

Historical Mapping Legends

Ordnance Survey County Series 1:10,560

	Gravel Pit		Sand Pit		Other Pits
	Quarry		Shingle		Orchard
	Osiers		Reeds		Marsh
	Mixed Wood		Deciduous		Brushwood
	Fir		Furze		Rough Pasture
	Arrow denotes flow of water		Trigonometrical Station		
	Site of Antiquities		Bench Mark		
	Pump, Guide Post, Signal Post		Well, Spring, Boundary Post		
	•285 Surface Level				
	Sketched Contour		Instrumental Contour		
	Main Roads		Minor Roads		
	Sunken Road		Raised Road		
	Road over Railway		Railway over River		
	Railway over Road		Level Crossing		
	Road over River or Canal		Road over Stream		
	Road over Stream				
	County Boundary (Geographical)				
	County & Civil Parish Boundary				
	Administrative County & Civil Parish Boundary				
	County Borough Boundary (England)				
	County Burgh Boundary (Scotland)				
	Rural District Boundary				
	Civil Parish Boundary				

Ordnance Survey Plan 1:10,000

	Chalk Pit, Clay Pit or Quarry		Gravel Pit
	Sand Pit		Disused Pit or Quarry
	Refuse or Slag Heap		Lake, Loch or Pond
	Dunes		Boulders
	Coniferous Trees		Non-Coniferous Trees
	Orchard		Scrub
	Bracken		Heath
	Marsh		Reeds
	Building		Glasshouse
	Sloping Masonry		Pylon
	Cutting		Embankment
	Road Under		Road Over
	Level Crossing		Foot Bridge
	Standard Gauge Multiple Track		Standard Gauge Single Track
	Siding, Tramway or Mineral Line		Narrow Gauge
	Geographical County		Administrative County, County Borough or County of City
	Municipal Borough, Urban or Rural District, Burgh or District Council		Borough, Burgh or County Constituency
	Civil Parish		
	BP, BS Boundary Post or Stone		Police Station
	Church		Post Office
	Club House		Public Convenience
	Fire Engine Station		Public House
	Foot Bridge		Signal Box
	Fountain		Spring
	Guide Post		Telephone Call Box
	Mile Post		Telephone Call Post
	Mile Stone		Well

1:10,000 Raster Mapping

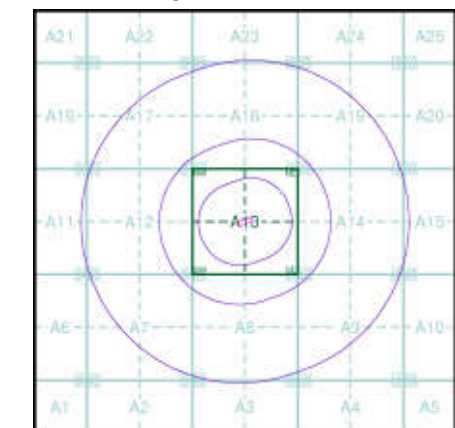
	Gravel Pit		Refuse tip or slag heap
	Rock		Rock (scattered)
	Boulders		Boulders (scattered)
	Shingle		Mud
	Sand		Sand Pit
	Slopes		Top of cliff
	General detail		Underground detail
	Overhead detail		Narrow gauge railway
	Multi-track railway		Single track railway
	County boundary (England only)		Civil, parish or community boundary
	District, Unitary, Metropolitan, London Borough boundary		Constituency boundary
	Area of wooded vegetation		Non-coniferous trees
	Non-coniferous trees (scattered)		Coniferous trees
	Coniferous trees (scattered)		Positioned tree
	Orchard		Coppice or Osiers
	Rough Grassland		Heath
	Scrub		Marsh, Salt Marsh or Reeds
	Water feature		Flow arrows
	Mean high water (springs)		Mean low water (springs)
	Telephone line (where shown)		Electricity transmission line (with poles)
	Bench mark (where shown)		Triangulation station
	Point feature (e.g. Guide Post or Mile Stone)		Pylon, flare stack or lighting tower
	Site of (antiquity)		Glasshouse
	General Building		Important Building



Geo-Environmental Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Hertfordshire	1:10,560	1884	2
Bedfordshire	1:10,560	1887	3
Hertfordshire	1:10,560	1899	4
Bedfordshire	1:10,560	1901	5
Hertfordshire	1:10,560	1925	6
Bedfordshire	1:10,560	1925	7
Hertfordshire	1:10,560	1925	8
Bedfordshire	1:10,560	1938	9
Bedfordshire	1:10,560	1948 - 1950	10
Hertfordshire	1:10,560	1950	11
Ordnance Survey Plan	1:10,000	1960	12
Ordnance Survey Plan	1:10,000	1980	13
Ordnance Survey Plan	1:10,000	1986	14
10K Raster Mapping	1:10,000	1999	15
10K Raster Mapping	1:10,000	2006	16
VectorMap Local	1:10,000	2016	17

Historical Map - Slice A



Order Details

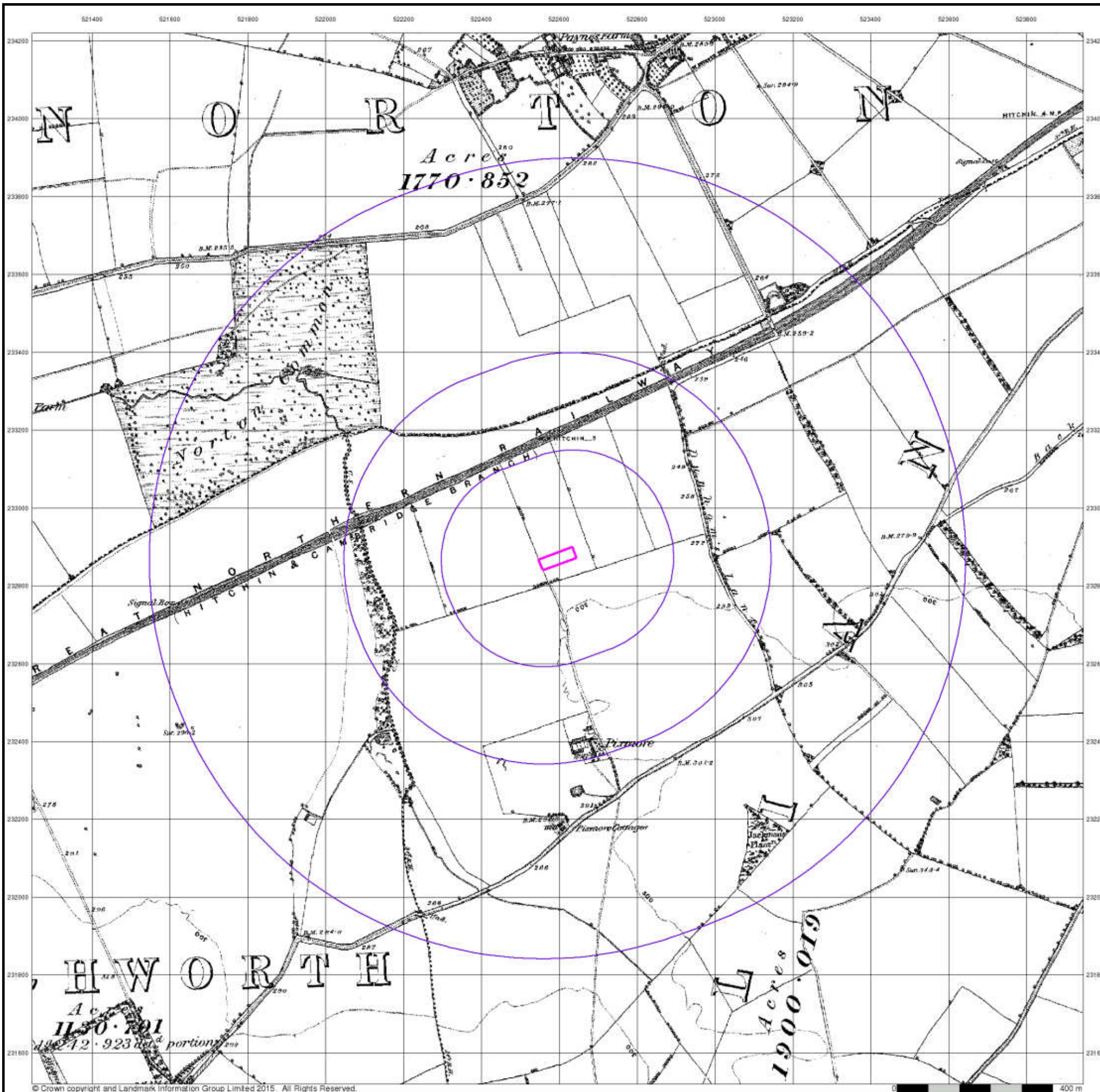
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Site Area (Ha): 0.27
Search Buffer (m): 1000

Site Details

Pixmore Avenue/, Protea Way, LETCHWORTH GARDEN CITY, Hertfordshire, SG6 1QY

Landmark
INFORMATION GROUP

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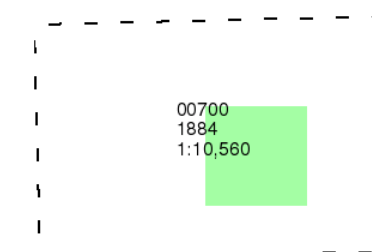
Geo-Environmental Hertfordshire

Published 1884

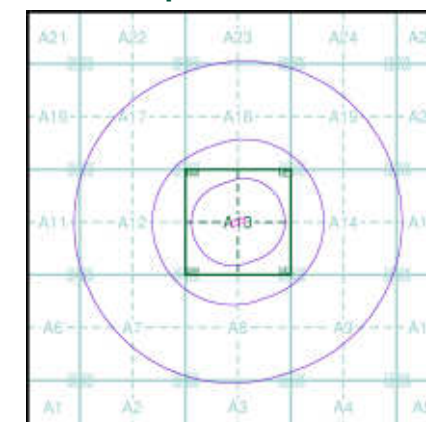
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

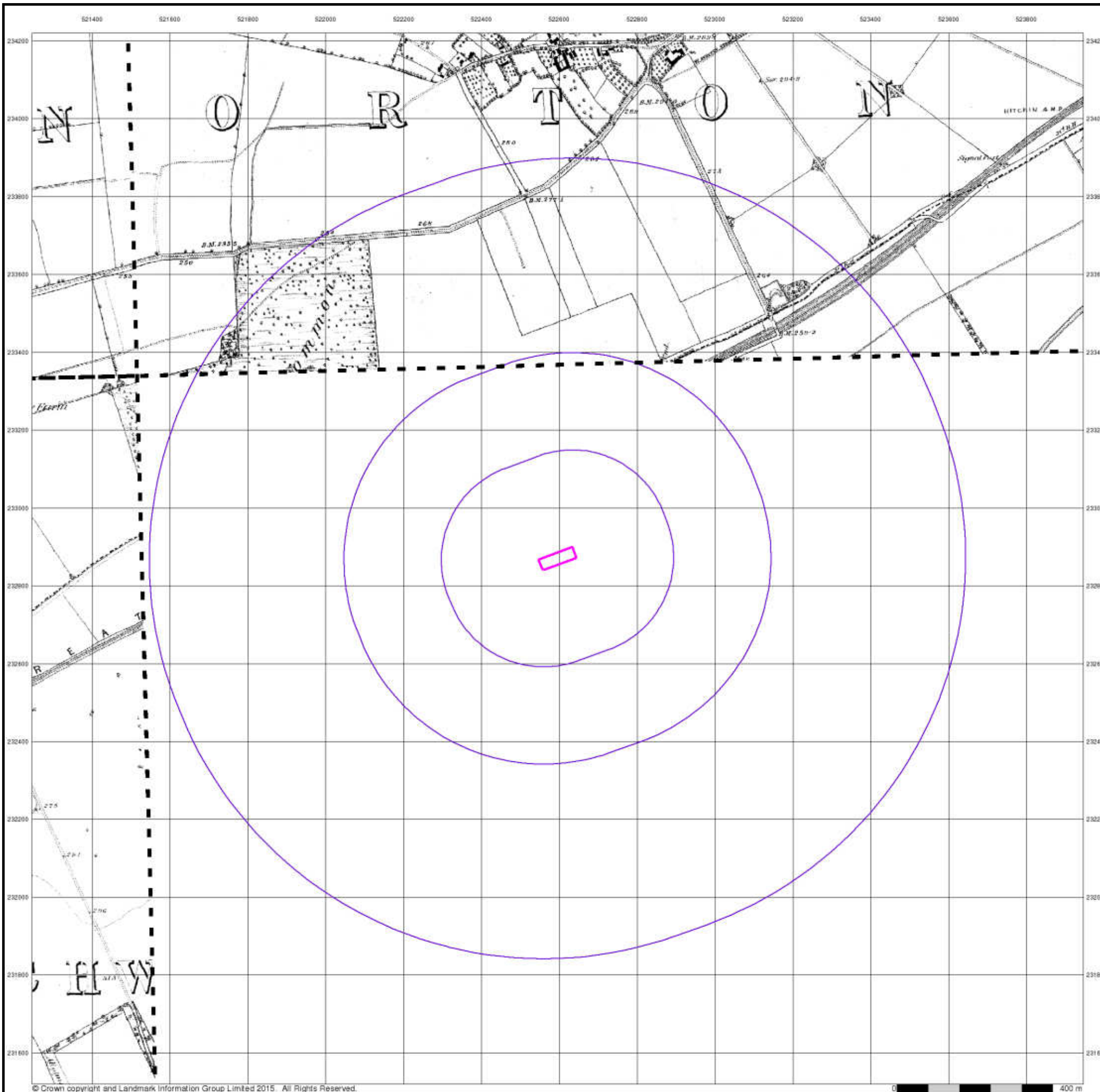
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Geo-Environmental Bedfordshire

Published 1887

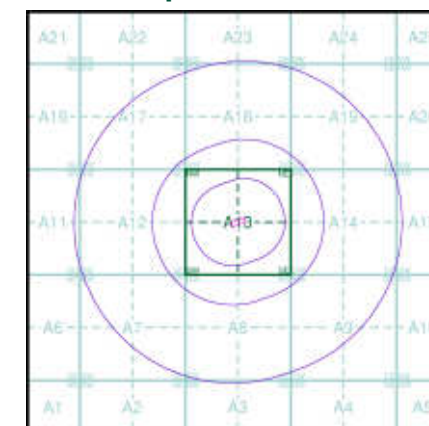
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Map Name(s) and Date(s)

027NW 1887 1:10,560	027NE 1887 1:10,560
027SW 1887 1:10,560	

Historical Map - Slice A



Order Details

Order Number: 101516660_1_1
Customer Ref: GE15860
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Geo-Environmental Hertfordshire

Published 1899

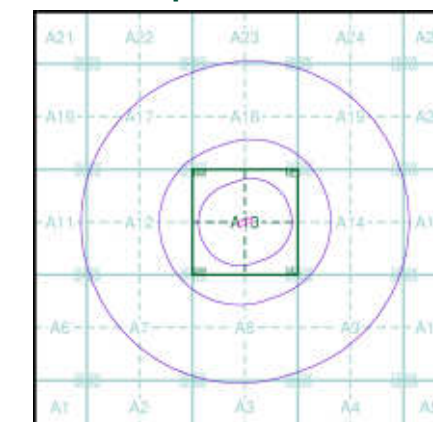
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Map Name(s) and Date(s)

007NW 1899 1:10,560	007NE 1899 1:10,560
007SW 1899 1:10,560	007SE 1899 1:10,560

Historical Map - Slice A



Order Details

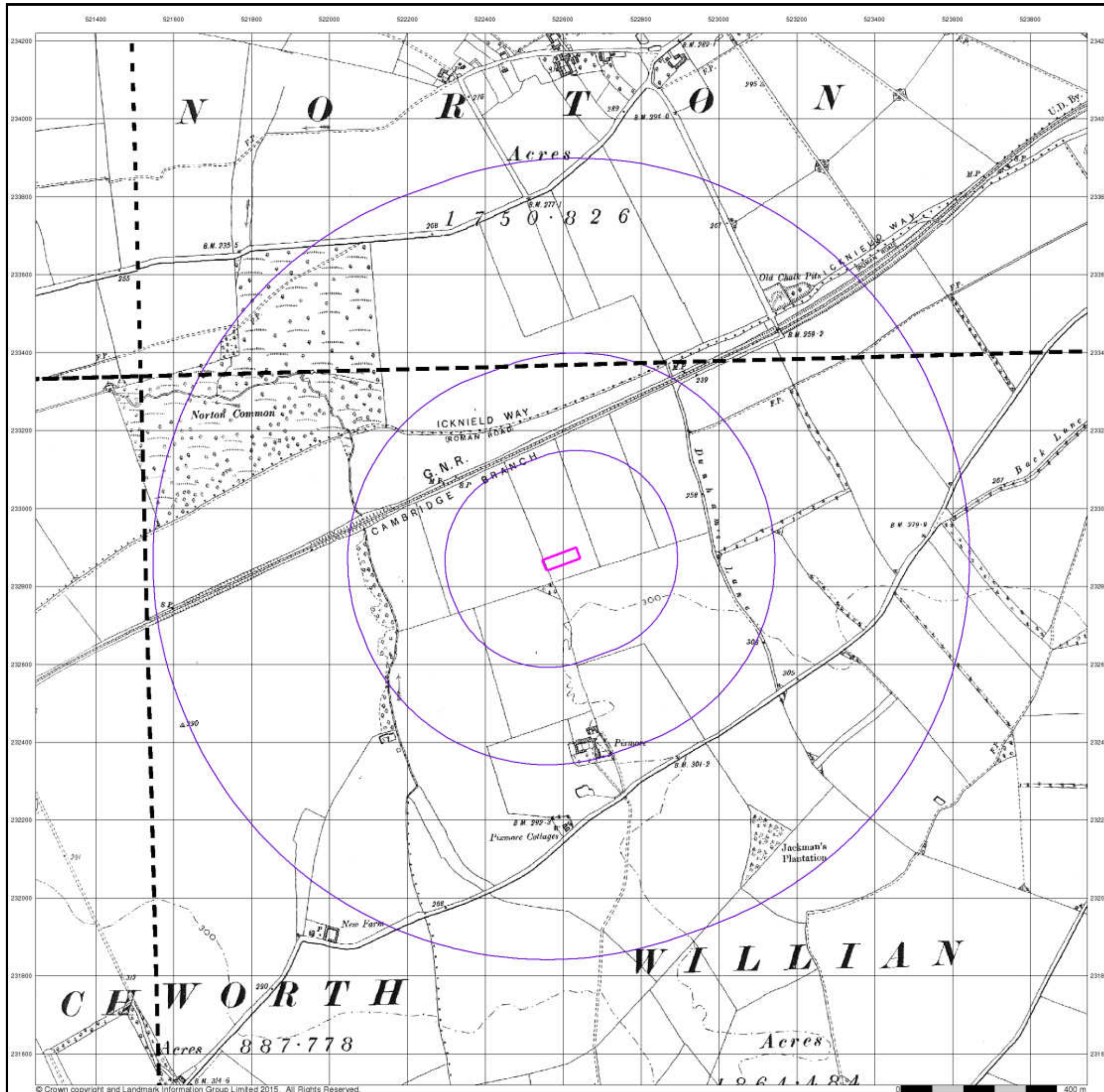
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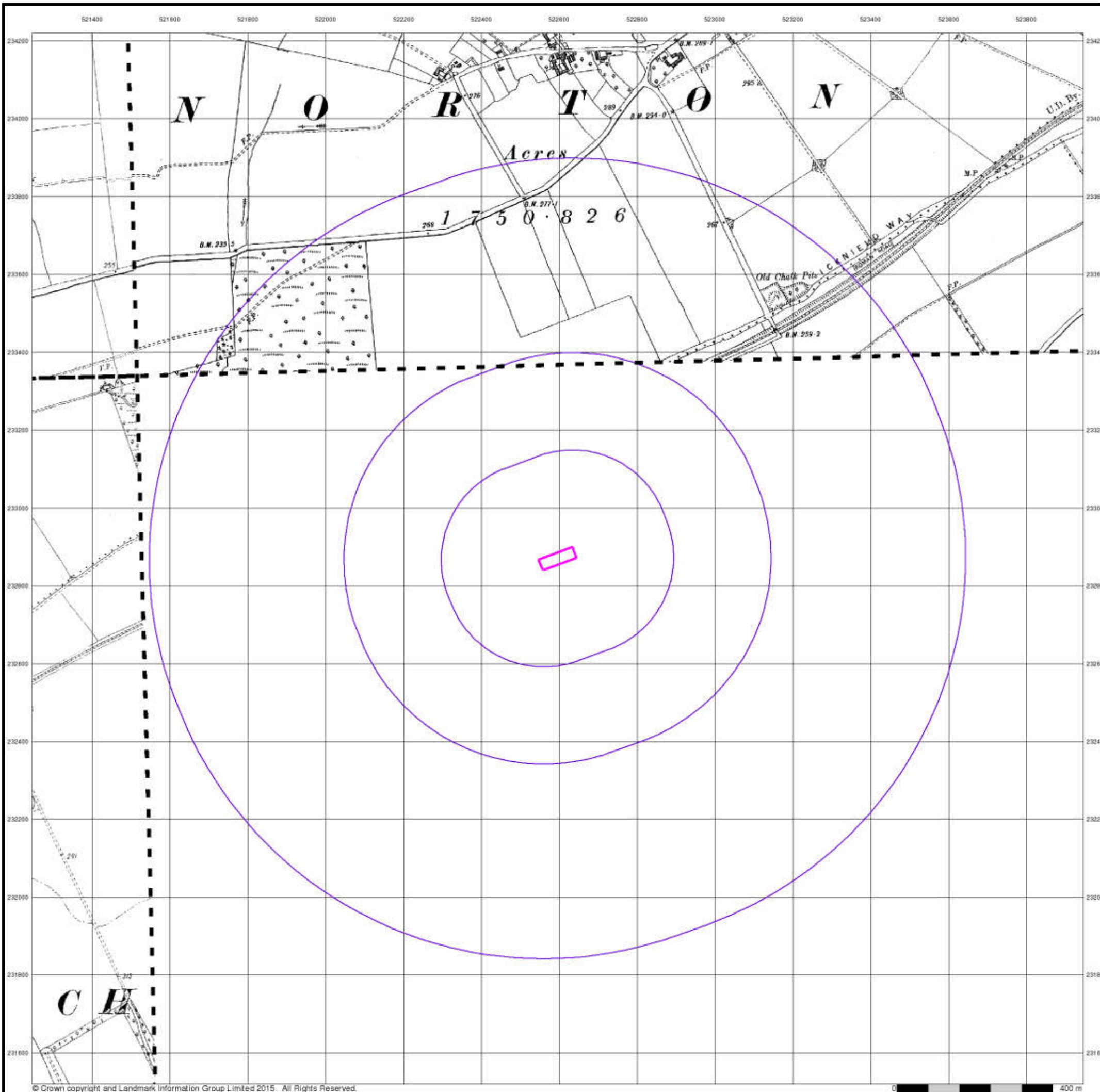
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0 400 m



**Geo-Environmental
Bedfordshire**

Published 1901

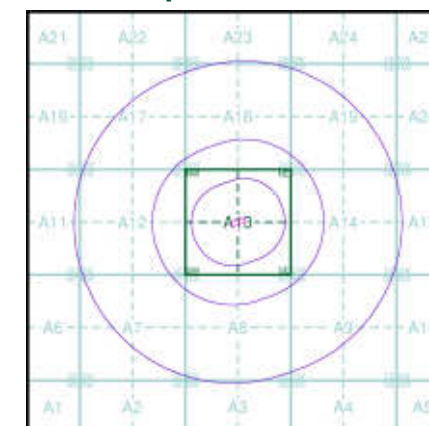
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Map Name(s) and Date(s)

027NW 1901 1:10,560	027NE 1901 1:10,560
027SW 1901 1:10,560	

Historical Map - Slice A



Order Details

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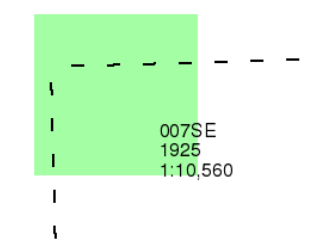
Geo-Environmental Hertfordshire

Published 1925

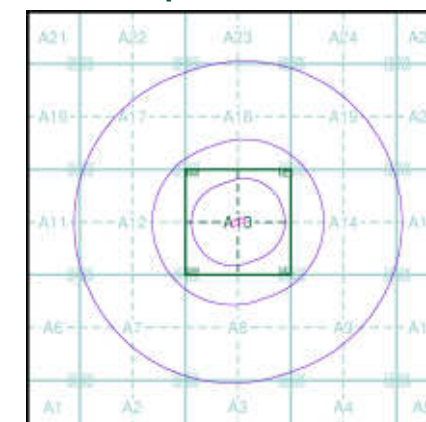
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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

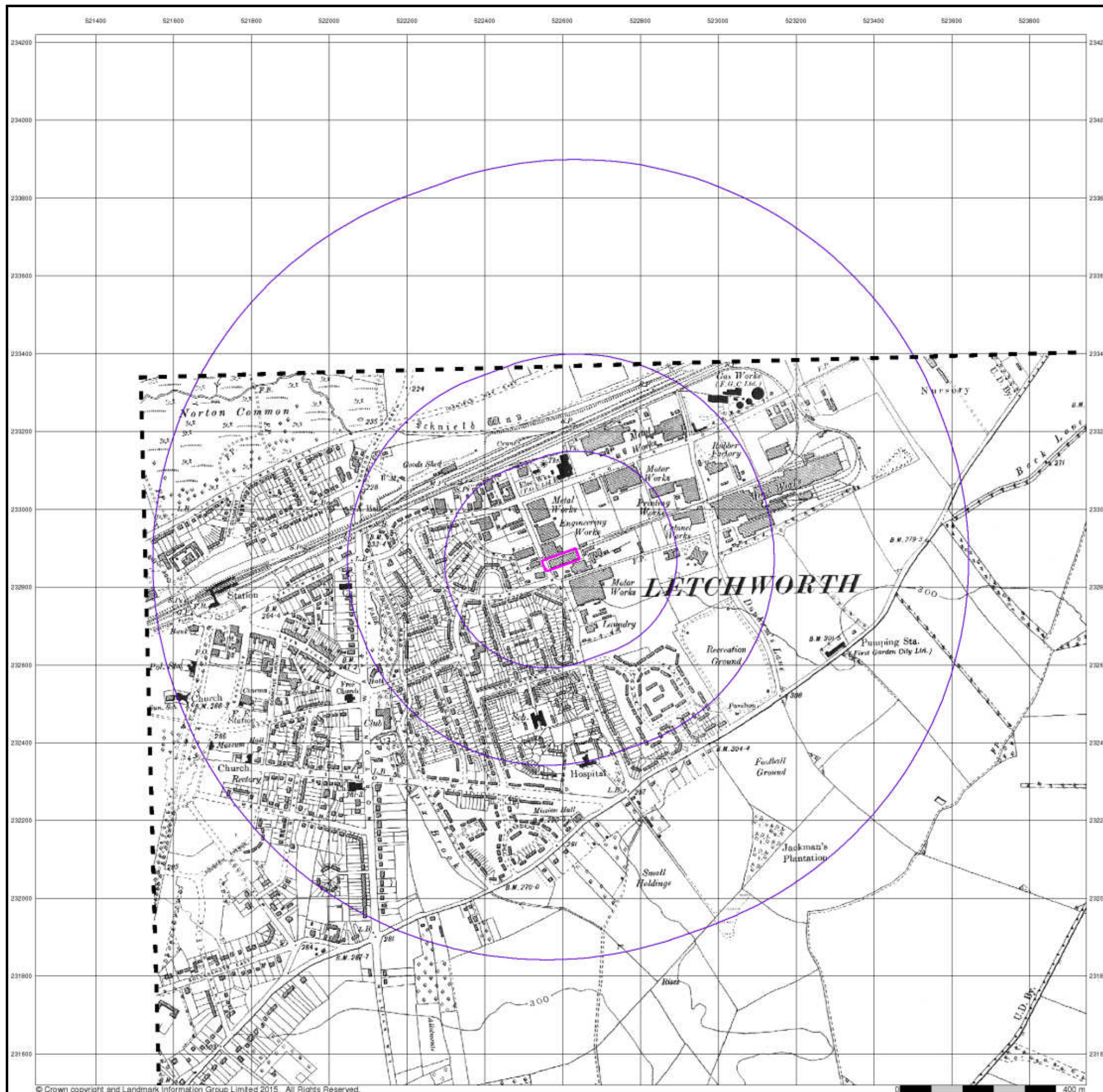
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Geo-Environmental Bedfordshire

Published 1925

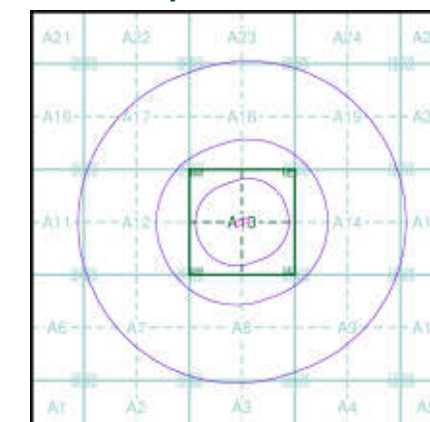
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Map Name(s) and Date(s)

027NW 1925 1:10,560	027NE 1925 1:10,560
027SW 1925 1:10,560	

Historical Map - Slice A



Order Details

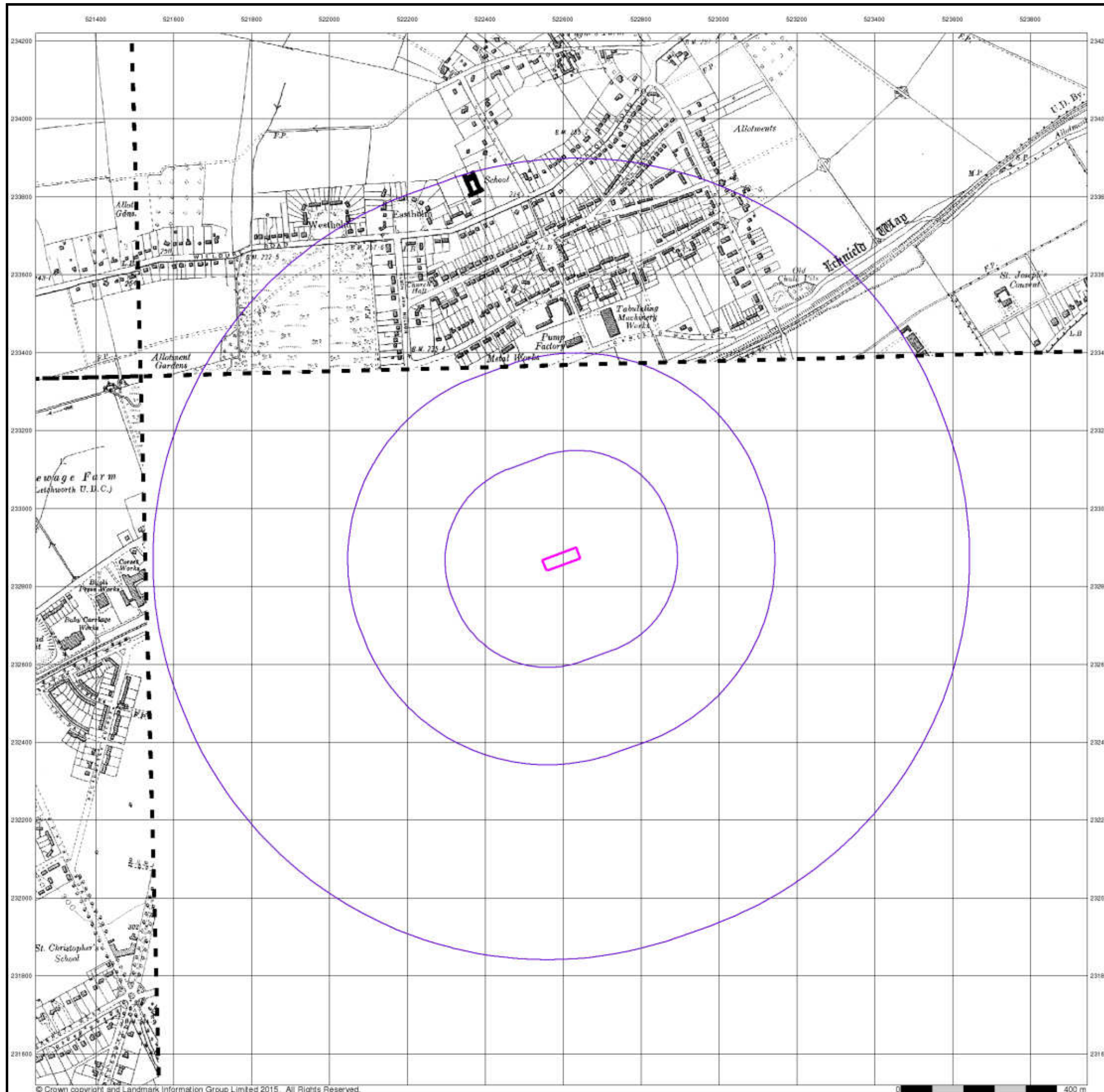
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Customer Ref: GE15860
National Grid Reference: 522600, 232870
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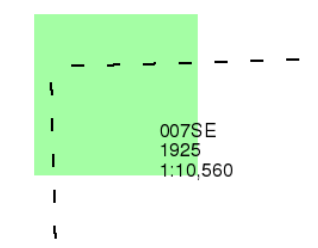
Geo-Environmental Hertfordshire

Published 1925

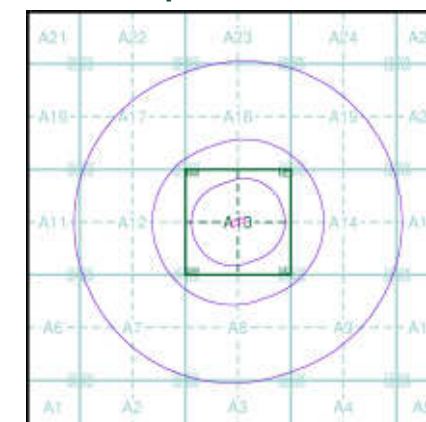
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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

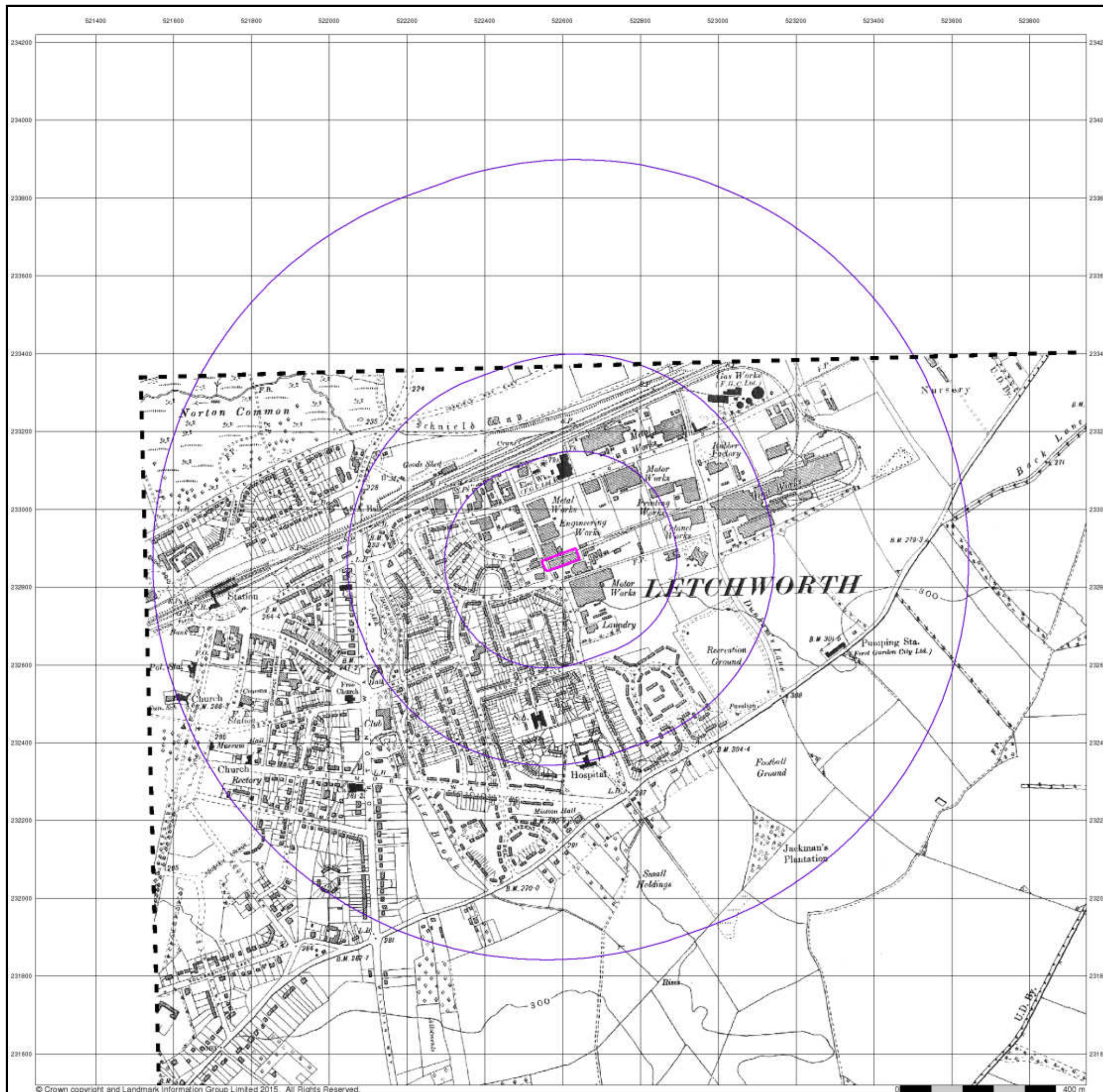
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Geo-Environmental Bedfordshire

Published 1938

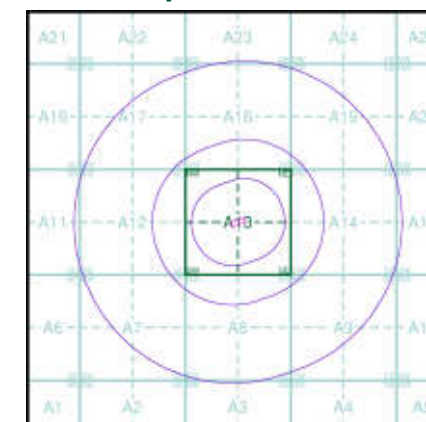
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Map Name(s) and Date(s)

027NW 1938 1:10,560	027NE 1938 1:10,560
027SW 1938 1:10,560	

Historical Map - Slice A



Order Details

Order Number: 101516660_1_1
Customer Ref: GE15860
National Grid Reference: 522600, 232870
Slice: A
Site Area (Ha): 0.27
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Site Details

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Geo-Environmental Bedfordshire

Published 1948 - 1950

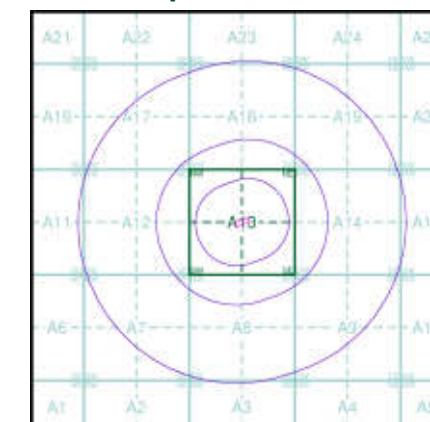
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Map Name(s) and Date(s)

027NW 1948 1:10,560	027NE 1950 1:10,560
027SW 1950 1:10,560	

Historical Map - Slice A



Order Details

Order Number: 101516660_1_1
Customer Ref: GE15860
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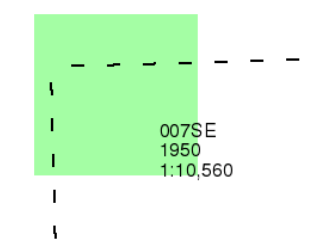
Geo-Environmental Hertfordshire

Published 1950

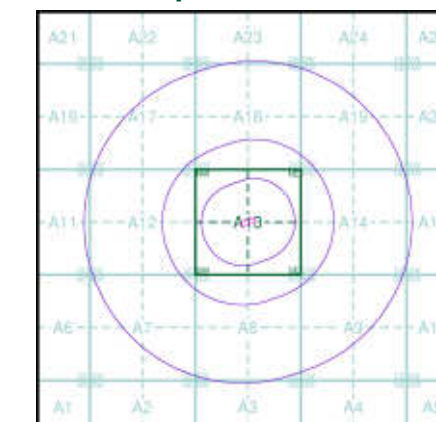
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Geo-Environmental Ordnance Survey Plan

Published 1960

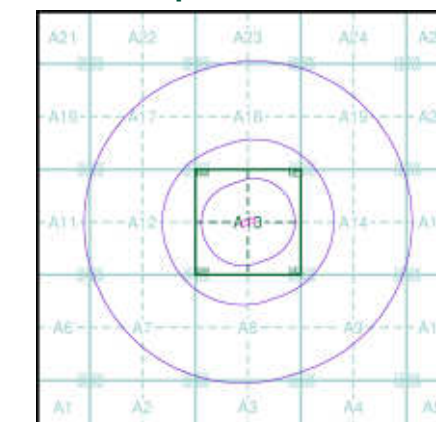
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Map Name(s) and Date(s)

TL23SW
1960
1:10,560

Historical Map - Slice A



Order Details

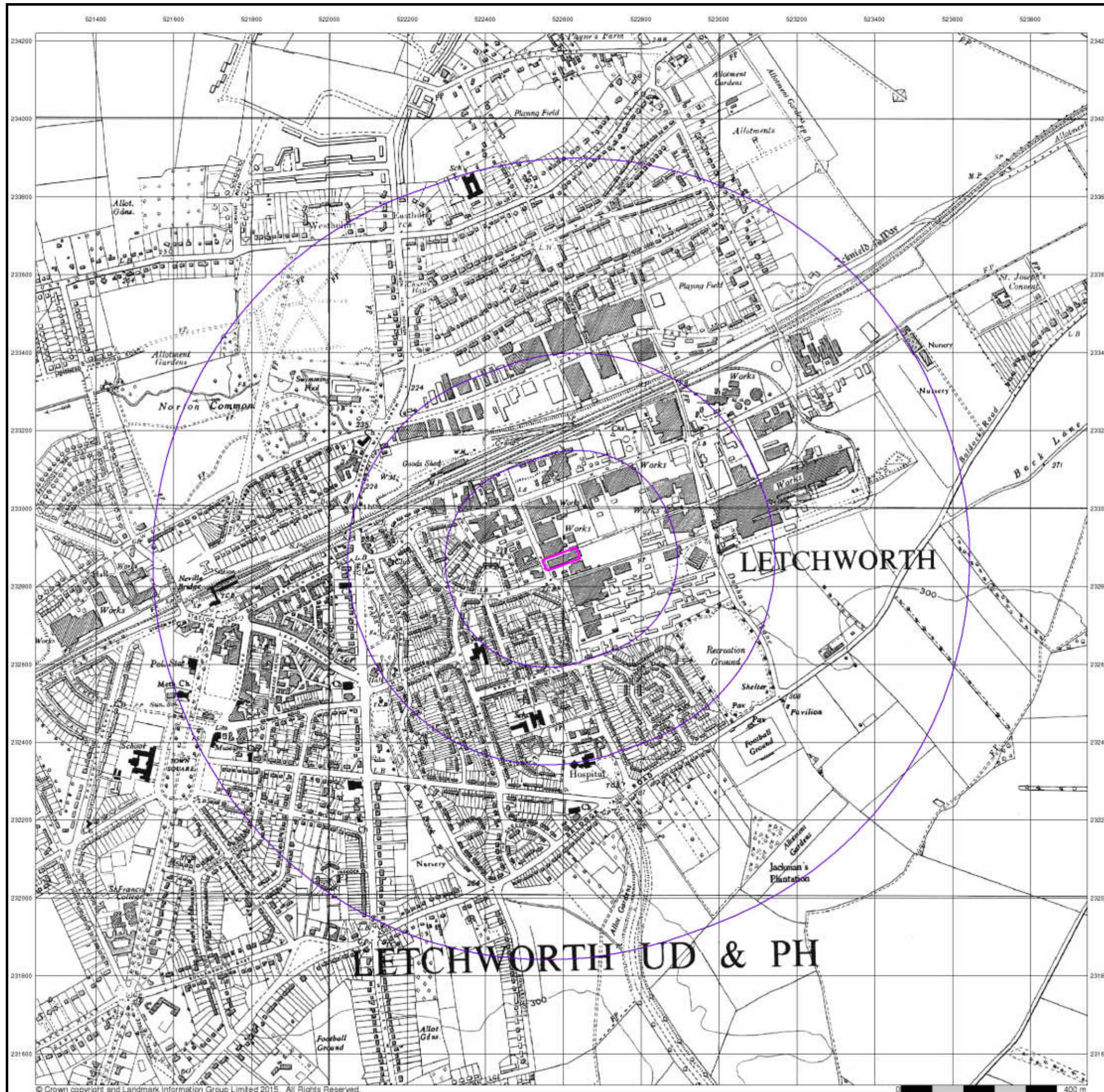
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Geo-Environmental Ordnance Survey Plan

Published 1980

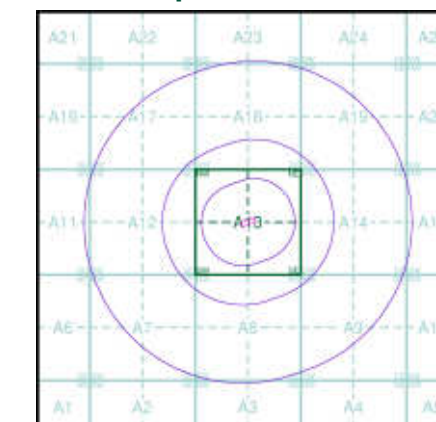
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

TL23SW
1980
1:10,000

Historical Map - Slice A



Order Details

Order Number: 101516660_1_1
Customer Ref: GE15860
National Grid Reference: 522600, 232870
Slice: A
Site Area (Ha): 0.27
Search Buffer (m): 1000

Site Details

Pixmore Avenue/, Protea Way, LETCHWORTH GARDEN
CITY, Hertfordshire, SG6 1QY

Landmark
INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Geo-Environmental Ordnance Survey Plan

Published 1986

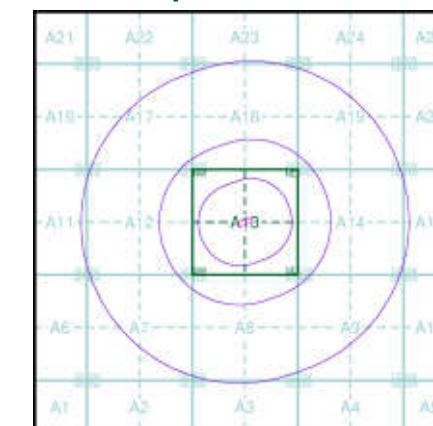
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

TL23SW
1986
1:10,000

Historical Map - Slice A



Order Details

Order Number: 101516660_1_1
Customer Ref: GE15860
National Grid Reference: 522600, 232870
Slice: A
Site Area (Ha): 0.27
Search Buffer (m): 1000

Site Details

Pixmore Avenue/, Protea Way, LETCHWORTH GARDEN
CITY, Hertfordshire, SG6 1QY

Landmark
INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Geo-Environmental 10k Raster Mapping

Published 1999

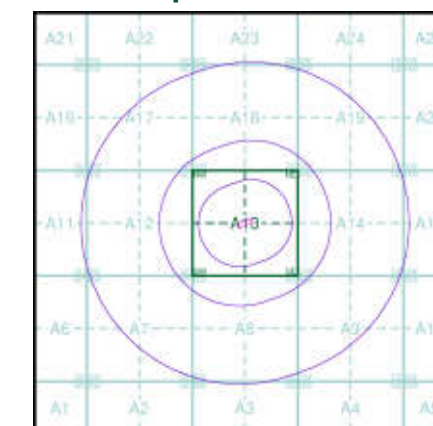
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

TL23SW
1999
1:10,000

Historical Map - Slice A



Order Details

Order Number: 101516660_1_1
Customer Ref: GE15860
National Grid Reference: 522600, 232870
Slice: A
Site Area (Ha): 0.27
Search Buffer (m): 1000

Site Details

Pixmore Avenue/, Protea Way, LETCHWORTH GARDEN
CITY, Hertfordshire, SG6 1QY

Landmark
INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Geo-Environmental 10k Raster Mapping

Published 2006

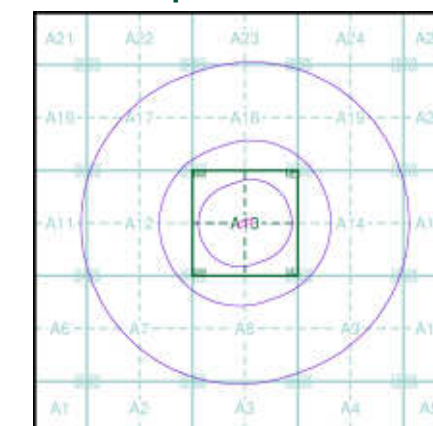
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

TL23SW
2006
1:10,000

Historical Map - Slice A



Order Details

Order Number: 101516660_1_1
Customer Ref: GE15860
National Grid Reference: 522600, 232870
Slice: A
Site Area (Ha): 0.27
Search Buffer (m): 1000

Site Details

Pixmore Avenue/, Protea Way, LETCHWORTH GARDEN
CITY, Hertfordshire, SG6 1QY

Landmark
INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Geo-Environmental VectorMap Local

Published 2016

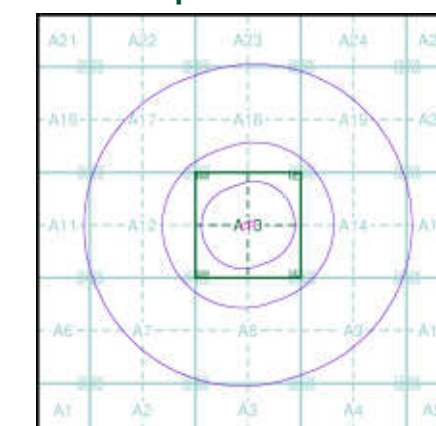
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities), 1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)

TL23SW
2016
Variable

Historical Map - Slice A



Order Details

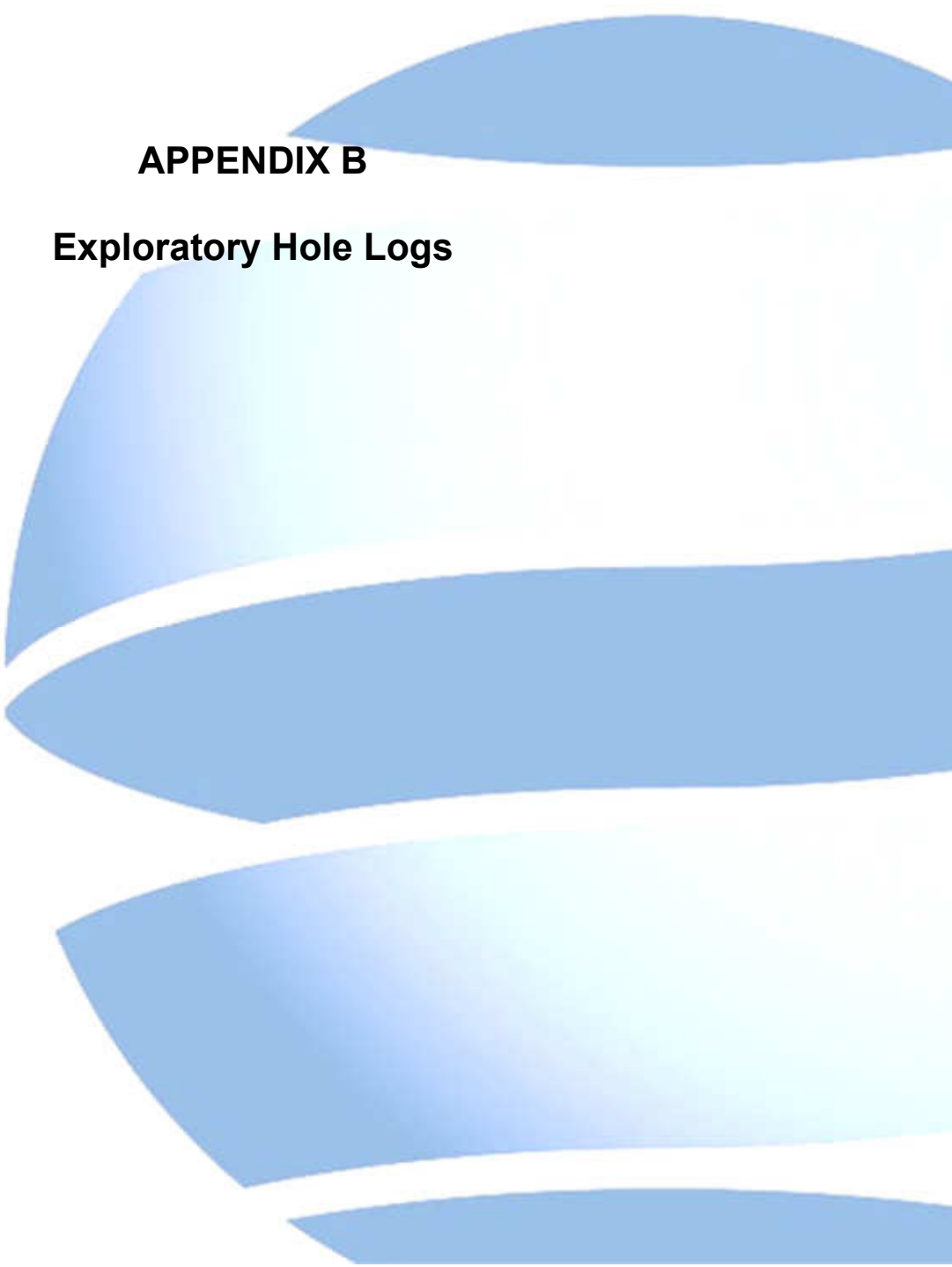
Order Number: 101516660_1_1
Customer Ref: GE15860
National Grid Reference: 522600, 232870
Slice: A
Site Area (Ha): 0.27
Search Buffer (m): 1000

Site Details

Pixmore Avenue/, Protea Way, LETCHWORTH GARDEN
CITY, Hertfordshire, SG6 1QY

Landmark
INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



APPENDIX B

Exploratory Hole Logs

 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. BH01 Sheet 1 of 3	
Project Name: Pixmore Avenue, Letchworth		Project No. GE18750		Co-ords: 522565E - 232867N		Hole Type CP	
Location: Letchworth, Hertfordshire				Level: 86.75		Scale 1:50	
Client: Ashe Construction				Dates: 20/05/2020		Logged By	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20 - 0.30	D		0.40	86.35		Crushed concrete brick clay MADE GROUND	1
		0.50 - 0.60 0.50 - 1.00	D B					Firm slightly fissured brown CLAY with rock chalk LOWESTOFT FORMATION	
		1.20 - 1.65 1.20	D S	N=14 (2,2/3,3,4,4)					
		1.50 - 2.00	B						
		1.70 - 1.80	D						
		2.00 - 2.45	U	Ublow=88					2
		2.50 - 2.60 2.50 - 3.00	D B						
		3.00 - 3.45 3.00	D S	N=16 (2,3/3,4,4,5)					3
		3.50 - 3.60	D						
		4.00 - 4.45	U	Ublow=100					4
		4.50 - 4.60	D		4.30	82.45		Firm to stiff mottled green and grey sandy slightly gravelly CLAY LOWESTOFT FORMATION	
		5.00 - 5.45 5.00	D S	N=17 (2,3/4,4,4,5)					5
		6.00 - 6.10	D		6.20	80.55		Stiff fissured grey CLAY with chalk LOWESTOFT FORMATION	6
		6.50 - 6.95 6.50 - 7.00	UF B	Ublow=100					
		7.00 - 7.45 7.00	D S	N=19 (3,3/4,4,5,6)					7
		7.50 - 7.60	D						
		8.00 - 8.45 8.00	D S	N=22 (3,4/5,5,6,6)					8
		9.00 - 9.10	D		8.70	78.05		Putty CHALK with flints WHITE CHALK SUBGROUP	9
	9.50 - 9.95 9.50	D S	N=24 (5,7/9,5,5,5)					10	
Continued on Next Sheet									

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	
150	7.50	6.40	6.00	18.20	18.50	





Geo-Environmental www.gesl.net

Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL

Borehole Log

Borehole No.

BH01

Sheet 2 of 3

Project Name: Pixmore Avenue, Letchworth

Project No.
GE18750

Co-ords: 522565E - 232867N

Hole Type
CP

Location: Letchworth, Hertfordshire

Level: 86.75

Scale
1:50

Client: Ashe Construction

Dates: 20/05/2020

Logged By

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description																		
		Depth (m)	Type	Results																						
		10.50 - 10.60	D	N=19 (3,4/4,5,5,5)																						
		11.00 - 11.45 11.00	D S																							
		12.00 - 12.10	D																							
		12.50 - 12.95 12.50	D S	N=20 (3,4/4,5,5,6)																						
		13.50 - 13.60	D																							
		14.00 - 14.45 14.00	D S																							
		15.00 - 15.10	D	N=19 (3,4/4,5,5,5)																						
		15.50 - 15.95 15.50	D S																							
		16.50 - 16.60	D																							
		17.00 - 17.45 17.00	D S	N=20 (2,3/4,5,5,6)																						
		18.00 - 18.10	D																							
		18.50 - 18.91 18.50	D S																							
		19.50 - 19.60	D	N=19 (3,4/4,5,5,5)																						
20.00 - 20.45 20.00	D S																									
		N=47 (25 for 111mm/18,20,4,5)																								
		N=22 (4,4/5,5,6,6)																								
		Continued on Next Sheet																								
Casing		Water Strikes (mbgl)																		Chiselling (mbgl)		Remarks				
Diameter	Depth (m)	Depth Strike																		Rose to	Depth from				Depth to	
150	7.50	6.40																		6.00	18.20				18.50	
																										





Geo-Environmental

Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL
www.gesl.net

Borehole Log

Borehole No.

BH01

Sheet 3 of 3

Project Name: Pixmore Avenue, Letchworth

Project No.
GE18750

Co-ords: 522565E - 232867N

Hole Type
CP

Location: Letchworth, Hertfordshire

Level: 86.75

Scale
1:50

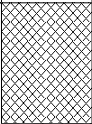
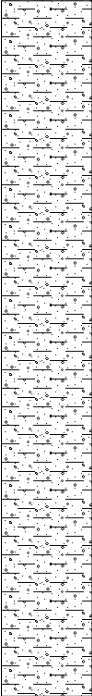
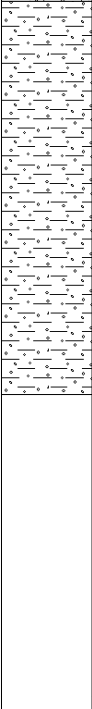
Client: Ashe Construction

Dates: 20/05/2020

Logged By

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					20.45	66.30		End of Borehole at 20.45m	21 22 23 24 25 26 27 28 29 30
Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks			
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to				
150	7.50	6.40	6.00	18.20	18.50				

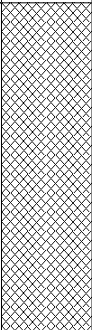
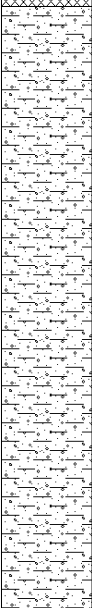
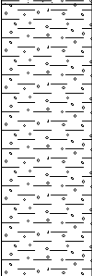
 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. WS02 Sheet 1 of 1	
Project Name: Pixmore Avenue, Letchworth		Project No. GE18750		Co-ords: 522587E - 232877N		Hole Type WLS	
Location: Letchworth, Hertfordshire				Level: 86.10		Scale 1:25	
Client: Ashe Construction				Dates: 20/05/2020		Logged By KOD	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.40	85.70		Dark brown to black gravelly SAND with brick fragments and frequent rootlets. MADE GROUND	
		0.50 0.50	D PP	3.5kg/cm2					
		1.00 1.00	D PP	3.8kg/cm2		Very stiff brown and bluish grey mottled gravelly CLAY with orange staining and some rotting rootlets. LOWESTOFT FORMATION			
		1.50 1.50 1.50	D ES PP	5.0kg/cm2					
		2.00 2.00	D PP	4.5kg/cm2					
		2.50 2.50	D PP	5.0kg/cm2					
		3.00 3.00	D PP	5.0kg/cm2					
		3.50 3.50	D PP	3.7kg/cm2					
	4.00 4.00	D PP	4.0kg/cm2	4.00	82.10	End of Borehole at 4.00m			

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	



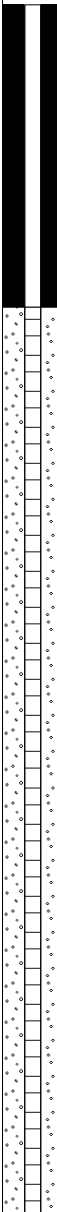
 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. WS03 Sheet 1 of 1	
Project Name: Pixmore Avenue, Letchworth		Project No. GE18750		Co-ords: 522576E - 232858N		Hole Type WLS	
Location: Letchworth, Hertfordshire				Level: 86.66		Scale 1:25	
Client: Ashe Construction				Dates: 20/05/2020		Logged By KOD	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.70	ES		1.10	85.56		Brown gravelly SAND with abundant brick fragments some black staining and some rootlets. MADE GROUND	1	
		1.20 1.20	D ES					Stiff orangish and bluish grey mottled slightly sandy gravelly CLAY with some reddish orange staining and some rotting rootlets. Gravel is fine to coarse sub angular chalk and some flint. LOWESTOFT FORMATION		
		1.50 1.50	D PP	4.0kg/cm2						
			2.00 2.00	D PP	2.5kg/cm2	3.10	83.56		2	
			2.50 2.50	D PP	3.1kg/cm2					
			3.00 3.00	D PP	3.8kg/cm2					
			3.50 3.50	D PP	4.2kg/cm2	4.00	82.66		Very stiff dark brown and dark bluish grey mottled slightly gravelly CLAY with reddish orange staining. Gravel is fine sub angular chalk. LOWESTOFT FORMATION	3
			4.00 4.00	D PP	4.8kg/cm2					
		End of Borehole at 4.00m							4	
5										

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	

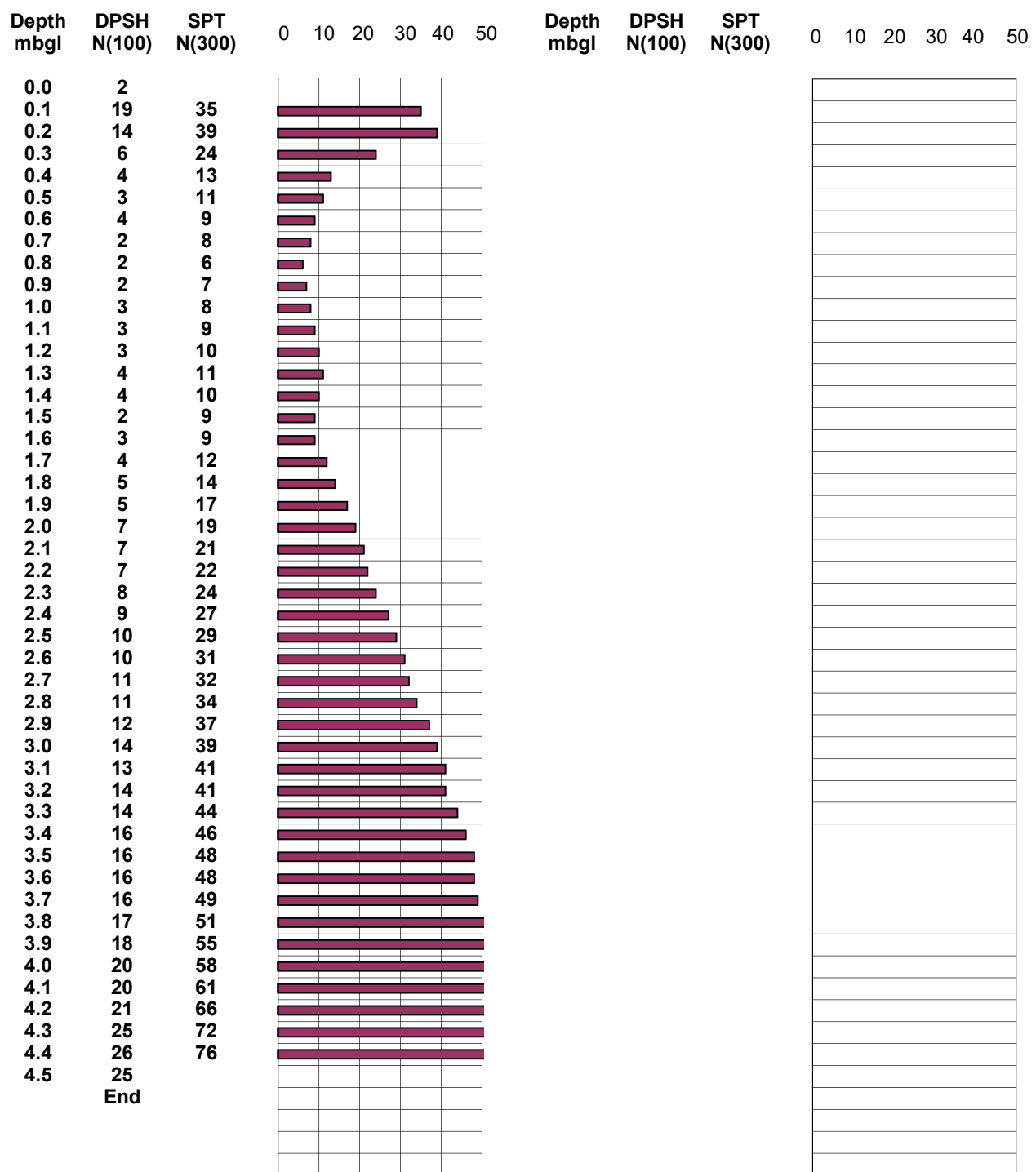


 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. WS05 Sheet 1 of 1	
Project Name: Pixmore Avenue, Letchworth		Project No. GE18750		Co-ords: 522639E - 232875N		Hole Type WLS	
Location: Letchworth, Hertfordshire				Level: 85.98		Scale 1:25	
Client: Ashe Construction				Dates: 20/05/2020		Logged By KOD	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES				Brown very gravelly sandy CLAY with brick fragments, concrete rubble and some rootlets. MADE GROUND		
					0.50	85.48			
		0.70	ES		0.60	85.38		Black charred material. MADE GROUND	
		1.00	D					Firm to stiff orangish brown and bluish grey mottled slightly sandy gravelly CLAY with reddish orange staining, some rootlets and some rotting rootlets. Gravel is fine to medium sub rounded chalk. LOWESTOFT FORMATION	1
		1.00	PP	2.5kg/cm2					
					1.20	84.78			
		1.50	D					Very stiff brown and bluish grey mottled slightly sandy very gravelly CLAY with orange staining. Gravel is fine to coarse sub angular chalk. LOWESTOFT FORMATION	
		1.50	PP	5.0kg/cm2					
		2.00	D						2
		2.00	PP	5.0kg/cm2					
	2.50	D							
	2.50	PP	3.8kg/cm2						
				2.80	83.18				
	3.00	D					Very stiff dark brown and bluish grey mottled slightly sandy gravelly CLAY. Sand is fine. Gravel is fine to medium sub rounded chalk and some sandstone. LOWESTOFT FORMATION	3	
	3.00	PP	4.2kg/cm2						
	3.50	D							
	3.50	PP	3.7kg/cm2						
	4.00	D							
	4.00	PP	4.0kg/cm2	4.00	81.98		End of Borehole at 4.00m	4	
								5	

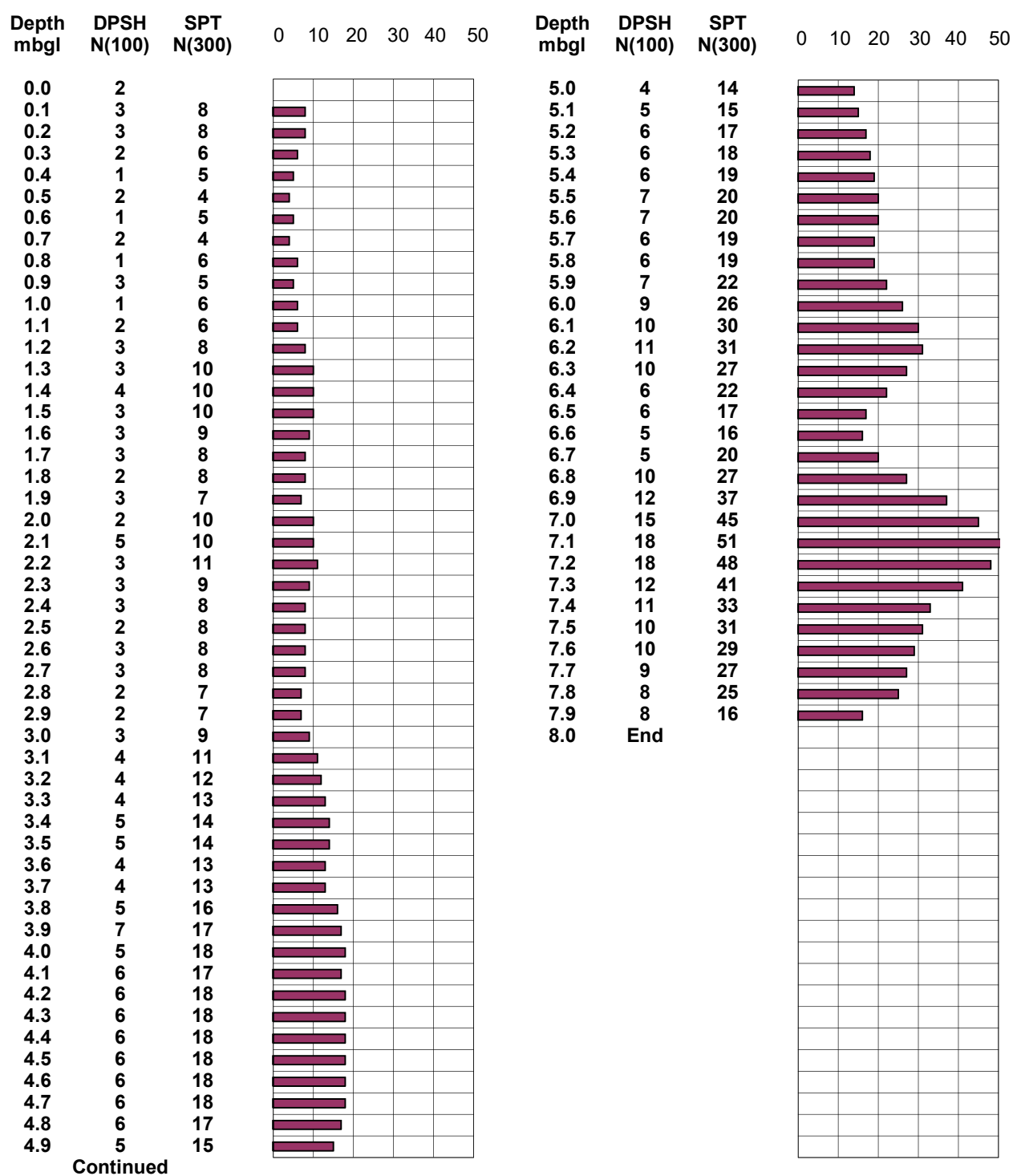
Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	





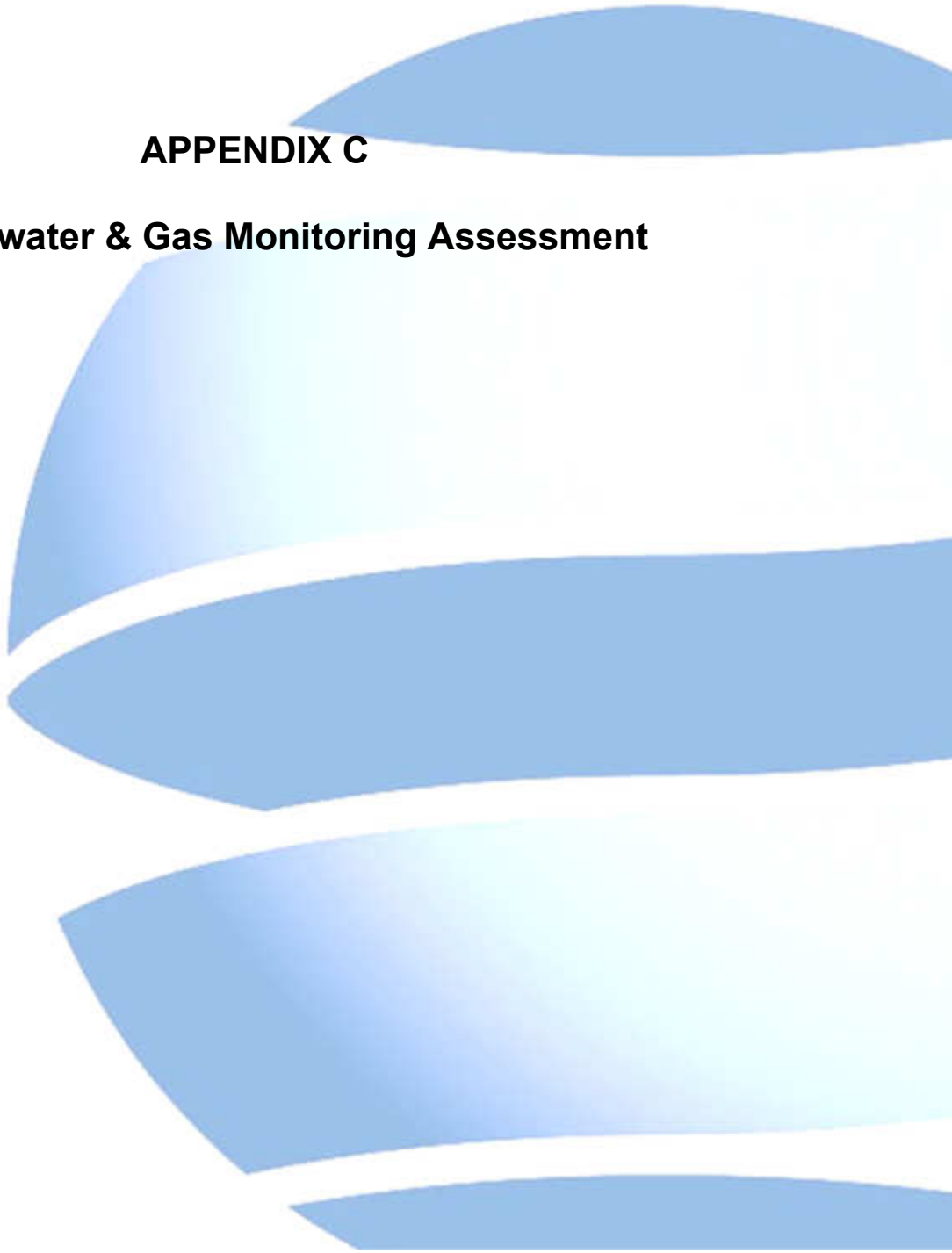
Note: DPSH'N' and SPT'N' directly correlate. SPT'N'(300) calculated as sum of DPSH'N' over 300mm

Project:	Pixmore Avenue, Letchworth			Title:	DYNAMIC PROBE LOG DP1
Client:	Ashe Construction			Geo-Environmental Services Ltd Unit 7, Danworth Farm, Cuckfield Road, Hurstpierpoint, West Sussex, BN6 9GL E: mail@gesl.net T: 01273 832972	
Ref No:	GE18750	Rev:	0		
Drawn:	-	Date:	20/05/2020		
Figure:	-	Scale:	Not To Scale		



Note: DPSH'N' and SPT'N' directly correlate. SPT'N'(300) calculated as sum of DPSH'N' over 300mm

Project:	Pixmore Avenue, Letchworth			Title:	DYNAMIC PROBE LOG DP2
Client:	Ashe Construction			Geo-Environmental Services Ltd Unit 7, Danworth Farm, Cuckfield Road, Hurstpierpoint, West Sussex, BN6 9GL E: mail@gesl.net T: 01273 832972	
Ref No:	GE18750	Rev:	0		
Drawn:	-	Date:	20/05/2020		
Figure:	-	Scale:	Not To Scale		



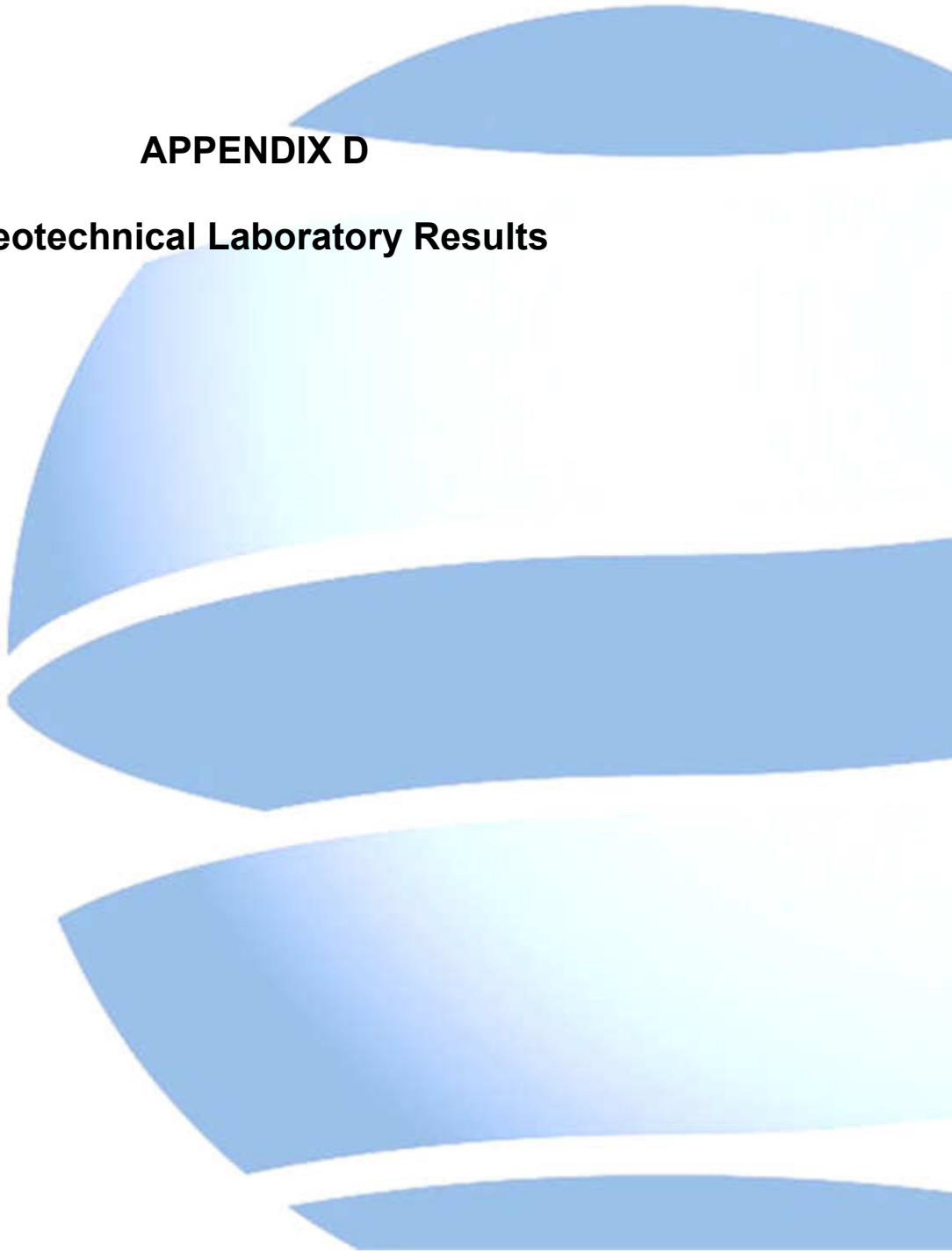
APPENDIX C

Groundwater & Gas Monitoring Assessment

Project: Pixmore Avenue, Letchworth
Ref: GE18750
Client: Ashe Construction



Location	Date	Time (sec)	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Flow (l/hr)	VOC (ppm)	Pressure (mb)	GWL (m bgl)	GSV/Qhgs		Characteristic Situation		CS1 Limiting Value Check			NHBC			
										CH ₄	CO ₂	BS8485 & C665		Flow	CH ₄	CO ₂	CH ₄		CO ₂	
												CH ₄	CO ₂				GSV	Conc.	GSV	Conc.
WS01	17/06/20	0	0.0	0.0	20.9	0.0	-	1003	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS01	17/06/20	10	0.0	0.8	20.1	0.0	-	1003	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS01	17/06/20	20	0.0	0.8	20.2	0.0	-	1003	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS01	17/06/20	30	0.0	0.8	20.2	0.0	-	1003	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS01	17/06/20	60	0.0	0.8	20.2	0.0	-	1003	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS01	17/06/20	90	0.0	0.8	20.2	0.0	-	1003	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS01	17/06/20	120	0.0	0.9	20.1	0.0	-	1003	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS01	17/06/20	180	0.0	0.9	20.1	0.0	-	1003	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS05	17/06/20	0	0.0	0.0	20.9	0.0	-	1003	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS05	17/06/20	10	0.0	4.7	15.1	0.0	-	1003	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS05	17/06/20	20	0.0	4.7	15.0	0.0	-	1003	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS05	17/06/20	30	0.0	4.8	14.9	0.0	-	1003	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS05	17/06/20	60	0.0	4.8	14.9	0.0	-	1003	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS05	17/06/20	90	0.0	4.8	14.9	0.0	-	1003	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS05	17/06/20	120	0.0	4.8	14.8	0.0	-	1003	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS05	17/06/20	180	0.0	5.0	14.7	0.0	-	1003	Dry	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	AMBER 1
WS01a	17/06/20	0	0.0	0.0	20.9	0.0	-	1003	1.85	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS01a	17/06/20	10	0.0	0.6	20.3	0.0	-	1003	1.85	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS01a	17/06/20	20	0.0	0.6	20.3	0.0	-	1003	1.85	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS01a	17/06/20	30	0.0	0.6	20.3	0.0	-	1003	1.85	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS01a	17/06/20	60	0.0	0.6	20.3	0.0	-	1003	1.85	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS01a	17/06/20	90	0.0	0.6	20.3	0.0	-	1003	1.85	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS01a	17/06/20	120	0.0	0.6	20.3	0.0	-	1003	1.85	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
WS01a	17/06/20	180	0.0	0.6	20.3	0.0	-	1003	1.85	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
Max values			0.0	5.0	20.9	0.0	0.0	1003.0	1.9	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	AMBER 1
Min Vaules			0.0	0.0	14.7	0.0	0.0	1003.0	1.9	0.000	0.000	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	GREEN
BH Flow LoD check			0.0	5.0	20.9	0.1	-	-	-	0.000	0.005	CS1	CS1	NO	NO	NO	GREEN	GREEN	GREEN	AMBER 1



APPENDIX D

Geotechnical Laboratory Results

					Summary of Natural Moisture Content, Liquid Limit and Plastic Limit Results						
Job No.		Project Name					Programme				
28288		Pixmore Avenue, Letchworth					Samples received		21/05/2020		
Project No.		Client					Schedule received		29/05/2020		
GE18750		GESL					Project started		01/06/2020		
							Testing Started		17/06/2020		
Hole No.	Sample				Soil Description	NMC %	Passing 425µm %	LL %	PL %	PI %	Remarks
	Ref	Top m	Base m	Type							
BH01	7	2.00	-	U	Extremely high strength brown mottled grey slightly gravelly slightly sandy silty CLAY with occasional fmc chalk fragments (gravel is fmc and sub-angular)	17	88	35	17	18	
BH01	12	4.00	-	U	Very high strength greyish brown slightly gravelly slightly sandy silty CLAY with occasional chalk fragments (gravel is fmc and angular)	17	86	34	17	17	
BH01	16	6.50	-	B	Dark grey slightly gravelly slightly sandy silty CLAY with occasional fmc chalk fragments and rootlets (gravel is fmc and sub-angular)	16	90	36	15	21	
WS01	5	2.00	-	D	Brown mottled grey slightly gravelly slightly sandy silty CLAY with occasional fm chalk fragments (gravel is fm and sub-angular to angular)	13	92	31	14	17	
WS02	8	3.00	-	D	Brownish grey slightly gravelly slightly sandy silty CLAY with occasional fmc chalk fragments (gravel is fmc and sub-angular)	16	87	31	16	15	
WS03	5	2.00	-	D	Brown mottled grey slightly gravelly slightly sandy silty CLAY with occasional intact chalk fragments (gravel is fm and sub-angular)	19	92	35	17	18	
WS04	4	1.00	-	D	Greyish brown slightly gravelly slightly sandy silty CLAY with occasional chalk fragments (gravel is fm and sub-angular)	15	87	35	15	20	
WS05	4	1.50	-	D	Brown mottled light grey slightly gravelly slightly sandy silty CLAY with occasional fmc intact chalk fragments (gravel is fm and sub-angular)	16	82	35	18	17	

	Test Methods: BS1377: Part 2: 1990: Natural Moisture Content : clause 3.2 Atterberg Limits: clause 4.3 and 5.0	Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU Tel: 01923 711 288 Email: James@k4soils.com	Checked and Approved Initials J.P Date: 19/06/2020
	Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)		
	MSF-5-R1(b)		

					Saturation Moisture Content - Summary of Results Tested in accordance with BS1377 : Part 2 : 1990, clause 3.3 unless annotated otherwise.						
Job No.		Project Name								Programme	
28288		Pixmore Avenue, Letchworth								Samples received	21/05/2020
										Schedule received	29/05/2020
Project No.		Client								Project started	
GE18750		GESL								Testing Started	
Hole No.	Sample				Description	SMC %	NMC %	Bulk Density Mg/m3	Dry Density Mg/m3	Remarks - Sample size complies with BS1377:1990: Part 2 (Yes/No)	
	Ref	Top m	Base m	Type							
BH01	25	12.50	-	D	Off white putty CHALK with rare fm intact chalk fragments	29	27	1.93	1.52	No	
BH01	31	17.00	-	D	Off white putty CHALK with rare fm intact chalk fragments	28	26	1.93	1.53	No	
BH01	35	20.00	-	D	Off greyish white putty CHALK with rare fm intact chalk fragments	30	27	1.90	1.50	No	
		Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU Tel: 01923 711 288 Email: James@k4soils.com								Checked and Approved Initials J.P Date: 19/06/2020	
2519		Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)								MSF-5-R18	

		Sulphate Content (Gravimetric Method) for 2:1 Soil: Water Extract and pH Value - Summary of Results Tested in accordance with BS1377 : Part 3 : 2018, Clause 7.6 & Clause 12							
Job No. 28288		Project Name Pixmore Avenue, Letchworth						Programme Samples received 21/05/2020 Schedule received 29/05/2020	
Project No. GE18750		Client GESL						Project started 01/06/2020 Testing Started 03/06/2020	
Hole No.	Sample				Soil description	Dry Mass passing 2mm %	SO4 Content mg/l	pH	Remarks
	Ref	Top m	Base m	Type					
BH01	16	6.50	-	UF	Dark grey slightly gravelly slightly sandy silty CLAY with occasional fmc chalk fragments and rootlets (gravel is fmc and sub-angular)	75	370	7.58	
BH01	25	12.50	-	D	Off white putty CHALK with rare fm intact chalk fragments	98	260	7.60	
		Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU Tel: 01923 711 288 Email: James@k4soils.com							Checked and Approved Initials J.P Date: 19/06/2020
2519		Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)							MSF-5-R29



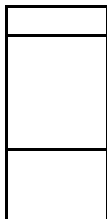
Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen

Job Ref	28288
Borehole/Pit No.	BH01
Sample No.	7
Depth Top	2.00 m
Depth Base	- m
Sample Type	U
Samples received	21/05/2020
Schedules received	29/05/2020
Date of test	02/06/2020

Remarks

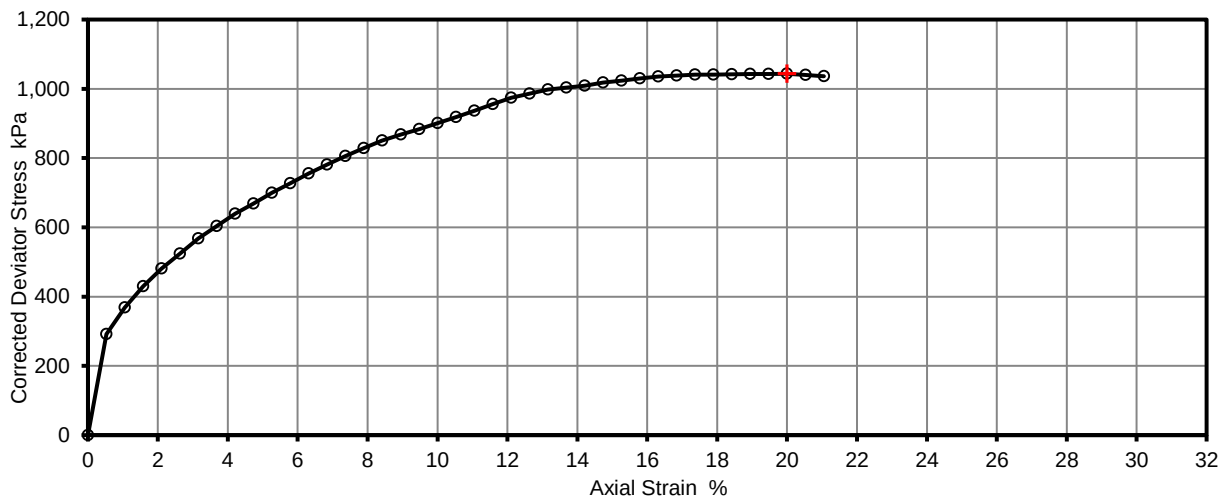
Insufficient sample for U100 test, U38 carried out

Position within sample

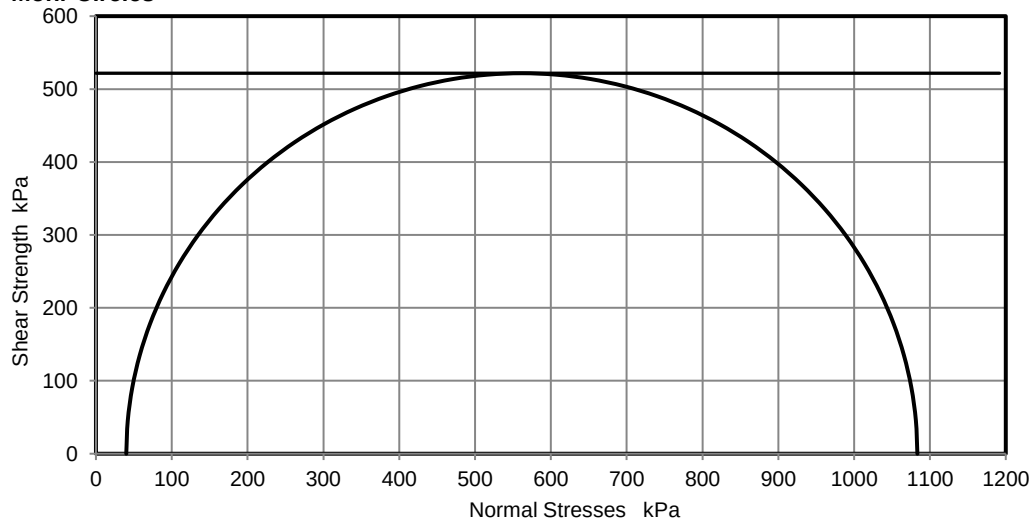


Test Number	1
Length	76.0 mm
Diameter	38.0 mm
Bulk Density	2.15 Mg/m3
Moisture Content	17 %
Dry Density	1.83 Mg/m3
Rate of Strain	2.0 %/min
Cell Pressure	40 kPa
Axial Strain	20.0 %
Deviator Stress, ($\sigma_1 - \sigma_3$) f	1043 kPa
Undrained Shear Strength, cu	522 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)$ f
Mode of Failure	Compound

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.



Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
Tel: 01923 711 288
Email: James@k4soils.com

Checked and Approved
Initials: J.P
Date 19/06/2020

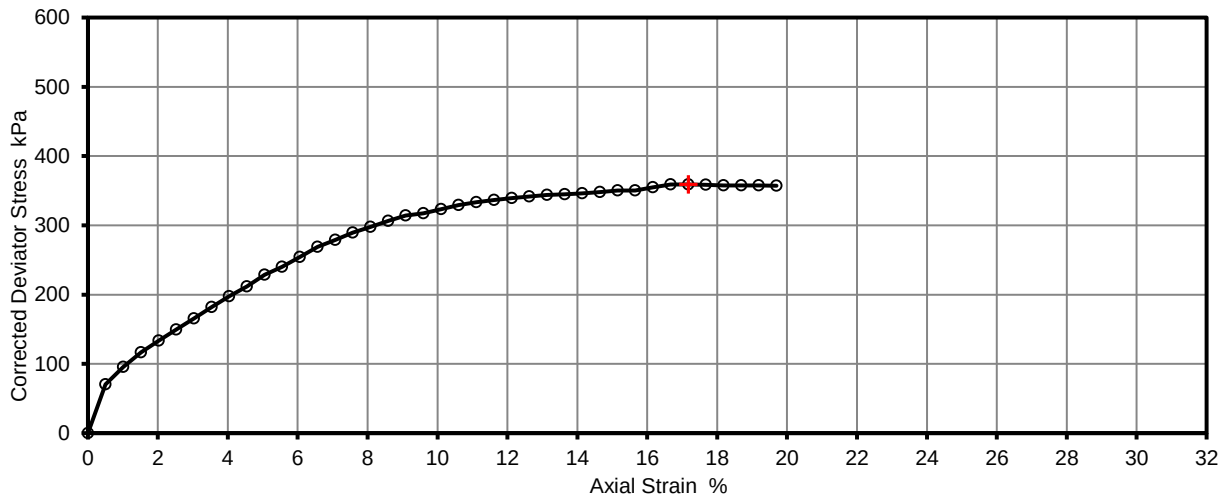
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	28288
				Borehole/Pit No.	BH01
Site Name	Pixmore Avenue, Letchworth			Sample No.	12
Project No.	GE18750	Client	GESL	Depth Top	4.00 m
Soil Description	Very high strength greyish brown slightly gravelly slightly sandy silty CLAY with occasional chalk fragments (gravel is fmc and angular)			Depth Base	- m
				Sample Type	U
				Samples received	21/05/2020
				Schedules received	29/05/2020
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	02/06/2020

Remarks

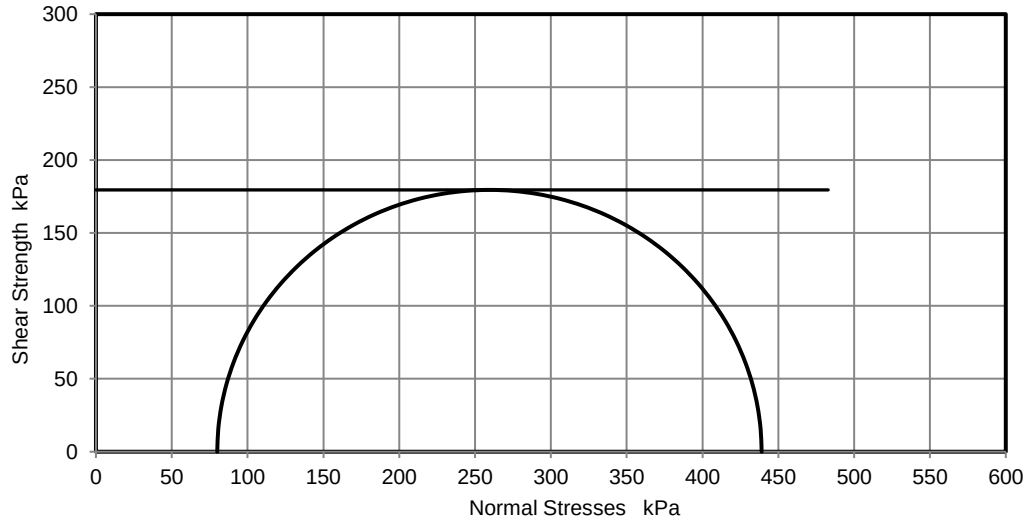
Position within sample

Test Number	1
Length	198.0 mm
Diameter	102.0 mm
Bulk Density	2.18 Mg/m ³
Moisture Content	16 %
Dry Density	1.88 Mg/m ³
Rate of Strain	2.0 %/min
Cell Pressure	80 kPa
Axial Strain	17.2 %
Deviator Stress, ($\sigma_1 - \sigma_3$)f	359 kPa
Undrained Shear Strength, cu	180 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)$ f
Mode of Failure	Compound

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.



2519

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
Tel: 01923 711 288
Email: James@k4soils.com

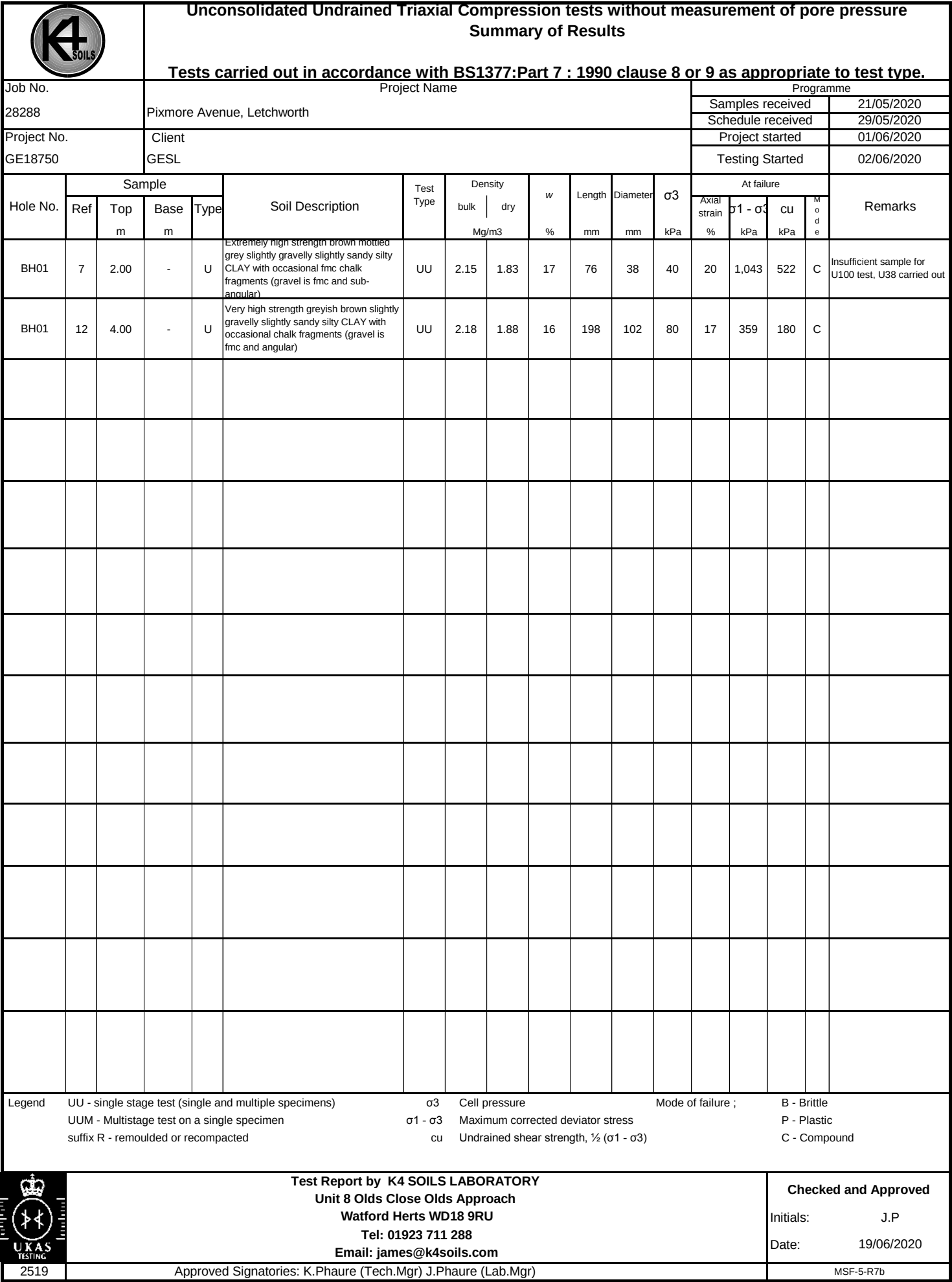
Checked and Approved

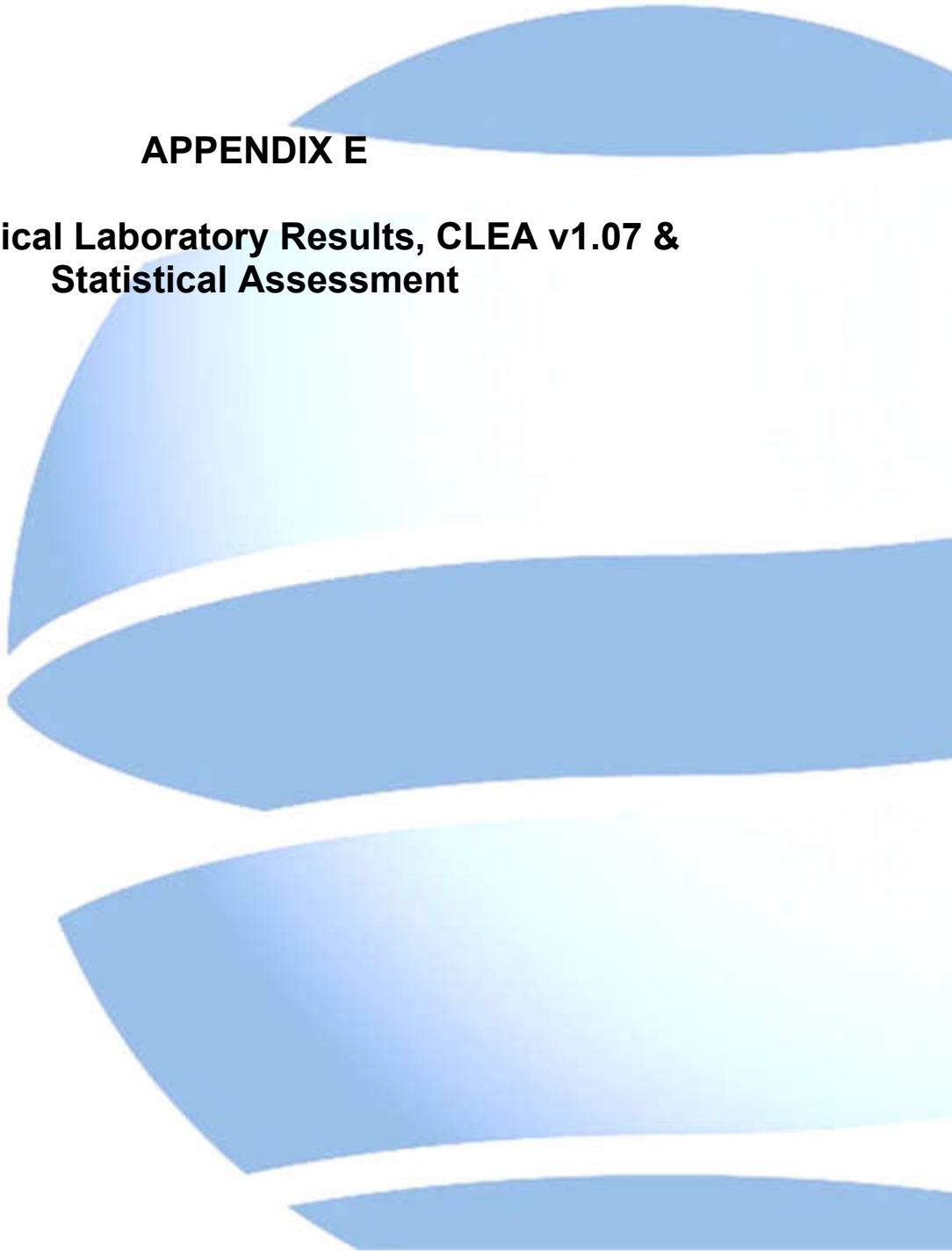
Initials: J.P

Date 19/06/2020

MSF-5 R7

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)





APPENDIX E

Geochemical Laboratory Results, CLEA v1.07 & Statistical Assessment

**Glyn Evans**

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t: 01923 225404

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e: reception@i2analytical.com

Analytical Report Number : 20-11907

Project / Site name:	Pixmore Avene Letchworth	Samples received on:	29/05/2020
Your job number:	GE18750	Sample instructed/ Analysis started on:	29/05/2020
Your order number:	2703	Analysis completed by:	08/06/2020
Report Issue Number:	1	Report issued on:	08/06/2020
Samples Analysed:	6 soil samples		

Signed:

Joanna Wawrzeczko
Technical Reviewer (Reporting Team)

For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Iss No 20-11907-1 Pixmore Avene Letchworth GE18750

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

The results included within the report relate only to the sample(s) submitted for testing.

Page 1 of 10

Analytical Report Number: 20-11907

Project / Site name: Pixmore Avenue Letchworth

Your Order No: 2703

Lab Sample Number	1522040	1522041	1522042	1522043	1522044
Sample Reference	WS1	WS2	WS3	WS4	WS5
Sample Number	ES	ES	ES	ES	ES
Depth (m)	0.30	0.20	0.70	0.30	0.20
Date Sampled	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	6.0	12
Total mass of sample received	kg	0.001	NONE	1.2	2.0

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	-	-	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.5	8.5	10.1	10.2	8.8
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphate as SO ₄	%	0.005	MCERTS	-	-	-	-	-
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	570	110	1200	1300	660
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.28	0.053	0.58	0.65	0.33
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	283	52.8	578	652	328
Sulphide	mg/kg	1	MCERTS	160	< 1.0	6.5	360	170
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	49	7.5	28	360	49
Elemental Sulphur	mg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Sulphur	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	4.9	0.8	0.7	4.2	1.8
Iodine, water soluble	mg/kg	10	NONE	< 10.0	-	< 10.0	< 10.0	-
Bromide	mg/kg	0.5	NONE	< 0.50	-	< 0.50	< 0.50	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	27	< 0.05	< 0.05	1.7	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	73	< 0.05	< 0.05	2.6	0.43
Acenaphthene	mg/kg	0.05	MCERTS	66	< 0.05	0.40	38	0.46
Fluorene	mg/kg	0.05	MCERTS	100	< 0.05	0.36	37	0.47
Phenanthrene	mg/kg	0.05	MCERTS	740*	0.83	4.2	320*	4.4
Anthracene	mg/kg	0.05	MCERTS	260	0.22	1.1	110	1.6
Fluoranthene	mg/kg	0.05	MCERTS	840*	1.2	6.7	360*	13
Pyrene	mg/kg	0.05	MCERTS	740*	1.1	6.2	340*	14
Benzo(a)anthracene	mg/kg	0.05	MCERTS	350	0.66	3.5	210	8.3
Chrysene	mg/kg	0.05	MCERTS	300	0.53	2.9	190	6.5
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	350	0.48	4.0	220	13
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	95	0.62	1.7	83	9.5
Benzo(a)pyrene	mg/kg	0.05	MCERTS	280	0.68	3.7	200	14
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	140	0.30	2.0	86	8.7
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	40	< 0.05	0.52	25	2.4
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	140	0.39	2.1	89	9.1

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	4540	7.00	39.2	2300	106
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Analytical Report Number: 20-11907

Project / Site name: Pixmore Avenue Letchworth

Your Order No: 2703

Lab Sample Number	1522040	1522041	1522042	1522043	1522044
Sample Reference	WS1	WS2	WS3	WS4	WS5
Sample Number	ES	ES	ES	ES	ES
Depth (m)	0.30	0.20	0.70	0.30	0.20
Date Sampled	20/05/2020	20/05/2020	20/05/2020	20/05/2020	20/05/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	9.4	16	16	18
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	2.9	1.1	1.1	7.6	2.6
Boron (water soluble)	mg/kg	0.2	MCERTS	2.2	1.6	1.4	5.3	1.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.5	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	30	30	23	28	47
Copper (aqua regia extractable)	mg/kg	1	MCERTS	56	270	37	32	220
Lead (aqua regia extractable)	mg/kg	1	MCERTS	110	46	41	20	160
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	5.7	< 0.3	3.1	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	23	20	24	61
Silver (aqua regia extractable)	mg/kg	1	NONE	81	-	11	4.0	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	49	42	36	52	77
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	120	110	97	43	110

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	13	< 2.0	< 2.0	5.7	4.2
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	24	< 8.0	< 8.0	33	16
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	49	< 8.0	< 8.0	59	77
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	86	< 10	< 10	98	97

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	53	< 1.0	< 1.0	4.1	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	420	< 2.0	4.7	290	7.3
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	2200	12	35	2000	95
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	1500	33	82	2400	340
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	4200	45	120	4700	440

Miscellaneous Organics

Cyclohexane Extractable Matter	mg/kg	100	NONE	< 100	-	< 100	< 100	-
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*Over range data, sample was diluted and results are estimated from an extrapolated calibration. Results should be interpreted with care.

Analytical Report Number: 20-11907

Project / Site name: Pixmore Avenue Letchworth

Your Order No: 2703

Lab Sample Number				1522045				
Sample Reference				WS3				
Sample Number				ES				
Depth (m)				1.20				
Date Sampled				20/05/2020				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	11				
Total mass of sample received	kg	0.001	NONE	2.0				

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-				
Asbestos Quantification Total	%	0.001	ISO 17025	-				

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.5				
Total Cyanide	mg/kg	1	MCERTS	-				
Total Sulphate as SO ₄	mg/kg	50	MCERTS	660				
Total Sulphate as SO ₄	%	0.005	MCERTS	0.066				
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-				
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.099				
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-				
Sulphide	mg/kg	1	MCERTS	-				
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	-				
Elemental Sulphur	mg/kg	5	MCERTS	-				
Total Sulphur	mg/kg	50	MCERTS	290				
Total Sulphur	%	0.005	MCERTS	0.029				
Total Organic Carbon (TOC)	%	0.1	MCERTS	-				
Iodine, water soluble	mg/kg	10	NONE	-				
Bromide	mg/kg	0.5	NONE	-				

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-				
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-				
Acenaphthylene	mg/kg	0.05	MCERTS	-				
Acenaphthene	mg/kg	0.05	MCERTS	-				
Fluorene	mg/kg	0.05	MCERTS	-				
Phenanthrene	mg/kg	0.05	MCERTS	-				
Anthracene	mg/kg	0.05	MCERTS	-				
Fluoranthene	mg/kg	0.05	MCERTS	-				
Pyrene	mg/kg	0.05	MCERTS	-				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-				
Chrysene	mg/kg	0.05	MCERTS	-				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-				

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-				
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Analytical Report Number: 20-11907

Project / Site name: Pixmore Avenue Letchworth

Your Order No: 2703

Lab Sample Number				1522045				
Sample Reference				WS3				
Sample Number				ES				
Depth (m)				1.20				
Date Sampled				20/05/2020				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-				
Boron (water soluble)	mg/kg	0.2	MCERTS	-				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-				
Chromium (hexavalent)	mg/kg	4	MCERTS	-				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-				
Silver (aqua regia extractable)	mg/kg	1	NONE	-				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-				

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	-				
Toluene	µg/kg	1	MCERTS	-				
Ethylbenzene	µg/kg	1	MCERTS	-				
p & m-xylene	µg/kg	1	MCERTS	-				
o-xylene	µg/kg	1	MCERTS	-				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-				

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-				

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-				

Miscellaneous Organics

Cyclohexane Extractable Matter	mg/kg	100	NONE	-				
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*Over range data, sample was diluted and results are estimated from an extrapolated calibration. Results should be interpreted with care.



Analytical Report Number: 20-11907
Project / Site name: Pixmore Avenue Letchworth
Your Order No: 2703

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1522040	WS1	0.30	144	Loose Fibrous Debris	Chrysotile	< 0.001	< 0.001

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.



Analytical Report Number : 20-11907

Project / Site name: Pixmore Avene Letchworth

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1522040	WS1	ES	0.30	Brown gravelly loam with vegetation.
1522041	WS2	ES	0.20	Brown clay and loam with gravel and brick.
1522042	WS3	ES	0.70	Brown rubble. **
1522043	WS4	ES	0.30	Brown gravelly loam with vegetation.
1522044	WS5	ES	0.20	Brown gravelly loam with vegetation.
1522045	WS3	ES	1.20	Brown clay and loam with gravel.

**Non MCERTS Matrix

Analytical Report Number : 20-11907

Project / Site name: Pixmore Avenue Letchworth

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In house method.	L082-PL	D	MCERTS
Cyclohexane Extractable Matter in soil	Gravimetrically determined through extraction with cyclohexane.	In-house method	L013-UK	D	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS

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The results included within the report relate only to the sample(s) submitted for testing.

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Analytical Report Number : 20-11907

Project / Site name: Pixmore Avenue Letchworth

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Water Soluble Bromide in soil by IC	Determination of water soluble bromide in soils by ion chromatography.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Sample Deviation Report



Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
WS1	ES	S	20-11907	1522040	c	Sulphide in soil	L010-PL	c
WS1	ES	S	20-11907	1522040	c	Total cyanide in soil	L080-PL	c
WS2	ES	S	20-11907	1522041	c	Sulphide in soil	L010-PL	c
WS2	ES	S	20-11907	1522041	c	Total cyanide in soil	L080-PL	c
WS3	ES	S	20-11907	1522042	c	Sulphide in soil	L010-PL	c
WS3	ES	S	20-11907	1522042	c	Total cyanide in soil	L080-PL	c
WS4	ES	S	20-11907	1522043	c	Sulphide in soil	L010-PL	c
WS4	ES	S	20-11907	1522043	c	Total cyanide in soil	L080-PL	c
WS5	ES	S	20-11907	1522044	c	Sulphide in soil	L010-PL	c
WS5	ES	S	20-11907	1522044	c	Total cyanide in soil	L080-PL	c

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Analytical Report Number : 20-11915

Project / Site name:	Pixmore Avenue Letchworth	Samples received on:	29/05/2020
Your job number:	GE18750	Sample instructed/ Analysis started on:	29/05/2020
Your order number:	2703	Analysis completed by:	05/06/2020
Report Issue Number:	1	Report issued on:	05/06/2020
Samples Analysed:	2 10:1 WAC samples		

Signed:

Joanna Wawrzeczko

Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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Waste Acceptance Criteria Analytical Results

Report No:	20-11915					
				Client: GESL		
Location	Pixmore Avenue Letchworth					
Lab Reference (Sample Number)	1522089 / 1522090			Landfill Waste Acceptance Criteria		
				Limits		
Sampling Date	20/05/2020			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WS3 ES					
Depth (m)	0.70					
Solid Waste Analysis						
TOC (%)**	0.7			3%	5%	6%
Loss on Ignition (%) **	2.8			--	--	10%
BTEX (µg/kg) **	< 10			6000	--	--
Sum of PCBs (mg/kg) **	< 0.007			1	--	--
Mineral Oil (mg/kg)	< 10			500	--	--
Total PAH (WAC-17) (mg/kg)	31			100	--	--
pH (units)**	8.3			--	>6	--
Acid Neutralisation Capacity (mol / kg)	9.0			--	To be evaluated	To be evaluated
Eluate Analysis	10:1		10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l		mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0138		0.123	0.5	2	25
Barium *	0.0166		0.148	20	100	300
Cadmium *	< 0.0001		< 0.0008	0.04	1	5
Chromium *	0.0059		0.053	0.5	10	70
Copper *	0.011		0.10	2	50	100
Mercury *	< 0.0005		< 0.0050	0.01	0.2	2
Molybdenum *	0.0071		0.0633	0.5	10	30
Nickel *	0.0007		0.0065	0.4	10	40
Lead *	0.0023		0.021	0.5	10	50
Antimony *	< 0.0017		< 0.017	0.06	0.7	5
Selenium *	< 0.0040		< 0.040	0.1	0.5	7
Zinc *	0.0074		0.066	4	50	200
Chloride *	2.3		20	800	15000	25000
Fluoride	3.0		27	10	150	500
Sulphate *	39		350	1000	20000	50000
TDS*	96		860	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010		< 0.10	1	-	-
DOC	7.11		63.4	500	800	1000
Leach Test Information						
Stone Content (%)	< 0.1					
Sample Mass (kg)	2.0					
Dry Matter (%)	92					
Moisture (%)	8.5					
Results are expressed on a dry weight basis, after correction for moisture content where applicable.				* = UKAS accredited (liquid eluate analysis only)		
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation				** = MCERTS accredited		

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.



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Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.

This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.



Analytical Report Number : 20-11915

Project / Site name: Pixmore Avenue Letchworth

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1522089	WS3	ES	0.70	Brown rubble. **
1522091	Stockpile	ES	0.70	Brown gravelly loam with vegetation.

**Non MCERTS Matrix

Analytical Report Number : 20-11915

Project / Site name: Pixmore Avenue Letchworth

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance on Sampling and Testing of Wastes to Meet Landfill Waste Acceptance"	L046-PL	W	NONE
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025

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Analytical Report Number : 20-11915

Project / Site name: Pixmore Avenue Letchworth

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Report generated 29/06/2020

Report title Pixmore Avenue, Letchworth



Created by SA at Geo-Environmental

BASIC SETTINGS

Land Use Residential without produce (C4SL)

Building Small terraced house

Receptor Female (res C4SL)

Start age class 16

End age class 18

Exposure Duration 60 years

Soil Sand

Exposure Pathways

Direct soil and dust ingestion



Consumption of homegrown produce



Soil attached to homegrown produce



Dermal contact with indoor dust



Dermal contact with soil



Inhalation of indoor dust



Inhalation of soil dust



Inhalation of indoor vapour



Inhalation of outdoor vapour





Land Use Residential without produce (C4SL)

Receptor Female (res C4SL)

Age Class	Exposure Frequencies (days yr ⁻¹)						Occupation Periods (hr day ⁻¹)		Soil to skin adherence factors (mg cm ²)		Direct soil ingestion rate (g day ⁻¹)	Body weight (kg)	Body height (m)	Inhalation rate (m ³ day ⁻¹)	Max exposed skin factor		Total skin area (m ²)
	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Indoors	Outdoors	Indoor	Outdoor							
									Indoor	Outdoor							
1	180	0	180	170	365	365	23.0	1.0	0.06	0.10	0.10	5.60	0.7	5.4	0.32	0.26	3.43E-01
2	365	0	365	170	365	365	23.0	1.0	0.06	0.10	0.10	9.80	0.8	8.0	0.33	0.26	4.84E-01
3	365	0	365	170	365	365	23.0	1.0	0.06	0.10	0.10	12.70	0.9	8.9	0.32	0.25	5.82E-01
4	365	0	365	170	365	365	23.0	1.0	0.06	0.10	0.10	15.10	0.9	10.1	0.35	0.28	6.36E-01
5	365	0	365	170	365	365	19.0	1.0	0.06	0.10	0.10	16.90	1.0	10.1	0.35	0.28	7.04E-01
6	365	0	365	170	365	365	19.0	1.0	0.06	0.10	0.10	19.70	1.1	10.1	0.33	0.26	7.94E-01
7	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	22.10	1.2	12.0	0.22	0.15	8.73E-01
8	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	25.30	1.2	12.0	0.22	0.15	9.36E-01
9	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	27.50	1.3	12.0	0.22	0.15	1.01E+00
10	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	31.40	1.3	12.0	0.22	0.15	1.08E+00
11	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	35.70	1.4	12.0	0.22	0.14	1.19E+00
12	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	41.30	1.4	15.2	0.22	0.14	1.29E+00
13	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	47.20	1.5	15.2	0.22	0.14	1.42E+00
14	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	51.20	1.6	15.2	0.22	0.14	1.52E+00
15	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	56.70	1.6	15.2	0.21	0.14	1.60E+00
16	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	59.00	1.6	15.2	0.21	0.14	1.63E+00
17	365	0	365	170	365	365	23.0	1.0	0.06	0.10	0.10	70.00	1.6	15.7	0.33	0.27	1.78E+00
18	365	0	365	170	365	365	23.0	1.0	0.06	0.10	0.10	70.90	1.6	13.6	0.33	0.27	1.80E+00



Consumption Rates

Age Class	Consumption rates (α FW kg^{-1} bodyweight day^{-1}) by Produce Group											
	MEAN RATES						90TH PERCENTILE RATES					
	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit
1	3.47E+00	5.22E+00	9.22E+00	8.90E-01	1.07E+00	1.87E+00	7.12E+00	1.07E+01	1.60E+01	1.83E+00	2.23E+00	3.82E+00
2	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
3	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
4	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
5	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
6	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
7	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
8	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
9	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
10	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
11	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
12	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
13	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
14	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
15	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
16	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
17	1.26E+00	6.00E-01	1.18E+00	6.90E-01	9.00E-02	1.27E+00	2.36E+00	1.12E+00	2.35E+00	1.29E+00	1.80E-01	2.38E+00
18	1.35E+00	6.40E-01	1.25E+00	7.40E-01	1.00E-01	1.36E+00	2.34E+00	1.12E+00	2.36E+00	1.28E+00	1.80E-01	2.37E+00

Top 2 applied? Yes

Where top 2 method is applied, two produce categories use 90th percentile rates, while the remainder use the mean. Produce categories vary on a chemical-by-chemical basis. Where top 2 method is not used, all produce categories for all chemicals assume 90th percentile rates.

Building Small terraced house**Soil** Sand

Building footprint (m ²)	2.80E+01
Living space air exchange rate (hr ⁻¹)	5.00E-01
Living space height (above ground, m)	4.80E+00
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	3.10E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm ²)	4.23E+02
Dust loading factor (µg m ⁻³)	5.00E+01

Porosity, Total (cm ³ cm ⁻³)	5.40E-01
Porosity, Air-Filled (cm ³ cm ⁻³)	3.00E-01
Porosity, Water-Filled (cm ³ cm ⁻³)	2.40E-01
Residual soil water content (cm ³ cm ⁻³)	7.00E-02
Saturated hydraulic conductivity (cm s ⁻¹)	7.36E-03
van Genuchten shape parameter <i>m</i> (dimensionless)	3.51E-01
Bulk density (g cm ⁻³)	1.18E+00
Threshold value of wind speed at 10m (m s ⁻¹)	7.20E+00
Empirical function (F _w) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	9.10E+00
Soil Organic Matter content (%)	4.30E+00
Fraction of organic carbon (g g ⁻¹)	2.49E-02
Effective total fluid saturation (unitless)	3.62E-01
Intrinsic soil permeability (cm ²)	9.83E-08
Relative soil air permeability (unitless)	7.68E-01
Effective air permeability (cm ²)	7.54E-08

Soil - Vapour Model

Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	Yes
Soil gas ingress rate ($\text{cm}^3 \text{s}^{-1}$)	2.50E+01
Building ventilation rate ($\text{cm}^3 \text{s}^{-1}$)	1.87E+04
Averaging time surface emissions (yr)	60
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model

Mean annual windspeed at 10m (m s^{-1})	5.00
Air dispersion factor at height of 0.8m *	2400.00
Air dispersion factor at height of 1.6m *	0.00
Fraction of site cover ($\text{m}^2 \text{m}^{-2}$)	0.75

* Air dispersion factor in $\text{g m}^{-2} \text{s}^{-1}$ per kg m^{-3} **Soil - Plant Model**

	Dry weight conversion factor	Homegrown fraction		Soil loading factor	Preparation correction factor
	g DW g^{-1} FW	Average	High		
		dimensionless		g g^{-1} DW	dimensionless
Green vegetables	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	0.103	0.06	0.40	1.00E-03	1.00E+00
Tuber vegetables	0.210	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	0.058	0.06	0.40	1.00E-03	6.00E-01
Shrub fruit	0.166	0.09	0.60	1.00E-03	6.00E-01
Tree fruit	0.157	0.04	0.27	1.00E-03	6.00E-01

Gardener type None

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RESULTS

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[illegible]

[illegible]

[illegible]

		Oral Health Criteria Value ($\mu\text{g kg}^{-1} \text{ BW day}^{-1}$)		Inhalation Health Criteria Value ($\mu\text{g kg}^{-1} \text{ BW day}^{-1}$)		Oral Mean Daily Intake ($\mu\text{g day}^{-1}$)	Inhalation Mean Daily Intake ($\mu\text{g day}^{-1}$)	Air-water partition coefficient (K_{aw}) ($\text{cm}^3 \text{ cm}^{-3}$)	Coefficient of Diffusion in Air ($\text{m}^2 \text{ s}^{-1}$)	Coefficient of Diffusion in Water ($\text{m}^2 \text{ s}^{-1}$)	$\log K_{oc}$ ($\text{cm}^3 \text{ g}^{-1}$)	$\log K_{ow}$ (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor ($\text{g g}^{-1} \text{ DW}$)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
21																	
22																	
23																	
24																	
25																	
26																	
27																	
28																	
29																	
30																	



[illegible]

[illegible]



Client/client ref	Ashe Construction
Project ref	GE18750
Site ref	Pixmore Avenue, Letchworth
Data description	Made Ground population
Contaminant(s)	Naphthalene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenzo(ah)anthracene, Beryllium
Test scenario	Planning: is true mean lower than critical concentration ($\mu < C_c$)? ▼
Date	29 June 2020
User details	SA

Statistics Calculator (Version 2)

Input data

This spreadsheet has been produced based on the document 'Guidance on Comparing Soil Contamination Data with a Critical Concentration (CIEH/CL:AIRE, 2008)'. Users of this spreadsheet should always refer to this guidance, the User Manual and to relevant guidance on UK legislation and policy, in order to understand how the procedure should be applied in an appropriate context.

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Go to summary

Project details

Select all filters

Deselect all filters

Easting	Northing	Depth (m)	User-defined 1	User-defined 2	User-defined 3	Sample ID	Naphthalene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(a)pyrene	Dibenzo(ah)anthracene	Beryllium	
							☐ Filter	☐ Filter	☐ Filter	☐ Filter	☐ Filter	☐ Filter	☐ Filter	☐ Filter
		0.30				WS1	27	350	300	350	280	40	2.9	
		0.20				WS2	0.05	0.66	0.53	0.48	0.68	0.05	1.1	
		0.70				WS3	0.05	3.5	2.9	4	3.7	0.52	1.1	
		0.30				WS4	1.7	210	190	220	200	25	7.6	
		0.20				WS5	0.05	8.3	6.5	13	14	2.4	2.6	

Client/client ref: Ashe Construction
 Project ref: GE18750
 Site ref: Pixmore Avenue, Letchworth
 Data description: Made Ground population
 Contaminant(s): Naphthalene,
 Benzo(a)anthracene, Chrysene,
 Benzo(b)fluoranthene, Benzo(a)pyrene,
 Dibenzo(ah)anthracene, Beryllium

	Naphthalene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(a)pyrene	Dibenzo(ah)anthracene	Beryllium		
Critical concentration, C_c	15.3	94.2	51.6	23.7	25.4	1.88	6.79		
Notes									
Full dataset size	5	5	5	5	5	5	5	0	0
Outliers present?	Yes	No	No	No	No	No	Yes		
Number of outliers temporarily excluded	0								
Number removed by filter	0	0	0	0	0	0	0	0	0
Sample size, n	5	5	5	5	5	5	5	0	0
Sample mean, $\bar{x}$	5.77	114.492	99.986	117.496	99.676	13.594	3.06	No Data	No Data
Standard deviation, s	11.8894176	159.012173	137.989981	159.733121	131.276071	18.0765644	2.67076768		
Number of non-detects	0	0	0	0	0	0	0	0	0
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Distribution	Non-normal	Normal	Normal	Normal	Normal	Normal	Normal		
Statistical approach	Auto: Chebychev	Auto: One-sample t-	Auto: One-sample t-	Auto: One-sample t-	Auto: One-sample t-	Auto: One-sample t-	Auto: One-sample t-	Auto	Auto

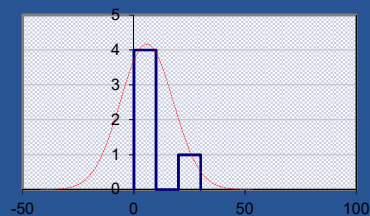
Test scenario:	Planning: is true mean lower than critical concentration ($\mu < C_c$)?					Evidence level required:	95%	Use Normal distribution to test for outlier	
t statistic, t_0 (or k_0)	-1.792327312	0.285351055	0.784074206	1.313029071	1.265167243	1.449019832	-3.122897442		
Upper confidence limit (on true mean concentration, μ)	28.9467416	266.092754	231.544388	269.784099	224.833407	30.8280314	5.60628551		
Evidence level	76%	39%	24%	13%	14%	11%	98%		
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level		
Result	$\mu \geq C_c$	$\mu \geq C_c$	$\mu \geq C_c$	$\mu \geq C_c$	$\mu \geq C_c$	$\mu \geq C_c$	$\mu < C_c$		
Select dataset	☒ Y	☐ Y	☐ Y	☐ Y	☐ Y	☐ Y	☐ Y	☐ Y	☐ Y

Back to data

Go to outlier test

Go to normality test

Show individual summary

[illegible]

Sample mean,

5.770

Standard deviation, s

11.889

Sample size, n

5

Maximum

27.000

Outlier Test Applicability

Not Applicable

Level of Significance,

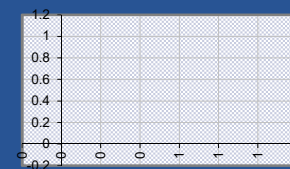
5%

$$T_n = 1.786$$
$$T_{crit} = 1.671$$

Outliers?

Yes

(None selected)



Dataset Naphthalene

Use Normal

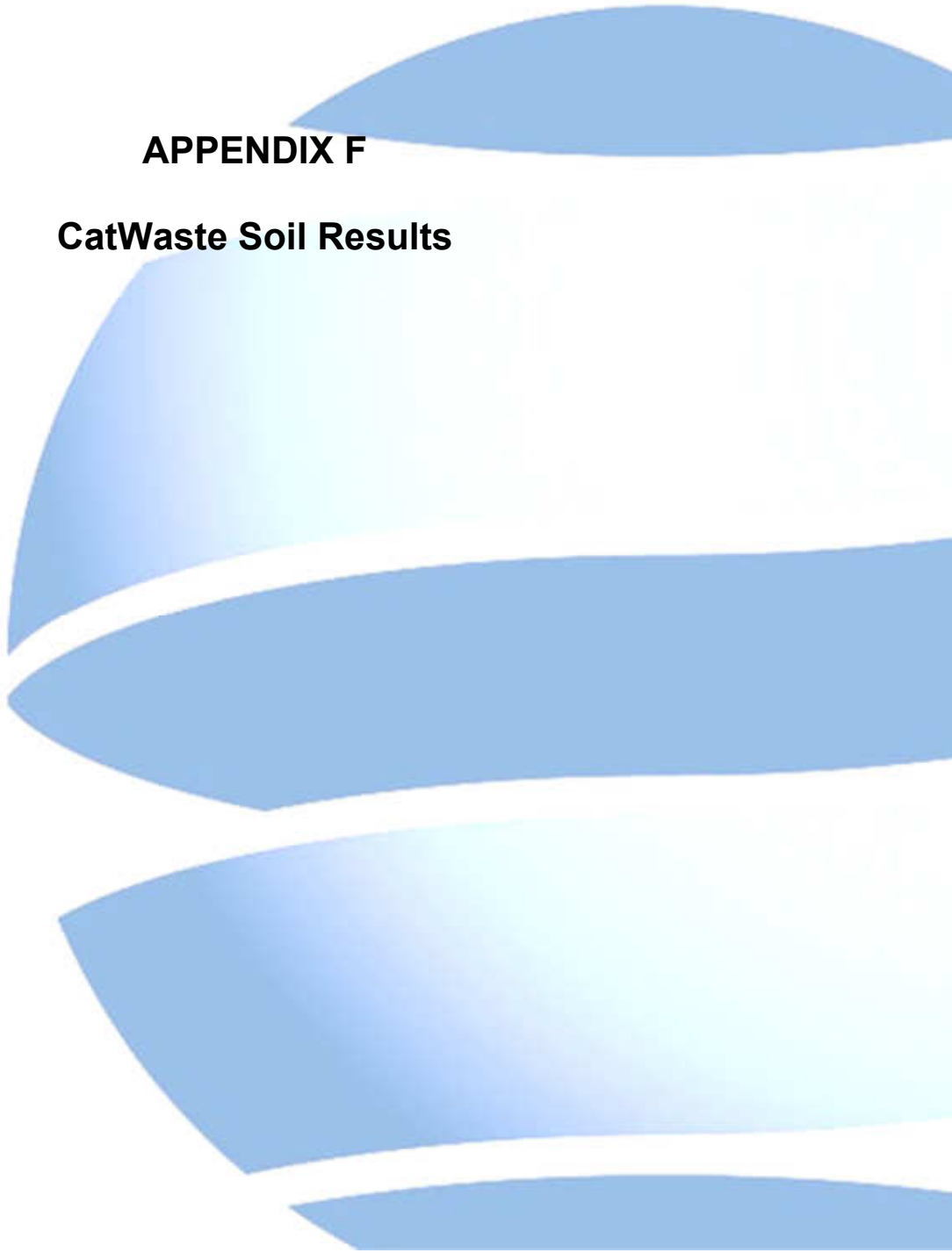
distribution to test for outliers

Exclude identified outliers

Show individual summary

Back to summary

Back to data



APPENDIX F

CatWaste Soil Results

Site Name	Pixmore Avenue, Letchworth
Location	Letchworth
Site ID	GE18750
Job Number	GE18750
Date	6/18/2020
User Name	laura.legate@gesl.net
Company Name	Geo-Environmental Services Limited

Hole ID	Sample Depth	Hazardous Waste Y/N	HP1	HP2	HP3	HP4	HP5	HP6	HP7	HP8	HP9	HP10	HP11	HP12	HP13	HP14	HP15	HP16
WS1	0.3	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS2	0.2	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS3	0.7	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS4	0.3	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS5	0.2	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

Site Name	Pixmore Avenue, Letchworth
Location	Letchworth
Site ID	GE18750
Job Number	GE18750
Date	6/18/2020
User Name	laura.legate@gesl.net
Company Name	Geo-Environmental Services Limited

Hole ID	Sample Depth	Contaminant	Contaminant Concentration (%)	Hazardous Waste Y/N	Hazard Property	Individual Hazard Statements Exceeded	Cumulative Hazard Statements Exceeded	Additional Hazard Statements (see notes section)
WS1	0.3	pH	0.00000	N				
WS1	0.3	Naphthalene	0.00270	N				H228 test
WS1	0.3	Acenaphthylene	0.00730	N				
WS1	0.3	Acenaphthene	0.00660	N				
WS1	0.3	Fluorene	0.01000	N				
WS1	0.3	Anthracene	0.02600	N				
WS1	0.3	Benzo(a)anthracene	0.03500	N				
WS1	0.3	Chrysene	0.03000	N				
WS1	0.3	Benzo(b)fluoranthene	0.03500	N				
WS1	0.3	Benzo(k)fluoranthene	0.00950	N				
WS1	0.3	Benzo(a)pyrene	0.02800	N				
WS1	0.3	Indeno(1,2,3-cd)pyrene	0.01400	N				
WS1	0.3	Di-benz(a,h)anthracene	0.00400	N				
WS1	0.3	Benzo(g,h,i)perylene	0.01400	N				
WS1	0.3	Arsenic	0.00245	N				
WS1	0.3	Boron	0.00509	N				
WS1	0.3	Cadmium	0.00028	N				
WS1	0.3	Chromium (Total)	0.00438	N				
WS1	0.3	Copper	0.01407	N				
WS1	0.3	Lead	0.01100	N				
WS1	0.3	Mercury	0.00057	N				
WS1	0.3	Nickel	0.00580	N				
WS1	0.3	Zinc	0.00000	N				
WS1	0.3	Zincx	0.02963	N				
WS1	0.3	Vanadium	0.00875	N				
WS2	0.2	pH	0.00000	N				
WS2	0.2	Phenanthrene	0.00008	N				
WS2	0.2	Anthracene	0.00002	N				
WS2	0.2	Fluoranthene	0.00012	N				
WS2	0.2	Pyrene	0.00011	N				
WS2	0.2	Benzo(a)anthracene	0.00007	N				
WS2	0.2	Chrysene	0.00005	N				
WS2	0.2	Benzo(b)fluoranthene	0.00005	N				
WS2	0.2	Benzo(k)fluoranthene	0.00006	N				
WS2	0.2	Benzo(a)pyrene	0.00007	N				
WS2	0.2	Indeno(1,2,3-cd)pyrene	0.00003	N				
WS2	0.2	Benzo(g,h,i)perylene	0.00004	N				
WS2	0.2	Arsenic	0.00144	N				
WS2	0.2	Boron	0.00370	N				
WS2	0.2	Chromium (Total)	0.00438	N				
WS2	0.2	Copper	0.06782	N				
WS2	0.2	Lead	0.00460	N				
WS2	0.2	Nickel	0.00606	N				
WS2	0.2	Zinc	0.00000	N				
WS2	0.2	Zincx	0.02716	N				
WS2	0.2	Vanadium	0.00750	N				
WS3	0.7	pH	0.00000	N				

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Job Number	GE18750
Date	6/18/2020
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Company Name	Geo-Environmental Services Limited

Hole ID	Sample Depth	Contaminant	Contaminant Concentration (%)	Hazardous Waste Y/N	Hazard Property	Individual Hazard Statements Exceeded	Cumulative Hazard Statements Exceeded	Additional Hazard Statements (see notes section)
WS3	0.7	Acenaphthene	0.00004	N				
WS3	0.7	Fluorene	0.00004	N				
WS3	0.7	Phenanthrene	0.00042	N				
WS3	0.7	Anthracene	0.00011	N				
WS3	0.7	Fluoranthene	0.00067	N				
WS3	0.7	Pyrene	0.00062	N				
WS3	0.7	Benzo(a)anthracene	0.00035	N				
WS3	0.7	Chrysene	0.00029	N				
WS3	0.7	Benzo(b)fluoranthene	0.00040	N				
WS3	0.7	Benzo(k)fluoranthene	0.00017	N				
WS3	0.7	Benzo(a)pyrene	0.00037	N				
WS3	0.7	Indeno(1,2,3-cd)pyrene	0.00020	N				
WS3	0.7	Di-benz(a,h)anthracene	0.00005	N				
WS3	0.7	Benzo(g,h,i)perylene	0.00021	N				
WS3	0.7	Arsenic	0.00245	N				
WS3	0.7	Boron	0.00324	N				
WS3	0.7	Chromium (Total)	0.00336	N				
WS3	0.7	Copper	0.00929	N				
WS3	0.7	Lead	0.00410	N				
WS3	0.7	Mercury	0.00031	N				
WS3	0.7	Nickel	0.00527	N				
WS3	0.7	Zinc	0.00000	N				
WS3	0.7	Zincx	0.02395	N				
WS3	0.7	Vanadium	0.00643	N				
WS4	0.3	pH	0.00000	N				
WS4	0.3	Naphthalene	0.00017	N				H228 test
WS4	0.3	Acenaphthylene	0.00026	N				
WS4	0.3	Acenaphthene	0.00380	N				
WS4	0.3	Fluorene	0.00370	N				
WS4	0.3	Anthracene	0.01100	N				
WS4	0.3	Benzo(a)anthracene	0.02100	N				
WS4	0.3	Chrysene	0.01900	N				
WS4	0.3	Benzo(b)fluoranthene	0.02200	N				
WS4	0.3	Benzo(k)fluoranthene	0.00830	N				
WS4	0.3	Benzo(a)pyrene	0.02000	N				
WS4	0.3	Indeno(1,2,3-cd)pyrene	0.00860	N				
WS4	0.3	Di-benz(a,h)anthracene	0.00250	N				
WS4	0.3	Benzo(g,h,i)perylene	0.00890	N				
WS4	0.3	Arsenic	0.00245	N				
WS4	0.3	Boron	0.01227	N				
WS4	0.3	Chromium (Total)	0.00409	N				
WS4	0.3	Copper	0.00804	N				
WS4	0.3	Lead	0.00200	N				
WS4	0.3	Nickel	0.00633	N				
WS4	0.3	Zinc	0.00000	N				
WS4	0.3	Zincx	0.01062	N				
WS4	0.3	Vanadium	0.00928	N				

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Hole ID	Sample Depth	Contaminant	Contaminant Concentration (%)	Hazardous Waste Y/N	Hazard Property	Individual Hazard Statements Exceeded	Cumulative Hazard Statements Exceeded	Additional Hazard Statements (see notes section)
WS5	0.2	pH	0.00000	N				
WS5	0.2	Acenaphthylene	0.00004	N				
WS5	0.2	Acenaphthene	0.00005	N				
WS5	0.2	Fluorene	0.00005	N				
WS5	0.2	Phenanthrene	0.00044	N				
WS5	0.2	Anthracene	0.00016	N				
WS5	0.2	Fluoranthene	0.00130	N				
WS5	0.2	Pyrene	0.00140	N				
WS5	0.2	Benzo(a)anthracene	0.00083	N				
WS5	0.2	Chrysene	0.00065	N				
WS5	0.2	Benzo(b)fluoranthene	0.00130	N				
WS5	0.2	Benzo(k)fluoranthene	0.00095	N				
WS5	0.2	Benzo(a)pyrene	0.00140	N				
WS5	0.2	Indeno(1,2,3-cd)pyrene	0.00087	N				
WS5	0.2	Di-benz(a,h)anthracene	0.00024	N				
WS5	0.2	Benzo(g,h,i)perylene	0.00091	N				
WS5	0.2	Arsenic	0.00276	N				
WS5	0.2	Boron	0.00301	N				
WS5	0.2	Chromium (Total)	0.00687	N				
WS5	0.2	Copper	0.05526	N				
WS5	0.2	Lead	0.00000	N				
WS5	0.2	Leadx	0.01600	N				
WS5	0.2	Nickel	0.01608	N				
WS5	0.2	Zinc	0.00000	N				
WS5	0.2	Zincx	0.02716	N				
WS5	0.2	Vanadium	0.01375	N				

Notes - Additional Information on Hazard Properties

Hazardous Property	Description	Hazard Statement	Note
HP1	Explosive	H200, H201, H202, H203, H204, H240 and H241	A waste is assessed for HP1 via test methods, rather than a concentration limit. If you have substances or a mixture containing explosive properties the waste should be tested in accordance with the European Chemical Agency's guidance on the application of the CLP Criteria.
HP2	Oxidising	H270, H271, H272	A waste is assessed for HP2 via test methods, rather than a concentration limit. If you have substances or a mixture containing oxidising properties the waste should be tested in accordance with the European Chemical Agency's guidance on the application of the CLP Criteria.
HP3	Flammable	H220 to H226, H228, H242, H250, H251m H252, H260, H261	A waste is assessed for HP3 via test methods, rather than a concentration limit. If you have substances or a mixture containing flammable properties the waste should be tested in accordance with the European Chemical Agency's guidance on the application of the CLP Criteria. If a waste contains either H220, H221, H260 or H261 a calculation can be performed to identify the minimum amount of that substance that will trigger HP3.
HP5	Specific Target Organ Toxicity (STOT)	H304	Should a waste contain two or more compounds displaying H304 (Asp. Tox 1) and equal or exceed its specific concentration limit of 10%, then a waste will be hazardous by HP5 if its kinematic viscosity exceeds 20.5 mm ² /s. Guidance should be sought from the CLP Criteria.
HP9	Infectious	N/A	A waste is assessed for HP9 via further testing, rather than a concentration limit. In cases where there is the potential for toxins to be present, further testing will be required. For healthcare waste reference should be made to the Department of health guidance: Safe management of healthcare waste.
HP12	Release of acute toxic gas	EUH029, EUH031, EUH032, H260 or H261	A waste is assessed for HP12 via test methods, rather than a concentration limit. If you have substances or a mixture that may release acute toxic gas the waste should be tested in accordance with the European Chemical Agency's guidance on the application of the CLP Criteria.
HP15	Explosive or explosive properties	H205, EUH001, EUH019 or EUH044	A waste is assessed for HP15 via test methods, rather than a concentration limit. If you have substances or a mixture that may exhibit explosive or explosive properties the waste should be tested in accordance with the European Chemical Agency's guidance on the application of the CLP Criteria.
HP16	Persistent organic pollutants	N/A	A waste is considered hazardous if the concentration of one or more compound (persistent organic pollutant) as listed in Appendix C of Environment Agency guidance WM3 is above its assigned concentration limit. For reference for dioxins and furans, this assessment incorporates the use of specific toxicity equivalent factors.