

GROUND INVESTIGATION

Upper Witham,
Whalebone Lane,
LITTLE PONTON
NG33 5BS



frontispiece - view to west with Little Ponton Hall in background

L-S&Co Project Number:	71 012
Status of Report:	FINAL
Date of Issue:	July 3 rd , 2025


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Report on: Ground investigation using boreholes

Report at: Upper Witham, Whalebone Lane, Little Ponton NG33 5BU

Report for: Wild Trout Trust, 4 Broadfield Court, Sheffield S8 0XF

Prepared by:



Status: **FINAL**

Issue list (.pdf copy): tjacklin:wildtrout.org

Issue list (hardcopy):

Issue date: July 3, 2025

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1. INTRODUCTION

1.1 Background

It is proposed to rewild the River Witham as it flows through the grounds of Little Ponton Hall by recreating the natural meandering route in the established flood plain.

The process will include earthworks and the nature of the ground in the area of the proposed works is not known.

At the request of the Wild Trout Trust borehole investigation was set out to investigate the ground along the proposed river realignment.

1.2 Objectives and limitations

This report gives a description of the superficial ground conditions at the Little Ponton site from a borehole investigation.

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- consequences of the report being used for any other purpose than that for which it was commissioned.

The conclusions and recommendations in this report represent our professional opinion, derived from currently accepted industry practices, exercising all reasonable skill and care to be expected of a professional engineering and environmental consultancy of similar size and experience.

The assessments and judgments given in this report are directed by both the finite quantity of data on which they are based and the proposed works to which they are addressed, taking account of the resources devoted to it by agreement with the client or agent, whether in writing or verbal instructions.

2. SITE PERSPECTIVE

2.1 Location and description

Little Ponton is a small village located some 3 km south of Grantham.

The village has grown around Little Ponton Hall which itself was built in the shallow valley of the north-flowing River Witham.

The subject site is an approximate 600 m long and 100 m wide stretch of flood plain of the River Witham as it flows northwards through the grounds of the Hall.

The local WWTW (waste water treatment works) is within the site.

The ground is naturally richly vegetated with evidence of wetland although, after six months of dry weather, the area is firm underfoot with no detected soft spots.



Fig 1 – location of the site

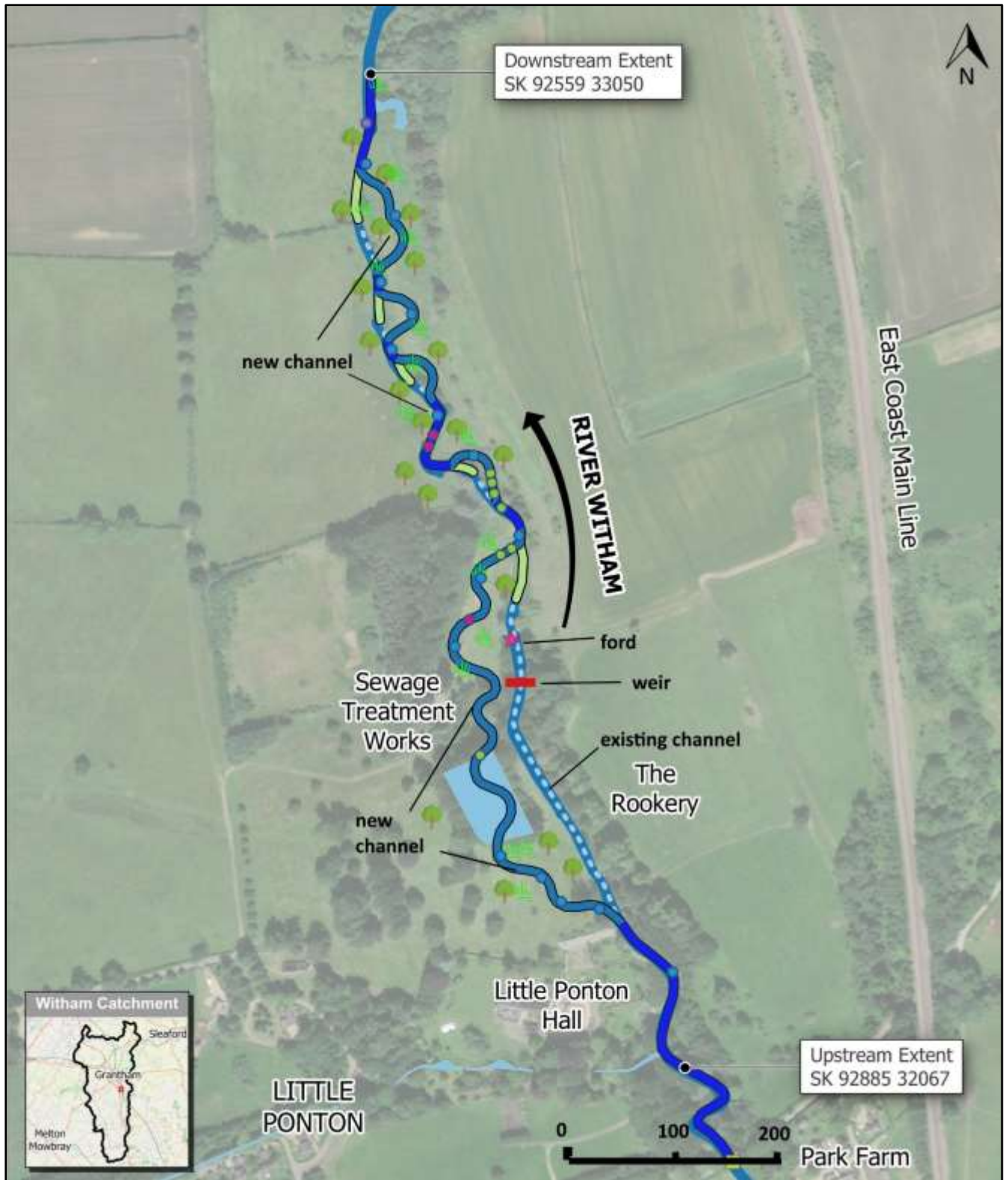


Fig 2 - plan of the site

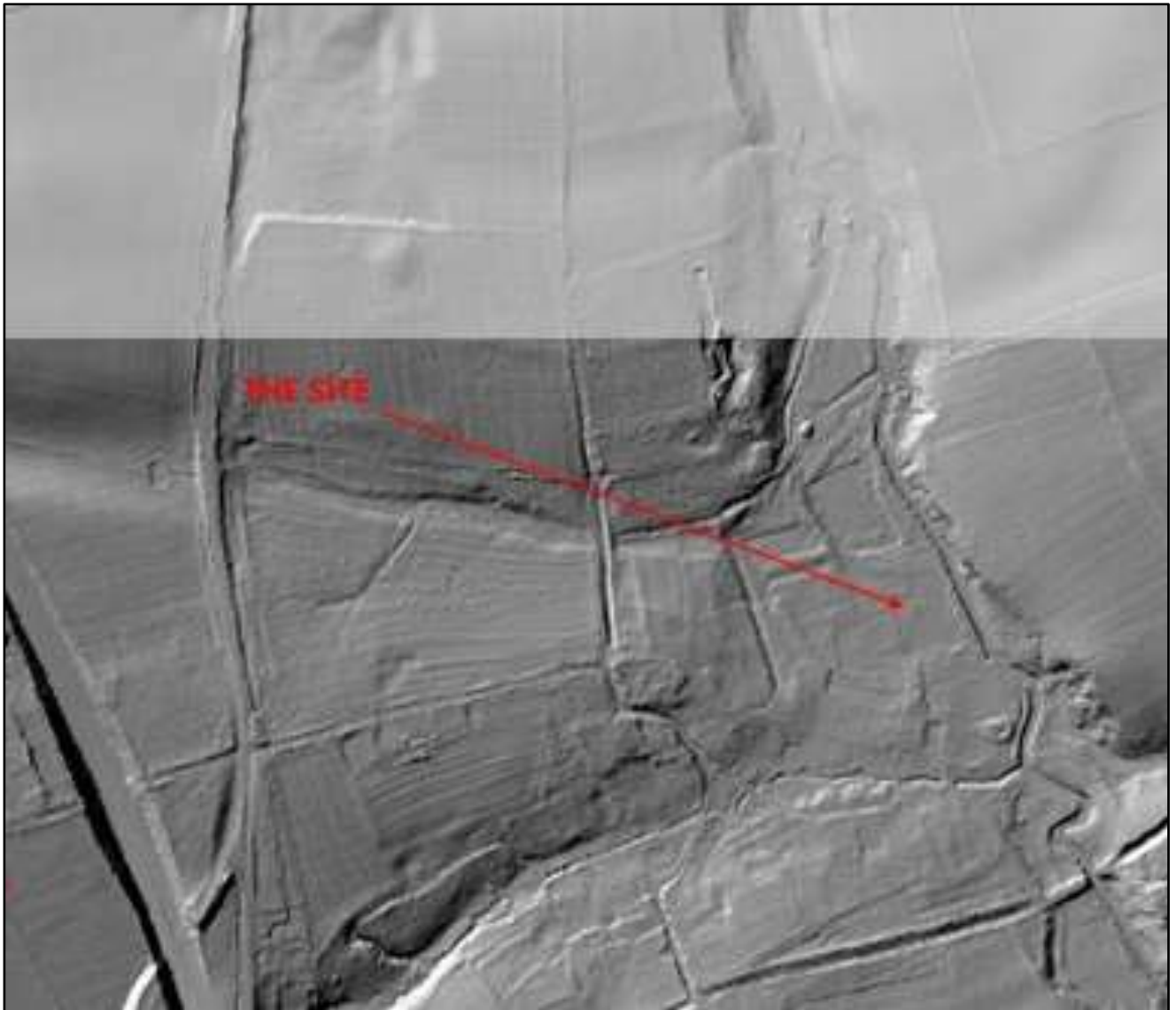


Fig 3 - LIDAR view (Archi Maps)

2.2 Geology and hydrogeology

The superficial geology of the site comprises of Recent Alluvium (from the River Witham) overlying the bedrock Middle Jurassic Lincolnshire Limestone.

The river has cut down through the limestone, exposing the underlying Northampton Ironstone and then the Whitby Mudstone.

Subsequently the river has acquired a bed of Alluvium along its length.

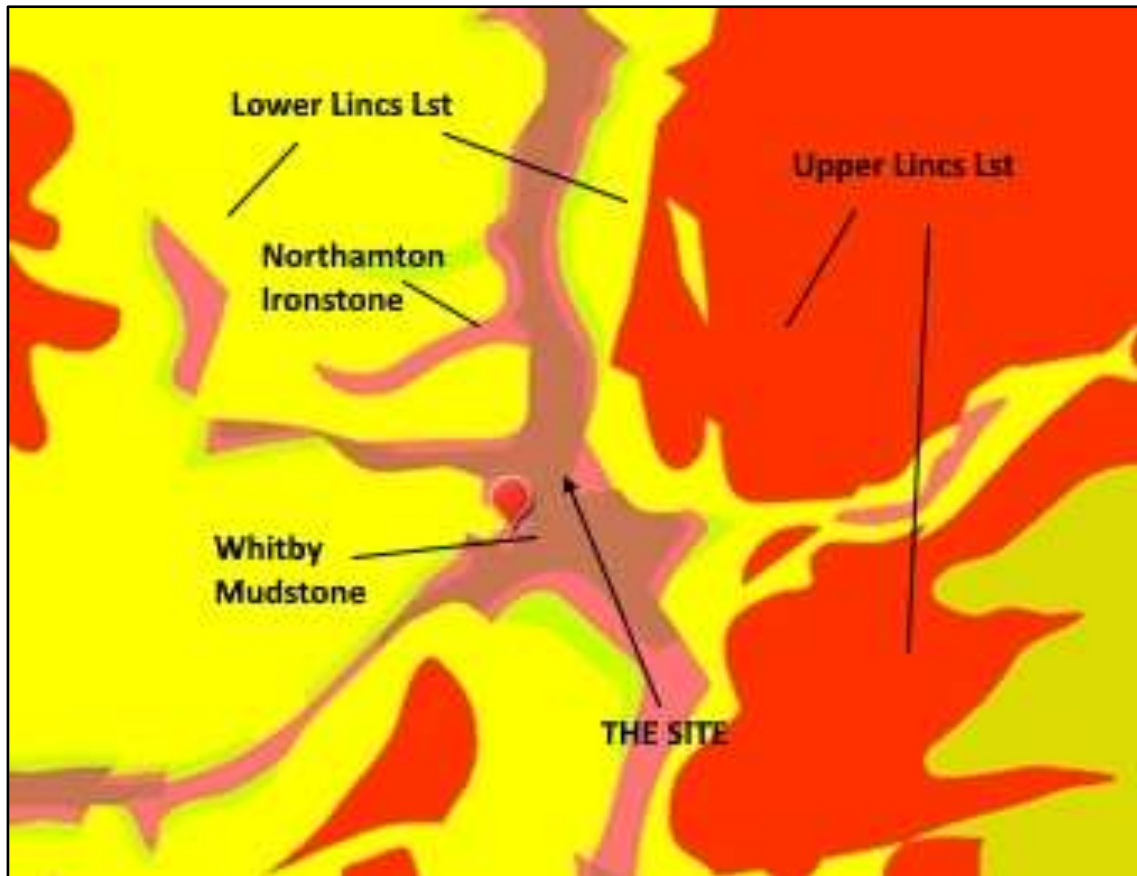


Fig 4 - bedrock geology



Fig 5 - superficial geology

2.2.1 Lincolnshire Limestone

The Lincolnshire Limestone outcrops for 130 km from the Humber Estuary to Peterborough and Kettering, from 3-5 km in the north to 6.5-8 km wide to the south.

It is underlain by the Grantham Formation (mostly pale grey sands, silts and clays) which thins significantly in places allowing contact with the underlying Northampton Ironstone.

The bed dips at 3° to the east north of Lincoln, less so to the south.

It reaches a maximum thickness of over 40 m in south Lincolnshire but thins out to the north and south and pinches out to the east, down dip, noticeably around Grantham.

The Lincolnshire Limestone can be divided into two sub-units:

- The Upper Lincolnshire Limestone has a variable thickness but is dominantly a yellow/orange coarse shelly cross-bedded oolite,
- Lower Lincolnshire Limestone is a grey fine-grained, micritic and peloidal limestone sometimes misleadingly referred to as 'cementstone'.

The interaction between the rivers and the limestone is complex and depends on the local geology:

- alluvial deposits in the Slea and Witham valleys enhance transmissivity; and
- the Witham at Lincoln and Slea at Ancaster cut through the aquifer.

2.2.2 Northampton Ironstone

The Northampton Ironstone consists of a basal bed of ironstone which may be overlain by sandstone and calcareous sandstone beds.

Layers of clay can be interbedded with the lowest horizons and sandy marginal facies are developed in certain localities.

The deposit was probably laid down in a shallow sea or lagoon which was freely connected to the open sea and thus subject to considerable wave action.

The deposit has been extensively worked in the region for ironstone in the historical past.

2.2.3 Whitby Mudstone

The Whitby Mudstone is a heavily over-consolidated clay, typically fissured and locally laminated, laid down in a quiet marine environment.

It is generally bluish grey in colour with some calcareous and ferruginous nodules.

Towards its base beds of fissile limestone are developed which are interbedded with shales.

2.2.4 Recent Alluvium

Alluvium comprises a sequence of Recent clay, silt, sand and gravel, which can be found interspersed with subordinate and sometimes extensive peat formed during the last 5000 years as sea level has risen, causing river plain aggradation.

The soil is typically normally consolidated and therefore in a soft condition, but at surface the effects of intermitted drying by weather and from vegetation, often produces a firmer crust as a result of this desiccation.

3. GROUND INVESTIGATION

3.1 Strategy

The specification for the investigation was prepared by CBEC on behalf of the Wild Trout Trust.

6 No. borehole positions (BH1 to BH6) were set out with a requirement to bore to 3 – 5 m depth to investigate the nature of the Alluvium in the flood plain.

Access to the borehole positions was across the flood plain and to minimize disruption and the risk of getting stuck a track-mounted drilling rig was used.

3.2 Work undertaken

6 No. boreholes were made at the positions designated by CBEC.

Boreholes BH1 to BH5 were made using the TeCOP track mounted rig which percussively drove a 1 m long 100 mm diameter core barrel per run.

Core was recovered within a plastic sleeve from the core barrel and then extruded to allow direct examination.

Machine access to the position of BH6, at the north end of the site and on the east bank of the river was restricted by damp overgrown ground and a steep valley side so that the bore was made using a hand auger.

The ground was logged to BS5930, giving an engineering description of the layers encountered.

The logs of the ground encountered are given below.

Samples were taken from BH1 by a representative from the Environment Agency.

3.3 Findings

All boreholes encountered ground conforming to the description of Alluvium from an engineering point of view.

The blue CLAY encountered in boreholes BH3 to BH6 is taken to be the weathered bedrock Whitby Mudstone.

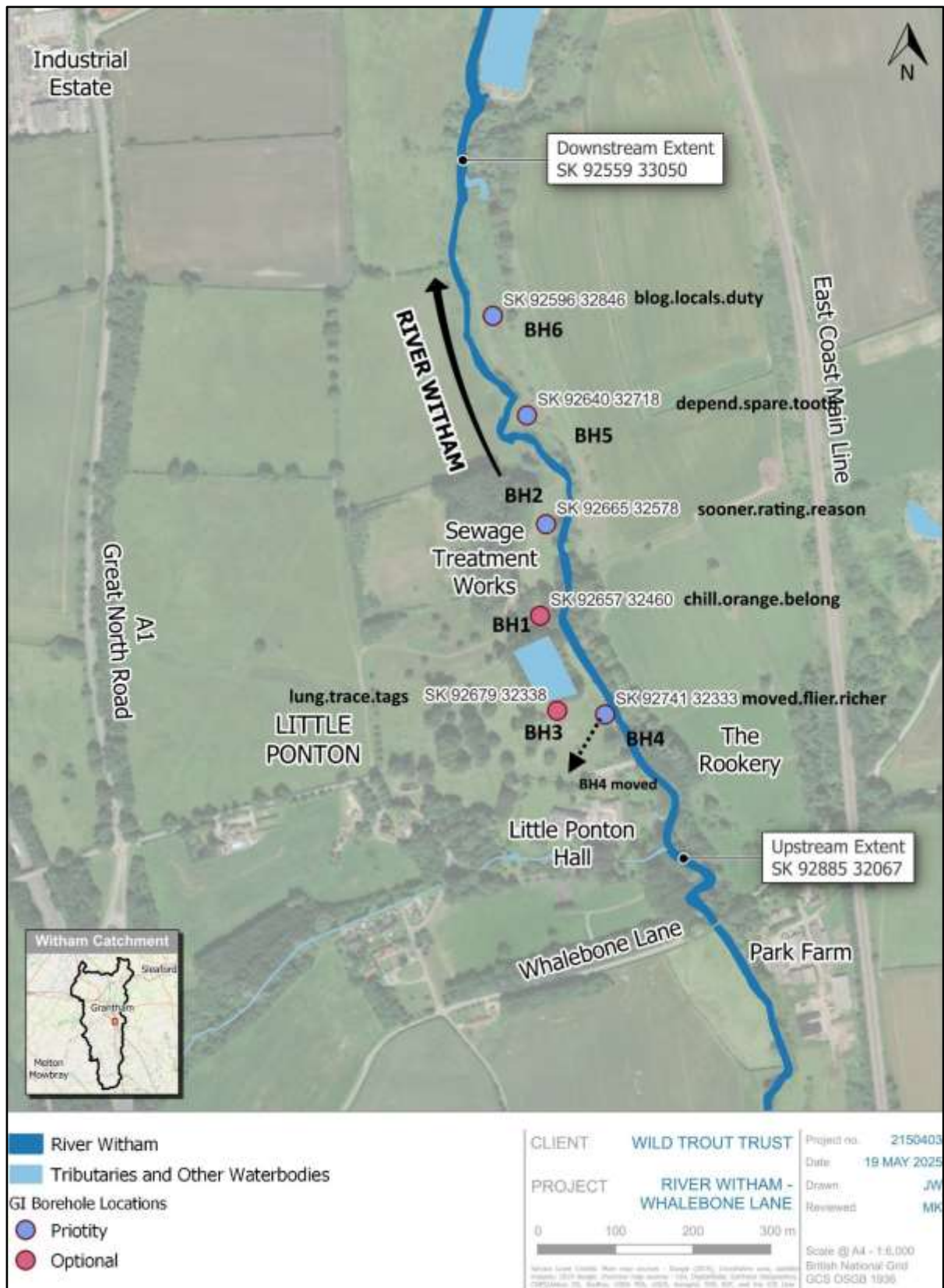


Fig 5 – borehole locations

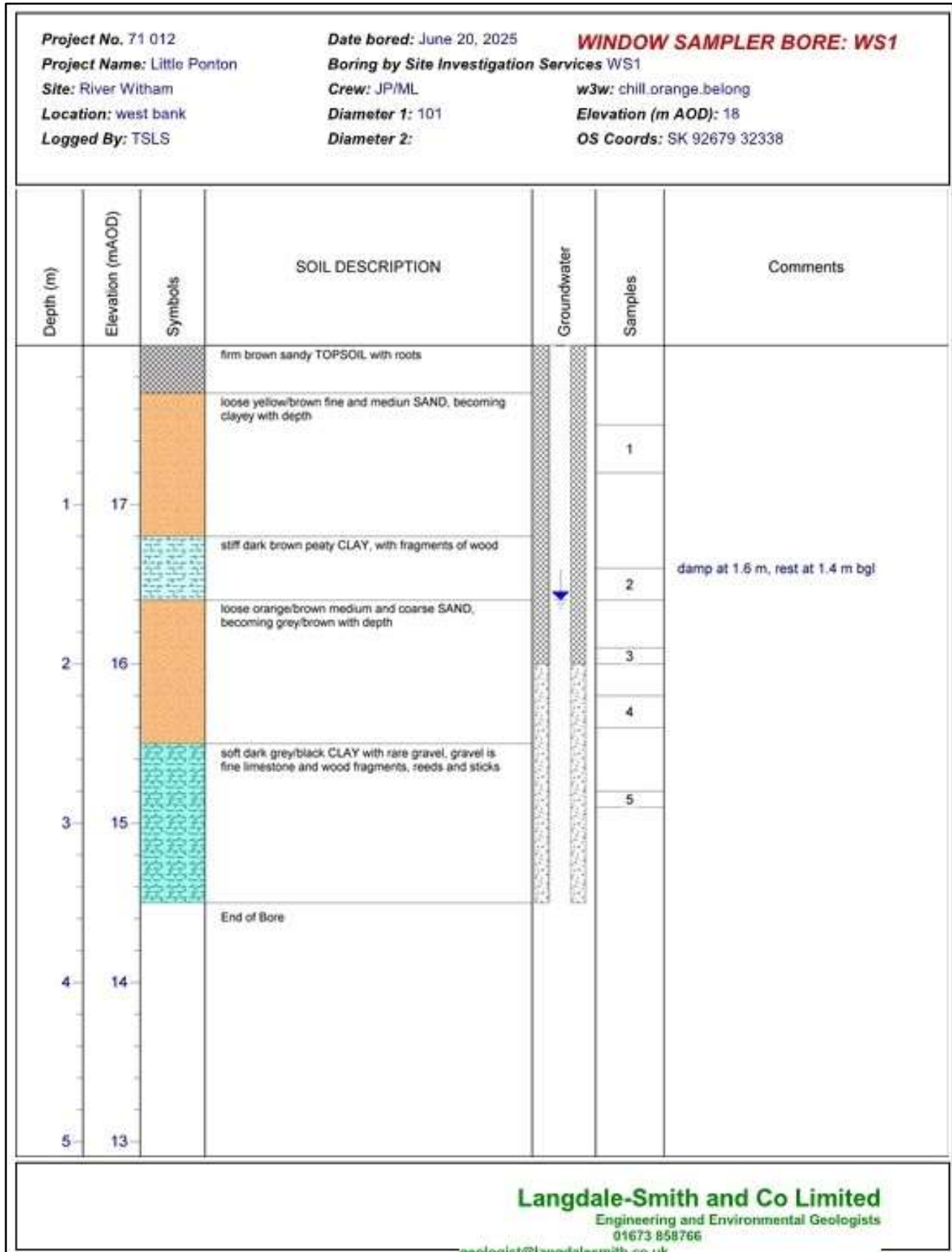




Fig 6 - core from BH1

<p>Project No. 71 012 Project Name: Little Ponton Site: River Witham Location: west bank Logged By: TSLS</p>	<p>Date bored: June 20, 2025 Boring by Site Investigation Services WS2 Crew: JP/ML Diameter 1: 101 Diameter 2:</p>	<p>WINDOW SAMPLER BORE: WS2 w3w: sooner.rating.reason Elevation (m AOD): 18 OS Coords: SK 92665 32578</p>
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Depth (m)	Elevation (mAOD)	Symbols	SOIL DESCRIPTION	Groundwater	Samples	Comments
			firm brown sandy TOPSOIL with roots			
			stiff yellow/brown CLAY (desiccated)			
1	17		soft yellow/brown silty CLAY	▼		rest at 1.1 m bgl
			loose yellow/brown fine and medium SAND			
2	16		loose yellow/brown slightly clayey fine and medium GRAVEL, gravel is angular limestone and chalk (?), wet			
3	15					
			End of Bore			
4	14					
5	13					

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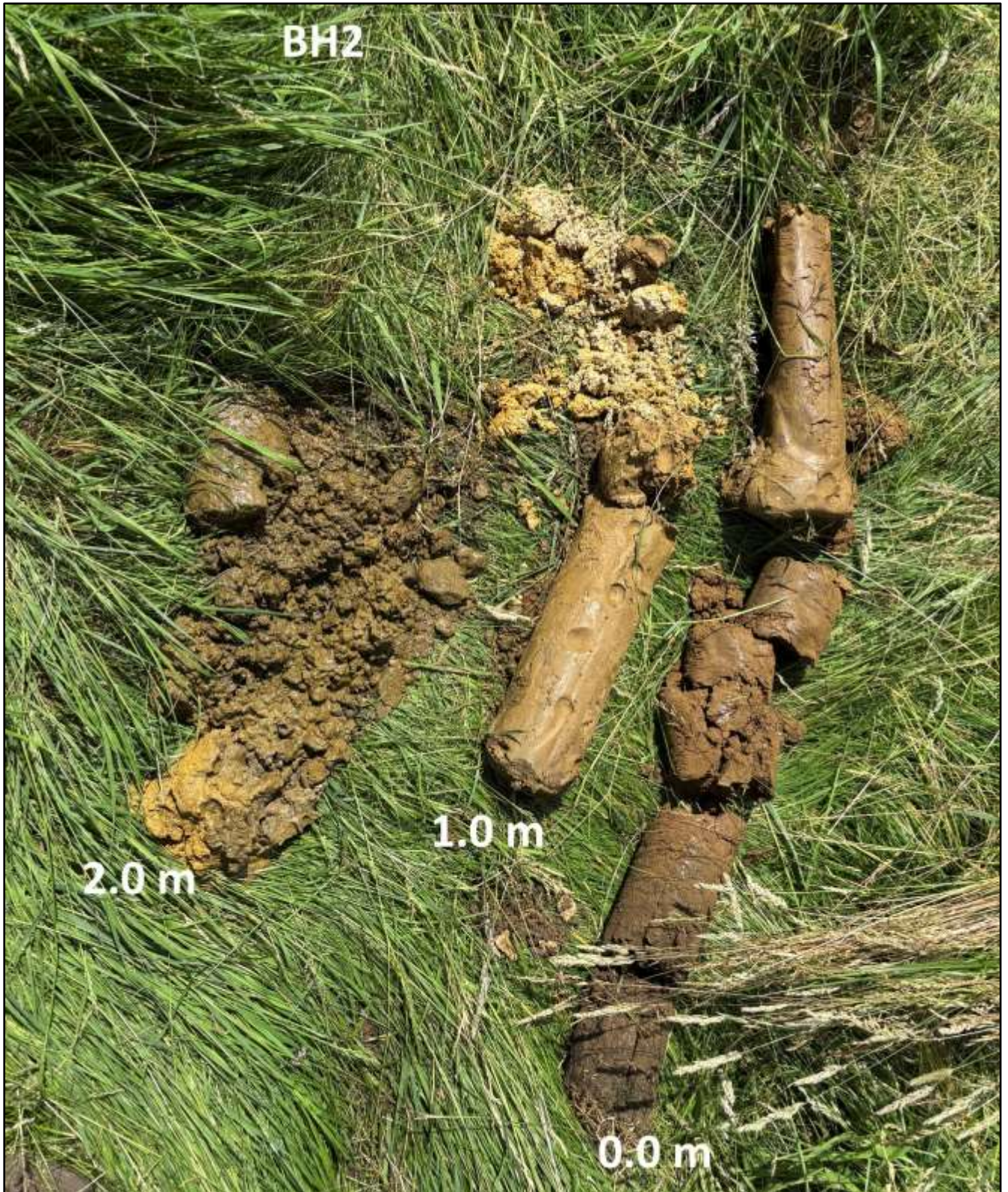


Fig 7 - core from BH2

Project No. 71 012	Date bored: June 26, 2025	WINDOW SAMPLER BORE: WS3
Project Name: Little Ponton	Boring by Site Investigation Services WS3	
Site: River Witham	Crew: JP/ML	w3w: lung.trace.tags
Location: west bank	Diameter 1: 101	Elevation (m AOD): 18
Logged By: TSLS	Diameter 2:	OS Coords: SK 92679 32338

Depth (m)	Elevation (mAOD)	Symbols	SOIL DESCRIPTION	Groundwater	Samples	Comments
			light brown TOPSOIL under grass			borehole dry
			stiff orange/brown silty CLAY with much fine and medium limestone gravel, matrix supported			
1	17		soft brown CLAY sand parting at 1.2 m bgl			
2	16		soft brown CLAY with some fine and medium limestone and flint gravel			
			stiff blue CLAY			
3	15					
			End of Bore			
4	14					
5	13					

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Fig 8 - core from BH3

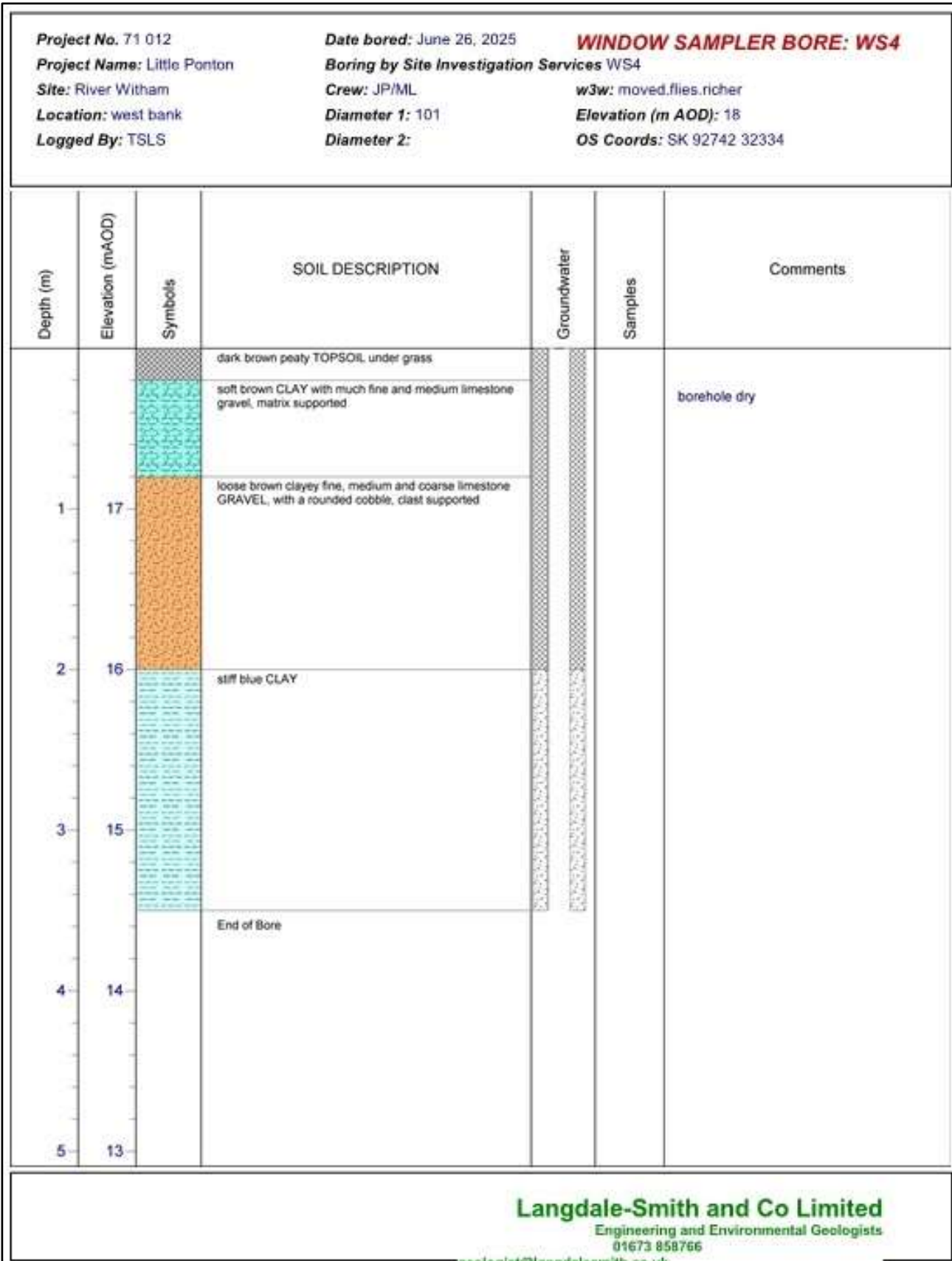




Fig 9 - core from BH4

Project No. 71 012

Project Name: Little Ponton

Site: River Witham

Location: east bank

Logged By: TSLS

Date bored: June 26, 2025

Boring by Site Investigation Services WS5

Crew: JP/ML

Diameter 1: 101

Diameter 2:

WINDOW SAMPLER BORE: WS5

w3w: depend.spare.tooth

Elevation (m AOD): 18

OS Coords: SK 92640 32718

Depth (m)	Elevation (mAOD)	Symbols	SOIL DESCRIPTION	Groundwater	Samples	Comments
1	17		dark brown peaty TOPSOIL			
			stiff brown silty CLAY			
			firm yellow/brown silty CLAY			
soft yellow/brown silty CLAY						
firm blue CLAY						
2	16		soft and very soft blue CLAY			seep at 2 m bgl, rise to 1 m
3	15		End of Bore			
4	14					
5	13					

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Fig 10 - core from BH5

Project No. 71 012 Project Name: Little Ponton Site: River Witham Location: east bank Logged By: TSLS		Date bored: June 26, 2025 Boring by Site Investigation Services WS6 Crew: JP/ML Diameter 1: 50 Diameter 2:		WINDOW SAMPLER BORE: WS6 w3w: blog.locals.duty Elevation (m AOD): 18 OS Coords: SK 92596 32846		
Depth (m)	Elevation (mAOD)	Symbols	SOIL DESCRIPTION	Groundwater	Samples	Comments
			dark brown peaty TOPSOIL			Bore with hand auger
			soft yellowbrown brown silty CLAY			
1	17		loose brown clayey fine and medium GRAVEL			seep at 1 m bgl
			firm blue CLAY			
			End of Bore			
2	16					
3	15					
4	14					
5	13					
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Fig 11 - core from BH6 (poor recovery)

<< END >>