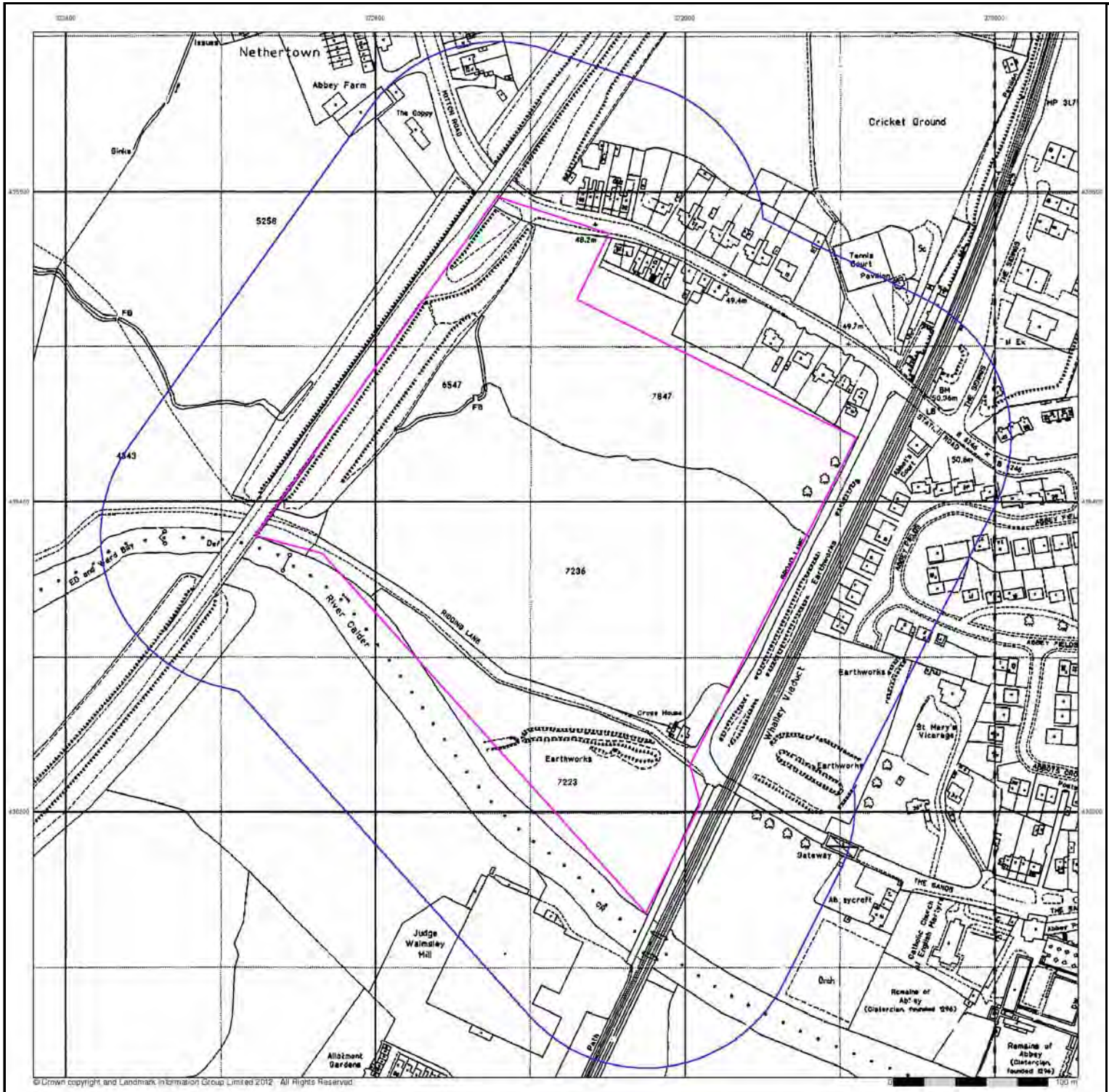


RSK

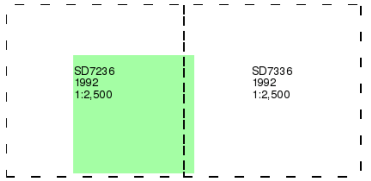
Large-Scale National Grid Data

Published 1992

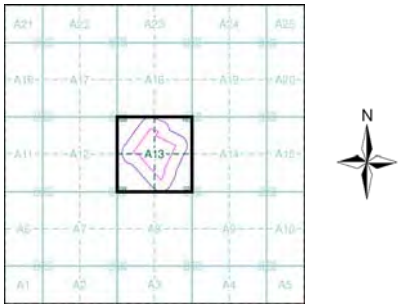
Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

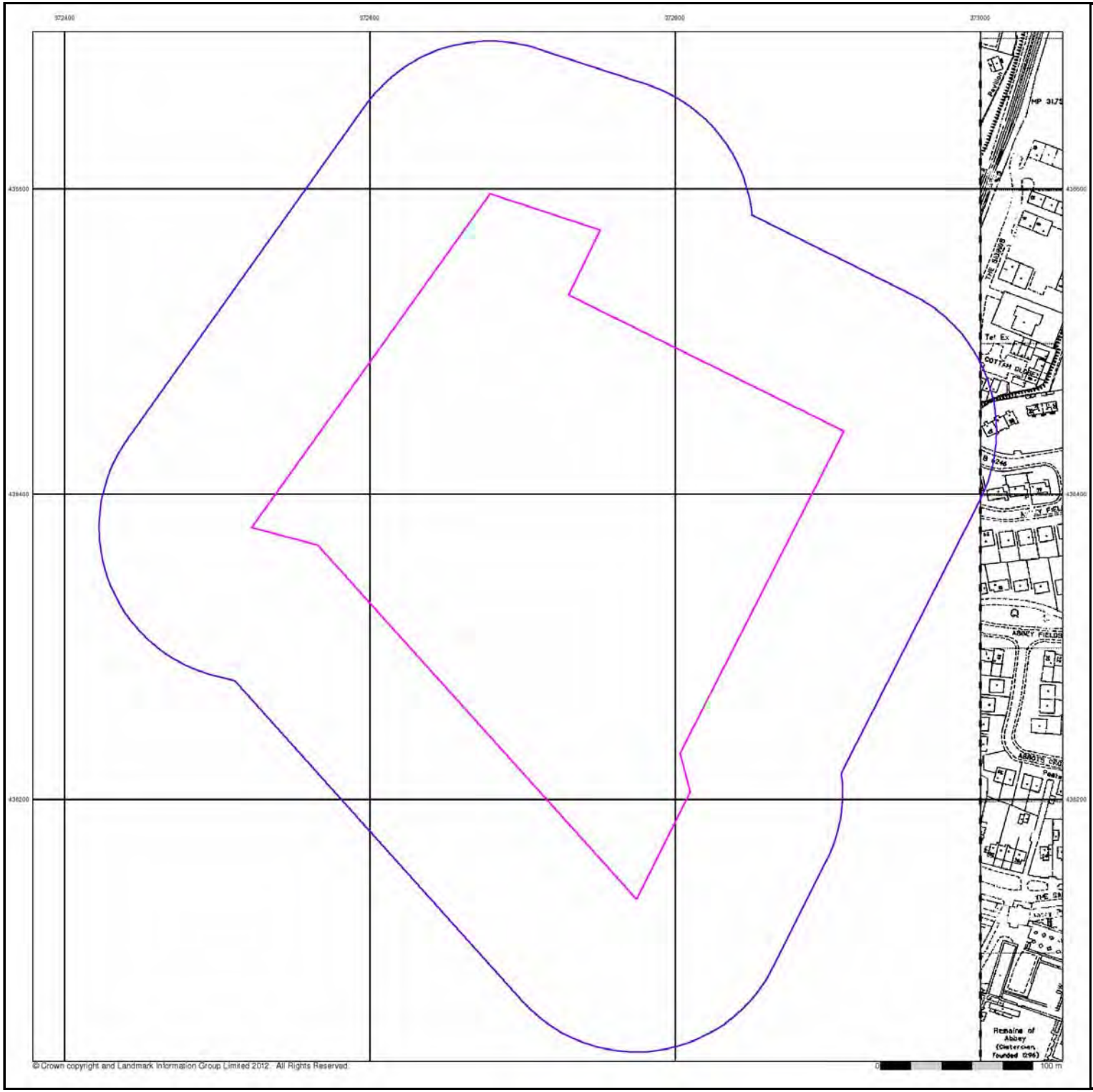
Order Number:	37954280_1_1
Customer Ref:	17134
National Grid Reference:	372730, 436370
Slice:	A
Site Area (Ha):	8.56
Search Buffer (m):	100

Site Details

Site at 372750, 436420

Landmark Information Group

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



RSK

Large-Scale National Grid Data

Published 1994

Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

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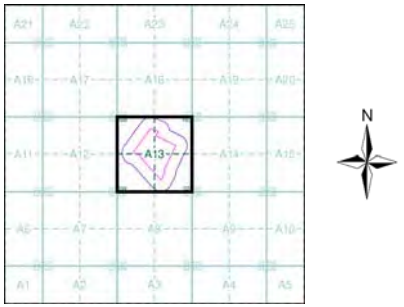

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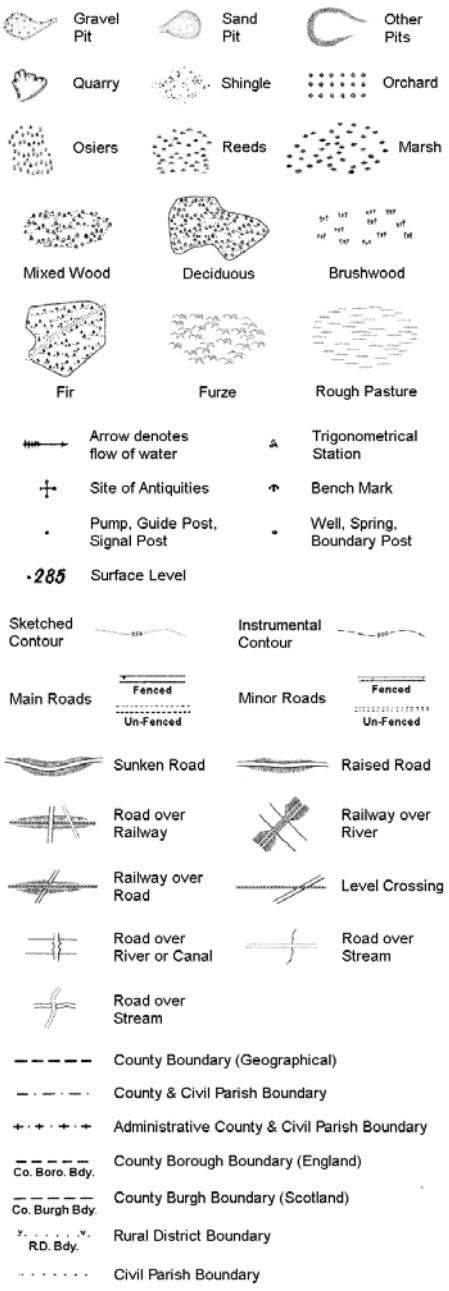
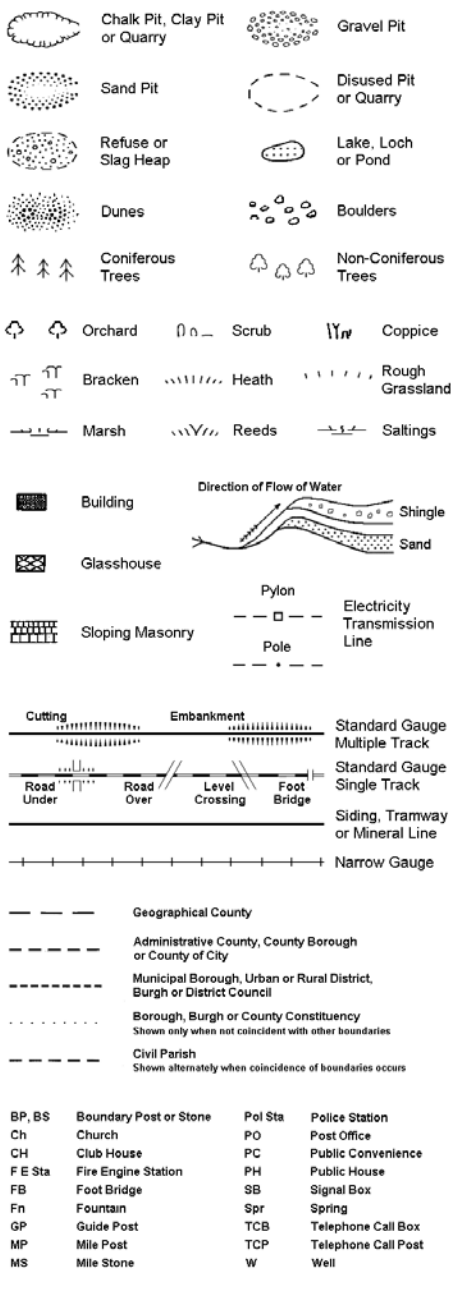
Historical Mapping Legends

Ordnance Survey County Series 1:10,560

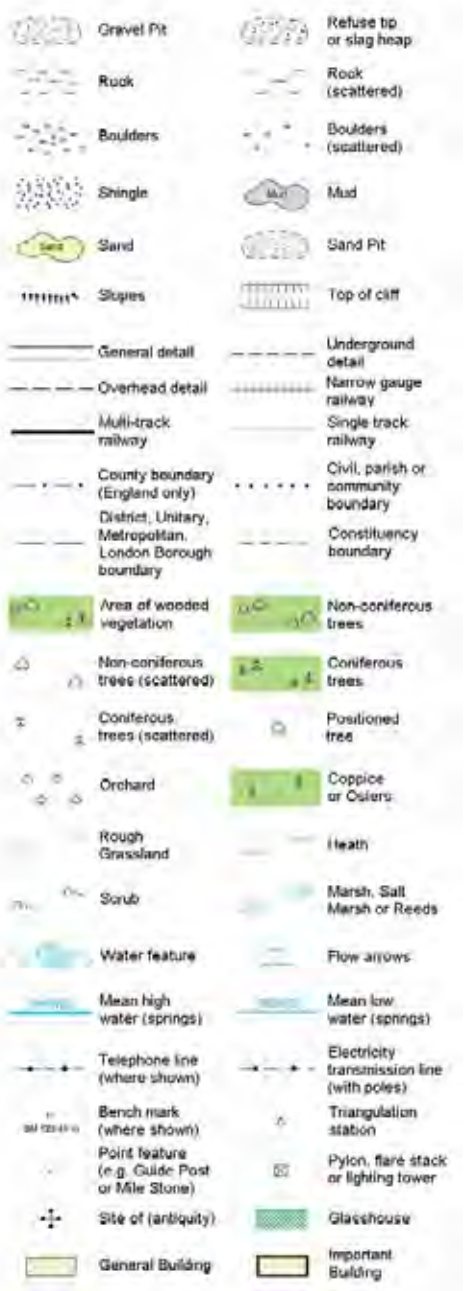


Ordnance Survey Plan 1:10,000



BP, BS	Boundary Post or Stone	Pol Sta	Police Station
Ch	Church	PO	Post Office
CH	Club House	PC	Public Convenience
F E Sta	Fire Engine Station	PH	Public House
FB	Foot Bridge	SB	Signal Box
Fn	Fountain	Spr	Spring
GP	Guide Post	TCB	Telephone Call Box
MP	Mile Post	TCP	Telephone Call Post
MS	Mile Stone	W	Well

1:10,000 Raster Mapping

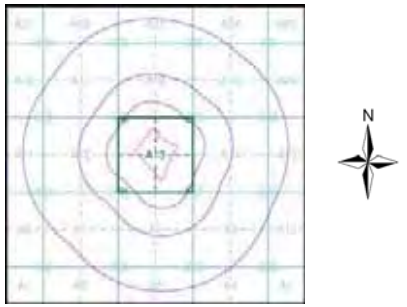


RSK

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:10,560	1848	2
Yorkshire	1:10,560	1848	3
Lancashire And Furness	1:10,560	1895	4
Yorkshire	1:10,560	1896	5
Yorkshire	1:10,560	1911	6
Lancashire And Furness	1:10,560	1913 - 1914	7
Lancashire And Furness	1:10,560	1932 - 1933	8
Ordnance Survey Plan	1:10,000	1955	9
Ordnance Survey Plan	1:10,000	1970	10
Ordnance Survey Plan	1:10,000	1975	11
10K Raster Mapping	1:10,000	2001	12
10K Raster Mapping	1:10,000	2006	13
10K Raster Mapping	1:10,000	2011	14

Historical Map - Slice A



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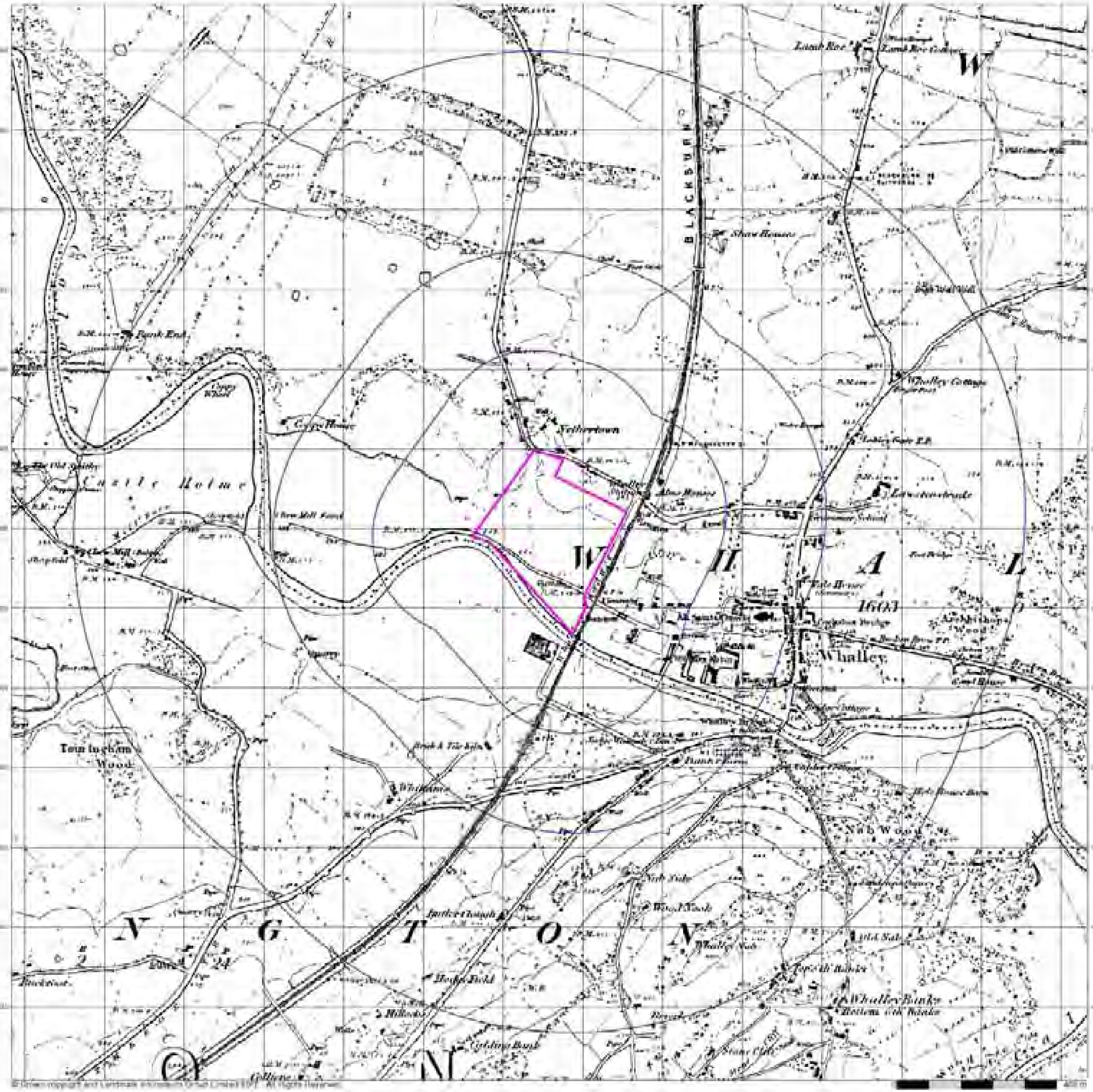


Lancashire And Furness

Published 1848

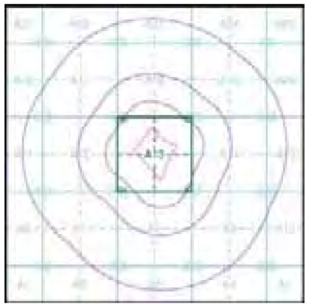
Source map scale - 1:10,560

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)

05500
1848
1:10,560

Historical Map - Slice A



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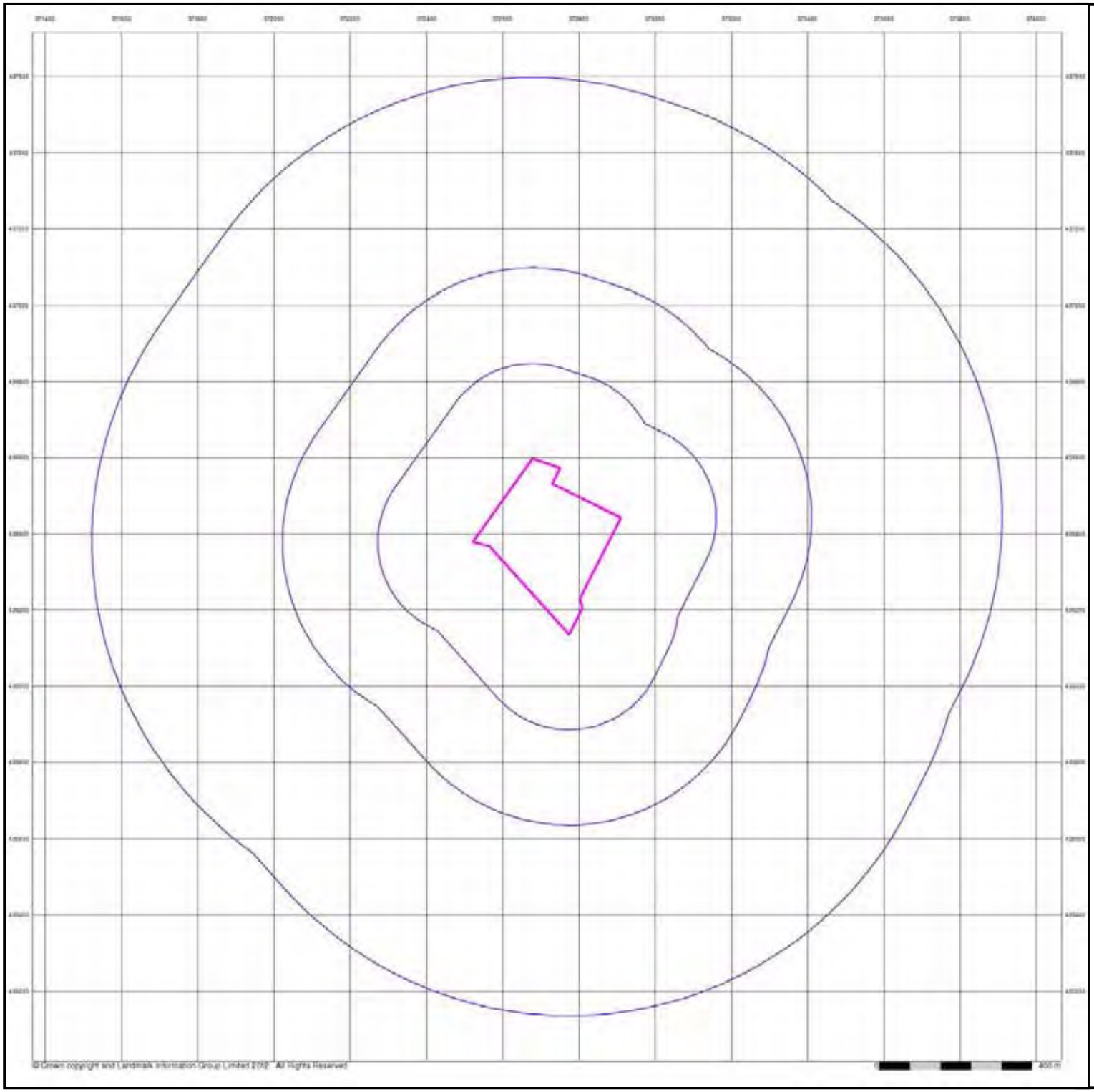

RSK

Yorkshire

Published 1848

Source map scale - 1:10,560

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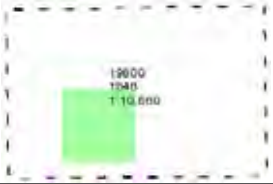
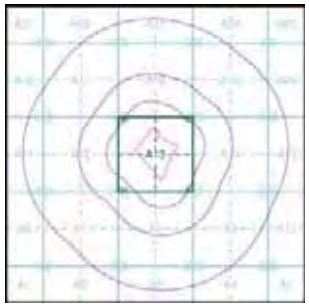


Historical Map - Slice A



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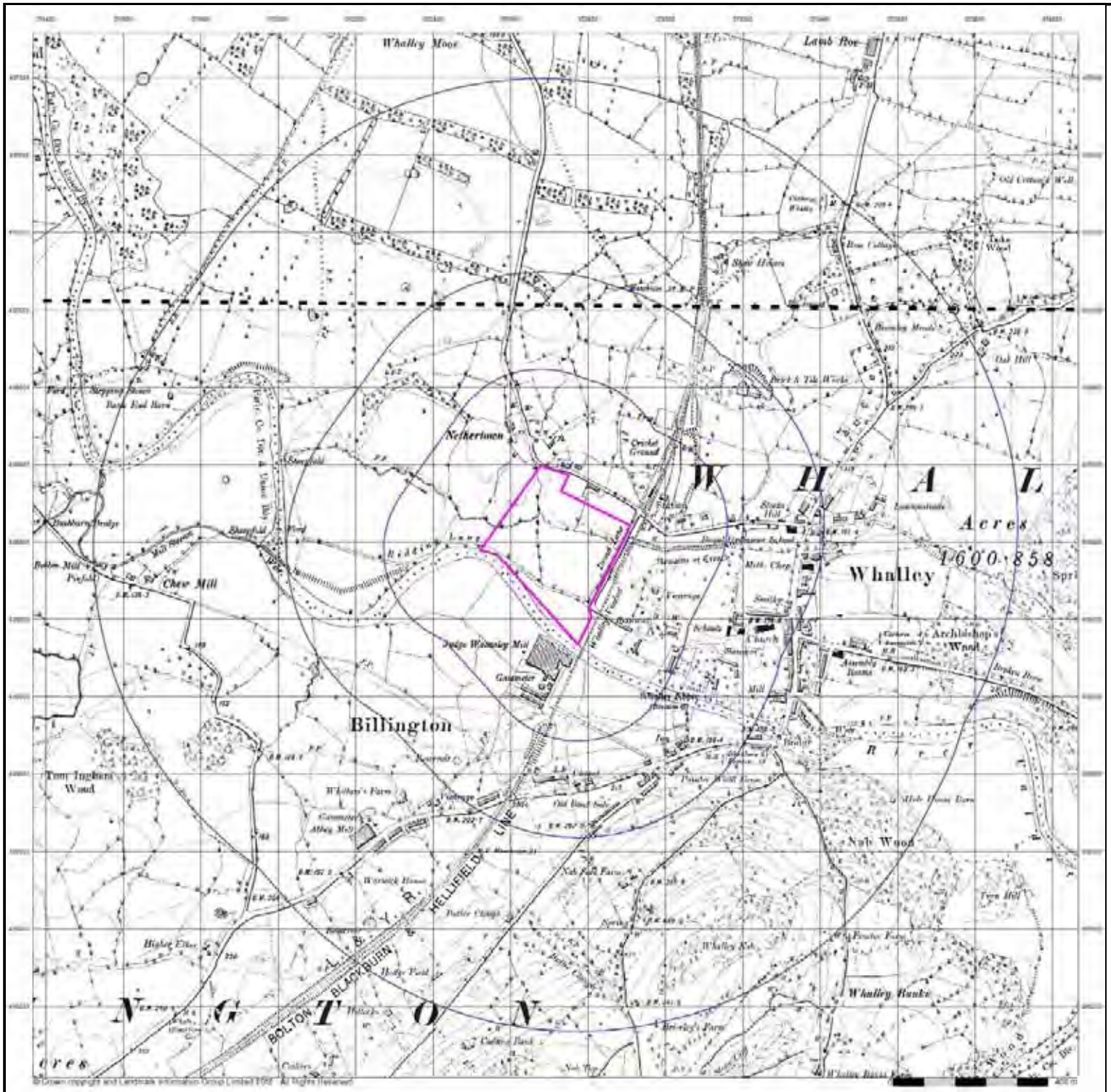

RSK

Lancashire And Furness

Published 1895

Source map scale - 1:10,560

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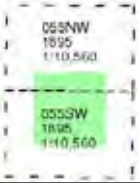
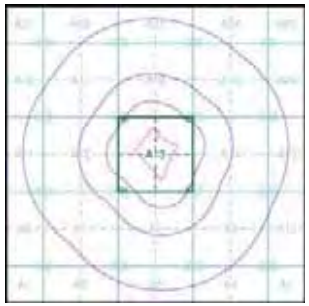
Map Name(s) and Date(s)



Historical Map - Slice A



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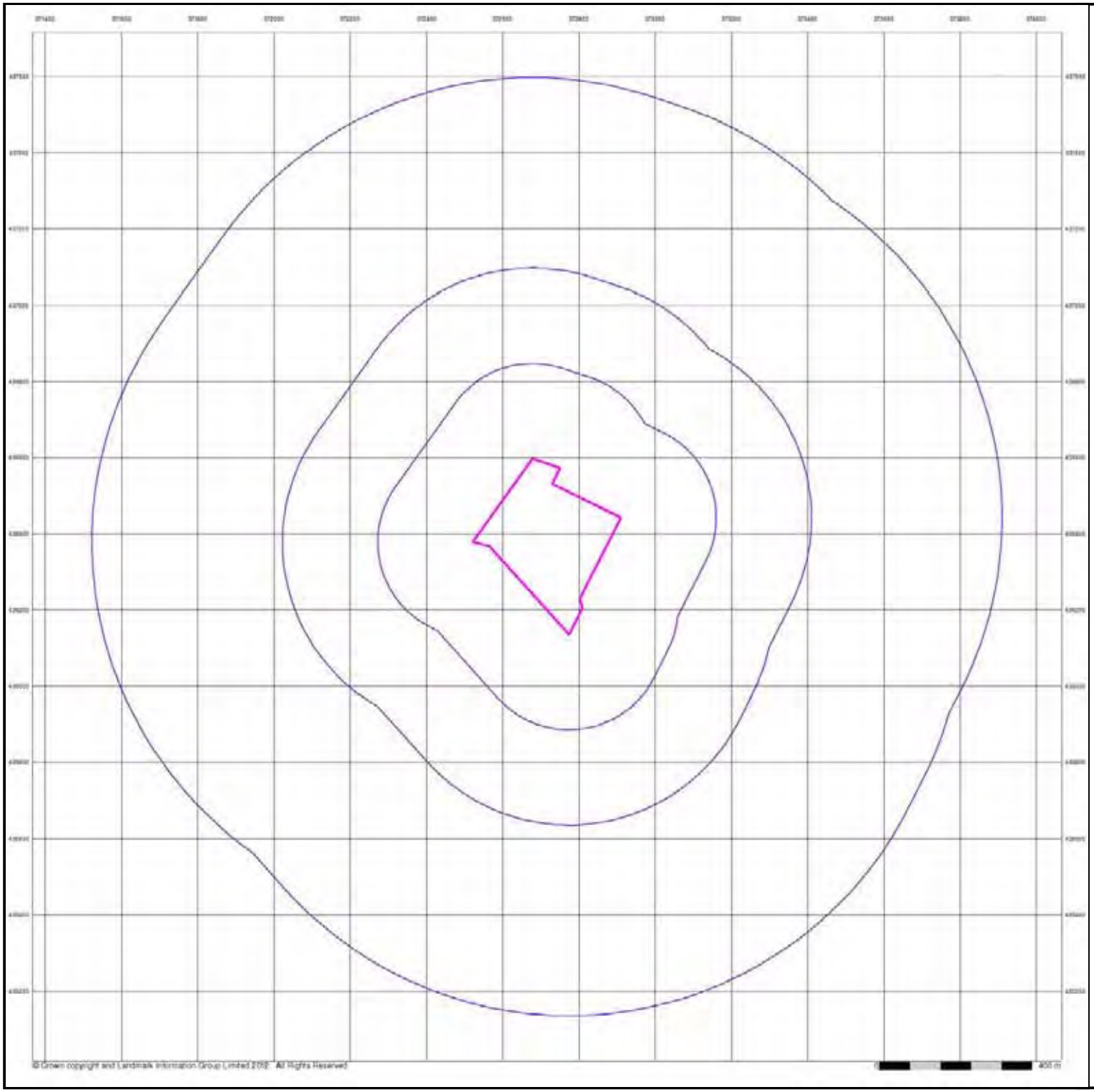

Yorkshire

Published 1896

Source map scale - 1:10,560

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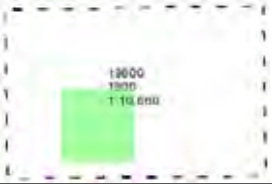
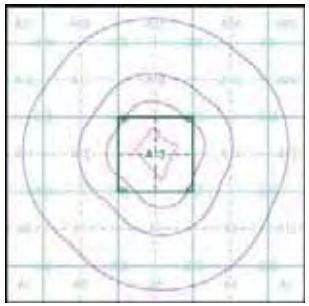


Historical Map - Slice A



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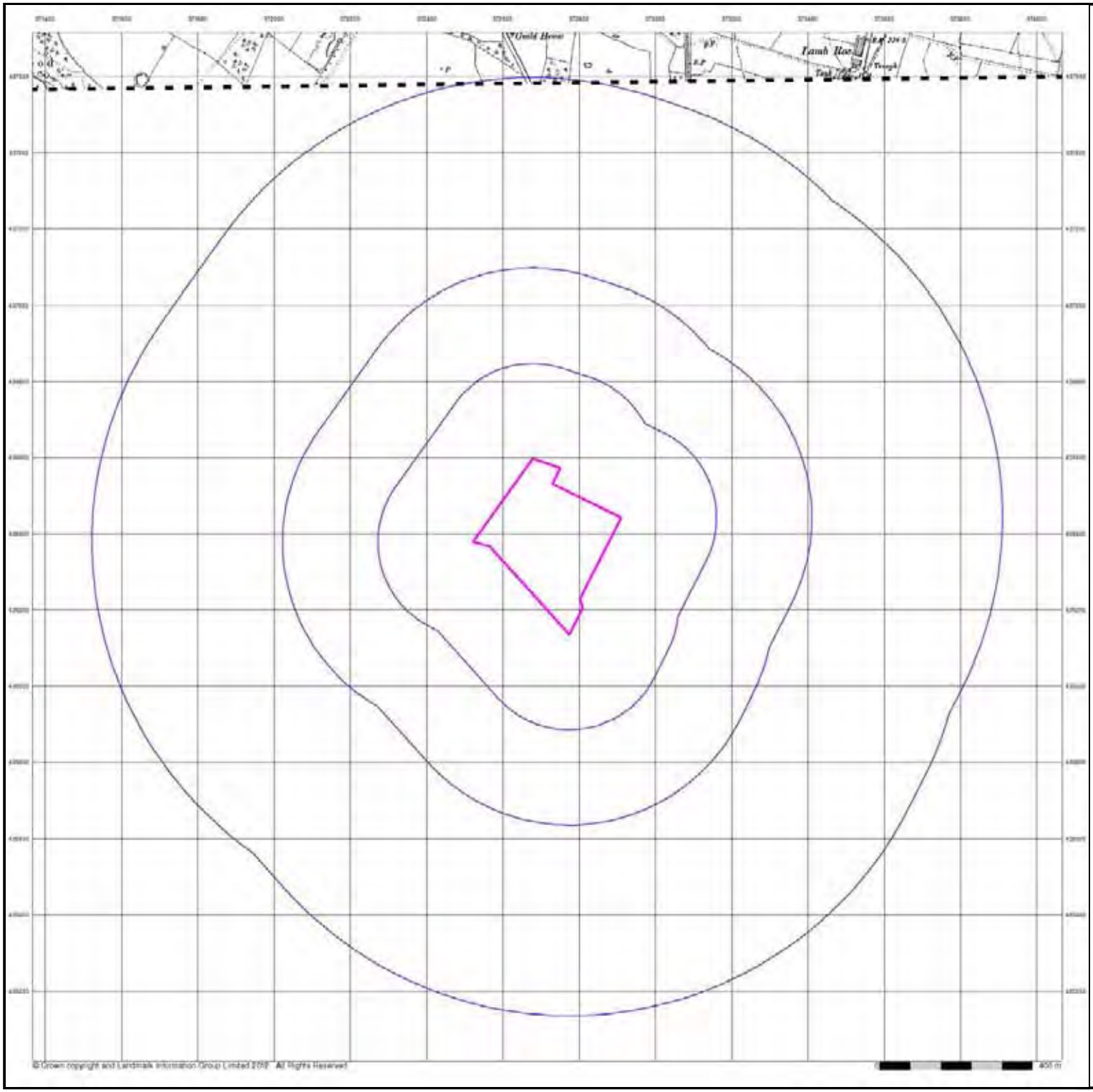


RSK

Yorkshire

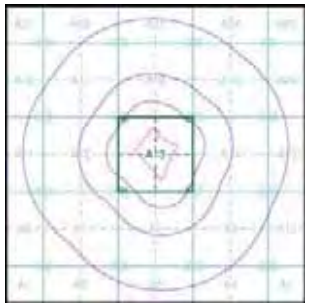
Published 1911

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



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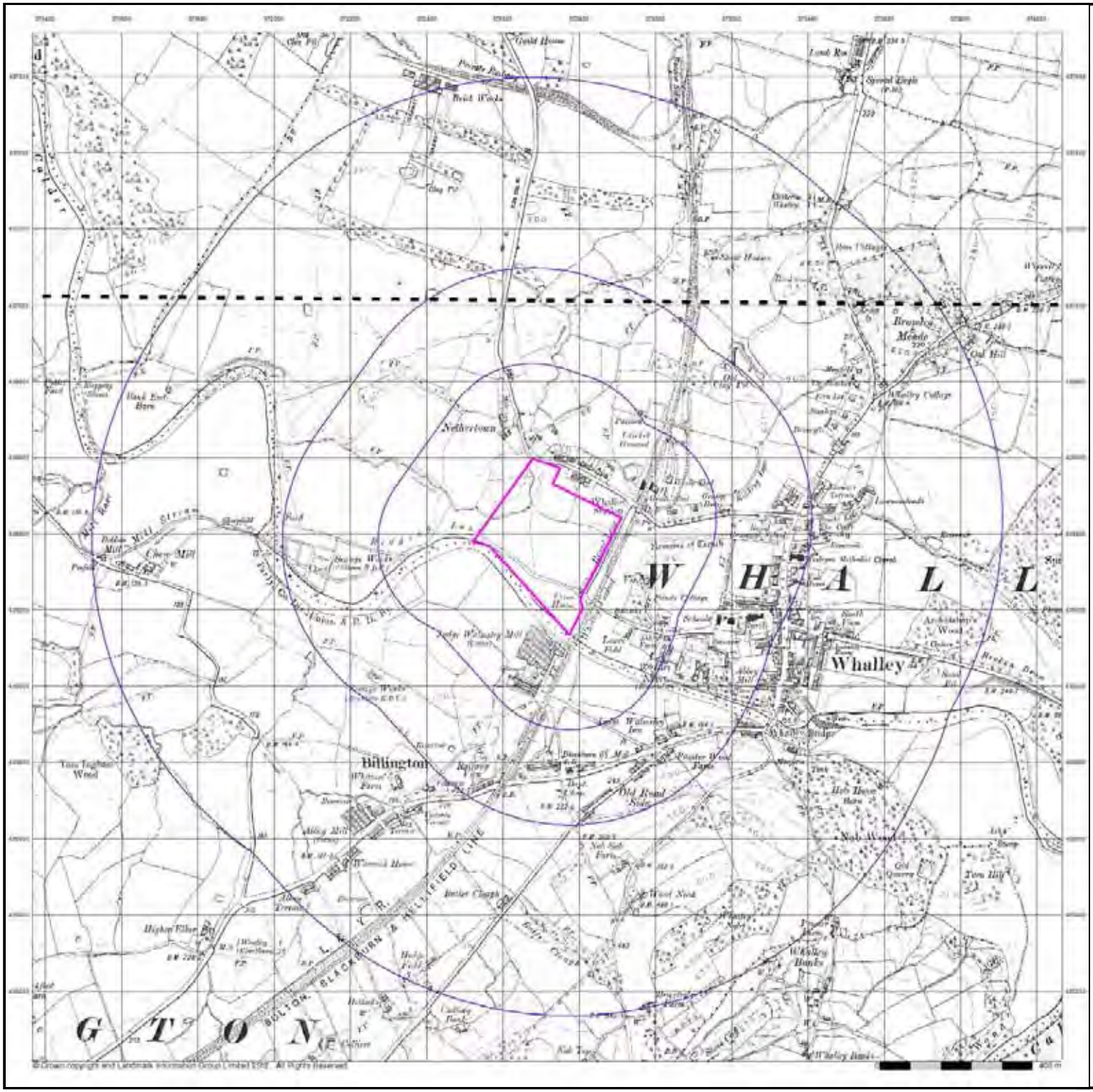

RSK

Lancashire And Furness

Published 1913 - 1914

Source map scale - 1:10,560

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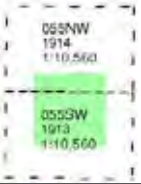
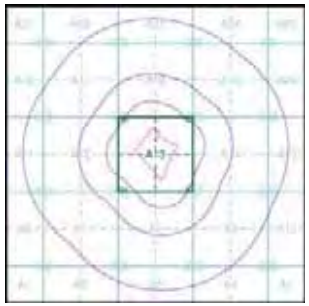


Historical Map - Slice A



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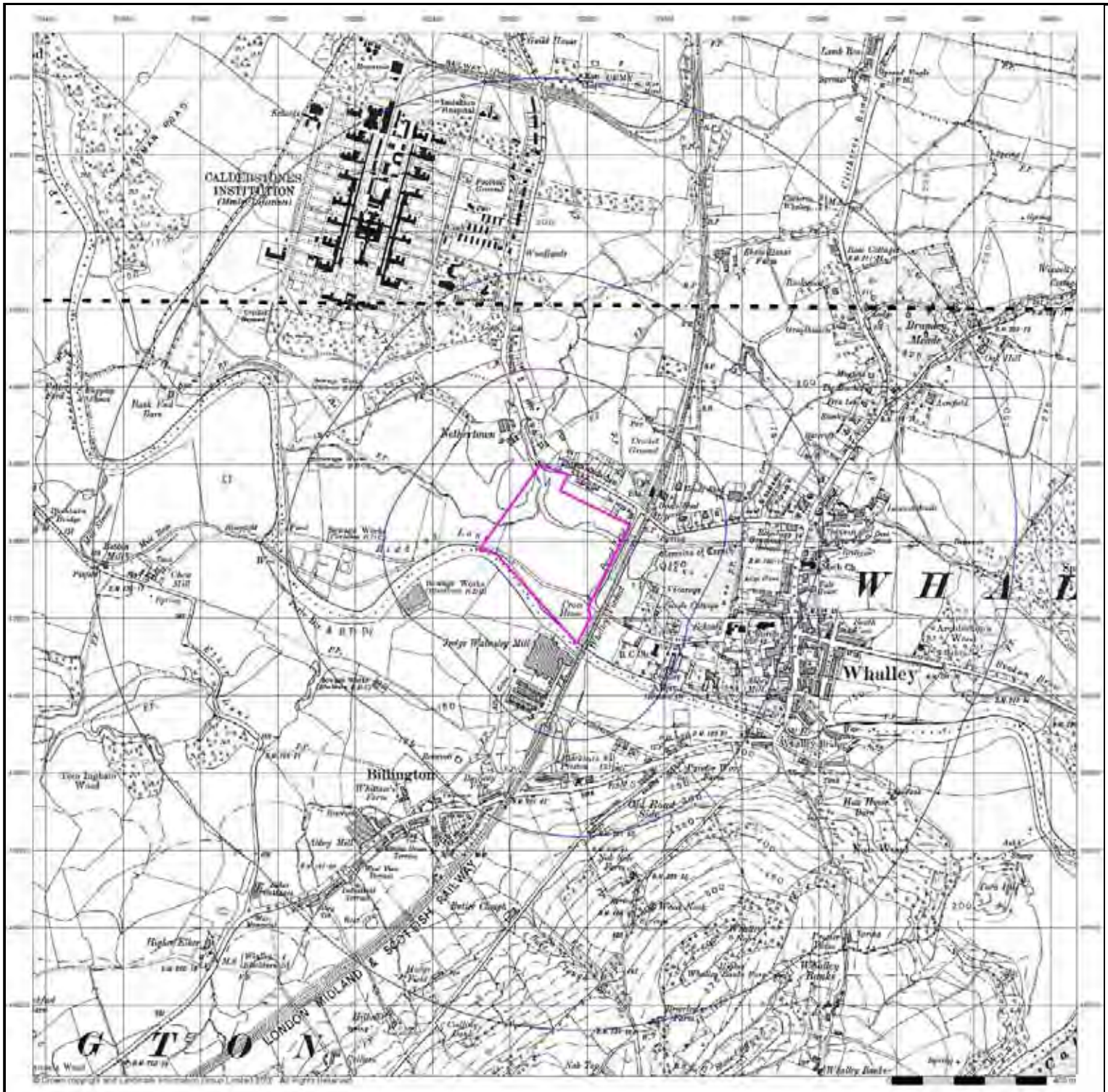

RSK

Lancashire And Furness

Published 1932 - 1933

Source map scale - 1:10,560

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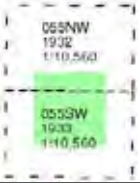
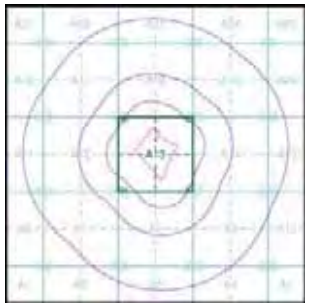


Historical Map - Slice A



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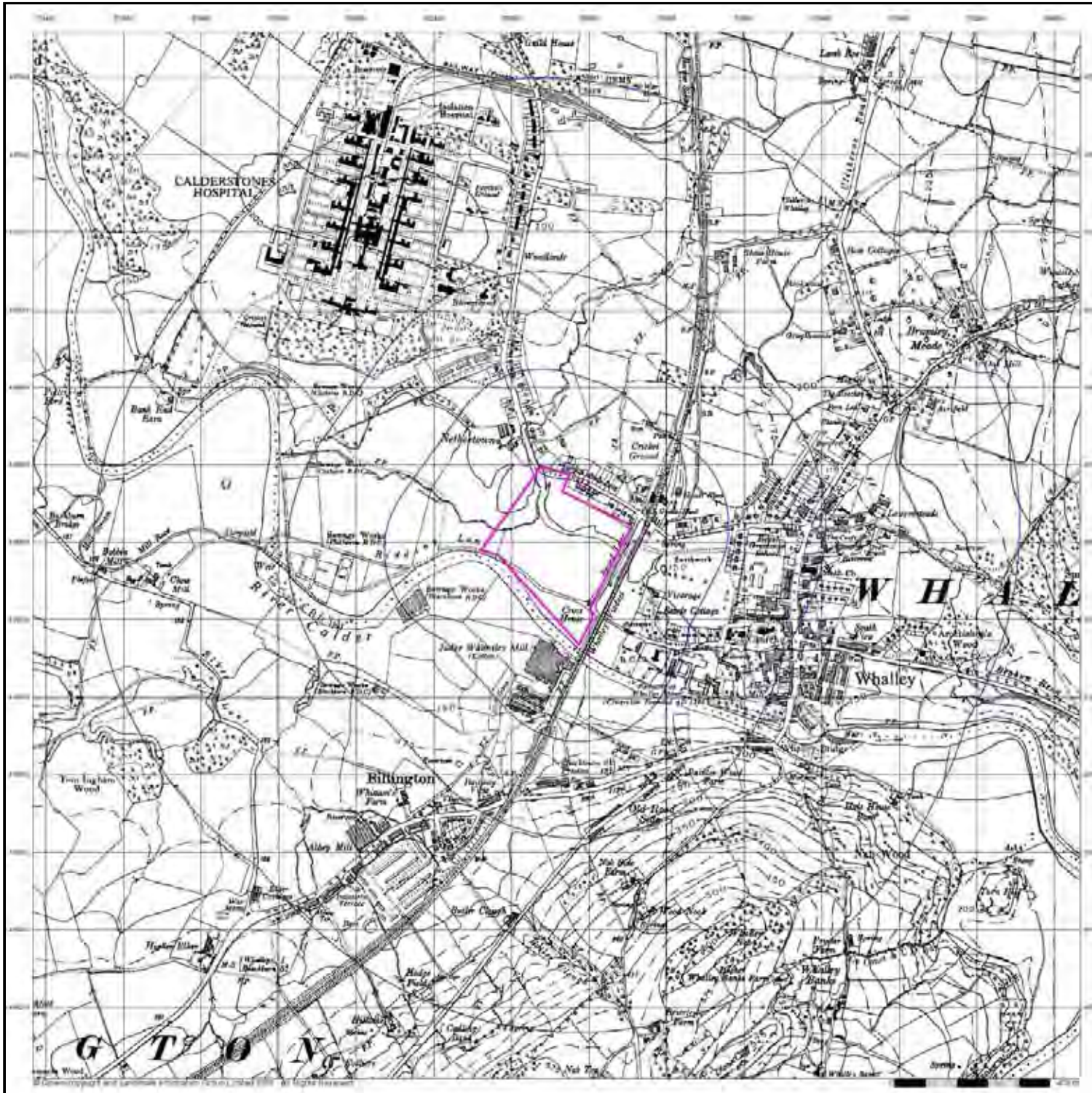

RSK

Ordnance Survey Plan

Published 1955

Source map scale - 1:10,000

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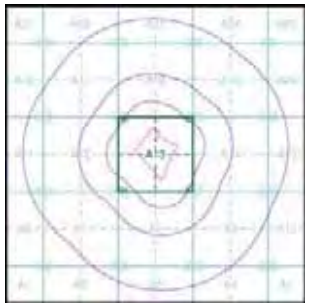
Map Name(s) and Date(s)

Historical Map - Slice A



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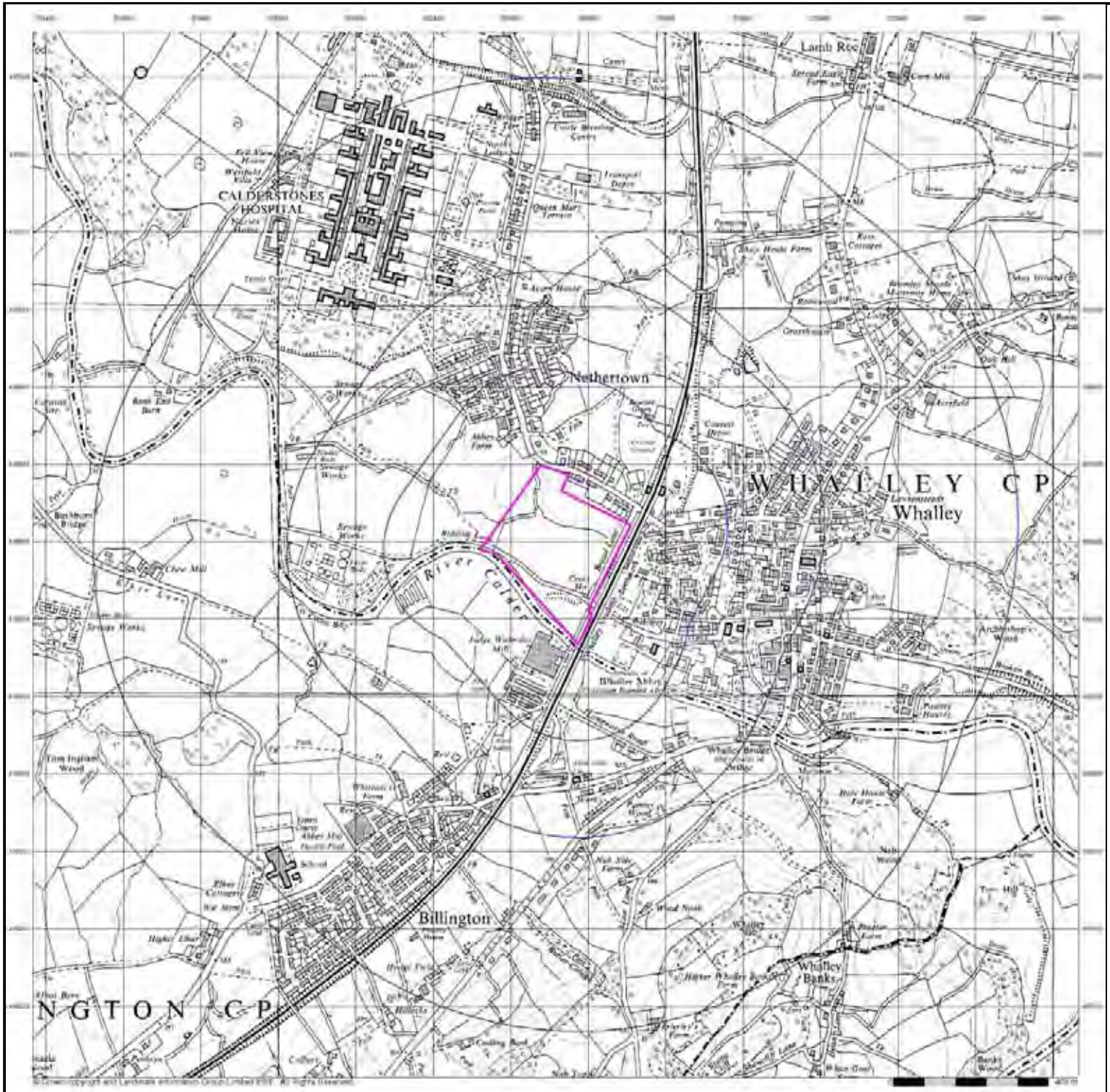


RSK

Ordnance Survey Plan

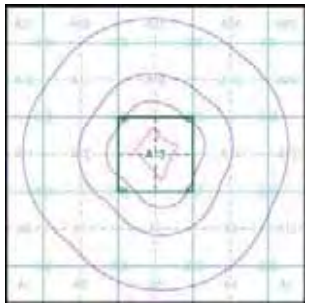
Published 1970

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)

Historical Map - Slice A



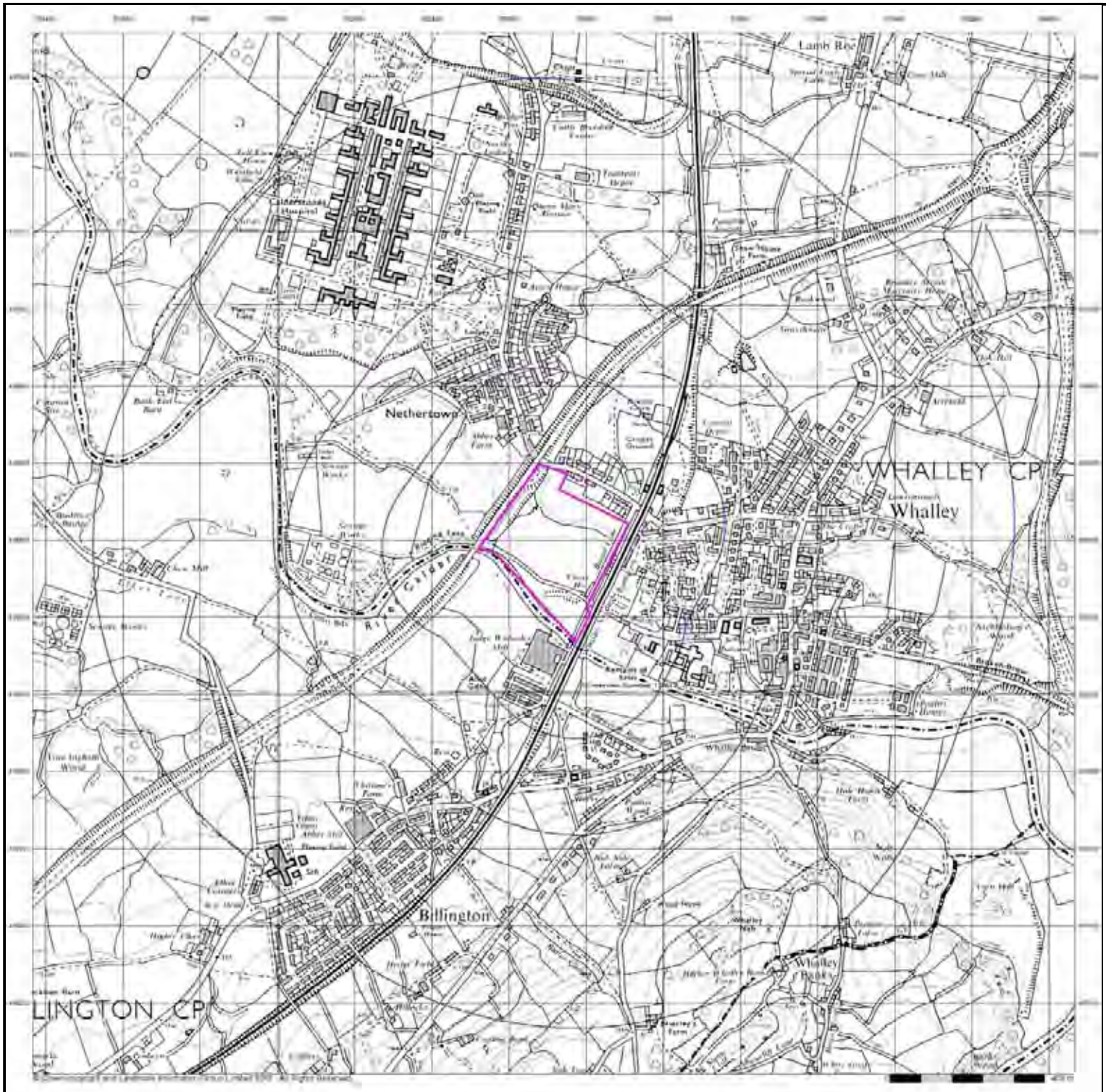
Order Details

Order Number:	37954280_1_1
Customer Ref:	17134
National Grid Reference:	372730, 436370
Slice:	A
Site Area (Ha):	8.56
Search Buffer (m):	1000

Site Details

Site at 372750, 436420

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



RSK

Ordnance Survey Plan

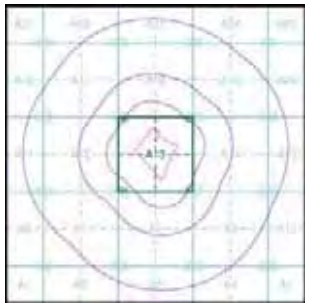
Published 1975

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)

Historical Map - Slice A



Order Details

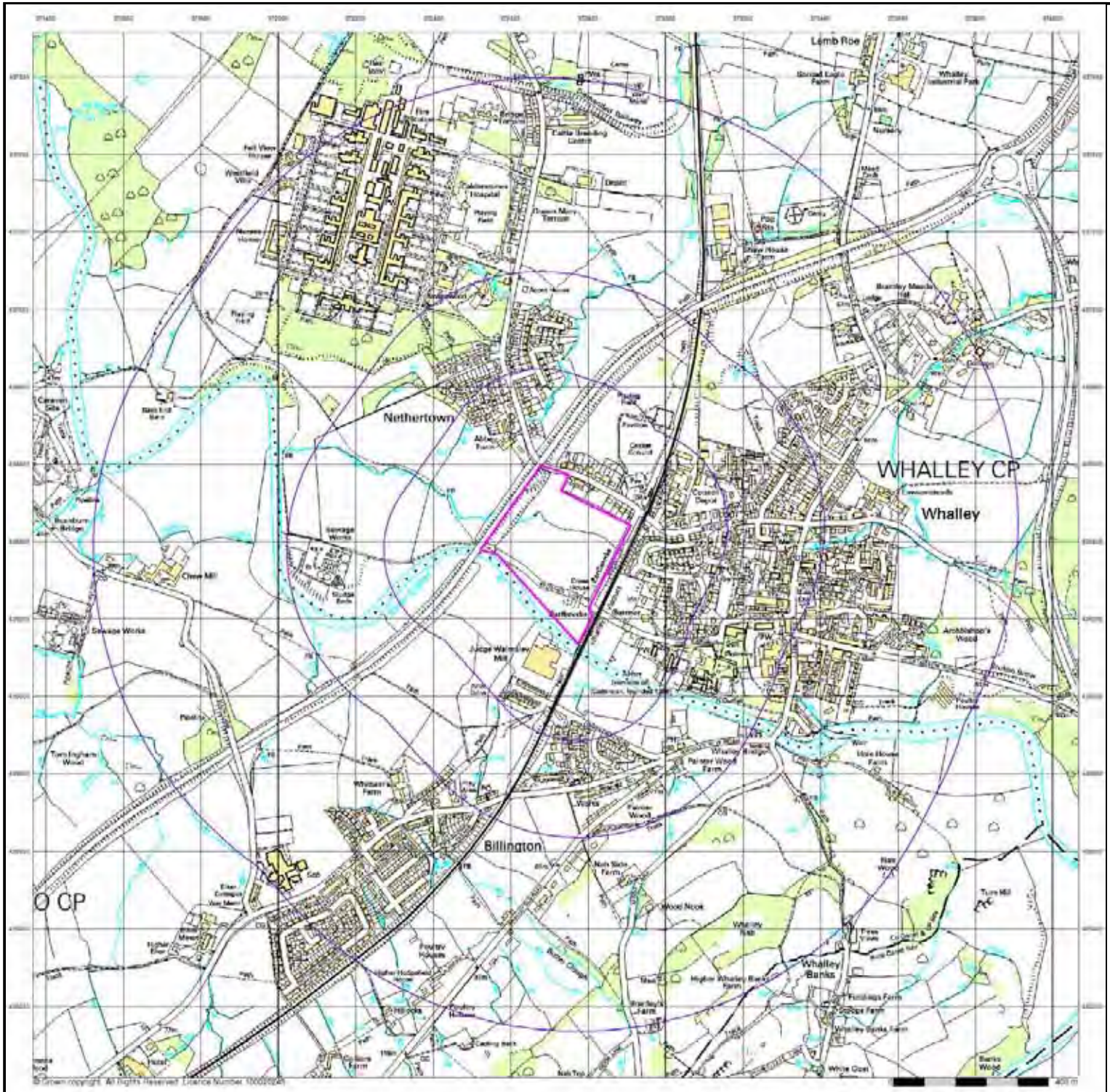
Order Number:	37954280_1_1
Customer Ref:	17134
National Grid Reference:	372730, 436370
Slice:	A
Site Area (Ha):	8.56
Search Buffer (m):	1000

Site Details

Site at 372750, 436420

Landmark

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



RSK

10k Raster Mapping

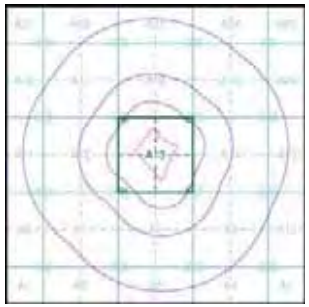
Published 2001

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)

Historical Map - Slice A



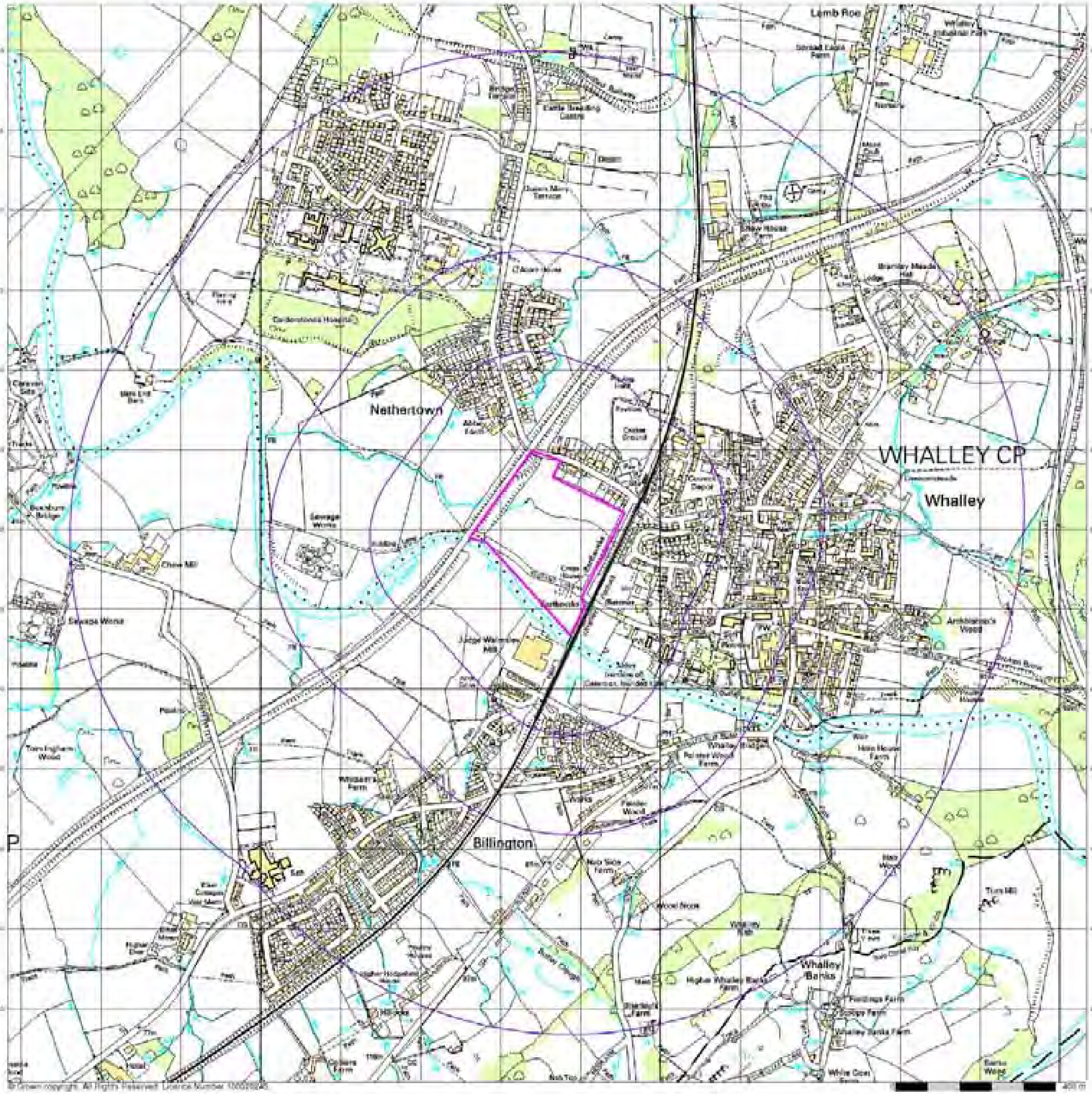
Order Details

Order Number:	37954280_1_1
Customer Ref:	17134
National Grid Reference:	372730, 436370
Slice:	A
Site Area (Ha):	8.56
Search Buffer (m):	1000

Site Details

Site at 372750, 436420

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



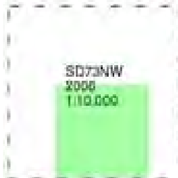
10k Raster Mapping

Published 2006

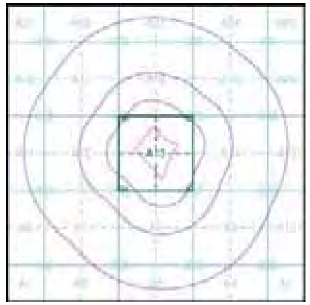
Source map scale - 1:10,000

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)



Historical Map - Slice A



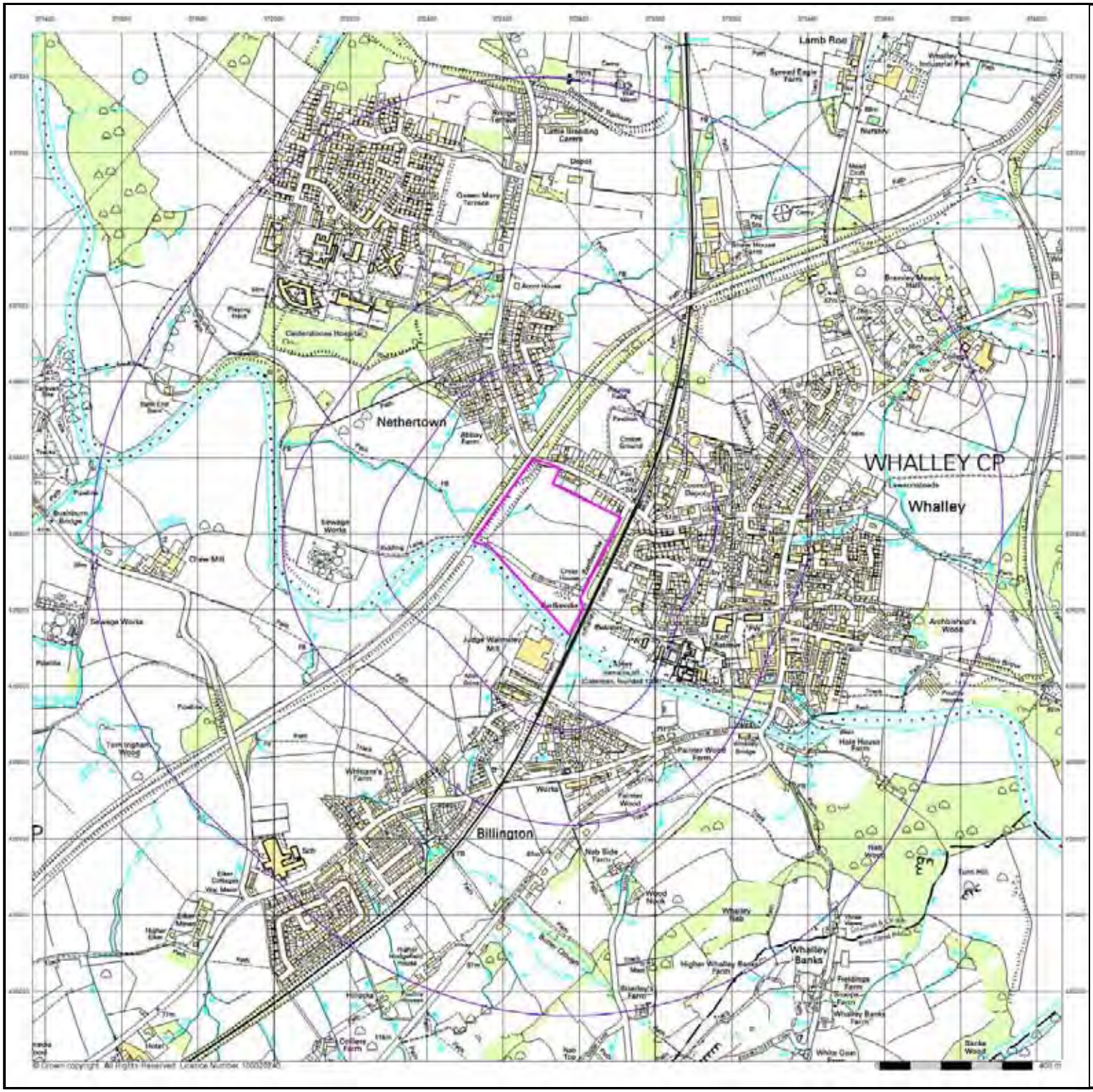
Order Details

Order Number: 37954280_1_1
Customer Ref: 17134
National Grid Reference: 372730, 436370
Slice: A
Site Area (Ha): 8.56
Search Buffer (m): 1000

Site Details

Site at 372750, 436420

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



RSK

10k Raster Mapping

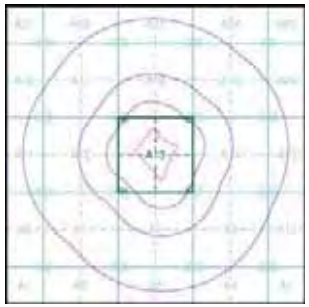
Published 2011

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)

Historical Map - Slice A



Order Details

Order Number:	37954280_1_1
Customer Ref:	17134
National Grid Reference:	372730, 436370
Slice:	A
Site Area (Ha):	8.56
Search Buffer (m):	1000

Site Details

Site at 372750, 436420

Landmark

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

APPENDIX C
PHOTOGRAPHIC ACCOUNT OF SITE WALKOVER

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Geoenvironmental Site Assessment
David Wilson Homes Northwest	Mitton Road, Whalley, Lancashire	

Photo No.	Date:
1	16 March 2012

Direction Photo Taken:
W

Description:

View from East site boundary overlooking Broad Lane and the Whalley Viaduct

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Geoenvironmental Site Assessment
David Wilson Homes Northwest	Mitton Road, Whalley, Lancashire	

Photo No.	Date:
2	16 March 2012

Direction Photo Taken:
S

Description:

View from the North of the site overlooking the residential properties immediately North of the site.

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Geoenvironmental Site Assessment
David Wilson Homes Northwest	Mitton Road, Whalley, Lancashire	

Photo No.	Date:
3	16 March 2012

Direction Photo Taken:
N

Description:

View from the North overlooking tributary of River Calder and semi-mature trees in the central part of the site.

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Geoenvironmental Site Assessment
David Wilson Homes Northwest	Mitton Road, Whalley, Lancashire	

Photo No.	Date:
4	16 March 2012

Direction Photo Taken:
NE

Description:

Cross house in the South-Eastern corner of the site.

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Geoenvironmental Site Assessment
David Wilson Homes Northwest	Mitton Road, Whalley, Lancashire	

Photo No.	Date:
5	16 March 2012

Direction Photo Taken:
N

Description:

Southern boundary of the site overlooking Ridding Lane.

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Geoenvironmental Site Assessment
David Wilson Homes Northwest	Mitton Road, Whalley, Lancashire	

Photo No.	Date:
6	16 March 2012

Direction Photo Taken:
N

Description:

View of the site from the Southern boundary of the site.

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Geoenvironmental Site Assessment
David Wilson Homes Northwest	Mitton Road, Whalley, Lancashire	

Photo No.	Date:
7	16 March 2012

Direction Photo Taken:
NE

Description:

View of the A59 west of the site from the Southwestern part of the site.

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Geoenvironmental Site Assessment
David Wilson Homes Northwest	Mitton Road, Whalley, Lancashire	

Photo No.	Date:
8	16 March 2012

Direction Photo Taken:
E

Description:

View of the Southwestern part of the site and the A59.

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Geoenvironmental Site Assessment
David Wilson Homes Northwest	Mitton Road, Whalley, Lancashire	

Photo No.	Date:
9	16 March 2012

Direction Photo Taken:
NE

Description:

View of the River Calder flowing East to West directly South of the site.

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Geoenvironmental Site Assessment
David Wilson Homes Northwest	Mitton Road, Whalley, Lancashire	

Photo No.	Date:
10	16 March 2012

Direction Photo Taken:
NE

Description:

View of the culvert in the Western part of the site.

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Geoenvironmental Site Assessment
David Wilson Homes Northwest	Mitton Road, Whalley, Lancashire	

Photo No.	Date:
11	16 March 2012

Direction Photo Taken:
W

Description:

View of the culvert in the Western part of the site.

APPENDIX D
RISK ASSESSMENT METHODOLOGY

CLR11 outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. Under CLR11, three stages of risk assessment exist: Preliminary, Generic Quantitative and Detailed Quantitative. An outline Conceptual Model should be formed at the preliminary risk assessment stage that collates all the existing information pertaining to a site in text, tabular or diagrammatic form. The outline conceptual model identifies potentially complete (termed possible) pollutant linkages (source–pathway–receptor) and is used as the basis for design of the site investigation. The outline Conceptual Model is updated as further information becomes available, for example as a result of the site investigation.

Production of a Conceptual Model requires an assessment of risk to be made. Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the likelihood and the consequences of an event must be taken into account when assessing risk. RSK has adopted guidance provided in CIRIA C552 for use in the production of conceptual models.

The likelihood of an event can be classified on a four-point system using the following terms and definitions based on CIRIA C552:

- Highly likely: the event appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution;
- Likely: it is probable that an event will occur or circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term;
- Low likelihood: circumstances are possible under which an event could occur, but it is not certain even in the long term that an event would occur and it is less likely in the short term; and
- Unlikely: circumstances are such that it is improbable the event would occur even in the long term.

The severity can be classified using a similar system also based on CIRIA C552. The terms and definitions relating to severity are:

- Severe: short term (acute) risk to human health likely to result in ‘significant harm’ as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. Short-term risk to an ecosystem or organism forming part of that ecosystem (note definition of ecosystem in ‘Draft Circular on Contaminated Land’, DETR 2000[lthomas4]);
- Medium: chronic damage to human health (‘significant harm’ as defined in ‘Draft Circular on Contaminated Land’, DETR 2000), pollution of sensitive water resources, significant change

in an ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000[lthomas5]);

- Mild: pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures or the environment[lthomas6]; and
- Minor: harm, not necessarily significant, but that could result in financial loss or expenditure to resolve. Non-permanent human health effects easily prevented by use of personal protective clothing. Easily repairable damage to buildings, structures and services[lthomas7].

Once the likelihood of an event occurring and its severity have been classified, a risk category can be assigned the table below.

		Consequences			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**Highly likely**	Very high	High	Moderate	Moderate/Low
	Likely	High	Moderate	Moderate/Low	Low
	Low likelihood	Moderate	Moderate/Low	Low	Very Low
	Unlikely	Moderate/Low	Low	Very Low	Very Low

Definitions of these risk categories are as follows together with an assessment of the further work that might be required:

- Very high: there is a high probability that severe harm could occur or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability and urgent investigation and remediation are likely to be required;
- High: harm is likely to occur. Realisation of the risk is likely to present a substantial liability and urgent investigation is required and remedial works may be necessary in the short term and are likely over the long term;
- Moderate: it is possible that harm could arise, but it is unlikely that the harm would be severe and it is more likely that the harm would be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term;
- Low: it is possible that harm could occur, but it is likely that if realised this harm would at worst normally be mild; and
- Very Low: there is a low possibility that harm could occur and if realised the harm is unlikely to be severe.

APPENDIX E
EXPLORATORY HOLE LOGS

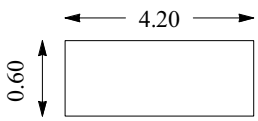
PRELIMINARY TRIAL PIT LOG

Contract:	Client:	Trialpit:
Mitton Road, Whalley	**David Wilson Homes North West**	**TP1**

Contract Ref:	Date:	Ground Level ():	Co-ordinates:	Sheet:
17134	**15.03.12**	**---**	**---**	**1** of **1**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Grass over TOPSOIL	0.20	
0.20	1	ES				Soft brown sandy slightly gravelly clay/silt (Alluvium)	(0.30)	
0.40	2	ES					0.50	
						Soft to firm brown/grey slightly sandy slightly gravelly CLAY. Gravel is subrounded to rounded fine to medium mudstone. (Alluvium)	(0.90)	
							1.40	
1.50	3	D				Grey slightly clayey slightly gravelly medium SAND. Gravel is fine to medium mudstone. (Alluvium)	(0.60)	
							2.00	
				15/03		Grey slightly clayey slightly sandy angular to subangular medium sized GRAVEL. (Alluvium)	(1.00)	
2.50	4	D					3.00	
						Trial pit terminated at 3.00m		

Plan (Not to Scale)



General Remarks

1. Trial pit backfilled with arisings on completion
2. Trial pit easy to excavate
3. Groundwater seepage at 2.40m
4. Pit collapsed at 2.40m

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MYusuf**	

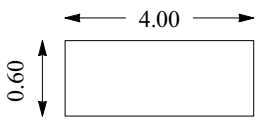
PRELIMINARY TRIAL PIT LOG

Contract:	Client:	Trialpit:
Mitton Road, Whalley	**David Wilson Homes North West**	**TP2**

Contract Ref:	Date:	Ground Level ():	Co-ordinates:	Sheet:
17134	**15.03.12**	**---**	**---**	**1** of **1**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Grass over TOPSOIL	0.20	
0.20	1	ES				Brown slightly clayey medium SAND AND GRAVEL with occasional boulders. (Alluvium)	(2.30)	
2.00 2.00	2 3	ES D						
						Trial pit terminated at 2.50m	2.50	

Plan (Not to Scale)



General Remarks

1. Trial pit backfilled with arisings on completion
2. Trial pit easy to excavate
3. No groundwater encountered
4. Pit collapsed at 2.30m

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MYusuf**	

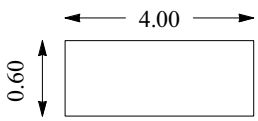
PRELIMINARY TRIAL PIT LOG

Contract:	Client:	Trialpit:
Mitton Road, Whalley	**David Wilson Homes North West**	**TP3**

Contract Ref:	Date:	Ground Level ():	Co-ordinates:	Sheet:
17134	**15.03.12**	**---**	**---**	**1** of **1**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Grass over TOPSOIL	0.20	
1.00 1.00	1 2	ES D				Brown slightly clayey medium to coarse SAND AND GRAVEL with occasional boulders of mudstone. (Alluvium)	(2.30)	
						Trial pit terminated at 2.50m	2.50	

Plan (Not to Scale)



General Remarks

1. Trial pit backfilled with arisings on completion
2. Trial pit easy to excavate
3. No groundwater encountered
4. Pit collapsed at 2.50m

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MYusuf**	

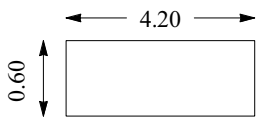
PRELIMINARY TRIAL PIT LOG

Contract:	Client:	Trialpit:
Mitton Road, Whalley	**David Wilson Homes North West**	**TP4**

Contract Ref:	Date:	Ground Level ():	Co-ordinates:	Sheet:
17134	**15.03.12**	**---**	**---**	**1** of **1**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Grass over TOPSOIL	0.20	
						Soft brown very sandy slightly gravelly SILT. (Alluvium)	0.40	
						Firm brown/grey slightly sandy slightly gravelly CLAY. Gravel is subrounded to rounded fine to medium mudstone.	(0.60)	
0.65	1	ES					1.00	
0.80	2	ES						
						Grey/brown slightly clayey slightly gravelly fine to medium SAND. Gravel is very fine. (Alluvium)	(0.30)	
							1.30	
						Grey slightly clayey slightly sandy medium GRAVEL. (Alluvium)	(1.00)	
				15/03				
2.00	3	ES					2.30	
						Trial pit terminated at 2.30m		

Plan (Not to Scale)



General Remarks

1. Trial pit backfilled with arisings on completion
2. Trial pit easy to excavate
3. Groundwater seepage at 2.00m
4. Pit collapsed at 2.00m

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MYusuf**	

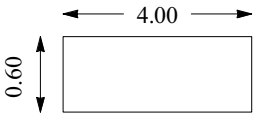
PRELIMINARY TRIAL PIT LOG

Contract:	Client:	Trialpit:
Mitton Road, Whalley	**David Wilson Homes North West**	**TP5**

Contract Ref:	Date:	Ground Level ():	Co-ordinates:	Sheet:
17134	**15.03.12**	**---**	**---**	**1** of **1**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Grass over TOPSOIL	0.20	
1.00 1.00	1 2	ES D				Brown slightly clayey gravelly medium SAND. Gravel is fine. (Alluvium)	(2.30)	
				15/03		. . . becoming wet and very gravelly from 2.00m (SAND AND GRAVEL) with occasional boulders of mudstone.	2.50	
						Trial pit terminated at 2.50m		

Plan (Not to Scale)



General Remarks

1. Trial pit backfilled with arisings on completion
2. Trial pit easy to excavate
3. Groundwater seepage at 2.20m
4. Pit collapsed at 2.20m

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MYusuf**	

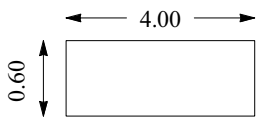
PRELIMINARY TRIAL PIT LOG

Contract:	Client:	Trialpit:
Mitton Road, Whalley	**David Wilson Homes North West**	**TP6**

Contract Ref:	Date:	Ground Level ():	Co-ordinates:	Sheet:
17134	**15.03.12**	**---**	**---**	**1** of **1**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Grass over TOPSOIL	0.20	
						Soft brown sandy slightly gravelly CLAY. Gravel is fine. (Alluvium)	(0.90)	
1.00	1	ES					1.10	
						Wet grey/brown slightly clayey sandy medium to coarse GRAVEL. (Alluvium)	(1.20)	
1.80	2	D					2.30	
						Trial pit terminated at 2.30m		

Plan (Not to Scale)



General Remarks

1. Trial pit backfilled with arisings on completion
2. Trial pit easy to excavate
3. No groundwater encountered
4. Pit collapsed at 2.30m

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MYusuf**	

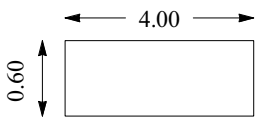
PRELIMINARY TRIAL PIT LOG

Contract:	Client:	Trialpit:
Mitton Road, Whalley	**David Wilson Homes North West**	**TP7**

Contract Ref:	Date:	Ground Level ():	Co-ordinates:	Sheet:
17134	**15.03.12**	**---**	**---**	**1** of **1**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Grass over TOPSOIL	(0.30) 0.30	
						Firm brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium mudstone.	(1.50) 1.80	
1.50 1.50	1 2	ES D		15/03		Soft grey sandy slightly gravelly CLAY. Gravel is angular fine to medium mudstone. (Alluvium)	(0.70) 2.50	
						Trial pit terminated at 2.50m		

Plan (Not to Scale)



General Remarks

1. Trial pit backfilled with arisings on completion
2. Trial pit easy to excavate
3. Trial pit remained stable during excavation
4. Groundwater seepage at 2.50m
5. Pit collapsed at 2.50m

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MYusuf**	

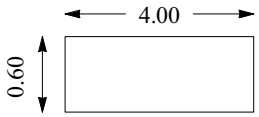
PRELIMINARY TRIAL PIT LOG

Contract:	Client:	Trialpit:
Mitton Road, Whalley	**David Wilson Homes North West**	**TP8**

Contract Ref:	Date:	Ground Level ():	Co-ordinates:	Sheet:
17134	**15.03.12**	**---**	**---**	**1** of **1**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Grass over TOPSOIL	0.20	
0.50	1	ES				Soft to firm grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine mudstone.	(1.60)	
1.50	2	D		15/03			1.80	
						Grey slightly clayey medium SAND AND GRAVEL. (Alluvium)	1.90	
						Trial pit terminated at 1.90m		

Plan (Not to Scale)



General Remarks

1. Trial pit backfilled with arisings on completion
2. Trial pit easy to excavate
3. Trial pit remained stable during excavation
4. Groundwater seepage at 1.80m

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MYusuf**	

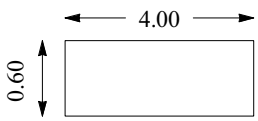
PRELIMINARY TRIAL PIT LOG

Contract:	Client:	Trialpit:
Mitton Road, Whalley	**David Wilson Homes North West**	**TP9**

Contract Ref:	Date:	Ground Level ():	Co-ordinates:	Sheet:
17134	**15.03.12**	**---**	**---**	**1** of **1**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Grass over TOPSOIL	0.20	
0.40 0.40	1 2	ES D				Firm brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded mudstone.	(0.80) 1.00	
				15/03		Grey/orange medium to coarse SAND AND GRAVEL. (Alluvium)	(0.50) 1.50	
						Trial pit terminated at 1.50m		

Plan (Not to Scale)



General Remarks

1. Trial pit backfilled with arisings on completion
2. Trial pit easy to excavate
3. Trial pit remained stable during excavation
4. Groundwater seepage at 1.50m
5. Sample recovered from 1.00m was damp/wet

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MYusuf**	

PRELIMINARY WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
Mitton Road, Whalley	**David Wilson Homes North West**	**WS1**

Contract Ref:	Date:	Ground Level ():	Co-ordinates:	Sheet:
17134	**16.03.12**	**---**	**---**	**1** of **2**

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
0.00 - 1.00 (75mm dia) 100% rec	0.50	1	ES				Grass over TOPSOIL	0.20	
							Soft brown slightly sandy slightly gravelly SILT. Gravel is subangular to subrounded fine to medium mudstone. (Alluvium)	(0.60)	
	1.00-1.45	2	SPT	N=9				0.80	
1.00 - 2.00 (75mm dia) 90% rec							Soft brown/grey sandy slightly gravelly CLAY. (Alluvium)	(1.00)	
	2.00-2.45	3	SPT	N=6				1.80	
	2.00	4	ES		16/03		Loose grey/brown slightly clayey medium to coarse SAND AND GRAVEL. (Alluvium)	(0.70)	
2.00 - 3.00 (75mm dia) 90% rec	2.50	5	D					2.50	
							Soft grey slightly sandy CLAY. (Alluvium)		
	3.00-3.45	6	SPT	N=7					
3.00 - 4.00 (75mm dia) 100% rec								(2.50)	
	4.00-4.45	7	SPT	N=6					
4.00 - 5.00 (75mm dia) 100% rec									

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)
16/03/12		5.00	3.00		2.40

General Remarks

1. Window sample hole terminated at 5.00m depth
2. Window sample hole backfilled with arisings on completion
3. Sample recovered from 1.80m was damp/wet
4. Groundwater encountered at 2.4m

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Archway Competitor**	**GSS**	**MYusuf**	

GINT_LIBRARY_V8_04.GLB!WINDOW SAMPLE LOG | 17134 MITTON ROAD, WHALLEY.GPJ - v8_04 | 29/03/12 - 09:00 | NJ.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk.

PRELIMINARY WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
Mitton Road, Whalley	**David Wilson Homes North West**	**WS1**

Contract Ref:	Date:	Ground Level ():	Co-ordinates:	Sheet:
17134	**16.03.12**	**---**	**---**	**2** of **2**

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
4.00 - 5.00 (75mm dia) 100% rec ▼							Soft grey slightly sandy CLAY. (Alluvium) *(stratum text copied from layer at 2.50m depth from previous sheet)*	5.00	
	5.00-5.45	8	SPT	N=8			Borehole terminated at 5.00m		

Drilling Progress and Water Observations					
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Archway Competitor**	**GSS**	**MYusuf**	

GINT_LIBRARY_V8_04.GLB!WINDOW SAMPLE LOG | 17134 MITTON ROAD, WHALLEY.GPJ - v8_04 | 29/03/12 - 09:00 | NJ.
RSK Environment Ltd, Fourways House, 57 Hilton Street, Piccadilly, Manchester, M1 2EJ. Tel: 0161 236 2757, Fax: 0161 236 7029, Web: www.rsk.co.uk.

PRELIMINARY WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
Mitton Road, Whalley	**David Wilson Homes North West**	**WS2**

Contract Ref:	Date:	Ground Level ():	Co-ordinates:	Sheet:
17134	**16.03.12**	**---**	**---**	**1** of **2**

Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
0.00 - 1.00 (75mm dia) 100% rec	0.70	1	ES				Grass over TOPSOIL	0.20	
							Soft grey/brown sandy slightly SILT. Gravel is subangular to subrounded fine to medium mudstone. (Alluvium)	(0.80)	
							. . . becoming very sandy at 0.80m	1.00	
	1.00-1.45	2	SPT	N=4			Loose brown clayey slightly gravelly fine to medium SAND. (Alluvium)	(0.80)	
1.00 - 2.00 (75mm dia) 70% rec	1.50	3	ES					1.80	
							Loose brown fine to medium SAND AND GRAVEL. (Alluvium)	2.00	
	2.00-2.45	4	SPT	N=5	16/03		No recovery		
2.00 - 4.00 (75mm dia) 0% rec	3.00-3.45	5	SPT	N=12				(2.10)	
	4.00-4.38	6	SPT	N:18 for 225mm				4.10	
4.00 - 5.00 (75mm dia) 80% rec							Brown slightly clayey fine to medium SAND AND GRAVEL. (Refusal and high SPT due to boulder) (Alluvium)	(0.50)	

Drilling Progress and Water Observations					
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)
16/03/12		5.00	2.00		2.40

General Remarks

1. Window sample hole terminated at 5.00m depth due to refusal
2. Window sample hole backfilled on completion
3. Window sample hole installed with monitoring well on completion of drilling
4. Samples recovered from 1.00m and 1.80m were damp/wet
5. Raised top-hat cover installed
6. Groundwater encountered at 2.4m

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Archway Competitor**	**GSS**	**MYusuf**	

GINT_LIBRARY_V8_04.GLB!WINDOW SAMPLE LOG | 17134 MITTON ROAD, WHALLEY.GPJ - v8_04 | 29/03/12 - 09:00 | NJ.
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PRELIMINARY WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
Mitton Road, Whalley	**David Wilson Homes North West**	**WS2**

Contract Ref:	Date:	Ground Level ():	Co-ordinates:	Sheet:
17134	**16.03.12**	**---**	**---**	**2** of **2**

Progress	Samples / Tests				Water	Backfill & Instru-mentation	Description of Strata	Depth (Thick ness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
							. . . becoming clayey at 4.50m	4.60	
4.00 - 5.00 (75mm dia) 80% rec							Stiff to very stiff grey slightly sandy slightly gravelly CLAY. Gravel is subangular fine to medium mudstone.	(0.40)	
	5.00-5.13	7	SPT	N:45 for 50mm			Borehole terminated at 5.00m	5.00	

Drilling Progress and Water Observations					
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Archway Competitor**	**GSS**	**MYusuf**	

GINT_LIBRARY_V8_04.GLB!WINDOW SAMPLE LOG | 17134 MITTON ROAD, WHALLEY.GPJ - v8_04 | 29/03/12 - 09:00 | NJ.
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PRELIMINARY WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
Mitton Road, Whalley	**David Wilson Homes North West**	**WS3**

Contract Ref:	Date:	Ground Level ():	Co-ordinates:	Sheet:
17134	**16.03.12**	**---**	**---**	**1** of **1**

Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
0.00 - 1.00 (75mm dia) 100% rec	0.50	1	ES				Grass over TOPSOIL	0.20	
							Soft brown slightly sandy slightly gravelly SILT. Gravel is subangular to subrounded fine to medium mudstone. (Alluvium)	(0.80)	
	1.00-1.45	2	SPT	N=12				1.00	
1.00 - 2.00 (75mm dia) 70% rec	1.50	3	ES		16/03		Medium dense brown slightly clayey gravelly fine to medium SAND. (Alluvium)	(1.20)	
	2.00	4	D					2.20	
	2.00-2.45	5	SPT	N=1			Very loose grey/brown slightly clayey fine to coarse SAND AND GRAVEL. (Alluvium)	(0.30)	
							Borehole terminated at 2.50m due to obstruction	2.50	

Drilling Progress and Water Observations					
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)
16/03/12		2.50	3.00		1.50

General Remarks

1. Window sample hole terminated at 2.50m depth due to obstruction
2. Window sample hole backfilled on completion
3. Window sample hole installed with monitoring well on completion of drilling
4. Raised top-hat cover installed
5. Groundwater encountered at 1.50m
6. Sample recovered from 2.20m was damp/wet

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Archway Competitor**	**GSS**	**MYusuf**	

GINT_LIBRARY_V8_04.GLB!WINDOW SAMPLE LOG | 17134 MITTON ROAD, WHALLEY.GPJ - v8_04 | 29/03/12 - 09:00 | NJ.
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PRELIMINARY WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
Mitton Road, Whalley	**David Wilson Homes North West**	**WS4**

Contract Ref:	Date:	Ground Level ():	Co-ordinates:	Sheet:
17134	**16.03.12**	**---**	**---**	**1** of **1**

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
0.00 - 1.00 (75mm dia) 100% rec							Grass over TOPSOIL	0.20	
	1.00-1.45	1	SPT	N=4			Soft brown sandy slightly gravelly SILT. Gravel is subangular to subrounded fine to medium mudstone. (Alluvium)	(1.00)	
1.00 - 2.00 (75mm dia) 80% rec	1.40	2	ES		16/03			1.20	
							Very soft brown sandy slightly gravelly CLAY. Gravel is fine mudstone. (Alluvium)	(0.80)	
2.00 - 3.00 (75mm dia) 60% rec	2.00-2.45	3	SPT	N=3				2.00	
							Very loose grey slightly clayey fine to coarse SAND AND GRAVEL. (Alluvium)	(1.00)	
	3.00-3.27	4	SPT	N:39 for 180mm			Borehole terminated at 3.00m due to refusal	3.00	

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)
16/03/12		2.50	3.00		1.40

General Remarks

1. Window sample hole terminated at 3.00m depth due to refusal
2. Window sample hole backfilled with arisings on completion
3. Groundwater encountered at 1.40m
4. Sample recovered from 1.20m and 2.00m were damp/wet

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Archway Competitor**	**GSS**	**MYusuf**	

GINT_LIBRARY_V8_04.GLB!WINDOW SAMPLE LOG | 17134 MITTON ROAD, WHALLEY.GPJ - v8_04 | 29/03/12 - 09:00 | NJ.
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PRELIMINARY WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
Mitton Road, Whalley	**David Wilson Homes North West**	**WS5**

Contract Ref:	Date:	Ground Level ():	Co-ordinates:	Sheet:
17134	**16.03.12**	**---**	**---**	**1** of **1**

Progress	Samples / Tests				Water	Backfill & Instru-mentation	Description of Strata	Depth (Thick ness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
0.00 - 1.00 (75mm dia) 100% rec							Grass over TOPSOIL	0.20	
							Soft brown sandy slightly gravelly SILT. (Alluvium)	0.40	
							Firm brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium mudstone.	(0.60)	
	1.00	1	ES					1.00	
	1.00-1.45	2	SPT	N=4			Soft grey/brown slightly sandy slightly gravelly CLAY. (Alluvium)		
1.00 - 2.00 (75mm dia) 90% rec	1.50	3	D					(1.20)	
	2.00-2.45	4	SPT	N=2				2.20	
					16/03		Very loose grey slightly clayey fine to coarse SAND AND GRAVEL. (Alluvium)		
2.00 - 3.00 (75mm dia) 70% rec								(0.80)	
	3.00-3.20	5	SPT	N:40 for 50mm			Borehole terminated at 3.00m	3.00	

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)
16/03/12		3.00	3.00		2.40

General Remarks

1. Window sample hole terminated at 3.00m depth
2. Window sample hole backfilled on completion
3. Window sample hole installed with monitoring well on completion of drilling
4. Raised top-hat cover installed
5. Sample recovered from 2.20m was damp/wet

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Archway Competitor**	**GSS**	**MYusuf**	

GINT_LIBRARY_V8_04.GLB!WINDOW SAMPLE LOG | 17134 MITTON ROAD, WHALLEY.GPJ - v8_04 | 29/03/12 - 09:00 | NJ.
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APPENDIX F
GROUND GAS MONMITORING DATA

Site: Mitton Road, Whalley
Job No.: 17134
Date: 13/04/2012

Borehole	Time Seconds (Minutes)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL *)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppm)			Depth to Water (m)
								PID	H_2S	CO	
WS2	0	-0.1		0.1	0.1	0.3	13.5		0	1	
	15	-0.1		0.1	0.1	0.1	10.8		0	2	
	30	-0.1		0.1	0.1	0.1	10.7		0	2	
	60 (1)	-0.1		0.1	0.1	0.1	10.5		0	2	
	90			0.1	0.1	0.1	10.4		0	2	
	120 (2)			0.1	0.1	0.1	10.3		0	2	Depth to Base
	180 (3)			0.1	0.1	0.1	10.2		0	2	
	240 (4)			0.1	0.1	0.1	10.0		0	2	
	300 (5)			0.1	0.1	0.1	9.8		0	2	
	360 (6)										
	420 (7)										
	480 (8)										
	540 (9)										
	600 (10)										

Notes:
Monitoring order is from **left to right** across table.
Monitoring should be for **not less** than 3 minutes. However, if high concentrations of gases initially recorded, monitoring should be for up to 10 minutes
* LEL = Lower Explosive Limit = 5%v/v

Relevant Information At Time Of Monitoring				
Monitored by (name, position):	Moh Yusuf			
Atmospheric Pressure (mB):	1002			
Weather:	Rainy			
Temperature (°C, between -10°C to +40°C only):	8			
Equipment Used (RSK Reference No.):	GA2000		**Last calibrated:**	Jan-12
			Last calibrated:	
			Last calibrated:	
Visible Signs of Vegetation Stress:				
Other Comments / Observations:				
Boreholes Sampled For Laboratory Analysis:				

Site: Mitton Road, Whalley
Job No.: 17134
Date: 13/04/2012

Borehole	Time Seconds (Minutes)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL *)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppm)			Depth to Water (m)
								PID	H_2S	CO	
WS3	0	-0.1		0.1	0.1	0.1	20.9		0		
	15	-0.1		0.1	0.1	4.8	16.9		0	4	
	30	-0.1		0.1	0.1	4.6	16.9		0	0	
	60 (1)	-0.1		0.1	0.1	4.6	16.9		0	0	
	90			0.1	0.1	4.6	16.9		0	0	
	120 (2)			0.1	0.1	4.6	16.9		0	0	Depth to Base
	180 (3)			0.1	0.1	4.6	16.9		0	0	
	240 (4)			0.1	0.1	4.6	16.9		0	0	
	300 (5)										
	360 (6)										
	420 (7)										
	480 (8)										
	540 (9)										
	600 (10)										

Notes:
Monitoring order is from **left to right** across table.
Monitoring should be for **not less** than 3 minutes. However, if high concentrations of gases initially recorded, monitoring should be for up to 10 minutes
* LEL = Lower Explosive Limit = 5%v/v

Relevant Information At Time Of Monitoring				
Monitored by (name, position):	Moh Yusuf			
Atmospheric Pressure (mB):	1002			
Weather:	Rainy			
Temperature (°C, between -10°C to +40°C only):	10			
Equipment Used (RSK Reference No.):	GA2000		**Last calibrated:**	Jan-12
			Last calibrated:	
			Last calibrated:	
Visible Signs of Vegetation Stress:				
Other Comments / Observations:				
Boreholes Sampled For Laboratory Analysis:				

Site: Mitton Road, Whalley
Job No.: 17134
Date: 13/04/2012

Borehole	Time Seconds (Minutes)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL *)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppm)			Depth to Water (m)
								PID	H_2S	CO	
WS5	0	0.1		0.1	0.2	0.8	8.2		0	2	
	15	-0.1		0.1	0.2	1.4	12.0		0	1	
	30	0.1		0.1	0.2	1.3	12.2		0	0	
	60 (1)	-0.1		0.1	0.2	`1.3	12.6		0	0	
	90			0.1	0.2	1.3	12.8		0	0	
	120 (2)			0.1	0.2	1.2	12.9		0	0	Depth to Base
	180 (3)			0.1	0.2	1.2	13.4		0	0	
	240 (4)			0.1	0.2	1.0	14.8		0	0	
	300 (5)					0.9	15.3				
	360 (6)										
	420 (7)										
	480 (8)										
	540 (9)										
	600 (10)										

Notes:
Monitoring order is from **left to right** across table.
Monitoring should be for **not less** than 3 minutes. However, if high concentrations of gases initially recorded, monitoring should be for up to 10 minutes
* LEL = Lower Explosive Limit = 5%v/v

Relevant Information At Time Of Monitoring				
Monitored by (name, position):	Moh Yusuf			
Atmospheric Pressure (mB):	1002			
Weather:	Rainy			
Temperature (°C, between -10°C to +40°C only):	10			
Equipment Used (RSK Reference No.):	GA2000		**Last calibrated:**	Jan-12
			Last calibrated:	
			Last calibrated:	
Visible Signs of Vegetation Stress:				
Other Comments / Observations:				
Boreholes Sampled For Laboratory Analysis:				

Site: Mitton Road, Whalley
Job No.: 17134
Date: 24/03/2012

Borehole	Time Seconds (Minutes)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL *)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppm)			Depth to Water (m)
								PID	H_2S	CO	
WS2	0	-0.1		0.1	0.1	0.4	19.9		0	0	
	15	-0.3		0.1	0.1	0.4	19.9		0	0	
	30	-0.3		0.1	0.1	0.3	19.9		0	0	
	60 (1)	-0.2		0.1	0.1	0.3	20.0		0	0	
	90			0.1	0.1	0.3	20.0		0	0	
	120 (2)			0.1	0.1	0.3	20.0		0	0	Depth to Base
	180 (3)			0.1	0.1	0.2	20.0		0	0	
	240 (4)			0.1	0.1	0.2	20.0		0	0	
	300 (5)			0.1	0.1	0.2	19.9		0	0	
	360 (6)										
	420 (7)										
	480 (8)										
	540 (9)										
	600 (10)										

Notes:
Monitoring order is from **left to right** across table.
Monitoring should be for **not less** than 3 minutes. However, if high concentrations of gases initially recorded, monitoring should be for up to 10 minutes
* LEL = Lower Explosive Limit = 5%v/v

Relevant Information At Time Of Monitoring				
Monitored by (name, position):	Moh Yusuf			
Atmospheric Pressure (mB):	1023			
Weather:	Sunny			
Temperature (°C, between -10°C to +40°C only):	12			
Equipment Used (RSK Reference No.):	GA2000		**Last calibrated:**	
			Last calibrated:	
			Last calibrated:	
Visible Signs of Vegetation Stress:				
Other Comments / Observations:				
Boreholes Sampled For Laboratory Analysis:				

Site: Mitton Road, Whalley
Job No.: 17134
Date: 24/03/2012

Borehole	Time Seconds (Minutes)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL *)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppm)			Depth to Water (m)
								PID	H_2S	CO	
WS3	0	-0.4		0.1	0.1	3.6	16.1		0		
	15	-0.4		0.1	0.1	4.7	14.9		0	4	
	30	-0.4		0.1	0.1	4.7	14.9		0	0	
	60 (1)	-0.4		0.1	0.1	4.7	14.9		0	0	
	90			0.1	0.1	4.7	14.9		0	0	
	120 (2)			0.1	0.1	4.7	15.0		0	0	Depth to Base
	180 (3)			0.1	0.1	4.7	14.9		0	0	
	240 (4)			0.1	0.1	4.7	14.9		0	0	
	300 (5)										
	360 (6)										
	420 (7)										
	480 (8)										
	540 (9)										
	600 (10)										

Notes:
Monitoring order is from **left to right** across table.
Monitoring should be for **not less** than 3 minutes. However, if high concentrations of gases initially recorded, monitoring should be for up to 10 minutes
* LEL = Lower Explosive Limit = 5%v/v

Relevant Information At Time Of Monitoring				
Monitored by (name, position):	Moh Yusuf			
Atmospheric Pressure (mB):	1023			
Weather:	Sunny			
Temperature (°C, between -10°C to +40°C only):	10			
Equipment Used (RSK Reference No.):	GA2000		**Last calibrated:**	
			Last calibrated:	
			Last calibrated:	
Visible Signs of Vegetation Stress:				
Other Comments / Observations:				
Boreholes Sampled For Laboratory Analysis:				

Site: Mitton Road, Whalley
Job No.: 17134
Date: 24/03/2012

Borehole	Time Seconds (Minutes)	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%v/v)	Methane (% LEL *)	Carbon Dioxide (%v/v)	Oxygen (%v/v)	Other Gases (ppm)			Depth to Water (m)
								PID	H_2S	CO	
WS5	0	-0.5		0.1	0.2	0.8	19.2		0	3	
	15	-0.5		0.1	0.2	0.8	19.4		0	2	
	30	-0.5		0.1	0.2	0.8	19.5		0	3	
	60 (1)	-0.5		0.1	0.2	0.8	19.8		0	3	
	90			0.1	0.2	0.7	19.6		0	3	
	120 (2)			0.1	0.2	0.7	19.6		0	3	Depth to Base
	180 (3)			0.1	0.2	0.7	19.7		0	3	
	240 (4)			0.1	0.2	0.7	19.7		0	3	
	300 (5)										
	360 (6)										
	420 (7)										
	480 (8)										
	540 (9)										
	600 (10)										

Notes:
Monitoring order is from **left to right** across table.
Monitoring should be for **not less** than 3 minutes. However, if high concentrations of gases initially recorded, monitoring should be for up to 10 minutes
* LEL = Lower Explosive Limit = 5%v/v

Relevant Information At Time Of Monitoring				
Monitored by (name, position):	Moh Yusuf			
Atmospheric Pressure (mB):	1023			
Weather:	Sunny			
Temperature (°C, between -10°C to +40°C only):	10			
Equipment Used (RSK Reference No.):	GA2000		**Last calibrated:**	
			Last calibrated:	
			Last calibrated:	
Visible Signs of Vegetation Stress:				
Other Comments / Observations:				
Boreholes Sampled For Laboratory Analysis:				

APPENDIX G
LOW-FLOW GROUNDWATER SAMPLING RECORDS

RSK Environment Limited
Fourways House
57 Hilton Street
Manchester
M1 2EJ
Tel: 0161 236 2757 Fax: 0161 236 2016

Site Name:	Mitton Road, Whalley
Project Number:	17134
Date:	23/03/12
Well ID:	WS2

1. Water Level Data: (Measured to the top of casing m). In every case also measure between top of well pipe & GL & record in comments

Total Well Length (m): **3.855**	**Length of Water Column (m):**	**Free Product (mm):** **None**
Depth to Water Table (m): **3.20**	**Casing Diameter (mm):** **50**	**Comments:**

2. Well Purging Methods:

Field Testing Equipment	Make	Model	Serial Number
	YSI	566	07L100518
	Eijkelkamp	Peristaltic pump	27278323
	Geo Tech	Interface Probe	3505

Time (24Hr)	Depth to Water (m)	Temp (°C)	pH	Spec. Cond (us/cm)	DO (%)	ORP (mV)	Colour / Odour
13.09	3.20	9.58	7.59	8605	86.5	9.7	Cloudy/odourless
13.14	3.20	9.62	7.50	8172	26.9	6.1	Cloudy/odourless
13.19	3.20	9.73	6.71	8186	10.9	11.8	Cloudy/odourless
13.24	3.20	9.96	6.90	8169	8.5	14.3	Cloudy/odourless
13.29	3.20	9.96	6.88	8170	7.2	16.3	Cloudy/odourless

	Yes	No	N/A
Acceptance criteria pass/fail			
Has required volume been removed			
Has required turbidity been reached			
Have parameters stabilized			

3. Sample Collection

Sample ID	Container Type	No. Containers	Preservation	Analysis Req.	Time
WS2	GB, PB, Vials	5	HNO3 for metals	TBC	13:29 to 13:55

RSK Environment Limited
Fourways House
57 Hilton Street
Manchester
M1 2EJ
Tel: 0161 236 2757 Fax: 0161 236 2016

Site Name:	Mitton Road, Whalley
Project Number:	17134
Date:	23/03/12
Well ID:	WS3

1. Water Level Data: (Measured to the top of casing m). In every case also measure between top of well pipe & GL & record in comments

Total Well Length (m): **2.93**	**Length of Water Column (m):**	**Free Product (mm):** **None**
Depth to Water Table (m): **2.50**	**Casing Diameter (mm):** **50**	**Comments:**

2. Well Purging Methods:

Field Testing Equipment	Make	Model	Serial Number
	YSI	566	07L100518
	Eijkelkamp	Peristaltic pump	27278323
	Geo Tech	Interface Probe	3505

Time (24Hr)	Depth to Water (m)	Temp (°C)	pH	Spec. Cond (us/cm)	DO (%)	ORP (mV)	Colour / Odour
14.02	2.50	10.42	7.73	8042	75.3	10.2	Brown & cloudy/odourless
14.07	2.50	10.66	7.68	7955	23.4	9.8	Brown & cloudy/odourless
14.12	2.50	10.68	7.0	7947	9.6	8.5	Brown & cloudy/odourless
14.17	2.50	10.68	6.93	7944	8.2	12.4	Brown & cloudy/odourless
14.22	2.50	10.68	6.95	7943	7.5	13.2	Brown & cloudy/odourless

	Yes	No	N/A
Acceptance criteria pass/fail			
Has required volume been removed			
Has required turbidity been reached			
Have parameters stabilized			

3. Sample Collection

Sample ID	Container Type	No. Containers	Preservation	Analysis Req.	Time
WS2	GB, PB, Vials	5	HNO3 for metals	TBC	14:22 to 14:40

RSK Environment Limited
Fourways House
57 Hilton Street
Manchester
M1 2EJ
Tel: 0161 236 2757 Fax: 0161 236 2016

Site Name:	Mitton Road, Whalley
Project Number:	17134
Date:	23/03/12
Well ID:	WS5

1. Water Level Data: (Measured to the top of casing m). In every case also measure between top of well pipe & GL & record in comments

Total Well Length (m): **3.78**	**Length of Water Column (m):**	**Free Product (mm):** **None**
Depth to Water Table (m): **2.89**	**Casing Diameter (mm):** **50**	**Comments:** Rapid drawdown of water in well. Insufficient groundwater recharge to allow stabilisation of parameters prior to sample collection.

2. Well Purging Methods:

Field Testing Equipment	Make	Model	Serial Number
	YSI	566	07L100518
	Eijkelkamp	Peristaltic pump	27278323
	Geo Tech	Interface Probe	3505

Time (24Hr)	Depth to Water (m)	Temp (°C)	pH	Spec. Cond (us/cm)	DO (%)	ORP (mV)	Colour / Odour
15.23	3.3	9.23	7.73	7093	10.3	24.9	Cloudy/odourless

Acceptance criteria pass/fail	N/A
Has required volume been removed	N/A
Has required turbidity been reached	N/A
Have parameters stabilized	No

3. Sample Collection

Sample ID	Container Type	No. Containers	Preservation	Analysis Req.	Time
WS2	PB, Vials	3	HNO3 for metals	TBC	15:24 to 15:55

APPENDIX H
LABORATORY CERTIFICATES FOR SOILS AND GROUNDWATER ANALYSIS – CHEMICAL

Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 12/01383
Issue Number: 1 **Date:** 03 April, 2012

Client:
RSK Environment Ltd Manchester
Fourways House
57 Hilton Street
Manchester
Lancashire
UK
M1 2EJ

Project Manager: Karl Hall / Mohammed Yusuf
Project Name: Whalley
Project Ref: 17134
Order No: Not specified
Date Samples Received: 19/03/12
Date Instructions Received: 22/03/12
Date Analysis Completed: 03/04/12

Prepared by:

Melanie Marshall
Laboratory Coordinator

Approved by:

Iain Haslock
Analytical Consultant

COOL BOX TEMPERATURES: 14.7, 14.7, 12.9, 10.8, 2.7 °C

Notes - Soil analysis
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 inert stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample bases. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.
Notes - General
Subscript "A" indicates analysis performed on the sample as received, "D" indicates analysis performed on dried & crushed sample.
All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts. Superscript "M" indicates method accredited to MCERTS.
The Deviating Samples report, which may be appended, indicates that samples were found to be deviating upon receipt or a holding time has been exceeded, therefore test results may not be an accurate record of the concentration at the time of sampling.
Predominant Matrix Codes - 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.
Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our MCERTS accreditation.
Secondary Matrix Codes - A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.
IS indicates Insufficient sample for analysis. NDP indicates No Determination Possible. NAD indicates No Asbestos Detected.
Superscript # indicates method accredited to ISO 17025.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.

Envirolab Job Number: 12/01383

Client Project Name: Whalley

Client Project Ref: 17134

Lab Sample ID	12/01383/2	12/01383/4	12/01383/9	12/01383/13	12/01383/14	12/01383/15	12/01383/16	12/01383/17	Units	Method ref
Client Sample No	2	1	1	1	1	1	2	1		
Client Sample ID	TP1	TP2	TP5	TP8	TP9	WS1	WS1	WS2		
Depth to Top	0.40	0.20	1.00	0.50	0.40	0.50	2.00	0.70		
Depth To Bottom										
Date Sampled	15-Mar-12	15-Mar-12	15-Mar-12	15-Mar-12	15-Mar-12	16-Mar-12	16-Mar-12	16-Mar-12		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4E	6E	5A	5	3E	5E	5A	3E		
pH_D M#	6.69	6.44	-	6.53	6.71	6.41	-	7.03	pH	A-T-031s
pH BRE_D M#	-	-	6.95	-	-	-	7.61	-	pH	A-T-031s
Sulphate BRE (water sol 2:1)$_D$ M#	-	-	25	-	-	-	<10	-	mg/l	A-T-026s
Total Organic $Carbon_D$ #	3.07	3.88	-	0.72	-	0.80	-	-	% w/w	A-T-032s
$Arsenic_D$ M#	7	7	-	<1	<1	5	-	5	mg/kg	A-T-024
$Cadmium_D$ M#	0.6	0.6	-	<0.5	<0.5	0.7	-	0.6	mg/kg	A-T-024
$Copper_D$ M#	35	23	-	10	8	15	-	19	mg/kg	A-T-024
$Chromium_D$ #	21	17	-	27	26	24	-	52	mg/kg	A-T-024
$Lead_D$ M#	70	43	-	19	16	23	-	27	mg/kg	A-T-024
$Mercury_D$	<0.17	<0.17	-	<0.17	<0.17	<0.17	-	0.24	mg/kg	A-T-024
$Nickel_D$ M#	14	12	-	15	14	16	-	29	mg/kg	A-T-024
$Selenium_D$ M#	1	1	-	<1	1	2	-	2	mg/kg	A-T-024
$Zinc_D$ M#	66	71	-	78	54	76	-	118	mg/kg	A-T-024

Envirolab Job Number: 12/01383

Client Project Name: Whalley

Client Project Ref: 17134

Lab Sample ID	12/01383/2	12/01383/4	12/01383/9	12/01383/13	12/01383/14	12/01383/15	12/01383/16	12/01383/17	Units	Method ref
Client Sample No	2	1	1	1	1	1	2	1		
Client Sample ID	TP1	TP2	TP5	TP8	TP9	WS1	WS1	WS2		
Depth to Top	0.40	0.20	1.00	0.50	0.40	0.50	2.00	0.70		
Depth To Bottom										
Date Sampled	15-Mar-12	15-Mar-12	15-Mar-12	15-Mar-12	15-Mar-12	16-Mar-12	16-Mar-12	16-Mar-12		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4E	6E	5A	5	3E	5E	5A	3E		
PAH 16										
Acenaphthene$_A^{M\#}$	0.03	0.04	-	-	<0.01	0.02	-	<0.01	mg/kg	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01	<0.01	-	-	<0.01	<0.01	-	<0.01	mg/kg	A-T-019s
Anthracene$_A^{\#}$	0.03	0.03	-	-	<0.01	<0.01	-	<0.01	mg/kg	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	0.03	0.12	-	-	<0.01	<0.01	-	<0.01	mg/kg	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	0.03	0.16	-	-	<0.01	<0.01	-	<0.01	mg/kg	A-T-019s
Benzo(b)fluoranthene$_A$	0.03	0.23	-	-	<0.01	<0.01	-	<0.01	mg/kg	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	0.04	0.20	-	-	<0.01	<0.01	-	<0.01	mg/kg	A-T-019s
Benzo(k)fluoranthene$_A$	0.03	0.05	-	-	<0.01	<0.01	-	<0.01	mg/kg	A-T-019s
Chrysene$_A^{M\#}$	0.04	0.16	-	-	<0.01	<0.01	-	<0.01	mg/kg	A-T-019s
Dibenzo(ah)anthracene$_A$	0.04	0.01	-	-	<0.01	<0.01	-	<0.01	mg/kg	A-T-019s
Fluoranthene$_A^{M\#}$	<0.01	0.33	-	-	<0.01	<0.01	-	<0.01	mg/kg	A-T-019s
Fluorene$_A^{M\#}$	0.03	0.03	-	-	0.01	<0.01	-	<0.01	mg/kg	A-T-019s
Indeno(123-cd)pyrene$_A^{\#}$	0.04	0.08	-	-	<0.01	<0.01	-	<0.01	mg/kg	A-T-019s
Naphthalene$_A^{M\#}$	0.04	0.20	-	-	0.08	0.06	-	0.11	mg/kg	A-T-019s
Phenanthrene$_A^{M\#}$	<0.01	0.15	-	-	<0.01	0.02	-	<0.01	mg/kg	A-T-019s
Pyrene$_A^{M\#}$	<0.01	0.30	-	-	0.03	0.02	-	<0.01	mg/kg	A-T-019s
Total PAH$_A$	0.38	2.11	-	-	0.11	0.14	-	0.11	mg/kg	A-T-019s

Envirolab Job Number: 12/01383

Client Project Name: Whalley

Client Project Ref: 17134

Lab Sample ID	12/01383/2	12/01383/4	12/01383/9	12/01383/13	12/01383/14	12/01383/15	12/01383/16	12/01383/17	Units	Method ref
Client Sample No	2	1	1	1	1	1	2	1		
Client Sample ID	TP1	TP2	TP5	TP8	TP9	WS1	WS1	WS2		
Depth to Top	0.40	0.20	1.00	0.50	0.40	0.50	2.00	0.70		
Depth To Bottom										
Date Sampled	15-Mar-12	15-Mar-12	15-Mar-12	15-Mar-12	15-Mar-12	16-Mar-12	16-Mar-12	16-Mar-12		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4E	6E	5A	5	3E	5E	5A	3E		
TPH CWG										
Ali >C5-C6$_A^\#$	-	<0.01	-	<0.01	-	-	-	-	mg/kg	A-T-022s
Ali >C6-C8$_A^\#$	-	<0.01	-	<0.01	-	-	-	-	mg/kg	A-T-022s
Ali >C8-C10$_A^\#$	-	<0.01	-	<0.01	-	-	-	-	mg/kg	A-T-022s
Ali >C10-C12$_A^\#$	-	<0.1	-	<0.1	-	-	-	-	mg/kg	A-T-023s
Ali >C12-C16$_A^\#$	-	<0.1	-	<0.1	-	-	-	-	mg/kg	A-T-023s
Ali >C16-C21$_A^\#$	-	<0.1	-	<0.1	-	-	-	-	mg/kg	A-T-023s
Ali >C21-C35$_A^\#$	-	<0.1	-	<0.1	-	-	-	-	mg/kg	A-T-023s
Total Aliphatics$_A^\#$	-	<0.1	-	<0.1	-	-	-	-	mg/kg	A-T-022+23s
Aro >C5-C7$_A^\#$	-	<0.01	-	<0.01	-	-	-	-	mg/kg	A-T-022s
Aro >C7-C8$_A^\#$	-	<0.01	-	<0.01	-	-	-	-	mg/kg	A-T-022s
Aro >C8-C9$_A^\#$	-	<0.01	-	<0.01	-	-	-	-	mg/kg	A-T-022s
Aro >C9-C10$_A^\#$	-	<0.01	-	<0.01	-	-	-	-	mg/kg	A-T-022s
Aro >C10-C12$_A^\#$	-	<0.1	-	<0.1	-	-	-	-	mg/kg	A-T-023s
Aro >C12-C16$_A^\#$	-	<0.1	-	<0.1	-	-	-	-	mg/kg	A-T-023s
Aro >C16-C21$_A^\#$	-	<0.1	-	<0.1	-	-	-	-	mg/kg	A-T-023s
Aro >C21-C35$_A^\#$	-	<0.1	-	<0.1	-	-	-	-	mg/kg	A-T-023s
Total Aromatics$_A^\#$	-	<0.1	-	<0.1	-	-	-	-	mg/kg	A-T-022+23s
TPH (Ali & Aro)$_A^\#$	-	<0.1	-	<0.1	-	-	-	-	mg/kg	A-T-022+23s
BTEX - Benzene$_A^\#$	-	<0.01	-	<0.01	-	-	-	-	mg/kg	A-T-022s
BTEX - Toluene$_A^\#$	-	<0.01	-	<0.01	-	-	-	-	mg/kg	A-T-022s
BTEX - Ethyl Benzene$_A^\#$	-	<0.01	-	<0.01	-	-	-	-	mg/kg	A-T-022s
BTEX - m & p Xylene$_A^\#$	-	<0.01	-	<0.01	-	-	-	-	mg/kg	A-T-022s
BTEX - o Xylene$_A^\#$	-	<0.01	-	<0.01	-	-	-	-	mg/kg	A-T-022s
MTBE$_A$	-	<0.01	-	<0.01	-	-	-	-	mg/kg	A-T-022s

Envirolab Job Number: 12/01383

Client Project Name: Whalley

Client Project Ref: 17134

Lab Sample ID	12/01383/18	12/01383/19	12/01383/21	12/01383/22					Units	Method ref
Client Sample No	2	1	1	1						
Client Sample ID	WS2	WS3	WS4	WS5						
Depth to Top	1.50	0.50	1.40	1.00						
Depth To Bottom										
Date Sampled	16-Mar-12	16-Mar-12	16-Mar-12	16-Mar-12						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	5	5AE	5	3E						
pH_D M#	7.22	-	-	-					pH	A-T-031s
pH BRE_D M#	-	6.62	7.12	6.83					pH	A-T-031s
Sulphate BRE (water sol 2:1)$_D$ M#	-	<10	18	19					mg/l	A-T-026s
Total Organic $Carbon_D$ #	0.34	1.07	-	0.51					% w/w	A-T-032s
$Arsenic_D$ M#	5	4	-	1					mg/kg	A-T-024
$Cadmium_D$ M#	<0.5	0.6	-	<0.5					mg/kg	A-T-024
$Copper_D$ M#	11	19	-	15					mg/kg	A-T-024
$Chromium_D$ #	18	27	-	42					mg/kg	A-T-024
$Lead_D$ M#	11	39	-	19					mg/kg	A-T-024
$Mercury_D$	<0.17	<0.17	-	0.17					mg/kg	A-T-024
$Nickel_D$ M#	12	17	-	30					mg/kg	A-T-024
$Selenium_D$ M#	<1	<1	-	<1					mg/kg	A-T-024
$Zinc_D$ M#	43	71	-	92					mg/kg	A-T-024

Envirolab Job Number: 12/01383

Client Project Name: Whalley

Client Project Ref: 17134

Lab Sample ID	12/01383/18	12/01383/19	12/01383/21	12/01383/22					Units	Method ref
Client Sample No	2	1	1	1						
Client Sample ID	WS2	WS3	WS4	WS5						
Depth to Top	1.50	0.50	1.40	1.00						
Depth To Bottom										
Date Sampled	16-Mar-12	16-Mar-12	16-Mar-12	16-Mar-12						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	5	5AE	5	3E						
PAH 16										
Acenaphthene$_A^{M\#}$	0.04	-	-	-					mg/kg	A-T-019s
Acenaphthylene$_A^{M\#}$	0.01	-	-	-					mg/kg	A-T-019s
Anthracene$_A^{\#}$	0.02	-	-	-					mg/kg	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	0.01	-	-	-					mg/kg	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	<0.01	-	-	-					mg/kg	A-T-019s
Benzo(b)fluoranthene$_A$	<0.01	-	-	-					mg/kg	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	0.02	-	-	-					mg/kg	A-T-019s
Benzo(k)fluoranthene$_A$	<0.01	-	-	-					mg/kg	A-T-019s
Chrysene$_A^{M\#}$	0.01	-	-	-					mg/kg	A-T-019s
Dibenzo(ah)anthracene$_A$	0.04	-	-	-					mg/kg	A-T-019s
Fluoranthene$_A^{M\#}$	<0.01	-	-	-					mg/kg	A-T-019s
Fluorene$_A^{M\#}$	0.02	-	-	-					mg/kg	A-T-019s
Indeno(123-cd)pyrene$_A^{\#}$	<0.01	-	-	-					mg/kg	A-T-019s
Naphthalene$_A^{M\#}$	0.06	-	-	-					mg/kg	A-T-019s
Phenanthrene$_A^{M\#}$	0.01	-	-	-					mg/kg	A-T-019s
Pyrene$_A^{M\#}$	<0.01	-	-	-					mg/kg	A-T-019s
Total PAH$_A$	0.26	-	-	-					mg/kg	A-T-019s

Envirolab Job Number: 12/01383

Client Project Name: Whalley

Client Project Ref: 17134

Lab Sample ID	12/01383/18	12/01383/19	12/01383/21	12/01383/22					Units	Method ref
Client Sample No	2	1	1	1						
Client Sample ID	WS2	WS3	WS4	WS5						
Depth to Top	1.50	0.50	1.40	1.00						
Depth To Bottom										
Date Sampled	16-Mar-12	16-Mar-12	16-Mar-12	16-Mar-12						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	5	5AE	5	3E						
TPH CWG										
Ali >C5-C6$_A^{\#}$	<0.01	-	-	<0.01					mg/kg	A-T-022s
Ali >C6-C8$_A^{\#}$	<0.01	-	-	<0.01					mg/kg	A-T-022s
Ali >C8-C10$_A^{\#}$	<0.01	-	-	<0.01					mg/kg	A-T-022s
Ali >C10-C12$_A^{\#}$	<0.1	-	-	<0.1					mg/kg	A-T-023s
Ali >C12-C16$_A^{\#}$	<0.1	-	-	<0.1					mg/kg	A-T-023s
Ali >C16-C21$_A^{\#}$	<0.1	-	-	<0.1					mg/kg	A-T-023s
Ali >C21-C35$_A^{\#}$	<0.1	-	-	<0.1					mg/kg	A-T-023s
Total Aliphatics$_A^{\#}$	<0.1	-	-	<0.1					mg/kg	A-T-022+23s
Aro >C5-C7$_A^{\#}$	<0.01	-	-	<0.01					mg/kg	A-T-022s
Aro >C7-C8$_A^{\#}$	<0.01	-	-	<0.01					mg/kg	A-T-022s
Aro >C8-C9$_A^{\#}$	<0.01	-	-	<0.01					mg/kg	A-T-022s
Aro >C9-C10$_A^{\#}$	<0.01	-	-	<0.01					mg/kg	A-T-022s
Aro >C10-C12$_A^{\#}$	<0.1	-	-	<0.1					mg/kg	A-T-023s
Aro >C12-C16$_A^{\#}$	<0.1	-	-	<0.1					mg/kg	A-T-023s
Aro >C16-C21$_A^{\#}$	<0.1	-	-	<0.1					mg/kg	A-T-023s
Aro >C21-C35$_A^{\#}$	<0.1	-	-	<0.1					mg/kg	A-T-023s
Total Aromatics$_A^{\#}$	<0.1	-	-	<0.1					mg/kg	A-T-022+23s
TPH (Ali & Aro)$_A^{\#}$	<0.1	-	-	<0.1					mg/kg	A-T-022+23s
BTEX - Benzene$_A^{\#}$	<0.01	-	-	<0.01					mg/kg	A-T-022s
BTEX - Toluene$_A^{\#}$	<0.01	-	-	<0.01					mg/kg	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	<0.01	-	-	<0.01					mg/kg	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	<0.01	-	-	<0.01					mg/kg	A-T-022s
BTEX - o Xylene$_A^{\#}$	<0.01	-	-	<0.01					mg/kg	A-T-022s
MTBE$_A$	<0.01	-	-	<0.01					mg/kg	A-T-022s

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: RSK Environment Ltd Manchester, Fourways House, 57 Hilton Street, , Manchester, Lancashire , UK, M1 2EJ **Project No:** 12/01383
Date Received: 22/03/2012 (am)

Project: Whalley
Clients Project No: 17134

Lab Sample ID	12/01383/2	12/01383/4	12/01383/9	12/01383/13	12/01383/14	12/01383/15	12/01383/16	12/01383/17	12/01383/18	12/01383/19	12/01383/21	12/01383/22
Client Sample No	2	1	1	1	1	1	2	1	2	1	1	1
Client Sample ID/Depth	TP1 0.40m	TP2 0.20m	TP5 1.00m	TP8 0.50m	TP9 0.40m	WS1 0.50m	WS1 2.00m	WS2 0.70m	WS2 1.50m	WS3 0.50m	WS4 1.40m	WS5 1.00m
Date Sampled	15/03/12	15/03/12	15/03/12	15/03/12	15/03/12	16/03/12	16/03/12	16/03/12	16/03/12	16/03/12	16/03/12	16/03/12
Deviation Code												
B				✓								
F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Key
B Separate container not supplied for volatiles analysis
F Maximum holding time exceeded between sampling date and analysis for analytes listed below

HOLDING TIME EXCEEDANCES

Lab Sample ID	12/01383/2	12/01383/4	12/01383/9	12/01383/13	12/01383/14	12/01383/15	12/01383/16	12/01383/17	12/01383/18	12/01383/19	12/01383/21	12/01383/22
Client Sample No	2	1	1	1	1	1	2	1	2	1	1	1
Client Sample ID/Depth	TP1 0.40m	TP2 0.20m	TP5 1.00m	TP8 0.50m	TP9 0.40m	WS1 0.50m	WS1 2.00m	WS2 0.70m	WS2 1.50m	WS3 0.50m	WS4 1.40m	WS5 1.00m
Date Sampled	15/03/12	15/03/12	15/03/12	15/03/12	15/03/12	16/03/12	16/03/12	16/03/12	16/03/12	16/03/12	16/03/12	16/03/12
pH	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 12/01424
Issue Number: 1 **Date:** 30 March, 2012

Client:
RSK Environment Ltd Manchester
Fourways House
57 Hilton Street
Manchester
Lancashire
UK
M1 2EJ

Project Manager: Karl Hall / Mohammed Yusef
Project Name: Whalley
Project Ref: 17134
Order No: Not specified
Date Samples Received: 26/03/12
Date Instructions Received: 27/03/12
Date Analysis Completed: 30/03/12

Prepared by:

Melanie Marshall
Laboratory Coordinator

Approved by:

Liz McDermott
Project Coordinator

COOL BOX TEMPERATURES: 3.9 °C

Notes - Soil analysis
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 inert stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample bases. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.
Notes - General
Subscript "A" indicates analysis performed on the sample as received, "D" indicates analysis performed on dried & crushed sample.
All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts. Superscript "M" indicates method accredited to MCERTS.
The Deviating Samples report, which may be appended, indicates that samples were found to be deviating upon receipt or a holding time has been exceeded, therefore test results may not be an accurate record of the concentration at the time of sampling.
Predominant Matrix Codes - 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.
Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our MCERTS accreditation.
Secondary Matrix Codes - A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.
IS indicates Insufficient sample for analysis. NDP indicates No Determination Possible. NAD indicates No Asbestos Detected.
Superscript # indicates method accredited to ISO 17025.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.

UKAS TESTING
1247

Envirolab Job Number: 12/01424

Client Project Name: Whalley

Client Project Ref: 17134

Lab Sample ID	12/01424/1	12/01424/2	12/01424/3						Units	Method ref
Client Sample No	`	2	3							
Client Sample ID	WS2	WS3	WS5							
Depth to Top	3.20	2.70	3.20							
Depth To Bottom										
Date Sampled	23-Mar-12	23-Mar-12	23-Mar-12							
Sample Type	Water - GW	Water - GW	Water - GW							
Sample Matrix Code										
Alkalinity (total) (w)$_A^\#$	295	-	-						mg/l Ca CO3	A-T-038
Arsenic (dissolved)$_A^\#$	<1	<1	5						µg/l	A-T-025
Cadmium (dissolved)$_A^\#$	<1	<1	<1						µg/l	A-T-025
Copper (dissolved)$_A^\#$	3	<1	3						µg/l	A-T-025
Chromium (dissolved)$_A^\#$	<1	<1	<1						µg/l	A-T-025
Lead (dissolved)$_A^\#$	<1	<1	<1						µg/l	A-T-025
Mercury (dissolved)$_A^\#$	<0.1	<0.1	<0.1						µg/l	A-T-025
Nickel (dissolved)$_A^\#$	3	<1	1						µg/l	A-T-025
Selenium (dissolved)$_A^\#$	<1	<1	<1						µg/l	A-T-025
Zinc (dissolved)$_A^\#$	9	3	5						µg/l	A-T-025

Envirolab Job Number: 12/01424

Client Project Name: Whalley

Client Project Ref: 17134

Lab Sample ID	12/01424/1	12/01424/2	12/01424/3						Units	Method ref
Client Sample No	`	2	3							
Client Sample ID	WS2	WS3	WS5							
Depth to Top	3.20	2.70	3.20							
Depth To Bottom										
Date Sampled	23-Mar-12	23-Mar-12	23-Mar-12							
Sample Type	Water - GW	Water - GW	Water - GW							
Sample Matrix Code										
PAH 16MS										
Acenaphthene (w)$_A$	NDP - IS	-	-						µg/l	A-T-019w
Acenaphthylene (w)$_A$	NDP - IS	-	-						µg/l	A-T-019w
Anthracene (w)$_A$	NDP - IS	-	-						µg/l	A-T-019w
Benzo(a)anthracene (w)$_A$	NDP - IS	-	-						µg/l	A-T-019w
Benzo(a)pyrene (w)$_A$	NDP - IS	-	-						µg/l	A-T-019w
Benzo(b)fluoranthene (w)$_A$	NDP - IS	-	-						µg/l	A-T-019w
Benzo(ghi)perylene (w)$_A$	NDP - IS	-	-						µg/l	A-T-019w
Benzo(k)fluoranthene (w)$_A$	NDP - IS	-	-						µg/l	A-T-019w
Chrysene (w)$_A$	NDP - IS	-	-						µg/l	A-T-019w
Dibenzo(ah)anthracene (w)$_A$	NDP - IS	-	-						µg/l	A-T-019w
Fluoranthene (w)$_A$	NDP - IS	-	-						µg/l	A-T-019w
Fluorene (w)$_A$	NDP - IS	-	-						µg/l	A-T-019w
Indeno(123-cd)pyrene (w)$_A$	NDP - IS	-	-						µg/l	A-T-019w
Naphthalene (w)$_A$	NDP - IS	-	-						µg/l	A-T-019w
Phenanthrene (w)$_A$	NDP - IS	-	-						µg/l	A-T-019w
Pyrene (w)$_A$	NDP - IS	-	-						µg/l	A-T-019w
Total PAH (w)$_A$	NDP - IS	-	-						µg/l	A-T-019w

Envirolab Job Number: 12/01424

Client Project Name: Whalley

Client Project Ref: 17134

Lab Sample ID	12/01424/1	12/01424/2	12/01424/3						Units	Method ref
Client Sample No	`	2	3							
Client Sample ID	WS2	WS3	WS5							
Depth to Top	3.20	2.70	3.20							
Depth To Bottom										
Date Sampled	23-Mar-12	23-Mar-12	23-Mar-12							
Sample Type	Water - GW	Water - GW	Water - GW							
Sample Matrix Code										
TPH CWG										
Ali >C5-C6 $(w)_A$	<1	<1	-						µg/l	A-T-022w
Ali >C6-C8 $(w)_A$	<1	<1	-						µg/l	A-T-022w
Ali >C8-C10 $(w)_A$	<1	<1	-						µg/l	A-T-022w
Ali >C10-C12 $(w)_A^{\#}$	<5	<5	-						µg/l	A-T-023w
Ali >C12-C16 $(w)_A^{\#}$	<5	<5	-						µg/l	A-T-023w
Ali >C16-C21 $(w)_A^{\#}$	<5	<5	-						µg/l	A-T-023w
Ali >C21-C35 $(w)_A^{\#}$	<5	<5	-						µg/l	A-T-023w
Total Aliphatics $(w)_A$	<5	<5	-						µg/l	A-T-022+23w
Aro >C5-C7 $(w)_A$	<1	<1	-						µg/l	A-T-022w
Aro >C7-C8 $(w)_A$	<1	<1	-						µg/l	A-T-022w
Aro >C8-C9 $(w)_A$	<1	<1	-						µg/l	A-T-022w
Aro >C9-C10 $(w)_A$	<1	<1	-						µg/l	A-T-022w
Aro >C10-C12 $(w)_A^{\#}$	<5	<5	-						µg/l	A-T-023w
Aro >C12-C16 $(w)_A^{\#}$	<5	<5	-						µg/l	A-T-023w
Aro >C16-C21 $(w)_A^{\#}$	<5	<5	-						µg/l	A-T-023w
Aro >C21-C35 $(w)_A^{\#}$	<5	<5	-						µg/l	A-T-023w
Total Aromatics $(w)_A$	<5	<5	-						µg/l	A-T-022+23w
TPH (Ali & Aro) $(w)_A$	<5	<5	-						µg/l	A-T-022+23w
BTEX - Benzene $(w)_A$	<1	<1	-						µg/l	A-T-022w
BTEX - Ethyl Benzene $(w)_A$	<1	<1	-						µg/l	A-T-022w
BTEX - Toluene $(w)_A$	<1	<1	-						µg/l	A-T-022w
BTEX - m & p Xylene $(w)_A$	<1	<1	-						µg/l	A-T-022w
BTEX - o Xylene $(w)_A$	<1	<1	-						µg/l	A-T-022w
MTBE $(w)_A$	<1	<1	-						µg/l	A-T-022w

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: RSK Environment Ltd Manchester, Fourways House, 57 Hilton Street, , Manchester, Lancashire , UK, M1 2EJ

Project No: 12/01424

Date Received: 27/03/2012 (am)

Project: Whalley

Clients Project No: 17134

NO DEVIATIONS IDENTIFIED

APPENDIX I
LABORATORY CERTIFICATES FOR SOILS ANALYSIS – GEOTECHNICAL

TESTING VERIFICATION CERTIFICATE

UKAS TESTING
1774

The test results included in this report are certified as:-

ISSUE STATUS: **FINAL**

CHECKING STATUS: **CHECKED**

In accordance with Structural Soils Ltd Laboratory Quality Assurance Manual, Issue 6, January 2010 all results sheets and summaries of results issued by the laboratory are checked by an approved signatory. This check will also involve checking of at least 10% of calculations for each test type to ensure that data has been correctly entered into the computer and calculated. The integrity of the test data and results are ensured by control of the computer system employed by the laboratory as part of the Software Verification Program as detailed in the Laboratory Quality Assurance Manual.

This testing verification certificate covers all testing compiled on or before the following datetime: **30/03/2012 16:22:47**.

Testing reported after this date is not covered by this Verification Certificate.

Approved Signatory
Mark Athorne (Laboratory Quality Manager)

STRUCTURAL SOILS The Potteries Pottery Street Castleford W. Yorkshire WF10 1NJ	Contract: **Whalley**	Job No: **780651**
		Sheet 1 of 9 AGS

STRUCTURAL SOILS LTD

TEST REPORT

Report No. 780651 r01

Date	30-March-2012	Contract	Whalley

Client RSK Environment Ltd
Address Spring Lodge
172 Chester Road
Helsby
Cheshire WA6 0AR

For the Attention of Moh Yusuf

Samples submitted by client	26/03/2012	Client Reference	17134
Testing Started	26/03/2012	Client Order No.	
Testing Completed	30/03/2012	Instruction Type	Written

Ukas Accredited Tests Underatken

Moisture Content (oven drying method) BS1377:Part 2:1990,clause 3.2
Liquid Limit (definitive method) BS1377:Part 2:1990,clause 4.3
Plastic Limit BS1377:Part 2:1990,clause 5.3
Plasticity Index Derivation BS1377:Part 2:1990,clause 5.4
Particle Size Distribution wet sieve method BS1377:Part 2:1990,clause 9.2

Please Note: Remaining samples will be retained for a period of one month from today and will then be disposed of

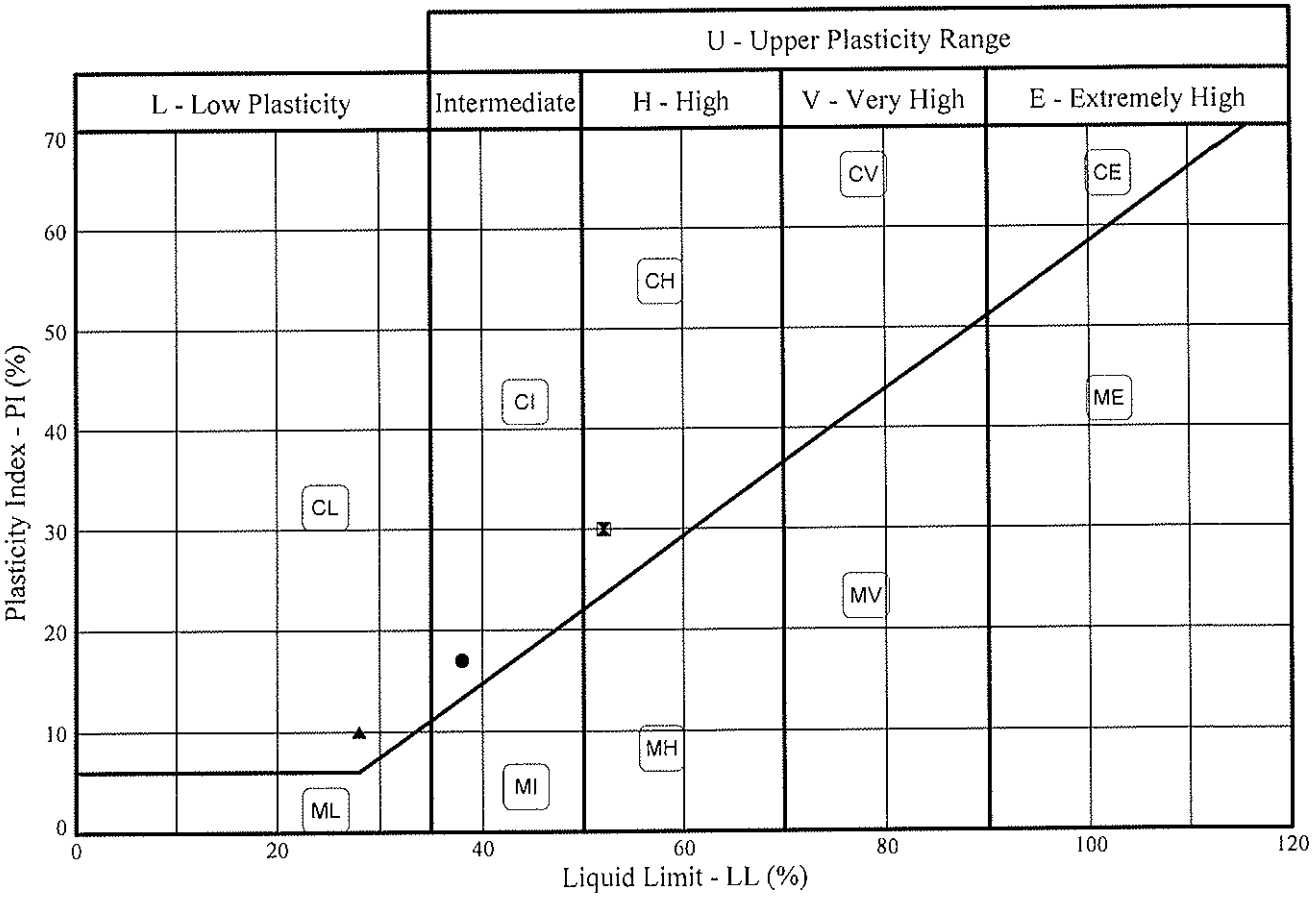
SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index %	% <425um	Description of Sample
TP8	1	D	1.50	25	38	21	17	100	Grey sandy CLAY
WS1	1	D	2.50	31	52	22	30	100	Brown slightly sandy CLAY
WS5	1	D	1.50	21	28	18	10	100	Light brown sandy CLAY

PLASTICITY CHART - PI Vs LL

In accordance with clause 42.3 of BS5930:1981
Testing in accordance with BS1377-2:1990



Sample Identification				BS Test Method #	Preparation Method +	MC %	LL %	PL %	PI %	<425um %
	Exploratory Position ID	Sample	Depth (m)							
●	TP8	1D	1.50	3.2/4.3/5.3/5.4	4.2.3	25	38	21	17	100
⊠	WS1	1D	2.50	3.2/4.3/5.3/5.4	4.2.3	31	52	22	30	100
▲	WS5	1D	1.50	3.2/4.3/5.3/5.4	4.2.3	21	28	18	10	100

Tested in accordance with the following clauses of BS1377-2:1990.

3.2 - Moisture Content
4.3 - Cone Penetrometer Method
4.4 - One Point Cone Penetrometer Method
4.6 - One Point Casagrande Method
5.3 - Plastic Limit Method
5.4 - Plasticity Index

+ Tested in accordanee with the following clauses of BS1377-2:1990.

4.2.3 - Natural State
4.2.4 - Wet Sieved

Key: * = Non standard test, NP = Non plastic.

Approved Signatories: M. ATHORNE S. ROYLE M. FISHER C. COLE

STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1NJ

Compiled By	Date
M. Fisher. MAUREEN FISHER	30/03/12

Contract: **Whalley**

Contract Ref: **780651**

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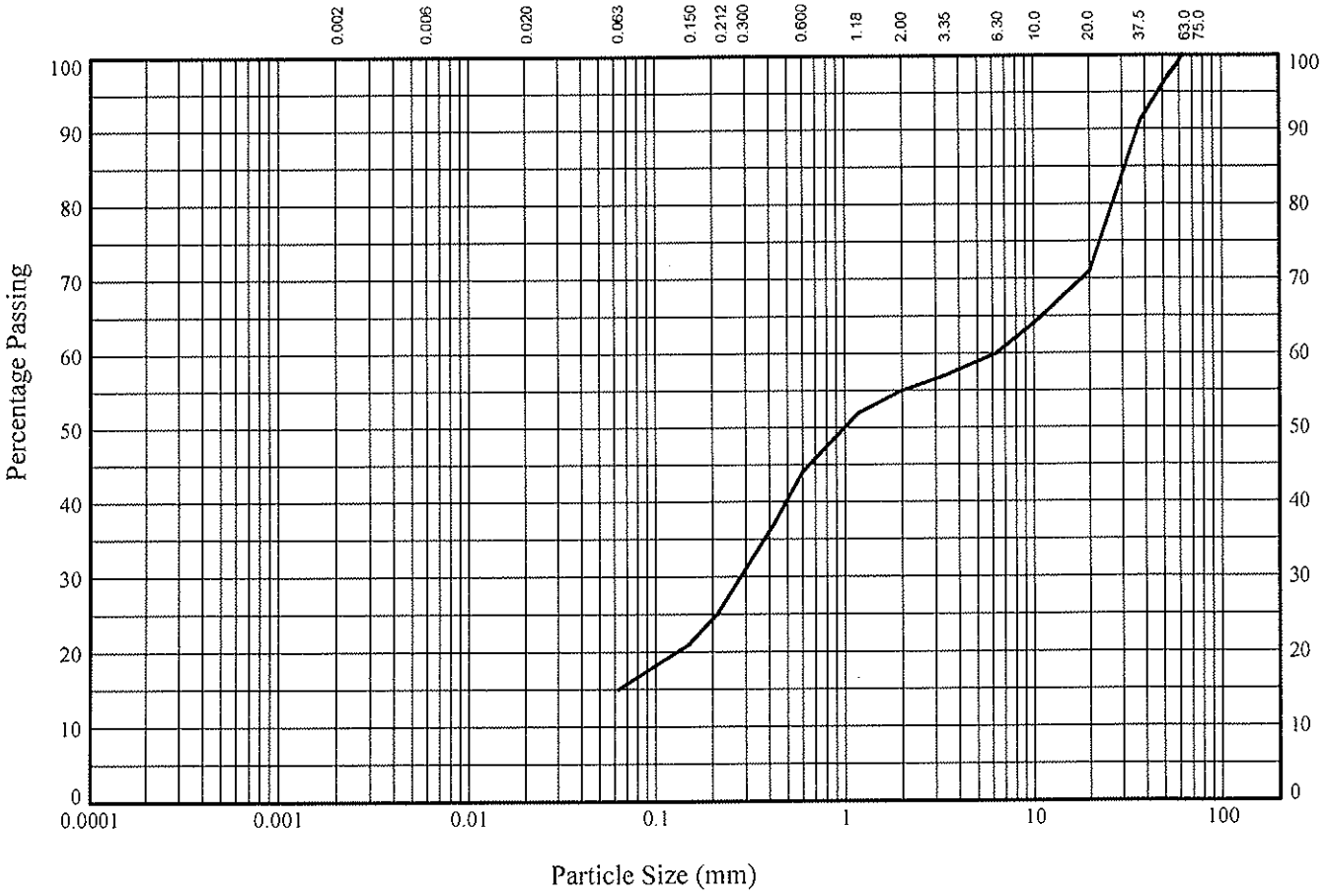
AGS

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2,9.5 of BS1377:Part 2:1990

Trial Pit : **TP5** Sample Ref: **1** Sample Type: **D** Depth (m): **1.00**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

BS Test Sieve (mm)	Percentage Passing
125.0	100
75.0	100
63.0	100
37.5	91
20.0	71
10.0	64
6.30	60
3.35	57
2.00	55
1.18	52
0.600	44
0.425	37
0.212	25
0.150	21
0.063	15

Particle Diameter	Percentage Passing

Soil Fraction	Sieve Percentage
GRAVEL	**45**
SAND	**40**
SILT/CLAY	**15**

Soil Description:
Red brown sandy gravelly CLAY

Approved Signatories: M. ATHORNE S. ROYLE M. FISHER C. COLE

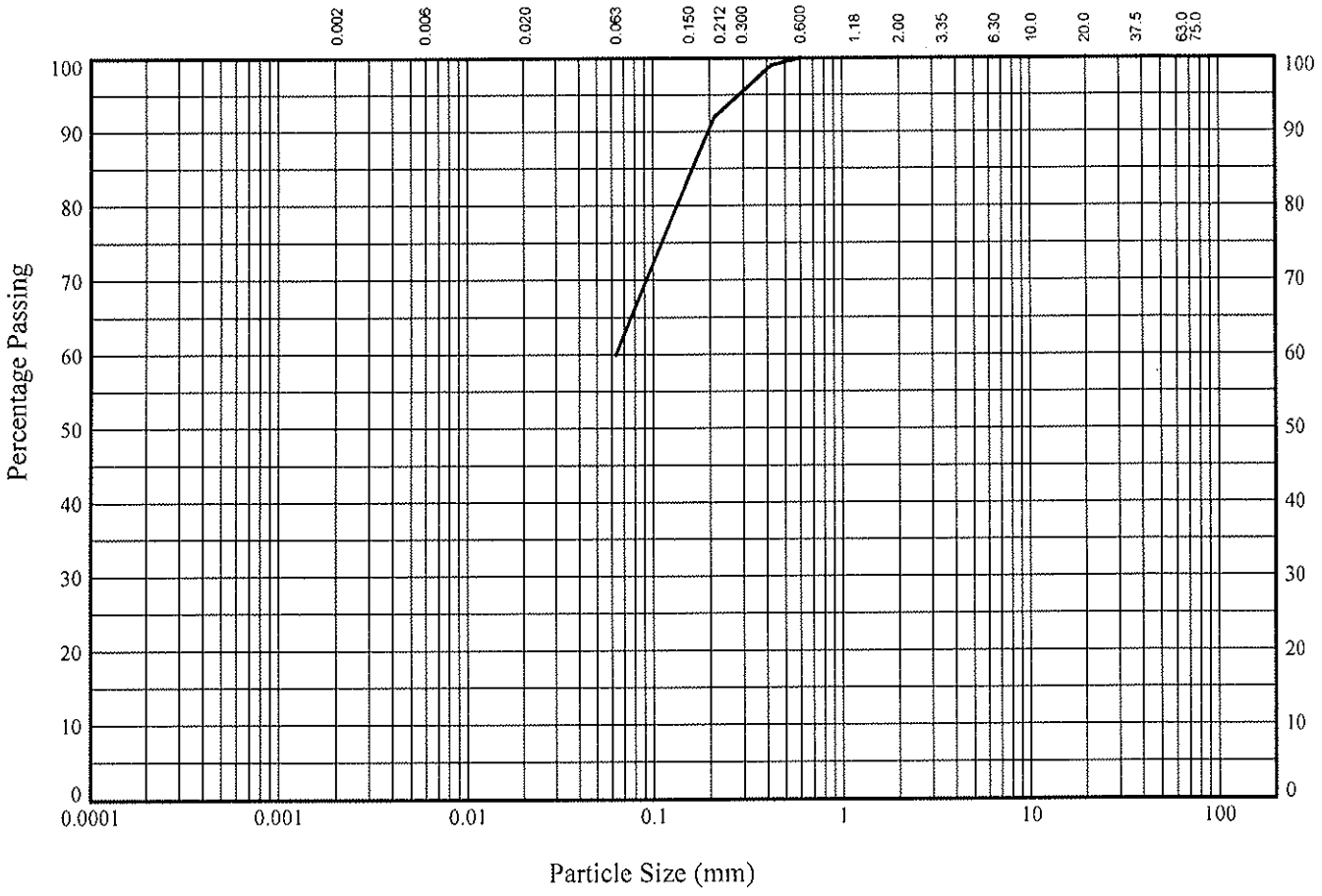
STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1NJ

Compiled By		Date
M. Fisher	MAUREEN FISHER	30/03/12
Contract: **Whalley**	Contract Ref: **780651**	
	Page 5 of 9	AGS

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2,9.5 of BS1377:Part 2:1990

Trial Pit : **TP8** Sample Ref: **1** Sample Type: **D** Depth (m): **1.50**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

BS Test Sieve (mm)	Percentage Passing
125.0	100
75.0	100
63.0	100
37.5	100
20.0	100
10.0	100
6.30	100
3.35	100
2.00	100
1.18	100
0.600	100
0.425	99
0.212	92
0.150	83
0.063	60

Particle Diameter	Percentage Passing

Soil Fraction	Sieve Percentage
GRAVEL	**0**
SAND	**40**
SILT/CLAY	**60**

Soil Description:
Grey sandy CLAY

Approved Signatories: M. ATHORNE S. ROYLE M. FISHER C. COLE

STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1NJ

Compiled By		Date
M. Fisher	MAUREEN FISHER	30/03/12

Contract: **Whalley**

Contract Ref: **780651**

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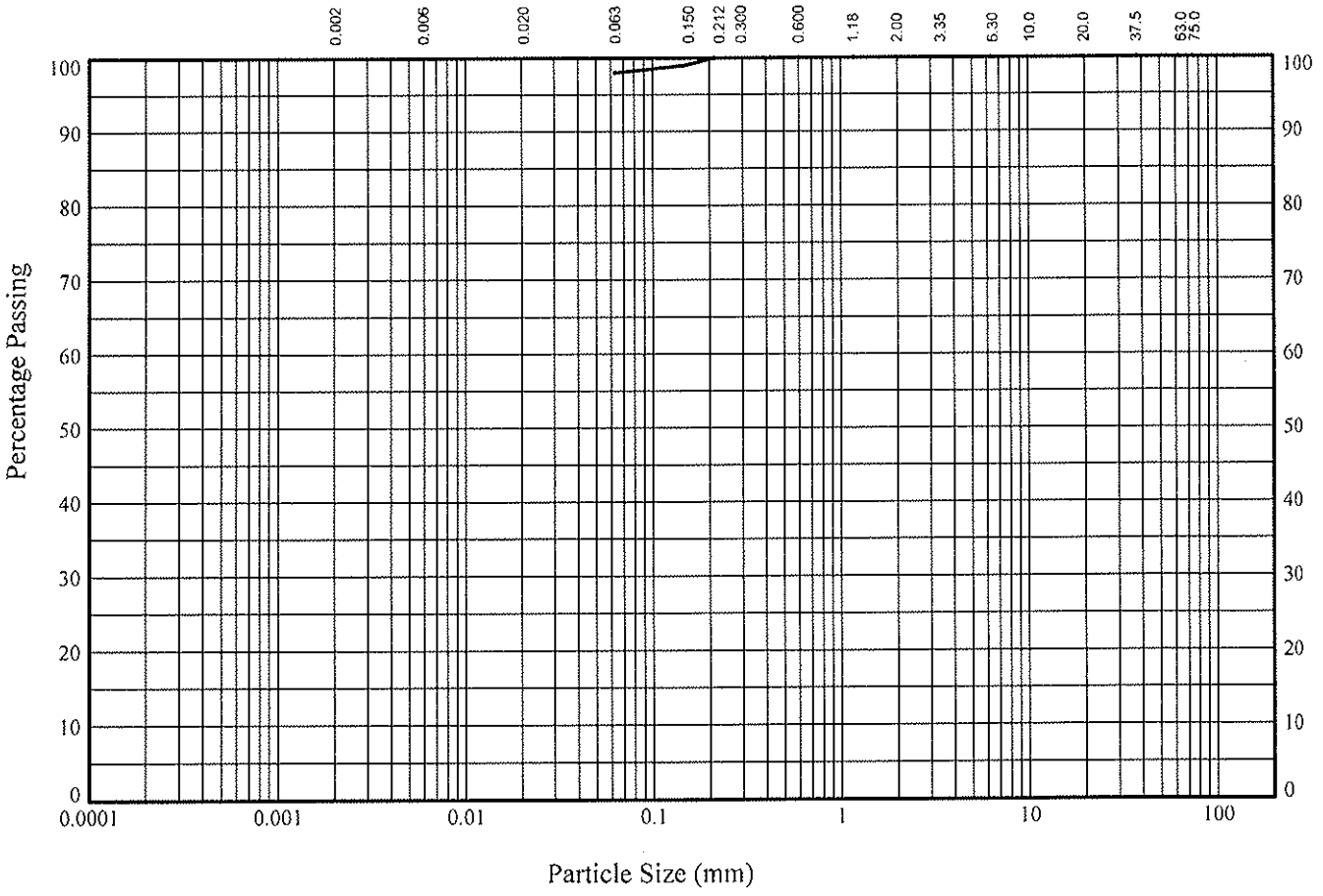
PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2,9.5 of BS1377:Part 2:1990

Window Sample : **WS1** Sample Ref: **1** Sample Type: **D** Depth (m): **2.50**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

BS Test Sieve (mm)	Percentage Passing
125.0	100
75.0	100
63.0	100
37.5	100
20.0	100
10.0	100
6.30	100
3.35	100
2.00	100
1.18	100
0.600	100
0.425	100
0.212	100
0.150	99
0.063	98

Particle Diameter	Percentage Passing

Soil Fraction	Sieve Percentage
GRAVEL	**0**
SAND	**2**
SILT/CLAY	**98**

Soil Description:
Brown slightly sandy CLAY

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Contract: **Whalley**	Contract Ref: **780651**	
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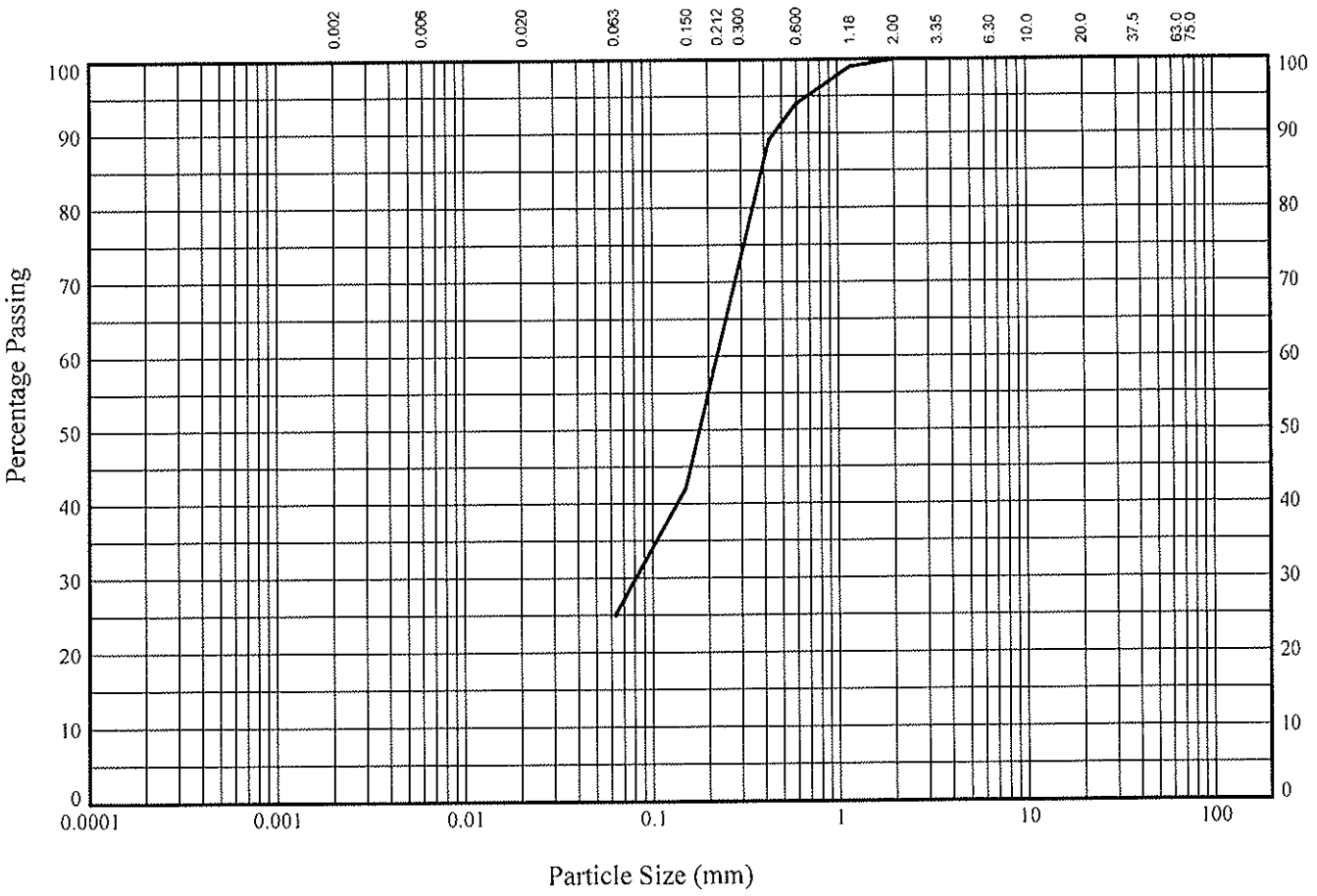
PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2,9.5 of BS1377:Part 2:1990

Window Sample : **WS2** Sample Ref: **1** Sample Type: **D** Depth (m): **1.70**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

BS Test Sieve (mm)	Percentage Passing
125.0	100
75.0	100
63.0	100
37.5	100
20.0	100
10.0	100
6.30	100
3.35	100
2.00	100
1.18	99
0.600	94
0.425	89
0.212	58
0.150	42
0.063	25

Particle Diameter	Percentage Passing

Soil Fraction	Sieve Percentage
GRAVEL	**0**
SAND	**75**
SILT/CLAY	**25**

Soil Description:
Red brown very clayey SAND

Approved Signatories: M. ATHORNE S. ROYLE M. FISHER C. COLE

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Compiled By		Date
M. Fisher	MAUREEN FISHER	30/03/12

Contract	Contract Ref:
Whalley	**780651**
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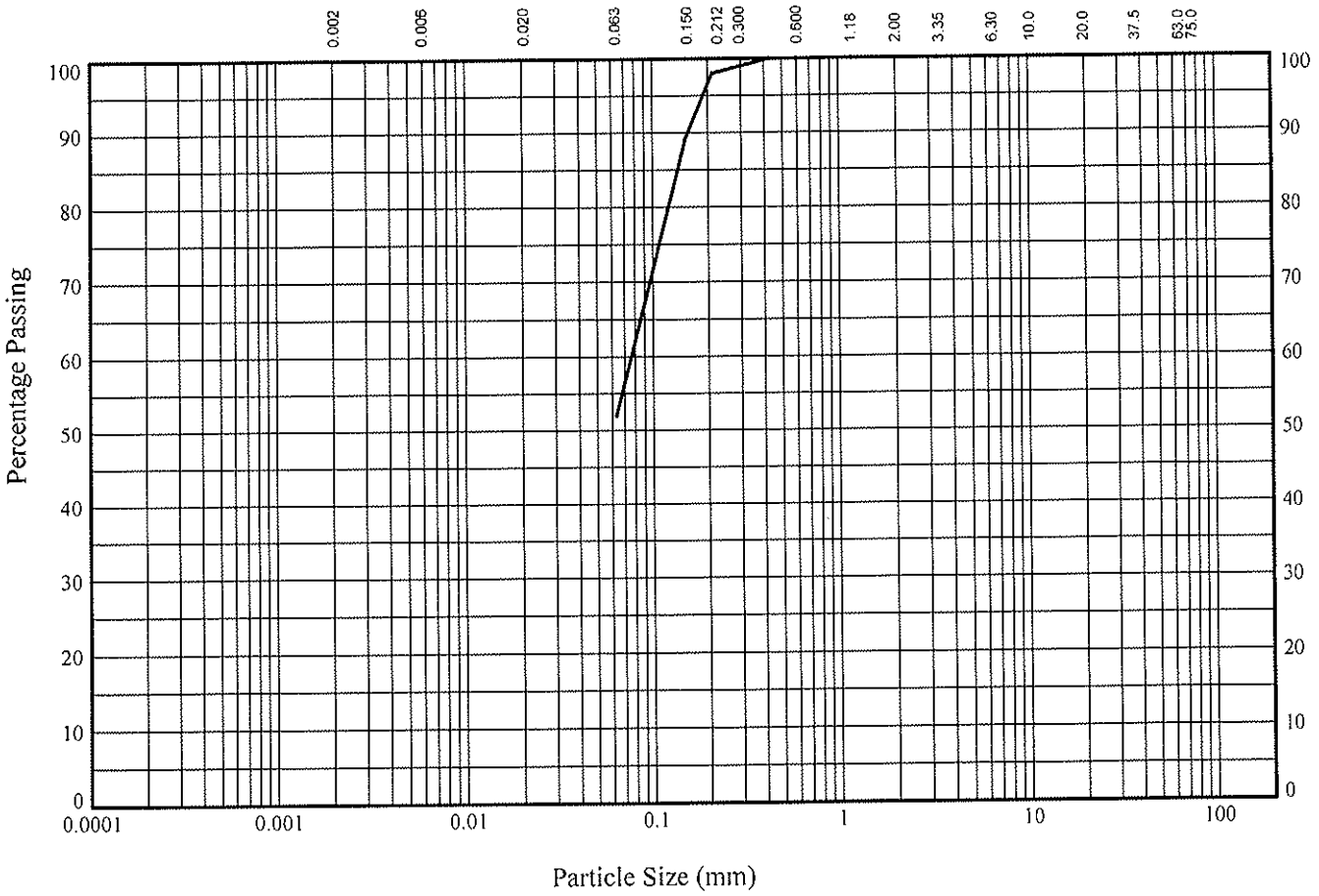
PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2,9.5 of BS1377:Part 2:1990

Window Sample : **WS5** Sample Ref: **1** Sample Type: **D** Depth (m): **1.50**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

BS Test Sieve (mm)	Percentage Passing
125.0	100
75.0	100
63.0	100
37.5	100
20.0	100
10.0	100
6.30	100
3.35	100
2.00	100
1.18	100
0.600	100
0.425	100
0.212	98
0.150	89
0.063	52

Particle Diameter	Percentage Passing

Soil Fraction	Sieve Percentage
GRAVEL	**0**
SAND	**48**
SILT/CLAY	**52**

Soil Description:
Light brown sandy CLAY

Approved Signatories: M. ATHORNE S. ROYLE M. FISHER C. COLE

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Compiled By	Date
M. Fisher — MAUREEN FISHER	30/03/12

Contract: **Whalley**

Contract Ref: **780651**

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APPENDIX J
GENERIC ASSESSMENT CRITERIA FOR HUMA HEALTH – RESIDENTIAL WITH PRIVATE GARDENS END-USE SCENARIO

Generic assessment criteria for human health: residential scenario – private gardens

The human health generic assessment criteria (GAC) have been developed during a period of regulatory review and updating of the Contaminated Land Exposure Assessment (CLEA) project. Therefore, the Environment Agency (EA) is in the process of publishing updated reports relating to the CLEA project and the GAC presented in this document may change to reflect these updates. This issue was prepared following the publication of soil guideline value (SGV) reports and associated publications[(1)] for mercury, selenium, benzene, toluene, ethylbenzene and xylene in March 2009, arsenic and nickel in May 2009, cadmium and phenol in June 2009, dioxins, furans and dioxin-like polychlorinated biphenyls (PCBs) in September 2009. It was also produced following publication of GAC by LQM[(6)]. Where available, the published soil guideline values (SGV)[(1)] were used as the GAC. The GAC for lead is discussed separately below owing to it not being derived using the same approach as other compounds.

Lead GAC derivation

The Environment Agency SGV and Tox reports for lead were withdrawn in 2009. In addition, the provisional tolerable weekly intake data published in the Netherlands were withdrawn in 2010 owing to concerns that they were not suitably protective of human health. The withdrawn SGVs were based on a target blood lead concentration of 10µg/dl. In the absence of current guidelines many consultants continue to use the withdrawn SGV. However, as this is not considered sufficiently protective of human health, after attendance at the SOBRA summer workshop June 2011, RSK has revised its GAC and is currently undertaking a review of recent toxicological developments that will be used to refine this GAC further in the coming months. In the meantime, RSK has undertaken sensitivity analysis using the Society of Environmental Geochemistry and Health (SEGH) equation and the CLEA model to produce an interim GAC value. The results are summarised below:

- Using CLEA with the former provisional tolerable weekly intake (PTWI) (25 µg/kg bw), assuming 100% lead is bioavailable, produces a GAC of 212 mg/kg
- Using CLEA with the former PTWI, assuming 50% lead is bioavailable, produces a GAC of 478 mg/kg
- Using the SEGH equation amended for a blood target concentration of 5.6 µg/dl (equal to the LOAEL for IQ defects) gives a negative GAC number unless other factors such as child background blood concentration or delta are amended. Without undertaking further research into these numbers, RSK can present sensitivity analysis to demonstrate the sensitivity of these input parameters but cannot justify one parameter over another. The results are:
    - GAC between 39mg/kg and 99mg/kg if the value of delta (the slope or response of blood Pb versus soil and dust Pb relationship) only is amended from 5 to 2µg/dl/1000µg/g. The value of 2 was chosen as it is within the reasonable range quoted in the former SGV report
    - GAC between 244mg/kg and 610mg/kg if the geometric mean of blood lead concentration in young children is reduced from 3.4µg/dl to 2µg/dl. This decrease has been simulated on the basis that blood concentrations are likely to decrease over time across the UK owing to a ban on lead in petrol, lead within paint used internally and water pipe replacement. This decrease is considered reasonable as the site is a new development

so lead-based paints will not be used internally and lead water supply pipelines will be absent.

Therefore, given the results above RSK proposes to use a GAC of **300mg/kg** for a residential end use. This value is broadly in the middle of the range of sensitivity modelling results quoted above when background mean blood lead concentrations in children are reduced to reflect a new development. The value is also broadly in the middle of the range of sensitivity modelling results for a range of bioavailability of lead between 50% and 100%. This number is considered reasonably protective of human health while being practical for use.

GAC derivation for other metals and organic compounds

Model selection

Soil assessment criteria (SAC) were calculated using CLEA v1.06 and the supporting UK guidance[1–6]. Groundwater assessment criteria (GrAC) protective of human health via the inhalation pathway were derived using the RBCA 1.3b model. RSK has updated the inputs within RBCA to reflect the UK guidance[1–5]. The SAC and GrAC collectively are termed GAC.

Conceptual model

In accordance with EA Science Report SC050221/SR3[3], the residential with private garden scenario considers risks to a female child between the ages of 0 and 6 years old. In accordance with Box 3.1, SR3[3], the pathways considered for production of the SAC in the residential with gardens scenario are:

- direct soil and dust ingestion;
- consumption of home-grown produce;
- consumption of soil attached to home-grown produce;
- dermal contact with soil and indoor dust, and
- inhalation of indoor and outdoor dust and vapours.

Figure 1 is a conceptual model illustrating these linkages.

The pathway considered in production of the GrAC is the volatilisation of compounds from groundwater and subsequent vapour inhalation by residents while indoors. Figure 2 illustrates this linkage. Although the outdoor air inhalation pathway is also valid, this contributes little to the overall risks owing to the dilution in outdoor air. Within RBCA, the solubility limit of the determinant restricts the extent of volatilisation, which in turn drives the indoor air inhalation pathway. While the same restriction is not built into the CLEA model, the CLEA model output cells are flagged red where the soil saturation limit has been exceeded.

An assumption used in the CLEA model is that of simple linear partitioning of a chemical in the soil between the sorbed, dissolved and vapour phase[4]. The upper boundaries of this partitioning are represented by the aqueous solubility and pure saturated vapour concentration of the chemical. The CLEA software uses a traffic light system to identify when individual and/or combined assessment criteria exceed the lower of either the aqueous-based or the vapour based

saturation limits. Where model output cells are flagged red the soil or vapour saturation limit has been exceeded and further consideration of the SAC to be used within the assessment is required. One approach that could be adopted is to use the 'modelled' solubility saturation limit or vapour saturation limit of the compound as the SAC. However, as stated within the CLEA handbook[4] this is likely to not be practical in many cases because of the very low limits and, in any case, is highly conservative. Unless free-phase product is present, concentrations of the chemical are unlikely to be present at sufficient concentration to result in an exceedance of the health criteria value (HCV).

RSK has adopted an approach for petroleum hydrocarbons in accordance with LQM/CIEH[6] whereby the concentration modelled for each petroleum hydrocarbon fraction has been tabulated as the SAC with the corresponding solubility or vapour saturation limit given in brackets. Therefore, when using the SAC to screen laboratory analysis the assessor should take note if a given SAC has a corresponding solubility or vapour saturation limit (in brackets), and subsequently incorporate this piece of information within the screening analytical discussion. If further assessment is required following this process then an additional approach can be utilised as detailed within Section 4.12 of the CLEA model handbook[4], which explains how to calculate an effective assessment criterion manually.

Input selection

Chemical data was obtained from EA Report SC050021/SR7[5] and the health criteria values (HCV) from the UK TOX[1] reports where available. For SAC for total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAH), toxicological and chemical specific parameters were obtained from the LQM/CIEH report[6]. Similarly, toxicological and specific chemical parameters for the volatile organic compound 1,2,4-trimethylbenzene were obtained from EIC/AGS/CL:AIRE[7].

For total petroleum hydrocarbons (TPH), aromatic hydrocarbons C_5-C_8 were not modelled since benzene and toluene are being modelled separately. The aromatic C_8-C_9 hydrocarbon fraction comprises ethylbenzene, xylene and styrene. Since ethylbenzene and xylene are being modelled separately, the physical, chemical and toxicological data for this band has been taken from styrene.

Owing to the lack of UK-specific data, default information in the RBCA model was used to evaluate methyl tertiary butyl ether (MTBE). No published UK data was available for 1,3,5-trimethylbenzene, so information was obtained from the US EPA as in the RBCA model. RBCA uses toxicity data for the inhalation pathway in different units to the CLEA model and cannot consider separately the mean daily intake (MDI), occupancy periods or breathing rates. Therefore, the HCV in RBCA was amended to take account of:

- amendments to the MDI using Table 3.4 of SR2[2]
- a child weighing 13.3kg (average of 0–6 year old female in accordance with Table 4.6 of SR3[3]) and breathing 11.85m^3 (average daily inhalation rate for a 0–6-year old female in accordance with Table 4.14 of SR3[3]

1. The 50% rule (for petroleum hydrocarbons, trimethylbenzenes and MTBE)[2] where MDI data is not available but background exposure is considered important in the overall exposure.

Physical parameters

For the residential with private gardens scenario, the CLEA default building is a small two-storey terrace house with concrete ground-bearing slab. The house is assumed to have a 100m^2 private garden consisting of lawn, flowerbeds and incorporating a 20m^2 plot for growing fruit and vegetables consumed by the residents. SR3[3] notes this residential building type to be the most conservative in terms of protection from vapour intrusion. The building parameters are outlined in Table 5.

The parameters for a sandy loam soil type were used in line with SR3[3]. This includes a value of 6% for the percentage of soil organic matter (SOM) within the soil. In RSK's experience, this is rather high for many sites. To avoid undertaking site-specific risk assessments for this parameter, RSK has produced an additional set of SAC for an SOM of 1% and 2.5%. For the GrAC, the depth to groundwater was taken as 2.5m based on RSK's experience of assessing the volatilisation pathway from groundwater.

GAC

The SAC were produced using the input parameters in Tables 1 to 5 and the GrAC using input parameters in Table 6. The final selected GAC are presented by pathway in Table 7 and the combined GAC in Table 8.

Figure 1: Conceptual model for CLEA residential scenario – private gardens

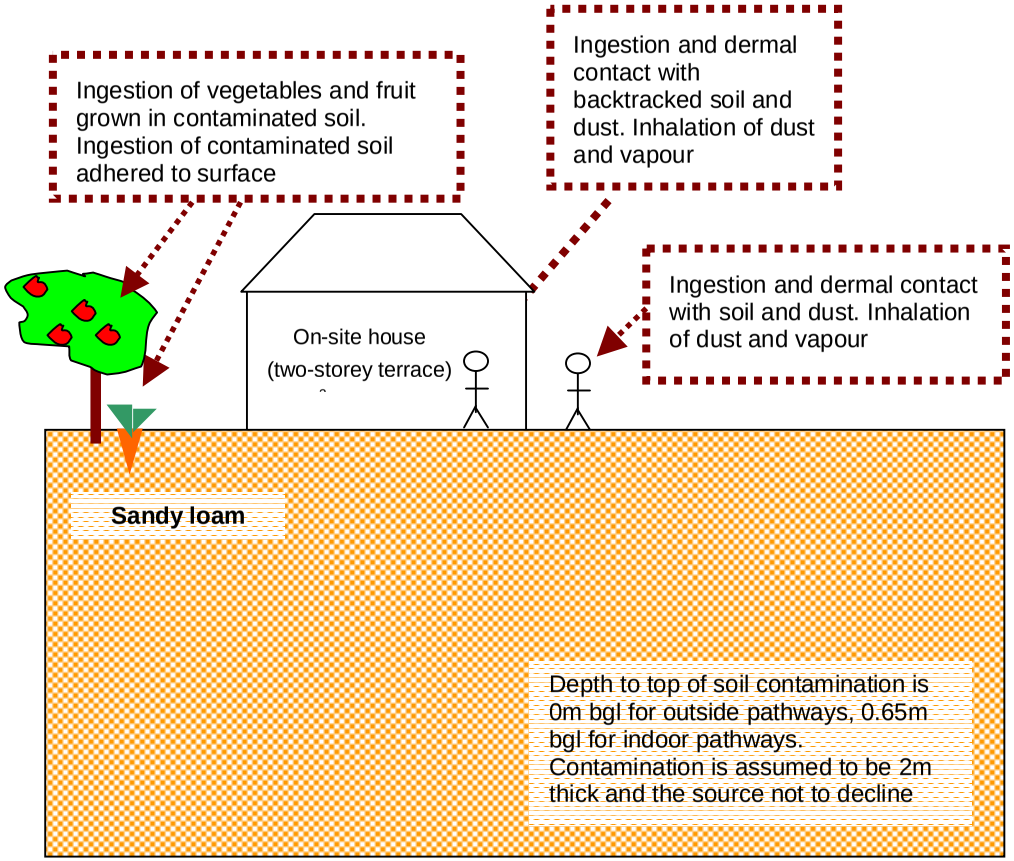

Table 1: Exposure assessment parameters for residential scenario - private gardens – inputs for CLEA model

Parameter	Value	Justification
Land use	Residential with homegrown produce	Chosen land use
Receptor	Female child age 1 to 6	Key generic assumption given in Box 3.1, report SC050021/SR3[3]
Building	Small terraced house	Key generic assumption given in Box 3.1, report SC050021/SR3. Two storey small terraced house chosen as it is the most conservative residential building type in terms of protection from vapor intrusion (Section 3.4.6, report SC050021/SR3)[3]
Soil type	Sandy Loam	Most common UK soil type (Section 4.3.1, From Table 3.1, report SC050021/SR3)[3]
Start AC (age class)	1	Range of age classes corresponding to key generic assumption that the critical receptor is a young female child aged zero to six. From Box 3.1, report SC050021/SR3[3]
End AC (age class)	6	
SOM (%)	6	Representative of sandy loamy soil according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents'[8]
	1	To provide SAC for sites where SOM <6% as often observed by RSK
	2.5	
pH	7	Model default

Table 2: Residential with private gardens –home-grown produce data for CLEA model

	Consumption rate (g FW kg^{-1} BW day^{-1}) by age class						Dry weight conversion factor	Home-grown fraction (average)	Home-grown fraction (high end)	Soil loading factor	Preparation correction factor
Name	1	2	3	4	5	6	g DW g^{-1} FW	-	-	g g^{-1} DW	-
Green vegetables	7.12	6.85	6.85	6.85	3.74	3.74	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	10.69	3.30	3.30	3.30	1.77	1.77	0.103	0.06	0.4	1.00E-03	1.00E+00
Tuber vegetables	16.03	5.46	5.46	5.46	3.38	3.38	0.21	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	1.83	3.96	3.96	3.96	1.85	1.85	0.058	0.06	0.4	1.00E-03	6.00E-01
Shrub fruit	2.23	0.54	0.54	0.54	0.16	0.16	0.166	0.09	0.6	1.00E-03	6.00E-01
Tree fruit	3.82	11.96	11.96	11.96	4.26	4.26	0.157	0.04	0.27	1.00E-03	6.00E-01
Justification	Table 4.17, SR3[3]						Table 6.3, SR3[3]	Table 4.19, SR3[3]		Table 6.3, SR3[3]	

Table 3: Residential with private gardens – land use data for CLEA model

Parameter	Unit	Age class					
		1	2	3	4	5	6
EF (soil and dust ingestion)	day yr^{-1}	180	365	365	365	365	365
EF (consumption of home-grown produce)	day yr^{-1}	180	365	365	365	365	365
EF (skin contact, indoor)	day yr^{-1}	180	365	365	365	365	365
EF (skin contact, outdoor)	day yr^{-1}	180	365	365	365	365	365
EF (inhalation of dust and vapour, indoor)	day yr^{-1}	365	365	365	365	365	365
EF (inhalation of dust and vapour, outdoor)	day yr^{-1}	365	365	365	365	365	365
Justification		Table 3.1, SR3[3]					
Occupancy period (indoor)	hr day^{-1}	23	23	23	23	19	19
Occupancy period (outdoor)	hr day^{-1}	1	1	1	1	1	1
Justification		Table 3.2, SR3[3]					
Soil to skin adherence factor (indoor)	mg cm^{-2} day^{-1}	6.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02
Soil to skin adherence factor (outdoor)	mg cm^{-2} day^{-1}	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Justification		Table 8.1, SR3[3]					
Soil and dust ingestion rate	g day^{-1}	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01
Justification		Table 6.2, SR3[3]					

Of note, for **cadmium**, the exposure assessment for a residential land use is based on estimates representative of lifetime exposure AC1-18. This is because the TDI_{oral} and TDI_{inh} – are based on considerations of the kidney burden accumulated over 50 years. It is therefore reasonable to consider exposure not only in childhood but averaged over a longer time period. See the Environment Agency Science report: SC05002 / TOX 3 [1] and Science Report SC050021/Cadmium SGV [1] for more information.

Table 4: Residential with private gardens – receptor data for CLEA model

Parameter	Unit	Age Class						Justification
		1	2	3	4	5	6	
Body weight	kg	5.6	9.8	12.7	15.1	16.9	19.7	Table 4.6, SR3[3]
Body height	m	0.7	0.8	0.9	0.9	1	1.1	
Inhalation rate	m^3 day^{-1}	8.5	13.3	12.7	12.2	12.2	12.2	Table 4.14, SR3[3]
Max exposed skin fraction (indoor)	m^2 m^{-2}	0.32	0.33	0.32	0.35	0.35	0.33	Table 4.8, SR3[3]
Max exposed skin fraction (outdoor)	m^2 m^{-2}	0.26	0.26	0.25	0.28	0.28	0.26	

See cadmium note as per Table 3 above.

Table 5: Residential with private gardens – soil and building inputs for CLEA model

Parameter	Unit	Value	Justification
Soil properties for sandy loam			
Porosity, total	cm^3 cm^{-3}	0.53	Default soil type is sandy loam, Section 4.3.1, SR3[3] Parameters for sandy loam from Table 4.4, SR3[3]
Porosity, air filled	cm^3 cm^{-3}	0.20	
Porosity, water filled	cm^3 cm^{-3}	0.33	
Residual soil water content	cm^3 cm^{-3}	0.12	
Saturated hydraulic conductivity	cm s^{-1}	3.56E-03	
van Genuchten shape parameter (*m*)	-	3.20E-01	
Bulk density	g cm^{-3}	1.21	
Threshold value of wind speed at 10m	m s^{-1}	7.20	Default value taken from Section 9.2.2, SR3[3]
Empirical function (F_x) for dust model	-	1.22	Value taken from Section 9.2.2, SR3[3]
Ambient soil temperature	K	283	Annual average soil temperature representative of UK surface soils. Section 4.3.1, SR3[3]
Air dispersion model			
Mean annual wind speed (10m)	m s^{-1}	5.00	Default value taken from Section 9.2.2, SR3[3]
Air dispersion factor at height of 0.8m	g m^{-2} s^{-1} per kg m^{-3}	2400	Values for a 0.01 ha site, appropriate to a residential land use in Newcastle (most representative city for UK). (from Table 9.1, SR3)[3] Assumed child of 6 is not tall enough to reach 1.6m
Air dispersion factor at height of 1.6m	g m^{-2} s^{-1} per kg m^{-3}	0	
Fraction of site with hard or vegetative cover	m^2 m^{-2}	0.75	Section 3.2.6, SR3 [3] based on residential land use

Parameter	Unit	Value	Justification
Building properties for small terrace house with ground-bearing floor slab			
Building footprint	m^2	28	From Table 3.3 and 4.21, SR3[3]
Living space air exchange rate	hr^{-1}	0.50	
Living space height (above ground)	m	4.8	
Living space height (below ground)	m	0.0	Assumed no basement
Pressure difference (soil to enclosed space)	Pa	3.1	From Table 3.3, SR3[3]
Foundation thickness	m	0.15	
Floor crack area	cm^2	423	
Dust loading factor	$\mu g\ m^{-3}$	50	Default value for a residential site taken from Section 9.3, SR3[3]
Vapour model			
Default soil gas ingress rate	$cm^3\ s^{-1}$	25	Generic flow rate, Section 10.3, SR3[3]
Depth to top of source (beneath building)	cm	50	Section 3.2.6, SR3 [3] states source is 50cm below building or 65cm below ground surface
Depth to top of source (no building)	cm	0	Section 10.2, SR3 [3] assumes impact from 0m to 1m for outdoor inhalation pathway
Thickness of contaminant layer	cm	200	Model default for indoor air, Section 4.9, SR4[4]
Time average period for surface emissions	years	6	Time period of a 0 to 6 year old, Box 3.5, SR3[3]
User-defined effective air permeability	cm^2	3.05E-08	Calculated for sandy loam using equations in Appendix 1, SR3[3]

Figure 2: GrAC conceptual model for RBCA residential with private gardens scenario

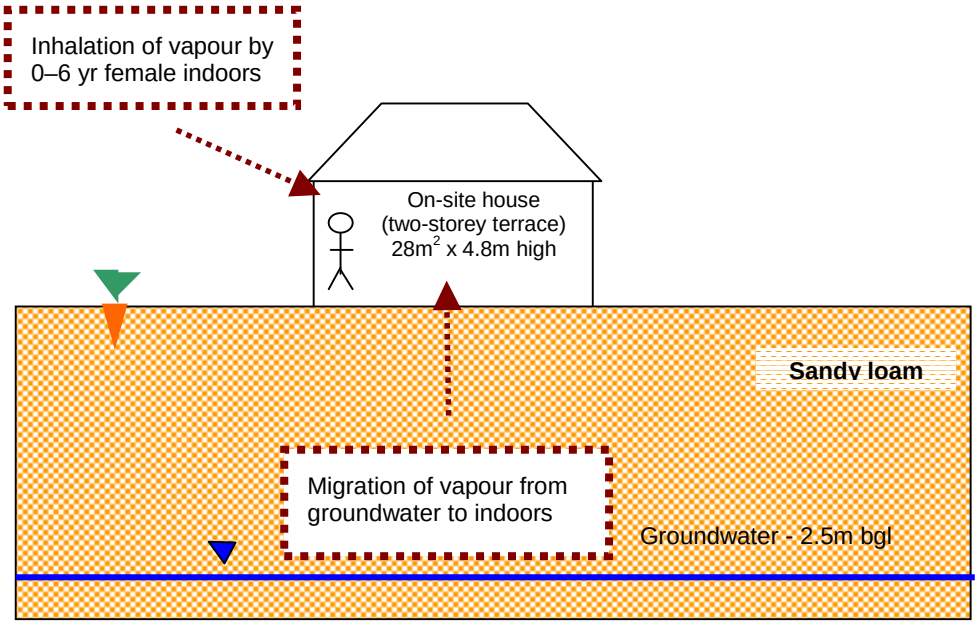

Table 6: Residential with private gardens – RBCA inputs

Parameter	Unit	Value	Justification
Receptor			
Averaging time	Years	6	From Box 3.1, SR3[3]
Receptor weight	kg	13.3	Average of CLEA 0–6 year old female data, Table 4.6, SR3[3]
Exposure duration	Years	6	From Box 3.1, report, SR3[3]
Exposure frequency	Days/yr	350	Weighted using occupancy period of 23 hours per day for 365 days of the year
Soil type – sandy loam			
Total porosity	-	0.53	CLEA value for sandy loam. Parameters for sandy loam from Table 4.4, SR3[3]
Volumetric water content	-	0.33	
Volumetric air content	-	0.20	
Dry bulk density	g cm^{-3}	1.21	
Vertical hydraulic conductivity	cm s^{-1}	3.56E-3	CLEA value for saturated conductivity of sandy loam, Table 4.4, SR3[3]
Vapour permeability	m^2	3.05E-12	Calculated for sandy loam using equations in Appendix 1, SR3[3]
Capillary zone thickness	m	0.1	Professional judgement

Parameter	Unit	Value	Justification
Fraction organic carbon	%	(i) 0.0348	Representative of sandy loam according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents'[8]
		(ii) 0.0058	To provide SAC for sites where SOM < 6% as often observed by RSK
Building			
Building volume/area ratio	m	4.8	Table 3.3, SR3[3]
Foundation area	m^2	28	
Foundation perimeter	m	22	Calculated assuming building measures 7m x 4m to give 28m^2 foundation area
Building air exchange rate	d^{-1}	12	Table 3.3, SR3[3]
Depth to bottom of foundation slab	m	0.15	
Foundation thickness	m	0.15	
Foundation crack fraction	-	0.0151	Calculated from floor crack area of 423 cm^2 and building footprint of 28m^2 in Table 4.21, SR3[3]
Volumetric water content of cracks	-	0.33	Assumed equal to underlying soil type in assumption that cracks become filled with soil over time. Parameters for sandy loam from Table 4.4, SR3[3]
Volumetric air content of cracks	-	0.2	
Indoor/outdoor differential pressure	Pa	3.1	From Table 3.3, SR3[3]

References

1. Environment Agency (2009), 'Science Report SC050021/benzene SGV, toluene SGV, ethylbenzene SGV, xylene SGV, mercury SGV, selenium SGV, nickel SGV, arsenic SGV, cadmium SGV, phenol SGV, dioxins, furans and dioxin like PCBs SGVs', 'Supplementary information for the derivation of SGV for: benzene, toluene, ethylbenzene, xylene, mercury, selenium, nickel, arsenic, cadmium, phenol, dioxins, furans and dioxin- like PCBs', and 'Contaminants in soil: updated collation of toxicological data and intake values for humans: benzene, toluene, ethylbenzene, xylene, mercury, selenium, nickel, arsenic, cadmium, phenol, dioxins, furans and dioxin- like PCBs', March 2009, May 2009 and September 2009.

2. Environment Agency (2009), *Human health toxicological assessment of contaminants in soil. Science Report – Final SC050021/SR2*, January (Bristol: Environment Agency).

3. Environment Agency (2009), *Science Report – SC050021/SR3. Updated technical background to the CLEA model* (Bristol: Environment Agency).

4. Environment Agency (2009), Contaminated Land Exposure Assessment (CLEA) software, version 1.06.

5. Environment Agency (2008), *Science Report SC050021/SR7. Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values* (Bristol: Environment Agency).

6. Chartered Institute for Environmental Health and Land Quality Management (2009), 'The LQM/CIEH Generic Assessment Criteria for Human Health', second edition.

7. CL:AIRE (2009), *Soil Generic Assessment Criteria for Human Health Risk Assessment* (London: CL:AIRE).

8. Changes made to the CLEA framework documents after the three-month evaluation period in 2008, released January 2009 by the Environment Agency.

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH PRIVATE GARDENS

Table 7

Human Health Generic Assessment Criteria by Pathway for Residential Scenario - Private Gardens

Compound	Notes	GrAC (mg/l)	SAC Appropriate to Pathway SOM 1% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 2.5% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 6% (mg/kg)			Soil Saturation Limit (mg/kg)
			Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Metals														
Arsenic	(b)(c)	-	3.24E+01	8.50E+01	-	NR	3.24E+01	8.50E+01	-	NR	3.24E+01	8.50E+01	-	NR
Cadmium	(b)	-	1.12E+01	1.85E+02	1.10E+01	NR	1.12E+01	1.85E+02	1.10E+01	NR	1.12E+01	1.85E+02	1.10E+01	NR
Chromium (III) - oxide		-	1.84E+04	3.55E+03	2.98E+03	NR	1.84E+04	3.55E+03	2.98E+03	NR	1.84E+04	3.55E+03	2.98E+03	NR
Chromium (VI) - hexavalent		-	1.02E+01	4.25E+00	3.21E+00	NR	1.02E+01	4.25E+00	3.21E+00	NR	1.02E+01	4.25E+00	3.21E+00	NR
Copper		-	2.66E+03	1.04E+04	2.33E+03	NR	2.66E+03	1.04E+04	2.33E+03	NR	2.66E+03	1.04E+04	2.33E+03	NR
Lead	(a)	-	3.00E+02	-	-	NR	3.00E+02	-	-	NR	3.00E+02	-	-	NR
Elemental Mercury (Hg^0)	(b)(d)	9.40E-03	-	1.70E-01	-	4.31E+00	-	4.24E-01	-	1.07E+01	-	1.02E+00	-	2.58E+01
Inorganic Mercury (Hg^{2+})	(b)	-	1.81E+02	2.55E+03	1.69E+02	NR	1.81E+02	2.55E+03	1.69E+02	NR	1.81E+02	2.55E+03	1.69E+02	NR
Methyl Mercury (Hg^{4+})	(b)	2.00E+01	1.39E+01	1.59E+01	7.40E+00	7.33E+01	1.39E+01	3.08E+01	9.55E+00	1.42E+02	1.39E+01	6.53E+01	1.14E+01	3.04E+02
Nickel	(b)(d)	-	5.31E+02	1.27E+02	-	NR	5.31E+02	1.27E+02	-	NR	5.31E+02	1.27E+02	-	NR
Selenium	(b)(c)	-	3.50E+02	-	-	NR	3.50E+02	NR	-	NR	3.50E+02	-	-	NR
Zinc	(c)	-	3.75E+03	2.55E+07	-	NR	3.75E+03	2.55E+07	-	NR	3.75E+03	2.55E+07	-	NR
Cyanide		-	2.66E+01	3.97E+00	3.68E+00	NR	2.66E+01	3.97E+00	3.68E+00	NR	2.66E+01	3.97E+00	3.68E+00	NR
Volatile Organic Compounds														
Benzene	(b)	7.20E+00	1.12E-01	2.69E-01	7.92E-02	1.22E+03	2.28E-01	4.99E-01	1.57E-01	2.26E+03	4.89E-01	1.04E+00	3.32E-01	4.71E+03
Toluene	(b)	1.90E+03	1.47E+02	6.26E+02	1.19E+02	8.69E+02	3.35E+02	1.38E+03	2.70E+02	1.92E+03	7.59E+02	3.14E+03	6.11E+02	4.36E+03
Ethylbenzene	(b)	2.60E+02	1.06E+02	1.70E+02	6.52E+01	5.18E+02	2.51E+02	3.98E+02	1.54E+02	1.22E+03	5.70E+02	9.32E+02	3.54E+02	2.84E+03
Xylene - m	(b)	8.40E+01	2.02E+02	5.56E+01	4.36E+01	6.25E+02	4.80E+02	1.31E+02	1.03E+02	1.47E+03	1.09E+03	3.07E+02	2.40E+02	3.46E+03
Xylene - o		1.00E+02	1.85E+02	5.98E+01	4.52E+01	4.78E+02	4.38E+02	1.40E+02	1.06E+02	1.12E+03	9.96E+02	3.27E+02	2.46E+02	2.62E+03
Xylene - p		8.70E+01	1.91E+02	5.34E+01	4.17E+01	5.76E+02	4.51E+02	1.26E+02	9.82E+01	1.35E+03	1.02E+03	2.94E+02	2.28E+02	3.17E+03
Total xylene		8.40E+01	2.02E+02	5.56E+01	4.36E+01	6.25E+02	4.80E+02	1.31E+02	1.03E+02	1.47E+03	1.09E+03	3.07E+02	2.40E+02	3.46E+03
Methyl t-Butyl ether		2.20E+03	1.75E+00	1.84E+02	1.75E+00	1.66E+04	3.68E+00	2.40E+02	3.67E+00	2.16E+04	7.41E+00	3.70E+02	7.37E+00	3.34E+04
Trichloroethene		1.80E+00	2.83E+00	1.10E-01	1.06E-01	1.54E+03	6.25E+00	2.30E-01	2.22E-01	3.22E+03	1.40E+01	5.11E-01	4.93E-01	7.14E+03
Tetrachloroethene		3.60E+00	1.06E+01	1.03E+00	9.36E-01	4.24E+02	2.44E+01	2.30E+00	2.10E+00	9.51E+02	5.55E+01	5.28E+00	4.82E+00	2.18E+03
1,1,1-Trichloroethane		2.60E+01	3.20E+02	6.33E+00	6.21E+00	1.43E+03	6.97E+02	1.29E+01	1.27E+01	2.92E+03	1.55E+03	2.84E+01	2.79E+01	6.39E+03
1,1,1,2 Tetrachloroethane		1.40E+01	5.19E+00	1.08E+00	8.93E-01	2.60E+03	1.22E+01	2.50E+00	2.08E+00	6.02E+03	2.78E+01	5.83E+00	4.82E+00	1.40E+04
1,1,2,2-Tetrachloroethane		1.40E+01	2.70E+00	2.76E+00	1.37E+00	2.67E+03	5.85E+00	5.65E+00	2.87E+00	5.46E+03	1.30E+01	1.24E+01	6.34E+00	1.20E+04
Carbon Tetrachloride		5.50E-02	1.05E+00	1.81E-02	1.79E-02	1.52E+03	2.41E+00	3.97E-02	3.93E-02	3.32E+03	5.44E+00	8.99E-02	8.92E-02	7.54E+03
1,2-Dichloroethane		3.00E-01	3.06E-02	6.46E-03	5.34E-03	3.41E+03	5.53E-02	9.32E-03	7.98E-03	4.91E+03	1.05E-01	1.60E-02	1.39E-02	8.43E+03
Vinyl Chloride		1.90E-02	3.69E-03	5.43E-04	4.73E-04	1.36E+03	6.64E-03	7.02E-04	6.35E-04	1.76E+03	1.21E-02	1.07E-03	9.86E-04	2.69E+03
1,2,4-Trimethylbenzene		7.50E-02	-	3.51E-01	-	5.57E+02	-	8.55E-01	-	1.36E+03	-	2.10E+00	-	3.25E+03
1,3,5-Trimethylbenzene		4.70E-02	1.45E+01	4.60E-01	4.56E-01	9.47E+01	3.47E+01	1.10E+00	1.09E+00	2.26E+02	7.94E+01	2.59E+00	2.56E+00	5.33E+02
Semi-Volatile Organic Compounds														
Acenaphthene		3.20E+00	2.18E+02	3.46E+03	2.05E+02	5.70E+01	5.08E+02	8.54E+03	4.79E+02	1.41E+02	1.06E+03	2.03E+04	1.01E+03	3.36E+02
Acenaphthylene		4.20E+00	1.78E+02	3.27E+03	1.68E+02	8.61E+01	4.17E+02	8.03E+03	3.97E+02	2.12E+02	8.90E+02	1.91E+04	8.51E+02	5.06E+02
Anthracene		2.10E-02	2.31E+03	1.08E+05	2.26E+03	1.17E+00	5.03E+03	2.65E+05	4.93E+03	2.91E+00	9.33E+03	6.15E+05	9.19E+03	6.96E+00
Benzo(a)anthracene		9.80E-03	7.00E+00	5.55E+00	3.10E+00	1.71E+00	8.98E+00	9.83E+00	4.69E+00	4.28E+00	1.01E+01	1.41E+01	5.88E+00	1.03E+01
Benzo(b)fluoranthene		2.00E-03	8.06E+00	1.79E+01	5.56E+00	1.22E+00	9.78E+00	1.97E+01	6.53E+00	3.04E+00	1.07E+01	2.05E+01	7.02E+00	7.29E+00
Benzo(g,h,i)perylene		2.60E-04	6.68E+01	1.27E+02	4.38E+01	1.54E-02	7.04E+01	1.32E+02	4.59E+01	3.85E-02	7.19E+01	1.34E+02	4.68E+01	9.23E-02
Benzo(k)fluoranthene		8.00E-04	1.25E+01	2.66E+01	8.51E+00	6.87E-01	1.44E+01	2.83E+01	9.56E+00	1.72E+00	1.53E+01	2.91E+01	1.00E+01	4.12E+00
Chrysene		2.00E-03	8.76E+00	1.95E+01	6.00E+00	4.40E-01	1.20E+01	2.45E+01	8.04E+00	1.10E+00	1.41E+01	2.72E+01	9.27E+00	2.64E+00
Dibenzo(a,h)anthracene		6.00E-04	1.19E+00	2.13E+00	7.62E-01	3.93E-03	1.33E+00	2.42E+00	8.58E-01	9.82E-03	1.39E+00	2.56E+00	9.03E-01	2.36E-02
Fluoranthene		2.30E-01	2.59E+02	2.69E+04	2.57E+02	1.89E+01	4.67E+02	6.23E+04	4.63E+02	4.73E+01	6.78E+02	1.28E+05	6.74E+02	1.13E+02
Fluorene		1.90E+00	1.70E+02	4.35E+03	1.63E+02	3.09E+01	3.91E+02	1.07E+04	3.77E+02	7.65E+01	8.00E+02	2.54E+04	7.76E+02	1.83E+02
Indeno(1,2,3-cd)pyrene		2.00E-04	4.58E+00	1.04E+01	3.18E+00	6.13E-02	5.74E+00	1.17E+01	3.85E+00	1.53E-01	6.37E+00	1.22E+01	4.19E+00	3.68E-01
Phenanthrene		5.30E-01	9.35E+01	5.04E+03	9.18E+01	3.60E+01	2.04E+02	1.23E+04	2.01E+02	8.96E+01	3.81E+02	2.86E+04	3.76E+02	2.14E+02
Pyrene		1.30E-01	5.69E+02	6.18E+04	5.63E+02	2.20E+00	1.05E+03	1.44E+05	1.04E+03	5.49E+00	1.56E+03	2.97E+05	1.56E+03	1.32E+01
Benzo(a)pyrene		3.80E-03	1.21E+00	2.62E+00	8.26E-01	9.11E-01	1.42E+00	2.81E+00	9.43E-01	2.28E+00	1.52E+00	2.90E+00	9.98E-01	5.46E+00
Naphthalene		1.90E+01	2.68E+01	1.64E+00	1.54E+00	7.64E+01	6.36E+01	3.93E+00	3.70E+00	1.83E+02	1.43E+02	9.27E+00	8.71E+00	4.32E+02
Phenol	(b)	-	4.51E+02	3.11E+02	1.84E+02	4.16E+04	9.38E+02	4.20E+02	2.90E+02	8.15E+04	2.04E+03	5.21E+02	4.15E+02	1.74E+05

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH PRIVATE GARDENS

Table 7

Human Health Generic Assessment Criteria by Pathway for Residential Scenario - Private Gardens

Compound	Notes	GrAC (mg/l)	SAC Appropriate to Pathway SOM 1% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 2.5% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 6% (mg/kg)			Soil Saturation Limit (mg/kg)
			Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Total Petroleum Hydrocarbons														
Aliphatic hydrocarbons EC_5-EC_6		1.00E+01	4.79E+03	2.98E+01	2.97E+01	3.04E+02	1.08E+04	5.47E+01	5.46E+01	5.58E+02	2.35E+04	1.13E+02	1.13E+02	1.15E+03
Aliphatic hydrocarbons >EC_6-EC_8		5.40E+00	1.43E+04	7.27E+01	7.26E+01	1.44E+02	3.21E+04	1.62E+02	1.62E+02	3.22E+02	6.36E+04	3.72E+02	3.71E+02	7.36E+02
Aliphatic hydrocarbons >EC_8-EC_{10}		2.30E-01	1.46E+03	1.89E+01	1.88E+01	7.77E+01	2.44E+03	4.60E+01	4.58E+01	1.90E+02	3.30E+03	1.09E+02	1.08E+02	4.51E+02
Aliphatic hydrocarbons >EC_{10}-EC_{12}		3.40E-02	3.52E+03	9.34E+01	9.28E+01	4.75E+01	4.01E+03	2.32E+02	2.29E+02	1.18E+02	4.24E+03	5.57E+02	5.37E+02	2.83E+02
Aliphatic hydrocarbons >EC_{12}-EC_{16}		7.60E-04	4.37E+03	7.82E+02	7.44E+02	2.37E+01	4.40E+03	1.95E+03	1.69E+03	5.91E+01	4.41E+03	4.68E+03	3.03E+03	1.42E+00
Aliphatic hydrocarbons >EC_{16}-EC_{35}	(c)	-	4.51E+04	-	-	8.48E+00	6.38E+04	-	-	2.12E+01	7.61E+04	-	-	5.09E+01
Aliphatic hydrocarbons >EC_{35}-EC_{44}	(c)	-	4.51E+04	-	-	8.48E+00	6.38E+04	-	-	2.12E+01	7.61E+04	-	-	5.09E+01
Aromatic hydrocarbons >EC_8-EC_9 (styrene)		7.40E+00	1.66E+02	2.65E+02	1.33E+02	6.20E+02	3.92E+02	6.47E+02	3.16E+02	1.52E+03	8.50E+02	1.54E+03	7.02E+02	3.61E+03
Aromatic hydrocarbons >EC_9-EC_{10}		7.40E+00	5.55E+01	3.33E+01	2.69E+01	6.13E+02	1.31E+02	8.16E+01	6.54E+01	1.50E+03	2.84E+02	1.94E+02	1.51E+02	3.58E+02
Aromatic hydrocarbons >EC_{10}-EC_{12}		2.50E+01	7.97E+01	1.82E+02	6.91E+01	3.64E+02	1.86E+02	4.48E+02	1.62E+02	8.99E+02	3.87E+02	1.07E+03	3.46E+02	2.15E+03
Aromatic hydrocarbons >EC_{12}-EC_{16}		5.80E+00	1.40E+02	2.00E+03	1.38E+02	1.69E+02	3.13E+02	4.96E+03	3.08E+02	4.19E+02	6.01E+02	1.18E+04	5.93E+02	1.00E+03
Aromatic hydrocarbons >EC_{16}-EC_{21}	(c)	-	2.47E+02	-	-	5.37E+01	4.82E+02	-	-	1.34E+02	7.66E+02	-	-	3.21E+02
Aromatic hydrocarbons >EC_{21}-EC_{35}	(c)	-	8.88E+02	-	-	4.83E+00	1.11E+03	-	-	1.21E+01	1.22E+03	-	-	2.90E+01
Aromatic hydrocarbons >EC_{35}-EC_{44}	(c)	-	8.88E+02	-	-	4.83E+00	1.11E+03	-	-	1.21E+01	1.22E+03	-	-	2.90E+01

Notes:

'-' Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway, or an absence of toxicological data.

NR - the compound is not volatile and therefore a soil saturation limit not calculated within CLEA

EC - equivalent carbon. GrAC - groundwater assessment criteria. SAC - soil assessment criteria.

The CLEA model output is colour coded depending upon whether the soil saturation limit has been exceeded.

Calculated SAC exceeds soil saturation limit and may significantly effect the interpretation of any exceedances since the contribution of the indoor and outdoor vapour pathway to total exposure is >10%. This shading has also been used for the RBCA output where the theoretical solubility limit has been exceeded. The SAC has been set as the model calculated SAC with the saturation limits shown in brackets.

Calculated SAC exceeds soil saturation limit but will not effect the SSV significantly since the contribution of the indoor and outdoor vapour pathway to total exposure is <10%.

Calculated SAC does not exceed the soil saturation limit.

For consistency where the theoretical solubility limit within RBCA has been exceeded in production of the GrAC, these cellls have also been hatched red.

The SAC for organic compounds are dependant upon soil organic matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58. 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, polycyclic aromatic hydrocarbons, MTBE, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway, section 10.1.1, SR3

(a) Sensitivity analysis undertaken on SEGH equation and CLEA model, considered reasonable in absence of UK specific data

(b) GAC taken from the Environment Agency SGV reports published 2009.

(c) SAC for selenium, aliphatic and aromatic hydrocarbons >EC16 does not include inhalation pathway owing to absence of toxicity data. SAC for arsenic is only based on oral contribution (rather than combined) owing to the relative small contribution from inhalation in accordance with the SGV report. The same approach has been adopted for zinc.

(d) SAC for elemental mercury, chromium VI and nickel is based on the inhalation pathway only owing to an absence of toxicity for elemental mercury, in accordance with the SGV report for nickel and LQM report for chromium VI.

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH PRIVATE GARDENS

Table 8
Human Health Generic Assessment Criteria for Residential Scenario - Private Gardens

Compound	GrAC for Groundwater (mg/l)	SAC for Soil SOM 1% (mg/kg)	SAC for Soil SOM 2.5% (mg/kg)	SAC for Soil SOM 6% (mg/kg)
Metals				
Arsenic	-	32	32	32
Cadmium	-	10	10	10
Chormium (III) - oxide	-	3,000	3,000	3,000
Chromium (VI) - hexavalent	-	4.3	4.3	4.3
Copper	-	2,300	2,300	2,300
Lead	-	300	300	300
Elemental Mercury (Hg^0)	0.009	0.17	0.42	1.0
Inorganic Mercury (Hg^{2+})	-	170	170	170
Methyl Mercury (Hg^{4+})	20	7.4	9.6	11
Nickel	-	130	130	130
Selenium	-	350	350	350
Zinc	-	3,800	3,800	3,800
Cyanide	-	3.7	3.7	3.7
Volatile Organic Compounds				
Benzene	7	0.079	0.157	0.33
Toluene	1,900	120	270	610
Ethylbenzene	260	65	154	350
Xylene - m	100	44	103	240
Xylene - o	87	45	106	250
Xylene - p	84	42	98	230
Total xylene	84	44	103	240
Methyl tertiary butyl ether (MTBE)	2,200	1.8	3.7	7.4
Trichloroethene	1.8	0.11	0.2	0.49
Tetrachloroethene	3.6	0.94	2.1	4.8
1,1,1-Trichloroethane	26	6.2	12.7	28
1,1,1,2Tetrachloroethane	14	0.89	2.1	4.8
1,1,2,2-Tetrachloroethane	14	1.4	2.87	6.3
Carbon Tetrachloride	0.055	0.018	0.039	0.089
1,2-Dichloroethane	0.30	0.0053	0.0080	0.014
Vinyl Chloride	0.019	0.00047	0.0006	0.001
1,2,4-Trimethylbenzene	0.075	0.35	0.85	2.1
1,3,5-Trimethylbenzene	0.047	0.46	1.1	2.6
Semi-Volatile Organic Compounds				
Acenaphthene	3.2	210	480	1,000
Acenaphthylene	4.2	170	400	850
Anthracene	0.021	2,300	4,900	9,200
Benzo(a)anthracene	0.0038	3.1	4.7	5.9
Benzo(b)fluoranthene	0.0020	5.6	6.5	7.0
Benzo(g,h,i)perylene	0.00026	44	46	47
Benzo(k)fluoranthene	0.00080	8.5	9.6	10
Chrysene	0.0020	6.0	8.0	9.3
Dibenzo(a,h)anthracene	0.00060	0.76	0.86	0.90
Fluoranthene	0.23	260	460	670
Fluorene	1.9	160	380	780
Indeno(1,2,3-cd)pyrene	0.0002	3.2	3.8	4.2
Phenanthrene	0.53	92	200	380
Pyrene	0.13	560	1,000	1,600
Benzo(a)pyrene	0.0038	0.83	0.94	1.0
Naphthalene	19	1.5	3.7	8.7
Phenol	-	180	290	420
Total Petroleum Hydrocarbons				
Aliphatic hydrocarbons EC_5-EC_6	10	30	55	110
Aliphatic hydrocarbons >EC_6-EC_8	5.4	73	160	370
Aliphatic hydrocarbons >EC_8-EC_{10}	0.23	19	46	110
Aliphatic hydrocarbons >EC_{10}-EC_{12}	0.034	93 (48)	230 (118)	540 (283)
Aliphatic hydrocarbons >EC_{12}-EC_{16}	0.00076	744 (24)	1,700 (59)	3,000 (142)
Aliphatic hydrocarbons >EC_{16}-EC_{35}	-	45,100 (8.48)	64,000 (21)	76,000
Aliphatic hydrocarbons >EC_{35}-EC_{44}	-	45,100 (8.48)	64,000 (21)	76,000
Aromatic hydrocarbons >EC_8-EC_9 (styrene)	7.4	130	316	700
Aromatic hydrocarbons >EC_9-EC_{10}	7.4	27	65	150
Aromatic hydrocarbons >EC_{10}-EC_{12}	25	69	160	346
Aromatic hydrocarbons >EC_{12}-EC_{16}	5.8	140	310	593
Aromatic hydrocarbons >EC_{16}-EC_{21}	-	250	480	770
Aromatic hydrocarbons >EC_{21}-EC_{35}	-	890	1,100	1,230
Aromatic hydrocarbons >EC_{35}-EC_{44}	-	890	1,100	1,230

Notes:

'-' Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway, or an absence of toxicological data.

EC - equivalent carbon. GrAC - groundwater assessment criteria. SAC - soil assessment criteria.

The SAC for organic compounds are dependent on Soil Organic Matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58.
1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, polycyclic aromatic hydrocarbons, MTBE, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway, section 10.1.1, SR3.

The SAC has been set as the model calculated SAC with the saturation limit shown in brackets. For consistency where the GrAC exceeds the solubility limit, GrAC has been set at the solubility limit. The GrAC conservative since concentrations of the chemical are very unlikely to be at sufficient concentration to result in an exceedance of the health criteria value at the point of exposure (i.e. indoor air) provided free-phase product is absent.

APPENDIX K
CONTROLLED WATERS GAC

This appendix presents the generic assessment criteria (GAC) that RSK considers are suitable for assessing risks to:

- vegetation via the uptake of phytotoxic determinants through plant roots
- controlled waters.

The GAC for each of these receptors is discussed in turn.

Controlled waters

The GAC for controlled waters are presented in Table A3. In line with the Environment Agency's (2006b) remedial targets methodology, the GAC for controlled waters are termed 'target concentrations'.

The target concentration can be derived by several means with consideration to:

- whether the substance is classified as hazardous or non-hazardous by the EU under the Water Framework Directive (2000/60/EC) and Groundwater Daughter Directive (2006/118/EC) implemented though the Environmental Permitting Regulations 2010;
- background concentrations in the aquifer; and
- published guidance such as Environmental Quality Standards that are protective of ecology or The Water Supply (Water Quality) Regulations 2001 that are protective of drinking water.

A list of target concentrations considered suitable to assess risks to principal aquifers and secondary aquifers are presented in Table A2. Those for a principal aquifer are taken from the UK water supply (water quality) standards where possible owing to the possibility of a drinking water supply being within an influencing distance from the site or the possibility of one being installed. The target concentrations for a secondary aquifer are generally taken as the freshwater EQS where available owing to groundwater in secondary aquifers commonly providing base flow to surface watercourses.

Table A2: Target concentrations for controlled waters

Determinant	Target concentrations (mg/l)	
	Principal aquifer/source protection zone	Secondary aquifer/surface watercourse
Metals		
Arsenic	0.01[1]	0.05[15a]
Cadmium	0.005[1]	</=0.00008, 0.00008, 0.00009, 0.00015, 0.00025 [15b]
Chromium (total)	0.05[1]	Use values for chromium III and VI
Chromium (VI)	Use value for total chromium	0.0034 [15a]
Chromium (III)		0.0047 [15a]
Copper	2.0[1]	0.001, 0.006, 0.01, 0.028[15e]
Lead	0.025 (before 25/12/2013), 0.01 (after 25/12/2013)[1]	0.0072[15a]
Mercury	0.001[1]	0.00005[15a)]
Nickel	0.02[1]	0.02[15a]
Selenium	0.01[1]	0.01[1,12]
Zinc	5[2]	0.008, 0.05, 0.075, 0.125 [15e]
Chlorinated solvents		
Trichloroethene	0.01[1]	0.01[15a]
Tetrachloroethene		0.01[15a]
1,1,1-Trichloroethane	0.0001[3]	0.1[15a]
1,1,2-Trichloroethane	0.0001[3]	0.4[15a]
Carbon tetrachloride	0.003[1]	0.012[15a)]
1,2-Dichloroethane	0.003[1]	0.01[15a]
Vinyl chloride	0.0005[1]	0.0005[1,12]
Trihalomethanes	0.1[4]	0.1[4,12]
Chloroform (one of the trihalomethanes included above)	-	0.0025[15a]
Polycyclic aromatic hydrocarbons		
Acenaphthene	0.0058[9,13]	0.0058[9]
Acenaphthylene	0.0058[9,13]	0.0058[9]
Anthracene	0.0001[13, 15a]	0.0001[15a]
Benzo(a)anthracene	0.000018[9,13]	0.000018[9]
Benzo(b)fluoranthene	0.0001[1]	0.00003[15f]
Benzo(k)fluoranthene		

Benzo(g,h,i)perylene		0.000002[15g]
Indeno(1,2,3-cd)pyrene		
Chrysene	0.00001[9,13]	0.00001[9]
Dibenzo(a,h)anthracene	0.00001[9,13]	0.00001[9]
Fluoranthene	0.00001[9,13]	0.00001[15a)]
Fluorene	0.0021[9,13]	0.0021[9]
Phenanthrene	0.003[9,13]	0.003[9]
Pyrene	0.00004[9,13]	0.00004[9]
Benzo(a)pyrene	0.00001[1]	0.00005[15a]
Naphthalene	0.0024[13,15]	0.0024[15a]
Petroleum hydrocarbons		
Total petroleum hydrocarbons	0.01[1]	0.01[2,10]
Benzene	0.001[1]	0.01[15a]
Toluene	0.004[3]	0.05[15a]
Ethylbenzene	0.02[13,14]	0.02[14]
Xylene	0.003[3]	0.03[15a]
Methyl tertiary butyl ether	0.015[6]	0.015[6,12]
Pesticides and herbicides		
Aldrin	0.003[3]	0.00001[15d]
Dieldrin	0.003[3]	
Endrin	0.0001[3]	
Isodrin	0.0001[3]	
Heptachlor	0.00003[1]	0.00003[1,12]
Heptachlor epoxide	0.00003[1]	0.00003[1,12]
Other pesticides	0.0001[1]	0.0001[1,12]
Total pesticides	0.0005[1]	0.0005[1,12]
Total DDT	0.001[8]	0.000025[15a]
Azinphos – methyl	0.0001[3]	0.00001[14]
Cyfluthrin	0.0001[3]	0.000001[3]
Demeton	0.0001[3]	0.0005[10]
Dichlorvos	0.000001[13,15]	0.000001[15a]
Dimethoate	0.0001[13,15a]	0.00048[15a]
Endosulphan	0.0001[13,15a]	0.000005[15a]
Fenitrothion	0.0001[3]	0.00001[15a]
Flucofuron	0.0001[3]	0.001[3]

Malathion	0.0001[3]	0.00001[15a]
Mevinphos	0.00002[7,13]	0.00002[7]
Omethoate	0.0001[3]	0.00001[3]
PCSDs (cyfluthrin, sulcofuron, flucofuron and permethrin)	0.00005[7,13]	0.00005[17]
Permethrin	0.0001[3]	0.00001[15a]
Sulcofuron	0.0001[3]	0.025[7]
Triazaphos	0.0001[3]	0.000005[10]
Atrazine	0.0001[3]	0.0006[15a]
Simazine		0.001[15a]
Bentazone	0.1[3]	0.5[15a]
Linuron	0.0001[3]	0.0005[15a]
Mecoprop	0.0001[3]	0.018[15a]
Trifluralin	0.0001[3]	0.00003[15a]
Miscellaneous		
Cyanide	0.05[1]	0.001[15a]
Phenol	0.0005[3]	0.0077[15a]
Sodium	200[1]	170[3]
Chloride	250[1]	250[5]
Ammonium (as NH_4^+)	0.5[1]	0.5[1,12]
Ammonia (NH_3 as N)	0.015[13]	0.015[3]
Sulphate	250[1]	400[5]
Iron	0.20[1]	1[15a]
Manganese	0.05[1]	0.05[1,12]
Aluminium	0.2[1]	0.2[1,12]
Nitrate (as NO_3)	50[1]	50[1,12]
Nitrite (as NO_2)	0.1[1]	0.1[1,12]

Notes:

1. Statutory Instrument 2000 No. 3184. The Water Supply (Water Quality) Regulations 2000.
2. Statutory Instrument 1989 No. 1147. The Water Supply (Water Quality) Regulations 1989.
3. Minimum reporting values listed in Annex (j) of Horizontal Guidance Note H1 (Environment Agency, 2010b). Note target concentration for xylenes is 0.003mg/l each for o-xylene and m/p xylene.

4. Statutory Instrument 2000 No. 3184. The Water Supply (Water Quality) Regulations 2000 – sum of chloroform, bromoform, dibromochloromethane and bromodichloromethane.

5. Proposed list of EQS for implementation of the Dangerous Substances Directive (76/464.EEC).

6. Environment Agency MTBE guidance, dated 2006.

7. Freshwater Environmental Quality Standards: The Water Framework Directive.

8. WHO's (2004) guidelines for drinking-water quality.

9. WRc plc (2002), R&D Technical Report P45. Where predicted no-effect concentration is below the laboratory method detection limit (LMDL) for chrysene, dibenzo(ah)anthracene and fluoranthene, the target concentration has been set at the LMDL of 0.00001mg/l.

10. Owing to hydrocarbons being hazardous substances, 0.01mg/l (DWS) should be used in the first instance against the total of the hydrocarbon bands. However, if the hydrocarbon concentrations measured in groundwater exceed this value, an alternative value of 0.05mg/l could be used providing it is justified based on the type of aquifer and distance to secondary receptors such as a stream. The value is taken as the lowest concentration in Statutory Instrument 1996 No. 3001 titled the Surface Waters (Abstraction for Drinking Water) (Classification) Regulations 1996.

11. Surface Waters (Dangerous Substances) (Classification) Regulations 1998.

12. Where a published target concentration considered suitable for use with a secondary aquifer could not be found for certain substances such as selenium, the target concentration used for the principal aquifer has been adopted.

13. Where a published target concentration considered suitable for use with a principal aquifer could not be found for certain substances such as ethylbenzene, the target concentration used for the secondary aquifer has been adopted.

14. Environment Agency Chemical Standards Database (May 2011).

15. The River Basin Districts Typology, Standards and Groundwater Threshold Values (Water Framework Directive) (England and Wales) Directions 2010.

    15a. Value for 'Good' status.

    15b. Applies to hardness ranges of <40mg/l $CaCO_3$, 40–<50mg/l $CaCO_3$, 50–<100mg/l $CaCO_3$, 100–<200mg/l $CaCO_3$ and >/=200mg/l $CaCO_3$. The target concentrations included in Table 3 are listed in order of increasing calcium carbonate concentrations.

    15c 'High' standard: < /= 50mg $CaCO_3$/l or >50–200mg $CaCO_3$/l and an altitude of >80m above mean sea level, >50–200mg $CaCO_3$/l and an altitude of < /= 80m above mean sea level, 'Good' standard: < /= 50mg $CaCO_3$/l or >50–200mg $CaCO_3$/l and an altitude of >80m above mean sea level, >50–200mg $CaCO_3$/l and an altitude of < /= 80m above sea level.

    15d. Sum of aldrin, dieldrin, endrin and isodrin.

    15e. Hardness ranges are 0–50mg/l $CaCO_3$, 50–100mg/l $CaCO_3$, 100–250mg/l $CaCO_3$ and >250mg/l $CaCO_3$. The target concentrations included in Table 3 are

listed in order of increasing calcium carbonate concentrations. Applies to annual average. Applies to annual average value for 'Good' status.

15f. Sum of benzo(a) anthracene and benzo(k)fluoranthene.

15g. Sum of benzo(g,h,l)perylene and indeno(1,2,3-cd)pyrene.

'-' A target concentration for chloroform for a principal aquifer is absent since it is one of the trihalomethane compounds. See note 4 above.

APPENDIX L
HASWASTE WASTE CLASSIFICATION

As cmpds (AsS), Cd (CdO), CrVI cmpds ($FeCrO_4$), Cu (Cu_2O), Inorg Hg cmpds (HgO), Pb cmpds ($PbSO_4$), Ni ($NiCO_3$), Se cmpds (SeS) and Zn as ZnO. Also Ba ($BaCO_3$), Be cmpds ($BeSO_4$), Co (CoO), Mn (MnO_2) and Mo (MoO_3).

HASWASTE v4a. Envirolab's Contaminated Land Soil Hazardous Waste Assessment Tool.

Envirolab, Sandpits Business Park, Mottram Road, Hyde, Cheshire SK14 3AR.

17134 - Mitton Road, Wahlley

TP/WS/BH		TP1	TP2	TP5	TP8	TP9	WS1	WS1	WS2	WS2	WS3	WS4	WS5		
Depth (m)		0.40	0.20	1.00	0.50	0.40	0.50	2.00	0.70	1.50	0.50	1.40	1.00		
Envirolab reference															
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Arsenic		7	7		1	1	5		5	5	4		1		
CrVI or Chromium		21	17		27	26	24		52	18	27		42		
Copper		35	23		10	8	15		19	11	19		15		
Lead		70	43		19	16	23		27	11	39		19		
Nickel		14	12		15	14	16		29	12	17		30		
Zinc		66	71		78	54	76		118	43	71		92		
Cadmium		0.6	0.6		0.5	0.5	0.7		0.6	0.5	0.6		0.5		
Mercury		0.2	0.2		0.2	0.2	0.2		0.2	0.2	0.2		0.2		
Selenium		1	1		1	1	2		2	1	1		1		
Barium															
Beryllium															
Cobalt															
Manganese															
Molybdenum															
Total USEPA 16 PAHs		0.4	2.1			0.1	0.1		0.1	0.3					
Acenaphthene		0.03	0.04			0.01	0.02		0.01	0.04					
Acenaphthylene		0.01	0.01			0.01	0.01		0.01	0.01					
Anthracene		0.03	0.03			0.01	0.01		0.01	0.02					
Benzo(a)anthracene		0.03	0.12			0.01	0.01		0.01	0.01					
Benzo(a)pyrene		0.03	0.16			0.01	0.01		0.01	0.01					
Benzo(b)fluoranthene		0.03	0.23			0.01	0.01		0.01	0.01					
Benzo(ghi)perylene		0.04	0.20			0.01	0.01		0.01	0.02					
Benzo(k)fluoranthene		0.03	0.05			0.01	0.01		0.01	0.01					
Chrysene		0.04	0.16			0.01	0.01		0.01	0.01					
Dibenzo(ah)anthracene		0.04	0.01			0.01	0.01		0.01	0.04					
Fluoranthene		0.01	0.33			0.01	0.01		0.01	0.01					
Fluorene		0.03	0.03			0.01	0.01		0.01	0.02					
Indeno(123cd)pyrene		0.04	0.08			0.01	0.01		0.01	0.01					
Naphthalene		0.04	0.20			0.08	0.06		0.11	0.06					
Phenanthrene		0.01	0.15			0.01	0.02		0.01	0.01					
Pyrene		0.01	0.30			0.03	0.02		0.01	0.01					
Benzo(j)fluoranthene															
Benzene															
Toluene															
Ethylbenzene															
Xylenes															
Trimethylbenzenes															
Chlorobenzene															
1,2-Dichlorobenzene															
1,3-Dichlorobenzene															
1,4-Dichlorobenzene															
1,2,4-Trichlorobenzene															
2-Chlorotoluene															
4-Chlorotoluene															
Trichloroethene (TCE)															
Oil in Waste Carcinogenic H7															
Total TPH	≥1,000mg/kg	0.1		0.1					0.1			0.1			
Petrol or (C6-C10)	≥1,000mg/kg	0.01		0.01					0.01			0.01			
Diesel or (C10-C25) or (conservative C10-C35)	≥10,000mg/kg	0.1		0.1					0.1			0.1			
Lube Oil or (C25+) or (conservative C21+)	≥1,000mg/kg	0.1		0.1					0.1			0.1			
8 IARC H7 Carcinogenic PAHs marker test (applicable to LRO only)	≥1%	240.00	#DIV/0!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	70.00	#DIV/0!	#DIV/0!	0.00	#DIV/0!	#DIV/0!	#DIV/0!
Kerosene															
Kerosene															
Creosote															
Creosote															
pH Corrosive H8 (Irritant H4)															
pH (soil)	≤2 H8 ≥11.5	6.7	6.4		6.5	6.7	6.4		7.0	7.2					
pH (leachate)	≤2 H8 ≥11.5														
Alkali Reserve (gNaOH/100g)															
H4 Alkali Reserve test	≥13														
H8 Alkali Reserve test	≥14.5														
Produces Toxic Gases H12															
Total Sulphide	≥1,400mg/kg														
Free Cyanide	≥1,200mg/kg														
Thiocyanate	≥2,600mg/kg														
Elemental/Free Sulphur															
PCBs Total															
Phenols Total by HPLC															
Phenol															
Cresols															
Xylenols															
1-Naphthol															
Resourcinol															
2,3,5,6-Tetrachlorophenol															
2,4,5-Trichlorophenol															
2,4,6-Trichlorophenol															
2,4-Dichlorophenol															
4-Chloro-3-methylphenol															
Pentachlorophenol															
Bis(2-ethylhexyl)phthalate															
Butylbenzylphthalate															
Di-n-butylphthalate															
Visual Fibre Screen or Asbestos ID (enter Y or N)	H7≥0.1%; H5≥3%; H6≥25%														

Hazard Codes	Thresholds	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Irritant H4	≥10%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Irritant H4	≥20%	0.003	0.002	0.000	0.003	0.003	0.003	0.000	0.006	0.002	0.003	0.000	0.006	0.000	0.000
Harmful H5	≥25%	0.017	0.012	0.000	0.007	0.006	0.008	0.000	0.012	0.005	0.011	0.000	0.011	0.000	0.000
Toxic H6 (Harmful H5)	≥0.1%H5<7%; H6≥7%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Toxic H6 (Harmful H5)	≥3%H5<25%; H6≥25%	0.004	0.004	0.000	0.003	0.003	0.004	0.000	0.007	0.003	0.004	0.000	0.006	0.000	0.000
Carcinogenic H7	≥0.1%	0.007	0.006	0.000	0.009	0.009	0.008	0.000	0.017	0.006	0.009	0.000	0.014	0.000	0.000
Carcinogenic H7	≥1%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Corrosive H8 (Irritant H4)	≥5%H4<10%; H8≥10%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Toxic for Reproduction H10	≥0.5%	0.010	0.006	0.000	0.003	0.003	0.003	0.000	0.006	0.002	0.006	0.000	0.006	0.000	0.000
Toxic for Reproduction H10	≥5%	0.010	0.006	0.000	0.003	0.002	0.003	0.000	0.004	0.002	0.006	0.000	0.003	0.000	0.000
Mutagenic H11	≥0.1%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mutagenic H11	≥1%	0.003	0.002	0.000	0.003	0.003	0.003	0.000	0.006	0.002	0.003	0.000	0.006	0.000	0.000
New H13 Sensitising	≥1%	0.0070	0.0056	0.0000	0.0089	0.0086	0.0079	0.0000	0.0172	0.0060	0.0089	0.0000	0.0139	0.0000	0.0000
Ecotoxic H14	≥1.0	0.120	0.100	0.000	0.100	0.084	0.102	0.000	0.174	0.067	0.112	0.000	0.141	0.000	0.000
New Ecotoxic H14 individual substance specific thresholds	≥0.0025%	0.00000	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
New Ecotoxic H14 individual substance specific thresholds	≥0.025%	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Consider other individual contaminants on a case by case basis.

Table 3.2 of Annex VI of the CLP Regulation incluing 1st ATP (sometimes called ATSP1).