry. After ploughing and a suitable period of weathering, fieldwalking will therefore be carried out over the northern extension area. The ploughzone above 25m AOD within the southern area may contain artefacts of later prehistoric date and it is proposed to undertake fieldwalking above this contour. Further trenching/test pitting may be required to test the results of the fieldwalking.

Andrew Josephs ♦ Environmental Consultant

Timing

It is proposed to carry out the field-based evaluation in a staged manner starting as soon as the crops have been harvested. The southern area will be harvested in mid-August and will be ploughed as soon as possible to allow the fieldwalking to take place probably one month later. The northern area is under beans which will be harvested in September. Geophysics and then trenching will take place before ploughing. The evaluation is likely to take up to 8 weeks. Further trenching may be required to verify the results of the fieldwalking, but it is unclear at the current time whether this can be achieved prior to August 2010 and will be dependent on crops.

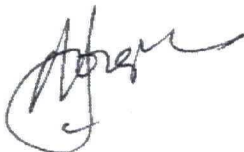
Conclusion

The review of known archaeology combined with the topographical model clearly demonstrates that the two extensions hold different potential. The northern extension would appear to have a high potential for archaeology of prehistoric date, with some potential for archaeology associated with post-Iron Age field systems. The southern extension would appear to have a low archaeological potential, and any archaeology that may have been there will have been degraded by the shifting channel of the river Derwent, and later drainage and agriculture.

Field-based evaluation will therefore mainly focus on the northern extension and we believe that this approach will successfully locate zones and features of archaeological potential that will allow requirements for preservation *in situ* or by record to be identified with confidence.

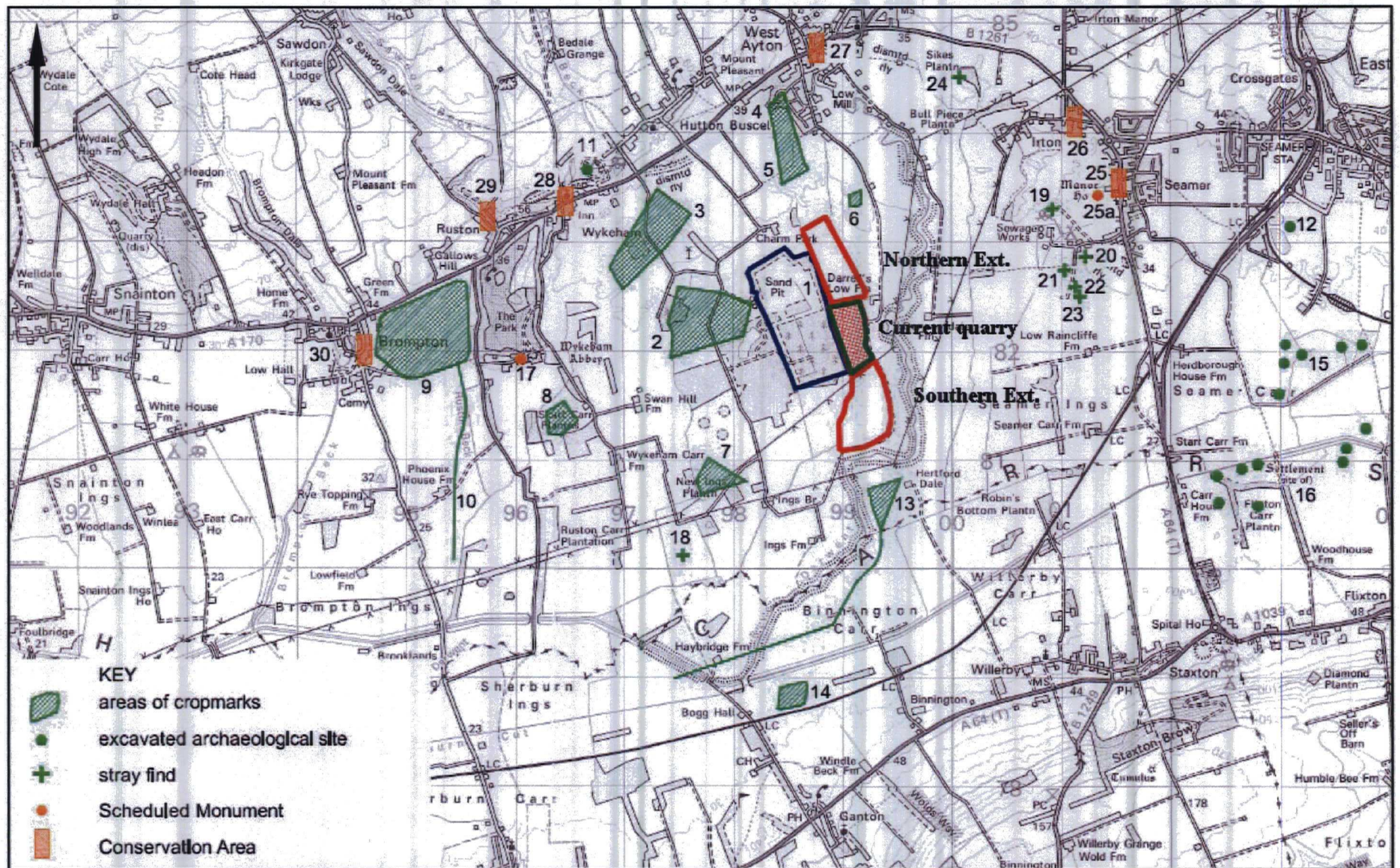
I look forward to hearing from you.

Yours sincerely,



Andrew Josephs
Director

Attachment: Figures pdf



© Crown copyright 2003. All rights reserved. Licence number 100043831

Figure 1 Cultural Heritage Resource in Vicinity of Proposed Extensions (after NAA 2003)

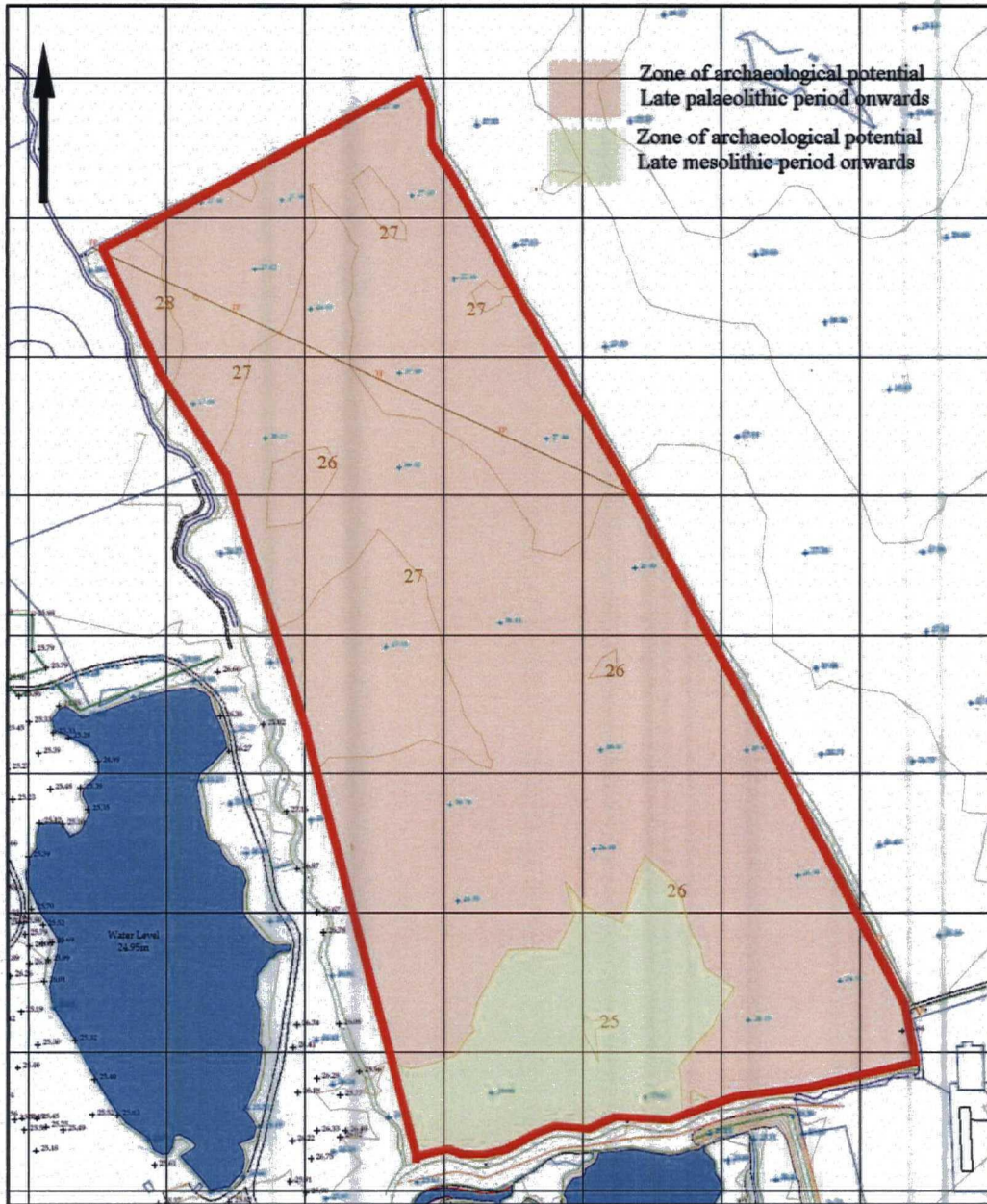


Figure 2 Northern Extension Topographical Model

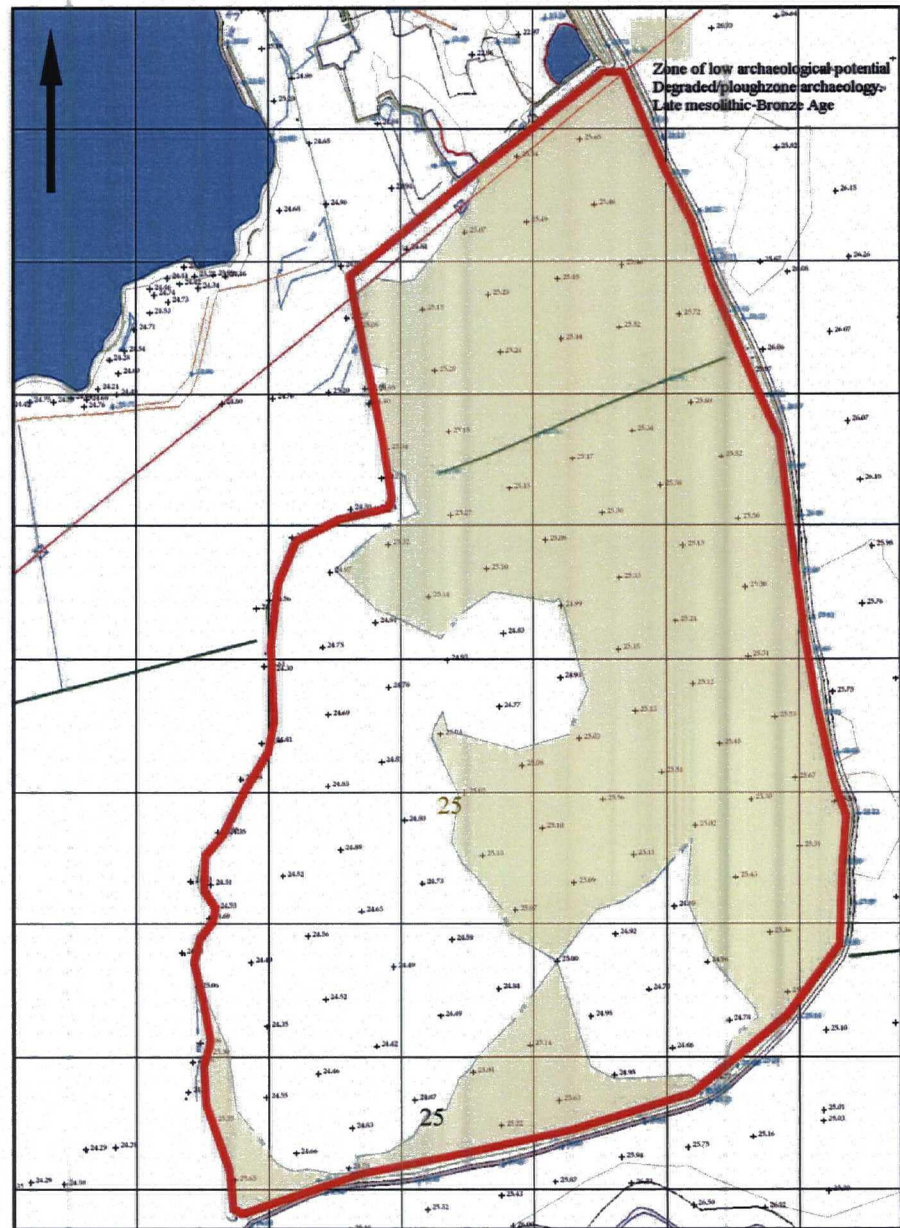


Figure 3 Southern Extension Topographical Model