

C8/36125/PA

8036 parish

rec 30/6/04

NYCC HER	
SNY	9756
ENY	2971
CNY	5049
Parish	8036
Rec'd	30/6/04

# Bottoms Field Borrow Pit, Wistow, North Yorkshire

palaeoecological augering

## ASUD Report 1117

June 2004

*Archaeological Services University of Durham*

on behalf of:

**Bullen Consultants**

11/12 Eldon Place, Bradford BD1 3AZ

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## **1. Summary**

### ***The project background***

- 1.1 A borrow pit is required at Bottoms Field, Wistow, as part of flood remediation works on the River Ouse following mining subsidence. Trial pits revealed fragments of decayed wood at 1.30m below the surface. Palaeoecological augering was carried out in order to record the stratigraphy and to identify whether the wood deposit was the result of a flood event or represents a buried forest. This report presents the results of the augering survey.

### ***Methods***

- 1.2 An east-west transect of boreholes was carried out across the study area using a thin gouge. The stratigraphy was recorded from each and sediment was retained from one of the boreholes for possible further analysis. The location and elevation of the boreholes were related to the provided bench mark using a Leica TCR 307 total station survey instrument with datalogger.

### ***Results***

- 1.3 The augering revealed that the wood deposit continued for at least 200 metres away from the river and was at least 4 metres thick in places. It did not contain sand or gravel and is unlikely to have been deposited as a result of a flood event. The sediment appears to represent an extensive wet woodland which dominated the landscape for a considerable time in the past.

### ***Recommendations***

- 1.4 A core taken using a power auger would allow the recovery of a longer sequence. Radiocarbon dating and palaeoecological analyses such as pollen, plant macrofossils and Coleoptera would provide detailed information about the development of the landscape.

## 2. Project background

### *Location*

- 2.1 The site is located at Bottoms Field, west of the River Ouse, near Wistow, Yorkshire (Figure 1). The site is centred on SE 626 338.

### *Objective*

- 2.2 The objective was to carry out a hand augering survey in order to record the stratigraphy and to identify the palaeoecological significance of the site.

### *Dates*

- 2.3 The augering was carried out on 2<sup>nd</sup> June, 2004. This report was prepared between 3-21<sup>st</sup> June 2004.

### *Personnel*

- 2.4 The augering was carried out by Dr Charlotte O'Brien, Mr Lorne Elliott and Mr Martin Railton. Report preparation was undertaken by Dr O'Brien, with diagrams by Mr Elliott and Mr Railton.

### *Archive*

- 2.5 The Bullen Consultants job number for this project is 103B166. The sediment from borehole AB4 is retained in a cold store at Archaeological Services University of Durham labelled with the site code BFW04.

## 3. Methods

- 3.1 Four boreholes were hand augered using a thin gouge. These were labelled AB1-4 and were located along an east-west transect across the site (Figure 2). The stratigraphy of each was recorded. The sediment from AB4 was retained in plastic guttering and wrapped in clingfilm and aluminium foil to prevent drying out. The location and elevation of the boreholes were related to the provided bench mark using a Leica TCR 307 total station survey instrument with datalogger. On return to the laboratory, the core from AB4 was stored in a cold store to prevent microbial activity.

## 4. Results

- 4.1 The borehole stratigraphy is presented in Table 1 and Figure 3. The grid references of the boreholes are listed in Table 2. The wood deposit was found to continue to a depth of at least six metres below the ground surface, however large wood fragments frequently obstructed the boring and it was not possible to ascertain the full vertical extent of the deposit in many of the boreholes.
- 4.2 In general, a similar stratigraphy was recorded in the four boreholes. A blue/grey, fine clay with wood pieces was present at the base of AB2, however this was not recorded elsewhere. The basal unit of the other boreholes was a crumbly, organic mud with abundant wood fragments, which was overlain by an organic clay also containing decayed wood pieces. Above this was a brown/grey clay and, on

occasion, an orange-mottle grey clay. A clay loam topsoil was recorded at the top of all of the boreholes.

Table 1 – Stratigraphy of the boreholes from transect AB

Borehole	Depth (cm)	Altitude (mOD)	Description
AB1	0-70	1.27 - 0.57	Dark brown clayey loam
	70-150	0.57 - -0.23	Brown/grey silty clay
	150-342	-0.23 - -2.15	Brown organic clay with abundant wood fragments
	342-395	-2.15 - -2.68	Dark brown clayey organic mud with abundant wood fragments
	Not bottomed		
AB2	0-33	0.84 - 0.51	Dark brown clayey loam
	33-82	0.51 - 0.02	Brown/grey silty clay
	82-363	0.02 - -2.79	Brown organic clay with wood fragments which are particularly abundant below 100cm depth.
	363-463	-2.79 - -3.79	Dark brown clayey organic mud with abundant wood fragments
	463-471	-3.79 - -3.87	Brown organic clay with wood fragments
	471-484	-3.87 - -4.00	Blue/grey fine clay with wood pieces
Not bottomed			
AB3	0-25	1.59 - 1.34	Dark brown clayey loam
	25-50	1.34 - 1.09	Brown/grey silty clay
	50-152	1.09 - 0.07	Orange mottled clay with bands of grey clay. Gritty from 90-95cm depth.
	152-577	0.07 - -4.18	Brown organic clay with abundant wood fragments. Large wood piece between 160-170cm.
Not bottomed			
AB4	0-28	1.28 - 1.00	Dark brown clayey loam
	28-82	1.00 - 0.42	Brown/grey silty clay
	82-127	0.42 - 0.01	Orange mottled grey clay
	127-203	0.01 - -0.75	Brown organic clay with abundant wood fragments
	203-450	0.75 - -3.22	Dark brown clayey organic mud with abundant wood fragments
	Not bottomed		

Table 2 – Locations of the boreholes

Borehole	Grid reference
AB1	462373 / 433765
AB2	462472 / 433776
AB3	462571 / 433787
AB4	462620 / 433793

## 5. Discussion

- 5.1 The woody deposit consists of a crumbly organic mud which becomes clay-rich towards the top. This organic mud and later organic clay ranges from a thickness of 2.5 – 4m. It is very unlikely that a single flood event could cause such a thickness of sediment to be deposited up to 200 metres away from the river. In addition, a much greater proportion of sand and gravel would have been expected in the sediment than was encountered.
- 5.2 It is more likely that the sediment built up over an extended period of time under waterlogged conditions which allowed the preservation of the organic material. The sediment suggests that the landscape was dominated by an extensive wet woodland. The red colouring of the wood pieces points to this having been an alder carr, however willow and other hydrophilous trees may also have been abundant.
- 5.3 Previous borehole surveys of the Humber Region have shown that much of the floodplain of the River Ouse and other rivers in the area were dominated by alder carr from approximately 5000 cal BC (Lillie & Gearey, 1999). This developed as a result of waterlogging and paludification of the valley bottoms following sea level rise as the climate improved in the early Holocene. These waterlogged conditions were exaggerated by poor drainage. The blue/grey fine clay which was recorded at the base of AB2 is probably a lacustrine or alluvial deposit of early-mid Holocene age.
- 5.4 The increased clay content of the upper section of the wood deposit is likely to relate to inwash from the river. It is unclear when and how the woodland disappeared, however this may have been caused by recent drainage and/or clearance.

## 6. Recommendations

- 6.1 Radiocarbon dating of a piece of wood or other plant macrofossil from the base of the organic deposit would establish how old the woodland was. A date from the top of it would show when the woodland disappeared. Pollen, plant macrofossil and coleopteran analysis would provide information about the development of the landscape and possibly about cultural activity in the vicinity, potentially over the duration of the Holocene. Although sediment was retrieved during the borehole survey, a core taken using a power auger would provide a longer sequence which may answer questions relating to the landscape prior to the woodland. It would also provide valuable additional material for palaeoecological analyses.

## 7. Reference

Lillie, M. & Gearey, B. (1999). The palaeoenvironmental survey of the Rivers Aire, Ouse, Wharfe and Derwent. In: Van de Noort & Ellis (eds) *Wetland Heritage of the Vale of York*. Humber Wetlands Project. Short Run Press Ltd, Exeter.pp331



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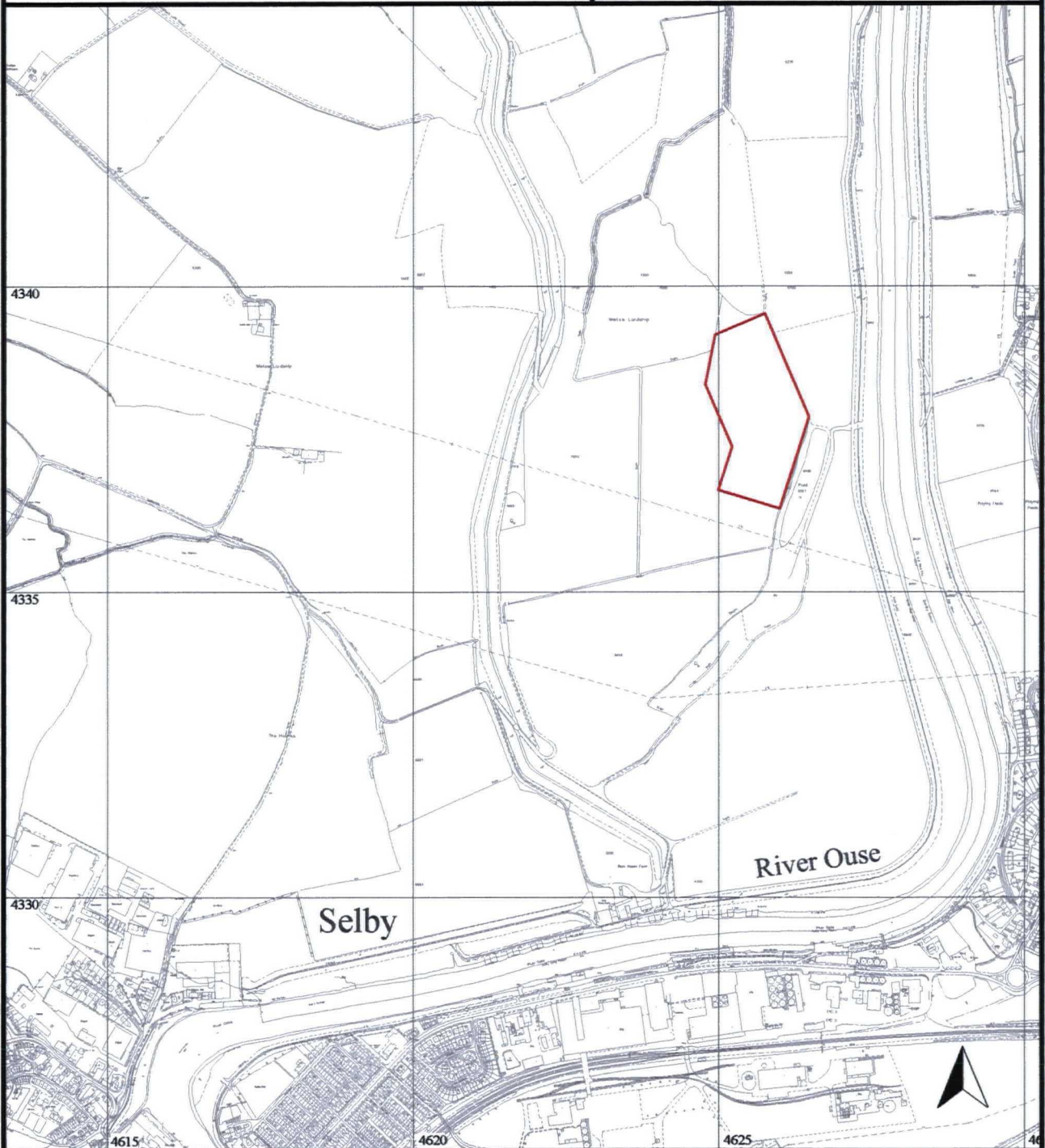
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Figure 1  
*Location of the borrow pit development*

0 500m

scale 1:10 000 - for A4 plot



outline of development area



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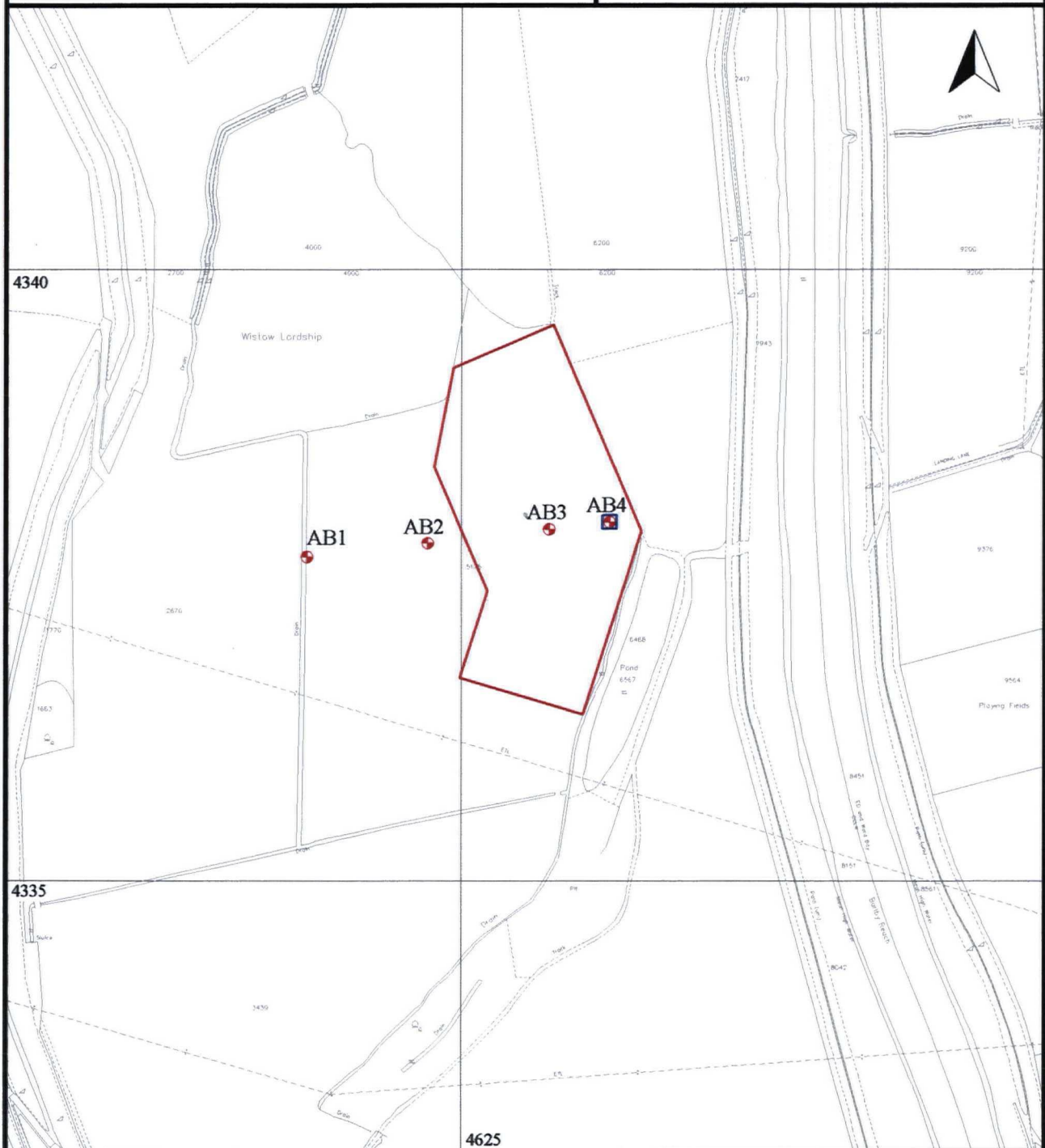
Figure 2  
Locations of boreholes

on behalf of  
**Bullen Consultants**

0 250m



scale 1:5000 - for A4 plot



location of borehole



location of core

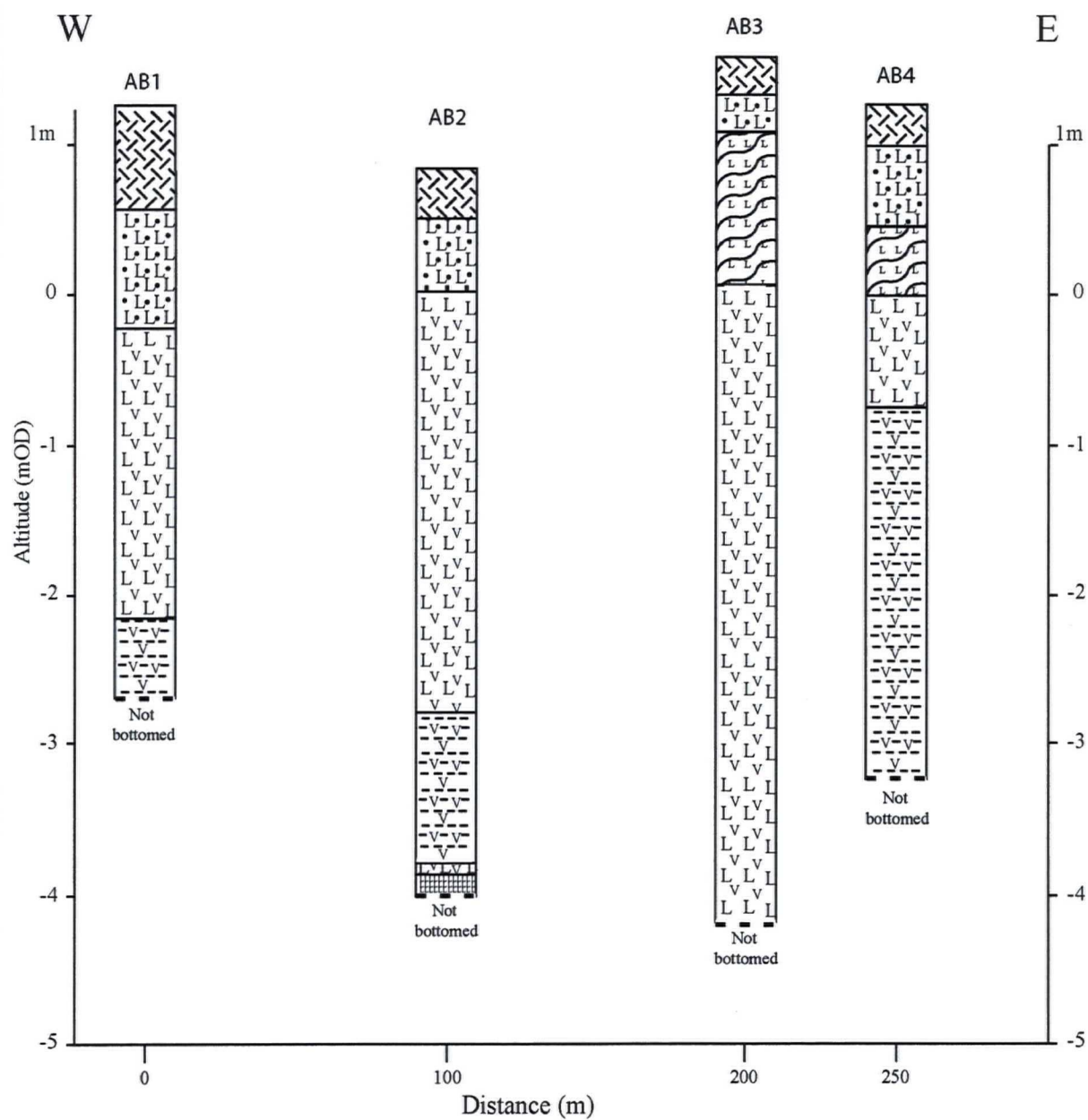


outline of  
development area



Figure 3

*Cross section of the borehole transect*



Clayey loam



Light Brown  
Organic Clay



Blue/Grey  
Fine Clay



Silty Clay



Dark Brown  
Clayey Organic Mud



Orange mottled  
Clay