will be recorded in a validation report assessing compliance with the approved criteria;

- A Design Sulphate (DS) class and Aggressive Chemical Environment for Concrete (ACEC) class should be derived for the Site in accordance with the recommendations given within BRE SD1 and based on pH and sulphate testing; and
- A programme of shallow gas monitoring is recommended following the turnover and reengineering of the Made Ground to determine whether protective measures are needed with proposed buildings.

The risk to Controlled Waters has been assessed in both the sitewide CWRA (ref. 18669-RLE-19-RP-O-0006) and phase specific CWRA (ref. 18669-RLL-26-XX-RP-O-0865) to further determine whether additional works are required to protect Controlled Waters receptors post-development. This, along with a formal Remediation Strategy should be agreed with Natural Resources Wales (NRW) and Local Authority (LA).

8.0 Geotechnical Testing

8.1. Sampling and Testing

Geotechnical sampling was undertaken by an Atkins Engineer during the 2018 ground investigation. No geotechnical sampling was undertaken in the 2016 IFA ground investigation.

Samples collected on Site were sent for geotechnical laboratory testing, which were undertaken in accordance with BS1377:1990. Laboratory testing was undertaken by Celtest and included the following:

Summary of Geotechnical Testing Undertaken on Samples	
Test	**Number of Samples Tested**
Moisture Content	24
Particle Size Distribution by Wet Sieve	24
Compaction Using 4.5kg rammer	24
Total Expansion BRE Tests	23

The above testing provided results to show the principal geotechnical properties of the major geological units identified during the ground investigation. A summary of the geotechnical laboratory results is presented in the following sections, and the laboratory data is included within **Appendix J**.

8.2. Classification Testing

8.2.1. Natural Moisture Content

24 compaction tests (4.5kg rammer) were undertaken on samples of Made Ground and recorded an optimum moisture content for the Made Ground of between 6.70% and 13.00%.

Moisture content tests were undertaken on 24 samples and recorded water content between 7.60% and 21.50%.

8.2.2. Material Grading and Classification

Particle size distribution tests were undertaken on 24 samples of the Made Ground on Site. The results of the particle size distribution tests on the Made Ground indicate the material can be generally described as a slightly clayey sandy GRAVEL or sandy GRAVEL with occasional cobbles, falling into Class falling into Class 1A & 1B – General Granular Fill[8]. This grading of material, when compacted/ reengineered, is likely to have limited permeability (approximately 10^{-7}), classed as poor draining soils and therefore inhibiting the downward migration of infiltrated rainwater into the Made Ground.

[8] Series 600 Earthworks, Manual of Contract Documents for Highway Works - Volume 1, Specification for Highway Works, Amendment February 2017.

8.3. BRE Total Expansion Tests

23 samples were scheduled for testing in accordance with BRE 481 Part B - Appendix B to determine the expansion of steel slag (over 28 days at 80°C) and recorded a total expansion of -0.6% to 1.2%. It is worth noting that the BRE test is a conservative test crushing material >20mm and placing it in a bath of water at 80°c for 28 days.

According to the RLL Technical Note (ref. 17480-RLE-18-XX-RP-O-001, dated March 2018) Geotechnical Guidance for Reuse of Made Ground Containing Slag, the guideline average expansion value considered to be acceptable is 2.5%.

Of the 23 samples tested, the mean value recorded was 0.31%. No samples produced results over 2.5%. The maximum total expansion value recorded was 1.20%.

A full copy of the results are included in **Appendix J**.

9.0 Conclusions and Recommendations

9.1. Conclusion

The Site is located within the Glan Llyn development at the former Llanwern Steelworks, approximately 5.5km to the east of Newport City Centre, at approximate National Grid Reference 336317E, 186693N. The Site is irregular in shape, covers an area of approximately 1.5ha and is located near the centre of the wider Glan Llyn development. It is understood that the Site is proposed to be redeveloped for a residential end use.

Historically, the Site comprised part of four open fields, segregated by reens and trees until 1967 when the Site formed part of Llanwern Steelworks. 1973 historic mapping shows railway sidings and access tracks to run approximately north to south through the centre of Site and the western side to form part of the ore stockyard. To the west of the Site were ore stockpiles, conveyors, travelling booms, roadways, a wetland area with drains, marshland and a small pond. As the steelworks expanded a sinter plant was constructed, encroaching on the western side of the Site alongside associated structures, conveyors, and tracks. The Site currently comprises an area used for the stockpiling of materials from the wider Glan Llyn Site.

The 2016 IFA ground investigation comprised 2 boreholes, with groundwater encountered in 1 location (CWCP31) within the Tidal Flat Deposits at a depth of 9.50mbgl. The 2018 Atkins ground investigation comprised 28 trial pits, with perched water encountered within the Made Ground in 27 locations.

Made Ground was encountered within all 30 exploratory holes. The Made Ground was encountered from ground level or underlying the surfacing at thicknesses of between 0.60m to 3.60m. Tidal Flat Deposits were encountered beneath the Made Ground in 28 locations, at depths of between 1.60m and 3.60m. The base of the formation was not encountered during the 2018 Atkins ground investigation, although the formation was recorded to depths of up to 3.70m. The base of the superficial deposits was proven at 10.00mbgl during the 2016 IFA ground investigation. Mercia Mudstone was encountered in one of the IFA boreholes (CWCP31) between 10.00mbgl to 10.95mbgl, with the base of the formation not proven.

Regional groundwater was only encountered in one exploratory hole (CWCP31) within Phase 4E during the IFA ground investigation, at a depth of 9.50mbgl within the basal sand layer of the Tidal Flat Deposits. As reported in the CWDQRA for the wider Site, groundwater is present beneath the Site as perched water within the Made Ground, or regional groundwater within the Tidal Flat Deposits (confined to the basal sand layers) and Mercia Mudstone.

Hydrocarbon odours/ oil sheens in perched water were encountered in ten locations within the Made Ground, at depths ranging from 0.00mbgl to 1.40mbgl. Given the relatively low number of exploratory locations at which evidence of hydrocarbon contamination was identified, the presence of gross contamination, unsuitable for retention within the development is considered unlikely. This is further supported by only limited elevated speciated hydrocarbons within soils samples.

Buried obstructions such as concrete slabs, electric cables and brick walls, steel cables and hard layers of slag or iron ore aggregate were encountered in 7 locations at depths between 0.00mbgl to at 1.50mbgl.

79 soil samples were collected and scheduled for analysis within the Made Ground and Superficial Deposits. The samples collected were conservatively assessed against LQM/ CIEH 2015 S4ULs (Suitable for Use Levels) for a residential end use with plant uptake (1% SOM). Chemical analysis has identified exceedances of lead, vanadium, benzene, benzo[b]fluoranthene, benzo[a]pyrene and dibenz(a,h)anthracene.

Asbestos was identified in five soil samples at concentrations of <0.001% to 0.0077%. In accordance with the IOM report soils with these concentrations are considered suitable for reuse beneath the clean cover system.

No water sampling has been undertaken within the Site as part of the 2016 IFA and 2018 Atkins investigation. Ground investigations undertaken across the wider development have identified elevated concentrations of contaminants that may potentially present a risk to Controlled Waters, this has been assessed in the DQRA.

A Site-specific ground gas assessment is recommended following the earthworks, comprising a programme of shallow ground gas monitoring following the turnover of the Made Ground to natural geology and reengineering of the site won Made Ground to formation levels. The classification of the Site will depend on the permeability of the upper clay of the Tidal Flat Deposits. Radon protection measures are not required.

9.2. Recommendations

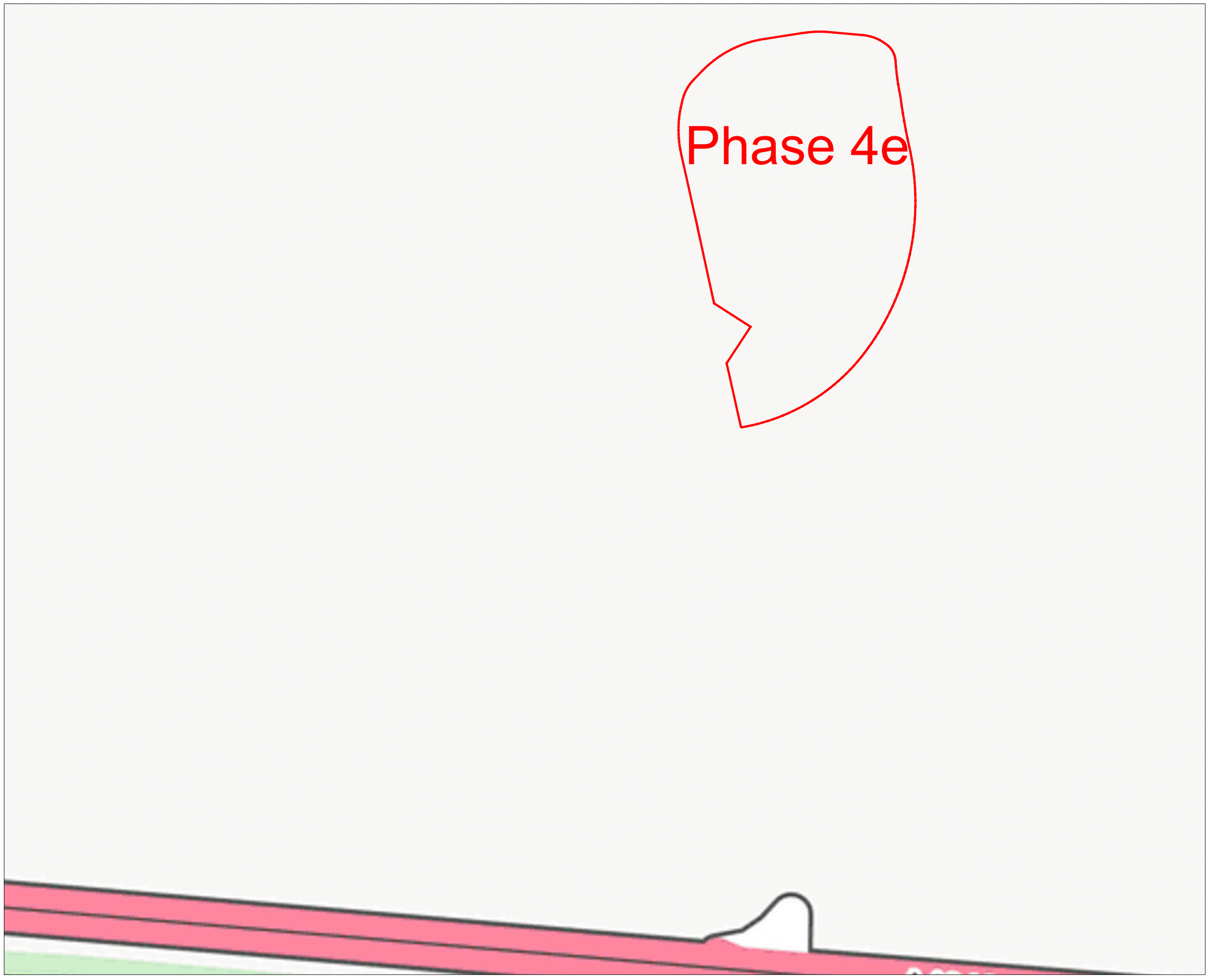
Following the completion of the ground investigation the following recommendations have been made:

- Removal of identified hotspot contamination on a grid square basis, and subsequent validation testing and reporting.
- Turnover of the Made Ground to natural geology with removal of obstructions.
- reengineering of materials in accordance with the approved Remediation Strategy and Earthworks Specification to an appropriate specification to achieve the required formation level.
- Chemical and geotechnical validation of the placement of material following turnover.
- A programme of shallow gas assessment is recommended following the earthworks to turnover and reengineer the Site.
- Concrete classification testing should be undertaken in accordance with BRE Special Digest 1.

- Phase-specific geotechnical assessments relating to the proposed development.
- Construction of buildings and hardstanding with suitable construction materials to break the pathway with underlying Made Ground, to intercept rainwater and to reduce infiltration.
- A 600mm clean cover system, suitable for a residential with plant uptake end use, will be required in areas of residential gardens and landscaping.
- Consultation with the water supply company in relation to the potential use of barrier pipe.
- Preparation of a Piling risk Assessment.
- Preparation of a Detailed Controlled Waters Risk Assessment to assess the risk posed to controlled waters within the future development and inform the Remediation Strategy.
- Preparation of an MMP to facilitate the reuse of excavated materials and import of soil for use in the cover system.

Appendices

Appendix A
Drawings and Plans



GENERAL NOTES

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KEY:

Approximate Site Boundary

Rev	Date	Amendments	By	Chk

Client

St Modwen Developments

Project

P18-669 Llanwern Reclamation

Drawing Title

Phase 4e

Site Location Plan

INFORMATION

	Drawn	Checked	Date
1:1250 @ A1	AMS	CW	28.10.24

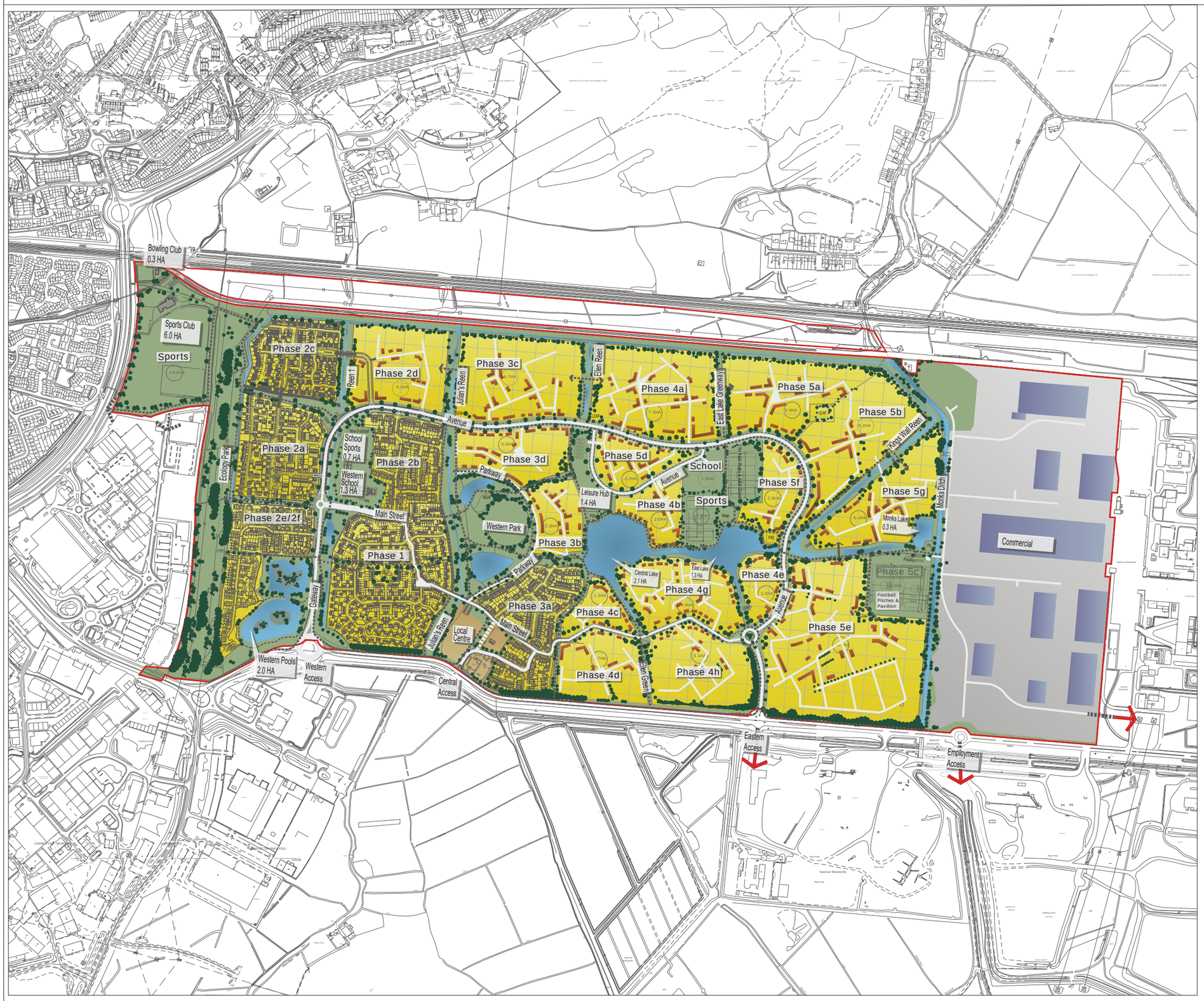
Drawing No. | Rev.

18669-RLL-24-XX-DR-O-0657 P01

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Glan Llyn -ESAMP Indicative Masterplan



Glan Llyn Residential Numbers (based on existing masterplan)					
Phase/Plot	Outlet	Area (HA)	Area (Acres)	Density (HA)	Total Units
1	Persimmon	**9.77**	**24.15**	31.4	307
2/a	Bellway	5.20	12.84	35	182
2/b	SMH	4.06	10.02	35	142
2/c	Bellway	4.30	10.62	35.3	152
2/d	Persimmon	4.98	12.30	35	174
2/e&f	SMH	5.10	12.61	29.8	152
1 and 2/Total		**33.40**	**82.54**		**1109**
3a		5.86	14.49	35	205
3b		2.32	5.74	35	81
3c		6.72	16.60	38.1	256
3d		3.45	8.53	35	121
3 Total		18.36	45.36		663
4a		7.19	17.78	34.8	250
4b		2.04	5.04	35	71
4c		1.53	3.78	35	54
4d		3.65	9.03	35	128
4e		1.49	3.68	35	52
4f		-	-	-	-
4g		4.64	11.46	35	162
4h		5.15	12.73	35	180
5a		5.65	13.95	35	198
5b		6.23	15.41	35	218
5c	Sports	2.67	6.60	35	93
5d		2.24	5.53	35	78
5e		13.72	33.90	35	480
5f		2.49	6.15	35	87
5g		5.06	12.50	35	177
4 and 5/Total		**63.75**	**157.53**		**2230**
1,2,3,4,5 Total		**115.51**	**285.44**		**4002**

NOTE: Areas and housing numbers assume that plot 5c sports is moved to CBP and converted to resi

SGP
Architects + Masterplanners

Waterfront House,
2a Smith Way, Grove Park,
Enderby, Leicester,
LE19 1SX
t: +44 (0)116 247 0557
www.stephengeorge.co.uk

SGP File Ref:	8111-08-A011	**Drawing No:**	8111-08-A011
Project No:	8111-08	**Rev:**	**Rev P09**
Drawn By:	NV	**Scale:**	1:5000 @A1
Date:	10/04/2019		

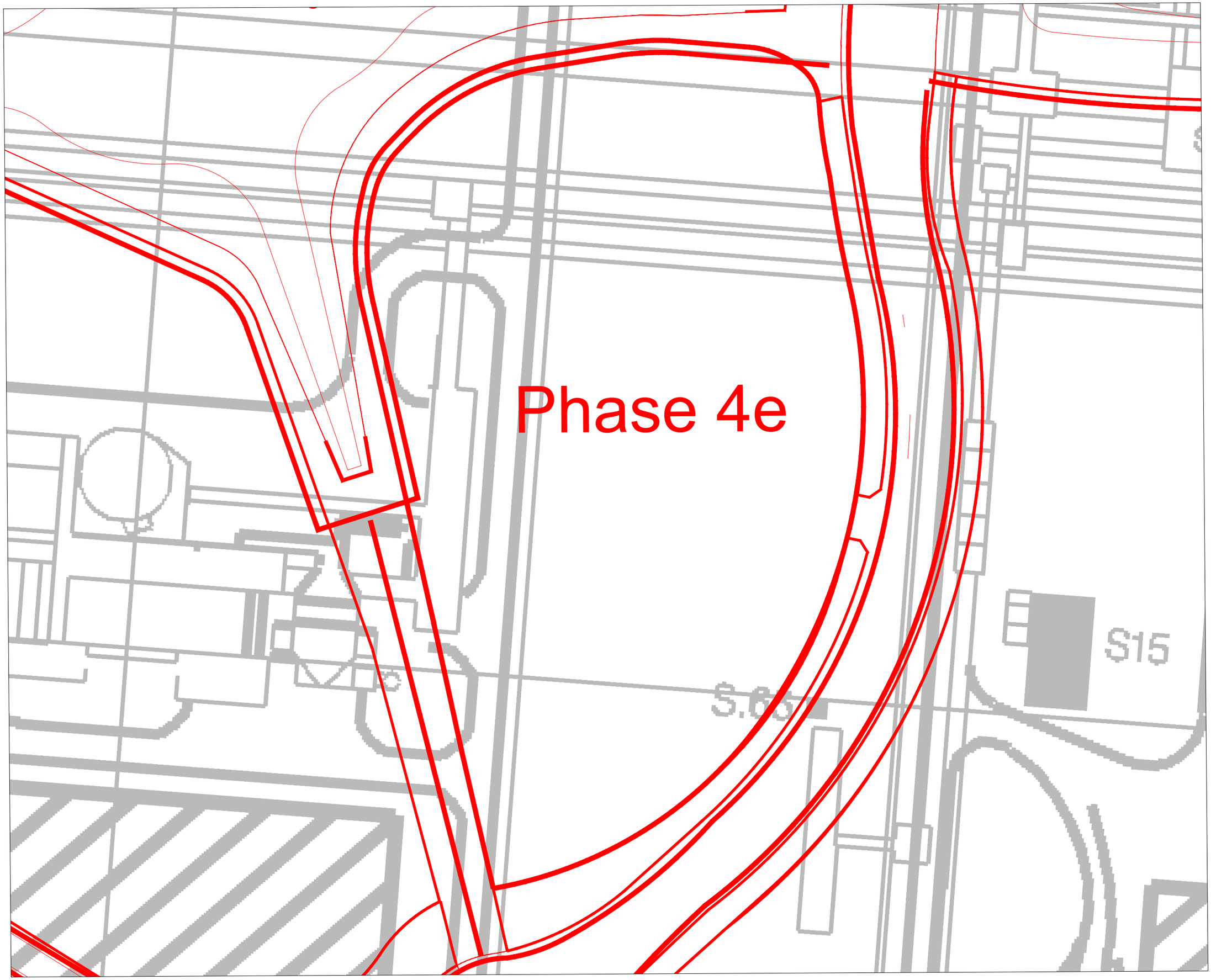
Notes:
Residential areas quoted are approximate gross site areas and include Leaps, Laps and on plot road infrastructure

Notes:
Residential areas quoted are approximate gross site areas and include Leaps, Laps and on plot road infrastruclayture

0 50 100 200 250 300 400 500
Metres at scale 1:5000

ST.MODWEN

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Rev	Date	Amendments	By	Chk

Client

St Modwen Developments

Project

P18-669 Llanwern Reclamation

Drawing Title

Phase 4E

Historical Obstruction Plan

INFORMATION

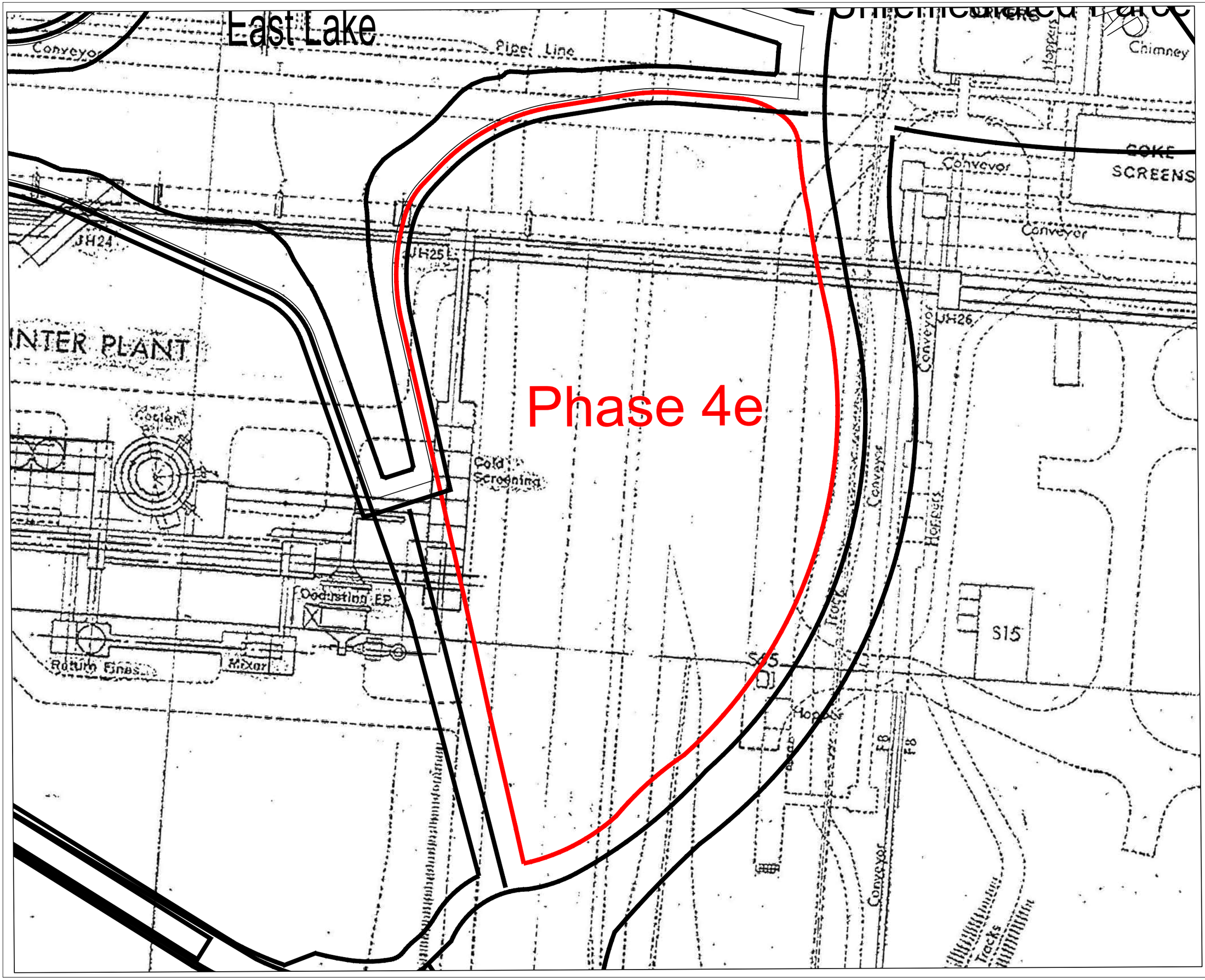
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NTS	SR	CW	05.01.23

Drawing No. Rev.

18669-RLL-22-XX-DR-O-0391

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KEY:

SITE BOUNDARY

WIDER SITE PHASING PLAN

Rev	Date	Amendments	By	Chk
P01	04/03/2026	First Issue	AMS	CW

Client

Revantage Real Estate

Project

P18-669 Glan Llyn, Llanwern, Newport

Drawing Title

Phase 4E

Historical Working Plan Overlay

INFORMATION

	Drawn	Checked	Date
NTS	AMS	CW	04/03/26

Drawing No. — Rev.

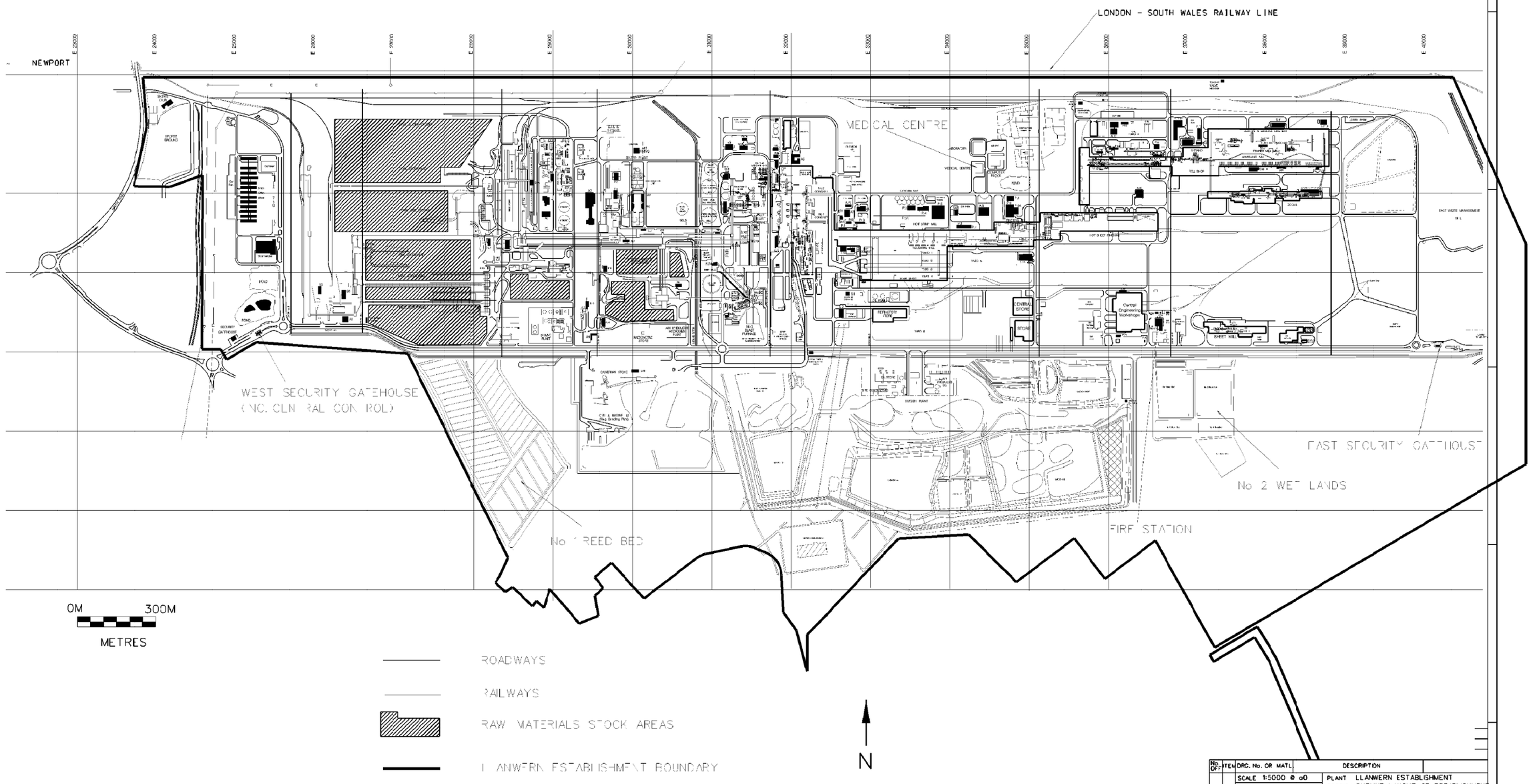
18669-RLL-26-XX-DR-O-0859 P01

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MAP 1
APPENDIX 15.1



No. OFF	ITEM	DRG. No. OR MATL	DESCRIPTION
		SCALE 1:5000 @ a0	PLANT LLANWERN ESTABLISHMENT
		UNIT OF MEASUREMENT	SECTION OUTLINE LAYOUT OF ESTABLISHMENT
		DRAWN N.W.C. 09.12.99	DESCRIPTION
		CHECKED	ROADS, RAILS AND STOCKING AREAS FOR COMAH REPORT
		TRACED	
		PASSED	COPYRIGHT-BRITISH STEEL LIMITED© 19

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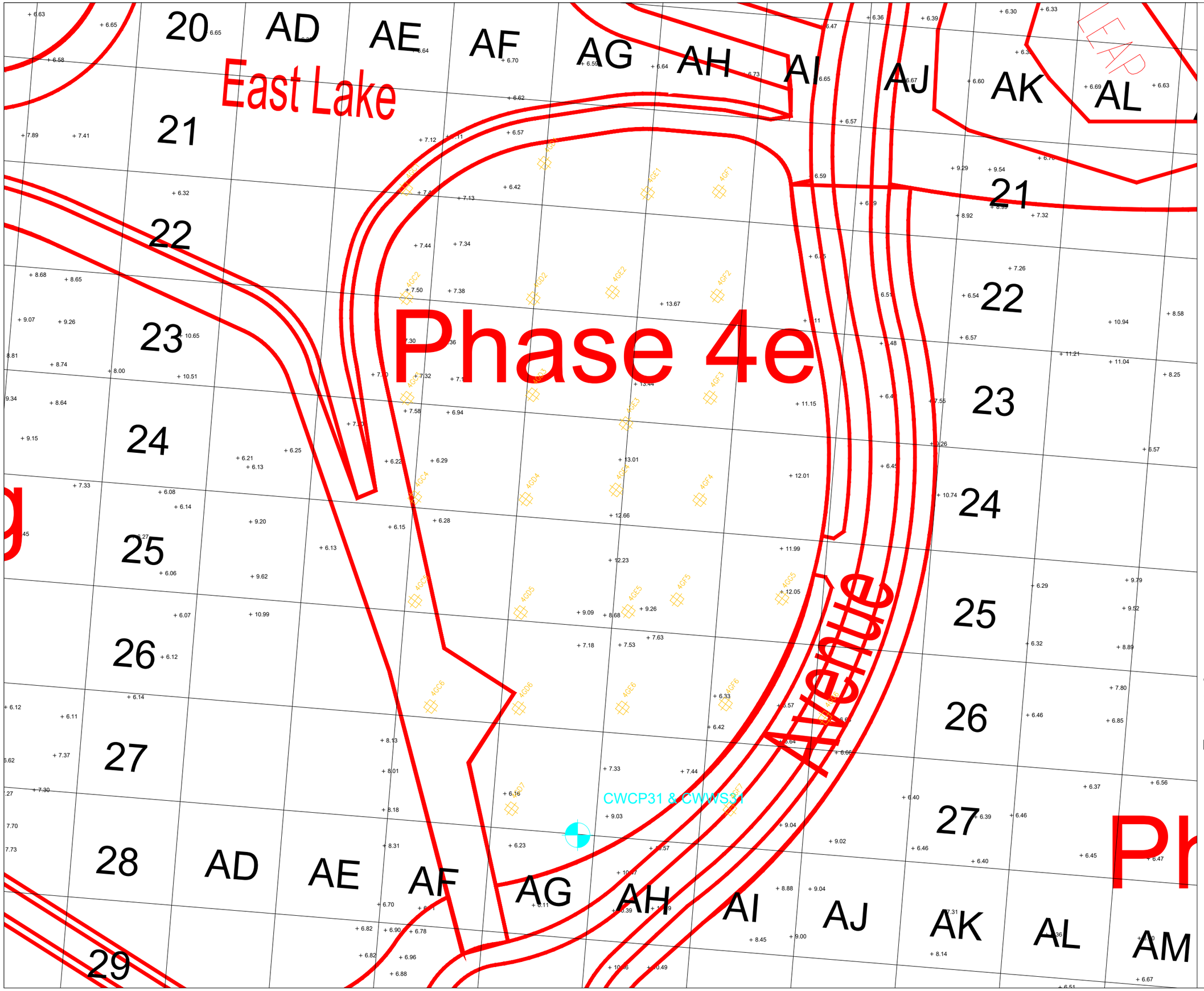
ORIGINATING OFFICE
DRG.No. 839181
RECEIVING OFFICE
DRG.No.

DIVISION STRIP PRODUCTS
WORKS LLANWERN

British Steel Limited

C.A.D.

PRELIMINARY No 5 7/2/01



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KEY:

- PHASE BOUNDARY
- CWRA BOREHOLE
- ATKINS TRIAL PITS

Rev	Date	Amendments	By	Chk
A	22:12:22	Atkins TPs Added	SR	CW

Client

ST Modewn Developments

Project

P18-669 Llanwern Reclamation

Drawing Title

4e Historical BH plan

INFORMATION

	Drawn	Checked	Date
NTS	ET	CW	05/12/22

Drawing No.

18669-RLL-22-XX-DR-O-0376

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Appendix B
Site Walkover Photographs

Phase 4E Site Walkover Photos



Photograph 1 (August 2021): West facing view of Made Ground stockpile located in the approximate centre of Phase 4E.



Photograph 2 (November 2023): South facing view of Phase 4E showing stockpiles Made Ground in the approximate centre of the phase and standing surface water.



Photograph 3 (November 2023): Northeast facing view of the northern side of Phase 4E showing significant standing surface water between two Made Ground stockpiles.

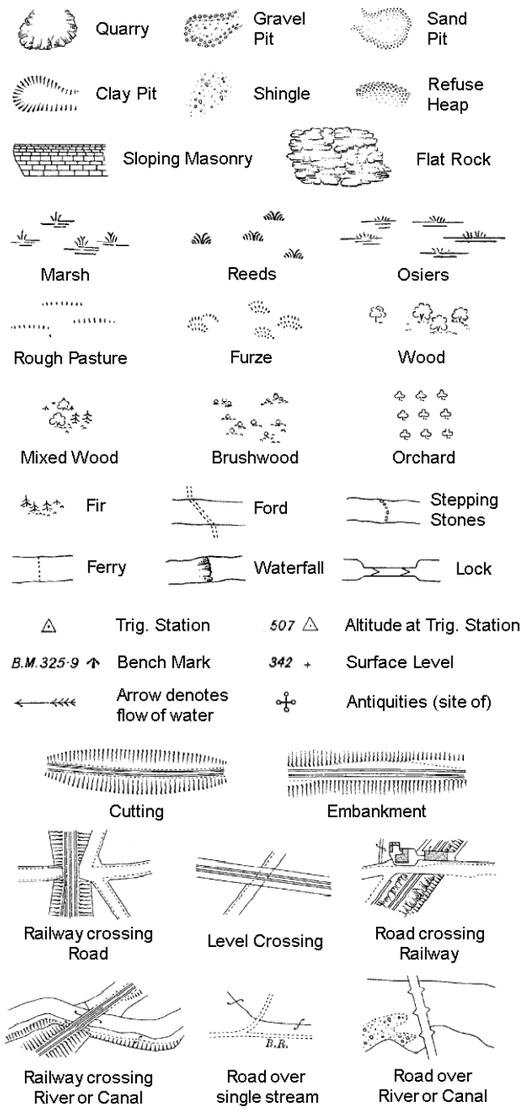


Photograph 4 (November 2023): Northeast facing view of the southwestern side of Phase 4E showing standing surface water pooled on open space within the phase.

Appendix C
Historical Maps

Historical Mapping Legends

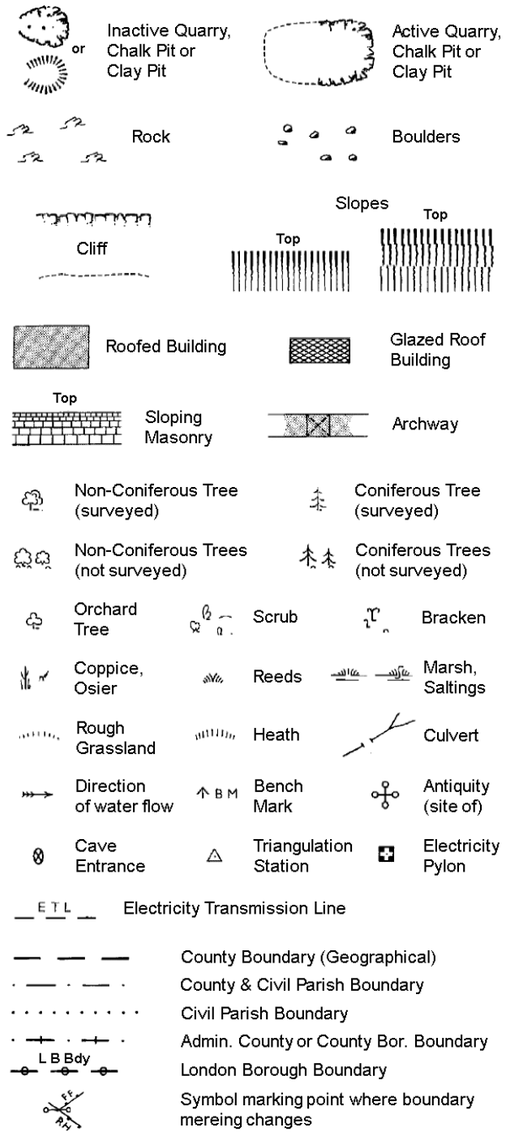
Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
County Borough Boundary (England)
Co. Boro. Bdy.
County Burgh Boundary (Scotland)
Co. Burgh Bdy.

B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	St.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

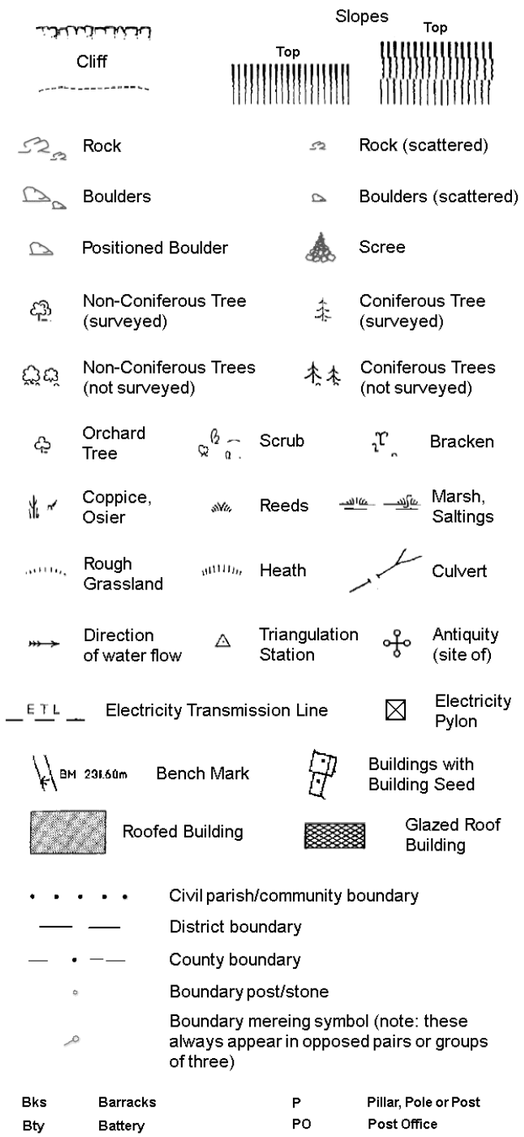
Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



County Boundary (Geographical)
County & Civil Parish Boundary
Civil Parish Boundary
Admin. County or County Bor. Boundary
L B Bdy
London Borough Boundary
Symbol marking point where boundary mereing changes

BH	Beer House	P	Pillar, Pole or Post
BP, BS	Boundary Post or Stone	PO	Post Office
Cn, C	Capstan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D Fn	Drinking Fountain	Pp	Pump
El P	Electricity Pillar or Post	SB, S Br	Signal Box or Bridge
FAP	Fire Alarm Pillar	SP, SL	Signal Post or Light
FB	Foot Bridge	Spr	Spring
GP	Guide Post	Tk	Tank or Track
H	Hydrant or Hydraulic	TCB	Telephone Call Box
LC	Level Crossing	TCP	Telephone Call Post
MH	Manhole	Tr	Trough
MP	Mile Post or Mooring Post	Wr Pt, Wr T	Water Point, Water Tap
MS	Mile Stone	W	Well
NTL	Normal Tidal Limit	Wd Pp	Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250



Civil parish/community boundary
District boundary
County boundary
Boundary post/stone
Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

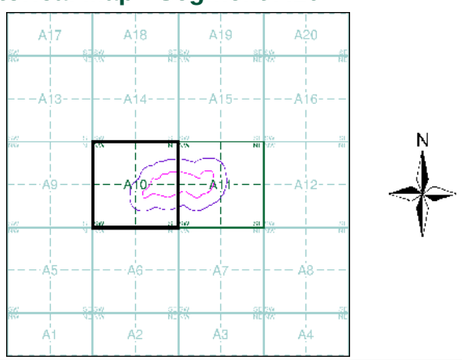
Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Filter Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Track
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governer	Wd Pp	Wind Pump
GP	Guide Post	Wr Pt, Wr T	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Monmouthshire	1:2,500	1883	2
Monmouthshire	1:2,500	1901	3
Monmouthshire	1:2,500	1921	4
Ordnance Survey Plan	1:1,250	1967	5
Ordnance Survey Plan	1:2,500	1967 - 1968	6
Supply of Unpublished Survey Information	1:1,250	1974	7
Additional SIMs	1:1,250	1986	8
Additional SIMs	1:1,250	1991	9
Large-Scale National Grid Data	1:1,250	1992	10
Large-Scale National Grid Data	1:1,250	1995	11
Historical Aerial Photography	1:2,500	2001	12

Historical Map - Segment A10



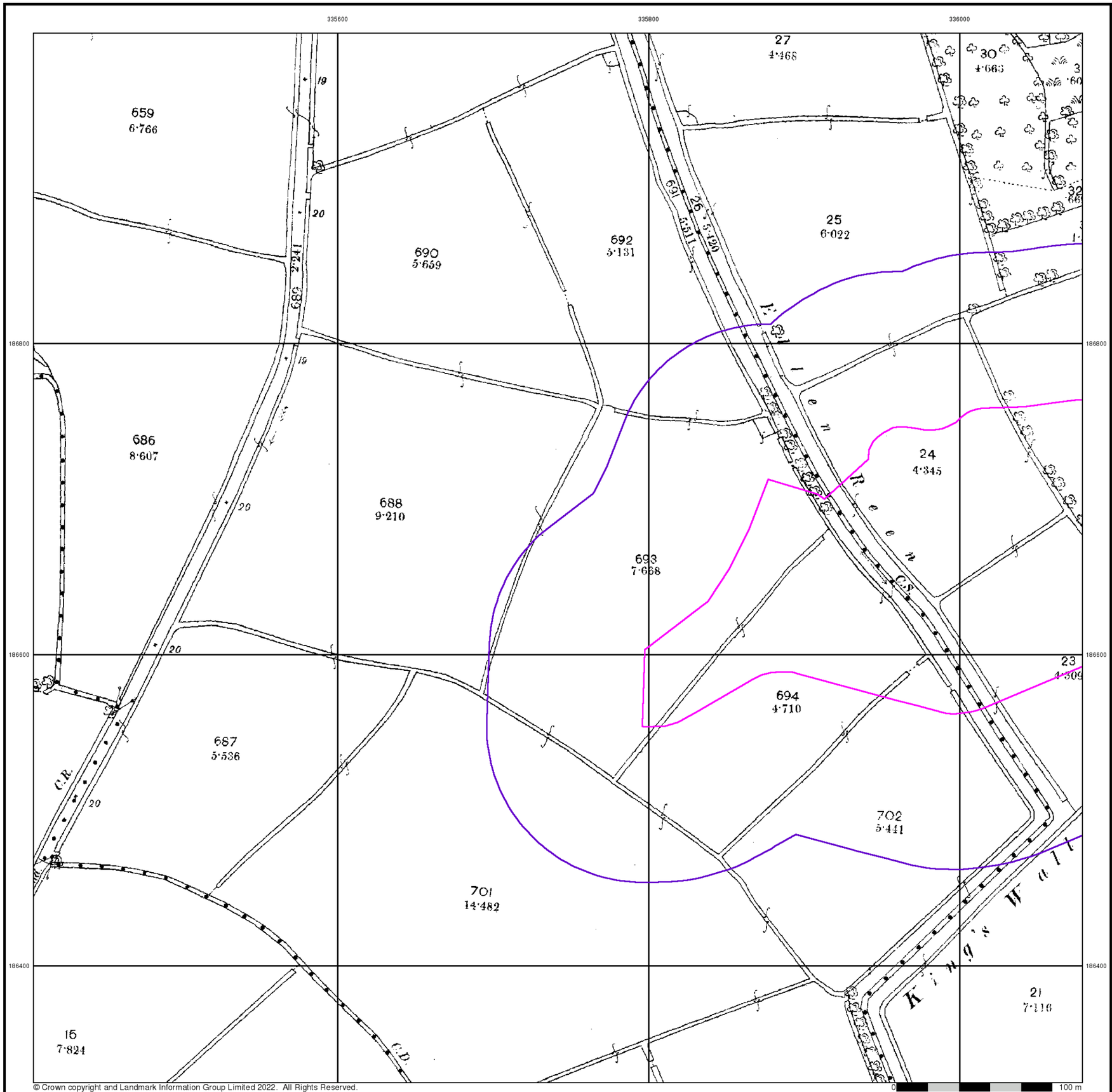
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National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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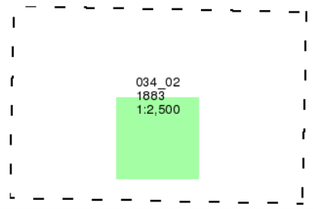
Monmouthshire

Published 1883

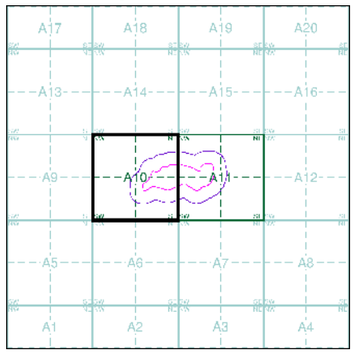
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)



Historical Map - Segment A10



Order Details

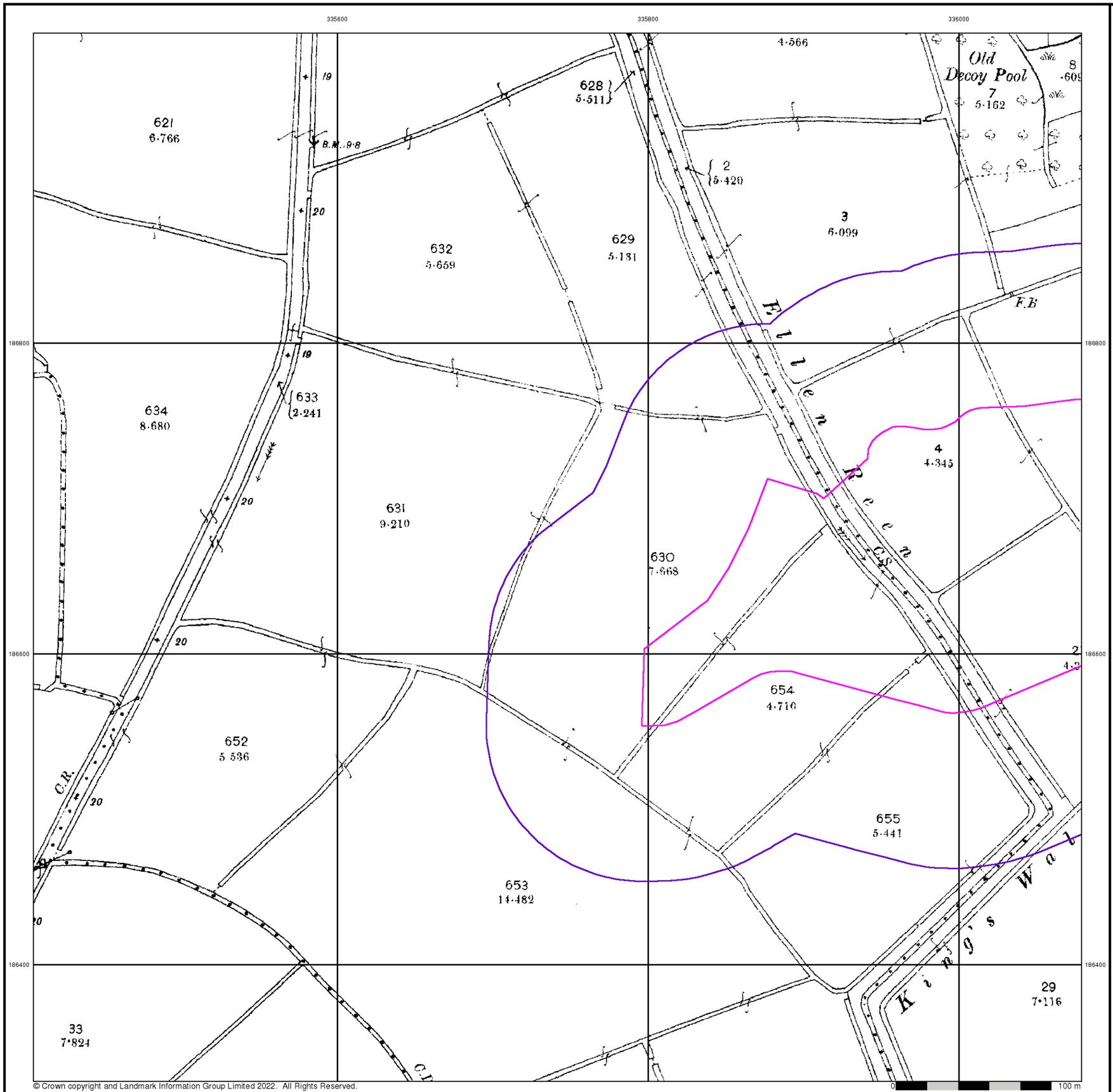
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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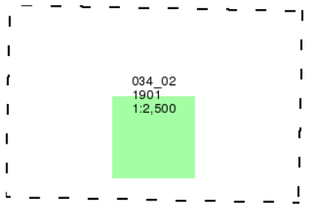
Monmouthshire

Published 1901

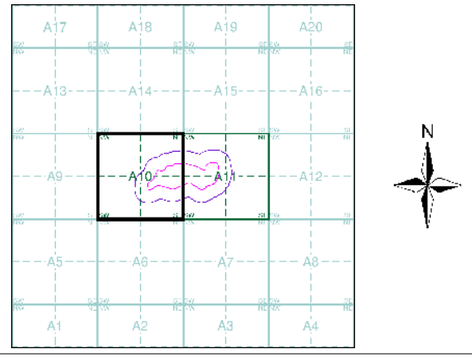
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)



Historical Map - Segment A10



Order Details

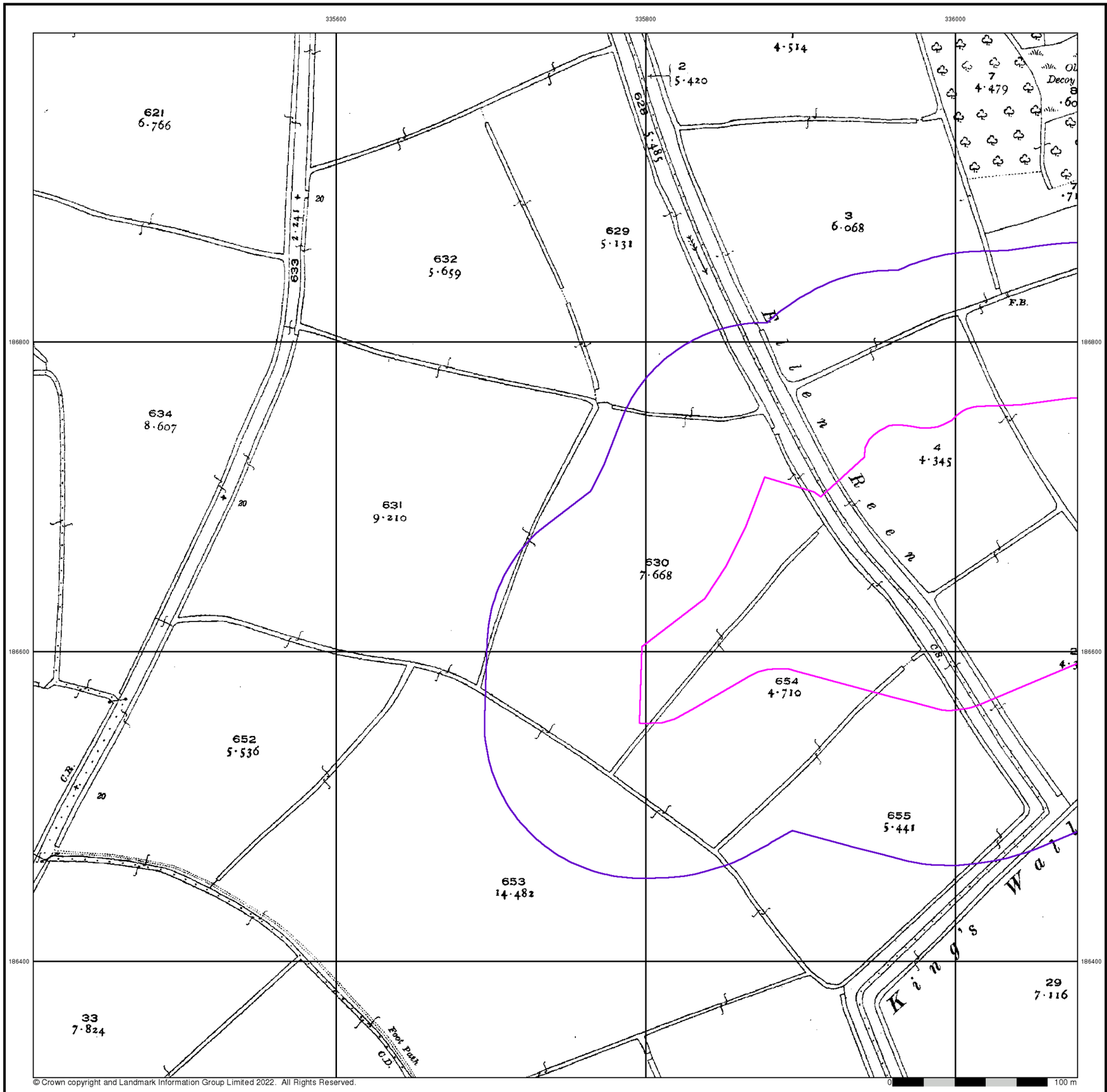
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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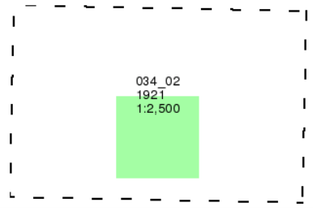
Monmouthshire

Published 1921

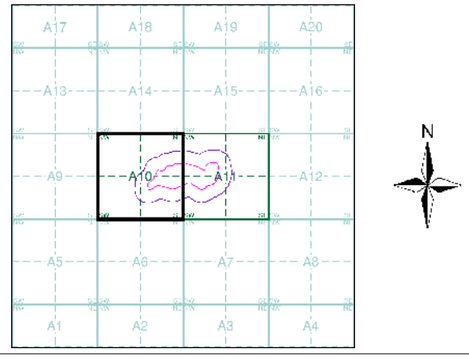
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)



Historical Map - Segment A10



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

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Ordnance Survey Plan

Published 1967

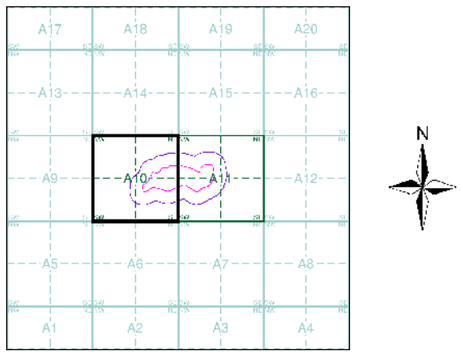
Source map scale - 1:1,250

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)

ST3586NW 1967 1:1,250	ST3586NE 1967 1:1,250	ST3686NW 1967 1:1,250
ST3586SW 1967 1:1,250	ST3586SE 1967 1:1,250	ST3686SW 1967 1:1,250

Historical Map - Segment A10



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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335600 335800 336000

186800 186600 186400

Spencer Steelworks
Ore Stocks
Travelling Boom Conveyor
Lighting Tower
Drain
Pond
QUEEN'S WAY
4772 139·66
0004 12·46
0004 148·75
0250 1·05
0004 1·07
4335 7·30

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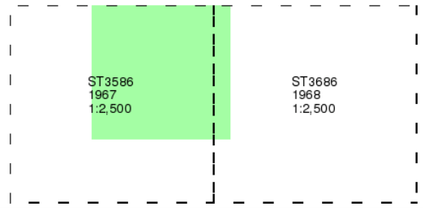
0 100 m

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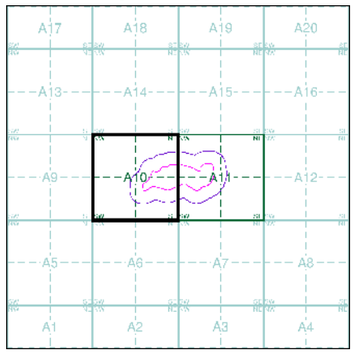
Ordnance Survey Plan
Published 1967 - 1968
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)



Historical Map - Segment A10



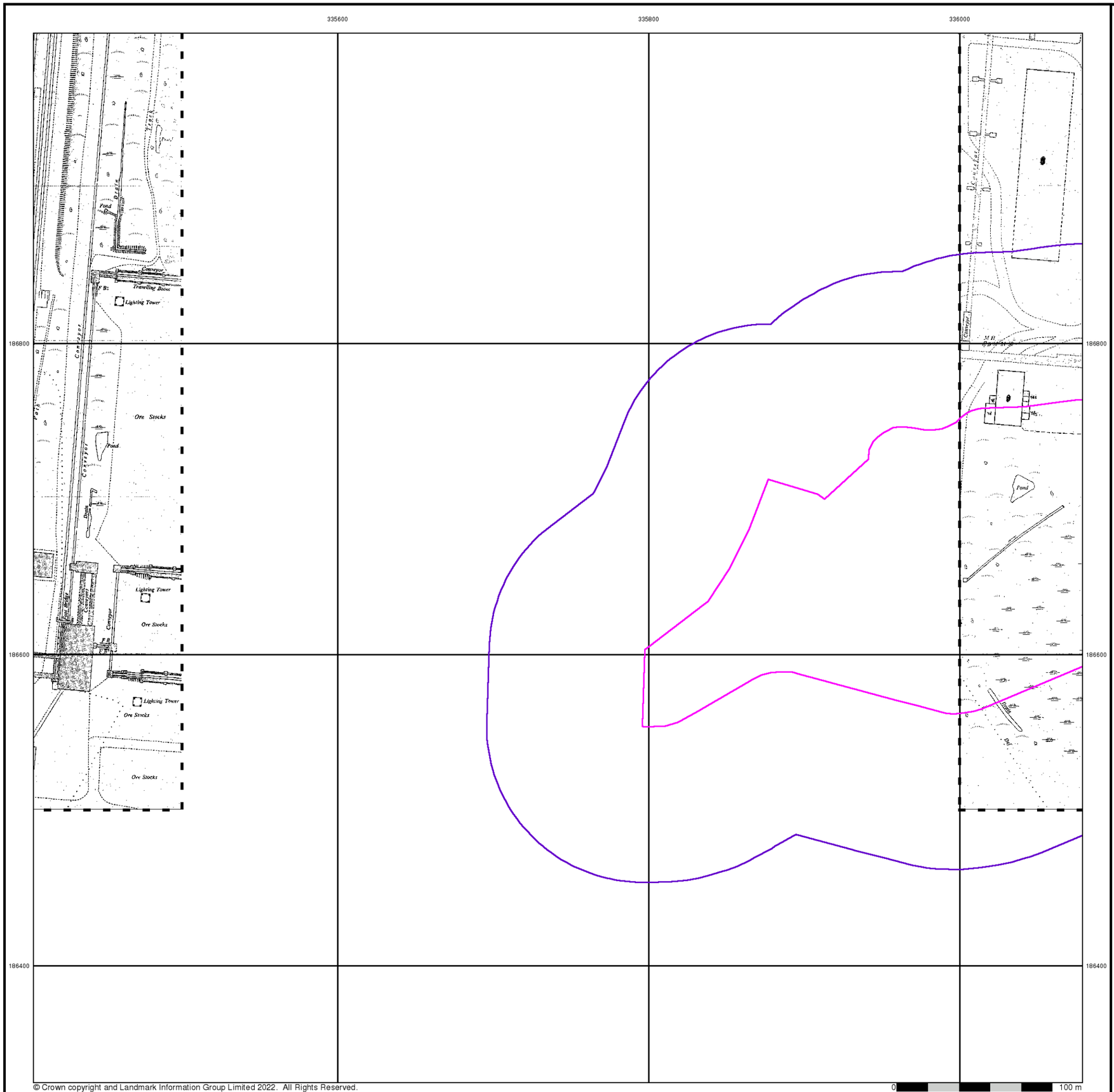
Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

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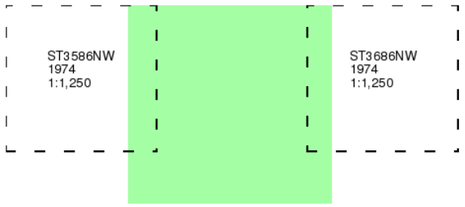
Supply of Unpublished Survey Information

Published 1974

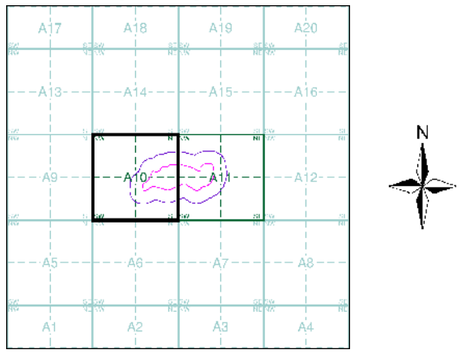
Source map scale - 1:1,250

SUSI maps (Supply of Unpublished Survey Information) were produced between 1972 and 1977, mainly for internal use at Ordnance Survey. These were more of a `work-in-progress' plan as they showed updates of individual areas on a map. These maps were unpublished, and they do not represent a single moment in time. They were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A10



Order Details

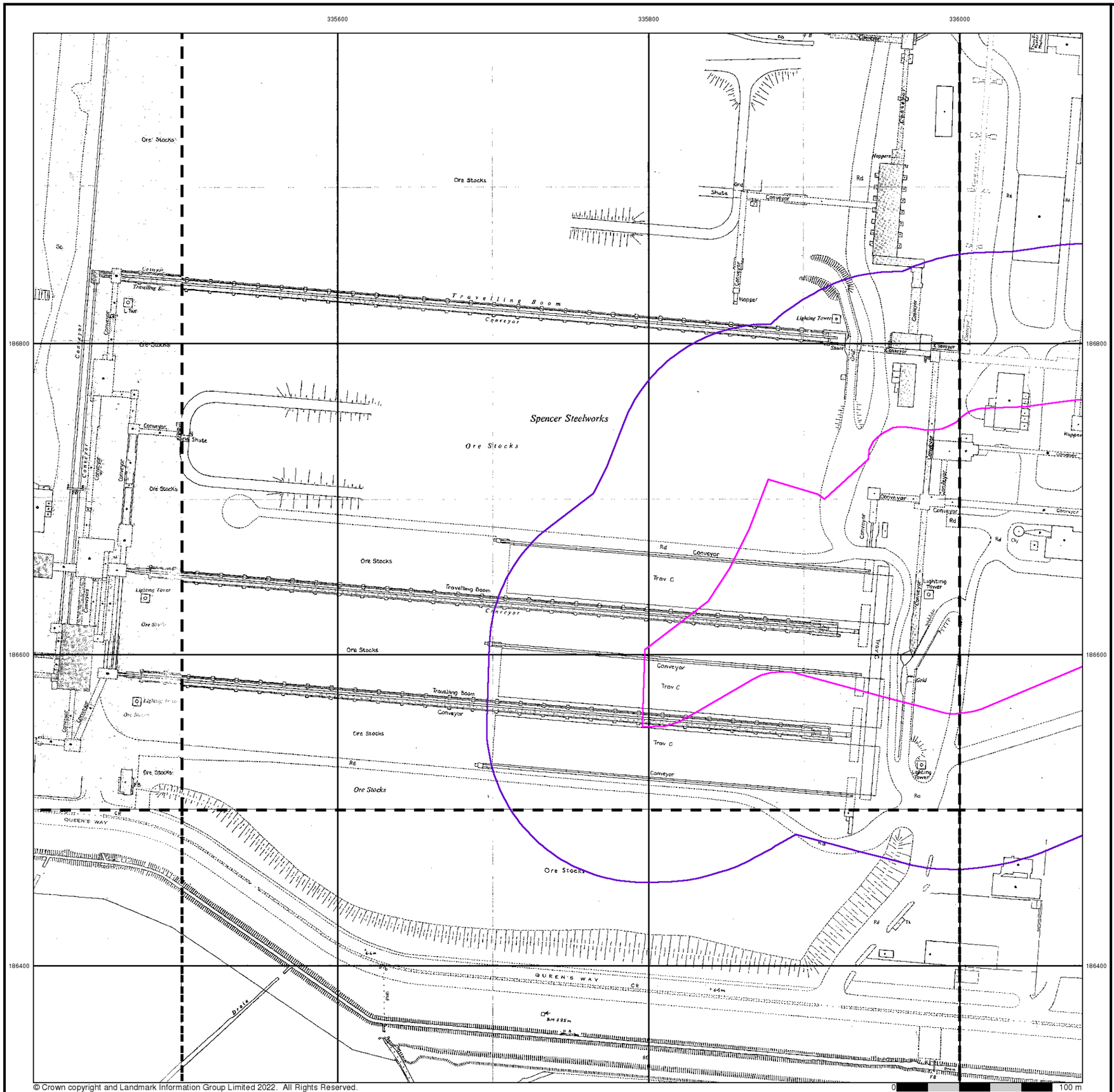
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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Additional SIMs

Published 1986

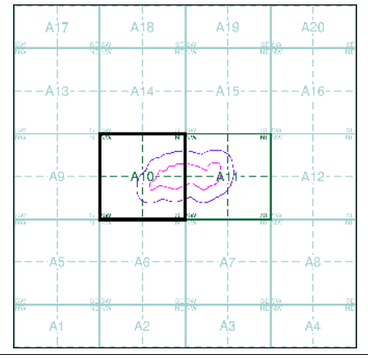
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

ST3586NW 1986 1:1,250	ST3586NE 1986 1:1,250	ST3686NW 1986 1:1,250
ST3586SW 1986 1:1,250	ST3586SE 1986 1:1,250	ST3686SW 1986 1:1,250

Historical Map - Segment A10



Order Details

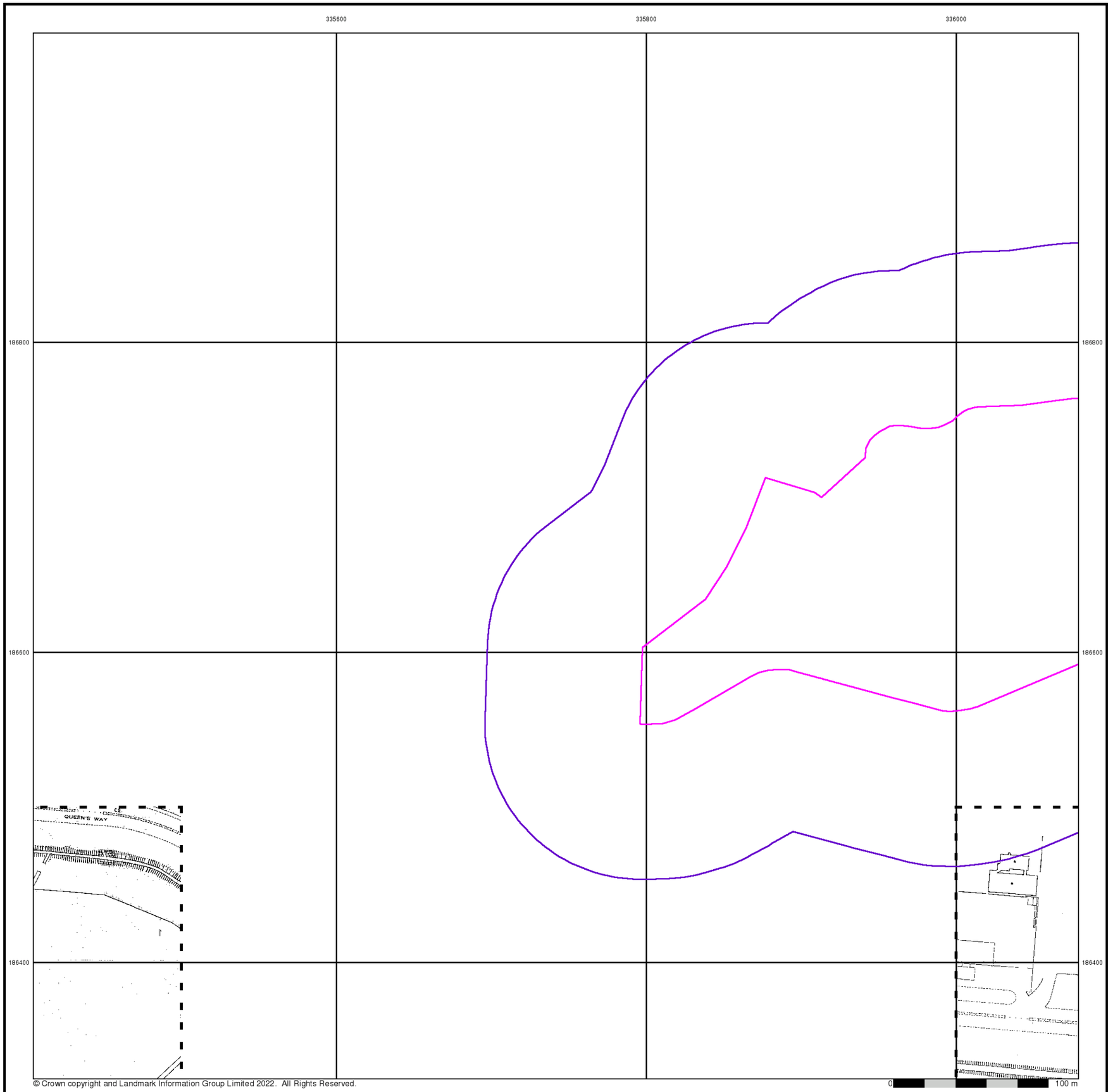
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

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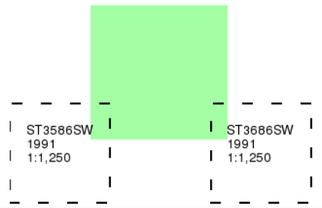
Additional SIMs

Published 1991

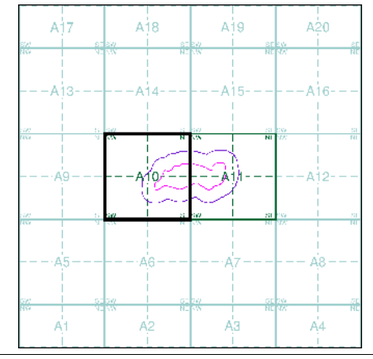
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A10



Order Details

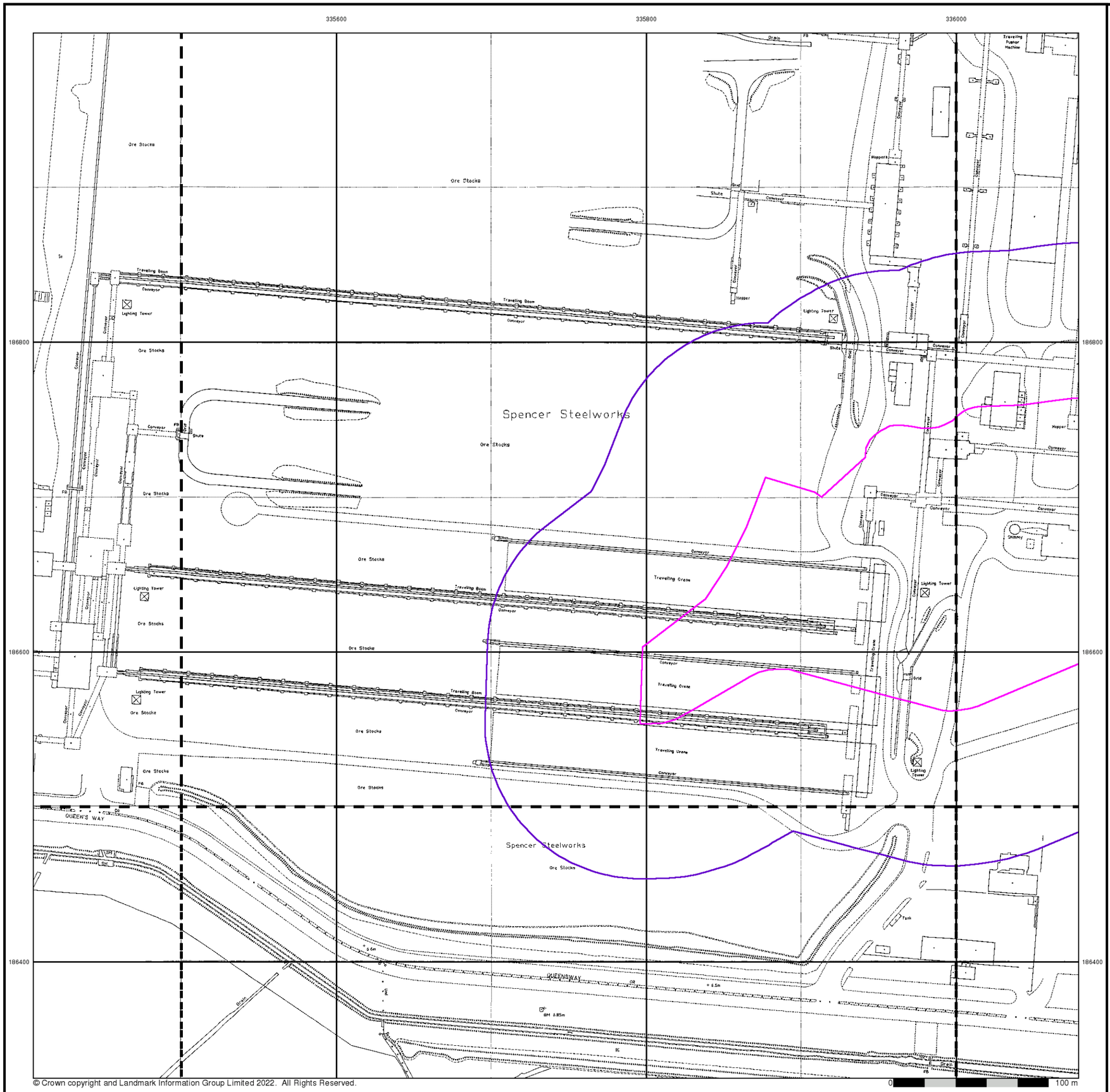
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

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Large-Scale National Grid Data

Published 1992

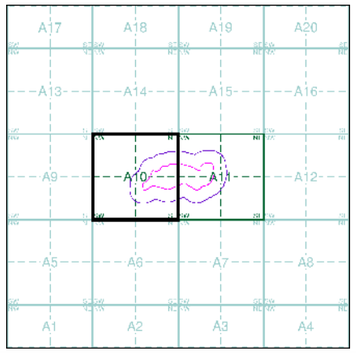
Source map scale - 1:1,250

'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)

ST3586NW 1992 1:1,250	ST3586NE 1992 1:1,250	ST3686NW 1992 1:1,250
ST3586SW 1992 1:1,250	ST3586SE 1992 1:1,250	ST3686SW 1992 1:1,250

Historical Map - Segment A10



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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335600 335800 336000

186800 186600 186400

Ore Stocks
Travelling Hopper
Conveyor
Lighting Tower
Hopper
Spencer Steelworks
QUEENS WAY
Tank
Slurry
RM 6.85m

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0 100 m

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Large-Scale National Grid Data

Published 1995

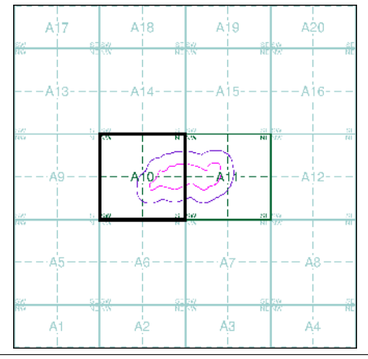
Source map scale - 1:1,250

'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)

ST3586NW 1995 1:1,250		ST3686NW 1995 1:1,250
ST3586SW 1995 1:1,250	ST3586SE 1995 1:1,250	ST3686SW 1995 1:1,250

Historical Map - Segment A10



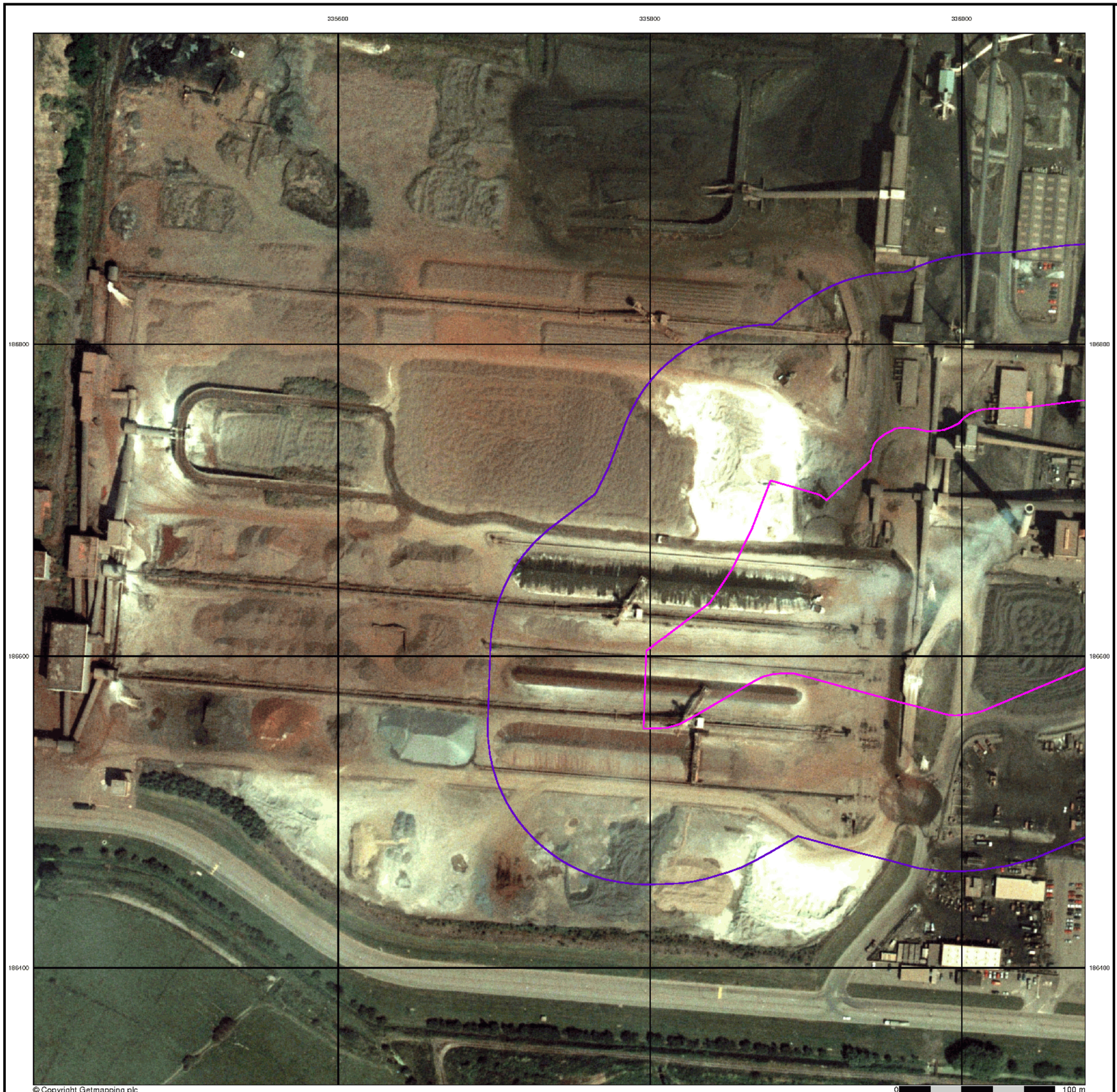
Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

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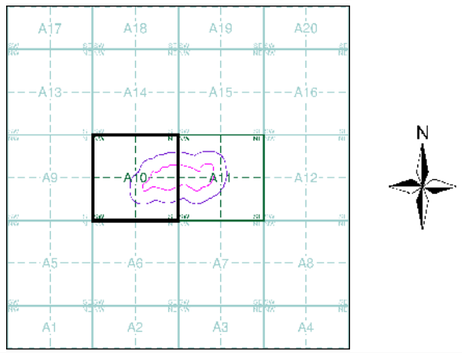
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Historical Aerial Photography

Published 2001

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Segment A10



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

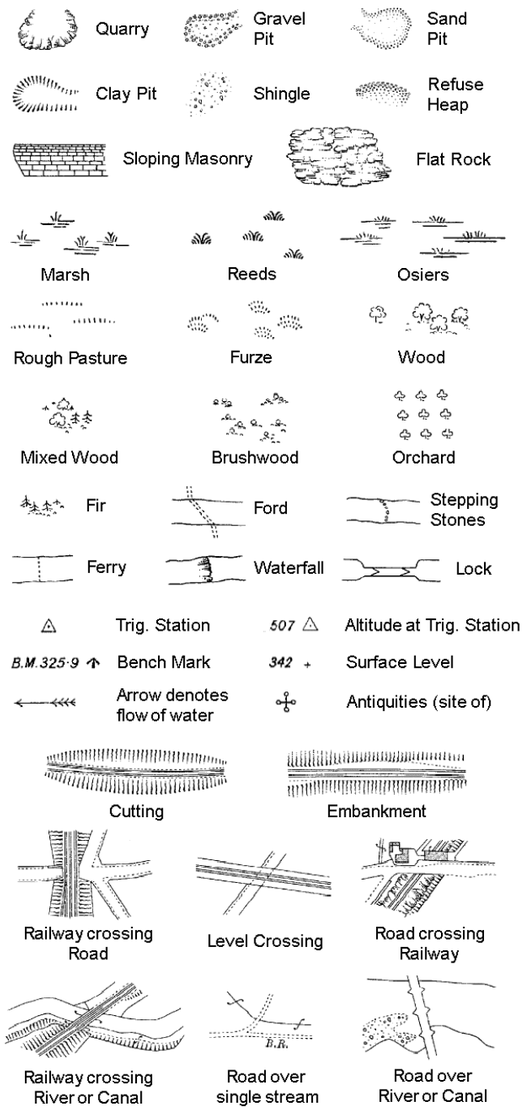
Site at 336079,186662

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Historical Mapping Legends

Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



County Boundary (Geographical)

County & Civil Parish Boundary

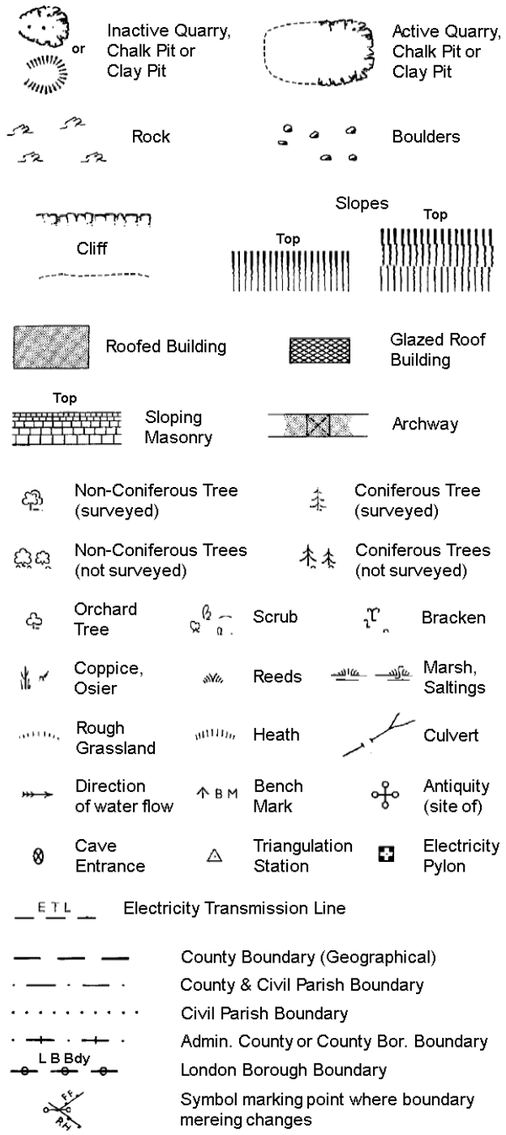
Administrative County & Civil Parish Boundary

Co. Boro. Bdy. County Borough Boundary (England)

Co. Burgh Bdy. County Burgh Boundary (Scotland)

B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	Sl.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



County Boundary (Geographical)

County & Civil Parish Boundary

Civil Parish Boundary

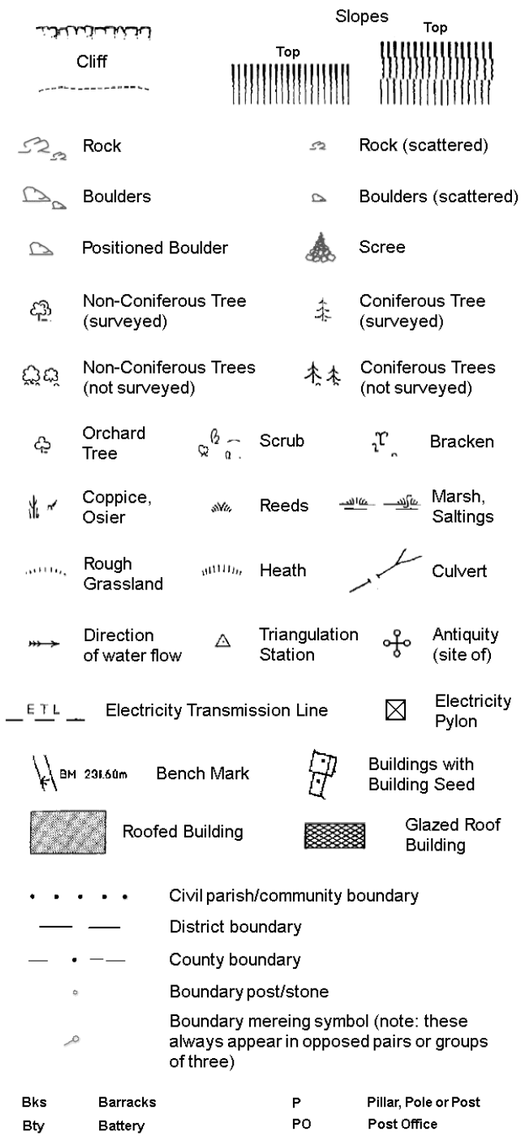
Admin. County or County Bor. Boundary

L B Bdy London Borough Boundary

Symbol marking point where boundary mereing changes

BH	Beer House	P	Pillar, Pole or Post
BP, BS	Boundary Post or Stone	PO	Post Office
Cn, C	Capstan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D Fn	Drinking Fountain	Pp	Pump
El P	Electricity Pillar or Post	SB, S Br	Signal Box or Bridge
FAP	Fire Alarm Pillar	SP, SL	Signal Post or Light
FB	Foot Bridge	Spr	Spring
GP	Guide Post	Tk	Tank or Track
H	Hydrant or Hydraulic	TCB	Telephone Call Box
LC	Level Crossing	TCP	Telephone Call Post
MH	Manhole	Tr	Trough
MP	Mile Post or Mooring Post	Wr Pt, Wr T	Water Point, Water Tap
MS	Mile Stone	W	Well
NTL	Normal Tidal Limit	Wd Pp	Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250



Civil parish/community boundary

District boundary

County boundary

Boundary post/stone

Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Filter Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Track
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governer	Wd Pp	Wind Pump
GP	Guide Post	Wr Pt, Wr T	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

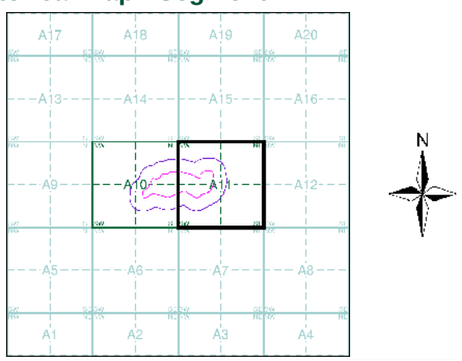
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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Monmouthshire	1:2,500	1883	2
Monmouthshire	1:2,500	1901	3
Monmouthshire	1:2,500	1921	4
Ordnance Survey Plan	1:1,250	1967	5
Ordnance Survey Plan	1:2,500	1968	6
Supply of Unpublished Survey Information	1:1,250	1974	7
Additional SIMs	1:1,250	1986	8
Additional SIMs	1:1,250	1991	9
Large-Scale National Grid Data	1:1,250	1992	10
Large-Scale National Grid Data	1:1,250	1995	11
Historical Aerial Photography	1:2,500	2001	12

Historical Map - Segment A11



Order Details

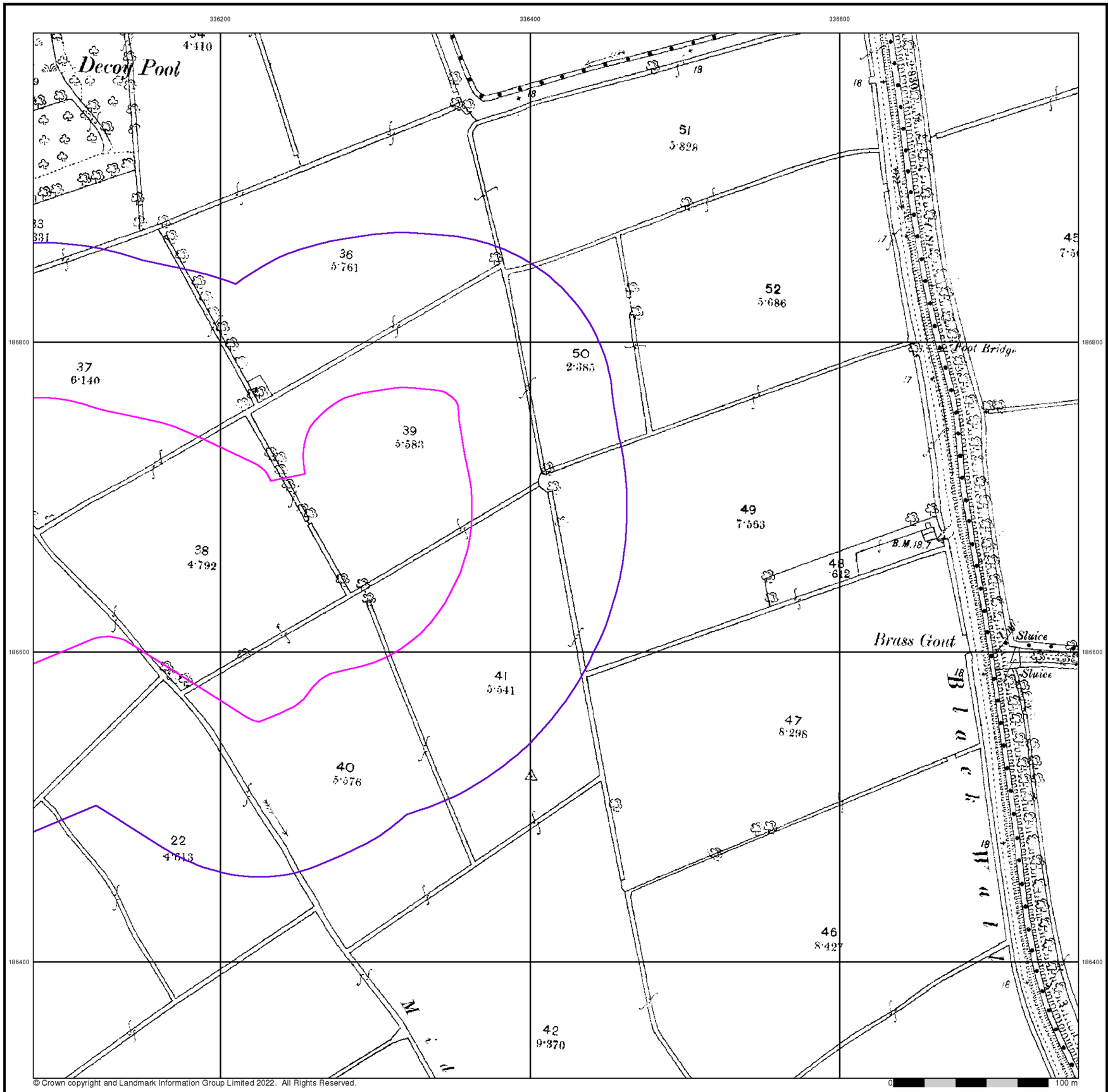
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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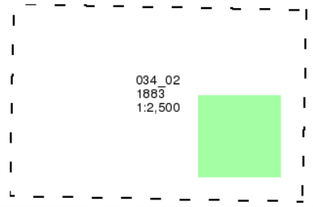
Monmouthshire

Published 1883

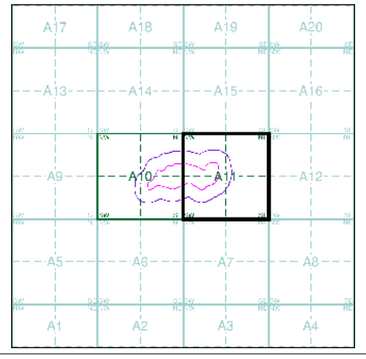
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)



Historical Map - Segment A11



Order Details

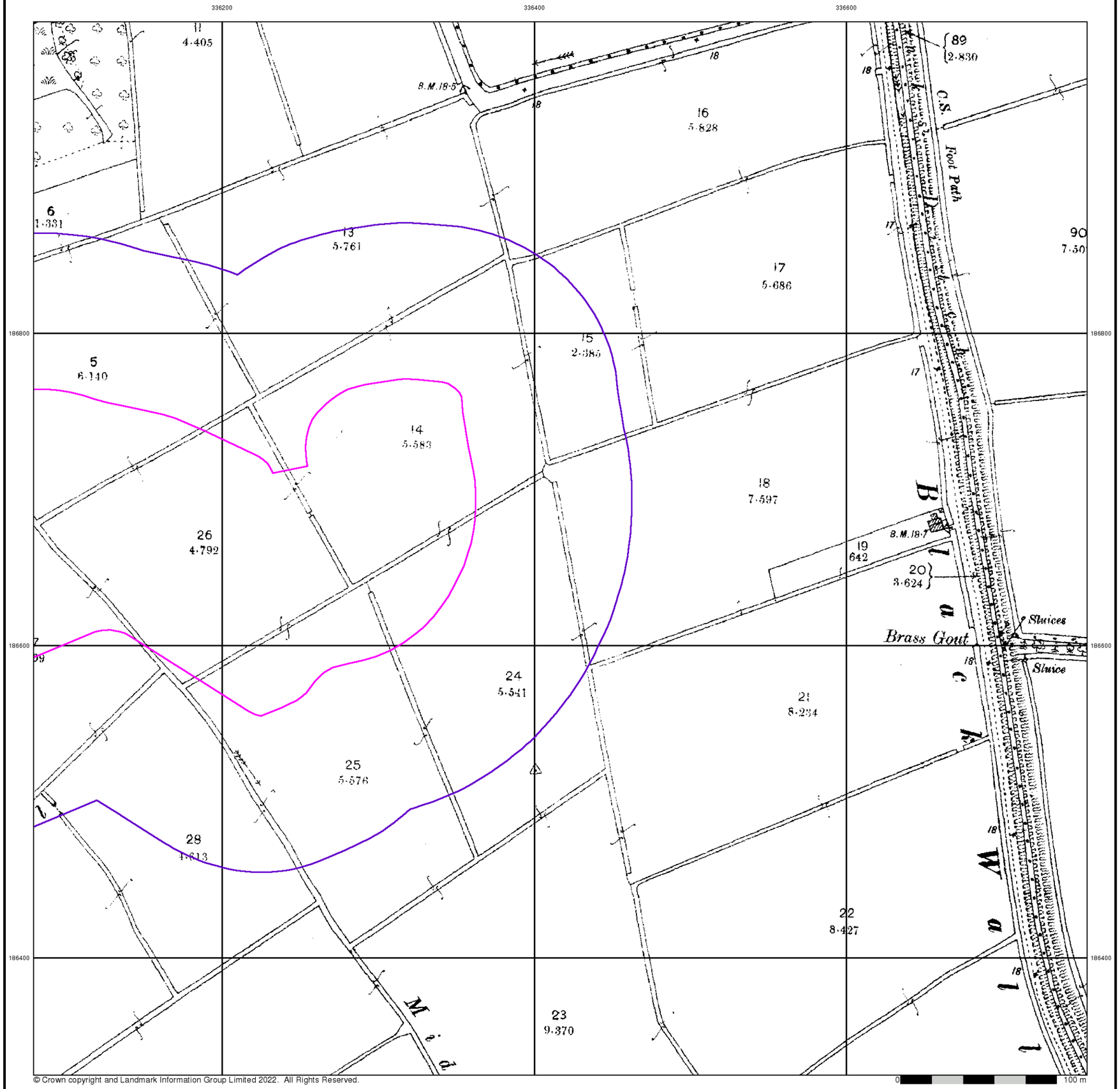
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

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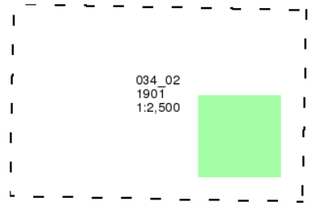
Monmouthshire

Published 1901

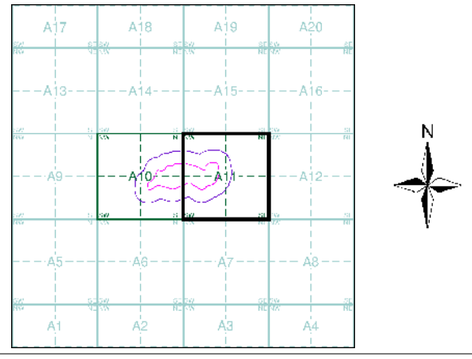
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)



Historical Map - Segment A11



Order Details

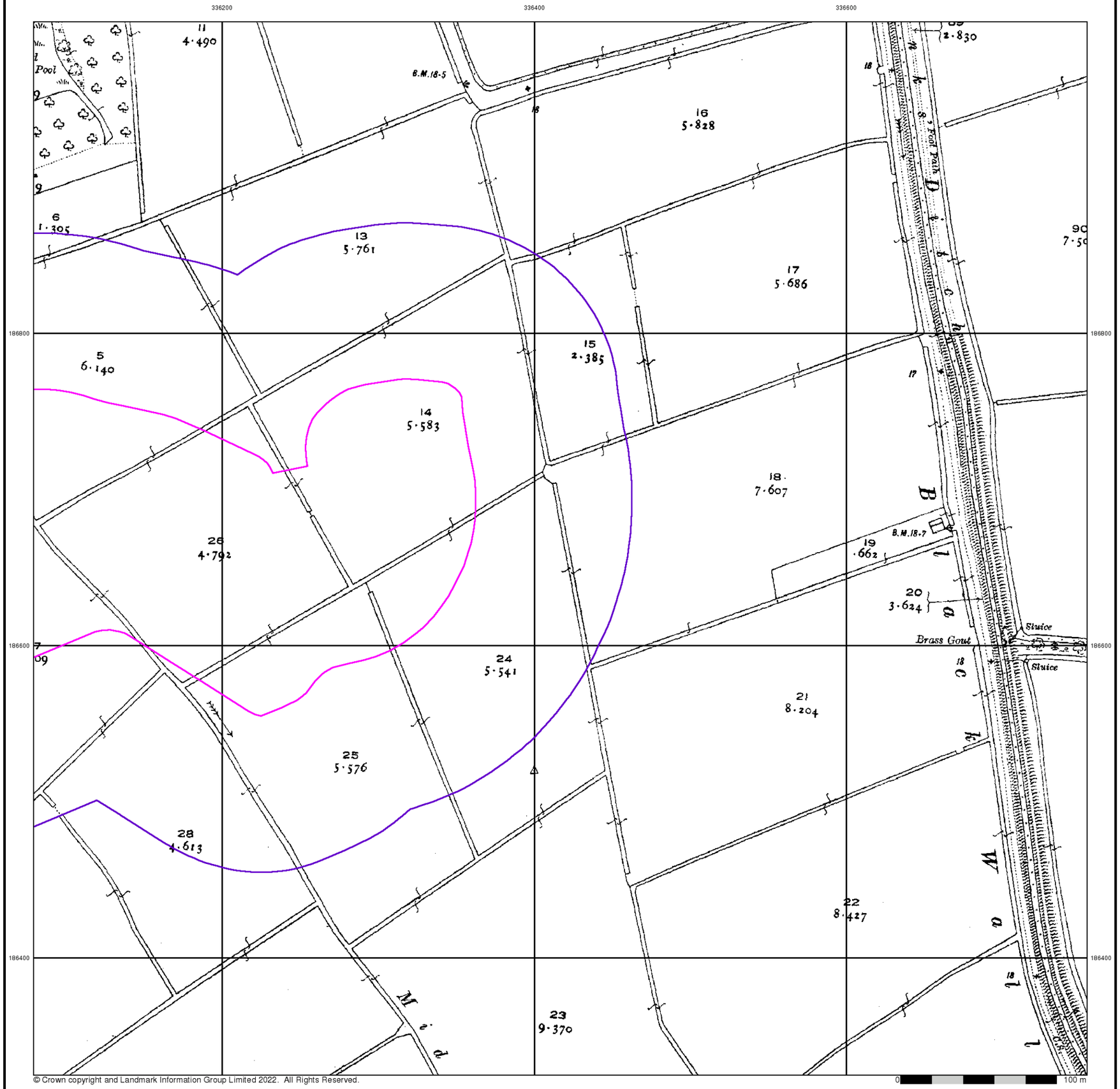
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

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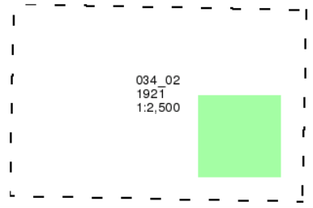
Monmouthshire

Published 1921

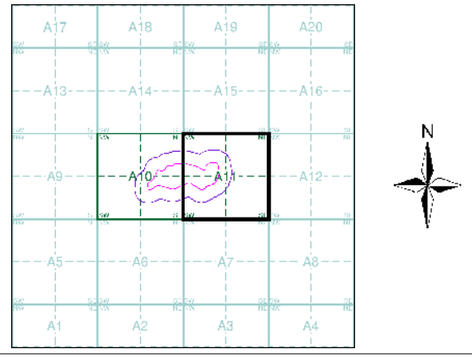
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)



Historical Map - Segment A11



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

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Ordnance Survey Plan

Published 1967

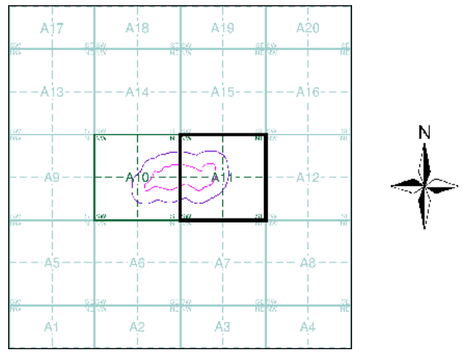
Source map scale - 1:1,250

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)

ST3686NW 1967 1:1,250	ST3686NE 1967 1:1,250
ST3686SW 1967 1:1,250	ST3686SE 1967 1:1,250

Historical Map - Segment A11



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

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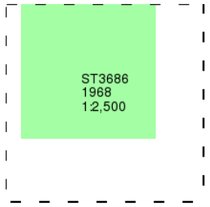
Ordnance Survey Plan

Published 1968

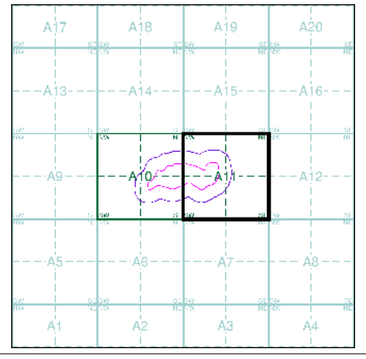
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)



Historical Map - Segment A11



Order Details

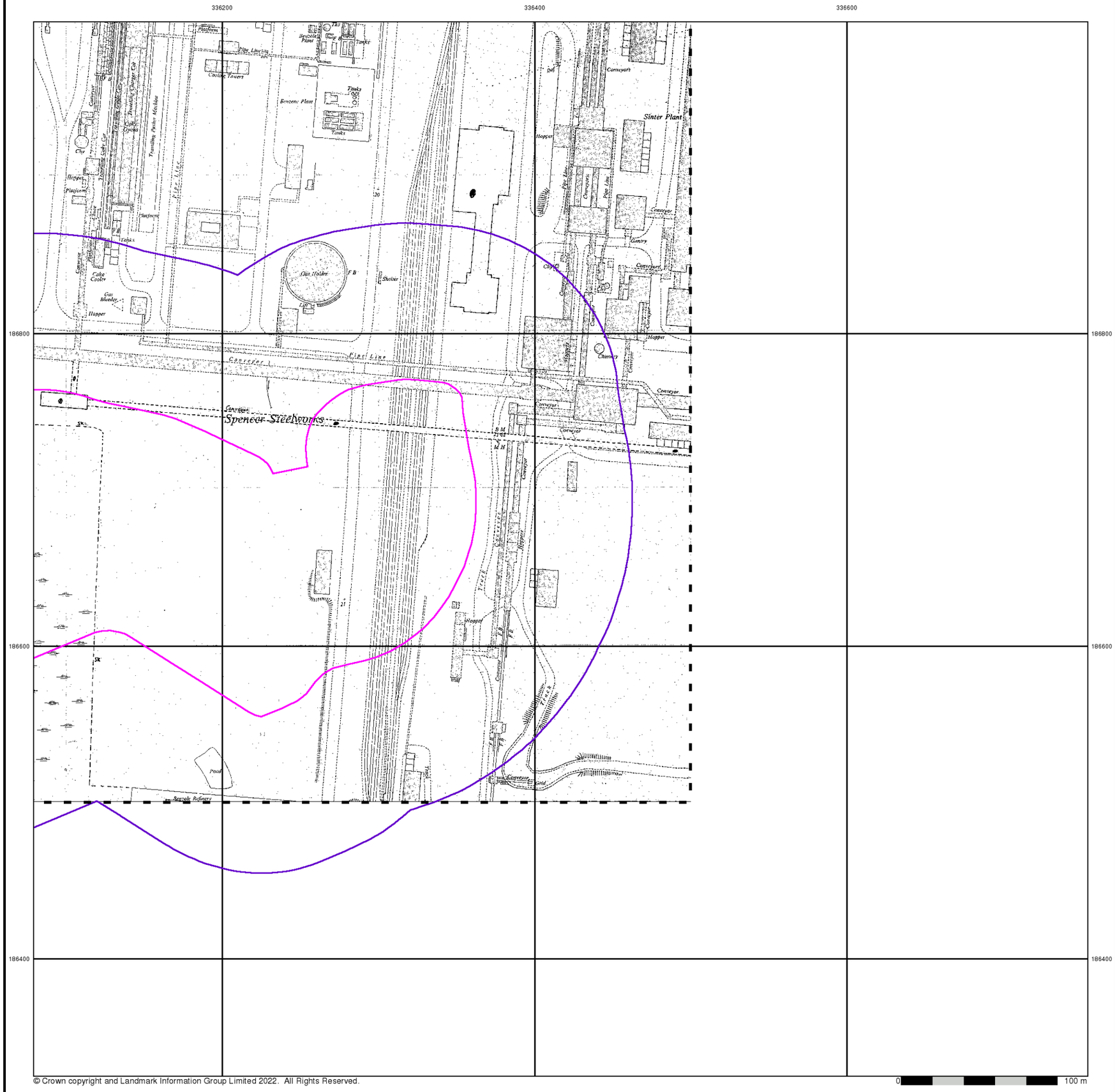
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

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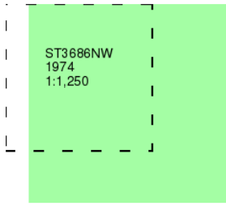
Supply of Unpublished Survey Information

Published 1974

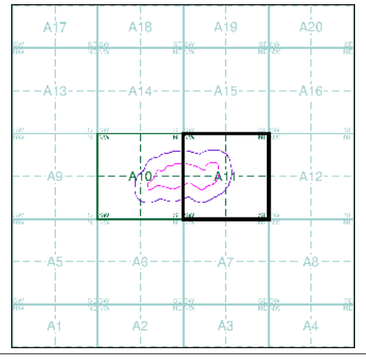
Source map scale - 1:1,250

SUSI maps (Supply of Unpublished Survey Information) were produced between 1972 and 1977, mainly for internal use at Ordnance Survey. These were more of a `work-in-progress' plan as they showed updates of individual areas on a map. These maps were unpublished, and they do not represent a single moment in time. They were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A11



Order Details

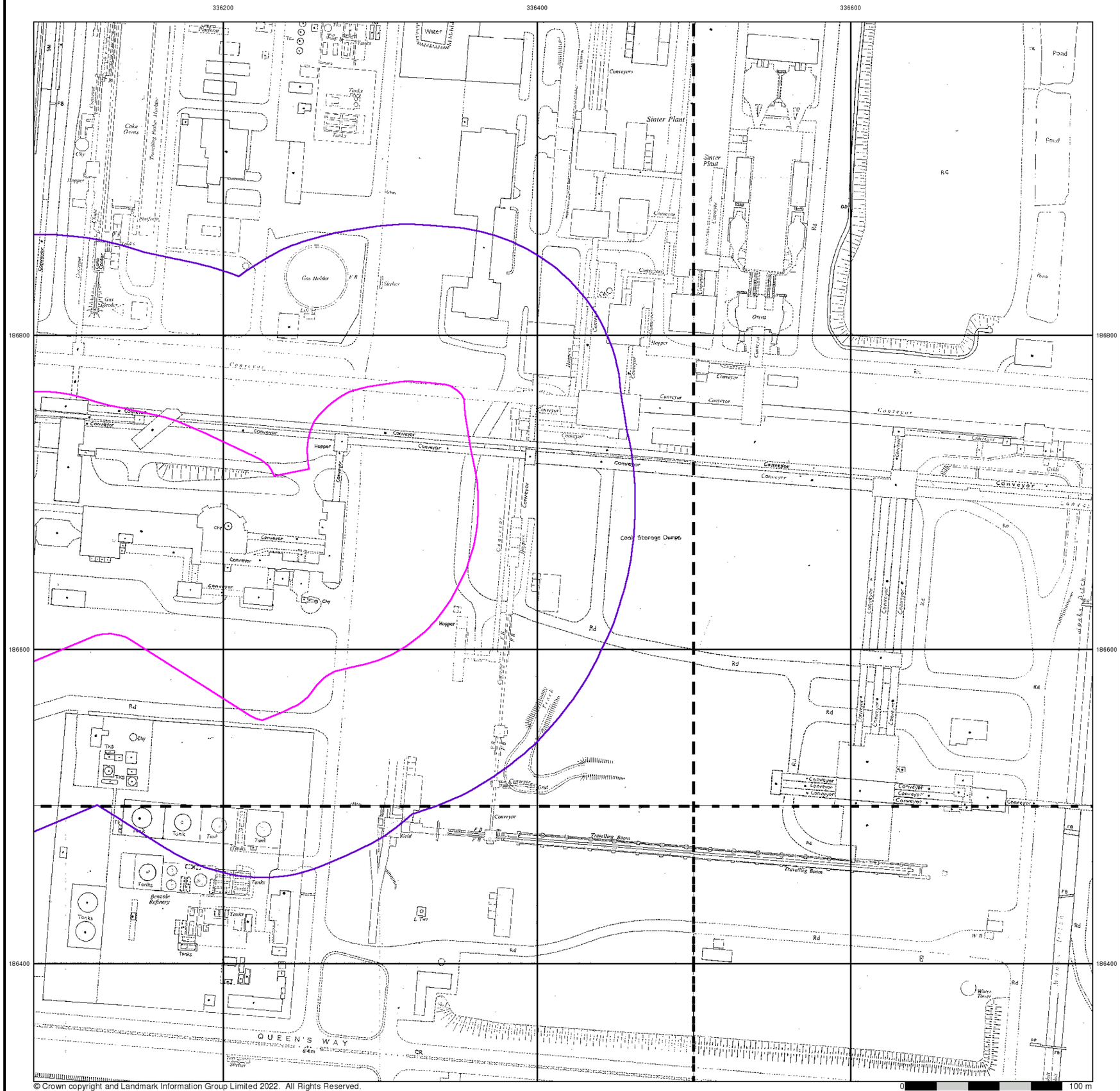
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

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Additional SIMs

Published 1986

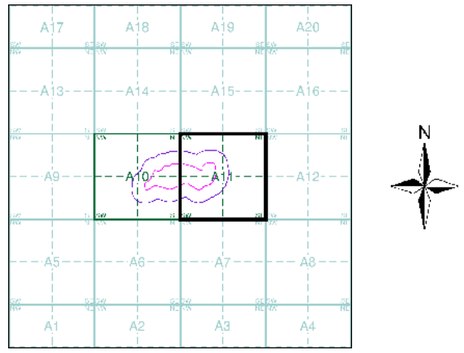
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

ST3686NW 1986 1:1,250	ST3686NE 1986 1:1,250
ST3686SW 1986 1:1,250	ST3686SE 1986 1:1,250

Historical Map - Segment A11



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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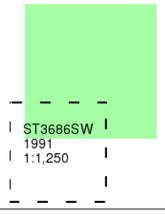
Additional SIMs

Published 1991

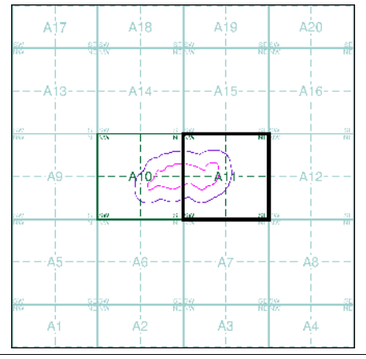
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A11



Order Details

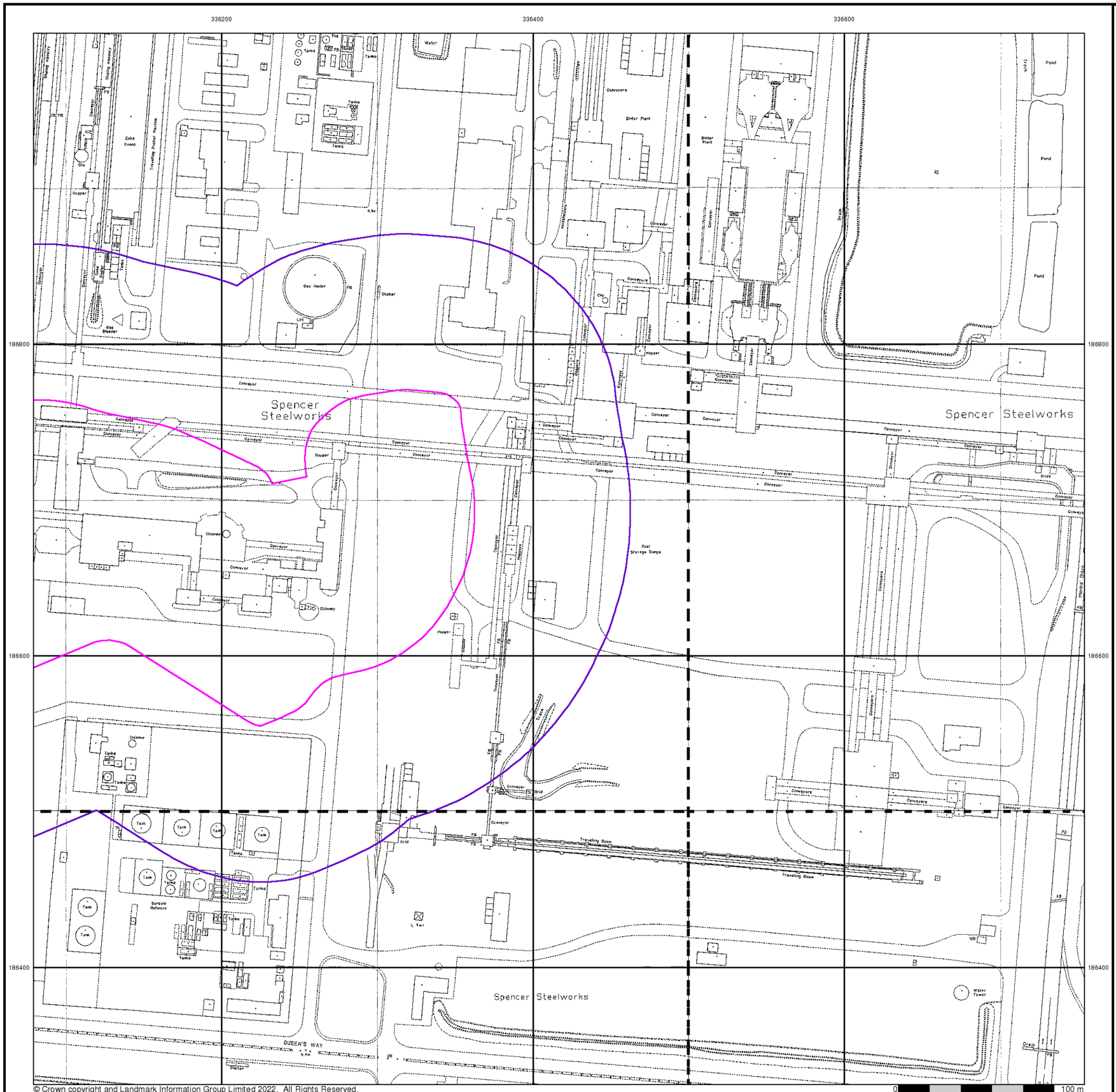
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

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Large-Scale National Grid Data

Published 1992

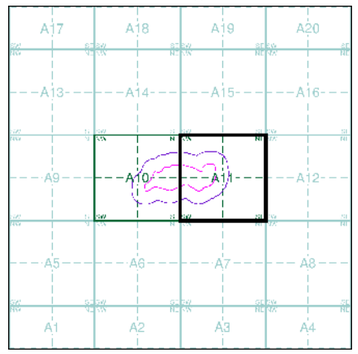
Source map scale - 1:1,250

'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)

ST3686NW 1992 1:1,250	ST3686NE 1992 1:1,250
ST3686SW 1992 1:1,250	ST3686SE 1992 1:1,250

Historical Map - Segment A11



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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Large-Scale National Grid Data

Published 1995

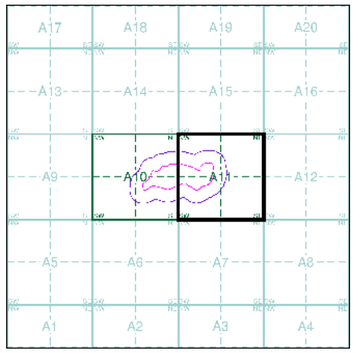
Source map scale - 1:1,250

'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)

ST3686NW 1995 1:1,250	ST3686NE 1995 1:1,250
ST3686SW 1995 1:1,250	ST3686SE 1995 1:1,250

Historical Map - Segment A11



Order Details

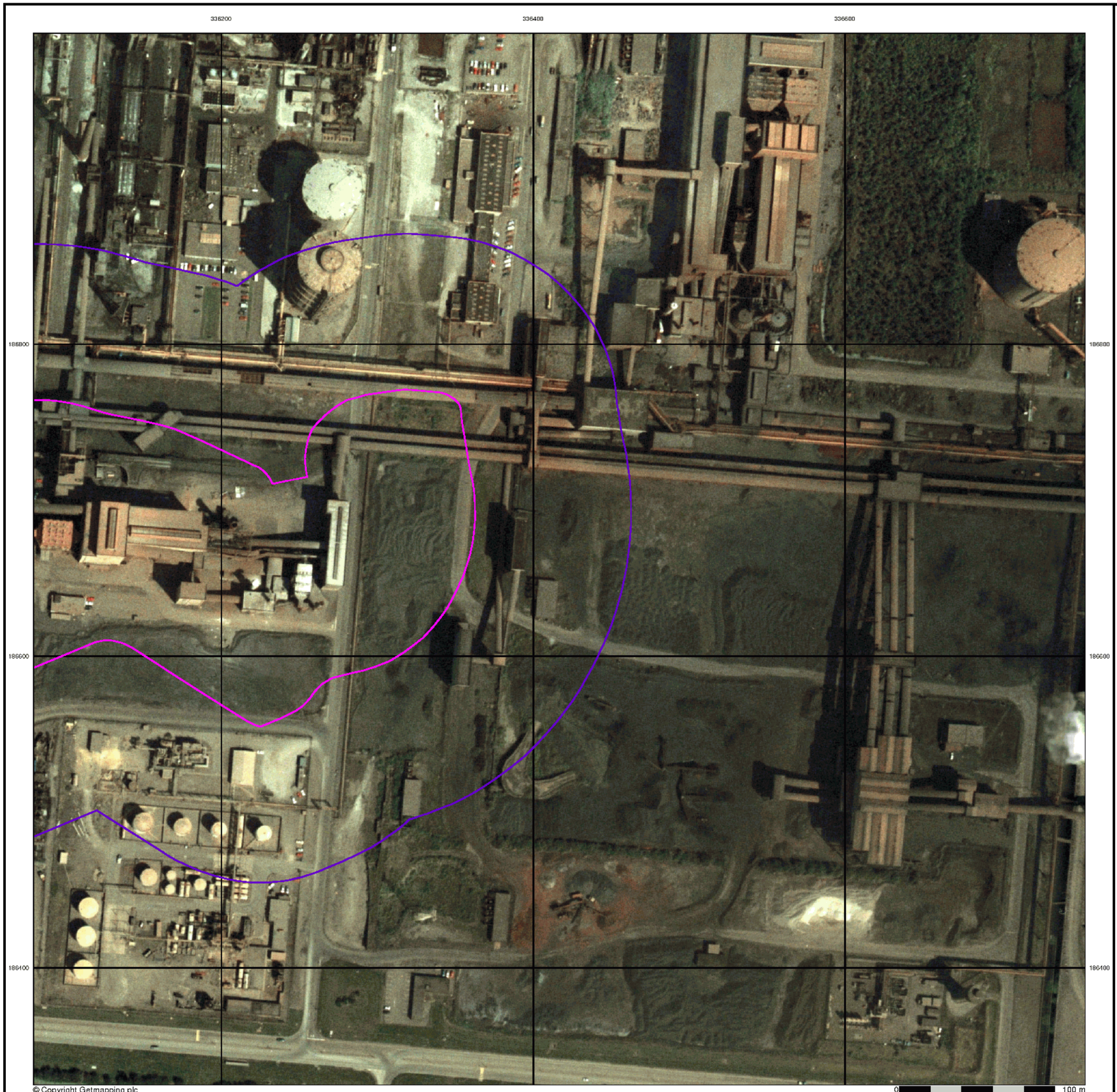
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

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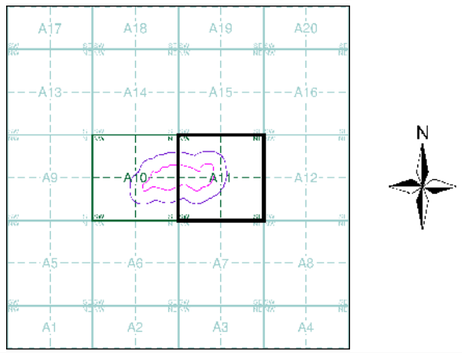
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Historical Aerial Photography

Published 2001

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Segment A11



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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Historical Mapping Legends

Ordnance Survey County Series 1:10,560

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

Ordnance Survey Plan 1:10,000

Chalk Pit, Clay Pit or Quarry
Gravel Pit
Sand Pit
Disused Pit or Quarry
Refuse or Slag Heap
Lake, Loch or Pond
Dunes
Boulders
Coniferous Trees
Non-Coniferous Trees
Orchard
Scrub
Coppice
Bracken
Heath
Rough Grassland
Marsh
Reeds
Saltings
Building
Direction of Flow of Water
Shingle
Sand
Glasshouse
Pylon
Electricity Transmission Line
Pole
Sloping Masonry
Cutting
Embankment
Standard Gauge Multiple Track
Road Under
Road Over
Level Crossing
Foot Bridge
Standard Gauge Single Track
Siding, Tramway or Mineral Line
Narrow Gauge
Geographical County
Administrative County, County Borough or County of City
Municipal Borough, Urban or Rural District, Burgh or District Council
Borough, Burgh or County Constituency
Shown only when not coincident with other boundaries
Civil Parish
Shown alternately when coincidence of boundaries occurs

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

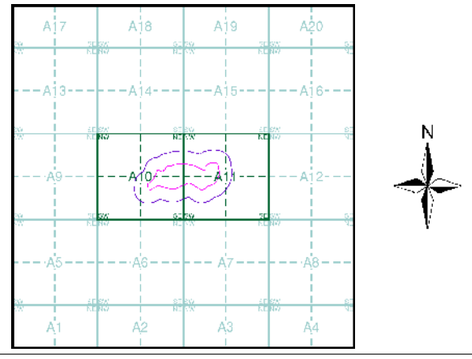
Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or community boundary
District, Unitary, Metropolitan, London Borough boundary
Constituency boundary
Area of wooded vegetation
Non-coniferous trees
Non-coniferous trees (scattered)
Coniferous trees
Coniferous trees (scattered)
Positioned tree
Orchard
Coppice or Osiers
Rough Grassland
Heath
Scrub
Marsh, Salt Marsh or Reeds
Water feature
Flow arrows
MHW(S) Mean high water (springs)
MLW(S) Mean low water (springs)
Telephone line (where shown)
Electricity transmission line (with poles)
BM 123.45 m Bench mark (where shown)
Triangulation station
Point feature (e.g. Guide Post or Mile Stone)
Pylon, flare stack or lighting tower
Site of (antiquity)
Glasshouse
General Building
Important Building

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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Monmouthshire	1:10,560	1886 - 1887	3
Monmouthshire	1:10,560	1902	4
Monmouthshire	1:10,560	1922	5
Monmouthshire	1:10,560	1938 - 1954	6
Historical Aerial Photography	1:10,560	1947	7
Historical Aerial Photography	1:10,560	1947	8
Monmouthshire	1:10,560	1954	9
Ordnance Survey Plan	1:10,000	1965	10
Ordnance Survey Plan	1:10,000	1973	11
Ordnance Survey Plan	1:10,000	1981 - 1989	12
Newport	1:10,000	1983	13
Ordnance Survey Plan	1:10,000	1987	14
10K Raster Mapping	1:10,000	1999	15
10K Raster Mapping	1:10,000	2006	16
VectorMap Local	1:10,000	2022	17

Historical Map - Slice A



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

Site at 336079,186662

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Russian Military Mapping Legends

1:5,000 and 1:10,000 mapping

a. Not drawn to scale b. Drawn to scale

- Government and Administrative Buildings
- Military and Industrial Buildings
- Military and Communication Areas
- Subway Entrance
- Fireproof Building
- Prominent Fireproof Building
- Non-fireproof Building
- Non-fireproof Building (non-dwelling)
- Factory, mill, and flour mill, with chimneys
- Factory, mill, and flour mill, without chimneys
- Power Station, drawn to scale
- Hydroelectric Power Station
- Radio Station, drawn to scale
- Telephone Station, drawn to scale
- Abandoned Open-pit Mine or Quarry
- Open-pit Salt Mine
- Pit
- Oil Deposit or Well
- Oil Seepage
- Tailings Pile
- Fuel Storage Tanks
- Natural Gas Tank
- Bench Mark
- Drill Hole
- Burial Mound
- Triangulation Point on Burial Mound
- Single-track Railroad
- Double-track Railroad and Station Building
- Coniferous Forest
- Deciduous Forest
- Mixed Forest
- Lawns
- Citrus Orchard
- Wet Ground
- Scattered Vegetation

243,8 — Values for prominent elevations

186.0 — Numbers for spot elevations, depth soundings, contour lines, etc.

0,2 — Velocity of the current, width of river bed, depth of river

Fractional terms: length and capacity of bridges; depth of fords and condition of the river bottom; height of forest and the diameter of trees

Russian Alphabet (For reference and phonetic interpretation of map text)

А а (A)	З з (Z)	П п (P)	Ч ч (CH)
Б б (B)	И и (I)	Р р (R)	Ш ш (SH)
В в (V)	Й й (Y)	С с (S)	Щ щ (SHCH)
Г г (G)	К к (K)	Т т (T)	ъ (–)
Д д (D)	Л л (L)	У у (U)	ы (Y)
Е е (E)	М м (M)	Ф ф (F)	ь (')
Ё ё (YO)	Н н (N)	Х х (KH)	Э э (E)
Ж ж (ZH)	О о (O)	Ц ц (TS)	Ю ю (YU or IU)
			Я я (YA or IA)

1:25,000 mapping

a. Not drawn to scale b. Drawn to scale

- Government and Administrative Buildings
- Military and Industrial Buildings
- Military and Communication Areas
- Subway Entrance
- Partly Demolished Buildings
- Demolished Buildings
- Built-Up Area with Fireproof Buildings Predominant
- Built-Up Area with Non-Fireproof Buildings Predominant
- Individual Fireproof Building
- Prominent Industrial Building
- Individual Dwelling, Fireproof
- Ruins of an Individual Dwelling
- Factory or Mill Chimney
- Factory or Mill with Chimney
- Factory or Mill without Chimney
- Mine or Open Pit Mine
- Operating Shaft or Mine
- Non-Operating Shaft or Mine
- Salt Mine
- Tailings Pile
- Pit
- Stone Quarry
- Gas Pump or Service Station
- Fuel Storage or Natural Gas Tank
- Oil or Natural Gas Derrick
- Small Hydroelectric Power Station
- Power Station
- Transformer Station
- Cemetery
- Burial Mound (height in metres)
- Triangulation Point on Burial Mound
- Triangulation Point
- Bench Mark
- Bench Mark (monumented)
- Telegraph Office
- Telephone Station
- Radio Station
- Radio Tower
- Airfield or Seaplane Base
- Landing Strip
- Main Highway
- Highway under Construction
- Improved Dirt Road (former truck road)
- Double-track Railroad with First Class Station
- Dismantled Railroad
- Railroad Under Construction
- Shore Embankment
- River or Ditch with Embankment
- Direction and velocity of current
- Well
- Water Reservoir or Rain Water Pit
- Spring
- Isobath with value
- Heavy (Index) Contour Line
- Contour Line and Value
- Half Contour Line
- Spot Elevation Value
- Coniferous
- Deciduous
- Mixed
- Scrub

Key to Numbers on Mapping

ST38NE_Newport

No.	Description
29	Mill (Steel)
71	Railway Station

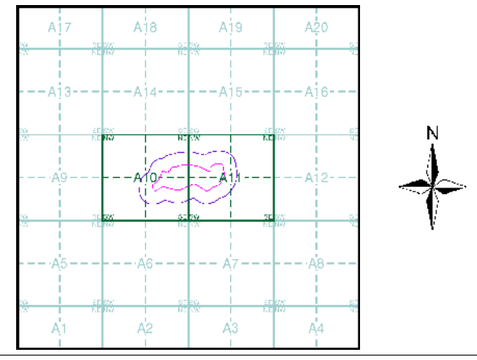
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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Monmouthshire	1:10,560	1886 - 1887	3
Monmouthshire	1:10,560	1902	4
Monmouthshire	1:10,560	1922	5
Monmouthshire	1:10,560	1938 - 1954	6
Historical Aerial Photography	1:10,560	1947	7
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Newport	1:10,000	1983	13
Ordnance Survey Plan	1:10,000	1987	14
10K Raster Mapping	1:10,000	1999	15
10K Raster Mapping	1:10,000	2006	16
VectorMap Local	1:10,000	2022	17

Russian Map - Slice A



Order Details

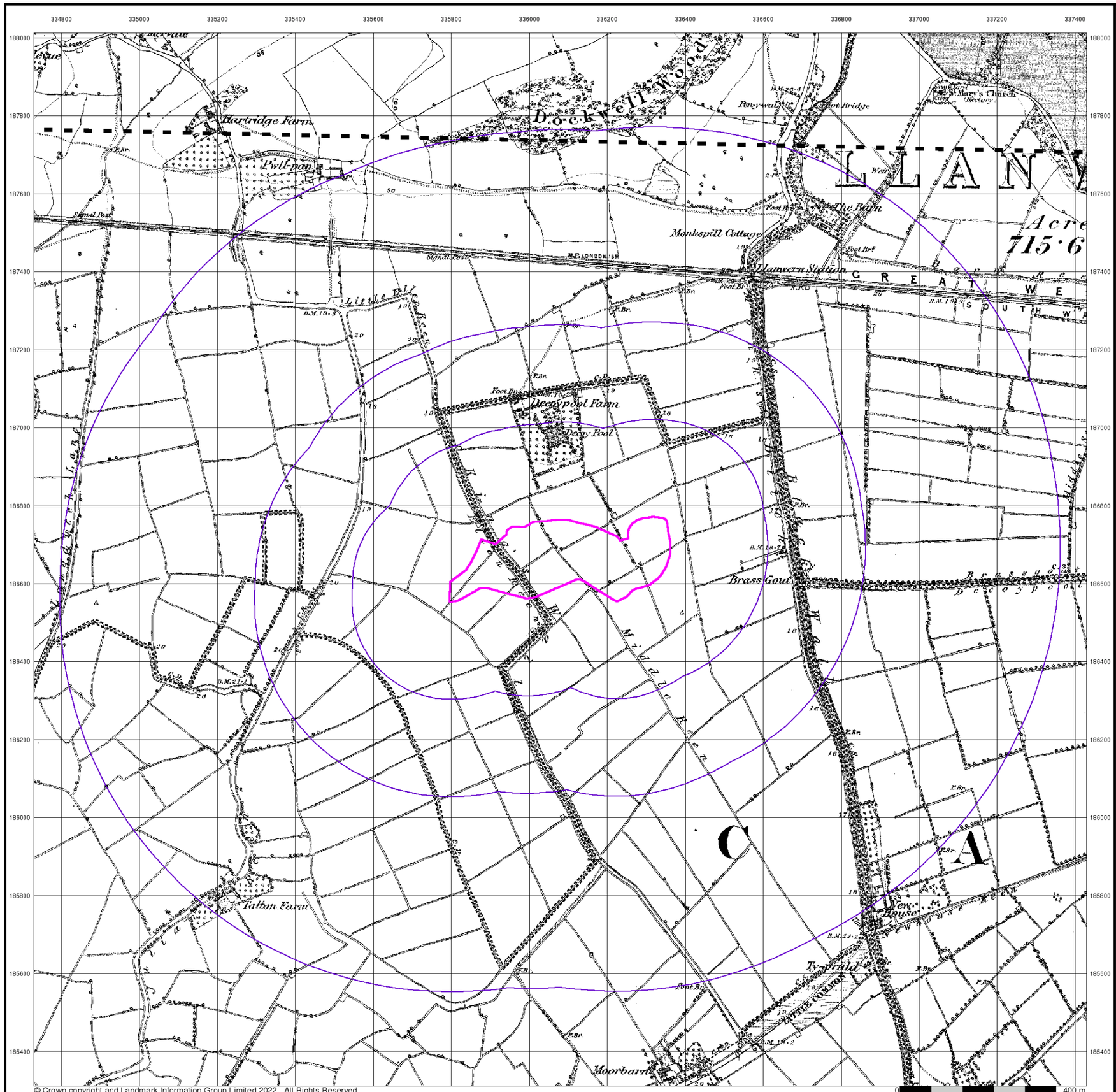
Order Number: 304885831_1_1
Customer Ref: Llanwern 4c 4g 4e
National Grid Reference: 336080, 186650
Slice: A
Site Area (Ha): 8.34
Search Buffer (m): 1000

Site Details

Site at 336079,186662

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Monmouthshire

Published 1886 - 1887

Source map scale - 1:10,560

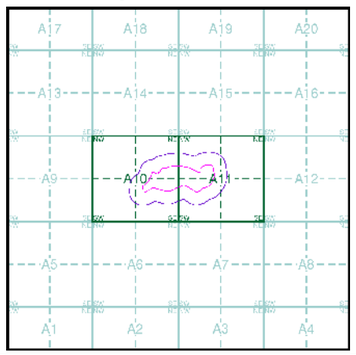
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some 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)

02900
1886
1:10,560

03400
1887
1:10,560

Historical Map - Slice A



Order Details

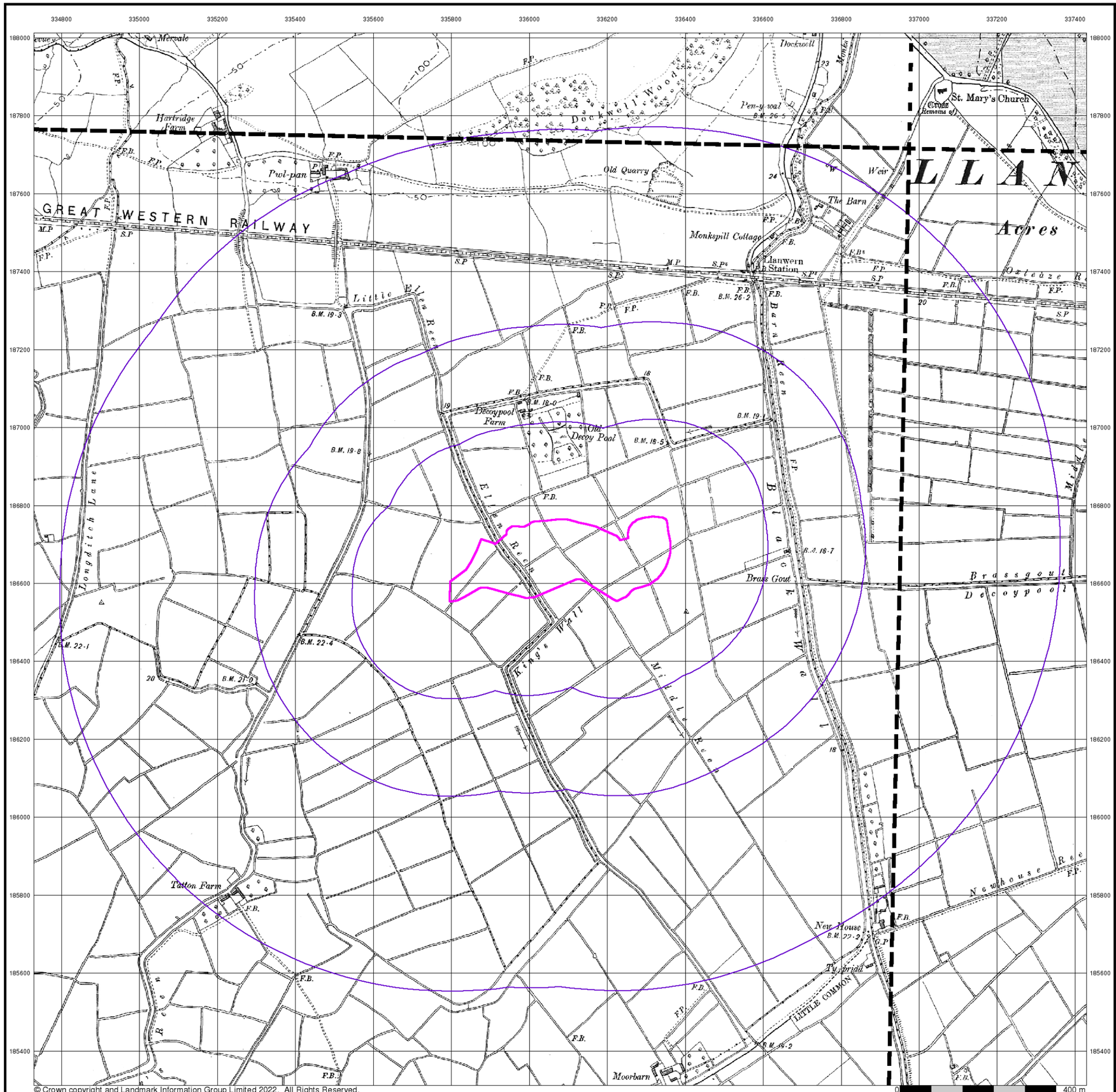
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National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

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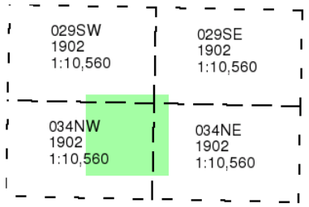
Monmouthshire

Published 1902

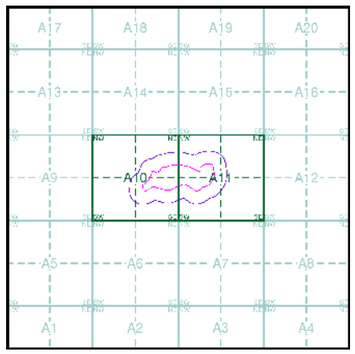
Source map scale - 1:10,560

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

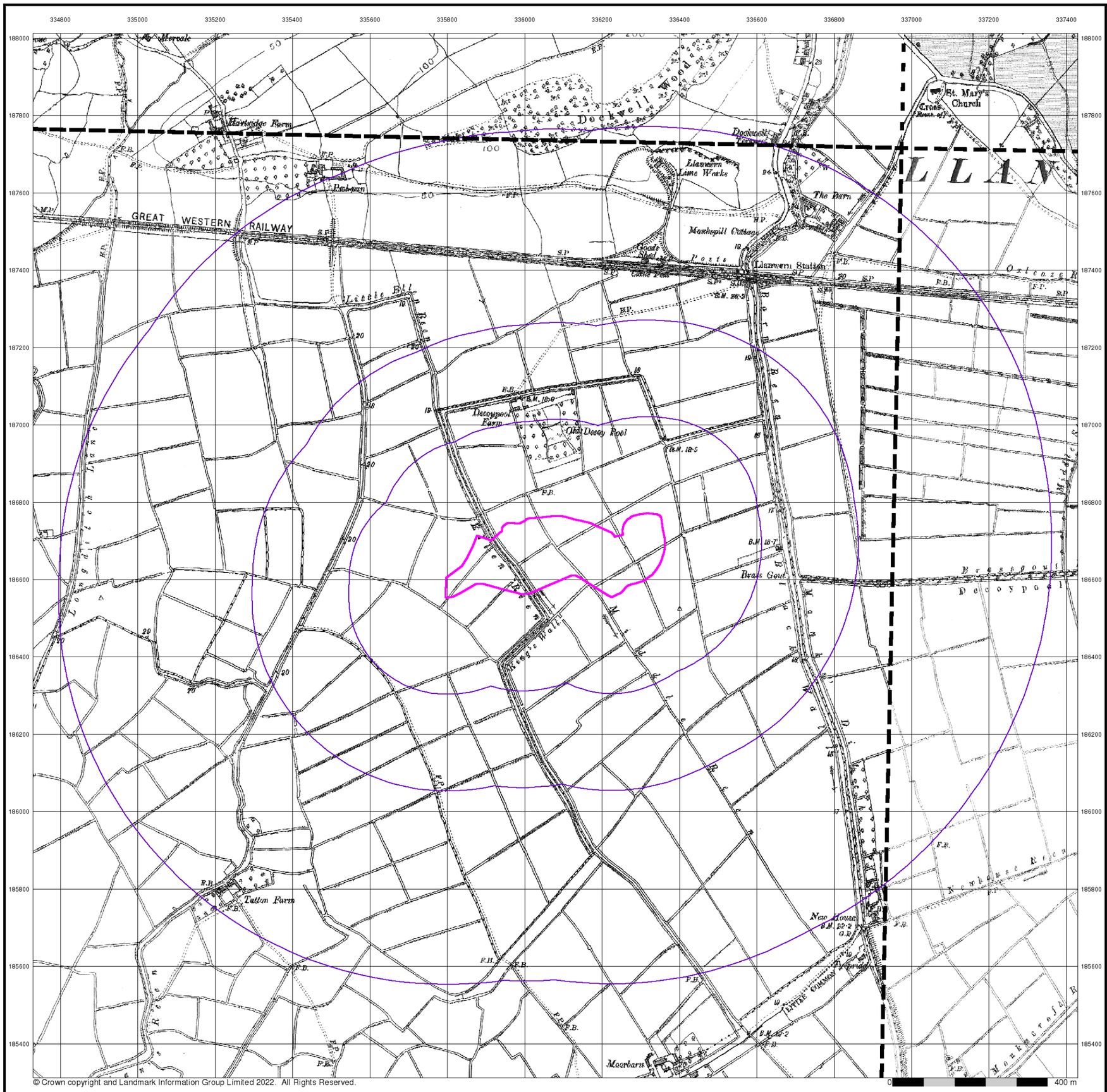
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National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

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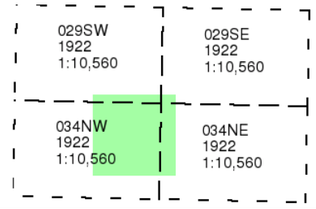
Monmouthshire

Published 1922

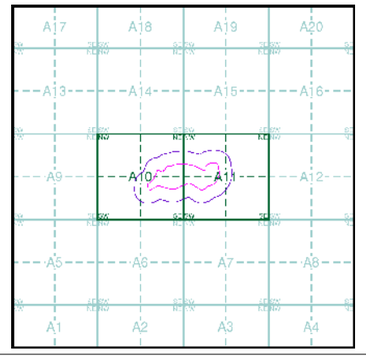
Source map scale - 1:10,560

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

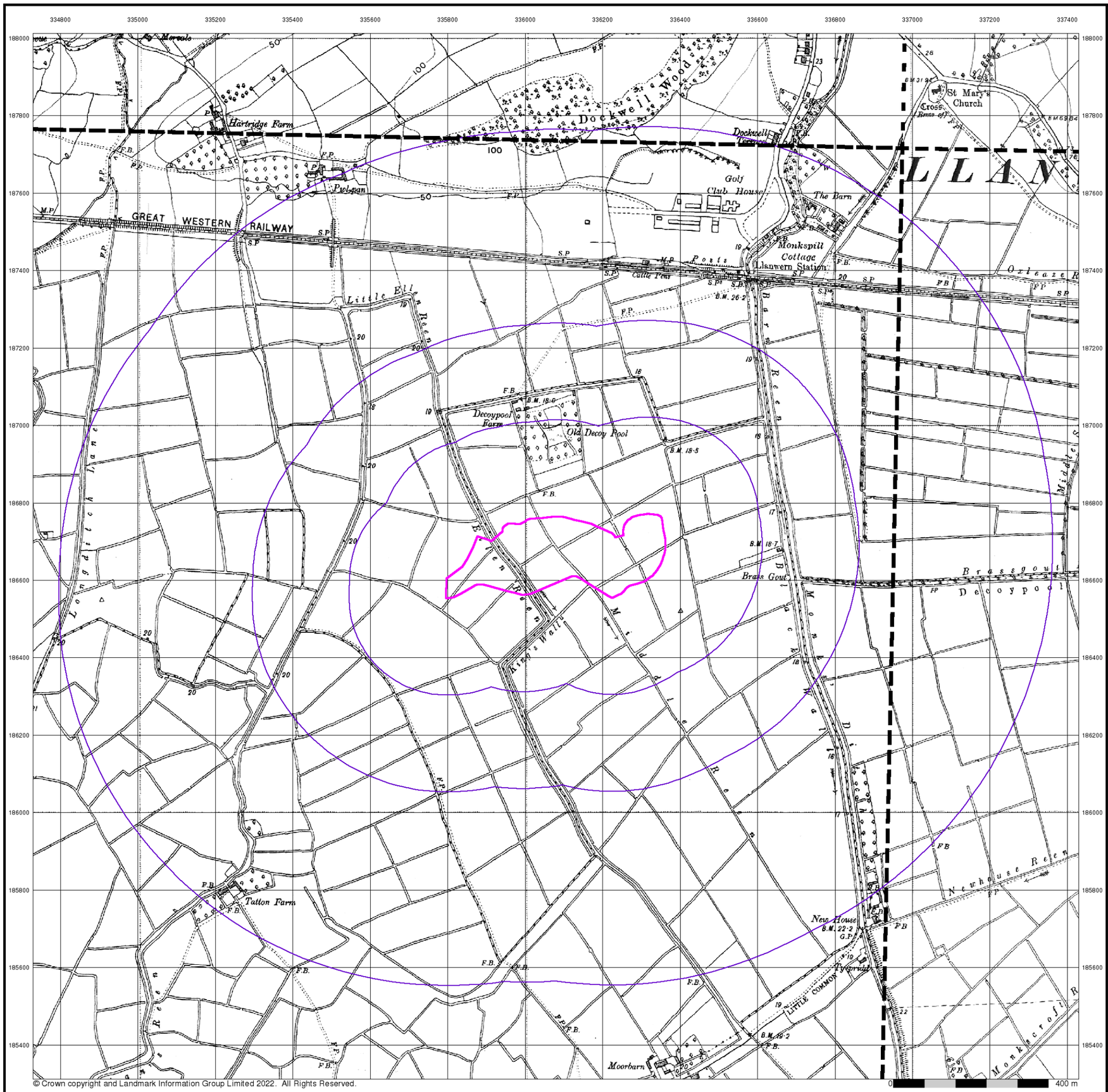
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

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Monmouthshire

Published 1938 - 1954

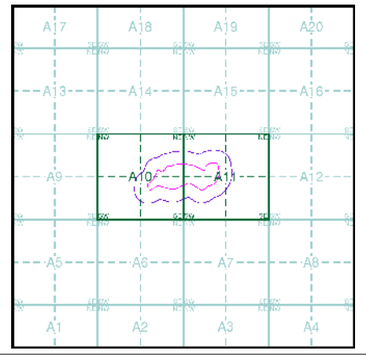
Source map scale - 1:10,560

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)

029SW 1938 1:10,560	029SE 1954 1:10,560
034NW 1938 1:10,560	034NE 1954 1:10,560

Historical Map - Slice A



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

Site at 336079,186662

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Historical Aerial Photography

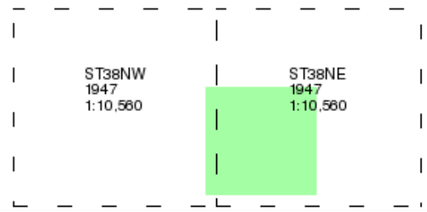
Published 1947

Source map scale - 1:10,560

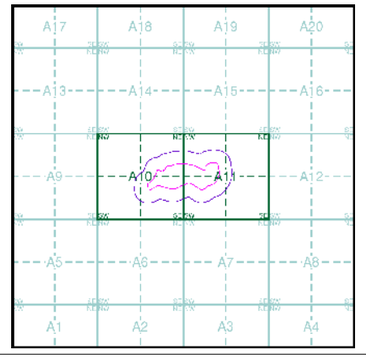
The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 1950's meant that every photograph was re-checked for potentially unsafe information with security sites replaced by fake fields or clouds. The original editions were withdrawn and only later made available after a period of fifty years although due to the accuracy of the editing, without viewing both revisions it is not easy to spot the edits. Where available Landmark have included both revisions.

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Map Name(s) and Date(s)



Historical Aerial Photography - Slice A



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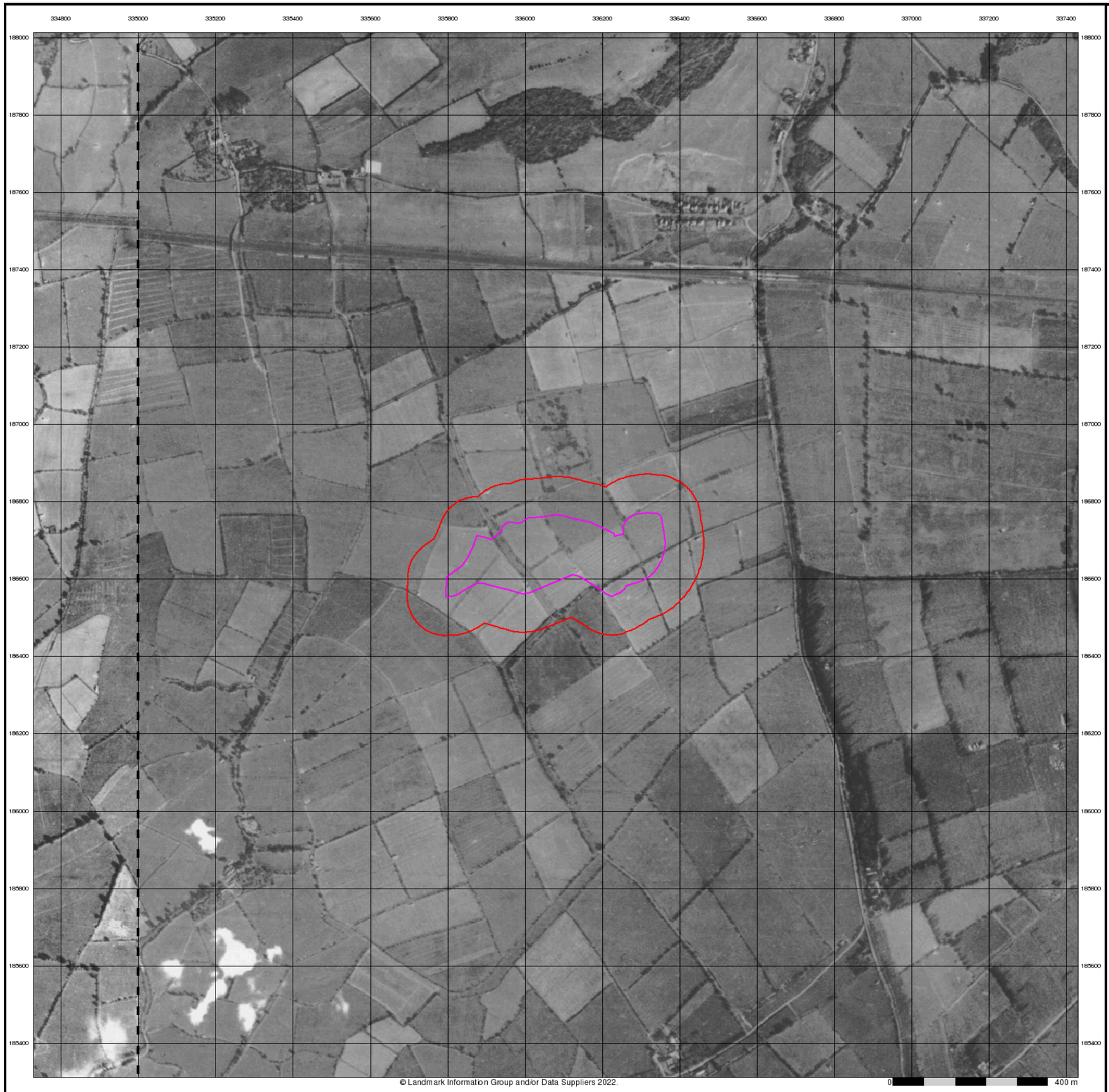
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Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

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Historical Aerial Photography

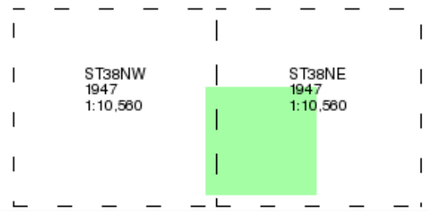
Published 1947

Source map scale - 1:10,560

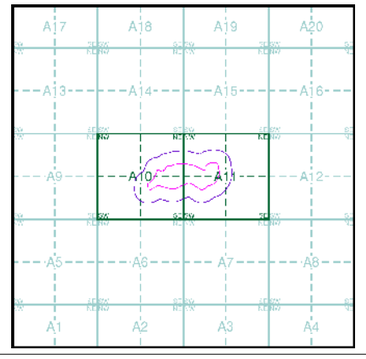
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Map Name(s) and Date(s)



Historical Aerial Photography - Slice A



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Order Details

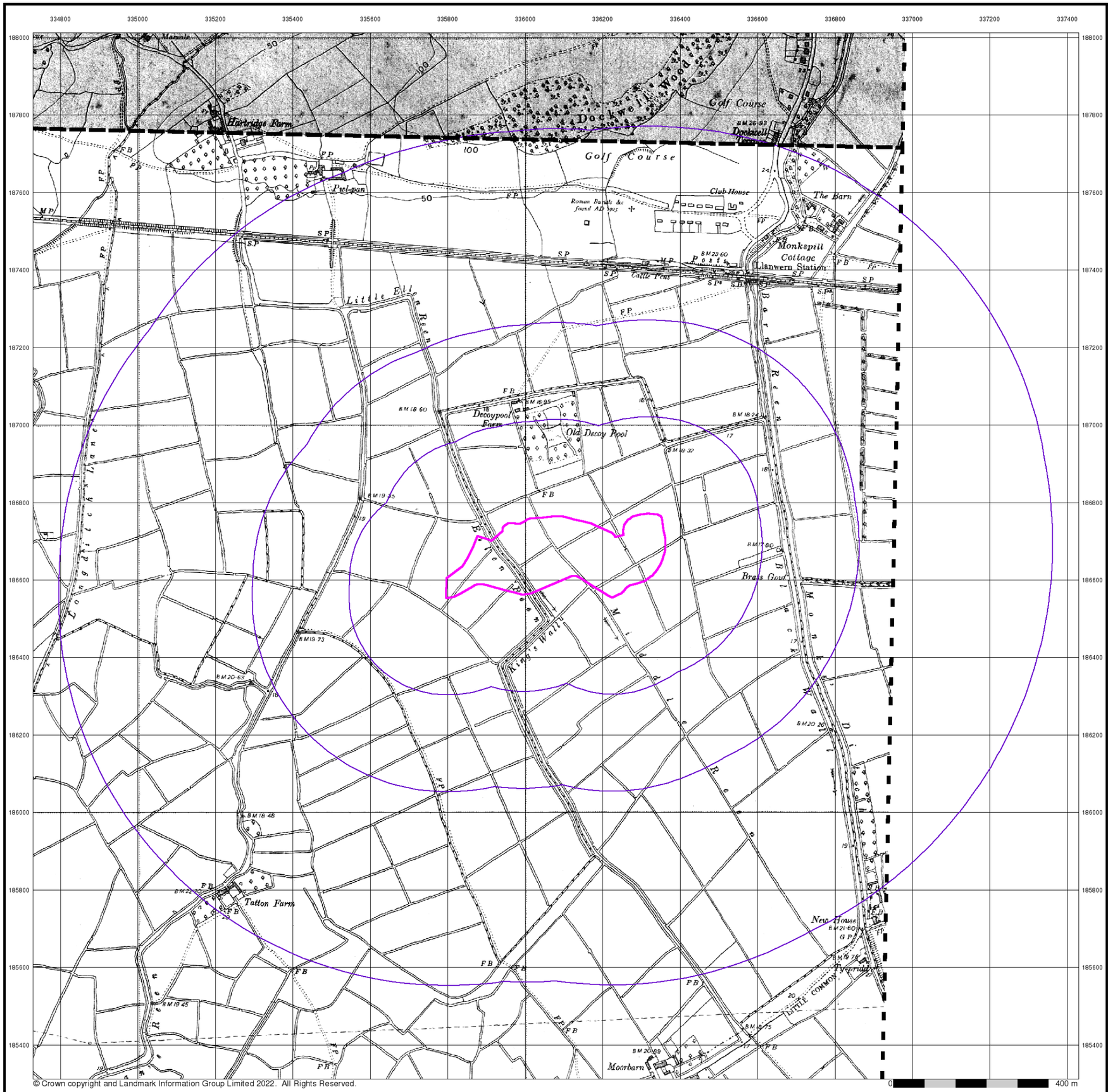
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National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

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Monmouthshire

Published 1954

Source map scale - 1:10,560

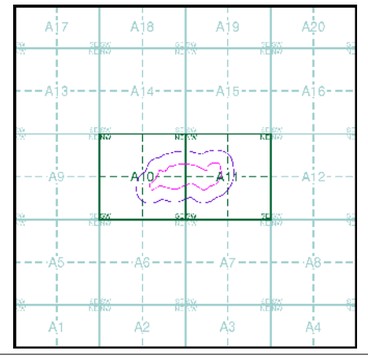
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Map Name(s) and Date(s)

029SW
1954
1:10,560

034NW
1954
1:10,560

Historical Map - Slice A



Order Details

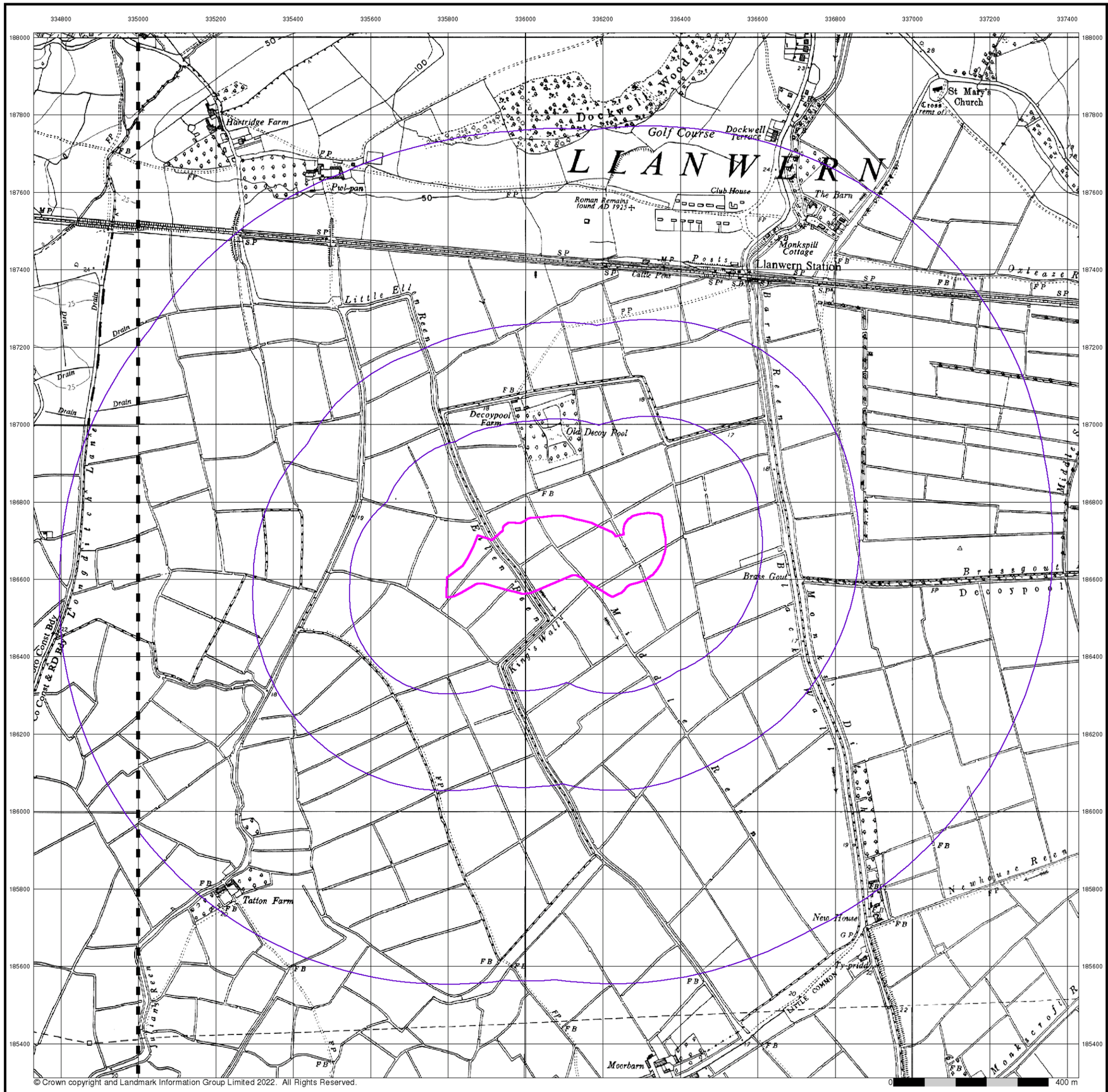
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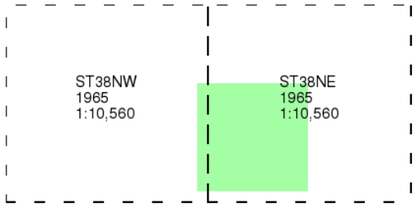
Ordnance Survey Plan

Published 1965

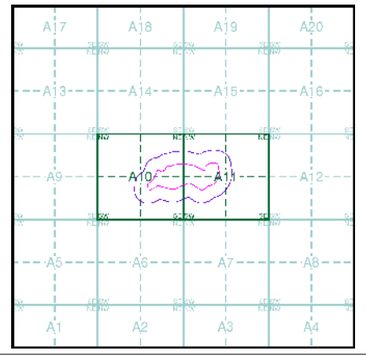
Source map scale - 1:10,000

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

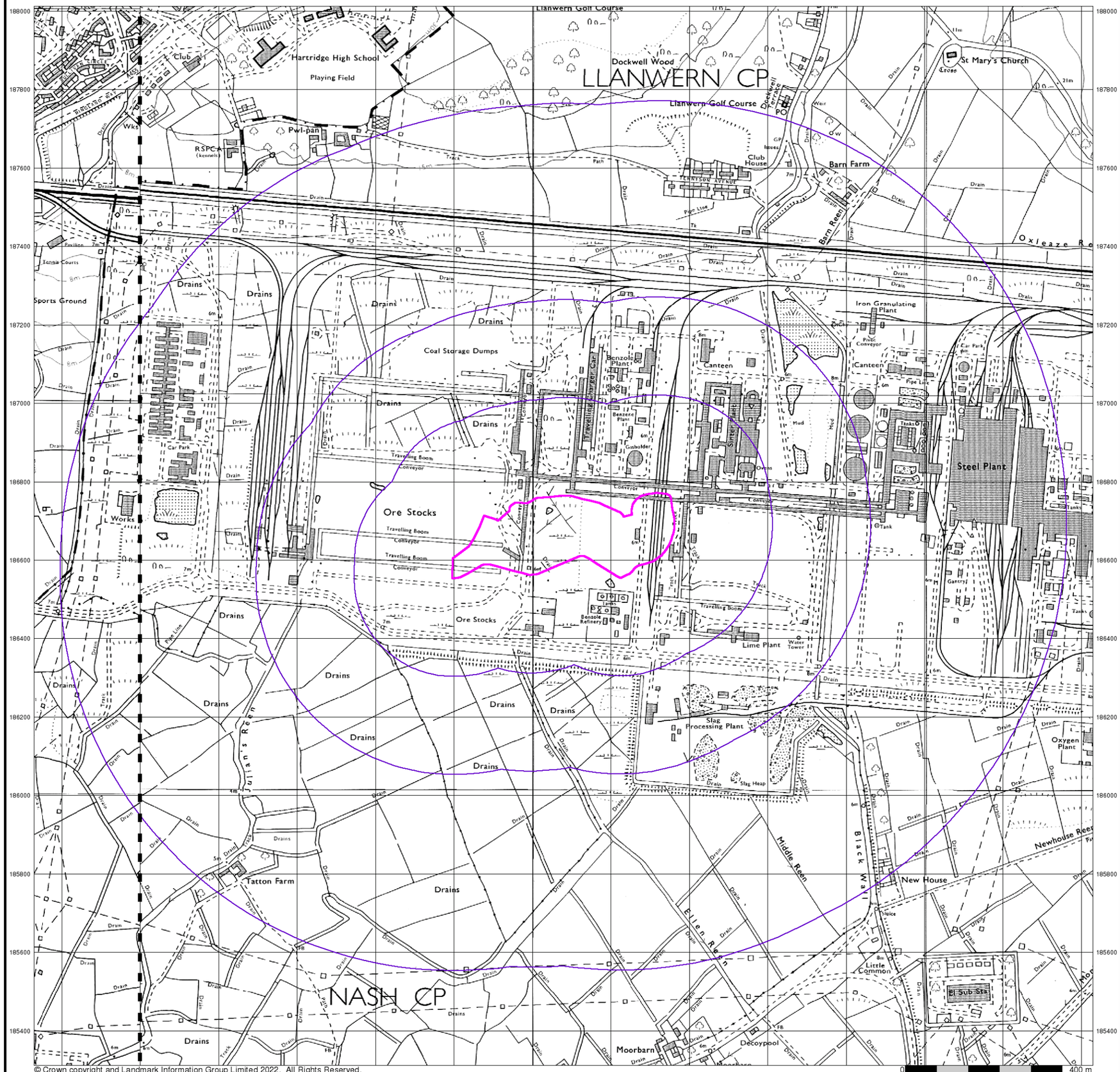
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National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

Site at 336079,186662

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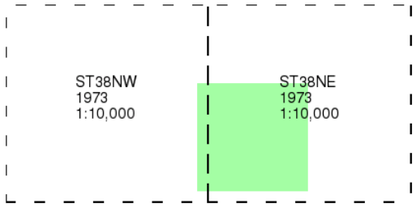
Ordnance Survey Plan

Published 1973

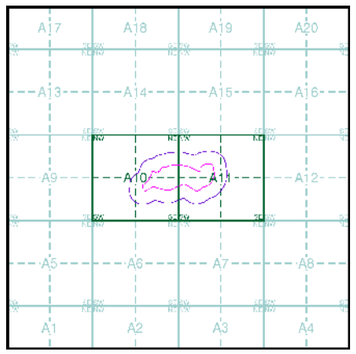
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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

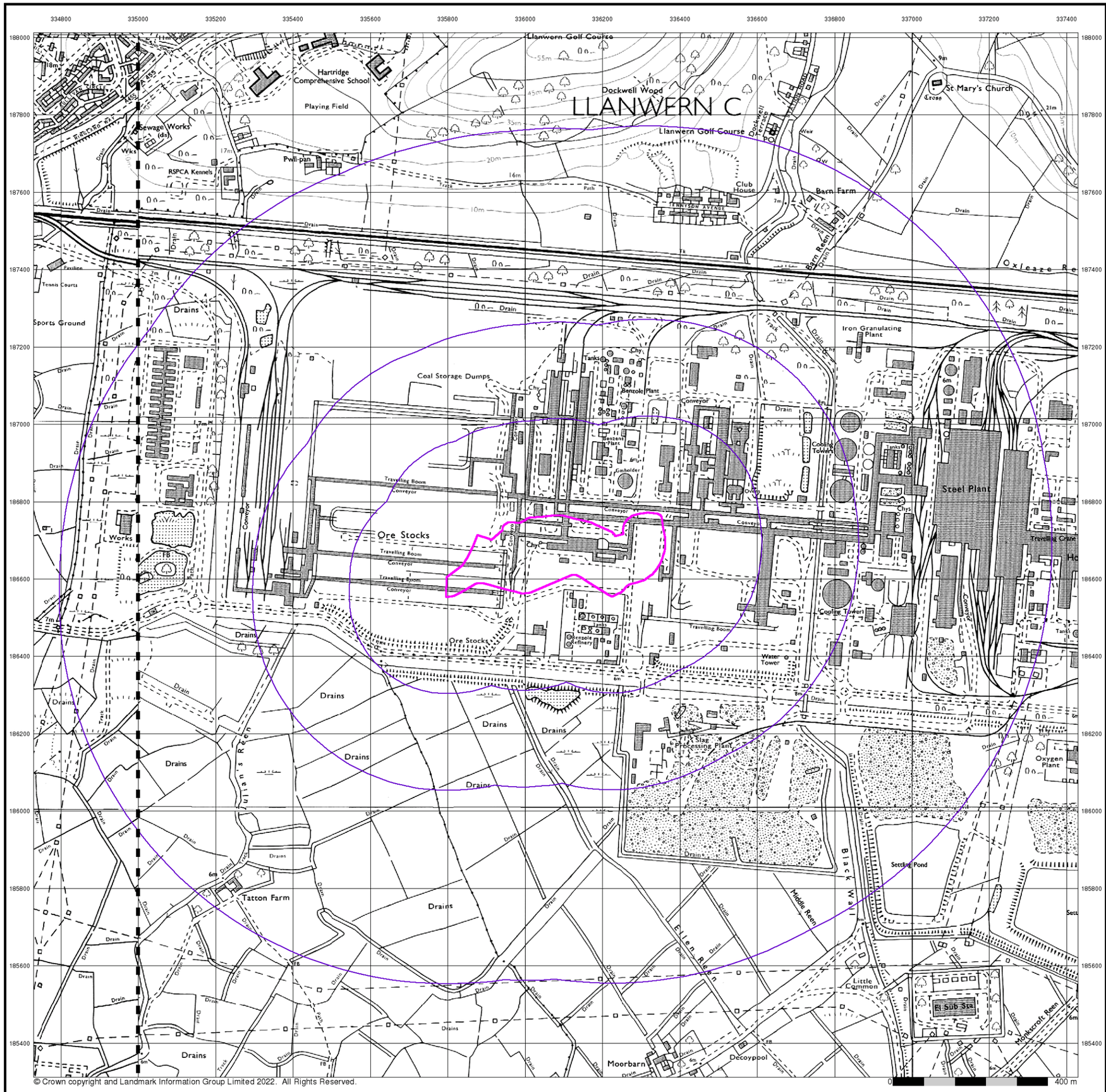
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Slice:	A
Site Area (Ha):	8.34
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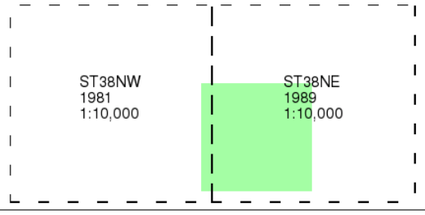
Ordnance Survey Plan

Published 1981 - 1989

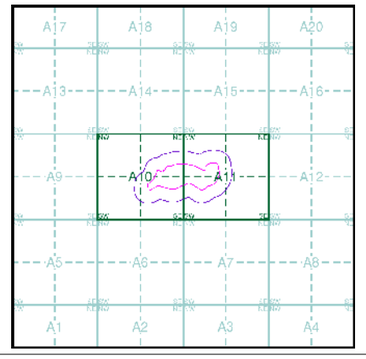
Source map scale - 1:10,000

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

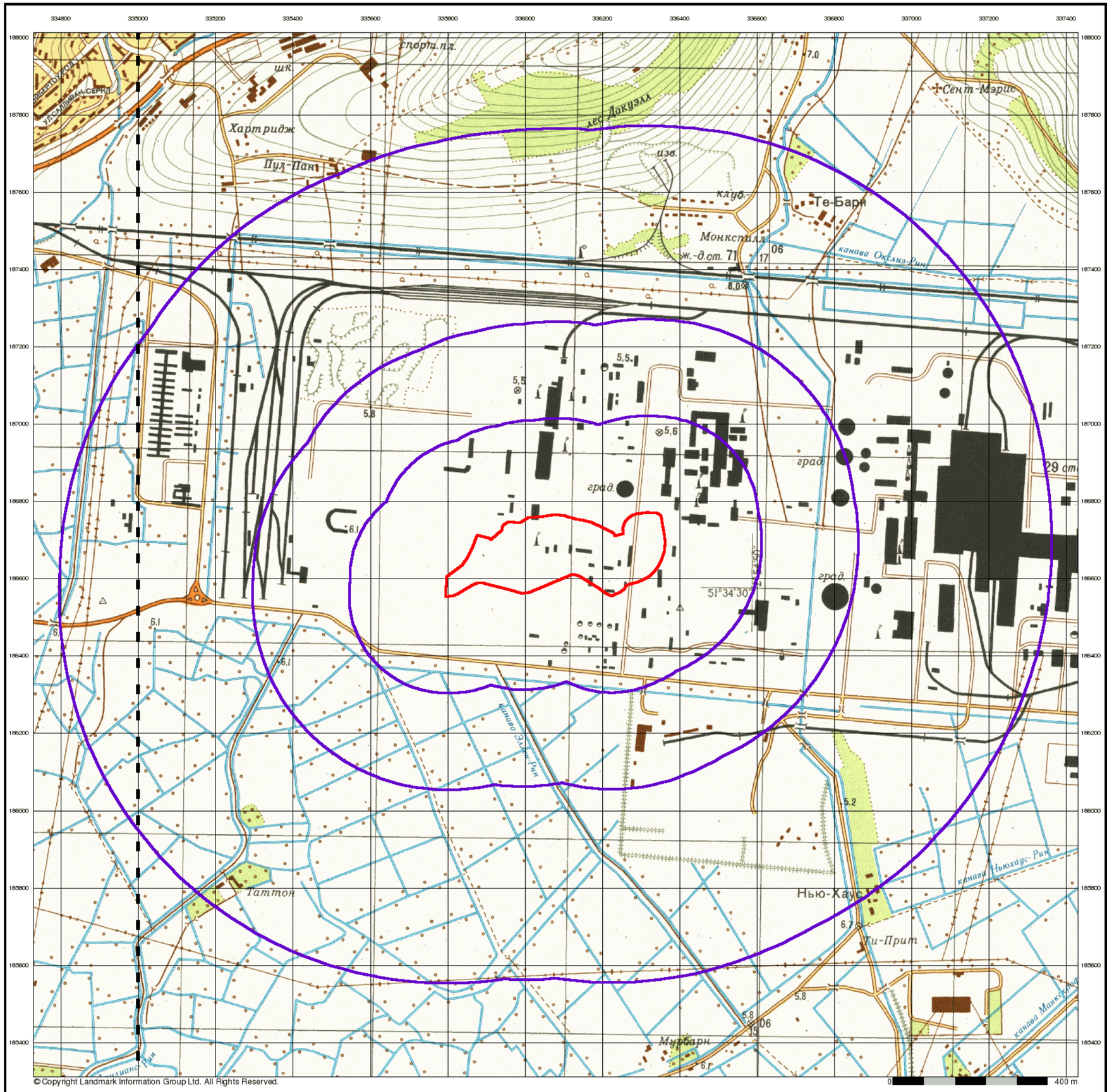
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Slice:	A
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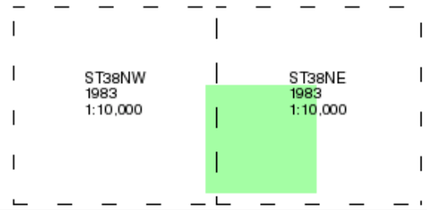
Newport

Published 1983

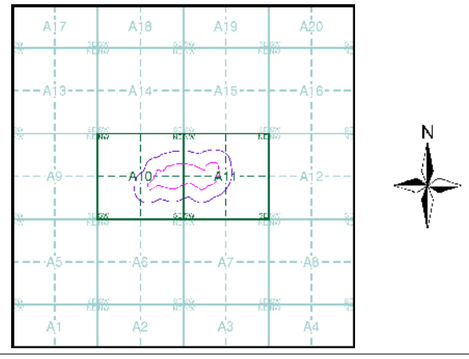
Source map scale - 1:10,000

These maps were produced by the Russian military during the Cold War between 1950 and 1997, and cover 103 towns and cities throughout the U.K. The maps are produced at 1:25,000, 1:10,000 and 1:5,000 scale, and show detailed land use, with colour-coded areas for development, green areas, and non-developed areas. Buildings are coloured black and important building uses (such as hospitals, post offices, factories etc.) are numbered, with a numbered key describing their use.
They were produced by the Russians for the benefit of navigation, as well as strategic military sites and transport hubs, for use if they were to have invaded the U.K. The detailed information provided indicates that the areas were surveyed using land-based personnel, on the ground, in the cities that are mapped.

Map Name(s) and Date(s)



Russian Map - Slice A



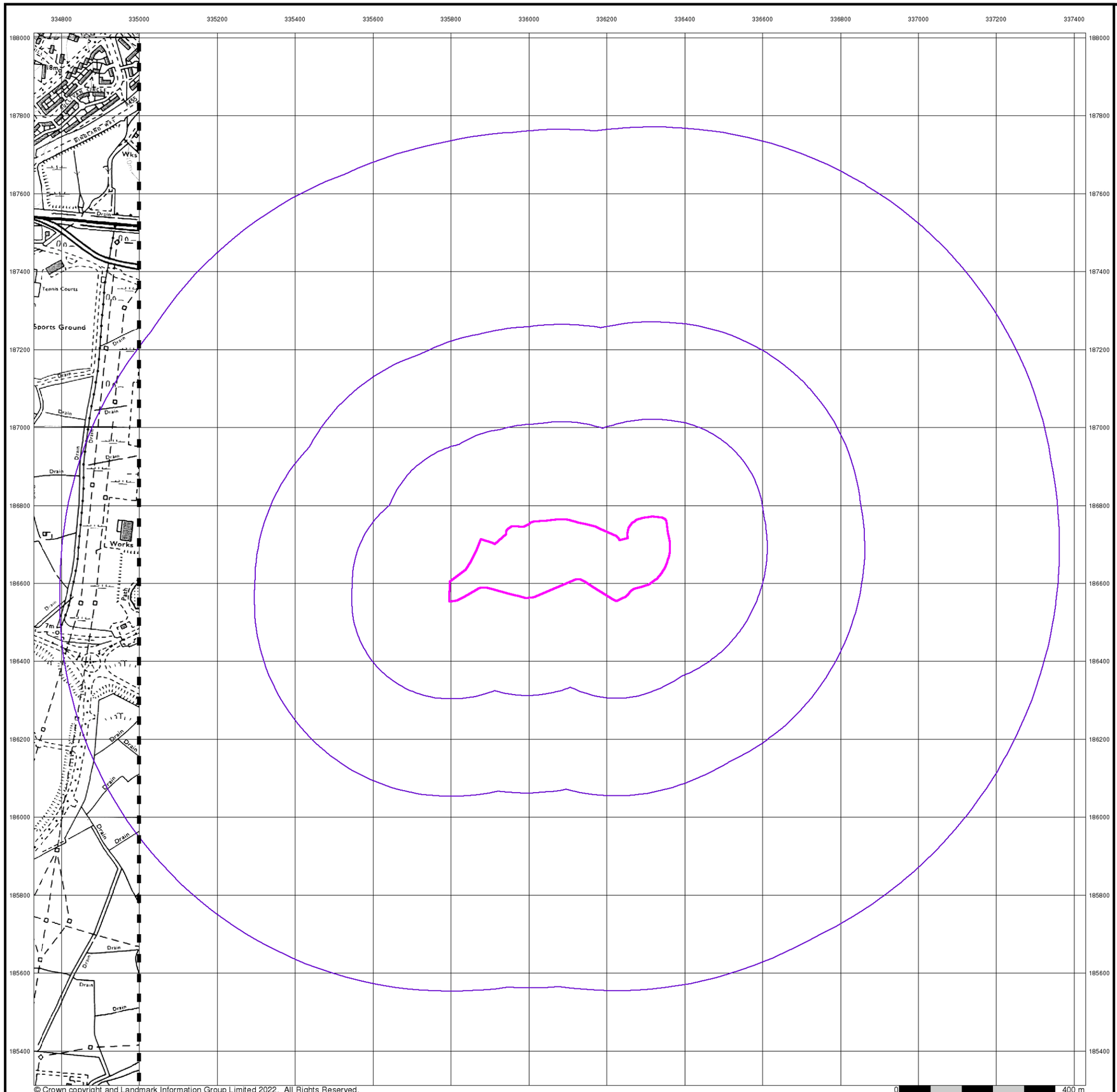
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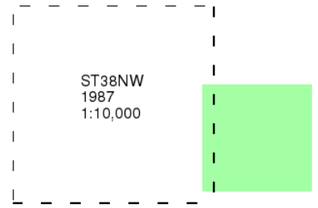
Ordnance Survey Plan

Published 1987

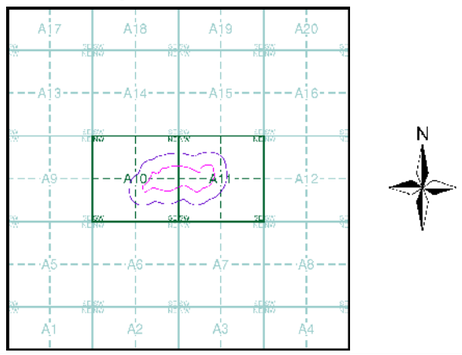
Source map scale - 1:10,000

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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

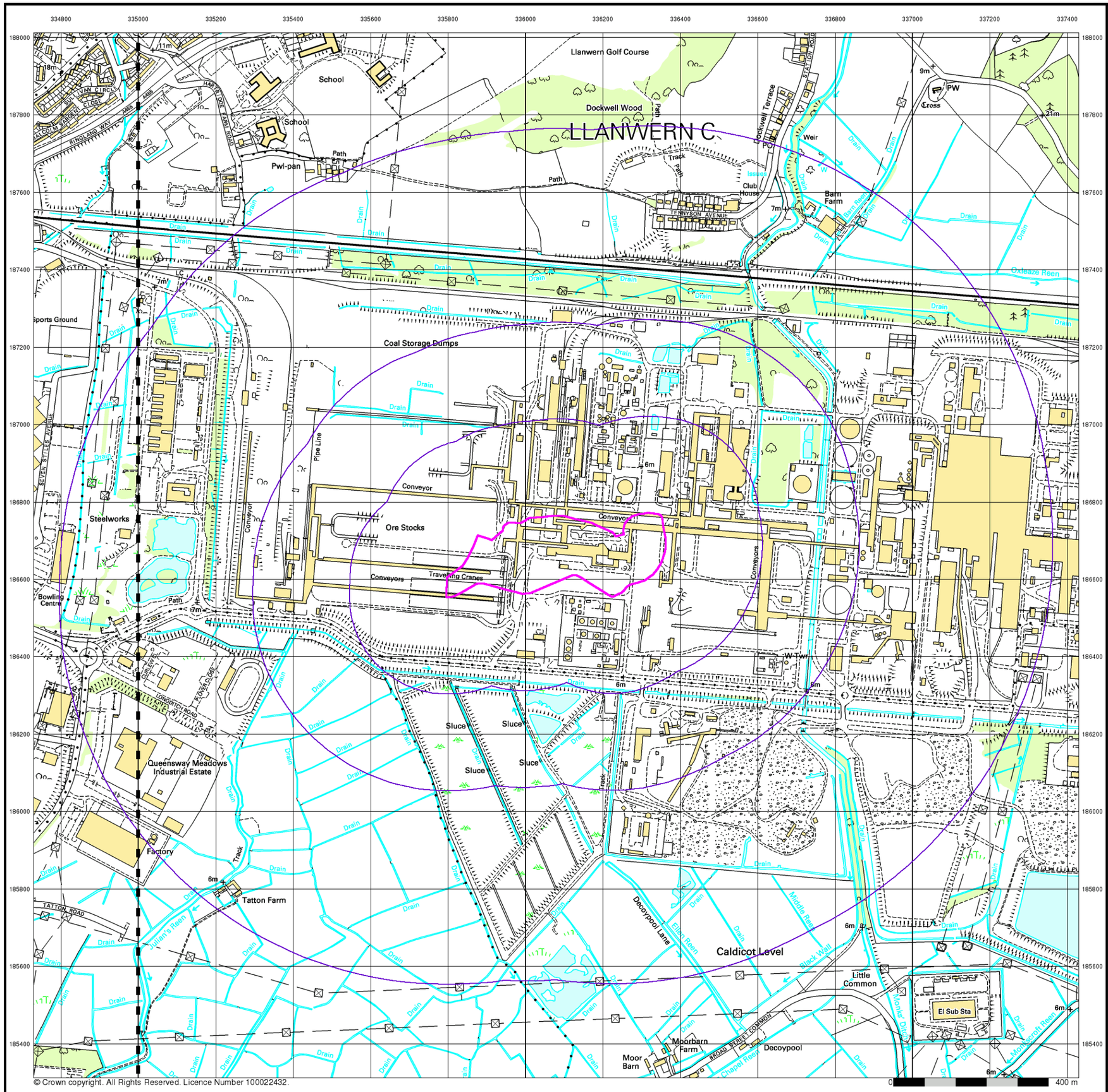
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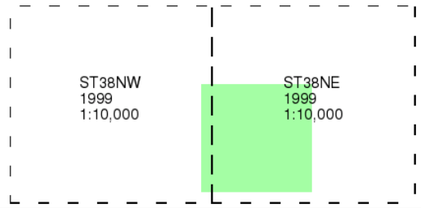
10k Raster Mapping

Published 1999

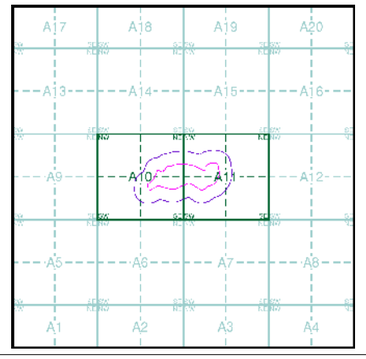
Source map scale - 1:10,000

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

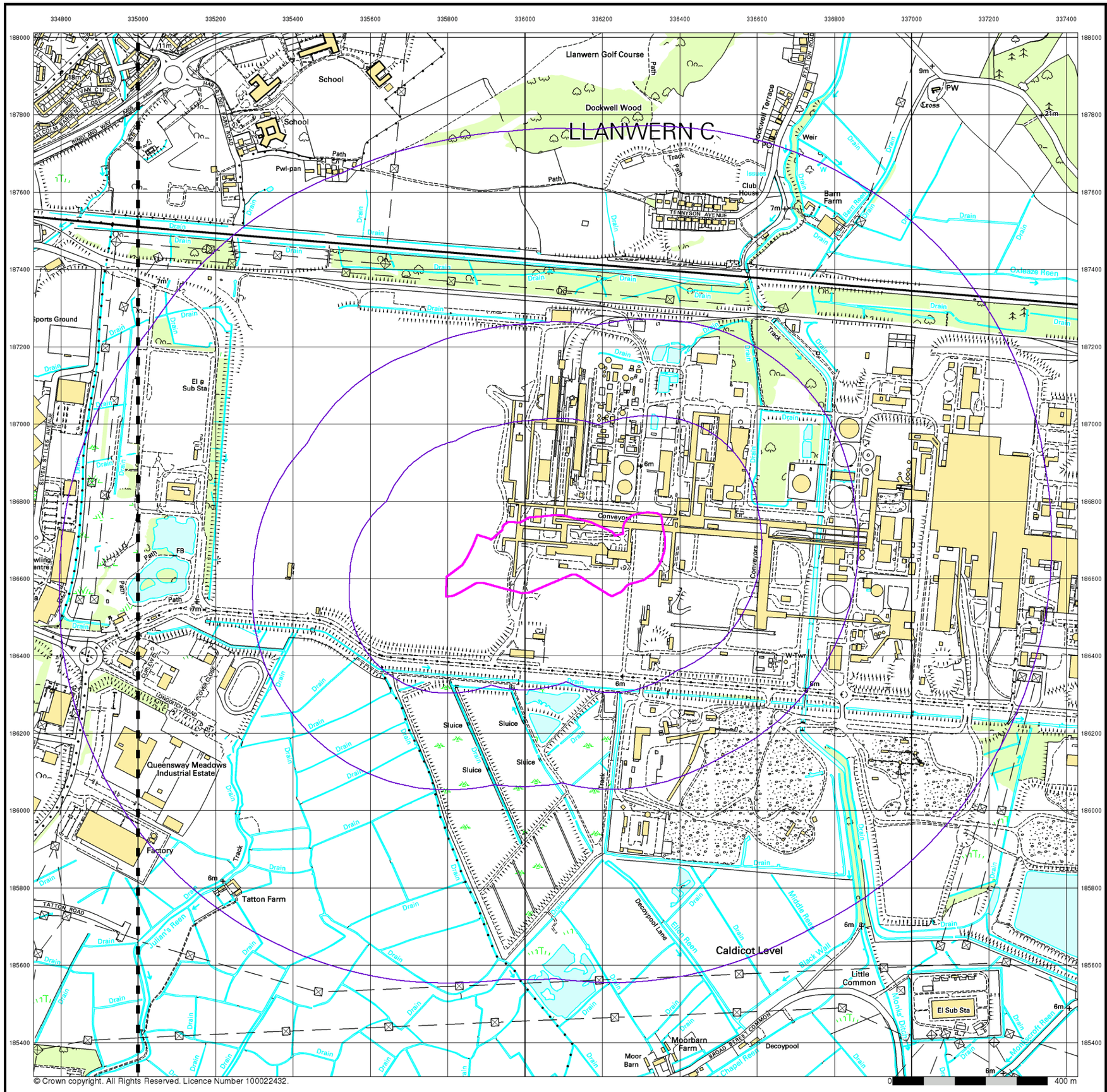
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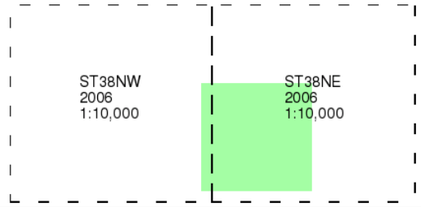
10k Raster Mapping

Published 2006

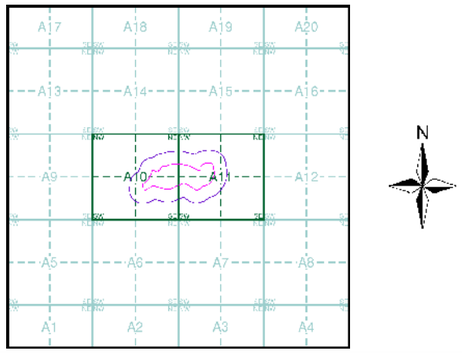
Source map scale - 1:10,000

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



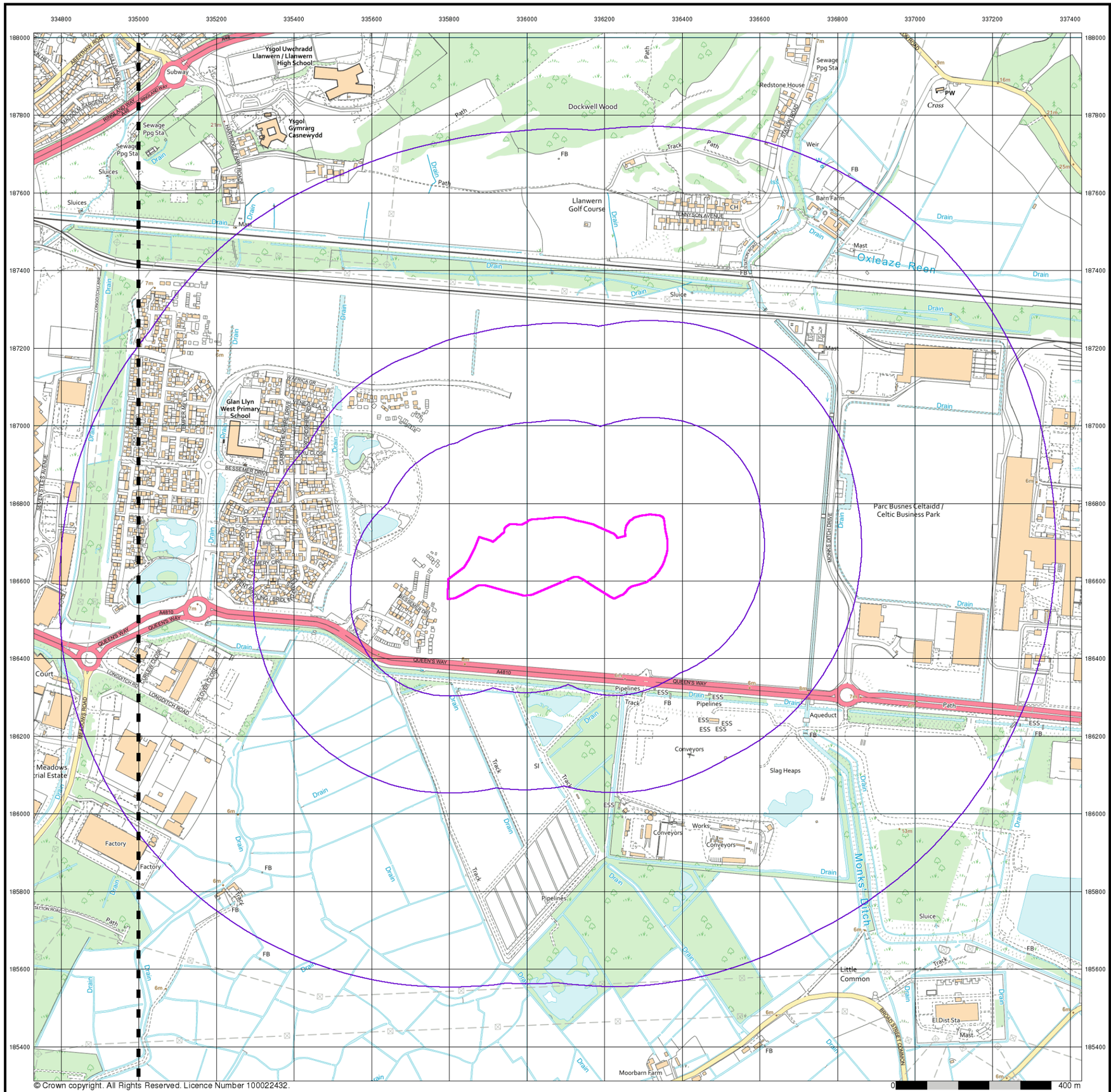
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Slice:	A
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Search Buffer (m):	1000

Site Details

Site at 336079,186662

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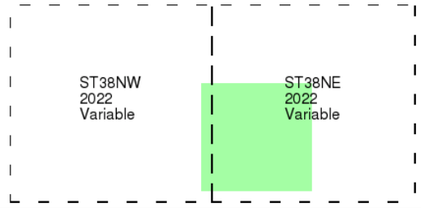
VectorMap Local

Published 2022

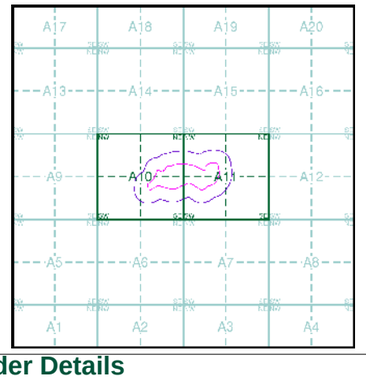
Source map scale - 1:10,000

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
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Geology 1:50,000 Maps Legends

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	TFD	Tidal Flat Deposits	Clay and Silt	Not Supplied - Holocene
	ALV	Alluvium	Clay, Silt, Sand and Gravel	Not Supplied - Holocene

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	LVN	Lavernock Shales Member	Mudstone	Not Supplied - Hettangian
	PNG	Penarth Group	Mudstone	Not Supplied - Rhaetian
	STM	St Mary's Well Bay Member	Limestone and Mudstone, Interbedded	Not Supplied - Rhaetian
	BAN	Blue Anchor Formation	Mudstone and Siltstone	Not Supplied - Norian
	BAN	Blue Anchor Formation	Mudstone	Not Supplied - Norian
	MMG	Mercia Mudstone Group	Mudstone	Not Supplied - Early Triassic
	SMG	St Maughans Formation	Argillaceous Rocks and [Subequal/Subordinate] Sandstone, Interbedded	Not Supplied - Early Devonian
		Faults		

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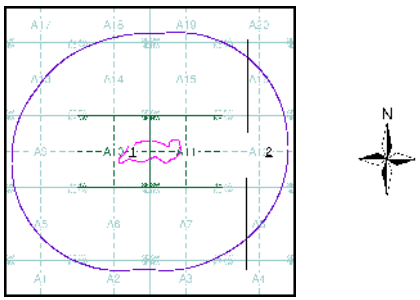
Geology 1:50,000 Maps

This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps.
The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:50,000 Maps Coverage

Map ID:	**2**	**Map ID:**	**1**
Map Sheet No:	**250**	**Map Sheet No:**	**249**
Map Name:	**Chepstow**	**Map Name:**	**Newport**
Map Date:	**1981**	**Map Date:**	**1969**
Bedrock Geology:	**Available**	**Bedrock Geology:**	**Available**
Superficial Geology:	**Available**	**Superficial Geology:**	**Available**
Artificial Geology:	**Not Available**	**Artificial Geology:**	**Available**
Faults:	**Not Supplied**	**Faults:**	**Not Supplied**
Landslip:	**Available**	**Landslip:**	**Available**
Rock Segments:	**Not Supplied**	**Rock Segments:**	**Not Supplied**

Geology 1:50,000 Maps - Slice A



Order Details:

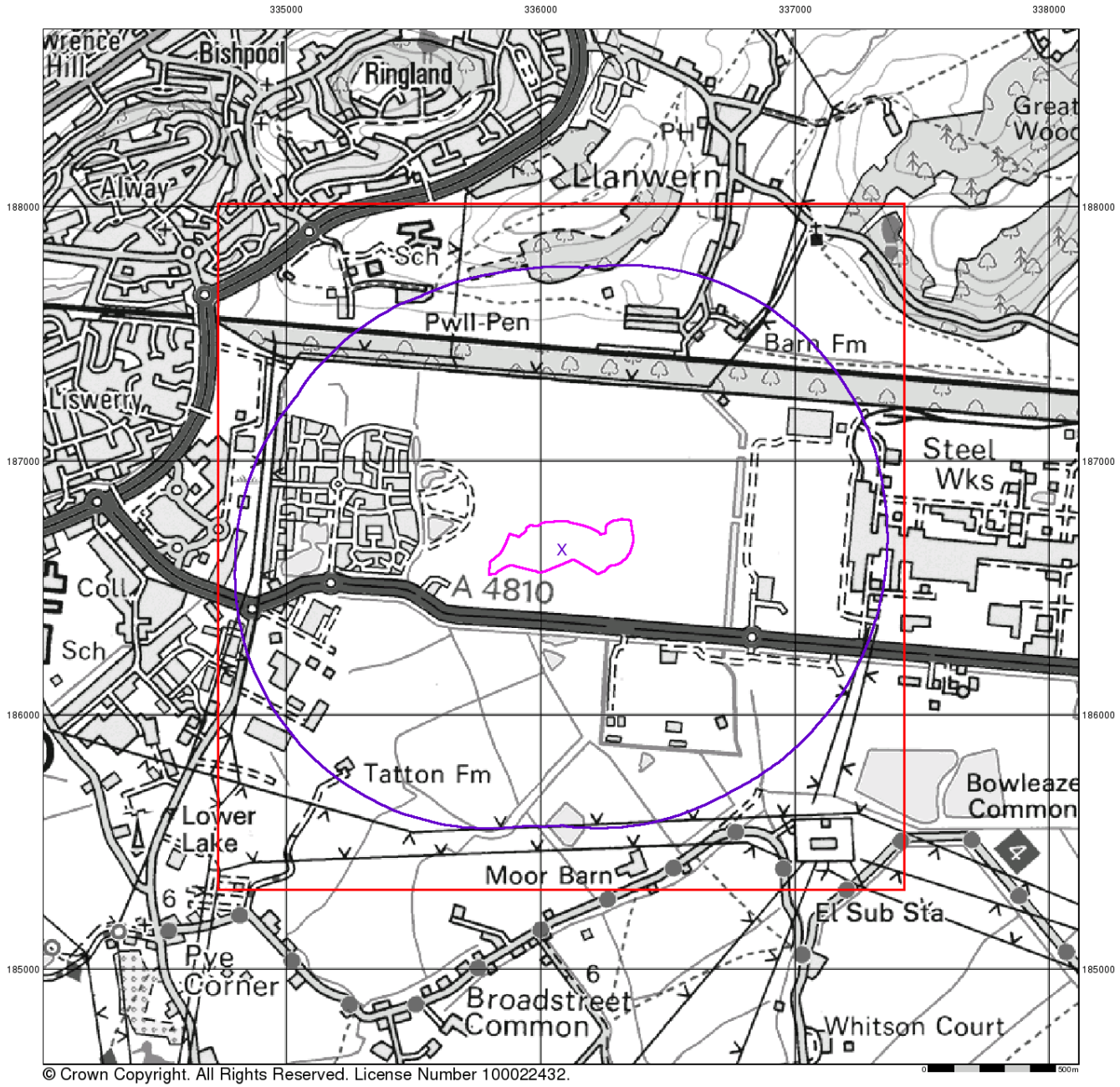
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Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details:

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Artificial Ground and Landslip

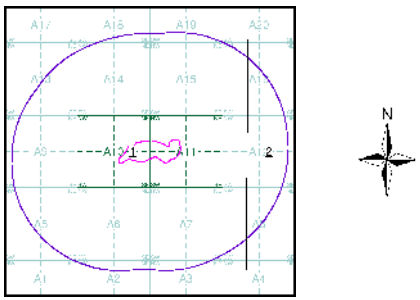
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- Infilled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes foundered strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A



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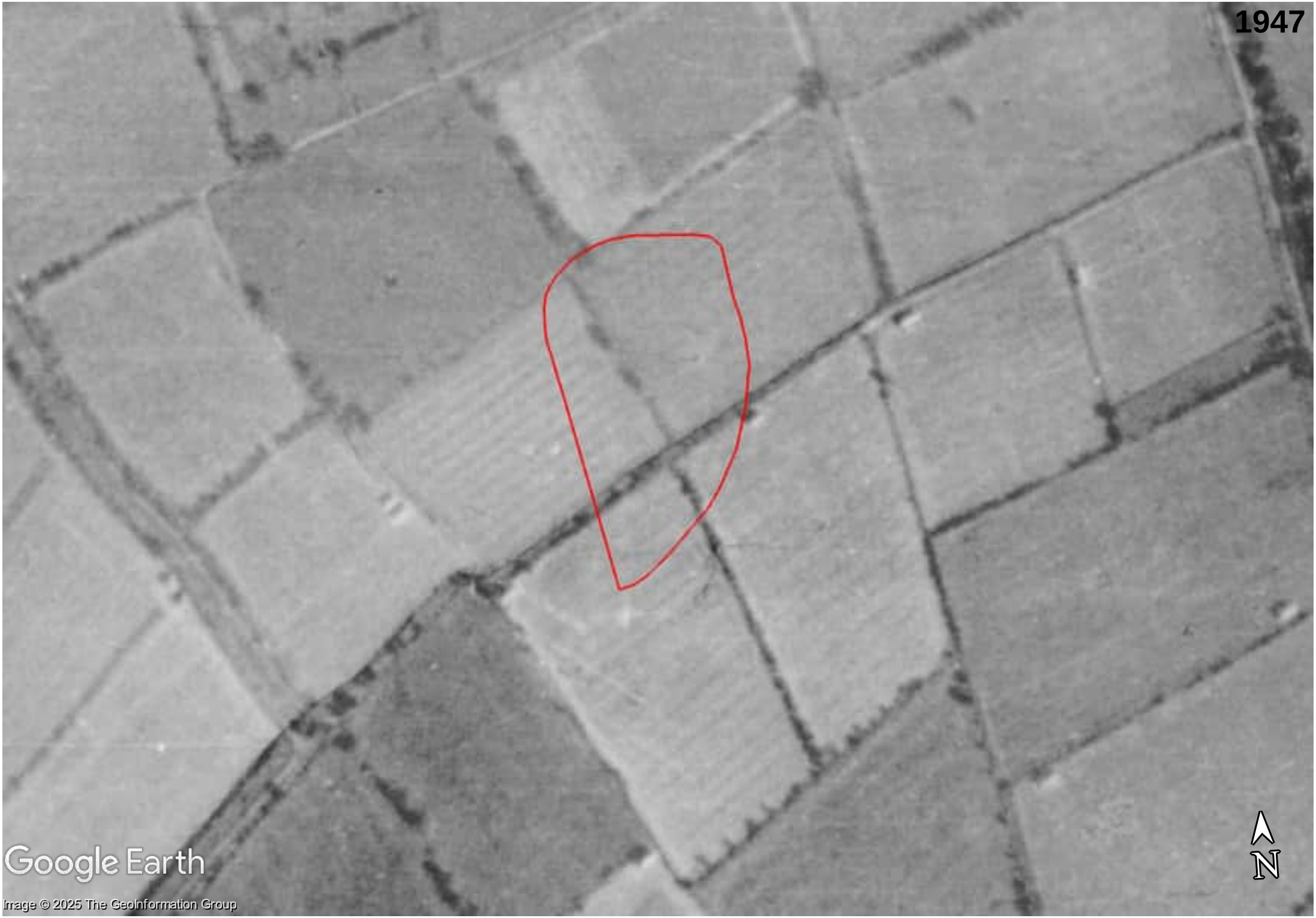
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Customer Reference:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details:

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1947
Google Earth
Image © 2025 The GeoInformation Group
N


2001
Google Earth
© 2025 Infoterra Ltd & Bluesky
N


2004
Google Earth
Image © 2025 Maxar Technologies
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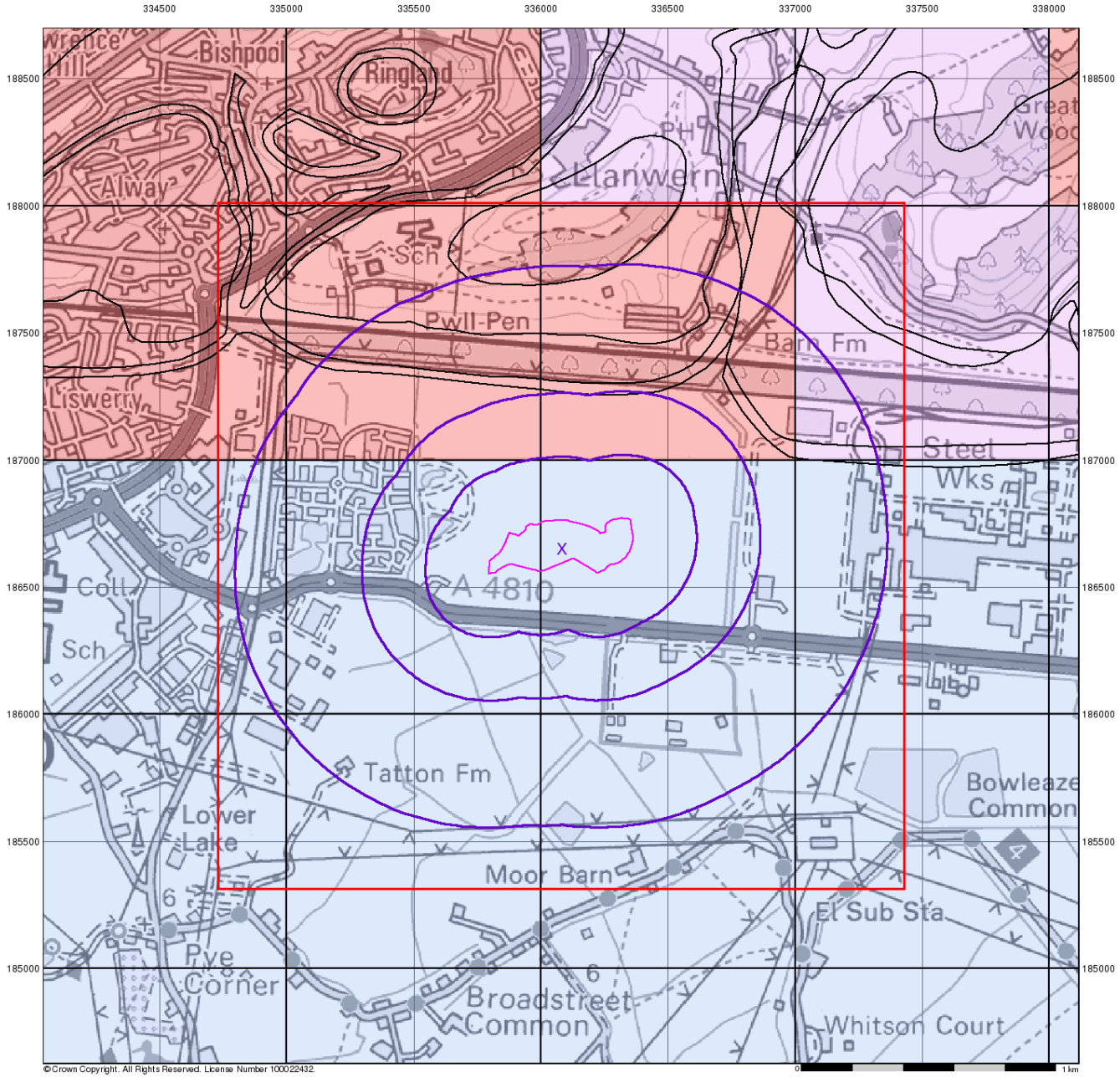

2006
Google Earth
Image © 2025 Maxar Technologies
N


2015
Google Earth
Image © 2025 Maxar Technologies
N


2018
Google Earth
Image © 2025 Maxar Technologies
N


2020
Google Earth
Image © 2025 Maxar Technologies
N

Appendix D
Envirocheck Report



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Groundwater Vulnerability

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

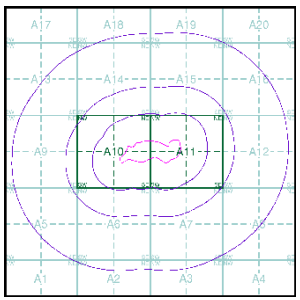
Agency and Hydrological

Bedrock Aquifers	Superficial Aquifers
High Vulnerability, Principal Aquifer	High Vulnerability, Principal Aquifer
High Vulnerability, Secondary Aquifer	High Vulnerability, Secondary Aquifer
Medium Vulnerability, Principal Aquifer	Medium Vulnerability, Principal Aquifer
Medium Vulnerability, Secondary Aquifer	Medium Vulnerability, Secondary Aquifer
Low Vulnerability, Principal Aquifer	Low Vulnerability, Principal Aquifer
Low Vulnerability, Secondary Aquifer	Low Vulnerability, Secondary Aquifer

Unproductive Aquifer

Soluble Rock

Site Sensitivity Context Map - Slice A



Order Details

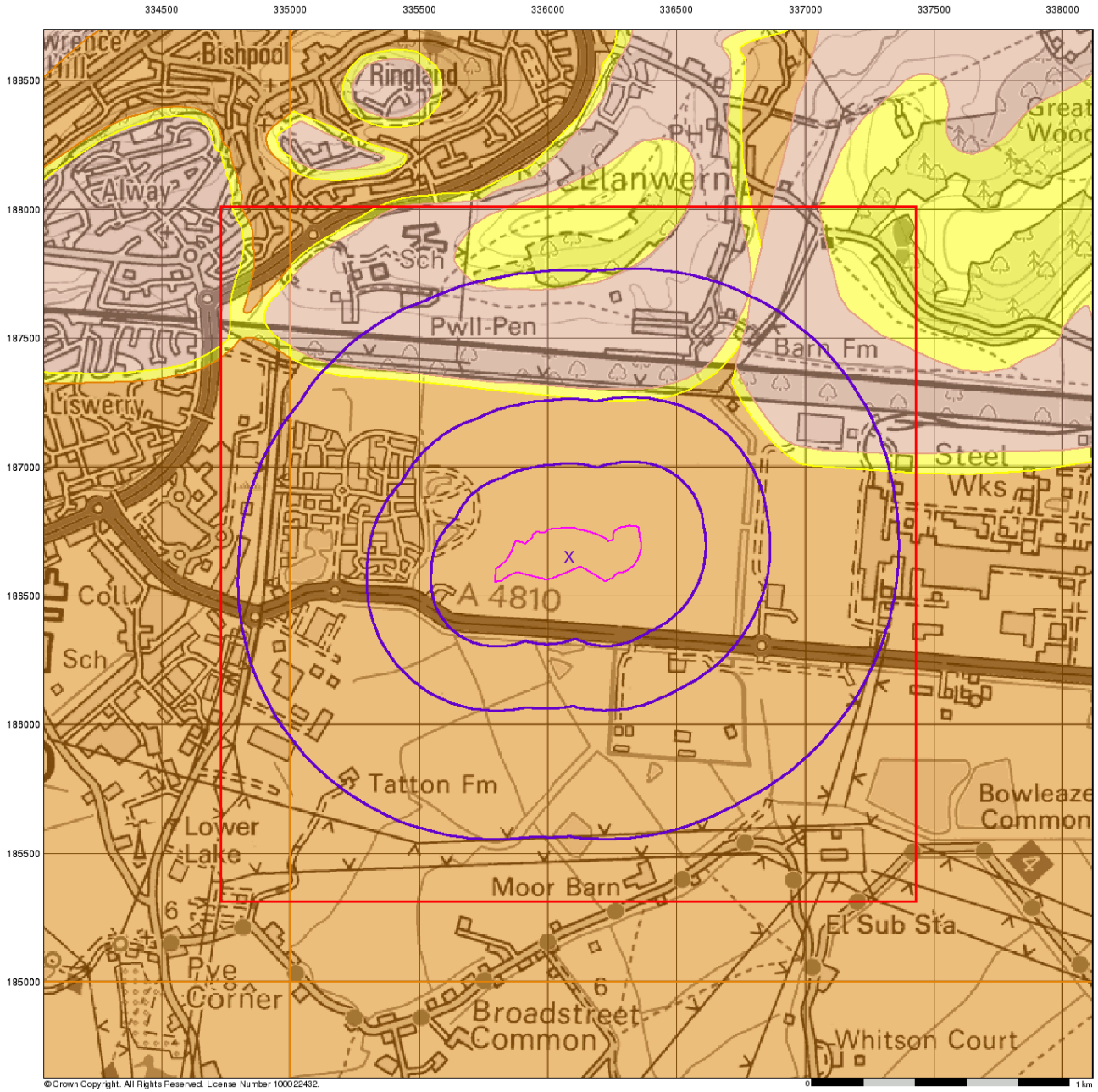
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Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

Site at 336079,186662

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Bedrock Aquifer Designation

General

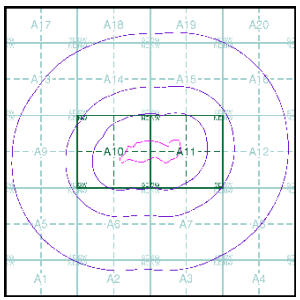
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



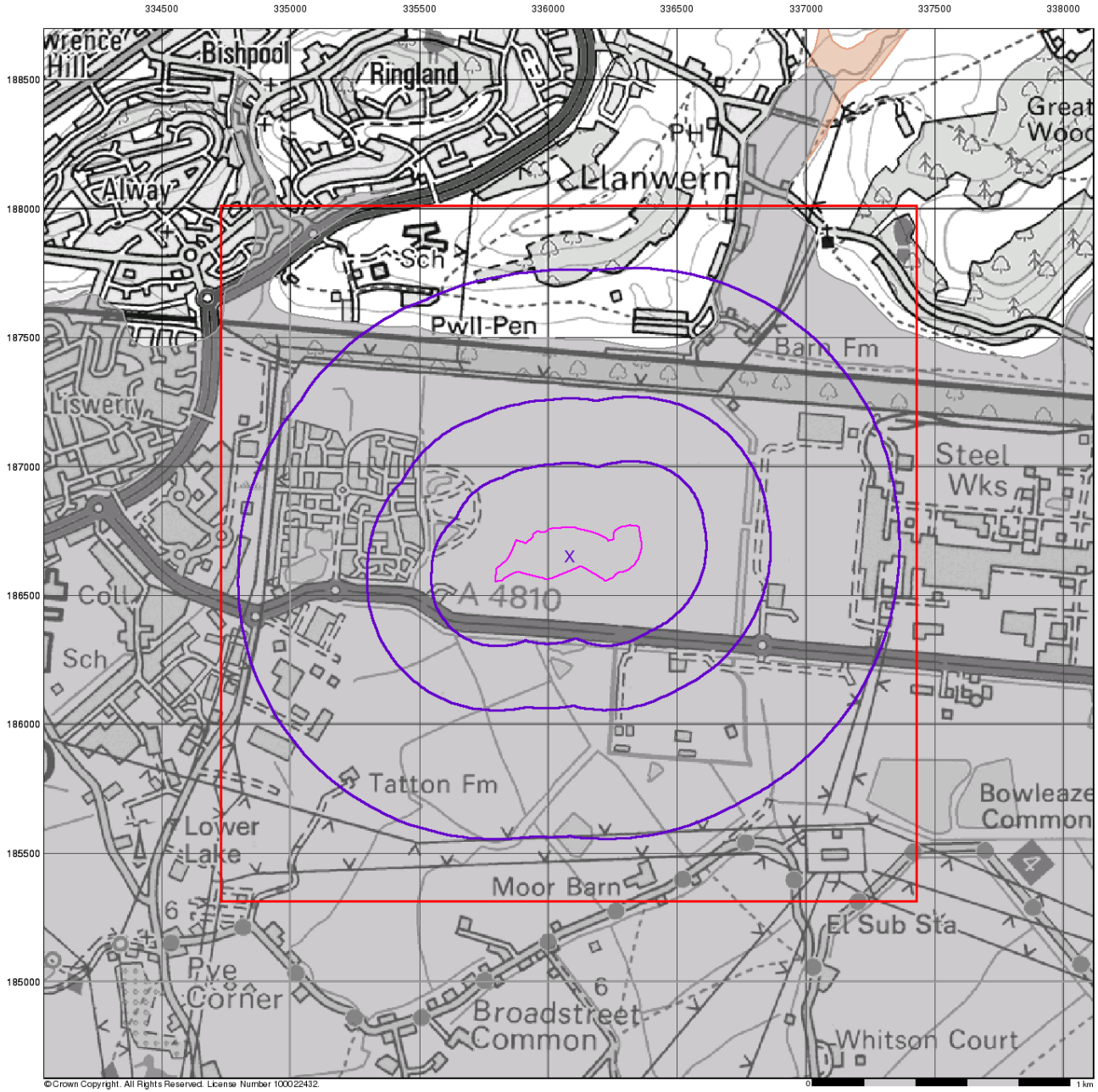
Order Details

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Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

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Superficial Aquifer Designation

General

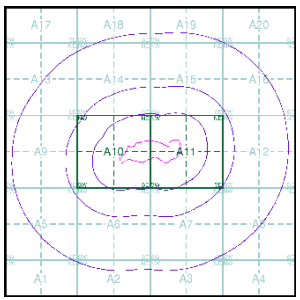
Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



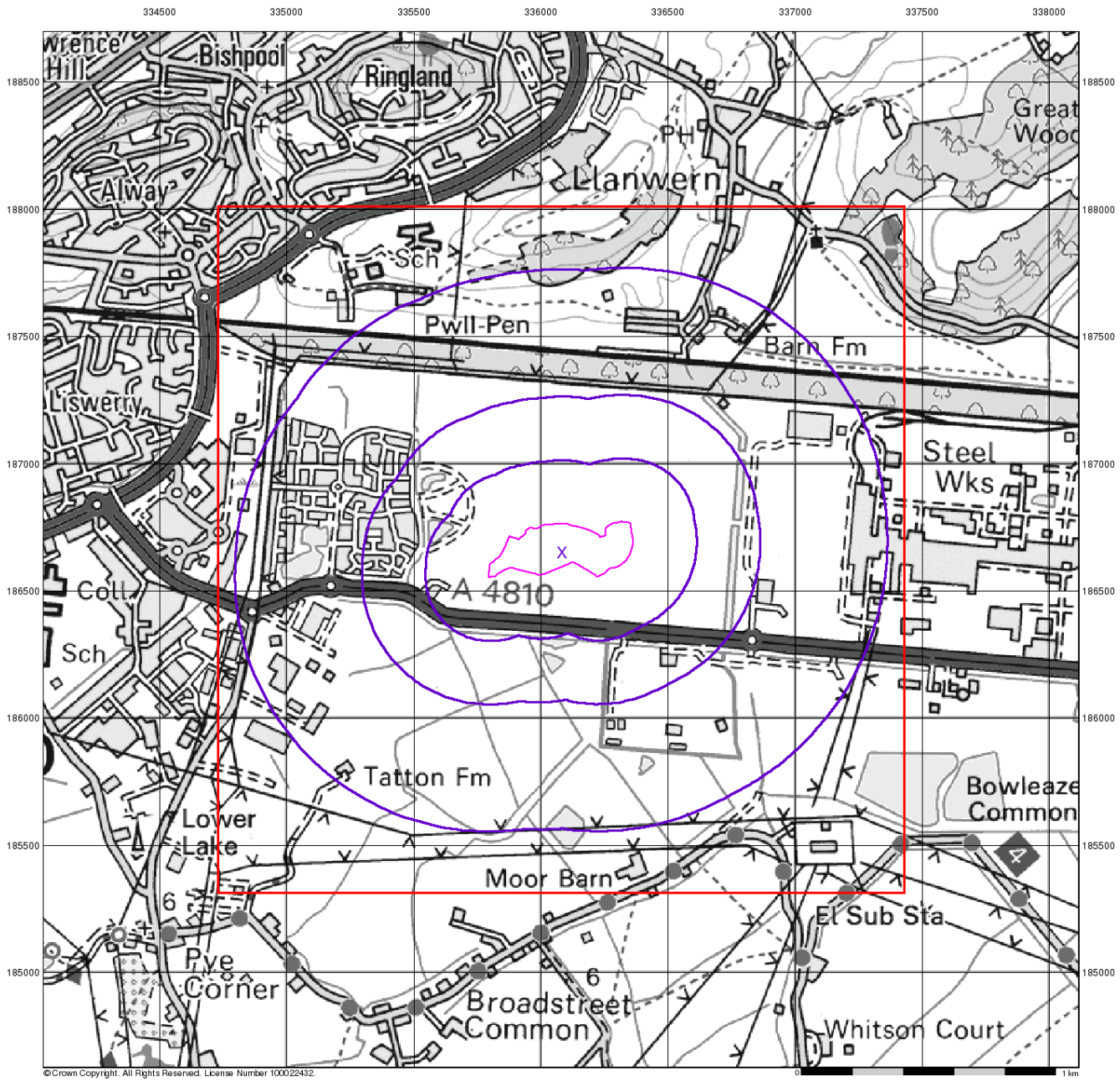
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Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

Site at 336079,186662

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Source Protection Zones

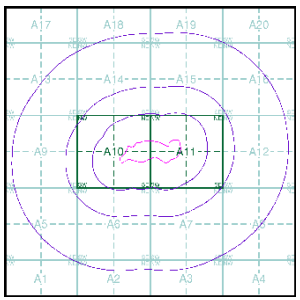
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)

Site Sensitivity Context Map - Slice A



Order Details

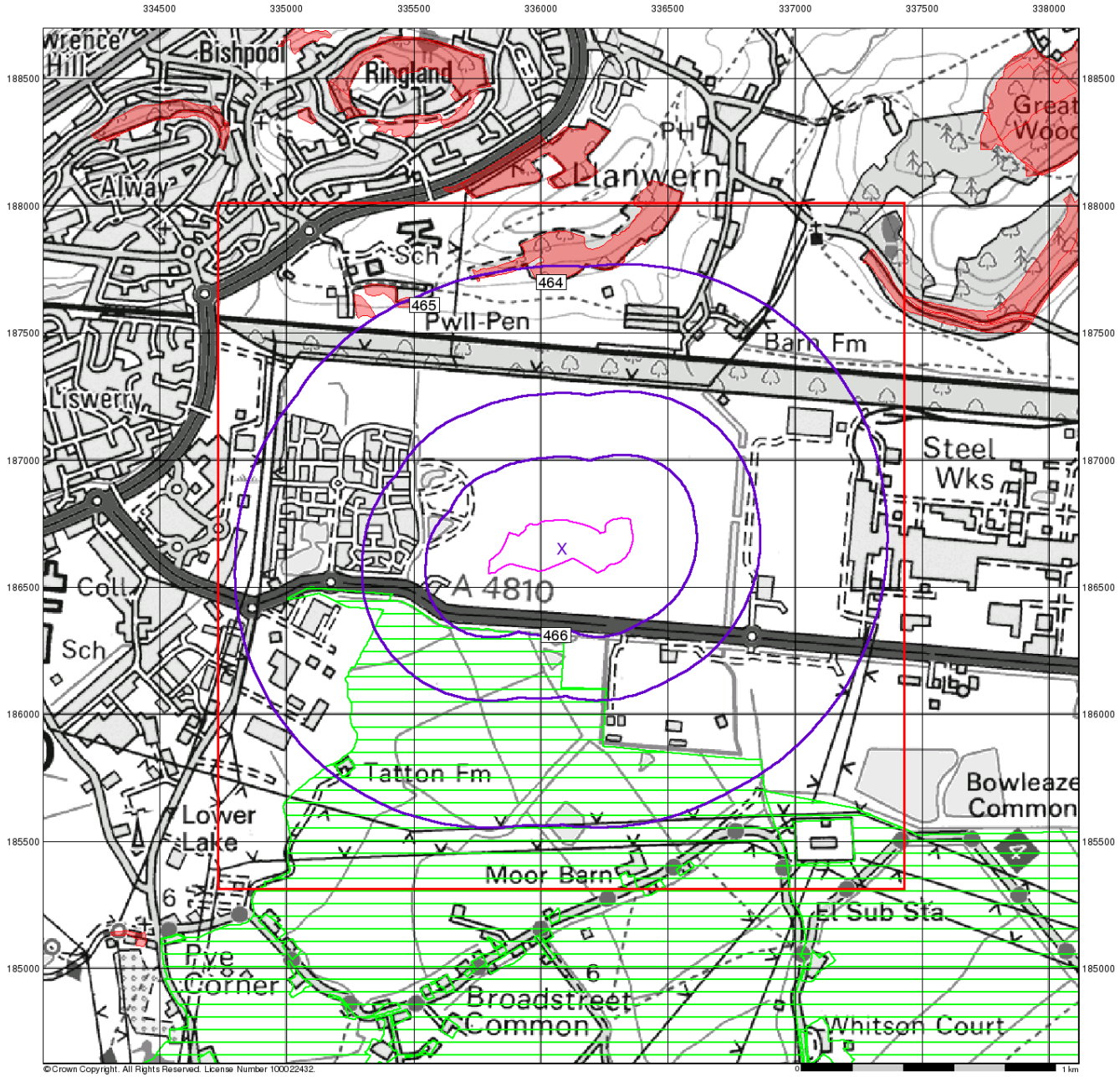
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National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

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Sensitive Land Uses

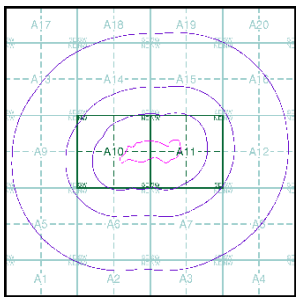
General

Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Sensitive Land Uses

- Ancient Woodland
- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area
- World Heritage Sites

Site Sensitivity Context Map - Slice A



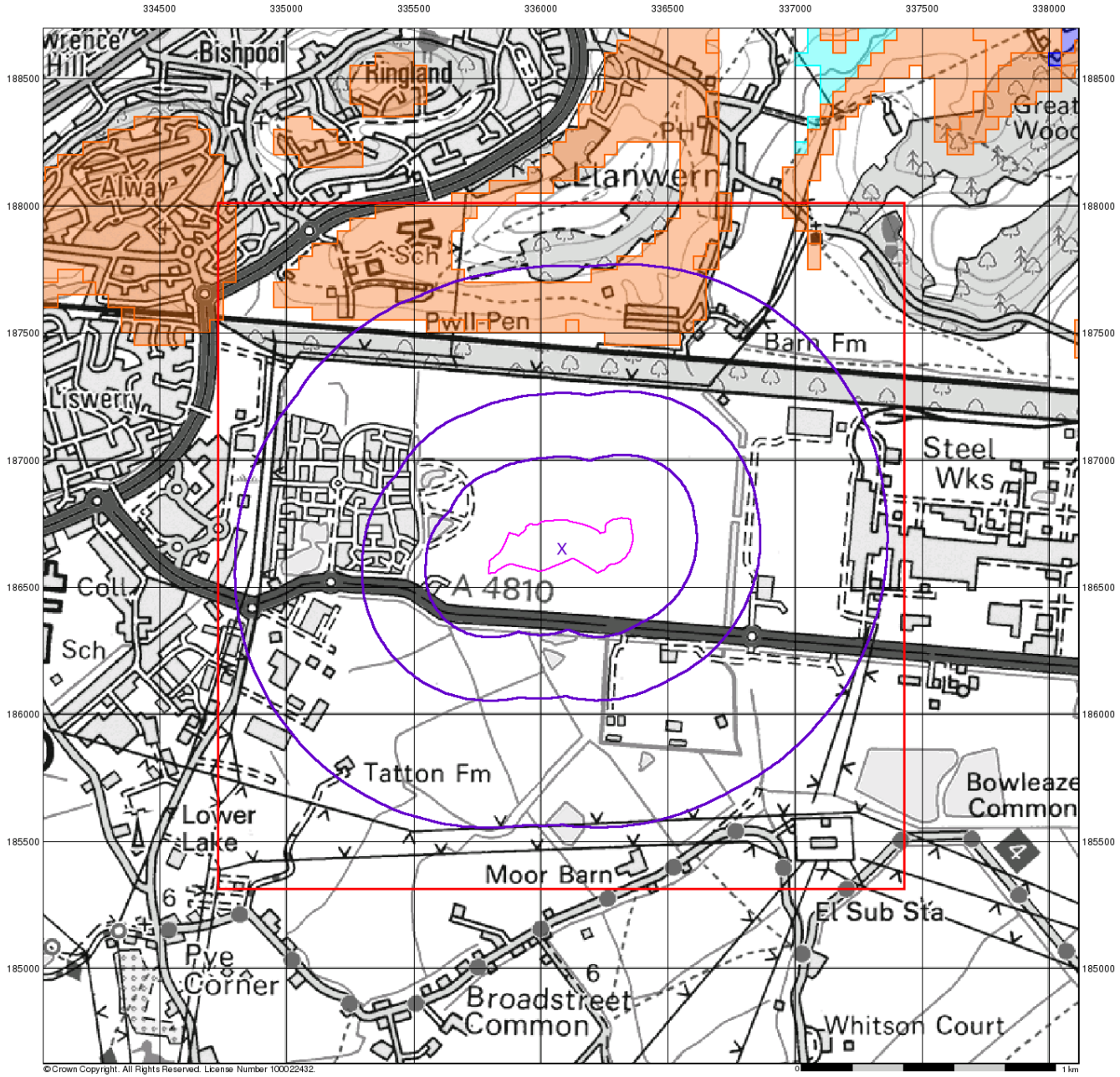
Order Details

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Site Details

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BGS Flood GFS Data

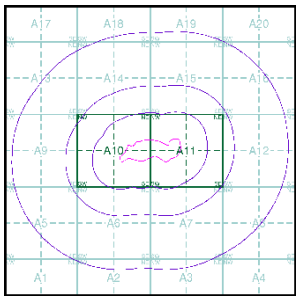
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice

Agency and Hydrological (Flood)

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Site Sensitivity Context Map - Slice A



Order Details

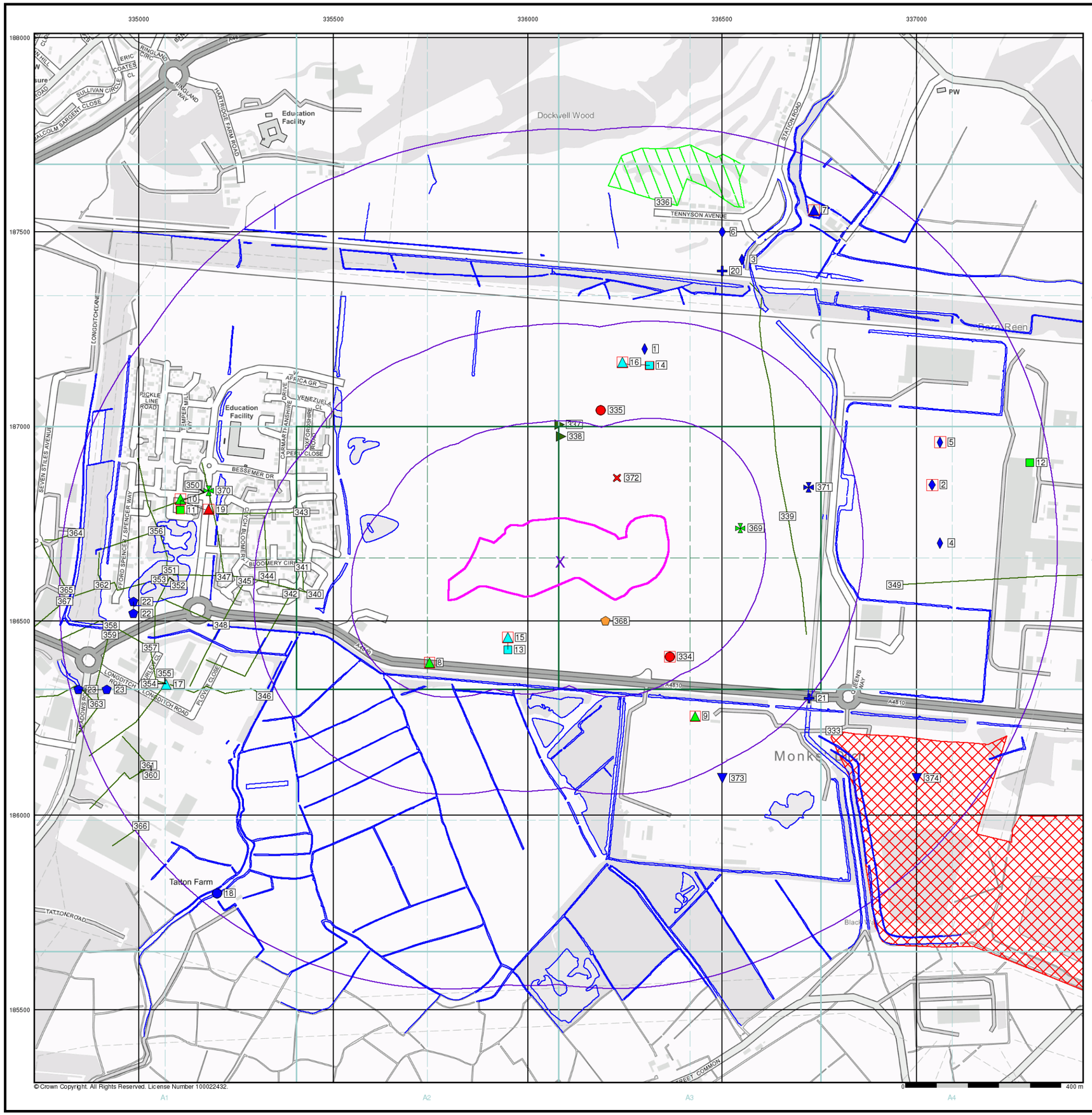
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National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

Site at 336079,186662

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

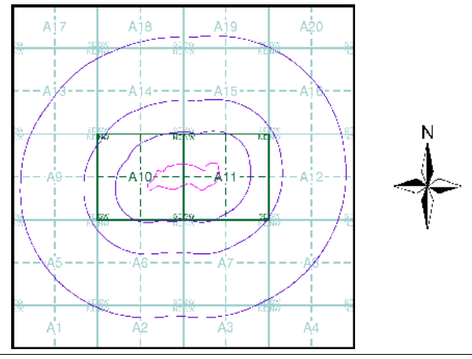
Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Geological

- BGS Recorded Mineral Site

Site Sensitivity Map - Slice A



Order Details

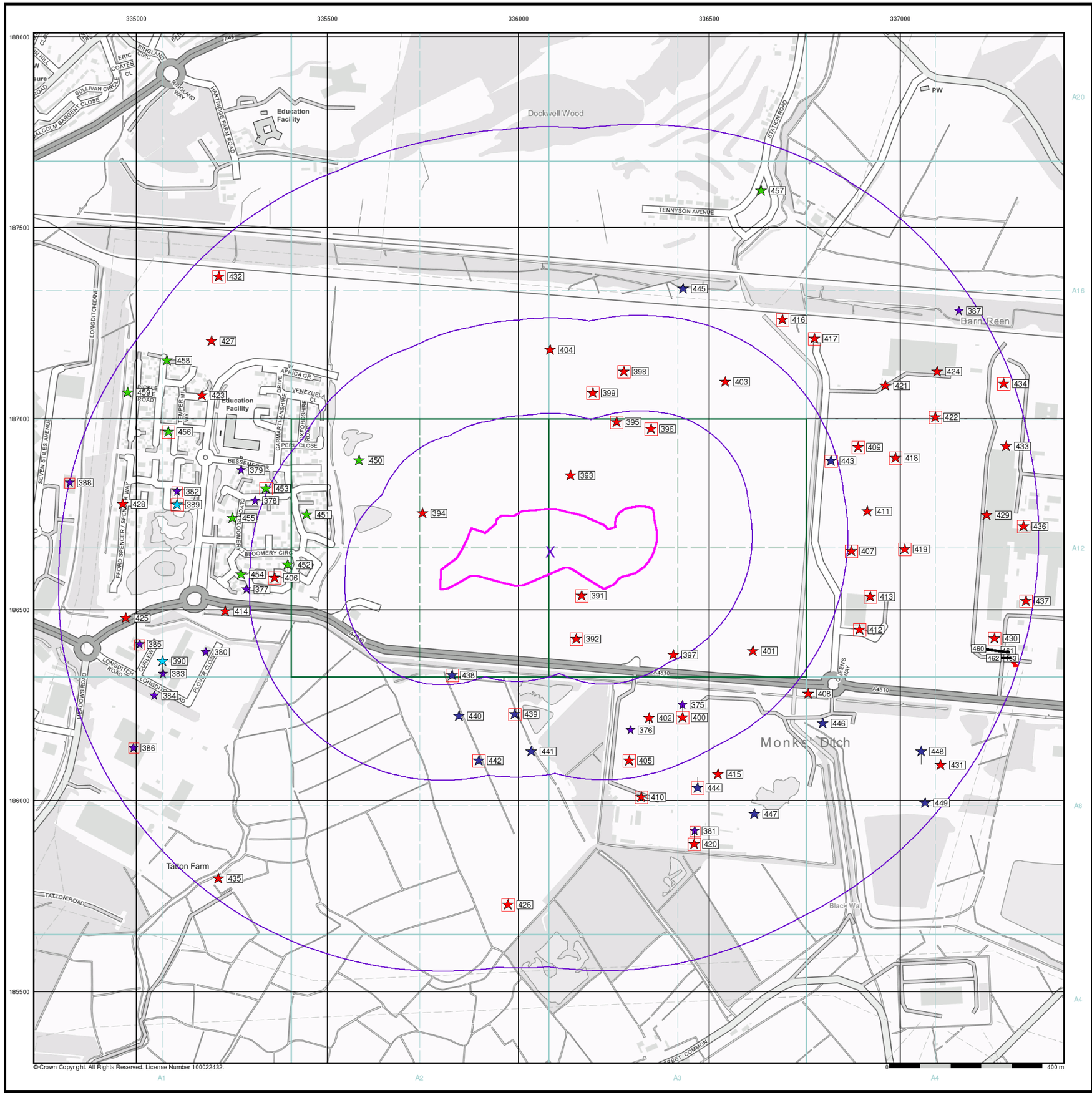
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Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

Site at 336079,186662

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Industrial Land Use Map

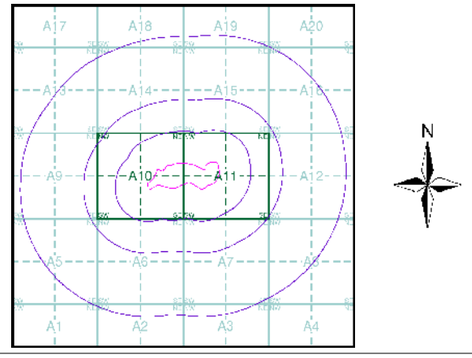
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry
- Gas Pipeline
- Points of Interest - Commercial Services
- Points of Interest - Education and Health
- Points of Interest - Manufacturing and Production
- Points of Interest - Public Infrastructure
- Points of Interest - Recreational and Environmental
- Underground Electrical Cables

Industrial Land Use Map - Slice A



Order Details

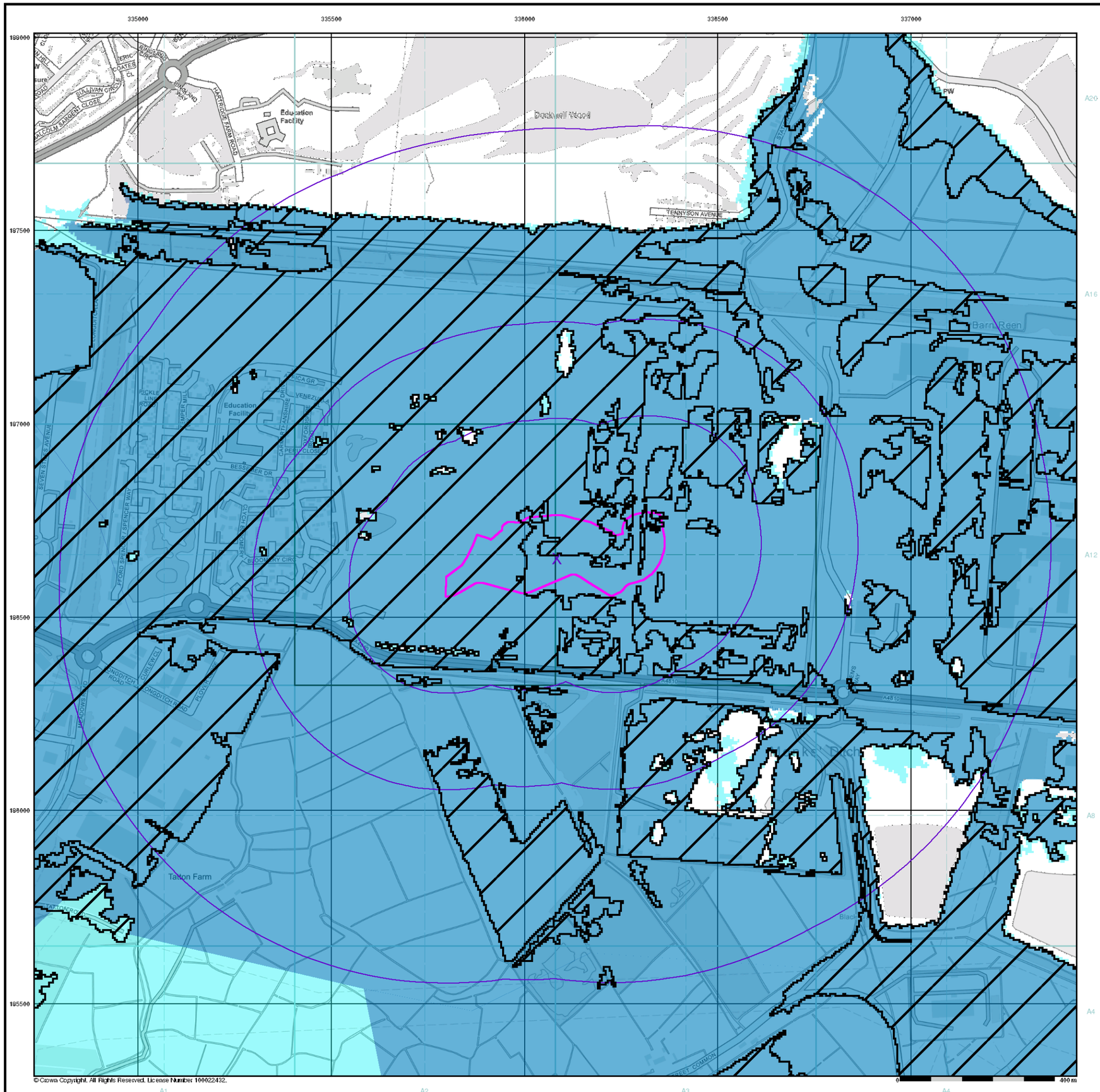
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National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

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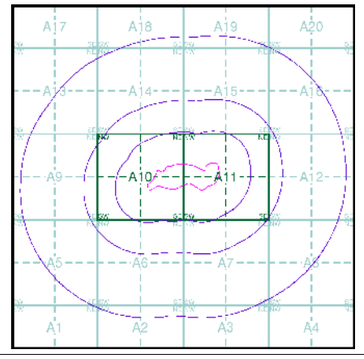
General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



Order Details

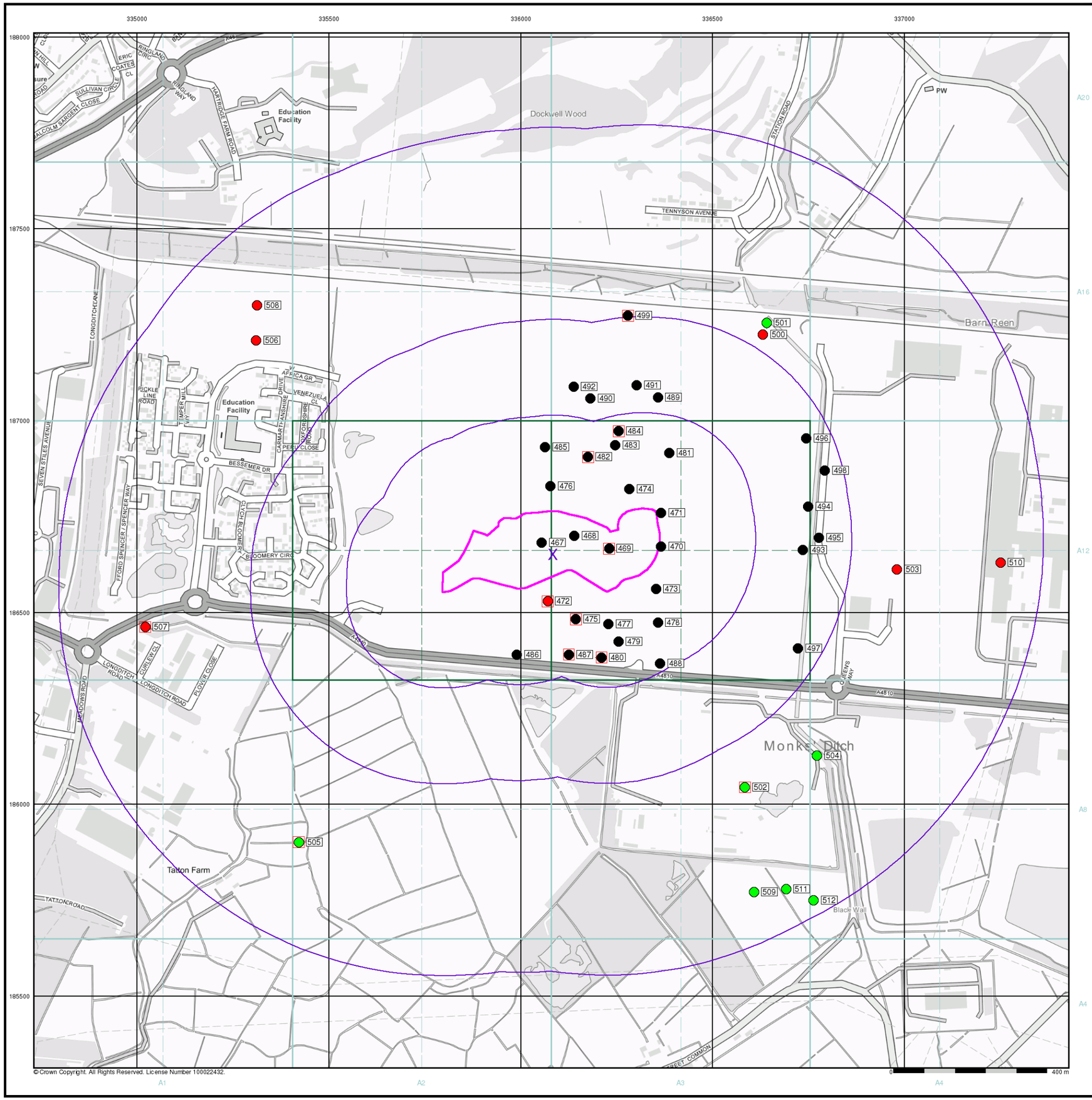
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Slice:	A
Site Area (Ha):	8.34
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Site Details

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

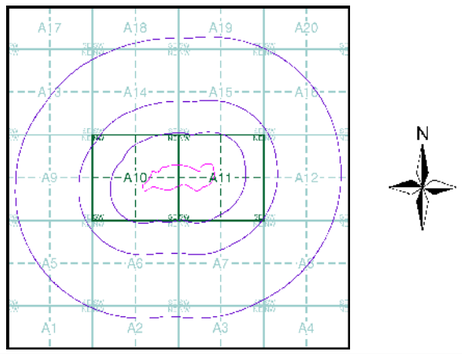
Agency and Hydrological (Boreholes)

- BGS Borehole Depth 0 - 10m
- BGS Borehole Depth 10 - 30m
- BGS Borehole Depth 30m +
- Confidential
- Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

Borehole Map - Slice A



Order Details

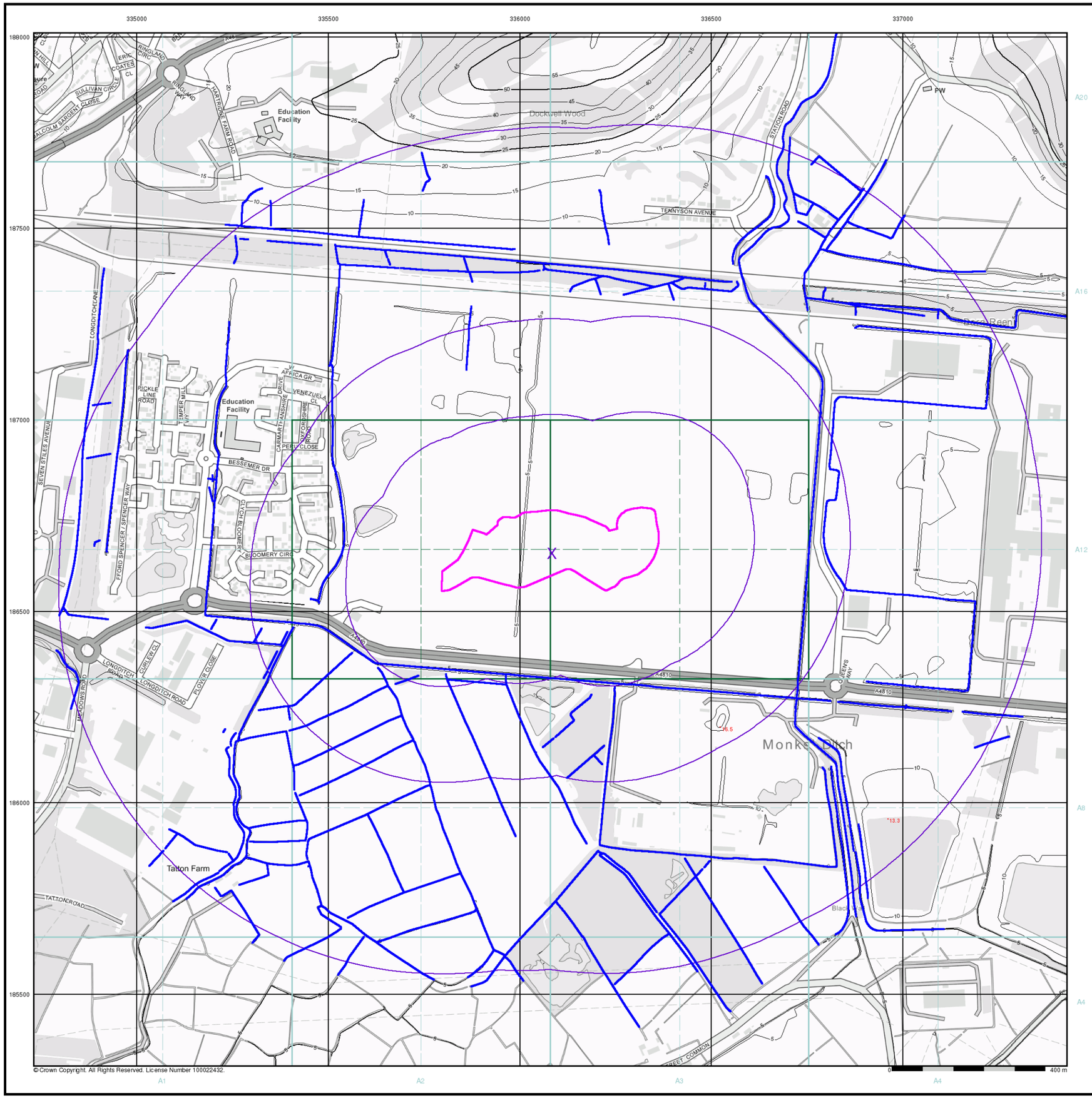
Order Number:	304885831_1_1
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National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

OS Water Network Data

- Canal
- Reservoir
- Foreshore
- Marsh
- Tidal River
- Inland River
- Drain
- Other
- Lake
- Transfer
- Lock Or Flight Of Locks
- Sea

Contours (height in meters)

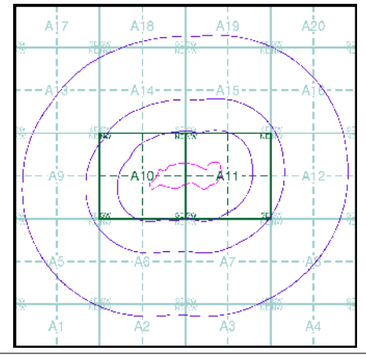
Standard Contour 105 100 95

Master Contour

Spot Height *167.3

- MLW Mean Low Water
- MHW Mean High Water

OS Water Network Map - Slice A



Order Details

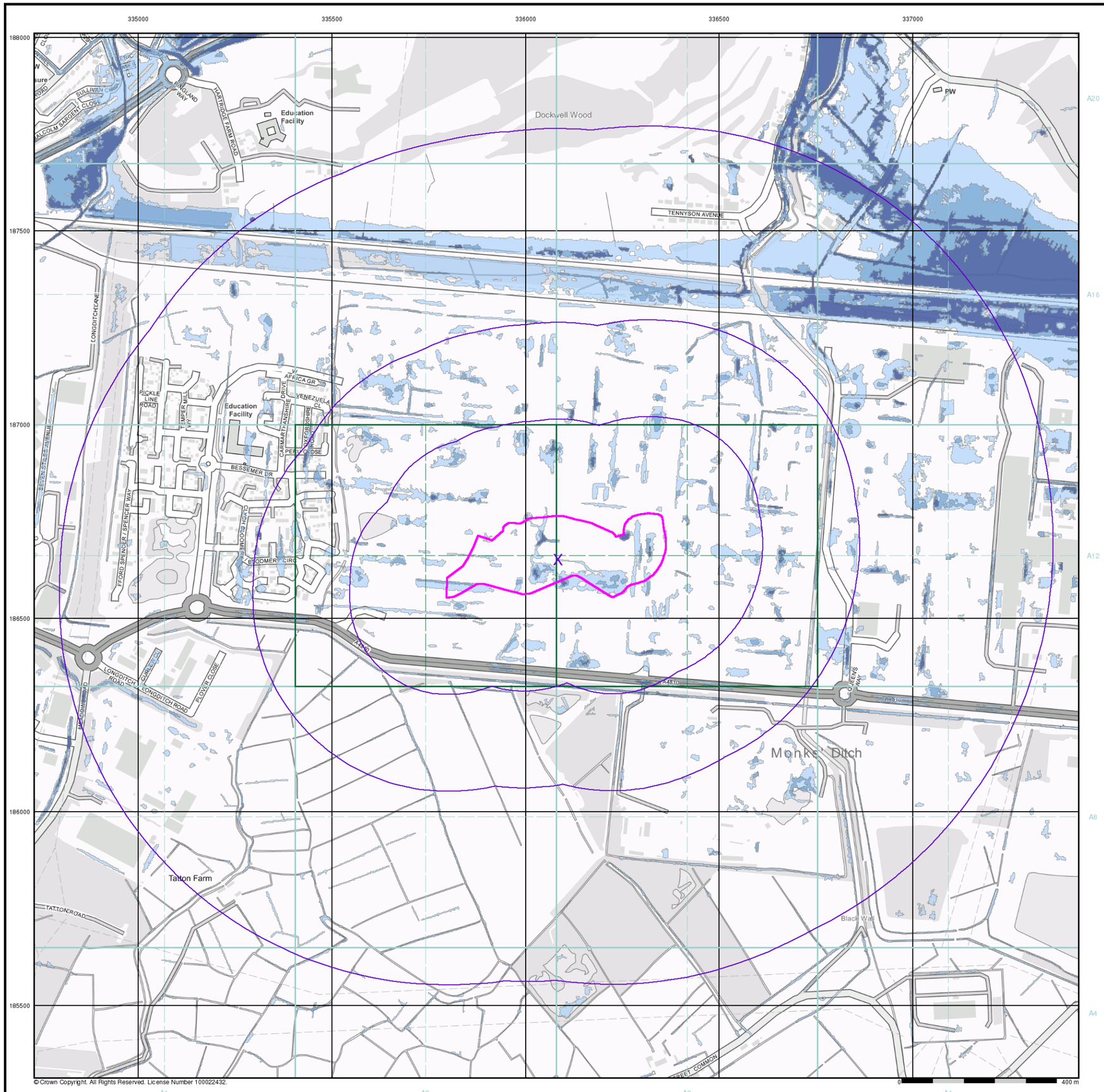
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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

Risk of Flooding from Surface Water

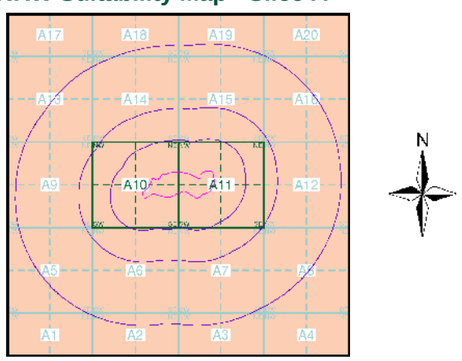
- High - 30 Year Return
- Medium - 100 Year Return
- Low - 1000 Year Return

Suitability

See the suitability map below

- National to county
- County to town
- Town to street
- Street to parcels of land
- Property

EA/NRW Suitability Map - Slice A



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

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Envirocheck® Report:

Datasheet

Order Details:

Order Number:
304885831_1_1

Customer Reference:
Llanwern 4c 4g 4e

National Grid Reference:
336080, 186650

Slice:
A

Site Area (Ha):
8.34

Search Buffer (m):
1000

Site Details:

Site at 336079,186662

Client Details:

Mr R Taylor
Rodgers Leask Ltd
Rodgers Leask Ltd
Seven House
18 High Street
Longbridge
Birmingham
B31 2UQ

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Contents

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	54
Hazardous Substances	57
Geological	58
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Data Suppliers	82
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Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination.
For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client.
In this datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility					n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 1			1	12
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices	pg 4				2
Integrated Pollution Controls	pg 4		2	4	28
Integrated Pollution Prevention And Control	pg 9				5
Local Authority Integrated Pollution Prevention And Control	pg 10		1	2	
Local Authority Pollution Prevention and Controls	pg 11		2	4	1
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 11		Yes		
Pollution Incidents to Controlled Waters	pg 12				1
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances	pg 12				2
River Quality	pg 12		1		1
River Quality Biology Sampling Points	pg 13				1
River Quality Chemistry Sampling Points	pg 14				1
Substantiated Pollution Incident Register	pg 14				2
Water Abstractions					
Water Industry Act Referrals					
Groundwater Vulnerability Map	pg 15	Yes	n/a	n/a	n/a
Bedrock Aquifer Designations	pg 15	Yes	n/a	n/a	n/a
Superficial Aquifer Designations	pg 15	Yes	n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences	pg 15	Yes	Yes	n/a	n/a
Flooding from Rivers or Sea without Defences	pg 17	Yes	Yes	n/a	n/a
Areas Benefiting from Flood Defences	pg 18	Yes	Yes	n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
OS Water Network Lines	pg 19		10	46	253

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Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites					
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)	pg 54				1
Licensed Waste Management Facilities (Locations)	pg 54		2	1	
Local Authority Landfill Coverage	pg 54	1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Potentially Infilled Land (Non-Water)	pg 54				1
Potentially Infilled Land (Water)	pg 54		2	6	23
Registered Landfill Sites					
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites	pg 56		1		
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)	pg 57		1		1
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)	pg 57			1	
Planning Hazardous Substance Consents	pg 57		1		
Planning Hazardous Substance Enforcements					

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Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Geological					
BGS 1:625,000 Solid Geology	pg 58	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry	pg 58	Yes		Yes	Yes
BGS Recorded Mineral Sites	pg 59				2
BGS Urban Soil Chemistry					
BGS Urban Soil Chemistry Averages					
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas			n/a	n/a	n/a
Mining Instability			n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities					
Non Coal Mining Areas of Great Britain				n/a	n/a
Potential for Collapsible Ground Stability Hazards				n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 59	Yes		n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 59	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 59	Yes		n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 59	Yes		n/a	n/a
Radon Potential - Radon Affected Areas			n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a
Industrial Land Use					
Contemporary Trade Directory Entries	pg 60			2	17
Fuel Station Entries					
Points of Interest - Commercial Services	pg 61				3
Points of Interest - Education and Health					
Points of Interest - Manufacturing and Production	pg 62		25	29	59
Points of Interest - Public Infrastructure	pg 71		4	8	7
Points of Interest - Recreational and Environmental	pg 73			4	8
Gas Pipelines					
Underground Electrical Cables	pg 74				4

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Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Use					
Ancient Woodland	pg 75				2
Areas of Adopted Green Belt					
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones					
Ramsar Sites					
Sites of Special Scientific Interest	pg 75		1		
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: British Steel Corporation Property Type: Undefined Or Other Location: Llanwern - Steelworks Blast Furnace, Blast Furnaces Lagoon Authority: Natural Resources Wales Catchment Area: Llanwern Outfall Reference: Ac0099001 Permit Version: 1 Effective Date: 20th August 1975 Issued Date: 20th August 1975 Revocation Date: 7th March 1986 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Stream Number 4 **Status: Consent expired** Positional Accuracy: Located by supplier to within 100m	A15SW (N)	430	2	336300 187200
2	**Discharge Consents** Operator: British Steel Corporation Property Type: Undefined Or Other Location: Llanwern Steelworks-Filter Uni Authority: Natural Resources Wales Catchment Area: Llanwern Outfall Reference: Ab0034302 Permit Version: 1 Effective Date: 15th February 1963 Issued Date: 15th February 1963 Revocation Date: 6th March 1986 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Stream Number 5 **Status: Consent expired** Positional Accuracy: Located by supplier to within 10m	A12NW (E)	693	2	337040 186850
2	**Discharge Consents** Operator: British Steel Corporation Property Type: Undefined Or Other Location: Llanwern Steelworks-Filter Uni Authority: Natural Resources Wales Catchment Area: Llanwern Outfall Reference: Ab0034303 Permit Version: 1 Effective Date: 15th February 1963 Issued Date: 15th February 1963 Revocation Date: 6th March 1986 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Stream Number 5 **Status: Consent expired** Positional Accuracy: Located by supplier to within 10m	A12NW (E)	693	2	337040 186850
2	**Discharge Consents** Operator: British Steel Corporation Property Type: Undefined Or Other Location: Llanwern Steelworks-Filter Uni Authority: Natural Resources Wales Catchment Area: Llanwern Outfall Reference: Ab0034304 Permit Version: 1 Effective Date: 15th February 1963 Issued Date: 15th February 1963 Revocation Date: 6th March 1986 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Stream Number 5 **Status: Consent expired** Positional Accuracy: Located by supplier to within 10m	A12NW (E)	693	2	337040 186850

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
2	**Discharge Consents** Operator: British Steel Corporation Property Type: Undefined Or Other Location: Llanwern Steelworks-Filter Uni Authority: Natural Resources Wales Catchment Area: Llanwern Outfall Reference: Ab0034305 Permit Version: 1 Effective Date: 15th February 1963 Issued Date: 15th February 1963 Revocation Date: 6th March 1986 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Stream Number 5 **Status: Consent expired** Positional Accuracy: Located by supplier to within 10m	A12NW (E)	693	2	337040 186850
2	**Discharge Consents** Operator: British Steel Corporation Property Type: Undefined Or Other Location: Llanwern Steelworks-Filter Uni Authority: Natural Resources Wales Catchment Area: Llanwern Outfall Reference: Ab0034306 Permit Version: 1 Effective Date: 15th February 1963 Issued Date: 15th February 1963 Revocation Date: 6th March 1986 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Stream Number 5 **Status: Consent expired** Positional Accuracy: Located by supplier to within 10m	A12NW (E)	693	2	337040 186850
2	**Discharge Consents** Operator: British Steel Corporation Property Type: Undefined Or Other Location: Llanwern Steelworks-Filter Uni Authority: Natural Resources Wales Catchment Area: Llanwern Outfall Reference: Ab0034307 Permit Version: 1 Effective Date: 15th February 1963 Issued Date: 15th February 1963 Revocation Date: 6th March 1986 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Stream Numbwer 5 **Status: Consent expired** Positional Accuracy: Located by supplier to within 10m	A12NW (E)	693	2	337040 186850
3	**Discharge Consents** Operator: Llanwern Community Council Property Type: Undefined Or Other Location: Tennyson Avenue, Llanwern, Newport Authority: Natural Resources Wales Catchment Area: Monks Ditch Reference: An0218901 Permit Version: 2 Effective Date: 10th September 1990 Issued Date: 10th September 1990 Revocation Date: 20th November 1992 Discharge Type: Unspecified Discharge Environment: Freshwater Stream/River Receiving Water: Monksditch **Status: Consent expired** Positional Accuracy: Located by supplier to within 10m	A15NE (NE)	694	2	336550 187430

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
4	**Discharge Consents** Operator: British Steel Corporation Property Type: Undefined Or Other Location: Llanwern Steelworks - Power Pl Authority: Natural Resources Wales Catchment Area: Llanwern Outfall Reference: Ac0098801 Permit Version: 1 Effective Date: 11th July 1975 Issued Date: 11th July 1975 Revocation Date: 7th March 1986 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Stream Number 5 **Status: Consent expired** Positional Accuracy: Located by supplier to within 10m	A12NW (E)	698	2	337060 186700
5	**Discharge Consents** Operator: British Steel Corporation Property Type: Undefined Or Other Location: Llanwern Steelworks-Hood & Lan Authority: Natural Resources Wales Catchment Area: Llanwern Outfall Reference: Ab0034301 Permit Version: 1 Effective Date: 15th February 1963 Issued Date: 15th February 1963 Revocation Date: 6th March 1986 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Stream Number 5 **Status: Consent expired** Positional Accuracy: Located by supplier to within 10m	A12NW (E)	735	2	337060 186960
5	**Discharge Consents** Operator: British Steel Corporation Property Type: Undefined Or Other Location: Llanwern Steelworks-Hood & Lan Authority: Natural Resources Wales Catchment Area: Llanwern Outfall Reference: Ab0034308 Permit Version: 1 Effective Date: 15th February 1963 Issued Date: 15th February 1963 Revocation Date: 6th March 1986 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Stream Number 5 **Status: Consent expired** Positional Accuracy: Located by supplier to within 10m	A12NW (E)	735	2	337060 186960
5	**Discharge Consents** Operator: British Steel Corporation Property Type: Undefined Or Other Location: Llanwern Steelworks-Hood & Lan Authority: Natural Resources Wales Catchment Area: Llanwern Outfall Reference: Ab0034310 Permit Version: 1 Effective Date: 15th February 1963 Issued Date: 15th February 1963 Revocation Date: 6th March 1986 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Stream Number 5 **Status: Consent expired** Positional Accuracy: Located by supplier to within 10m	A12NW (E)	735	2	337060 186960

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
6	**Discharge Consents** Operator: Llanwern Community Council Property Type: Undefined Or Other Location: Tennyson Avenue, Llanwern, Newport Authority: Natural Resources Wales Catchment Area: Monks Ditch Reference: An0218901 Permit Version: 1 Effective Date: 1st January 1901 Issued Date: 1st January 1901 Revocation Date: 9th September 1990 Discharge Type: Unspecified Discharge Environment: Freshwater Stream/River Receiving Water: Monksditch **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 100m	A15NE (NE)	749	2	336500 187500
7	**Enforcement and Prohibition Notices** Location: Barn Farm, Station Road, Llanwern, NEWPORT, Gwent, NP6 2DW Permit Reference: SM85/99KC Enforcement Date: 19th March 1999 Details: EA News Release 19/03/1999, Consistent unauthorised waste activities following repeated warnings. Positional Accuracy: Manually positioned to the address or location	A15NE (NE)	877	3	336736 187552
7	**Enforcement and Prohibition Notices** Location: Barn Farm, Station Road, Llanwern, NEWPORT, Gwent, NP6 2DW Permit Reference: SM85/99KC Enforcement Date: 19th March 1999 Details: EA Data 23/03/1999, Illegal tipping of controlled waste at farm premises, following long-standing complaints of unauthorised waste activities & flouting of repeated warnings from EA. First time Env. Act 1995 s37(1a) implemented for this purpose. Positional Accuracy: Manually positioned to the address or location	A15NE (NE)	892	3	336733 187570
8	**Integrated Pollution Controls** Name: Bitmac Ltd Location: Llanwern Works, Queensway, NEWPORT, Gwent, NP19 4QX Authority: Environment Agency, Welsh Region Permit Reference: BG7746 Dated: 4th August 1999 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.2 A (B) Carbonisation and associated processes within the Fuel & Power Industry **Status: Application has met the requirements for authorisation (but not yet authorised)** Positional Accuracy: Manually positioned to the road within the address or location	A10SE (SW)	172	3	335747 186389
8	**Integrated Pollution Controls** Name: Bitmac Ltd Location: Llanwern Works, Queensway, NEWPORT, Gwent, NP9 0QX Authority: Environment Agency, Welsh Region Permit Reference: BC3854 Dated: 5th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.2 A (A) Carbonisation and associated processes within the Fuel & Power Industry **Status: Application has met the requirements for authorisation (but not yet authorised)** Positional Accuracy: Manually positioned to the road within the address or location	A10SE (SW)	176	3	335752 186384
9	**Integrated Pollution Controls** Name: Cambrian Stone Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QX Authority: Environment Agency, Welsh Region Permit Reference: BG4437 Dated: 12th October 1999 Process Type: IPC major (substantial) variation Description: 2.1 A (L) Iron and Steel processes within the Metal Industry **Status: Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A7NE (SE)	364	3	336430 186251
9	**Integrated Pollution Controls** Name: Cambrian Stone Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QX Authority: Environment Agency, Welsh Region Permit Reference: BD7006 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 2.1 A (L) Iron and Steel processes within the Metal Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A7NE (SE)	364	3	336430 186251

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
9	**Integrated Pollution Controls** Name: Cambrian Stone Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QX Authority: Environment Agency, Welsh Region Permit Reference: AW7487 Dated: 23rd October 1996 Process Type: IPC minor (non-substantial) variation to previous variation Description: 2.1 A (L) Iron and Steel processes within the Metal Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A7NE (SE)	364	3	336430 186251
9	**Integrated Pollution Controls** Name: Cambrian Stone Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QX Authority: Environment Agency, Welsh Region Permit Reference: AD1925 Dated: 25th June 1992 Process Type: IPC new application Description: 2.1 A (L) Iron and Steel processes within the Metal Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A7NE (SE)	364	3	336430 186251
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: BH7920 Dated: 28th January 2000 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.3 A (A) Combustion processes within the Fuel & Power Industry **Status: Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: BH8047 Dated: 28th January 2000 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.2 A (A) Carbonisation and associated processes within the Fuel & Power Industry **Status: Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: BH2685 Dated: 22nd November 1999 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.2 A (A) Carbonisation and associated processes within the Fuel & Power Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Koppers Uk Ltd Location: Llanwern Works,Queensway, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: BF2358 Dated: 28th June 1999 Process Type: IPC major (substantial) variation Description: 1.2 A (B) Carbonisation and associated processes within the Fuel & Power Industry **Status: Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Multiserv (Asr) Ltd Location: Integrated Works - Llanwern, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: BF2714 Dated: 12th April 1999 Process Type: IPC minor (non-substantial) variation to previous variation Description: 2.1 A Iron and Steel processes within the Metal Industry **Status: Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: BF1831 Dated: 29th January 1999 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.2 A (A) Carbonisation and associated processes within the Fuel & Power Industry **Status:** **Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: BF1858 Dated: 29th January 1999 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.3 A (A) Combustion processes within the Fuel & Power Industry **Status:** **Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Multiserv (Asr) Ltd Location: Integrated Works - Llanwern, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: BD9726 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 2.1 A Iron and Steel processes within the Metal Industry **Status:** **Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: BE1950 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.2 A (A) Carbonisation and associated processes within the Fuel & Power Industry **Status:** **Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Koppers Uk Ltd Location: Llanwern Works,Queensway, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: BC6284 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.2 A (B) Carbonisation and associated processes within the Fuel & Power Industry **Status:** **Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: BE0864 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.3 A (A) Combustion processes within the Fuel & Power Industry **Status:** **Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: BA1079 Dated: 19th January 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.2 A (A) Carbonisation and associated processes within the Fuel & Power Industry **Status:** **Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
10	**Integrated Pollution Controls** Name: Multiserv (Asr) Ltd Location: Integrated Works - Llanwern, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: AY8271 Dated: 22nd October 1997 Process Type: IPC new application Description: 2.1 A Iron and Steel processes within the Metal Industry **Status:** **Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: AZ5561 Dated: 9th October 1997 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.3 A (A) Combustion processes within the Fuel & Power Industry **Status:** **Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: AU1941 Dated: 1st October 1997 Process Type: IPC staged application Description: 1.2 A (A) Carbonisation and associated processes within the Fuel & Power Industry **Status:** **Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: AW9986 Dated: 30th October 1996 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.2 A (A) Carbonisation and associated processes within the Fuel & Power Industry **Status:** **Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: AU8512 Dated: 5th June 1996 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.2 A (A) Carbonisation and associated processes within the Fuel & Power Industry **Status:** **Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Multiserv Group Ltd Location: Llanwern Works,Queensway, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: AQ9898 Dated: 30th July 1995 Process Type: IPC application for process that was regulated by HMIP for air releases under previous legislation Description: 2.1 A (L) Iron and Steel processes within the Metal Industry **Status:** **Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Multiserv Group Ltd Location: Llanwern Works,Queensway, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: AQ9928 Dated: 30th July 1995 Process Type: IPC application for process that was regulated by HMIP for air releases under previous legislation Description: 2.1 A Iron and Steel processes within the Metal Industry **Status:** **Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: AQ0726 Dated: 7th June 1995 Process Type: IPC application for process that was regulated by HMIP for air releases under previous legislation Description: 2.1 A (H) Iron and Steel processes within the Metal Industry **Status: Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Koppers Uk Ltd Location: Llanwern Works,Queensway, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: AK0677 Dated: 26th November 1993 Process Type: IPC major (substantial) variation Description: 1.2 A (A) Carbonisation and associated processes within the Fuel & Power Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: AF8475 Dated: 25th August 1993 Process Type: IPC application for process that was regulated by HMIP for air releases under previous legislation Description: 1.2 A (A) Carbonisation and associated processes within the Fuel & Power Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Koppers Uk Ltd Location: Llanwern Works,Queensway, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: AF8491 Dated: 29th June 1993 Process Type: IPC application for process that was regulated by HMIP for air releases under previous legislation Description: 1.2 A (A) Carbonisation and associated processes within the Fuel & Power Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: AF8467 Dated: 2nd May 1993 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.3 A (A) Combustion processes within the Fuel & Power Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: AF8459 Dated: 1st May 1993 Process Type: IPC minor (non-substantial) variation to previous variation Description: 1.3 A (A) Combustion processes within the Fuel & Power Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: AG6214 Dated: 15th March 1993 Process Type: IPC major (substantial) variation Description: 2.1 A (H) Iron and Steel processes within the Metal Industry **Status: Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: AB3285 Dated: 27th March 1992 Process Type: IPC application for process that was regulated by HMIP for air releases under previous legislation Description: 2.1 A (H) Iron and Steel processes within the Metal Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
10	**Integrated Pollution Controls** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Environment Agency, Welsh Region Permit Reference: AA2631 Dated: 30th November 1991 Process Type: IPC application for process that was regulated by HMIP for air releases under previous legislation Description: 1.3 A (A) Combustion processes within the Fuel & Power Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	3	335106 186809
11	**Integrated Pollution Prevention And Control** Name: Queensway Non-Haz Landfill Epr/Gp3331sv Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Natural Resources Wales Permit Reference: GP3331SV Original Permit Ref: Fp3637nm Effective Date: 12th August 2013 **Status: Effective** Application Type: Bespoke App. Sub Type: Not Supplied Positional Accuracy: Automatically positioned to the address Activity Code: 5.2 A(1) (A) Activity Description: Not Supplied Primary Activity: Y	A9NE (W)	722	2	335106 186809
11	**Integrated Pollution Prevention And Control** Name: Tata Steel Uk Limited Location: Llanwern Works East, Llanwern Works, Newport, Gwent, NP19 4QZ Authority: Natural Resources Wales Permit Reference: Bv9969is Original Permit Ref: Bv9969is Effective Date: Not Supplied **Status: Application refused** Application Type: Application App. Sub Type: New Positional Accuracy: Automatically positioned to the address Activity Code: 5.2 A(1) (A) Activity Description: Waste Landfilling; Greater Than 10 T/D With Capacity Greater Than 25,000T Excluding Inert Waste Primary Activity: Y	A9NE (W)	722	2	335106 186809
11	**Integrated Pollution Prevention And Control** Name: Tata Steel Uk Limited Location: Llanwern Steelworks Nrw/Epr/Bs3905ip/V004, Tata Steel Strip Products Uk, Llanwern Works,,, Newport, South Wales, NP19 4QZ Authority: Natural Resources Wales Permit Reference: TP3931ZP Original Permit Ref: Bs3905ip Effective Date: 13th May 2013 **Status: Effective** Application Type: Variation App. Sub Type: Simple Standard Variation Positional Accuracy: Located by supplier to within 100m Activity Code: 2.1 A(2) (C) Activity Description: Ferrous Metals; Applying Protective Fused Metal Coatings to Greater Than 2 tonnes/hour of Steel Primary Activity: N Activity Code: 1.1 A(1) (A) Activity Description: Combustion; Any Fuel Greater Or Equal To 50Mw Primary Activity: N Activity Code: 2.3 A(1) (A) Activity Description: Surface Treating Metals And Plastics; Electrolytic/Chemical Greater Than 30 Cubic Metres Primary Activity: N Activity Code: 2.1 A(1) (C) Activity Description: Ferrous Metals; Hot Rolling Greater Than 20T/Hr Primary Activity: Y	A9NE (W)	725	2	335100 186800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
11	**Integrated Pollution Prevention And Control** Name: Tata Steel Uk Limited Location: Llanwern Steelworks Ea/Epr/Bs3905ip/V002, Corus Strip Products, Llanwern Works,,, Newport, South Wales, NP19 4QZ Authority: Natural Resources Wales Permit Reference: DP3838GB Original Permit Ref: Bs3905ip Effective Date: 26th October 2009 **Status: Superseded By Variation** Application Type: Variation App. Sub Type: Standard Positional Accuracy: Located by supplier to within 100m Activity Code: 2.1 A(1) (C) Activity Description: Ferrous Metals; Hot Rolling Greater Than 20T/Hr Primary Activity: Y Activity Code: 1.1 A(1) (A) Activity Description: Combustion; Any Fuel Greater Or Equal To 50Mw Primary Activity: N Activity Code: 2.1 A(2) (C) Activity Description: Ferrous Metals; Applying Protective Fused Metal Coatings to Greater Than 2 tonnes/hour of Steel Primary Activity: N Activity Code: 2.3 A(1) (A) Activity Description: Surface Treating Metals And Plastics; Electrolytic/Chemical Greater Than 30 Cubic Metres Primary Activity: N	A9NE (W)	725	2	335100 186800
12	**Integrated Pollution Prevention And Control** Name: Llanwern Steelworks Epr/Bs3905ip Location: Corus Strip Products, Llanwern Steelworks, Newport, Gwent, NP19 4QZ Authority: Natural Resources Wales Permit Reference: Bs3905ip Original Permit Ref: Tp3931zp Effective Date: 13th May 2013 **Status: Effective** Application Type: Bespoke App. Sub Type: Not Supplied Positional Accuracy: Manually positioned to the address or location Activity Code: 2.1 PART A (1) C) Activity Description: Not Supplied Primary Activity: Y Activity Code: 2.1 PART A (2) C) Activity Description: Not Supplied Primary Activity: N Activity Code: 1.1 A(1) (A) Activity Description: Not Supplied Primary Activity: N	A12NE (E)	950	2	337291 186908
13	**Local Authority Integrated Pollution Prevention And Control** Name: Cambrian Stone Ltd Location: Llanwern Works, Newport Authority: Newport City Council, Public Protection and Environmental Services Permit Reference: APA/011 Dated: Not Supplied Process Type: Mineral Industries Description: 3/15 **Status: Permit Issued** Positional Accuracy: Manually positioned to the address or location	A10SE (SW)	143	4	335948 186426
14	**Local Authority Integrated Pollution Prevention And Control** Name: Civil & Marine Ltd Location: Llanwern Works, Newport, NP19 4QX Authority: Newport City Council, Public Protection and Environmental Services Permit Reference: LA-IPPC/001/05/v2 Dated: Not Supplied Process Type: Production and Processing of Metals Description: Drying & Grinding of blast furnace slag **Status: Permit Revoked** Positional Accuracy: Manually positioned to the address or location	A15SW (NE)	387	4	336313 187157
14	**Local Authority Integrated Pollution Prevention And Control** Name: Newport Galvanisers Ltd Location: Llanwern Works, Newport, NP19 4QX Authority: Newport City Council, Public Protection and Environmental Services Permit Reference: LA-IPPC002/06 Dated: Not Supplied Process Type: Production and Processing of Metals Description: Hot dip galvanising **Status: Permit Issued** Positional Accuracy: Manually positioned to the address or location	A15SW (NE)	387	4	336313 187157

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
15	**Local Authority Pollution Prevention and Controls** Name: Corus Group Plc Location: Llanwern Works, Zodiac Line, NEWPORT, Gwent, NP9 0XD Authority: Newport City Council, Public Protection and Environmental Services Permit Reference: Apa/013/92 Dated: 28th October 1992 Process Type: Local Authority Air Pollution Control Description: PG2/2 Hot dip galvanising processes **Status:** **Authorised** Positional Accuracy: Manually positioned to the address or location	A10SE (SW)	142	4	335948 186427
15	**Local Authority Pollution Prevention and Controls** Name: Cambrian Stone Ltd Location: Llanwern Works, NEWPORT, NP9 0QX Authority: Newport City Council, Public Protection and Environmental Services Permit Reference: APA/011 Dated: 16th August 1993 Process Type: Local Authority Air Pollution Control Description: PG3/15 Mineral drying and roadstone coating processes **Status:** **Authorised** Positional Accuracy: Manually positioned to the address or location	A10SE (SW)	143	4	335948 186426
16	**Local Authority Pollution Prevention and Controls** Name: Tarmac Limited Location: Llanwen Works, Queensway, Newport, Np19 0dx Authority: Newport City Council, Public Protection and Environmental Services Permit Reference: LAPPC/039/07/v1 Dated: 6th June 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG3/1Blending, packing, loading and use of bulk cement **Status:** **Permitted** Positional Accuracy: Manually positioned to the address or location	A15SW (NE)	387	4	336313 187157
16	**Local Authority Pollution Prevention and Controls** Name: Civil & Marine Ltd (Heidelberg Cement Group) Location: Llanwern Works, NEWPORT, Gwent, NP19 4QX Authority: Newport City Council, Public Protection and Environmental Services Permit Reference: LA-IPPC001/05/v2 Dated: 8th June 1993 Process Type: Local Authority Air Pollution Control Description: PG3/1Blending, packing, loading and use of bulk cement **Status:** **Transferred to LAIPPC** Positional Accuracy: Manually positioned to the address or location	A15SW (NE)	387	4	336313 187157
16	**Local Authority Pollution Prevention and Controls** Name: Newport Galvanisers Ltd Location: Llanwern Works, Newport, Np19 4qx Authority: Newport City Council, Public Protection and Environmental Services Permit Reference: LA-IPPC002/06/v1 Dated: 26th August 1992 Process Type: Local Authority Air Pollution Control Description: PG6/23 Coating of metal and plastic **Status:** **Transferred to LAIPPC** Positional Accuracy: Manually positioned to the address or location	A15SW (NE)	387	4	336313 187157
16	**Local Authority Pollution Prevention and Controls** Name: Tarmac Topmix Location: Llanwern Works, Queensway, Llanwern, Newport, NP19 0QX Authority: Newport City Council, Public Protection and Environmental Services Permit Reference: LAPPC/031/05/v2 Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: PG3/1Blending, packing, loading and use of bulk cement **Status:** **Permitted** Positional Accuracy: Manually positioned to the address or location	A15SW (NE)	387	4	336313 187157
17	**Local Authority Pollution Prevention and Controls** Name: Nationwide Crash Repair Location: Curlew Close, Queensway Meadows Industrial Estate, Newport, Gwent, Np19 4sy Authority: Newport City Council, Public Protection and Environmental Services Permit Reference: LAPPC/015/05/v1 Dated: 29th January 1997 Process Type: Local Authority Pollution Prevention and Control Description: PG6/34 Respraying of road vehicles **Status:** **Permitted** Positional Accuracy: Manually positioned to the address or location	A9SE (W)	760	4	335069 186333
	Nearest Surface Water Feature	A10NW (W)	192	-	335667 186746

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
18	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Farm Authority: Environment Agency, Welsh Region Pollutant: Sewage - Septic Tank Effluent Note: Not Supplied Incident Date: 15th June 1992 Incident Reference: 4272 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A5SE (SW)	961	3	335200 185800
19	**Registered Radioactive Substances** Name: Corus Uk Ltd Location: Llanwern Works, Newport, Gwent, NP19 4QZ Authority: Natural Resources Wales Permit Reference: Bw8747 Dated: 1st December 2003 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Minor variation to authorisation under RSA **Status: Authorisation either revoked or cancelled** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	2	335106 186809
19	**Registered Radioactive Substances** Name: Corus Uk Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QZ Authority: Natural Resources Wales Permit Reference: AE9085 Dated: 31st March 1991 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Authorisation under RSA **Status: Authorisation either revoked or cancelled** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	2	335106 186809
	River Quality Name: Monks D GQA Grade: River Quality C Reach: Bsc Transformer Stn. - Barn Fm. Estimated Distance (km): 2.5 Flow Rate: Flow less than 0.31 cumecs Flow Type: River Year: 2000	A11NE (E)	158	3	336500 186815
	River Quality Name: Monks D GQA Grade: River Quality B Reach: Barn Fm. - M4 Estimated Distance (km): 3.1 Flow Rate: Flow less than 0.31 cumecs Flow Type: River Year: 2000	A15NE (NE)	657	3	336500 187406

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
20	**River Quality Biology Sampling Points** Name: Monks Ditch Reach: Bsc Transformer Station To Barn Farm Estimated Distance: 2.50 Positional Accuracy: Located by supplier to within 100m Year: 1990 GQA Grade: River Quality Biology GQA Grade C - Fairly Good Year: 1995 GQA Grade: River Quality Biology GQA Grade B - Good Year: 2000 GQA Grade: River Quality Biology GQA Grade B - Good Year: 2002 GQA Grade: River Quality Biology GQA Grade Not Supplied Year: 2003 GQA Grade: River Quality Biology GQA Grade B - Good Year: 2004 GQA Grade: River Quality Biology GQA Grade B - Good Year: 2005 GQA Grade: River Quality Biology GQA Grade B - Good Year: 2006 GQA Grade: River Quality Biology GQA Grade A - Very Good Year: 2007 GQA Grade: River Quality Biology GQA Grade A - Very Good Year: 2008 GQA Grade: River Quality Biology GQA Grade A - Very Good Year: 2009 GQA Grade: River Quality Biology GQA Grade C - Fairly Good	A15NE (NE)	651	3	336500 187400

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
21	**River Quality Chemistry Sampling Points** Name: Monks Ditch Reach: Bsc Transformer Stn. To Barn Farm Estimated Distance: 2.50 Objective: Not Supplied Positional Accuracy: Located by supplier to within 10m Year: 1990 GQA Grade: River Quality Chemistry GQA Grade E - Poor Compliance: Not Supplied Year: 1993 GQA Grade: River Quality Chemistry GQA Grade E - Poor Compliance: Not Supplied Year: 1994 GQA Grade: River Quality Chemistry GQA Grade D - Fair Compliance: Not Supplied Year: 1995 GQA Grade: River Quality Chemistry GQA Grade D - Fair Compliance: Not Supplied Year: 1996 GQA Grade: River Quality Chemistry GQA Grade D - Fair Compliance: Not Supplied Year: 1997 GQA Grade: River Quality Chemistry GQA Grade C - Fairly Good Compliance: Not Supplied Year: 1998 GQA Grade: River Quality Chemistry GQA Grade C - Fairly Good Compliance: Not Supplied Year: 1999 GQA Grade: River Quality Chemistry GQA Grade C - Fairly Good Compliance: Not Supplied Year: 2000 GQA Grade: River Quality Chemistry GQA Grade C - Fairly Good Compliance: Not Supplied Year: 2001 GQA Grade: River Quality Chemistry GQA Grade C - Fairly Good Compliance: Not Supplied Year: 2002 GQA Grade: River Quality Chemistry GQA Grade B - Good Compliance: Not Supplied Year: 2003 GQA Grade: River Quality Chemistry GQA Grade B - Good Compliance: Not Supplied Year: 2004 GQA Grade: River Quality Chemistry GQA Grade B - Good Compliance: Not Supplied Year: 2005 GQA Grade: River Quality Chemistry GQA Grade B - Good Compliance: Not Supplied Year: 2006 GQA Grade: River Quality Chemistry GQA Grade C - Fairly Good Compliance: Not Supplied Year: 2007 GQA Grade: River Quality Chemistry GQA Grade C - Fairly Good Compliance: Not Supplied Year: 2008 GQA Grade: River Quality Chemistry GQA Grade C - Fairly Good Compliance: Not Supplied Year: 2009 GQA Grade: River Quality Chemistry GQA Grade B - Good Compliance: Not Supplied	A7NE (SE)	502	3	336723 186301
22	**Substantiated Pollution Incident Register** Authority: Natural Resources Wales Incident Date: 13th June 2013 Incident Reference: 1121873 Water Impact: Category 4 - No Impact Air Impact: Category 3 - Minor Incident Land Impact: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 10m Pollutant: Contaminated Water: Other Contaminated Water	A9SW (W)	810	2	334986 186549
23	**Substantiated Pollution Incident Register** Authority: Natural Resources Wales Incident Date: 7th March 2013 Incident Reference: 1092554 Water Impact: Category 4 - No Impact Air Impact: Category 3 - Minor Incident Land Impact: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 10m Pollutant: Sewage Materials: Grey Water	A5NW (W)	980	2	334844 186323

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Groundwater Vulnerability Map Combined Classification: Secondary Bedrock Aquifer - Low Vulnerability Combined Vulnerability: Low Combined Aquifer: Productive Bedrock Aquifer, Unproductive Superficial Aquifer Pollutant Speed: High Bedrock Flow: Well Connected Fractures Dilution: 300-550 mm/year Baseflow Index: >70% Superficial Patchiness: >90% Superficial Thickness: 3-10m Superficial Recharge: Low	A10SE (W)	0	2	336000 186652
	Groundwater Vulnerability Map Combined Classification: Secondary Bedrock Aquifer - Low Vulnerability Combined Vulnerability: Low Combined Aquifer: Productive Bedrock Aquifer, Unproductive Superficial Aquifer Pollutant Speed: High Bedrock Flow: Well Connected Fractures Dilution: 300-550 mm/year Baseflow Index: >70% Superficial Patchiness: >90% Superficial Thickness: 3-10m Superficial Recharge: Low	A11SW (S)	0	2	336084 186652
	Bedrock Aquifer Designations Aquifer Designation: Secondary Aquifer - B	A11SW (S)	0	2	336084 186652
	Superficial Aquifer Designations Aquifer Designation: Unproductive Strata	A11SW (S)	0	2	336084 186652
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SW (E)	0	2	336295 186640
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SW (N)	0	2	336084 186660
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NW (NE)	0	2	336250 186755
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NW (E)	0	2	336320 186735
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial/Tidal Models Boundary Accuracy: As Supplied	A11SW (S)	0	2	336084 186652
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SW (E)	10	2	336345 186615
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SW (E)	11	2	336290 186580
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NW (NE)	25	2	336200 186795

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NW (NE)	30	2	336305 186800
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SW (SE)	40	2	336280 186540
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NW (E)	40	2	336390 186775
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NW (NE)	54	2	336180 186800
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NE (E)	62	2	336420 186730
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SW (S)	95	2	336140 186470
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NW (NE)	104	2	336250 186870
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NW (NE)	116	2	336405 186870
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SW (S)	123	2	336170 186440
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NW (NE)	129	2	336185 186875
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SW (SE)	156	2	336265 186405
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SW (SE)	205	2	336335 186380
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A10SE (SW)	214	2	335785 186340
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NE (E)	241	2	336590 186800
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A6NE (S)	242	2	336035 186320
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SE (E)	247	2	336535 186470

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SW (N)	0	2	336084 186660
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NW (E)	0	2	336320 186735
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NW (NE)	0	2	336250 186755
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SW (E)	0	2	336295 186640
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial/Tidal Models Boundary Accuracy: As Supplied	A11SW (S)	0	2	336084 186652
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SW (E)	10	2	336345 186615
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SW (E)	11	2	336290 186580
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NW (NE)	25	2	336200 186795
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NW (NE)	30	2	336305 186800
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SW (SE)	40	2	336280 186540
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NW (E)	40	2	336390 186775
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NW (NE)	54	2	336180 186800
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NE (E)	62	2	336420 186730
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SW (S)	95	2	336140 186470
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NW (NE)	104	2	336250 186870
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NW (NE)	116	2	336405 186870

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SW (S)	123	2	336170 186440
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NW (NE)	129	2	336185 186875
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SW (SE)	156	2	336265 186405
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SW (SE)	205	2	336335 186380
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A10SE (SW)	214	2	335785 186340
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11NE (E)	241	2	336590 186800
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A6NE (S)	242	2	336035 186320
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A11SE (E)	247	2	336535 186470
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11SW (E)	0	2	336295 186640
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11NW (NE)	0	2	336250 186755
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11NW (E)	0	2	336320 186735
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11SW (N)	0	2	336084 186660
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11SW (E)	10	2	336345 186615
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11SW (E)	11	2	336290 186580
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11NW (NE)	25	2	336200 186795
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11NW (NE)	30	2	336305 186800
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11SW (SE)	40	2	336280 186540
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11NW (E)	40	2	336390 186775
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11NW (NE)	54	2	336180 186800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11NE (E)	62	2	336420 186730
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11SW (S)	95	2	336140 186470
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11NW (NE)	104	2	336250 186870
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11NW (NE)	116	2	336405 186870
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11SW (S)	123	2	336170 186440
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11NW (NE)	129	2	336185 186875
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11SW (SE)	156	2	336265 186405
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11SW (SE)	205	2	336335 186380
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A10SE (SW)	214	2	335785 186340
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11NE (E)	241	2	336590 186800
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A6NE (S)	242	2	336035 186320
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A11SE (E)	247	2	336535 186470
	Flood Water Storage Areas None				
	Flood Defences None				
24	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 818.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A10SE (S)	204	5	335963 186336
25	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A10SE (SW)	218	5	335807 186336
26	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A10SE (SW)	221	5	335807 186333

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
27	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 13.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A10SE (SW)	222	5	335807 186332
28	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 331.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A10SE (S)	228	5	336055 186328
29	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 12.2 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A10SE (S)	229	5	335963 186336
30	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 64.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A10SW (SW)	231	5	335735 186332
31	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 152.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NE (S)	233	5	335963 186309
32	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 104.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NE (SW)	235	5	335812 186319
33	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 14.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NE (S)	241	5	335963 186324
34	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NE (S)	255	5	335964 186310
35	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 175.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NE (S)	255	5	335964 186310

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
36	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1296.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7NW (SE)	255	5	336248 186301
37	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 17.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7NW (SE)	256	5	336294 186309
38	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 54.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A10SW (SW)	261	5	335639 186342
39	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 311.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7NW (SE)	262	5	336311 186307
40	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 137.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A10SW (W)	267	5	335534 186648
41	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 24.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A10NW (W)	267	5	335540 186672
42	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 194.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A10NW (W)	267	5	335541 186678
43	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 159.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7NW (S)	276	5	336188 186282
44	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A10SW (SW)	285	5	335562 186392

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
45	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 282.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NW (SW)	286	5	335655 186305
46	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 86.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NW (SW)	286	5	335659 186301
47	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 208.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A10SW (SW)	296	5	335554 186384
48	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A10SW (W)	322	5	335476 186522
49	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 20.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A10SW (W)	325	5	335473 186527
50	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 128.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NE (SW)	334	5	335854 186223
51	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 311.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NW (SW)	342	5	335691 186228
52	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 71.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NW (SW)	342	5	335691 186228
53	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 13.2 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A10NW (W)	382	5	335519 186864

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
54	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 148.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A10NW (W)	394	5	335515 186877
55	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1057.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Monks' Ditch Catchment Name: Usk and Llwyd Primacy: 1	A11SE (E)	394	5	336750 186597
56	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 166.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14SE (NW)	397	5	335860 187130
57	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 329.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NW (SW)	398	5	335721 186164
58	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 126.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NW (SW)	398	5	335721 186164
59	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 55.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A10SW (W)	400	5	335408 186457
60	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 36.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7NW (S)	403	5	336088 186169
61	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 38.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7NW (S)	406	5	336220 186150
62	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 38.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9SE (W)	417	5	335393 186447

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
63	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 6.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NE (S)	417	5	336032 186147
64	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 15.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NE (S)	422	5	336035 186142
65	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 749.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A12NW (E)	432	5	336794 186690
66	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 90.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7NW (S)	433	5	336192 186124
67	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 32.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7NW (S)	433	5	336192 186124
68	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 104.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NE (S)	436	5	336041 186129
69	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 257.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Julian's Reen Catchment Name: Usk and Llwyd Primacy: 2	A9SE (W)	439	5	335382 186408
70	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 6.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Longditch Reen Catchment Name: Usk and Llwyd Primacy: 2	A9SE (W)	439	5	335382 186409
71	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Longditch Reen Catchment Name: Usk and Llwyd Primacy: 2	A9SE (W)	439	5	335382 186408

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
72	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 17.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7NE (SE)	442	5	336621 186281
73	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 71.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Longditch Reen Catchment Name: Usk and Llwyd Primacy: 2	A9SE (W)	444	5	335376 186413
74	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 85.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7NE (SE)	454	5	336638 186280
75	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 50.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9SE (W)	458	5	335367 186396
76	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 209.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NE (S)	459	5	335905 186105
77	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 43.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9SE (W)	481	5	335326 186455
78	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 17.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14SW (NW)	482	5	335510 187025
79	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 58.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14SW (NW)	494	5	335510 187042
80	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 77.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5NE (SW)	502	5	335395 186251

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
81	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 19.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9SE (SW)	502	5	335341 186344
82	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 34.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5NE (SW)	502	5	335395 186251
83	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 180.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NE (SW)	509	5	335766 186046
84	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 244.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NE (SW)	509	5	335766 186046
85	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 294.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Longditch Reen Catchment Name: Usk and Llwyd Primacy: 2	A9SE (W)	510	5	335304 186418
86	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Monks' Ditch Catchment Name: Usk and Llwyd Primacy: 1	A7NE (SE)	519	5	336723 186274
87	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 40.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Monks' Ditch Catchment Name: Usk and Llwyd Primacy: 1	A7NE (SE)	521	5	336723 186271
88	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7NE (SE)	521	5	336723 186271
89	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 83.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7NE (SE)	524	5	336728 186272

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
90	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 10.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7NW (S)	529	5	336099 186042
91	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 23.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16SW (NE)	532	5	336820 187014
92	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 26.6 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14SW (NW)	535	5	335510 187101
93	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 67.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7NW (S)	536	5	336104 186034
94	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 126.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16SW (NE)	545	5	336822 187038
95	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 25.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Monks' Ditch Catchment Name: Usk and Llwyd Primacy: 1	A7NE (SE)	546	5	336720 186232
96	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 44.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15SW (NE)	549	5	336402 187314
97	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 203.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5NE (SW)	549	5	335391 186184
98	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 19.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14SW (NW)	553	5	335511 187127

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
99	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 81.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15SW (N)	558	5	336271 187327
100	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 553.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Monks' Ditch Catchment Name: Usk and Llwyd Primacy: 1	A7NE (SE)	563	5	336718 186206
101	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 43.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15SW (N)	567	5	336211 187328
102	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 190.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14SW (NW)	570	5	335506 187145
103	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14SW (NW)	570	5	335506 187145
104	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 74.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15SW (N)	574	5	336131 187336
105	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 140.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NW (N)	577	5	336213 187375
106	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 38.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NW (N)	577	5	336350 187347
107	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 91.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NE (NE)	580	5	336422 187344

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
108	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 39.4 Watercourse Level: Underground Permanent: True Watercourse Name: Monks' Ditch Catchment Name: Usk and Llwyd Primacy: 1	A15SE (NE)	584	5	336642 187269
109	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 8.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NW (NE)	589	5	336388 187356
110	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 104.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NE (NE)	591	5	336483 187342
111	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 15.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NE (NE)	591	5	336483 187342
112	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 88.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SW (S)	591	5	336132 185972
113	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NW (NE)	592	5	336396 187358
114	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 28.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9SE (W)	594	5	335208 186478
115	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1126.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Monks' Ditch Catchment Name: Usk and Llwyd Primacy: 1	A15SE (NE)	595	5	336615 187297
116	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 31.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NW (NE)	595	5	336401 187360

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
117	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 8.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NW (SW)	595	5	335406 186105
118	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 63.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NW (SW)	599	5	335409 186098
119	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 300.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9NE (W)	608	5	335198 186726
120	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 172.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A8NW (SE)	610	5	336831 186264
121	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 369.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NW (N)	610	5	336147 187402
122	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 18.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NW (N)	610	5	336195 187369
123	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 125.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NE (NE)	610	5	336428 187372
124	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 52.9 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9SE (W)	613	5	335183 186545
125	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 12.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NW (N)	613	5	336213 187375

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126	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 218.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SW (SW)	616	5	335602 185970
127	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 110.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SW (SW)	616	5	335602 185970
128	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 8.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NW (N)	617	5	336192 187379
129	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 26.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NE (N)	618	5	335876 187360
130	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 129.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NW (N)	620	5	336161 187382
131	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 184.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NE (N)	626	5	336027 187387
132	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NE (N)	628	5	336062 187391
133	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 37.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9NE (W)	628	5	335198 186788
134	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 15.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NE (N)	631	5	336064 187395

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135	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 324.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A8NW (SE)	632	5	336780 186169
136	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9NE (W)	637	5	335208 186845
137	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 32.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9NE (W)	637	5	335208 186845
138	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 584.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A8NW (E)	644	5	336906 186316
139	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NE (N)	644	5	335868 187386
140	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 41.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NE (N)	646	5	335866 187387
141	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 177.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NE (N)	646	5	335866 187387
142	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 207.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NE (N)	646	5	336061 187409
143	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9NE (W)	646	5	335197 186840

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144	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 10.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9NE (W)	647	5	335197 186845
145	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9NE (W)	647	5	335197 186845
146	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 32.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9NE (W)	648	5	335211 186877
147	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.4 Watercourse Level: Underground Permanent: True Watercourse Name: Julian's Reen Catchment Name: Usk and Llwyd Primacy: 2	A5NE (SW)	648	5	335268 186178
148	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 20.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16SW (NE)	651	5	336934 187053
149	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Julian's Reen Catchment Name: Usk and Llwyd Primacy: 2	A5NE (SW)	651	5	335267 186175
150	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 78.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6NW (SW)	652	5	335413 186026
151	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 37.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5NE (SW)	654	5	335258 186183
152	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 107.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9NE (W)	659	5	335214 186909

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153	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 179.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Julian's Reen Catchment Name: Usk and Llwyd Primacy: 2	A5NE (SW)	659	5	335266 186163
154	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 31.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15SE (NE)	660	5	336751 187287
155	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 800.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16SW (NE)	669	5	336955 187051
156	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 9.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5NE (SW)	672	5	335231 186192
157	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 137.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 1	A15NE (NE)	675	5	336556 187408
158	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SW (S)	680	5	336205 185875
159	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 45.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 2	A15SE (NE)	682	5	336746 187319
160	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 35.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 2	A15SE (NE)	682	5	336746 187319
161	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SW (S)	682	5	336203 185874

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162	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 172.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SW (S)	682	5	336203 185874
163	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.6 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SW (S)	685	5	336207 185871
164	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SW (S)	686	5	336212 185869
165	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 206.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NE (N)	687	5	335854 187426
166	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 212.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SW (S)	687	5	336217 185868
167	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NE (N)	688	5	335986 187446
168	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 395.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NE (N)	689	5	335975 187445
169	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 281.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SW (S)	689	5	336214 185867
170	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 159.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5NE (SW)	691	5	335240 186145

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171	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 13.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NW (N)	693	5	336233 187459
172	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 152.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SW (SW)	697	5	335443 185953
173	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 52.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SW (SW)	697	5	335443 185953
174	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SW (SW)	698	5	335651 185871
175	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 111.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SW (SW)	702	5	335653 185867
176	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 66.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 2	A16SW (NE)	706	5	336791 187314
177	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 31.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16SW (NE)	706	5	336791 187314
178	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 152.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NW (NW)	706	5	335683 187396
179	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 76.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NW (N)	707	5	336231 187472

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180	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 28.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 2	A15NE (NE)	708	5	336742 187354
181	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 452.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Black Wall Catchment Name: Usk and Llwyd Primacy: 2	A8NW (SE)	709	5	336813 186094
182	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 71.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14SW (NW)	714	5	335526 187334
183	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 13.3 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A13SE (W)	718	5	335209 187014
184	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 15.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NW (NW)	723	5	335662 187405
185	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 66.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A13SE (NW)	724	5	335211 187027
186	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 53.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SE (SE)	731	5	336431 185854
187	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 16.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 2	A15NE (NE)	732	5	336743 187382
188	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 24.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16SW (NE)	734	5	336877 187275

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189	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 103.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SE (S)	739	5	335845 185816
190	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SE (S)	739	5	335845 185816
191	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 237.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 2	A16SW (NE)	740	5	336857 187303
192	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 19.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16SW (NE)	740	5	336857 187303
193	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SE (S)	740	5	335843 185815
194	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 149.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SE (S)	742	5	335839 185814
195	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A12SE (E)	744	5	337092 186534
196	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 14.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NW (NW)	744	5	335654 187425
197	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 144.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SW (SW)	744	5	335440 185902

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198	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 44.3 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A13SE (NW)	745	5	335234 187089
199	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 52.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 2	A15NE (NE)	749	5	336752 187395
200	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 181.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16SW (NE)	751	5	336876 187299
201	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 21.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SE (SE)	758	5	336496 185848
202	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NW (NW)	759	5	335649 187439
203	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 125.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NW (NW)	762	5	335648 187442
204	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A8NW (SE)	764	5	337009 186254
205	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 117.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A8NW (SE)	766	5	337009 186250
206	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A8NW (SE)	766	5	337007 186246

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207	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 122.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A13SE (NW)	770	5	335232 187133
208	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 24.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SE (SE)	771	5	336477 185826
209	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 50.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NW (NW)	775	5	335531 187406
210	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.2 Watercourse Level: Underground Permanent: True Watercourse Name: Julian's Reen Catchment Name: Usk and Llwyd Primacy: 2	A5NE (SW)	775	5	335261 185994
211	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 69.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Julian's Reen Catchment Name: Usk and Llwyd Primacy: 2	A5NE (SW)	779	5	335260 185990
212	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 54.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NW (N)	783	5	336215 187547
213	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 157.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5NE (SW)	783	5	335253 185990
214	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SE (SE)	783	5	336460 185809
215	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 135.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SE (SE)	784	5	336459 185807

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216	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SE (SE)	784	5	336459 185807
217	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 328.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SE (SE)	785	5	336460 185806
218	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 120.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SW (SW)	789	5	335448 185847
219	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 161.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SW (SW)	795	5	335697 185766
220	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 109.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SW (SW)	797	5	335451 185835
221	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SW (SW)	797	5	335451 185835
222	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 136.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 1	A15NE (NE)	800	5	336632 187514
223	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 70.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Julian's Reen Catchment Name: Usk and Llwyd Primacy: 2	A5SE (SW)	800	5	335292 185933
224	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 2	A16NW (NE)	801	5	336780 187440

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225	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 2	A16NW (NE)	804	5	336781 187443
226	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Oxleaze Reen Catchment Name: Usk and Llwyd Primacy: 1	A16NW (NE)	809	5	336786 187445
227	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 32.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 1	A16NW (NE)	809	5	336785 187446
228	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.1 Watercourse Level: Underground Permanent: True Watercourse Name: Oxleaze Reen Catchment Name: Usk and Llwyd Primacy: 1	A16NW (NE)	811	5	336791 187444
229	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Oxleaze Reen Catchment Name: Usk and Llwyd Primacy: 1	A16NW (NE)	812	5	336795 187443
230	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 420.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Oxleaze Reen Catchment Name: Usk and Llwyd Primacy: 1	A16NW (NE)	814	5	336799 187442
231	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 30.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16NW (NE)	814	5	336799 187442
232	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 98.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NW (NW)	821	5	335581 187478
233	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NW (NW)	821	5	335524 187454

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
234	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 308.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NW (NW)	821	5	335581 187478
235	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NW (NW)	823	5	335519 187453
236	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 190.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SW (S)	824	5	336092 185742
237	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 394.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SW (S)	824	5	336092 185742
238	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 248.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Middle Reen Catchment Name: Usk and Llwyd Primacy: 2	A7SE (SE)	830	5	336638 185833
239	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 116.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SE (S)	836	5	335888 185722
240	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SE (S)	836	5	335888 185722
241	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SE (S)	837	5	335885 185721
242	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 1	A16NW (NE)	840	5	336798 187475

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
243	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 83.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NE (NE)	840	5	336727 187519
244	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 270.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SE (S)	840	5	335883 185718
245	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 141.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NW (NW)	842	5	335483 187456
246	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 65.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16NW (NE)	844	5	336817 187467
247	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 57.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5SE (SW)	846	5	335340 185842
248	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5SE (SW)	846	5	335340 185842
249	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 109.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5SE (SW)	847	5	335340 185841
250	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.8 Watercourse Level: Underground Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 1	A16NW (NE)	848	5	336803 187481
251	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 1	A16NW (NE)	856	5	336807 187488

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
252	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.2 Watercourse Level: Underground Permanent: True Watercourse Name: Julian's Reen Catchment Name: Usk and Llwyd Primacy: 2	A5SE (SW)	857	5	335287 185865
253	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 315.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Ellen Reen Catchment Name: Usk and Llwyd Primacy: 2	A7SW (S)	857	5	336365 185710
254	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 63.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NE (NE)	863	5	336725 187542
255	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NE (NE)	864	5	336723 187544
256	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 77.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Julian's Reen Catchment Name: Usk and Llwyd Primacy: 2	A5SE (SW)	864	5	335286 185858
257	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.1 Watercourse Level: Underground Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 1	A16NW (NE)	868	5	336813 187498
258	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 43.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NE (NE)	868	5	336721 187549
259	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 194.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A8SW (SE)	869	5	336885 185944
260	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 10.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 1	A16NW (NE)	872	5	336816 187501

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
261	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 127.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9SW (W)	875	5	334925 186479
262	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 254.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9NW (W)	877	5	334938 186813
263	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 21.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NE (N)	878	5	335747 187598
264	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 266.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SW (SW)	881	5	335482 185731
265	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 172.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SW (SW)	881	5	335493 185725
266	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 14.0 Watercourse Level: Underground Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 1	A16NW (NE)	883	5	336822 187509
267	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 140.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5SE (SW)	883	5	335236 185871
268	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 23.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5SE (SW)	885	5	335239 185867
269	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 44.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5SE (SW)	892	5	335252 185848

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
270	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 17.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16SW (NE)	895	5	337091 187266
271	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NE (N)	895	5	335754 187618
272	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 86.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A14NE (N)	897	5	335755 187620
273	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 1	A16NW (NE)	897	5	336831 187520
274	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 28.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16NW (NE)	898	5	336809 187539
275	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 96.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 1	A16NW (NE)	898	5	336832 187522
276	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 23.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9NW (W)	898	5	334903 186685
277	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16NW (NE)	901	5	336809 187539
278	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 157.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 1	A8NE (E)	902	5	337156 186238

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
279	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 31.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16NW (NE)	902	5	336780 187559
280	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 13.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9NW (W)	902	5	334949 186908
281	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 20.6 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NE (NE)	903	5	336737 187581
282	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 13.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16NW (NE)	903	5	336756 187571
283	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 9.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16NW (NE)	903	5	336768 187565
284	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16NW (NE)	903	5	336776 187561
285	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 146.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NE (NE)	904	5	336715 187592
286	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 25.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A15NE (NE)	904	5	336715 187592
287	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 261.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9NW (W)	905	5	334951 186922

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
288	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.3 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16SE (NE)	906	5	337092 187284
289	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 193.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16NW (NE)	909	5	336855 187520
290	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 20.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 2	A16SE (NE)	909	5	337093 187288
291	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 17.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16NW (NE)	909	5	336855 187520
292	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 195.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SW (S)	911	5	336390 185659
293	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 123.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A7SW (S)	911	5	336390 185659
294	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 1	A15NE (NE)	916	5	336643 187633
295	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 6.6 Watercourse Level: Underground Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 2	A16SE (NE)	917	5	337109 187279
296	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 403.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Barn Reen Catchment Name: Usk and Llwyd Primacy: 2	A16SE (NE)	918	5	337114 187274

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
297	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 1	A15NE (NE)	918	5	336645 187634
298	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 62.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9NW (W)	920	5	334931 186912
299	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 395.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A8SW (SE)	922	5	336877 185871
300	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.9 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16NW (NE)	926	5	336865 187534
301	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 120.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A6SW (SW)	927	5	335593 185650
302	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 167.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16NW (NE)	930	5	336867 187537
303	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 180.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A2NW (SW)	934	5	335626 185636
304	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 73.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A13NE (NW)	935	5	335253 187409
305	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 50.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5SE (SW)	937	5	335107 185920

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306	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 25.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5SE (SW)	937	5	335107 185920
307	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.9 Watercourse Level: Underground Permanent: True Watercourse Name: Julian's Reen Catchment Name: Usk and Llwyd Primacy: 2	A5SE (SW)	937	5	335225 185811
308	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 140.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5SE (SW)	940	5	335213 185818
309	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 110.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Julian's Reen Catchment Name: Usk and Llwyd Primacy: 2	A5SE (SW)	941	5	335221 185809
310	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 99.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A2NE (S)	947	5	335932 185615
311	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 33.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A2NE (S)	947	5	335932 185615
312	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 62.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A13NE (NW)	955	5	335350 187509
313	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 893.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9NW (W)	957	5	334850 186744
314	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 62.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5SE (SW)	957	5	335247 185771

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
315	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 20.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A13NE (NW)	959	5	335291 187471
316	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5SE (SW)	959	5	335250 185767
317	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A2NE (S)	961	5	335963 185602
318	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 152.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5SE (SW)	962	5	335254 185760
319	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 121.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A2NE (S)	964	5	335960 185599
320	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 80.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A2NE (S)	964	5	335960 185599
321	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 46.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A13SW (W)	972	5	334932 187045
322	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 93.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A8NE (SE)	974	5	337187 186144
323	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 105.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9SW (W)	978	5	334846 186326

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
324	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 71.6 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5NW (W)	978	5	334848 186314
325	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 22.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A9SW (W)	990	5	334807 186510
326	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 30.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16NW (NE)	992	5	336761 187667
327	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 8.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A16NW (NE)	994	5	336893 187597
328	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 143.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 1	A16NW (NE)	994	5	336875 187611
329	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 54.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A5SE (SW)	995	5	335070 185874
330	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 124.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A13NE (NW)	997	5	335273 187506
331	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A13NE (NW)	997	5	335273 187506
332	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 40.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Usk and Llwyd Primacy: 2	A13NE (NW)	999	5	335272 187507

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
333	**Licensed Waste Management Facilities (Landfill Boundaries)** Name: Llanwern Landfill : South Side Of Queensway Licence Number: 30009 Location: Llanwern Landfill South Side Of Queensway, Corus, Llanwern Works, Newport, Gwent, NP19 4QX Licence Holder: Corus Strip Products P P C (Gp3331sv) Authority: Natural Resources Wales Site Category: Industrial Waste Landfills Max Input Rate: Not Supplied **Licence Status:** **Modified** Issued: 31st May 1979 Positional Accuracy: Positioned by the supplier Boundary Accuracy: As Supplied	A8NW (SE)	605	2	336788 186218
334	**Licensed Waste Management Facilities (Locations)** Licence Number: CB3491HU Location: Englobe Wastewater Treatment Plant Glan Llyn St Modwen Development Site, Queen¿s Way, Llanwern, Newport, NP19 4TZ Operator Name: Englobe Regeneration UK Limited Operator Location: Not Supplied Authority: Natural Resources Wales Site Category: Physico-chemical Treatment Facilities **Licence Status:** **Effective** Issued: 2nd March 2022 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A11SW (SE)	194	2	336338 186394
334	**Licensed Waste Management Facilities (Locations)** Licence Number: PAN-011383 Location: Glan Llyn Development Site, Queensway, Llanwern, NP19 4TZ Operator Name: Celtic Technologies Ltd Operator Location: Not Supplied Authority: Natural Resources Wales Site Category: Mobile Plant for remediation of land **Licence Status:** **Effective** Issued: 15th October 2020 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A11SW (SE)	196	2	336365 186408
335	**Licensed Waste Management Facilities (Locations)** Licence Number: PAN-015198 Location: Phase 4a and 5, Glan Llyn Former Coking Works, Llanwern, Newport, NP19 4QZ Operator Name: Vertase FLI Operator Location: Not Supplied Authority: Natural Resources Wales Site Category: Mobile Plant for remediation of land **Licence Status:** **Effective** Issued: 8th November 2021 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A15SW (N)	292	2	336187 187042
	Local Authority Landfill Coverage Name: Newport County Borough Council - Has no landfill data to supply		0	6	336084 186652
336	**Potentially Infilled Land (Non-Water)** Bearing Ref: N Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1989	A15NW (N)	800	10	336349 187576
337	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1989	A10NE (N)	211	10	336078 186975
338	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1989	A11NW (N)	211	10	336081 186975

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
339	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A11NE (E)	311	10	336668 186769
340	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A10SW (W)	344	10	335453 186569
341	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A10SW (W)	374	10	335422 186638
342	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SE (W)	406	10	335390 186570
343	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A10NW (W)	418	10	335419 186779
344	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SE (W)	467	10	335330 186615
345	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SE (W)	525	10	335272 186603
346	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A5NE (SW)	534	10	335324 186306
347	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SE (W)	578	10	335220 186613
348	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SE (W)	588	10	335211 186489
349	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A12SW (E)	590	10	336945 186592
350	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9NE (W)	669	10	335169 186830
351	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SE (W)	717	10	335081 186624
352	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SE (W)	718	10	335079 186611
353	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SW (W)	745	10	335052 186607
354	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SE (W)	758	10	335069 186339
355	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SW (W)	760	10	335067 186340
356	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9NW (W)	763	10	335045 186730
357	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SW (W)	776	10	335030 186431
358	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SW (W)	870	10	334929 186488
359	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SW (W)	874	10	334926 186476

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
360	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A5NW (SW)	876	10	335031 186127
361	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A5NW (SW)	880	10	335025 186129
362	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SW (W)	891	10	334906 186593
363	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A5NW (W)	943	10	334892 186286
364	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9NW (W)	968	10	334838 186726
365	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SW (W)	983	10	334814 186580
366	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A5SW (SW)	983	10	335004 185973
367	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SW (W)	987	10	334810 186550
368	**Registered Waste Treatment or Disposal Sites** Licence Holder: Bitmac Ltd Licence Reference: 026/80 Site Location: Llanwern Works, NEWPORT, Gwent, NP9 0XN Operator Location: Queensway, Llanwern Works, Newport, Gwent Authority: Environment Agency Wales, South East Area Site Category: Incineration Max Input Rate: Undefined Waste Source Restrictions: Only waste produced on site Licence Status: Site now IPC authorisedAuthorised Dated: 1st March 1980 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste Sulphuric Acid (Acid Tars)	A11SW (SE)	60	3	336200 186500

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
369	**Control of Major Accident Hazards Sites (COMAH)** Name: British Oxygen Co Limited Location: NEWPORT, Gwent, NP18 2DS Reference: Not Supplied Type: Lower Tier **Status: Record Ceased To Be Supplied Under COMAH Regulations** Positional Accuracy: Manually positioned to the address or location	A11NE (E)	187	7	336546 186739
370	**Control of Major Accident Hazards Sites (COMAH)** Name: Air Products Public Limited Company Location: Llanwern Works, Newport, Gwent, NP19 4QZ Reference: Not Supplied Type: Lower Tier **Status: Active** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	7	335106 186809
371	**Notification of Installations Handling Hazardous Substances (NIHHS)** Name: B.S.C. Location: Llanwern Works, NEWPORT, Gwent, NPT 0XN **Status: Not Active** Positional Accuracy: Manually positioned to the address or location	A11NE (E)	379	7	336722 186844
372	**Planning Hazardous Substance Consents** Name: British Steel Location: Llanwern Steelworks, Llanwern, Newport , Gwent, NP9 0XN Authority: Newport City Council, Planning Department Application Ref: 93/0089/Hsc Hazardous Substance: Liquefied extremely flammable gas (including LPG) and natural gas (whether liquefied or not) Maximum Quantity: 320 Application date: 9th February 1993 **Decision: Deemed Consent GrantedGranted** Positional Accuracy: Located by supplier to within 10m	A11NW (NE)	116	8	336229 186868

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Triassic Rocks (Undifferentiated)	A11SW (S)	0	1	336084 186652
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A11SW (S)	0	1	336084 186652
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 120 - 180 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 30 - 45 mg/kg	A15SW (N)	486	1	336130 187263
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 30 - 45 mg/kg	A15SW (N)	531	1	336137 187306
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 120 - 180 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 30 - 45 mg/kg	A16SW (NE)	613	1	336795 187190
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 30 - 45 mg/kg	A16SW (NE)	654	1	336845 187194
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 35 - 45 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 30 - 45 mg/kg	A15NW (N)	689	1	336107 187491

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
373	**BGS Recorded Mineral Sites** Site Name: Llanwern Steelworks Slag Location: Llanwern, Newport, Gwent Source: British Geological Survey, National Geoscience Information Service Reference: 13203 Type: Tip **Status: Ceased** Operator: Tarmac (A Crh Company) Operator Location: Not Supplied Periodic Type: Not Available Geology: Blast Furnace Slag Commodity: Blast Furnace Slag Positional Accuracy: Located by supplier to within 100m	A7NE (SE)	529	1	336500 186100
374	**BGS Recorded Mineral Sites** Site Name: Llanwern Works Location: Llanwern, Newport, Gwent Source: British Geological Survey, National Geoscience Information Service Reference: 13204 Type: Tip **Status: Ceased** Operator: Hanson Cement Operator Location: Not Supplied Periodic Type: Not Available Geology: Ground Granulated Blast Furnace Slag - Addition, Cementitious Commodity: Blast Furnace Slag Positional Accuracy: Located by supplier to within 100m	A8NW (SE)	843	1	337000 186100
	BGS Measured Urban Soil Chemistry No data available				
	BGS Urban Soil Chemistry Averages No data available				
	Coal Mining Affected Areas In an area that might not be affected by coal mining				
	Non Coal Mining Areas of Great Britain No Hazard				
	Potential for Collapsible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A11SW (S)	0	1	336084 186652
	Potential for Compressible Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A11SW (S)	0	1	336084 186652
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A11SW (S)	0	1	336084 186652
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11SW (S)	0	1	336084 186652
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A11SW (S)	0	1	336084 186652
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A11SW (S)	0	1	336084 186652
	Radon Potential - Radon Affected Areas Affected Area: The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A11SW (S)	0	1	336084 186652
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A11SW (S)	0	1	336084 186652

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
375	**Contemporary Trade Directory Entries** Name: Tarmac Westen Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QX Classification: Stone Products - Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SE)	364	-	336430 186251
376	**Contemporary Trade Directory Entries** Name: Civil & Marine Ltd Location: Llanwern Works, NEWPORT, Gwent, NP19 4QX Classification: Concrete Products **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SE)	377	-	336294 186184
377	**Contemporary Trade Directory Entries** Name: Petras Cleaning Co Ltd Location: 33, Bridling Crescent, Newport, NP19 4TU Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9SE (W)	509	-	335288 186553
378	**Contemporary Trade Directory Entries** Name: Cariad Location: 54, Bloomery Circle, Newport, NP19 4TT Classification: Hospitals **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9NE (W)	520	-	335311 186785
379	**Contemporary Trade Directory Entries** Name: Hope Oven Cleaning Location: 4, BESSEMER DRIVE, NEWPORT, NP19 4TP Classification: Oven cleaning **Status: Active** Positional Accuracy: Automatically positioned to the address	A9NE (W)	586	-	335274 186865
380	**Contemporary Trade Directory Entries** Name: Rushlift Location: Plover Close, Queensway Meadows Industrial Estate, Newport, Gwent, NP19 4SZ Classification: Fork Lift Trucks **Status: Active** Positional Accuracy: Automatically positioned to the address	A9SE (W)	637	-	335182 186389
381	**Contemporary Trade Directory Entries** Name: Tarmac Location: LLANWERN WORKS, LLANWERN, NEWPORT, NP19 4QX Classification: Concrete Products **Status: Active** Positional Accuracy: Automatically positioned to the address	A7SE (SE)	677	-	336460 185920
381	**Contemporary Trade Directory Entries** Name: Tarmac Western Ltd Location: Llanwern Works, Newport, NP19 4QX Classification: Quarries **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SE (SE)	678	-	336462 185920
382	**Contemporary Trade Directory Entries** Name: Stiller Group Location: Llanwern Works, Newport, Gwent, NP19 4QZ Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	-	335106 186809
382	**Contemporary Trade Directory Entries** Name: R & R Industrial Location: Llanwern Works, Newport, Gwent, NP19 4QZ Classification: Engineering Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9NE (W)	722	-	335106 186809
383	**Contemporary Trade Directory Entries** Name: Nationwide Crash Repair Centres Location: Curlew Close, Newport, NP19 4SY Classification: Car Body Repairs **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9SE (W)	759	-	335070 186332

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
384	**Contemporary Trade Directory Entries** Name: Landrover Newport Location: Longditch Road, Queensway Meadows Industrial Estate, Newport, Gwent, NP19 4SW Classification: Car Customisation & Conversion Specialists **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A5NW (W)	801	-	335046 186275
385	**Contemporary Trade Directory Entries** Name: J & B Sewing Machines Location: Curlew Close, Newport, NP19 4SY Classification: Sewing Machines - Industrial **Status: Active** Positional Accuracy: Automatically positioned to the address	A9SW (W)	802	-	335008 186409
385	**Contemporary Trade Directory Entries** Name: Stratstone Land Rover Location: Longditch Road, Queensway Meadows Industrial Estate, Newport, NP19 4SW Classification: Car Dealers **Status: Active** Positional Accuracy: Automatically positioned to the address	A9SW (W)	846	-	334967 186387
386	**Contemporary Trade Directory Entries** Name: Motorpoint Newport Location: Meadows Road, Queensway Meadows Industrial Estate, Newport, Gwent, NP19 4SS Classification: Car Dealers - Used **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A5NW (SW)	905	-	334992 186138
386	**Contemporary Trade Directory Entries** Name: Motorpoint Location: Meadows Road, Queensway Meadows Industrial Estate, Newport, NP19 4SS Classification: Car Dealers **Status: Active** Positional Accuracy: Automatically positioned to the address	A5NW (SW)	906	-	334992 186137
387	**Contemporary Trade Directory Entries** Name: Grant Rail Location: British Steel Site,Llanwern Wks, Newport, Gwent, NP6 1XX Classification: Mechanical Engineers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A16SE (NE)	956	-	337154 187282
388	**Contemporary Trade Directory Entries** Name: Dutton Forshaw Citroen & Peugeot Location: Seven Stiles Avenue,Newport Retail Park, Newport, Gwent, NP19 4QS Classification: Car Dealers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A9NW (W)	1000	-	334825 186832
388	**Contemporary Trade Directory Entries** Name: Robins & Day Newport Location: Seven Stiles Avenue,Newport Retail Park, Newport, Gwent, NP19 4QS Classification: Car Dealers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A9NW (W)	1000	-	334825 186835
389	**Points of Interest - Commercial Services** Name: Stiller Group Location: Llanwern Works, Newport, NP19 4QZ Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A9NE (W)	722	9	335106 186809
389	**Points of Interest - Commercial Services** Name: Stiller Group Location: Llanwern Works, Newport, NP19 4QZ Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A9NE (W)	722	9	335106 186809
390	**Points of Interest - Commercial Services** Name: Nationwide Crash Repair Centres Ltd Location: Curlew Close, Queensway Meadows Industrial Estate, Newport, NP19 4SY Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A9SE (W)	760	9	335069 186333

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
391	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SW (SE)	47	9	336165 186536
391	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SW (SE)	71	9	336226 186484
392	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SW (SE)	74	9	336197 186487
392	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SW (SE)	82	9	336174 186489
392	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SW (SE)	84	9	336210 186473
392	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SW (S)	85	9	336142 186505
392	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SW (SE)	93	9	336225 186462
392	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SW (S)	116	9	336166 186454
392	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SW (SE)	119	9	336207 186438
392	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SW (S)	121	9	336152 186457
392	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SW (S)	150	9	336151 186424
392	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SW (S)	156	9	336114 186438

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
392	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SW (S)	157	9	336176 186406
392	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SW (S)	172	9	336112 186420
392	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SW (S)	193	9	336111 186397
393	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11NW (N)	94	9	336136 186851
394	**Points of Interest - Manufacturing and Production** Name: Spencer Steelworks Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A10NE (W)	135	9	335749 186753
395	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11NW (NE)	161	9	336275 186927
395	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11NW (NE)	187	9	336285 186955
395	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11NW (NE)	215	9	336305 186985
395	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11NW (NE)	227	9	336257 186991
395	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (NE)	235	9	336274 187002
395	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (N)	256	9	336204 187008
395	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (NE)	256	9	336284 187024

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
395	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (NE)	257	9	336245 187020
395	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (NE)	270	9	336294 187039
395	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (NE)	278	9	336255 187043
395	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (N)	282	9	336186 187032
395	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (NE)	284	9	336261 187049
395	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (N)	292	9	336199 187044
396	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11NW (NE)	204	9	336347 186973
396	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (NE)	248	9	336359 187016
397	**Points of Interest - Manufacturing and Production** Name: Spencer Steelworks Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A11SW (SE)	237	9	336405 186381
398	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (NE)	310	9	336274 187078
398	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (N)	319	9	336227 187079
398	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (N)	336	9	336252 187101

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
398	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (N)	355	9	336276 187123
398	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (NE)	359	9	336295 187129
398	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (N)	371	9	336266 187138
398	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (N)	391	9	336213 187150
398	**Points of Interest - Manufacturing and Production** Name: Spencer Steelworks Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A15SW (N)	422	9	336247 187187
399	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (N)	315	9	336195 187067
399	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (N)	361	9	336149 187120
400	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A7NW (SE)	350	9	336370 186237
400	**Points of Interest - Manufacturing and Production** Name: Tarmac (Western) Ltd Location: Llanwern Works, Newport, NP19 4QX Category: Extractive Industries Class Code: Unspecified Quarries Or Mines Positional Accuracy: Positioned to address or location	A7NE (SE)	364	9	336430 186251
400	**Points of Interest - Manufacturing and Production** Name: Tarmac Westen Ltd Location: Llanwern Works, Newport, NP19 4QX Category: Extractive Industries Class Code: Stone Quarrying and Preparation Positional Accuracy: Positioned to address or location	A7NE (SE)	364	9	336430 186251
401	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SE (SE)	360	9	336614 186392
402	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A7NW (SE)	372	9	336342 186202

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
403	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SE (NE)	384	9	336541 187097
404	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SW (N)	416	9	336083 187180
405	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A7NW (SE)	423	9	336350 186151
405	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A7NW (S)	455	9	336290 186105
406	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A9SE (W)	435	9	335362 186583
406	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A9SE (W)	450	9	335346 186563
407	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12SW (E)	511	9	336872 186654
407	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NW (E)	511	9	336873 186668
407	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NW (E)	587	9	336949 186689
408	**Points of Interest - Manufacturing and Production** Name: Steelworks Location: NP19 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A8NW (SE)	543	9	336759 186280
409	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NW (E)	548	9	336886 186887
409	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NW (E)	561	9	336889 186925

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
410	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A7NW (S)	555	9	336322 186009
410	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A7NW (S)	561	9	336321 186003
410	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A7NW (S)	565	9	336330 186000
411	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NW (E)	555	9	336914 186757
412	**Points of Interest - Manufacturing and Production** Name: Celtic Business Park Location: NP19 Category: Industrial Features Class Code: Business Parks and Industrial Estates Positional Accuracy: Positioned to an adjacent address or location	A12SW (E)	560	9	336850 186389
412	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12SW (E)	576	9	336893 186448
412	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12SW (E)	585	9	336907 186461
412	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12SW (E)	594	9	336918 186464
412	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12SW (E)	603	9	336928 186466
413	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12SW (E)	560	9	336911 186569
413	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12SW (E)	577	9	336921 186534
414	**Points of Interest - Manufacturing and Production** Name: Spencer Steelworks Location: NP19 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A9SE (W)	567	9	335232 186496

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
415	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A7NE (SE)	568	9	336523 186069
416	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A15SE (NE)	594	9	336682 187257
416	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A15SE (NE)	596	9	336695 187250
416	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A15SE (NE)	599	9	336683 187262
416	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15SE (NE)	601	9	336691 187259
417	**Points of Interest - Manufacturing and Production** Name: Steelworks Location: NP19 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A16SW (NE)	613	9	336776 187205
417	**Points of Interest - Manufacturing and Production** Name: Spencer Steelworks Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A16SW (NE)	616	9	336775 187210
418	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NW (E)	648	9	336988 186888
418	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NW (E)	649	9	336987 186897
419	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12SW (E)	650	9	337011 186658
419	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NW (E)	726	9	337088 186674
420	**Points of Interest - Manufacturing and Production** Name: Spencer Steelworks Location: NP19 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A7SE (SE)	667	9	336508 185951

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
420	**Points of Interest - Manufacturing and Production** Name: Tarmac Location: Tarmac Ltd Lanwern Works, Queensway, Llanwern, Newport, NP19 4QX Category: Extractive Industries Class Code: Unspecified Quarries Or Mines Positional Accuracy: Positioned to address or location	A7SE (SE)	677	9	336460 185920
421	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A16SW (NE)	691	9	336961 187087
422	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NW (E)	762	9	337089 186954
422	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A16SW (E)	778	9	337091 187004
422	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A16SE (E)	805	9	337095 187071
423	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SE (NW)	776	9	335171 187061
424	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A16SE (NE)	827	9	337096 187123
425	**Points of Interest - Manufacturing and Production** Name: Spencer Steelworks Location: NP19 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A9SW (W)	828	9	334972 186478
426	**Points of Interest - Manufacturing and Production** Name: Spencer Steelworks Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A6SE (S)	835	9	335973 185728
426	**Points of Interest - Manufacturing and Production** Name: Steelworks Location: NP19 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A6SE (S)	841	9	335973 185722
427	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SE (NW)	840	9	335196 187203
428	**Points of Interest - Manufacturing and Production** Name: Spencer Steelworks Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A9NW (W)	852	9	334964 186777

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
429	**Points of Interest - Manufacturing and Production** Name: Spencer Steelworks Location: NP19 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A12NE (E)	866	9	337226 186748
430	**Points of Interest - Manufacturing and Production** Name: Spencer Steelworks Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A12SE (E)	920	9	337247 186425
430	**Points of Interest - Manufacturing and Production** Name: Steelworks Location: NP19 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A12SE (E)	920	9	337247 186424
431	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A8NE (SE)	933	9	337106 186093
432	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13NE (NW)	934	9	335216 187372
432	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13NE (NW)	935	9	335215 187372
432	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13NE (NW)	938	9	335211 187372
433	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NE (E)	939	9	337277 186928
434	**Points of Interest - Manufacturing and Production** Name: Spencer Steelworks Location: NP19 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A16SE (E)	946	9	337239 187090
434	**Points of Interest - Manufacturing and Production** Name: Spencer Steelworks Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A16SE (E)	977	9	337271 187092
435	**Points of Interest - Manufacturing and Production** Name: F T P Waters Location: Tatton Farm, Broad Street Common, Nash, Newport, NP18 2BE Category: Farming Class Code: Livestock Farming Positional Accuracy: Positioned to address or location	A5SE (SW)	956	9	335214 185796
436	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NE (E)	961	9	337323 186718

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
436	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NE (E)	986	9	337348 186720
437	**Points of Interest - Manufacturing and Production** Name: Tanks Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12SE (E)	980	9	337329 186522
437	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12SE (E)	989	9	337338 186523
437	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12SE (E)	989	9	337335 186503
437	**Points of Interest - Manufacturing and Production** Name: Tank Location: NP19 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12SE (E)	996	9	337342 186506
438	**Points of Interest - Public Infrastructure** Name: Sluice Location: NP19 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A10SE (SW)	222	9	335812 186332
438	**Points of Interest - Public Infrastructure** Name: Sluice Location: NP19 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A10SE (SW)	222	9	335817 186333
438	**Points of Interest - Public Infrastructure** Name: Sluice Location: NP19 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A10SE (SW)	227	9	335826 186328
439	**Points of Interest - Public Infrastructure** Name: Sluice Location: NP19 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A6NE (S)	246	9	335955 186319
439	**Points of Interest - Public Infrastructure** Name: Sluice Location: NP19 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A6NE (S)	337	9	335990 186226
439	**Points of Interest - Public Infrastructure** Name: Sluice Location: NP19 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A6NE (S)	338	9	335985 186225
440	**Points of Interest - Public Infrastructure** Name: Sluice Location: NP19 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A6NE (SW)	334	9	335844 186222

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
441	**Points of Interest - Public Infrastructure** Name: Sluice Location: NP19 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A6NE (S)	435	9	336034 186129
442	**Points of Interest - Public Infrastructure** Name: Sluice Location: NP19 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A6NE (S)	458	9	335892 186104
442	**Points of Interest - Public Infrastructure** Name: Sluice Location: NP19 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A6NE (S)	458	9	335896 186105
443	**Points of Interest - Public Infrastructure** Name: Sluice Location: NP19 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A12NW (E)	471	9	336816 186842
443	**Points of Interest - Public Infrastructure** Name: Sluice Location: NP19 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A12NW (E)	484	9	336819 186889
444	**Points of Interest - Public Infrastructure** Name: Slag Heap Location: NP19 Category: Infrastructure and Facilities Class Code: Waste Storage, Processing and Disposal Positional Accuracy: Positioned to an adjacent address or location	A7NE (SE)	538	9	336526 186105
444	**Points of Interest - Public Infrastructure** Name: Slag Heap Location: NP19 Category: Infrastructure and Facilities Class Code: Refuse Disposal Facilities Positional Accuracy: Positioned to an adjacent address or location	A7NE (SE)	550	9	336469 186062
445	**Points of Interest - Public Infrastructure** Name: Sluice Location: NP19 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A15NE (NE)	580	9	336431 187341
446	**Points of Interest - Public Infrastructure** Name: Slag Heap Location: NP19 Category: Infrastructure and Facilities Class Code: Refuse Disposal Facilities Positional Accuracy: Positioned to an adjacent address or location	A8NW (SE)	622	9	336797 186203
447	**Points of Interest - Public Infrastructure** Name: Slag Heap Location: NP19 Category: Infrastructure and Facilities Class Code: Refuse Disposal Facilities Positional Accuracy: Positioned to an adjacent address or location	A7SE (SE)	704	9	336618 185965
448	**Points of Interest - Public Infrastructure** Name: Slag Heap Location: NP19 Category: Infrastructure and Facilities Class Code: Waste Storage, Processing and Disposal Positional Accuracy: Positioned to an adjacent address or location	A8NW (SE)	889	9	337055 186096
449	**Points of Interest - Public Infrastructure** Name: Slag Heap Location: NP19 Category: Infrastructure and Facilities Class Code: Refuse Disposal Facilities Positional Accuracy: Positioned to an adjacent address or location	A8NW (SE)	961	9	337065 185994

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
450	**Points of Interest - Recreational and Environmental** Name: Play Area Location: NP19 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A10NW (NW)	344	9	335583 186891
451	**Points of Interest - Recreational and Environmental** Name: Play Area Location: NP19 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A10NW (W)	381	9	335446 186749
452	**Points of Interest - Recreational and Environmental** Name: Play Area Location: NP19 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A9SE (W)	402	9	335396 186598
453	**Points of Interest - Recreational and Environmental** Name: Play Area Location: NP19 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A9NE (W)	468	9	335346 186723
453	**Points of Interest - Recreational and Environmental** Name: Play Area Location: NP19 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A9NE (W)	501	9	335339 186804
454	**Points of Interest - Recreational and Environmental** Name: Play Area Location: NP19 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A9SE (W)	523	9	335274 186593
455	**Points of Interest - Recreational and Environmental** Name: Play Area Location: NP19 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A9NE (W)	564	9	335251 186740
456	**Points of Interest - Recreational and Environmental** Name: Play Area Location: NP19 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A9NE (W)	802	9	335083 186966
456	**Points of Interest - Recreational and Environmental** Name: Play Area Location: NP19 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A9NW (W)	818	9	335035 186899
457	**Points of Interest - Recreational and Environmental** Name: Play Area Location: NP18 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A15NE (NE)	879	9	336635 187597
458	**Points of Interest - Recreational and Environmental** Name: Play Area Location: NP19 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A13SE (NW)	904	9	335080 187152
459	**Points of Interest - Recreational and Environmental** Name: Play Area Location: NP19 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A13SW (W)	944	9	334977 187069

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
460	**Underground Electrical Cables** Unique Feature Identifier: 10005592 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 27th October 2017	A12SE (E)	965	10	337283 186389
461	**Underground Electrical Cables** Unique Feature Identifier: 10005510 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 27th October 2017	A12SE (E)	966	10	337283 186384
462	**Underground Electrical Cables** Unique Feature Identifier: 10007516 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 27th October 2017	A12SE (E)	973	10	337288 186374
463	**Underground Electrical Cables** Unique Feature Identifier: 10005509 Cable Status: Commissioned Cable Type: Alternating Current Record Last Updated: 27th October 2017	A12SE (E)	975	10	337289 186374

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
464	**Ancient Woodland** Name: Not Supplied Reference: 8382 Area(m²): 94558.08 Type: Ancient and Semi-Natural Woodland	A18SE (N)	937	2	336041 187700
465	**Ancient Woodland** Name: Not Supplied Reference: 15604 Area(m²): 8307.38 Type: Ancient and Semi-Natural Woodland	A14NW (NW)	956	2	335542 187608
466	**Sites of Special Scientific Interest** Name: Gwent Levels - Nash And Goldcliff Multiple Areas: Y Total Area (m2): 7606485.93 Source: Natural Resources Wales Reference: 64933wdb Designation Details: Biological Designation Date: 20th August 1987 Date Type: Notified	A6NE (S)	220	2	336058 186311

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices		
Newport City Council - Public Protection and Environmental Services	January 2015	Annual Rolling Update
Natural Resources Wales	June 2020	Annually
Monmouthshire Council - Environment Department	September 2017	Annual Rolling Update
Discharge Consents		
Environment Agency - Welsh Region	August 2014	Quarterly
Natural Resources Wales	October 2022	Quarterly
Enforcement and Prohibition Notices		
Environment Agency - Welsh Region	March 2013	
Integrated Pollution Controls		
Environment Agency - Welsh Region	January 2009	
Integrated Pollution Prevention And Control		
Environment Agency - Welsh Region	January 2021	Quarterly
Natural Resources Wales	October 2022	Quarterly
Local Authority Integrated Pollution Prevention And Control		
Monmouthshire Council - Environmental Health Department	June 2014	Variable
Newport City Council - Public Protection and Environmental Services	June 2014	Variable
Local Authority Pollution Prevention and Controls		
Monmouthshire Council - Environmental Health Department	June 2014	Annual Rolling Update
Newport City Council - Public Protection and Environmental Services	June 2014	Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements		
Monmouthshire Council - Environmental Health Department	June 2014	Variable
Newport City Council - Public Protection and Environmental Services	June 2014	Variable
Nearest Surface Water Feature		
Ordnance Survey	September 2022	
Pollution Incidents to Controlled Waters		
Environment Agency - Welsh Region	December 1998	
Prosecutions Relating to Authorised Processes		
Environment Agency - Welsh Region	July 2015	
Natural Resources Wales	July 2015	
Prosecutions Relating to Controlled Waters		
Environment Agency - Welsh Region	March 2013	
Natural Resources Wales	March 2013	
Registered Radioactive Substances		
Natural Resources Wales	January 2015	
Environment Agency - Welsh Region	June 2016	As notified
River Quality		
Environment Agency - Head Office	November 2001	Not Applicable
River Quality Biology Sampling Points		
Environment Agency - Head Office	April 2012	
River Quality Chemistry Sampling Points		
Environment Agency - Head Office	April 2012	
Substantiated Pollution Incident Register		
Environment Agency Wales - South East Area	January 2021	Quarterly
Natural Resources Wales	October 2022	Quarterly
Water Abstractions		
Environment Agency - Welsh Region	October 2022	Quarterly
Natural Resources Wales	October 2022	Quarterly
Water Industry Act Referrals		
Environment Agency - Welsh Region	October 2017	
Natural Resources Wales	October 2022	Quarterly

Data Currency

Agency & Hydrological	Version	Update Cycle
Groundwater Vulnerability Map Natural Resources Wales	June 2018	As notified
Bedrock Aquifer Designations Natural Resources Wales	January 2018	Annually
Superficial Aquifer Designations Natural Resources Wales	January 2018	Annually
Source Protection Zones Natural Resources Wales	July 2022	Annual Rolling Update
Extreme Flooding from Rivers or Sea without Defences Natural Resources Wales	September 2020	
Flooding from Rivers or Sea without Defences Natural Resources Wales	September 2020	
Areas Benefiting from Flood Defences Natural Resources Wales	November 2019	Quarterly
Flood Water Storage Areas Natural Resources Wales	August 2019	Quarterly
Flood Defences Natural Resources Wales	November 2019	Quarterly
OS Water Network Lines Ordnance Survey	October 2022	Quarterly
Surface Water 1 in 30 year Flood Extent Natural Resources Wales	May 2018	Annually
Surface Water 1 in 100 year Flood Extent Natural Resources Wales	May 2018	Annually
Surface Water 1 in 1000 year Flood Extent Natural Resources Wales	May 2018	Annually
Surface Water Suitability Natural Resources Wales	February 2016	Annually
BGS Groundwater Flooding Susceptibility British Geological Survey - National Geoscience Information Service	May 2013	As notified

Waste	Version	Update Cycle
BGS Recorded Landfill Sites		
British Geological Survey - National Geoscience Information Service	November 2002	As notified
Historical Landfill Sites		
Natural Resources Wales	July 2019	Quarterly
Integrated Pollution Control Registered Waste Sites		
Environment Agency - Welsh Region	January 2009	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries)		
Natural Resources Wales	October 2021	Quarterly
Environment Agency Wales - South East Area	October 2022	Quarterly
Licensed Waste Management Facilities (Locations)		
Environment Agency Wales - South East Area	July 2021	Quarterly
Natural Resources Wales	July 2022	Quarterly
Local Authority Landfill Coverage		
Monmouthshire Council - Environment	February 2003	Not Applicable
Newport City Council	February 2003	Not Applicable
Local Authority Recorded Landfill Sites		
Monmouthshire Council - Environment	October 2018	
Newport City Council	October 2018	
Potentially Infilled Land (Non-Water)		
Landmark Information Group Limited	December 1999	Not Applicable
Potentially Infilled Land (Water)		
Landmark Information Group Limited	December 1999	
Registered Landfill Sites		
Environment Agency Wales - South East Area	March 2006	Not Applicable
Registered Waste Transfer Sites		
Environment Agency Wales - South East Area	April 2018	
Registered Waste Treatment or Disposal Sites		
Environment Agency Wales - South East Area	June 2015	
Hazardous Substances	**Version**	**Update Cycle**
Control of Major Accident Hazards Sites (COMAH)		
Health and Safety Executive	January 2022	Bi-Annually
Explosive Sites		
Health and Safety Executive	March 2017	Annually
Notification of Installations Handling Hazardous Substances (NIHHS)		
Health and Safety Executive	August 2001	
Planning Hazardous Substance Enforcements		
Monmouthshire Council - Environment	February 2016	Variable
Newport City Council - Planning Department	October 2015	Variable
Planning Hazardous Substance Consents		
Monmouthshire Council - Environment	February 2016	Variable
Newport City Council - Planning Department	October 2015	Variable

Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology British Geological Survey - National Geoscience Information Service	January 2009	As notified
BGS Estimated Soil Chemistry British Geological Survey - National Geoscience Information Service	December 2015	As notified
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	November 2022	Bi-Annually
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB) Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011 November 2020	As notified
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	Annual Rolling Update
Mining Instability Ove Arup & Partners	June 1998	Not Applicable
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	April 2020	As notified
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	September 2022	Annually
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	September 2022	Annually

Data Currency

Industrial Land Use	Version	Update Cycle
Contemporary Trade Directory Entries Thomson Directories	October 2022	Quarterly
Fuel Station Entries Catalist Ltd - Experian	August 2022	Quarterly
Gas Pipelines National Grid	October 2021	Bi-Annually
Points of Interest - Commercial Services PointX	December 2022	Quarterly
Points of Interest - Education and Health PointX	December 2022	Quarterly
Points of Interest - Manufacturing and Production PointX	December 2022	Quarterly
Points of Interest - Public Infrastructure PointX	December 2022	Quarterly
Points of Interest - Recreational and Environmental PointX	December 2022	Quarterly
Underground Electrical Cables National Grid	May 2021	Bi-Annually

Sensitive Land Use	Version	Update Cycle
Ancient Woodland		
Natural Resources Wales	September 2018	Bi-Annually
Areas of Adopted Green Belt		
Monmouthshire Council	July 2022	Quarterly
Newport City Council	July 2022	Quarterly
Areas of Unadopted Green Belt		
Monmouthshire Council	July 2022	Quarterly
Newport City Council	July 2022	Quarterly
Areas of Outstanding Natural Beauty		
Natural Resources Wales	August 2022	Bi-Annually
Environmentally Sensitive Areas		
The National Assembly for Wales - GI Services (Department of Planning & Countryside)	January 2017	
Forest Parks		
Forestry Commission	April 1997	Not Applicable
Local Nature Reserves		
Monmouthshire Council	August 2018	Bi-Annually
Newport City Council	August 2018	Bi-Annually
Marine Nature Reserves		
Natural Resources Wales	August 2018	Bi-Annually
National Nature Reserves		
Natural Resources Wales	February 2022	Bi-Annually
National Parks		
Natural Resources Wales	February 2018	Annually
Nitrate Vulnerable Zones		
The National Assembly for Wales - GI Services (Department of Planning & Countryside)	April 2016	
Natural Resources Wales	July 2019	Bi-Annually
Ramsar Sites		
Natural Resources Wales	July 2019	Bi-Annually
Sites of Special Scientific Interest		
Natural Resources Wales	March 2020	Bi-Annually
Special Areas of Conservation		
Natural Resources Wales	August 2020	Bi-Annually
Special Protection Areas		
Natural Resources Wales	August 2018	Bi-Annually

Data Suppliers

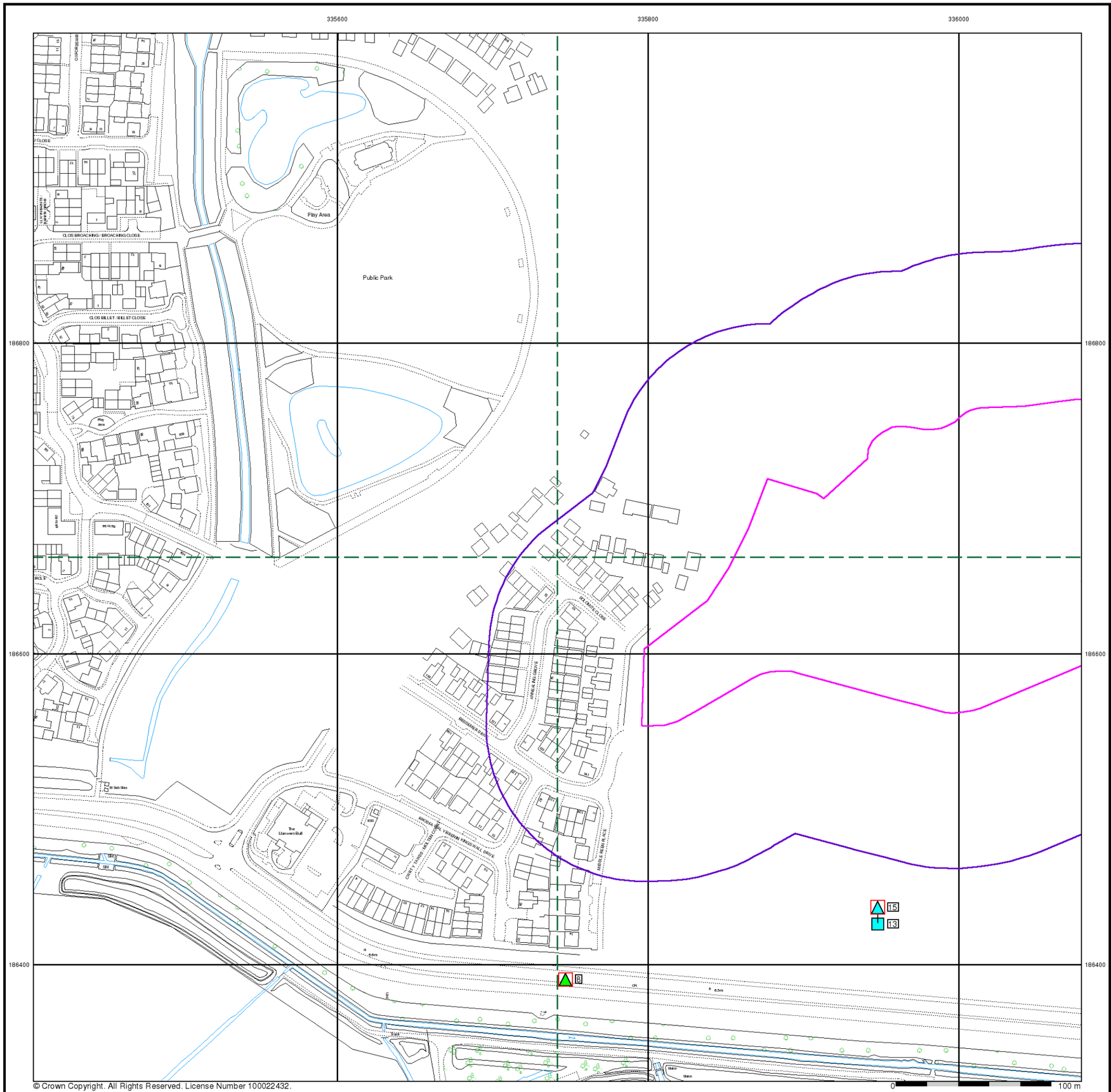
A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
Environment Agency	
Scottish Environment Protection Agency	
The Coal Authority	
British Geological Survey	
Centre for Ecology and Hydrology	
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Stantec UK Ltd	

Useful Contacts

Contact	Name and Address	Contact Details
1	**British Geological Survey - Enquiry Service** British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
2	**Natural Resources Wales** Ty Cambria, 29 Newport Road, Cardiff, CF24 0TP	Telephone: 0300 065 3000 Email: enquiries@naturalresourceswales.gov.uk
3	**Environment Agency - National Customer Contact Centre (NCCC)** PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
4	**Newport City Council - Public Protection and Environmental Services** Civic Centre, Newport, Gwent, NP20 4UR	Telephone: 01633 656656 Fax: 01633 232429 Website: www.newport.gov.uk
5	**Ordnance Survey** Adanac Drive, Southampton, Hampshire, SO16 0AS	Telephone: 03456 05 05 05 Email: customerservices@ordnancesurvey.co.uk Website: www.ordnancesurvey.gov.uk
6	**Newport City Council** Civic Centre, Newport, South Wales, NP9 4UR	Telephone: 01633 656656 Fax: 01633 244721 Website: www.newport.gov.uk
7	**Health and Safety Executive** 5S.2 Redgrave Court, Merton Road, Bootle, L20 7HS	Website: www.hse.gov.uk
8	**Newport City Council - Planning Department** Civic Centre, Newport, South Wales, NP9 4UR	Telephone: 01633 656656 Fax: 01633 244721 Website: www.newport.gov.uk
9	**PointX** 7 Abbey Court, Eagle Way, Sowton, Exeter, Devon, EX2 7HY	Website: www.pointx.co.uk
10	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9966 Fax: 0844 844 9951 Email: helpdesk@landmark.co.uk Website: www.landmark.co.uk
-	**Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards** Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.



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- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location
- Pylon
- Overhead Transmission Line

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
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- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

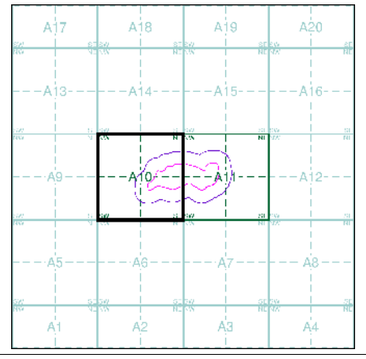
Geological

- BGS Recorded Mineral Site

Waste

- BGS Recorded Landfill Site (Location)
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- EA Historic Landfill (Polygon)
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- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Site Sensitivity Map - Segment A10



Order Details

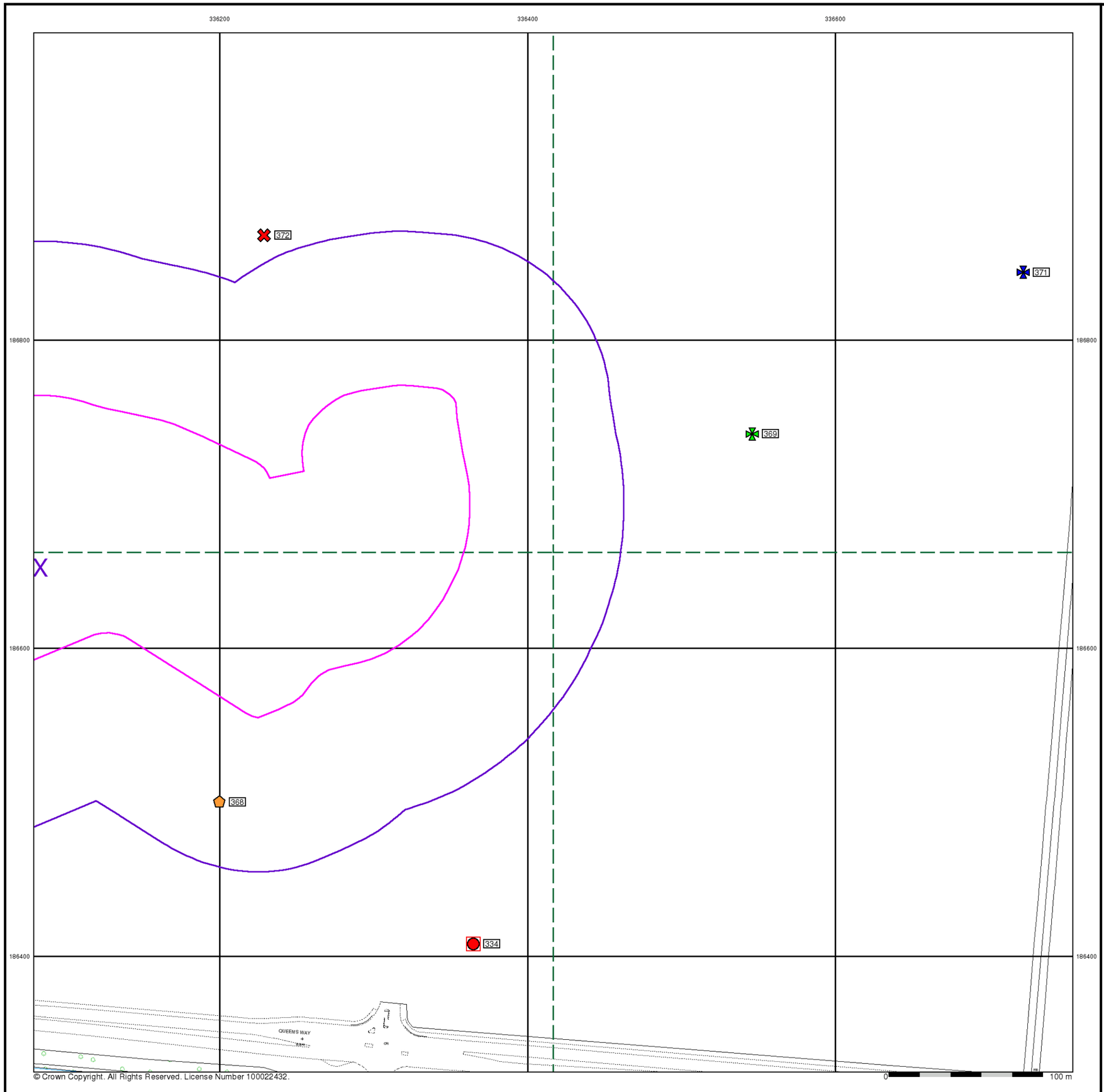
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Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Plot Buffer (m):	100

Site Details

Site at 336079,186662

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- Specified Site
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- Several of Type at Location
- Pylon
- Overhead Transmission Line

Agency and Hydrological

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- Water Industry Act Referral

Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

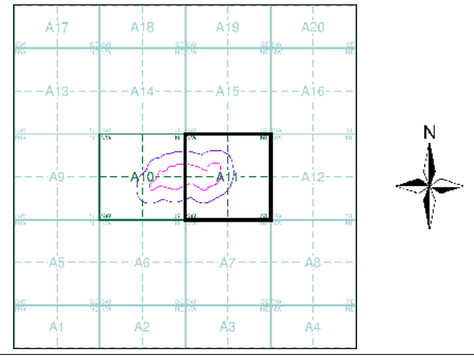
Geological

- BGS Recorded Mineral Site

Waste

- BGS Recorded Landfill Site (Location)
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- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Site Sensitivity Map - Segment A11



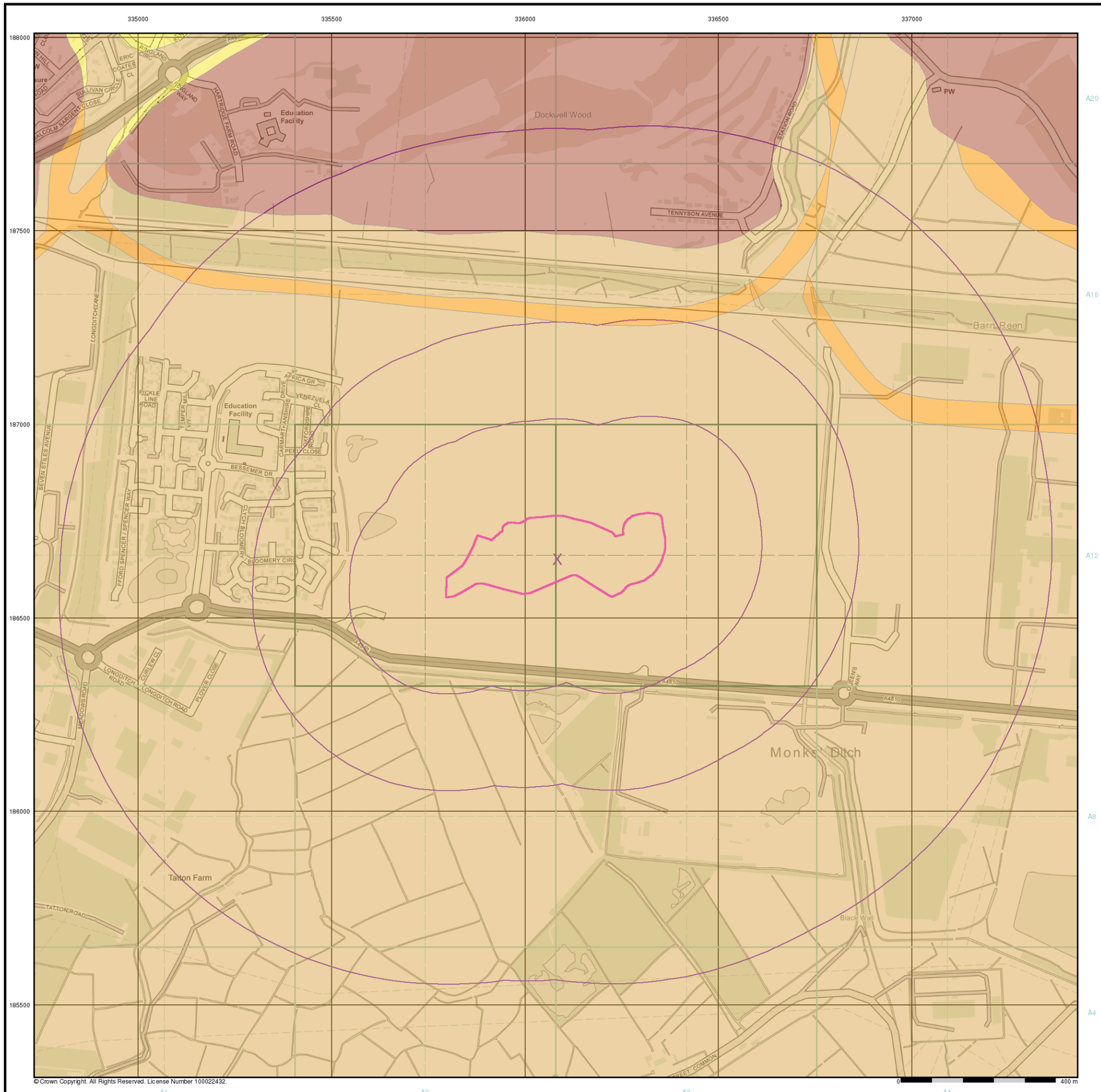
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Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Plot Buffer (m):	100

Site Details

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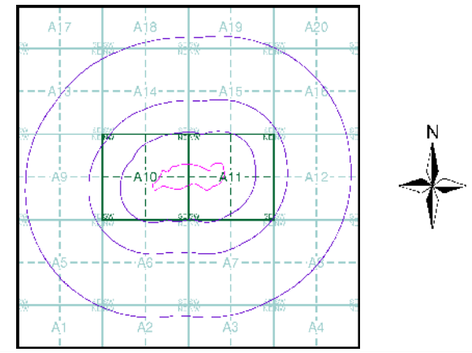
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Arsenic

Arsenic Concentrations mg/kg

- < 15
- 15 - 25
- 25 - 35
- 35 - 45
- 45 - 60
- 60 - 120
- > 120

Estimated Soil Chemistry Arsenic - Slice A



Order Details

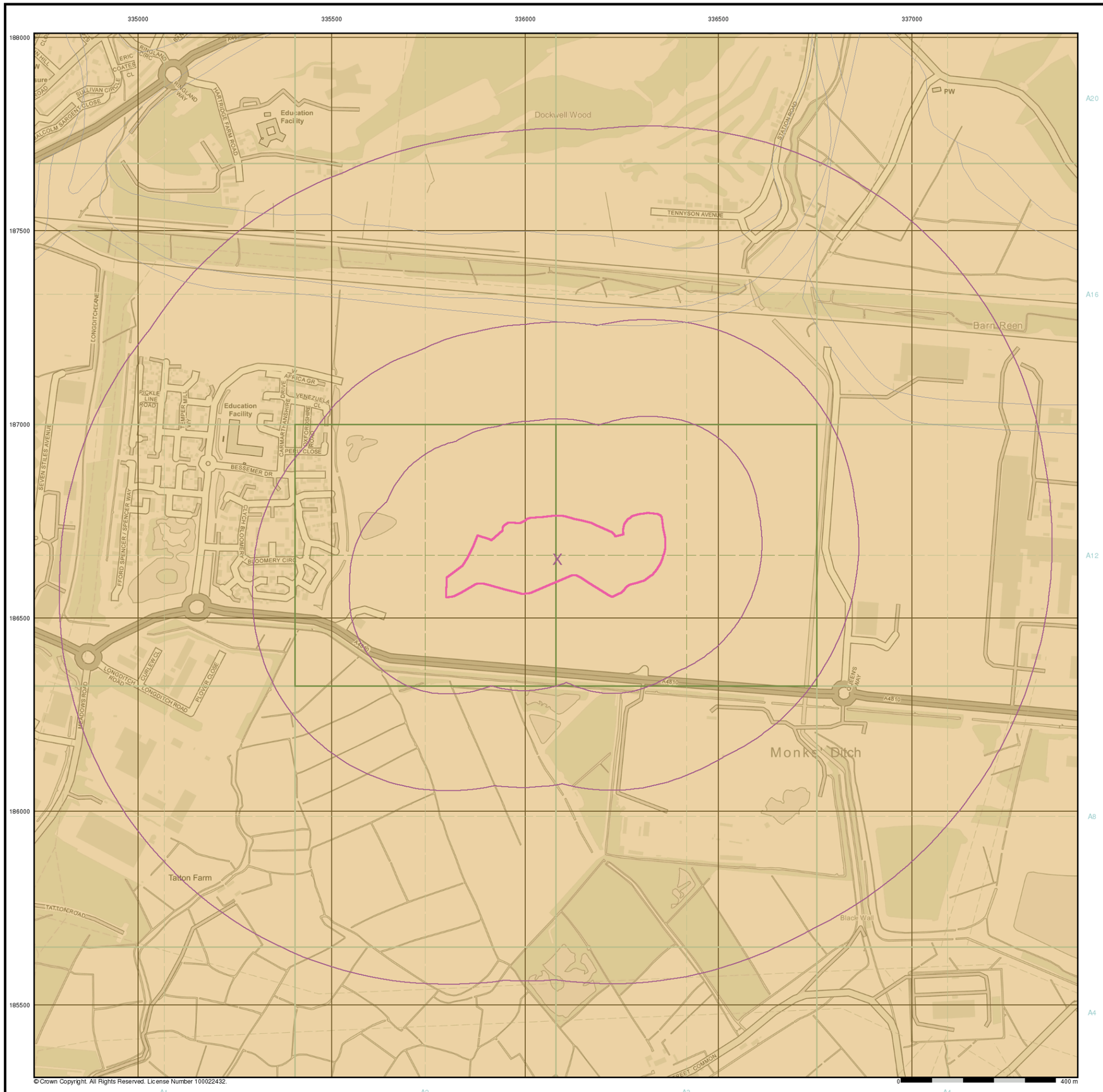
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National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

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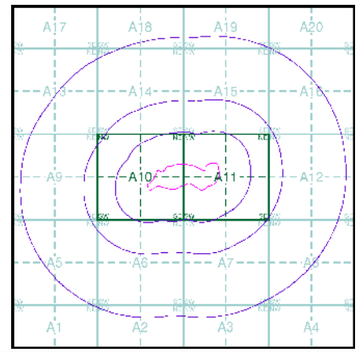
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Cadmium

Cadmium Concentrations mg/kg

- < 1.8
- 1.8 - 2.2
- 2.2 - 3.0
- > 3.0

Estimated Soil Chemistry Cadmium - Slice A



Order Details

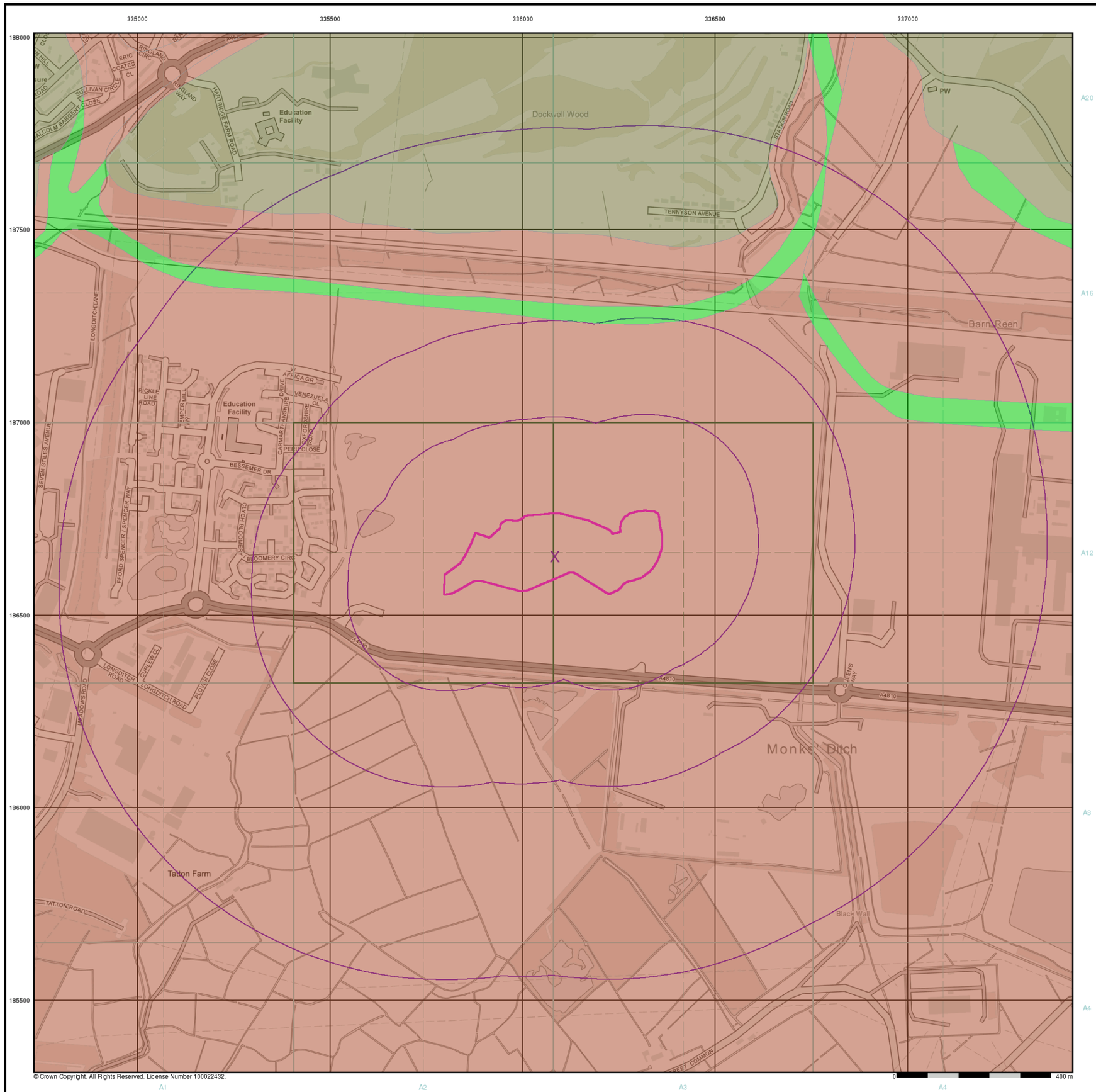
Order Details:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

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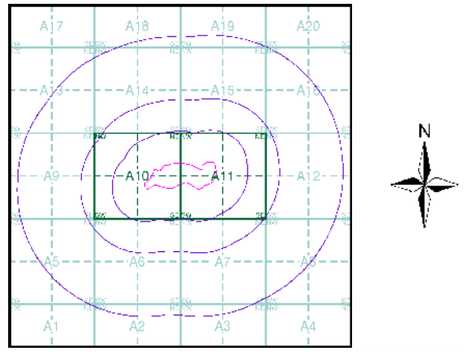
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Chromium

Chromium Concentrations mg/kg

- < 20
- 20 - 40
- 40 - 60
- 60 - 90
- 90 - 120
- 120 - 180
- > 180

Estimated Soil Chemistry Chromium - Slice A



Order Details

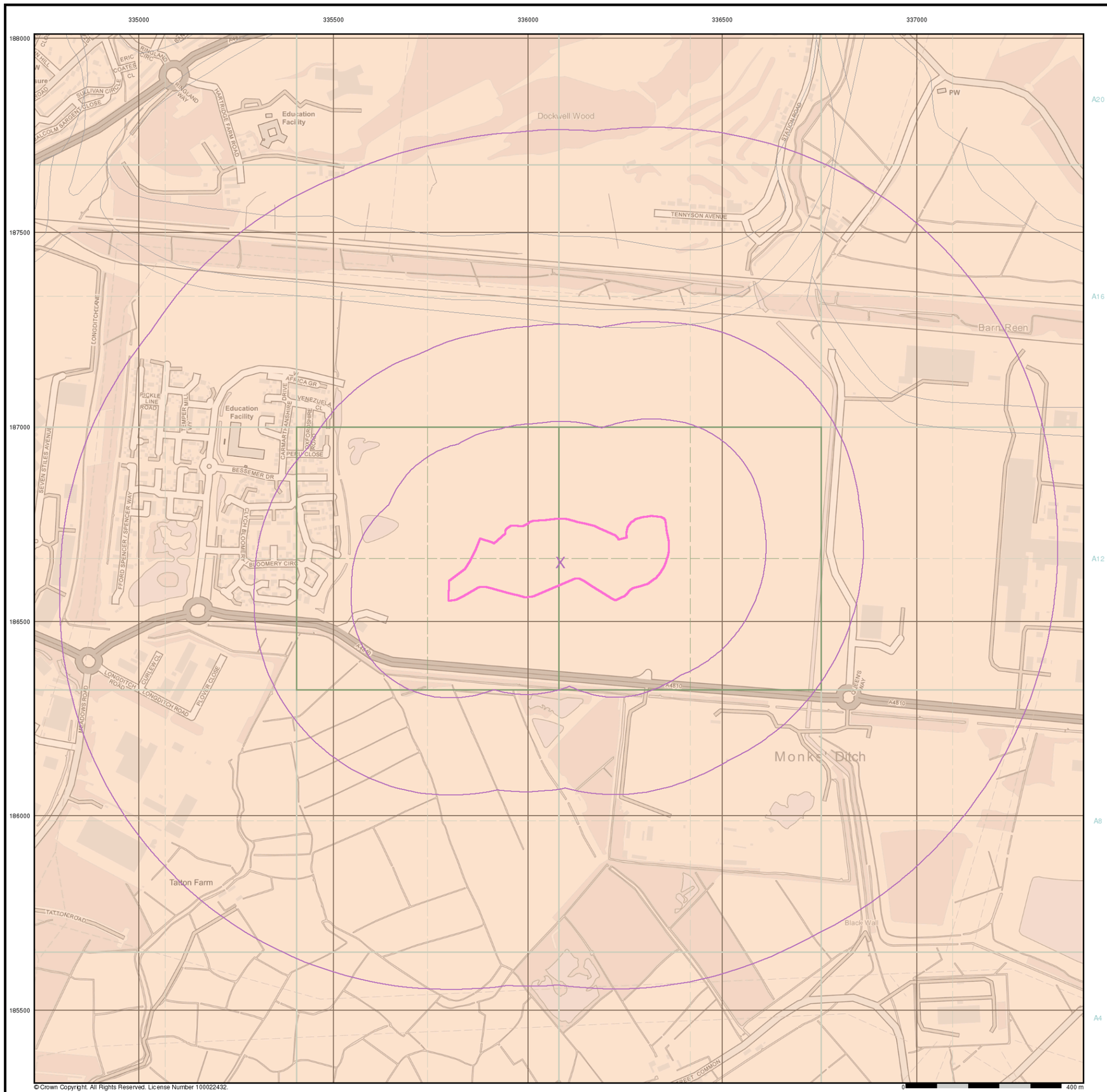
Order Details:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

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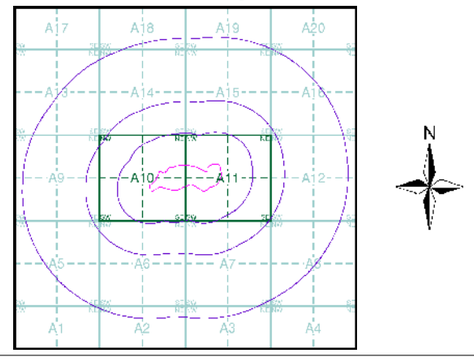
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Lead

Lead Concentrations mg/kg

- <100 mg/kg
- 100 - 200
- 200 - 300
- 300 - 600
- 600 - 1200
- >1200

Estimated Soil Chemistry Lead - Slice A



Order Details

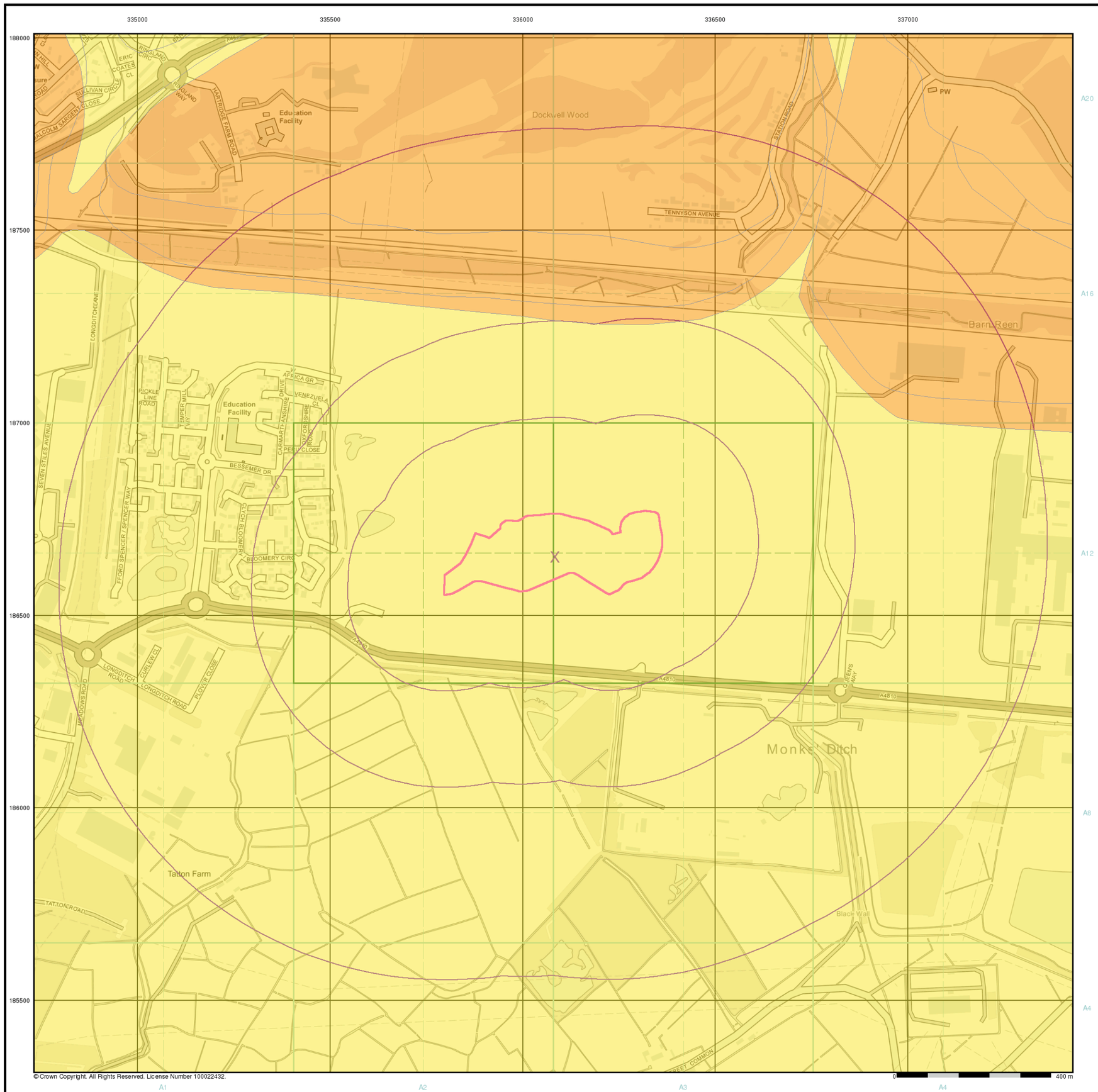
Order Details:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

Site at 336079,186662

Landmark INFORMATION GROUP

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General

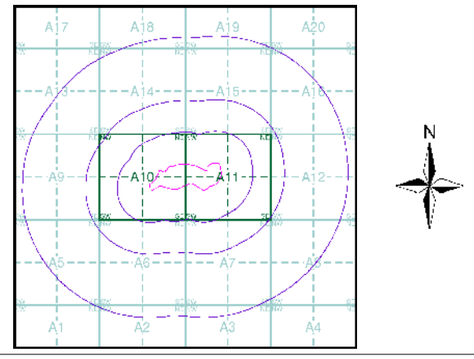
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Nickel

Nickel Concentrations mg/kg

- < 15
- 15 - 30
- 30 - 45
- 45 - 60
- 60 - 80
- 80 - 100
- > 100

Estimated Soil Chemistry Nickel - Slice A



Order Details

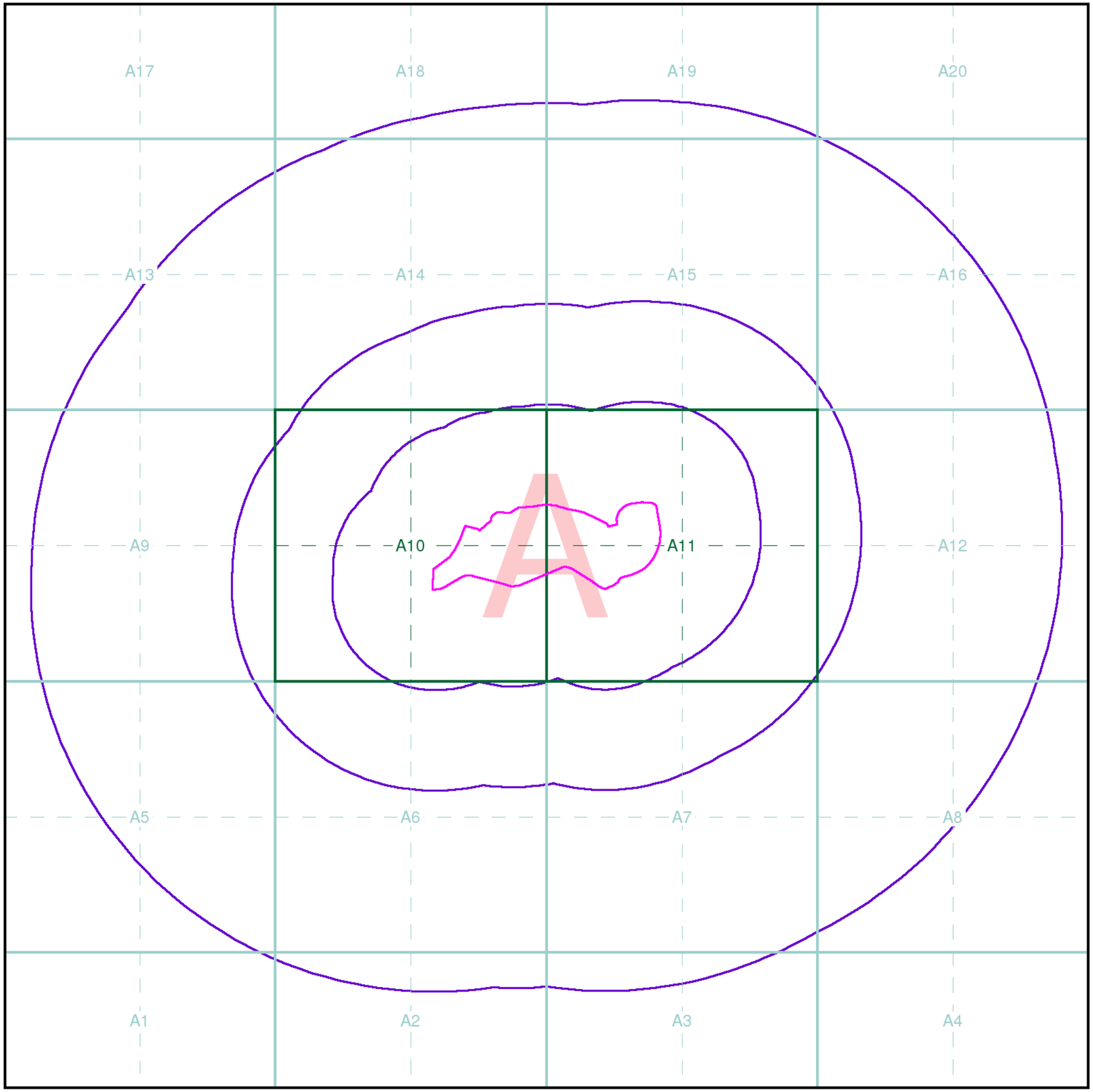
Order Details:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

Site at 336079,186662

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Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice
Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

Segment
A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant
A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:

Map data

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Cyfoeth Naturiol Cymru
Natural Resources Wales

Envirocheck reports are compiled from 136 different sources of data.

Client Details

Mr R Taylor, Rodgers Leask Ltd, Rodgers Leask Ltd,
Seven House, 18 High Street, Longbridge, Birmingham,
B31 2UQ

Order Details

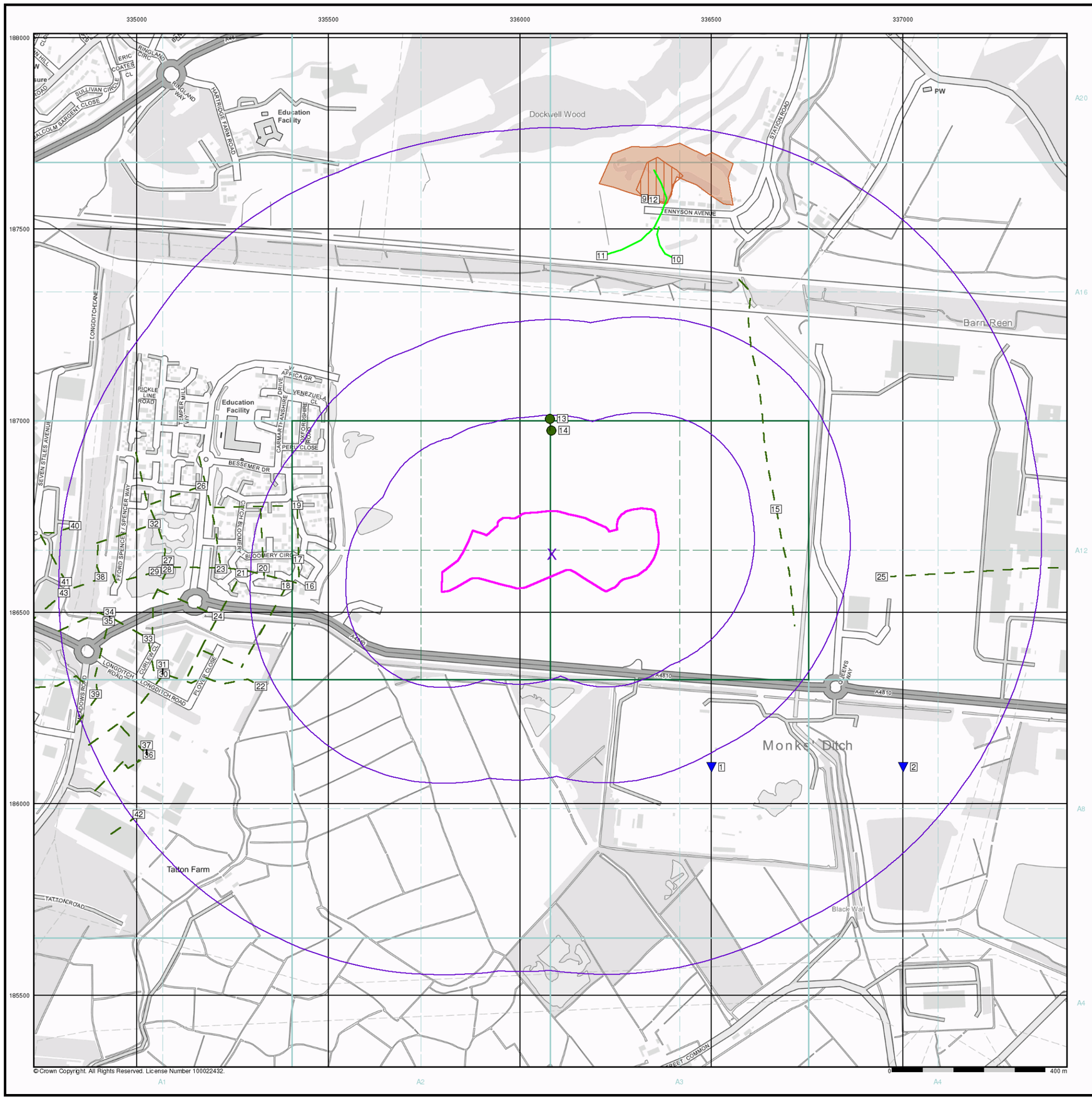
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336100, 186660
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

Site at 336079,186662

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http://www.landmarkinfo.co.uk/Terms/Show/515

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Historical Land Use Information (1:10,000)

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Map ID

Several of Type at Location

Potentially Contaminative Industrial Uses (Past Land Uses - Mining)

	Point	Line	Polygon
Air Shafts	◆		
Disturbed Ground	◆		
General Quarrying	◆		
Heap, unknown constituents	◆		
Mineral Railway	◆		
Mining and Quarrying General	◆		
Mining of Coal & Lignite	◆		
Quarrying of Sand and Clay, Operation of Sand and Gravel Pits	◆		

Historical Land Use

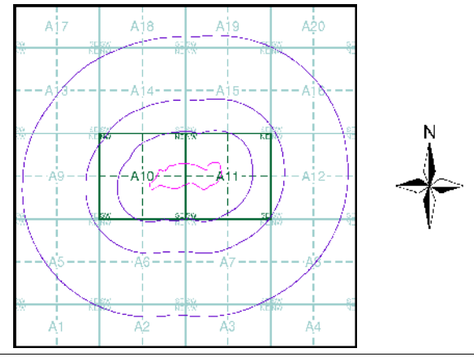
	Point	Line	Polygon
Potentially Infilled Land (Non-Water)	●		
Potentially Infilled Land (Water)	●		
Former Marsh	✠		

Mining Data

Potential Mining Area

BGS Recorded Mineral Site

Mining and Ground Stability - Slice A



Order Details

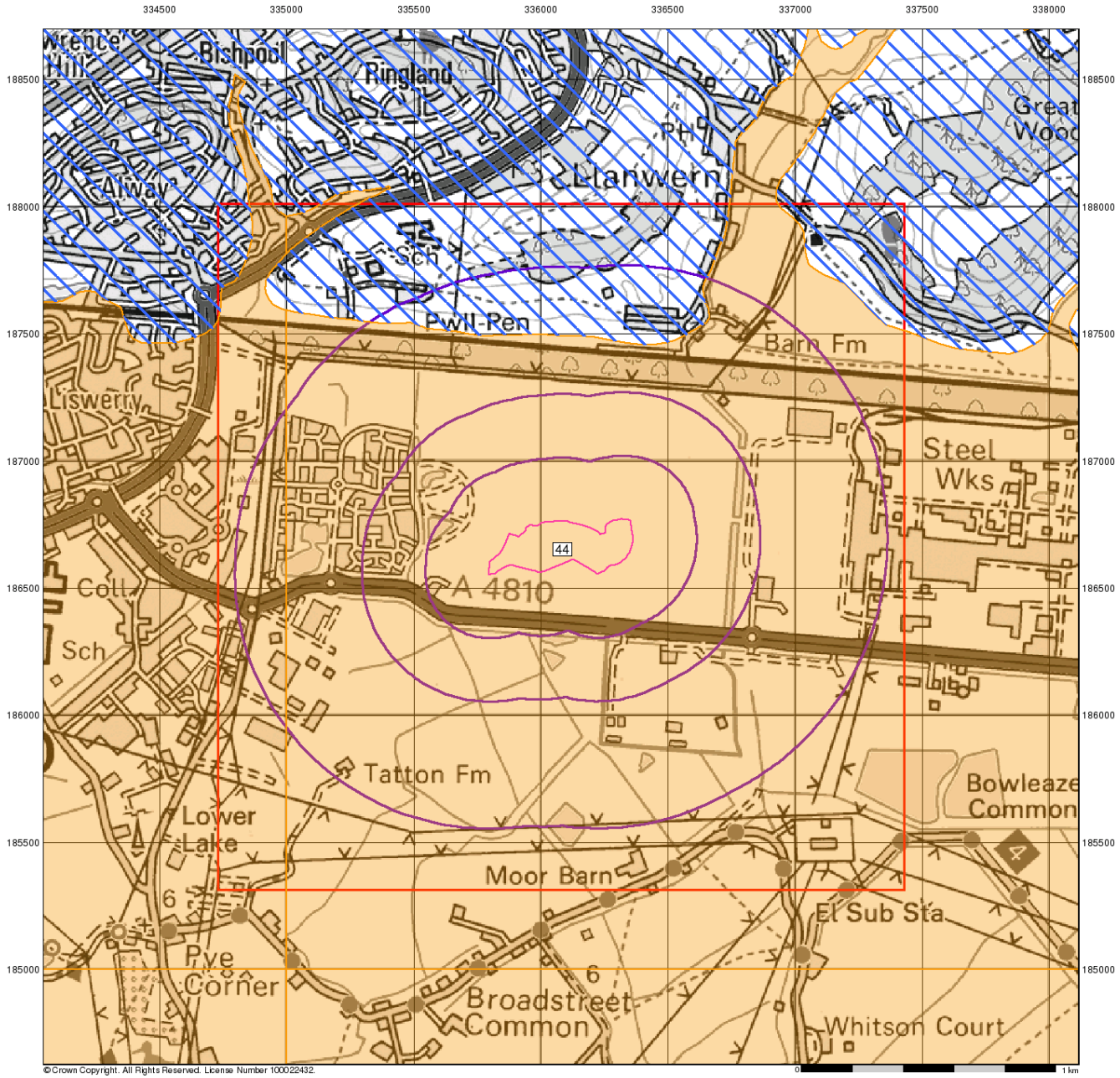
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

Site at 336079,186662

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Ground Stability Data (1:50,000)

General

Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Potential for Compressible Ground Stability Hazards

High | Low
Moderate | Very Low

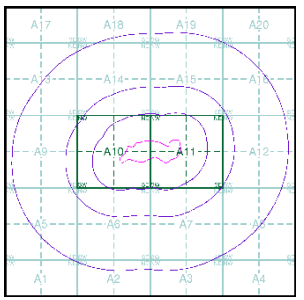
Potential for Collapsible Ground Stability Hazards

High | Low
Moderate | Very Low

Brine Pumping and Salt Mining

	Point	Polygon
Brine Pumping Related Feature	▲	▨
Salt Mining Related Feature	▲	▨

Mining and Ground Stability - Slice A



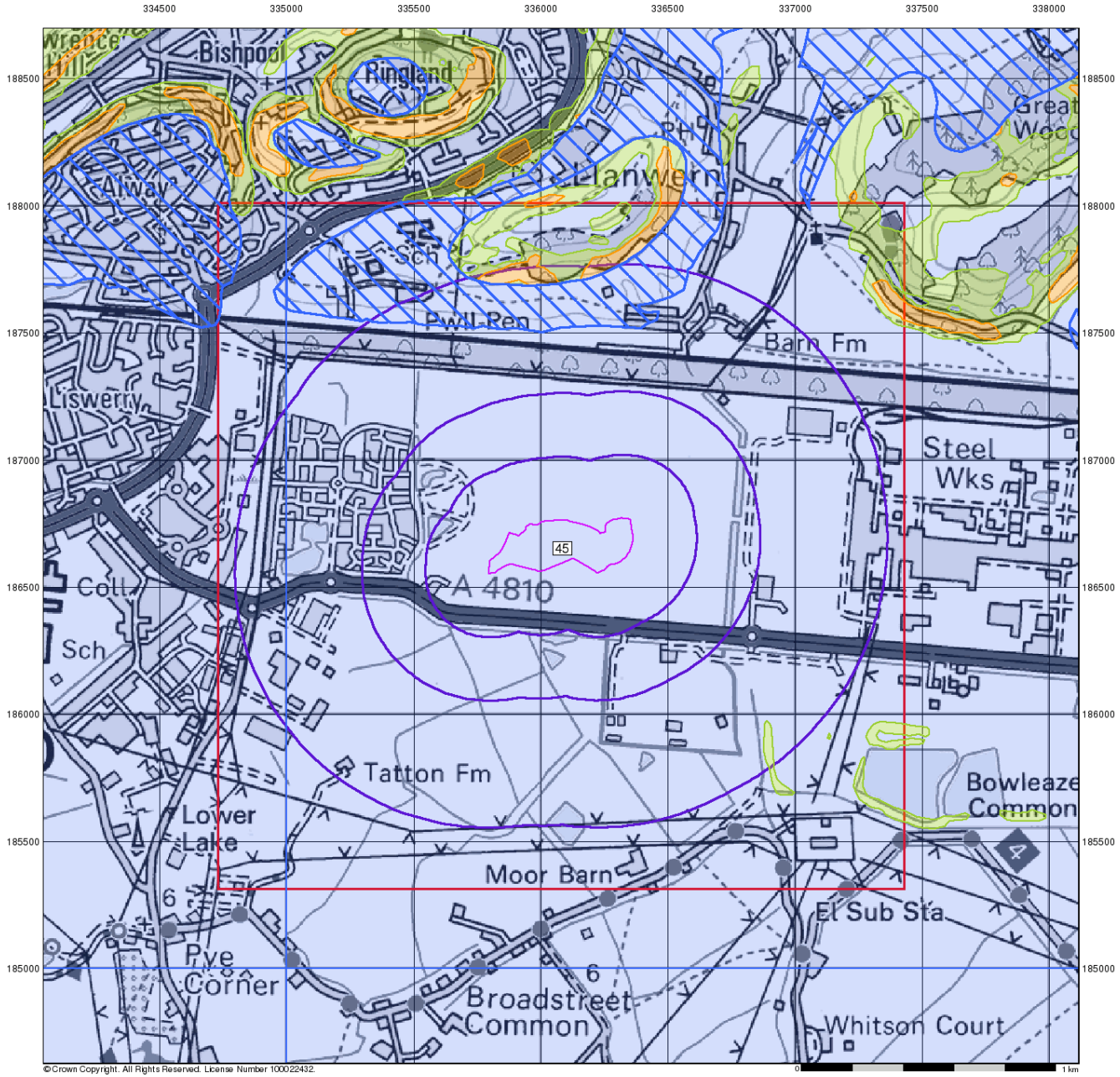
Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

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Ground Stability Data (1:50,000)

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

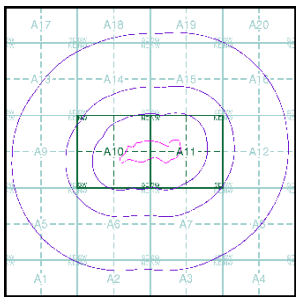
Potential for Landslide Ground Stability Hazards

High | Low | Moderate | Very Low

Potential for Ground Dissolution Stability Hazards

High | Low | Moderate | Very Low

Mining and Ground Stability - Slice A



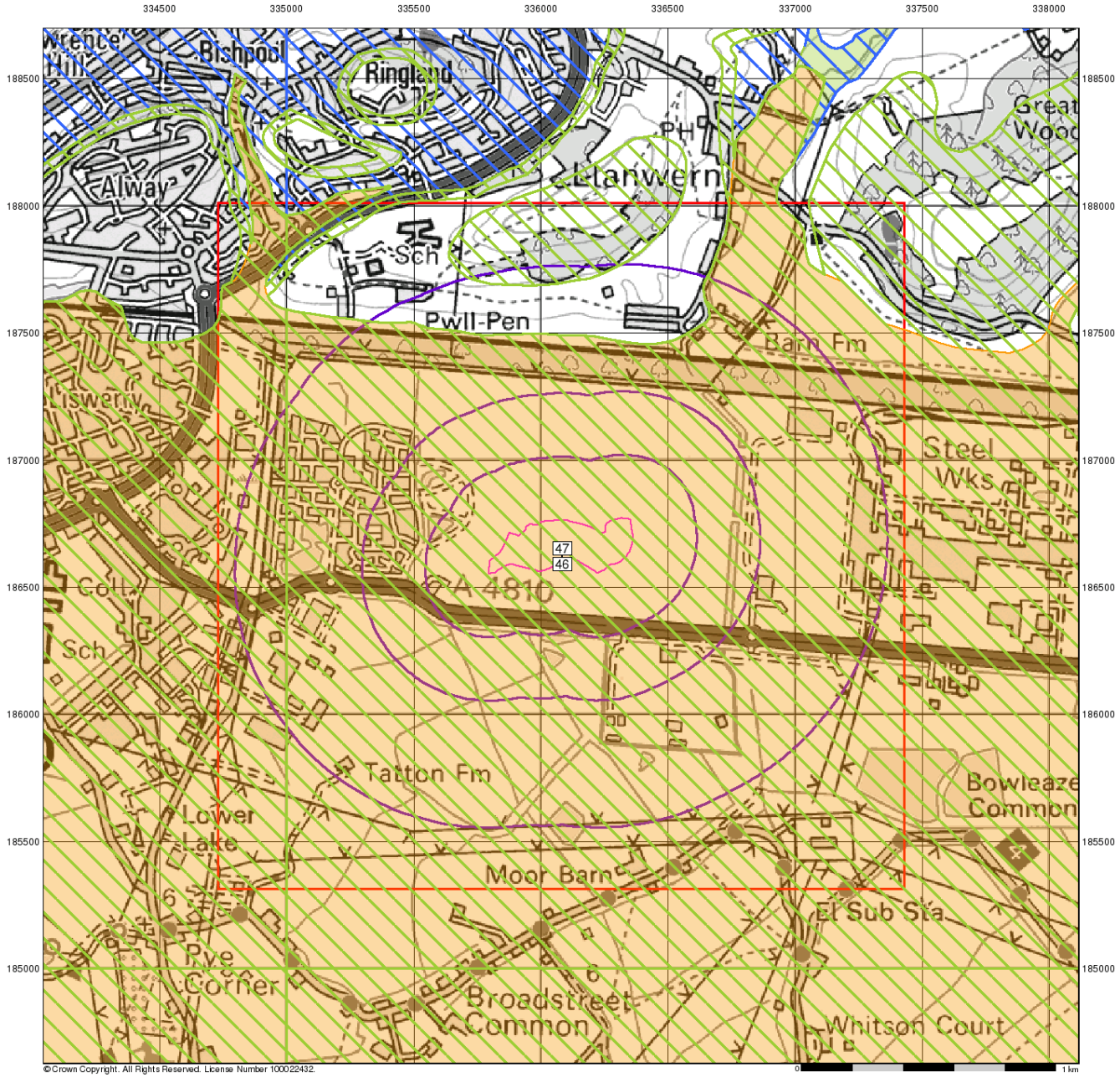
Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

Site at 336079,186662

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Ground Stability Data (1:50,000)

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

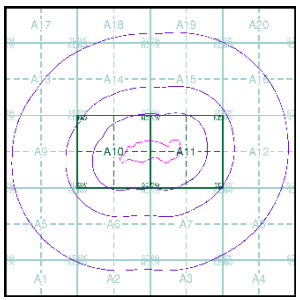
Potential for Running Sand Ground Stability Hazards

High | Low | Moderate | Very Low

Potential for Shrinking or Swelling Clay Ground Stability Hazards

High | Low | Moderate | Very Low

Mining and Ground Stability - Slice A



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

Site at 336079,186662

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Envirocheck® Report:

Mining and Ground Stability Datasheet

Order Details:

Order Number:
304885831_1_1

Customer Reference:
Llanwern 4c 4g 4e

National Grid Reference:
336080, 186650

Slice:
A

Site Area (Ha):
8.34

Search Buffer (m):
1000

Site Details:

Site at 336079,186662

Client Details:

Mr R Taylor
Rodgers Leask Ltd
Rodgers Leask Ltd
Seven House
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Longbridge
Birmingham
B31 2UQ

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Contents

Report Section and Details	Page Number
Summary	-
The Summary section provides an overview of the data contained within the report, detailing the number of data set features or the existence of a data set in relation to the buffer selected. For ease of reference, the report is broken down into 4 sections of data; Mining and Natural Cavities Data, Historical Land Use Information (1:2,500), Historical Land Use Information (1:10,000) and Ground Stability Data (1:50,000).	
Mining and Natural Cavities Data	1
The Mining and Natural Cavities Data section features data sets related to the existence of mining areas and their potential hazards; and details of naturally formed cavities. Data sets within this section are not plotted, with the exception of BGS Recorded Mineral Sites and Potential Mining Areas which feature on the Historical Land Use Information (1:10,000) map.	
Historical Land Use Information (1:2,500)	2
The Historical Land Use Information (1:2,500) section contains data captured from analysis carried out by Landmark of 1:1,250 and 1:2,500 scale historical Ordnance Survey mapping, identifying areas where, historically, the land uses were potentially contaminative. For the purpose of this Envirocheck module, only historical data relating to mining and ground stability has been included and plotted on the corresponding Historical Land Use Information (1:2,500) map. This section also includes the Subterranean Features data set, which details various man-made and man-used underground spaces obtained from the Subterranea Britannica society.	
Historical Land Use Information (1:10,000)	3
The Historical Land Use (1:10,000) section covers data captured from the systematic analysis carried out by Landmark of 1:10, 560 and 1:10,000 scale historical Ordnance Survey mapping dating back to the mid-19th century, identifying potentially contaminative past industrial land uses. For the purpose of this Envirocheck module, only data relating to mining and ground stability has been included and plotted on the accompanying Historical Land Use Information (1:10,000) map.	
Ground Stability Data (1:50,000)	5
The Ground Stability (1:50,000) section includes the BGS Geosure data suite, reporting features to 250m and plotted onto 3 separate maps. Also reported is brine subsidence, brine mining and salt mining data sets, of which Brine Pumping and Salt Mining Related Features are plotted, and subsidence insurance claims and insurance investigations data, which is not plotted.	
Historical Map List	6
The Historical Map List section details the historical mapping that has been analysed for your site, in relation to the Historical Land Use Information sections.	
Data Currency	7
Data Suppliers	8
Useful Contacts	9

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The brine subsidence data relating to the Driotwich area as provided in this report is derived from JPB studies and physical monitoring undertaken annually over more than 35 years. For more detailed interpretation contact enquiries@jpb.co.uk. JPB retain the copyright and intellectual rights to this data and accept no liability for any loss or damage, including in direct or consequential loss, arising from the use of this data.

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Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m
Mining and Natural Cavities Data					
BGS Recorded Mineral Sites	pg 1				2
Coal Mining Affected Areas			n/a	n/a	n/a
Man Made Mining Cavities					
Mining Instability			n/a	n/a	n/a
Natural Cavities					
Non Coal Mining Areas of Great Britain				n/a	n/a
Potential Mining Areas					
Historical Land Use Information (1:2,500)					
Extractive Industries or Potential Excavations from 1855-1909 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1893-1915 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1906-1937 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1924-1949 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1950-1980 (100m)	pg 2	2	4	n/a	n/a
Subterranean Features (100m)				n/a	n/a
Historical Land Use Information (1:10,000)					
Air Shafts					
Disturbed Ground					
General Quarrying	pg 3				1
Heap, unknown constituents					
Mineral Railway	pg 3				2
Mining & quarrying general					
Mining of coal & lignite					
Quarrying of sand & clay, operation of sand & gravel pits					
Former Marshes					
Potentially Infilled Land (Non-Water)	pg 3				1
Potentially Infilled Land (Water)	pg 3		2	6	23
Ground Stability Data (1:50,000)					
CBSCB Compensation District			n/a	n/a	n/a
Brine Pumping Related Features					
Brine Subsidence Solution Area					
Potential for Collapsible Ground Stability Hazards	pg 5	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 5	Yes		n/a	n/a
Potential for Ground Dissolution Stability Hazards	pg 5	Yes		n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 5	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 5	Yes		n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 5	Yes		n/a	n/a
Salt Mining Related Features					

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Summary

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Mining and Natural Cavities Data

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**BGS Recorded Mineral Sites** Site Name: Llanwern Steelworks Slag Location: Llanwern, Newport, Gwent Source: British Geological Survey, National Geoscience Information Service Reference: 13203 Type: Tip **Status: Ceased** Operator: Tarmac (A Crh Company) Operator Location: Not Supplied Periodic Type: Not Available Geology: Blast Furnace Slag Commodity: Blast Furnace Slag Positional Accuracy: Located by supplier to within 100m	A7NE (SE)	529	1	336500 186100
2	**BGS Recorded Mineral Sites** Site Name: Llanwern Works Location: Llanwern, Newport, Gwent Source: British Geological Survey, National Geoscience Information Service Reference: 13204 Type: Tip **Status: Ceased** Operator: Hanson Cement Operator Location: Not Supplied Periodic Type: Not Available Geology: Ground Granulated Blast Furnace Slag - Addition, Cementitious Commodity: Blast Furnace Slag Positional Accuracy: Located by supplier to within 100m	A8NW (SE)	843	1	337000 186100
	Coal Mining Affected Areas In an area which may not be affected by coal mining				
	Non Coal Mining Areas of Great Britain No Hazard				

Historical Land Use Information (1:2,500)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
3	**Extractive Industries or Potential Excavations from 1950-1980** Use: Pond First Map Published Date: 1967 Last Map Published Date: N/A	A11NW (E)	0	-	336229 186708
4	**Extractive Industries or Potential Excavations from 1950-1980** Use: Pond First Map Published Date: 1967 Last Map Published Date: N/A	A10NE (NW)	0	-	336047 186704
5	**Extractive Industries or Potential Excavations from 1950-1980** Use: Pipe Line First Map Published Date: 1967 Last Map Published Date: 1967	A11NW (NE)	6	-	336148 186791
6	**Extractive Industries or Potential Excavations from 1950-1980** Use: Pond First Map Published Date: 1967 Last Map Published Date: N/A	A11SW (SE)	32	-	336183 186528
7	**Extractive Industries or Potential Excavations from 1950-1980** Use: Pipe Line First Map Published Date: 1967 Last Map Published Date: 1969	A11NW (NE)	42	-	336165 186790
8	**Extractive Industries or Potential Excavations from 1950-1980** Use: Gas Holder First Map Published Date: 1967 Last Map Published Date: N/A	A11NW (NE)	56	-	336246 186822

Historical Land Use Information (1:10,000)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
9	**General Quarrying** Use: Not Supplied Date of Mapping: 1887 - 1922	A15NW (N)	797	-	336326 187580
10	**Mineral Railway** Use: Not Supplied Date of Mapping: 1922	A15NW (NE)	656	-	336410 187421
11	**Mineral Railway** Use: Not Supplied Date of Mapping: 1922	A15NW (N)	668	-	336213 187430
12	**Potentially Infilled Land (Non-Water)** Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1989	A15NW (N)	800	-	336349 187576
13	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1989	A10NE (N)	211	-	336078 186975
14	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1989	A11NW (N)	211	-	336081 186975
15	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A11NE (E)	311	-	336668 186769
16	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A10SW (W)	344	-	335453 186569
17	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A10SW (W)	374	-	335422 186638
18	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SE (W)	406	-	335390 186570
19	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A10NW (W)	418	-	335419 186779
20	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SE (W)	467	-	335330 186615
21	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SE (W)	525	-	335272 186603
22	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A5NE (SW)	534	-	335324 186306
23	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SE (W)	578	-	335220 186613
24	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SE (W)	588	-	335211 186489
25	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A12SW (E)	590	-	336945 186592
26	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9NE (W)	669	-	335169 186830
27	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SE (W)	717	-	335081 186624
28	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SE (W)	718	-	335079 186611
29	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SW (W)	745	-	335052 186607

Historical Land Use Information (1:10,000)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
30	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SE (W)	758	-	335069 186339
31	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SW (W)	760	-	335067 186340
32	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9NW (W)	763	-	335045 186730
33	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SW (W)	776	-	335030 186431
34	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SW (W)	870	-	334929 186488
35	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SW (W)	874	-	334926 186476
36	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A5NW (SW)	876	-	335031 186127
37	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A5NW (SW)	880	-	335025 186129
38	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SW (W)	891	-	334906 186593
39	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A5NW (W)	943	-	334892 186286
40	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9NW (W)	968	-	334838 186726
41	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SW (W)	983	-	334814 186580
42	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A5SW (SW)	983	-	335004 185973
43	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1965	A9SW (W)	987	-	334810 186550

Ground Stability Data (1:50,000)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	CBSCB Compensation District The site does not fall within the brine compensation area.				
	Brine Subsidence Solution Area The site does not fall within the brine subsidence solution area.				
	Potential for Collapsible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A11SW (S)	0	1	336084 186652
44	**Potential for Compressible Ground Stability Hazards** Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A11SW (S)	0	1	336084 186652
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A11SW (S)	0	1	336084 186652
45	**Potential for Landslide Ground Stability Hazards** Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11SW (S)	0	1	336084 186652
46	**Potential for Running Sand Ground Stability Hazards** Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A11SW (S)	0	1	336084 186652
47	**Potential for Shrinking or Swelling Clay Ground Stability Hazards** Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A11SW (S)	0	1	336084 186652

Historical Map List

The following mapping has been analysed for Historical Land Use Information (1:2,500):

1:2,500	Mapsheet	Published Date
Ordnance Survey Plan	ST3586	1967

The following mapping has been analysed for Historical Land Use Information (1:10,000):

1:10,560	Mapsheet	Published Date
Monmouthshire	029_00	1886
Monmouthshire	034_00	1887
Monmouthshire	029_SE	1902
Monmouthshire	029_SW	1902
Monmouthshire	034_NE	1902
Monmouthshire	034_NW	1902
Monmouthshire	029_SE	1922
Monmouthshire	029_SW	1922
Monmouthshire	034_NE	1922
Monmouthshire	034_NW	1922
Monmouthshire	034_NW	1938
Monmouthshire	029_SE	1954
Monmouthshire	029_SW	1954
Monmouthshire	034_NE	1954
Ordnance Survey Plan	ST38NE	1965
Ordnance Survey Plan	ST38NW	1965
1:10,000	**Mapsheet**	**Published Date**
Ordnance Survey Plan	ST38NE	1989
Ordnance Survey Plan	ST38NW	1994

Data Currency

Mining and Cavities Data	Version	Update Cycle
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	November 2022	Bi-Annually
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	Annual Rolling Update
Man Made Mining Cavities Stantec UK Ltd	December 2021	Bi-Annually
Mining Instability Ove Arup & Partners	June 1998	Not Applicable
Natural Cavities Stantec UK Ltd	December 2021	Bi-Annually
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Historical Land Use Information (1:2,500)	**Version**	**Update Cycle**
Subterranean Features Landmark Information Group Limited	June 2022	Bi-Annually
Ground Stability Data (1:50,000)	**Version**	**Update Cycle**
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB) Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011 November 2020	 As notified
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	April 2020	As notified
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Brine Subsidence Solution Area Johnson Poole & Bloomer	December 2020	Annual Rolling Update

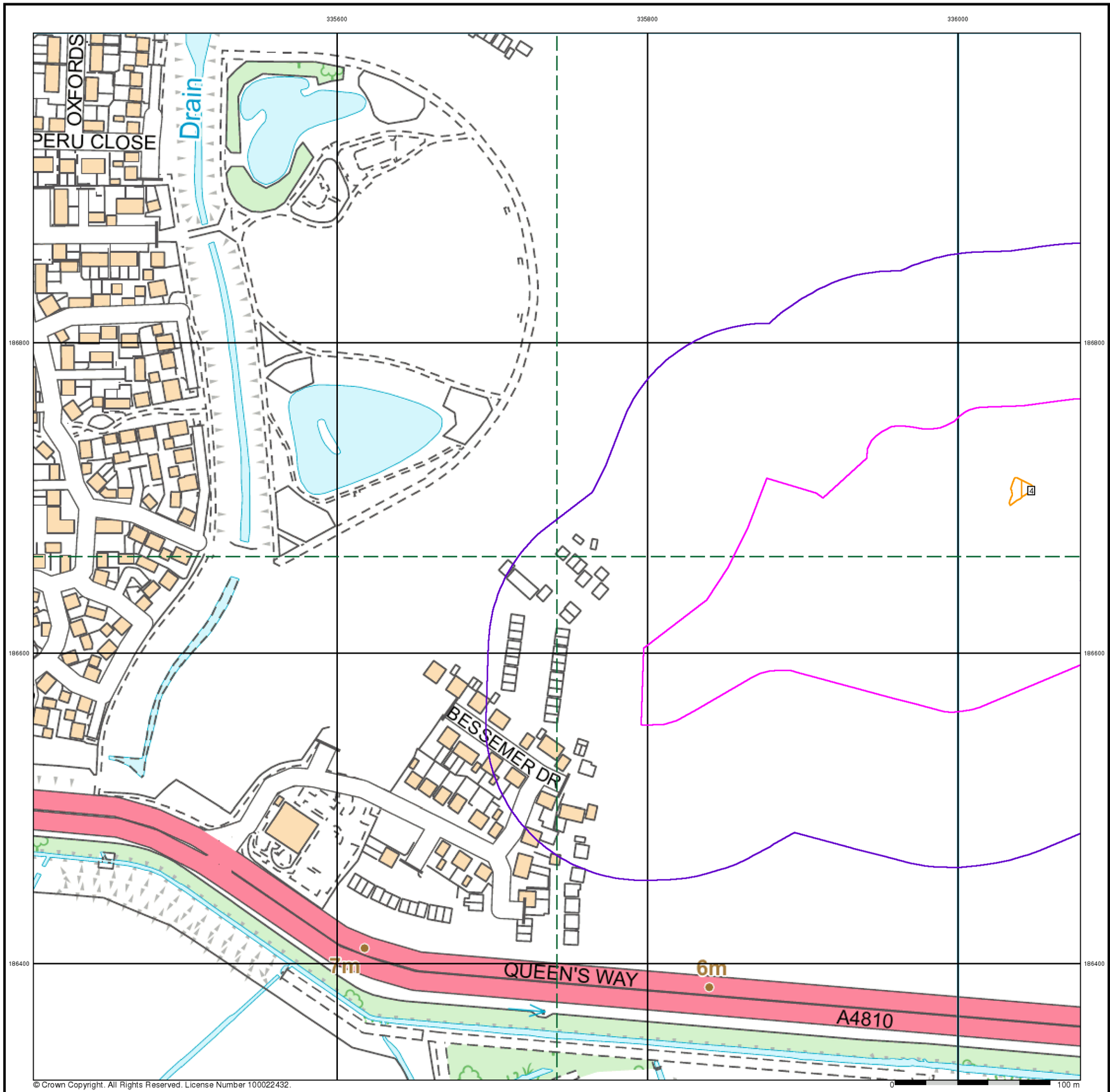
Data Suppliers

A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	Map data
British Geological Survey	British Geological Survey, Natural Environment Research Council
The Coal Authority	The Coal Authority
Ove Arup	ARUP
Stantec UK Ltd	Stantec
Wardell Armstrong	wardell armstrong, your earth our world
Johnson Poole & Bloomer	JPB

Useful Contacts

Contact	Name and Address	Contact Details
1	**British Geological Survey - Enquiry Service** British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
-	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk



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Historical Land Use Information (1:2,500)

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Map ID

Several of Type at Location

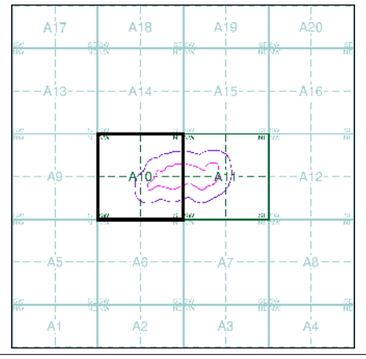
Potentially Contaminative Industrial Uses (Extractive Industries Activity)

	Point	Line	Polygon
Extractive Industries Activity from 1855 - 1909	▲	—	▭
Extractive Industries Activity from 1893 - 1915	▲	—	▨
Extractive Industries Activity from 1906 - 1937	▲	—	▦
Extractive Industries Activity from 1924 - 1949	▲	—	▨
Extractive Industries Activity from 1950 - 1980	▲	—	▥

Subterranean Features

	Point	Line	Polygon
Subterranean Features	▼	- - -	▭

Mining and Ground Stability - Segment A10



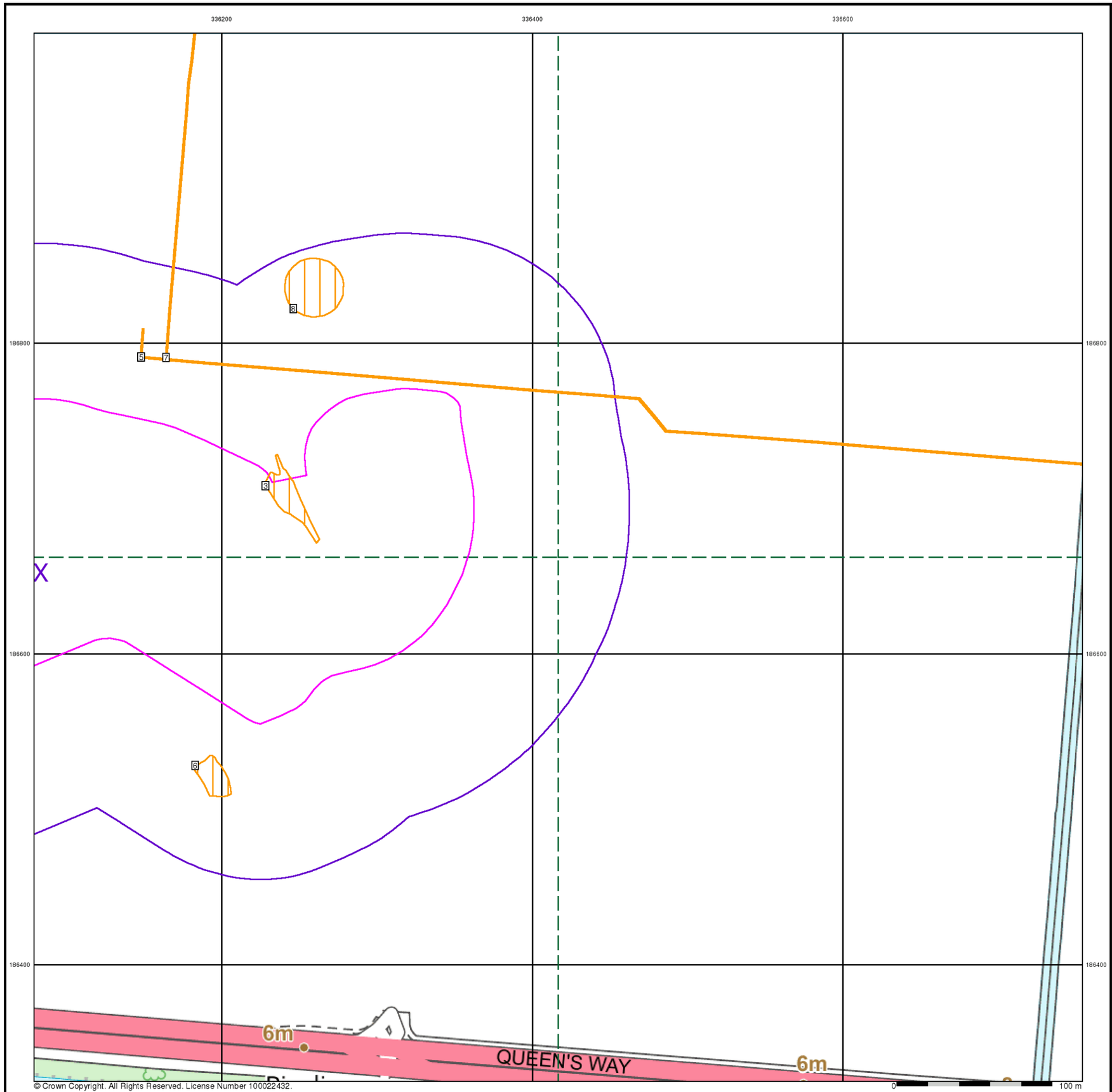
Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Plot Buffer (m):	100

Site Details

Site at 336079,186662

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Historical Land Use Information (1:2,500)

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Map ID

Several of Type at Location

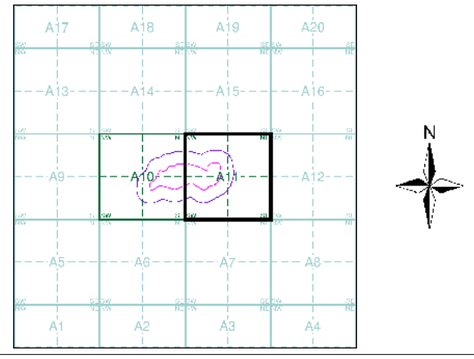
Potentially Contaminative Industrial Uses (Extractive Industries Activity)

	Point	Line	Polygon
Extractive Industries Activity from 1855 - 1909	▲	—	▭
Extractive Industries Activity from 1893 - 1915	▲	—	▨
Extractive Industries Activity from 1906 - 1937	▲	—	▭
Extractive Industries Activity from 1924 - 1949	▲	—	▨
Extractive Industries Activity from 1950 - 1980	▲	—	▭

Subterranean Features

	Point	Line	Polygon
Subterranean Features	▼	- - -	▭

Mining and Ground Stability - Segment A11



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Plot Buffer (m):	100

Site Details

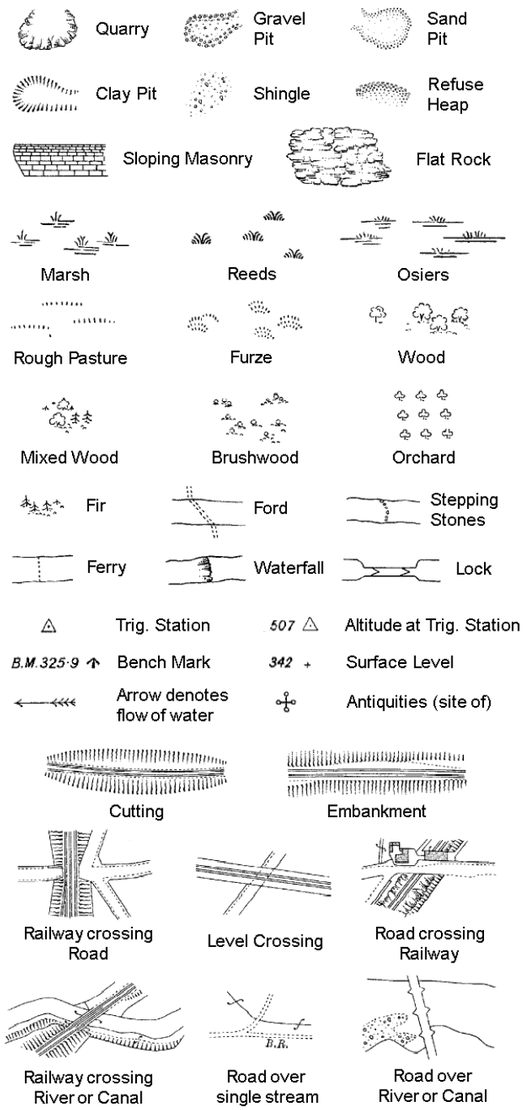
Site at 336079,186662

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Historical Mapping Legends

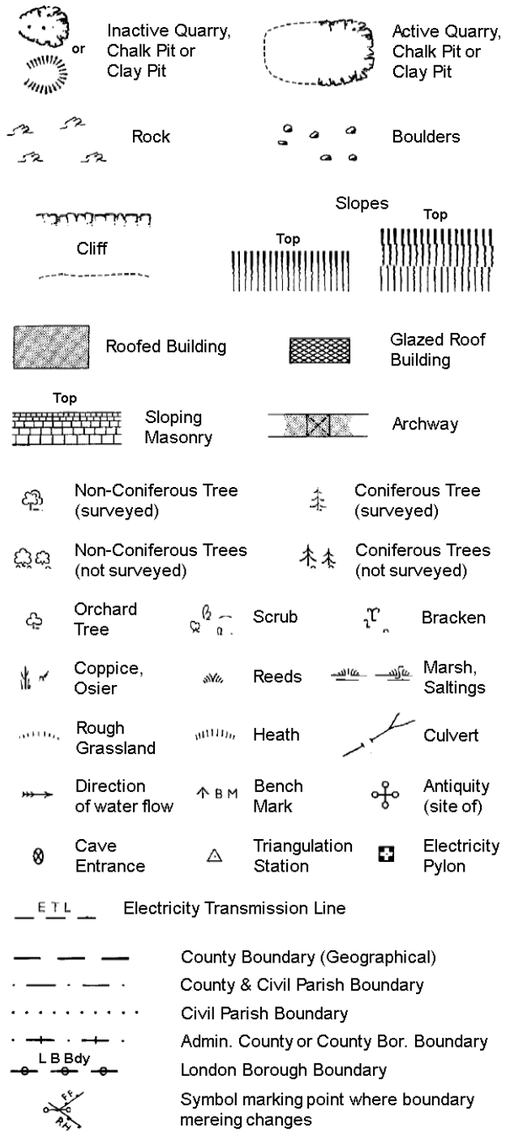
Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
County Borough Boundary (England)
Co. Boro. Bdy.
County Burgh Boundary (Scotland)
Co. Burgh Bdy.

B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	St.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

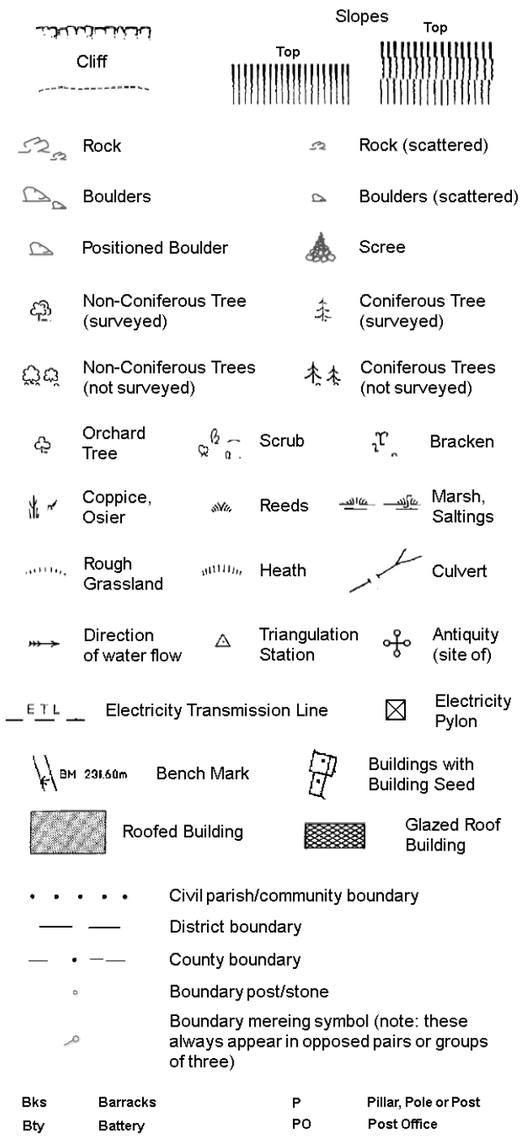
Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



County Boundary (Geographical)
County & Civil Parish Boundary
Civil Parish Boundary
Admin. County or County Bor. Boundary
L B Bdy
London Borough Boundary
Symbol marking point where boundary mereing changes

BH	Beer House	P	Pillar, Pole or Post
BP, BS	Boundary Post or Stone	PO	Post Office
Cn, C	Capstan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D Fn	Drinking Fountain	Pp	Pump
El P	Electricity Pillar or Post	SB, S Br	Signal Box or Bridge
FAP	Fire Alarm Pillar	SP, SL	Signal Post or Light
FB	Foot Bridge	Spr	Spring
GP	Guide Post	Tk	Tank or Track
H	Hydrant or Hydraulic	TCB	Telephone Call Box
LC	Level Crossing	TCP	Telephone Call Post
MH	Manhole	Tr	Trough
MP	Mile Post or Mooring Post	Wr Pt, Wr T	Water Point, Water Tap
MS	Mile Stone	W	Well
NTL	Normal Tidal Limit	Wd Pp	Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250



Civil parish/community boundary
District boundary
County boundary
Boundary post/stone
Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

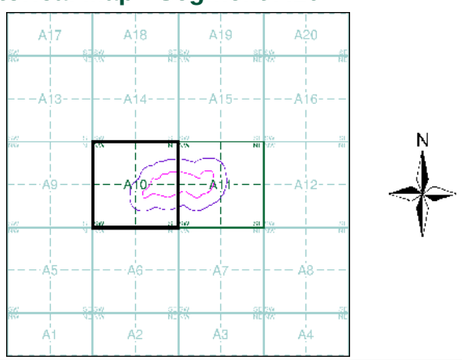
Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Filter Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Track
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governer	Wd Pp	Wind Pump
GP	Guide Post	Wr Pt, Wr T	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Monmouthshire	1:2,500	1883	2
Monmouthshire	1:2,500	1901	3
Monmouthshire	1:2,500	1921	4
Ordnance Survey Plan	1:1,250	1967	5
Ordnance Survey Plan	1:2,500	1967 - 1968	6
Supply of Unpublished Survey Information	1:1,250	1974	7
Additional SIMs	1:1,250	1986	8
Additional SIMs	1:1,250	1991	9
Large-Scale National Grid Data	1:1,250	1992	10
Large-Scale National Grid Data	1:1,250	1995	11
Historical Aerial Photography	1:2,500	2001	12

Historical Map - Segment A10



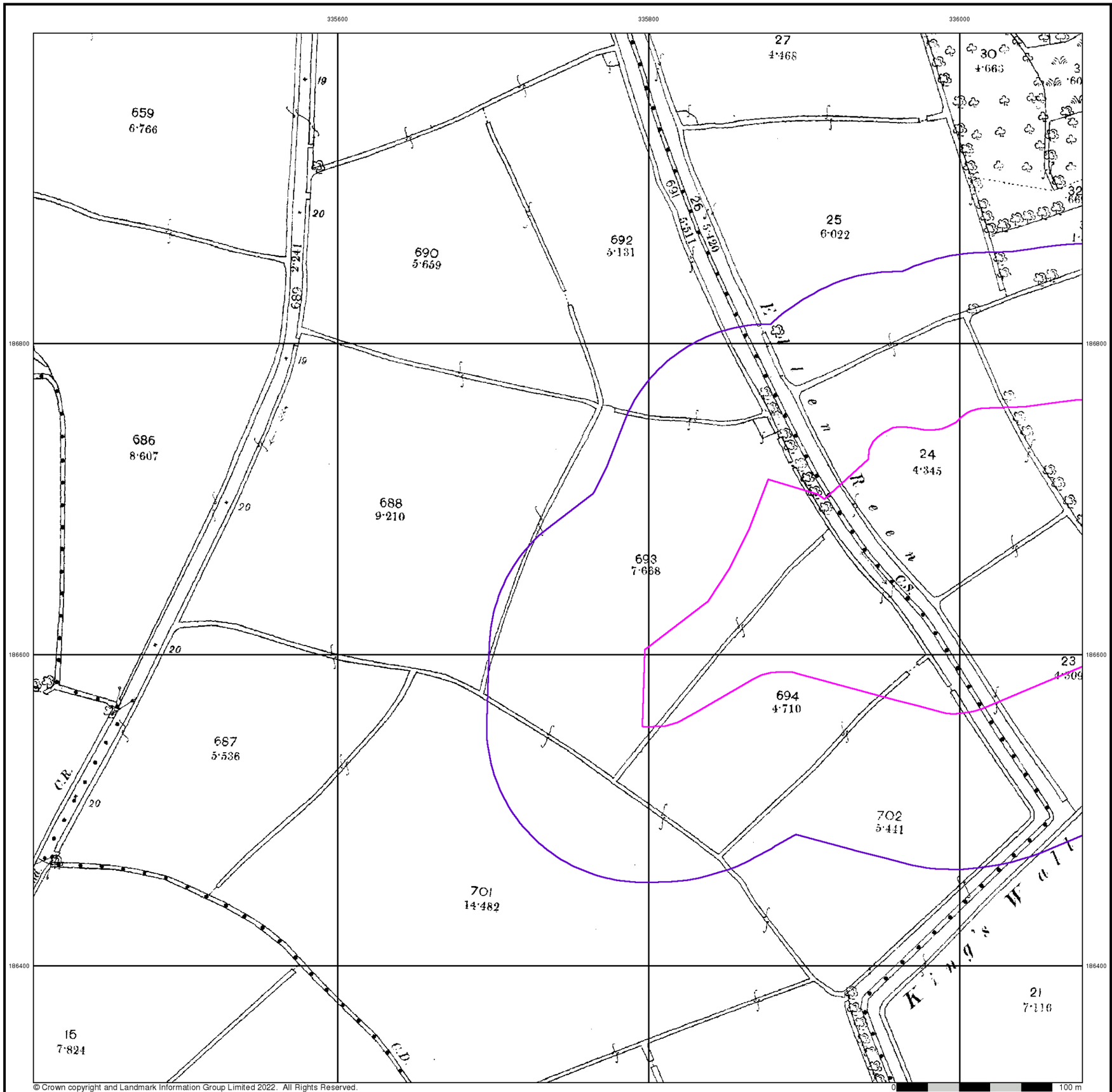
Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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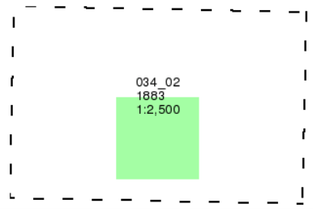
Monmouthshire

Published 1883

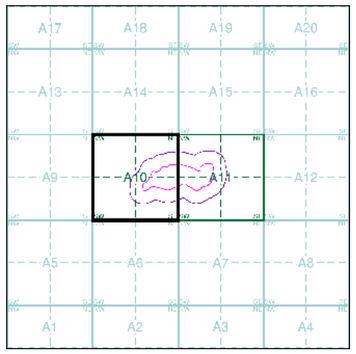
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)



Historical Map - Segment A10



Order Details

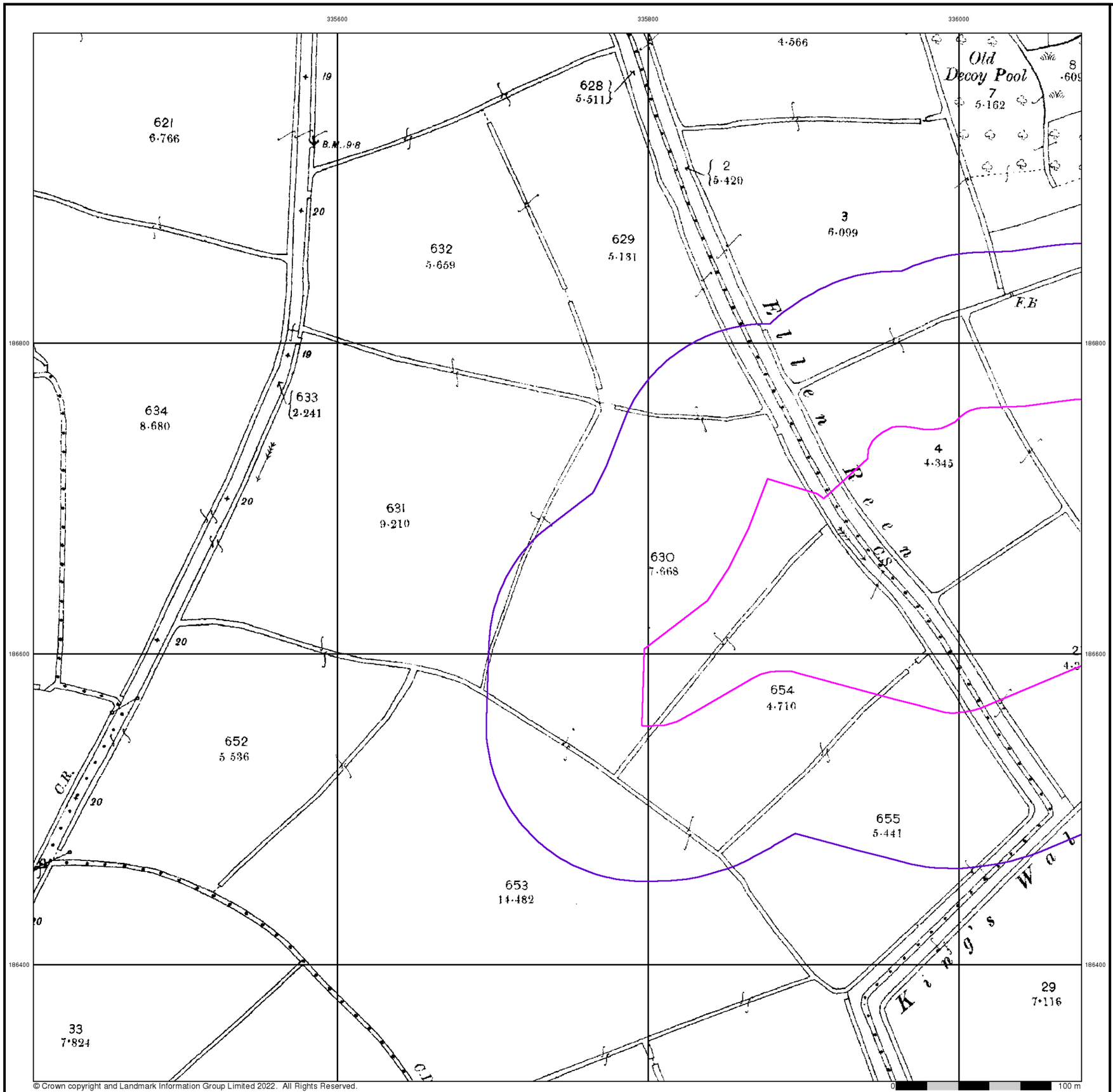
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

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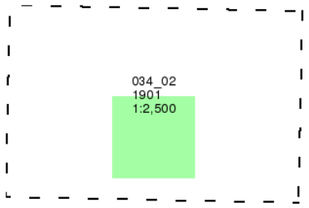
Monmouthshire

Published 1901

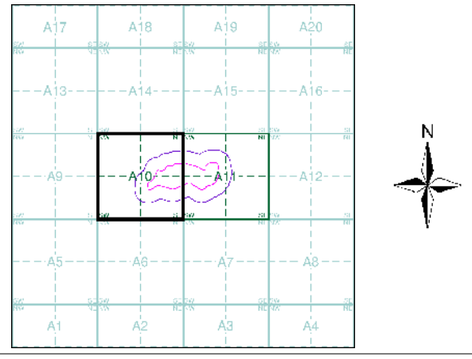
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)



Historical Map - Segment A10



Order Details

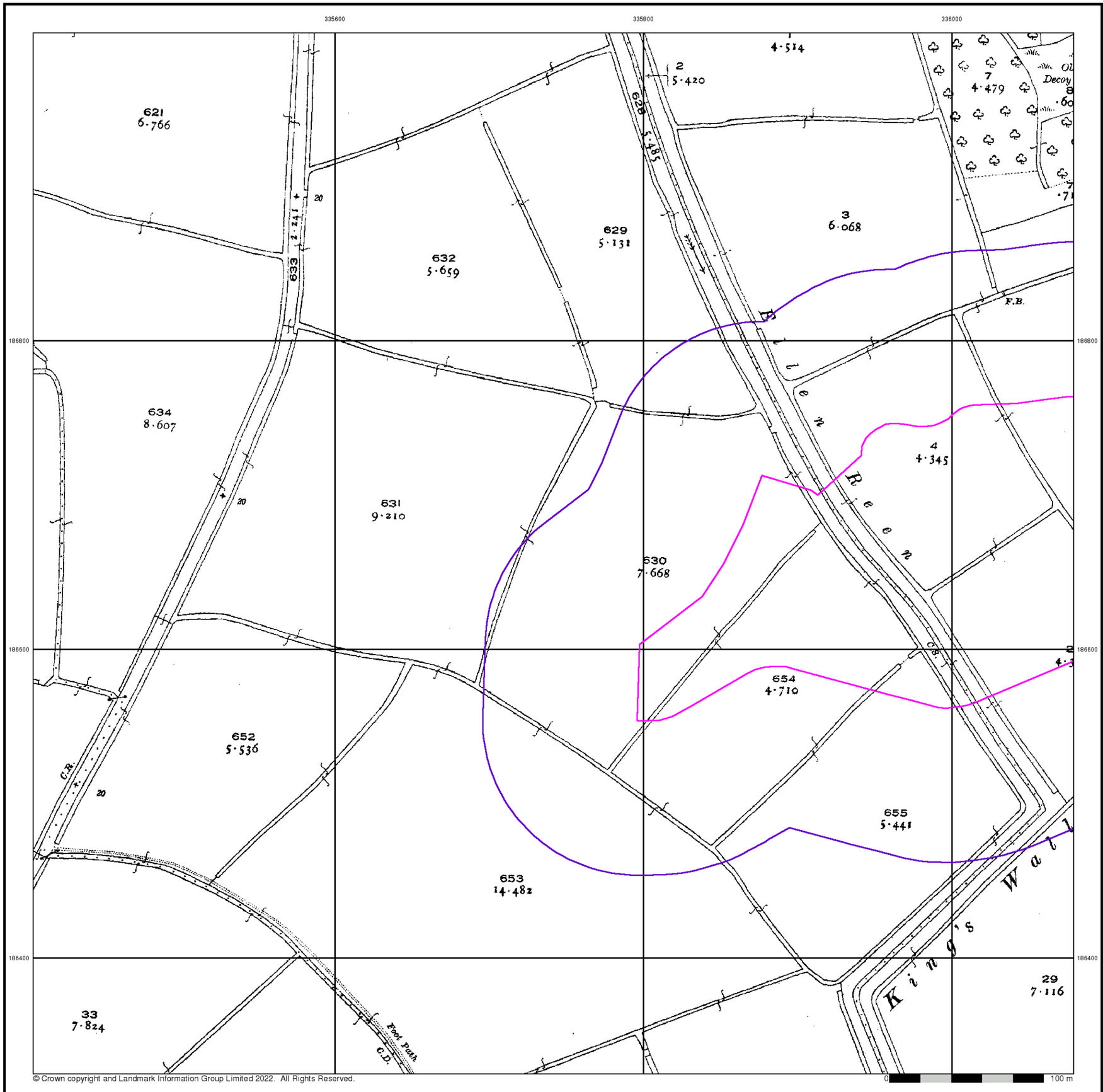
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Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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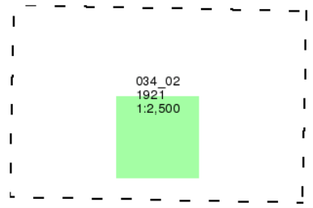
Monmouthshire

Published 1921

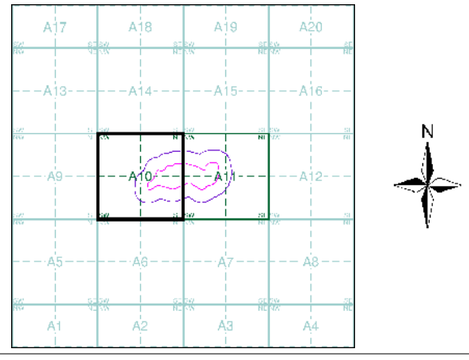
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)



Historical Map - Segment A10



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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Ordnance Survey Plan

Published 1967

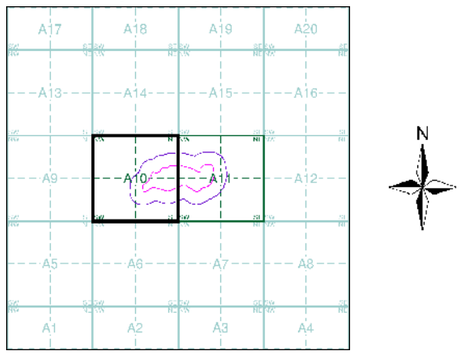
Source map scale - 1:1,250

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Map Name(s) and Date(s)

ST3586NW 1967 1:1,250	ST3586NE 1967 1:1,250	ST3686NW 1967 1:1,250
ST3586SW 1967 1:1,250	ST3586SE 1967 1:1,250	ST3686SW 1967 1:1,250

Historical Map - Segment A10



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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335600 335800 336000

186800 186600 186400

Spencer Steelworks
Ore Stocks
Travelling Boom Conveyor
Lighting Tower
Drain
Pond
QUEEN'S WAY
4772 139·66
0004 12·46
0004 148·75
0250 1·05
0004 1·07
4335 7·30

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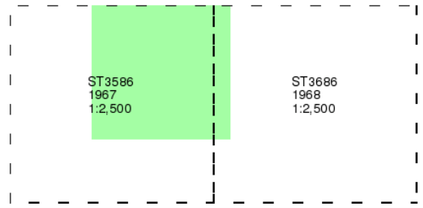
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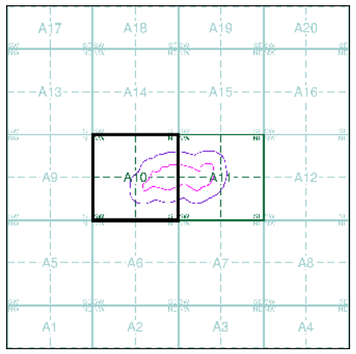
Ordnance Survey Plan
Published 1967 - 1968
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)



Historical Map - Segment A10



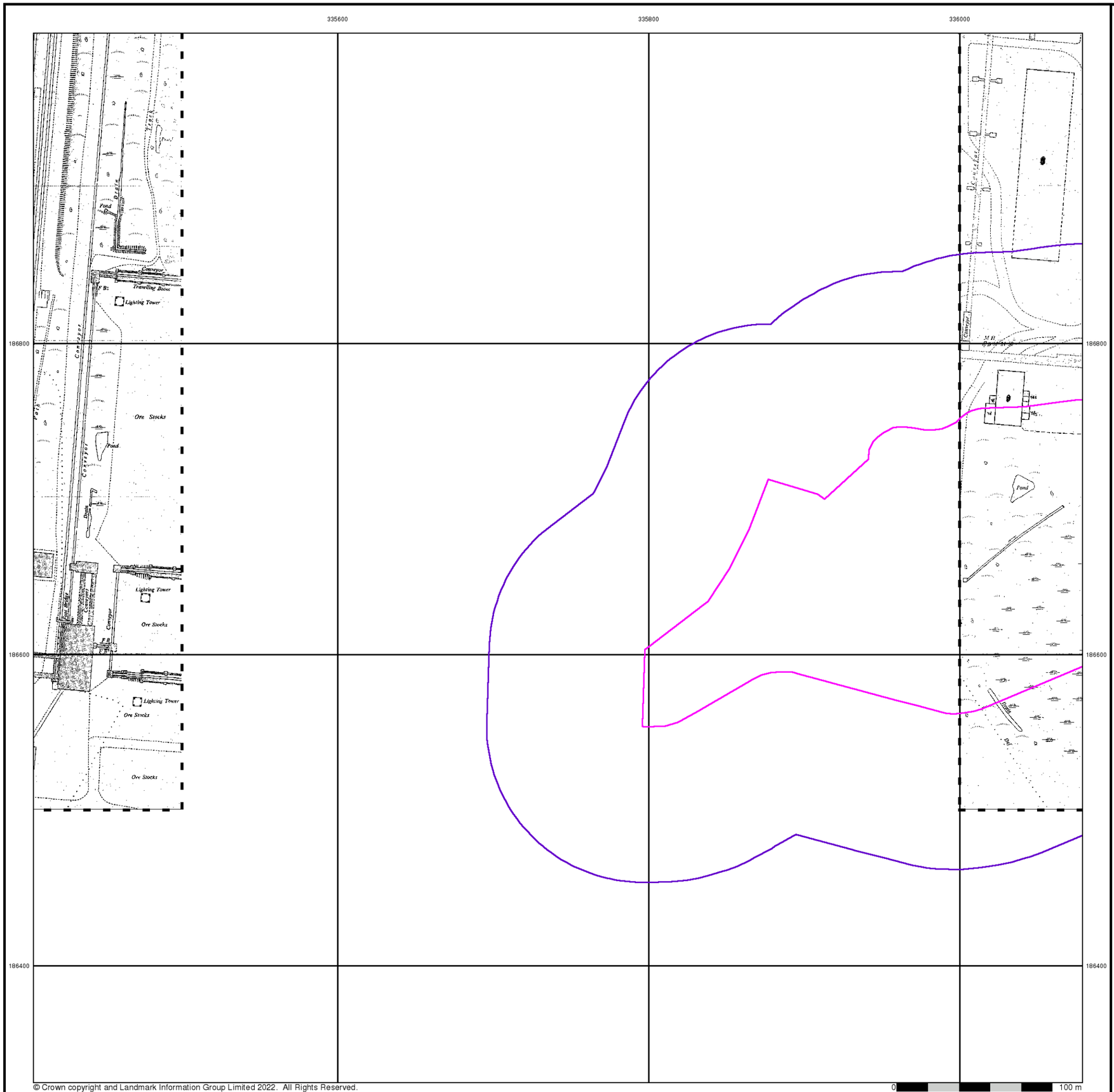
Order Details

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Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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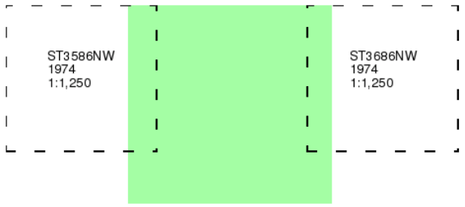
Supply of Unpublished Survey Information

Published 1974

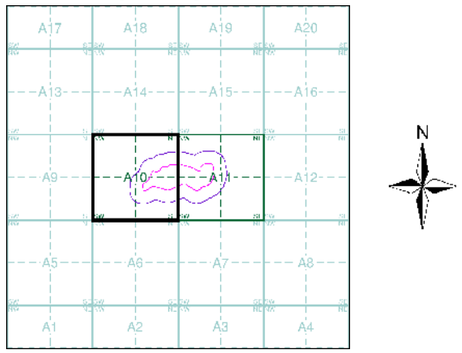
Source map scale - 1:1,250

SUSI maps (Supply of Unpublished Survey Information) were produced between 1972 and 1977, mainly for internal use at Ordnance Survey. These were more of a `work-in-progress' plan as they showed updates of individual areas on a map. These maps were unpublished, and they do not represent a single moment in time. They were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A10



Order Details

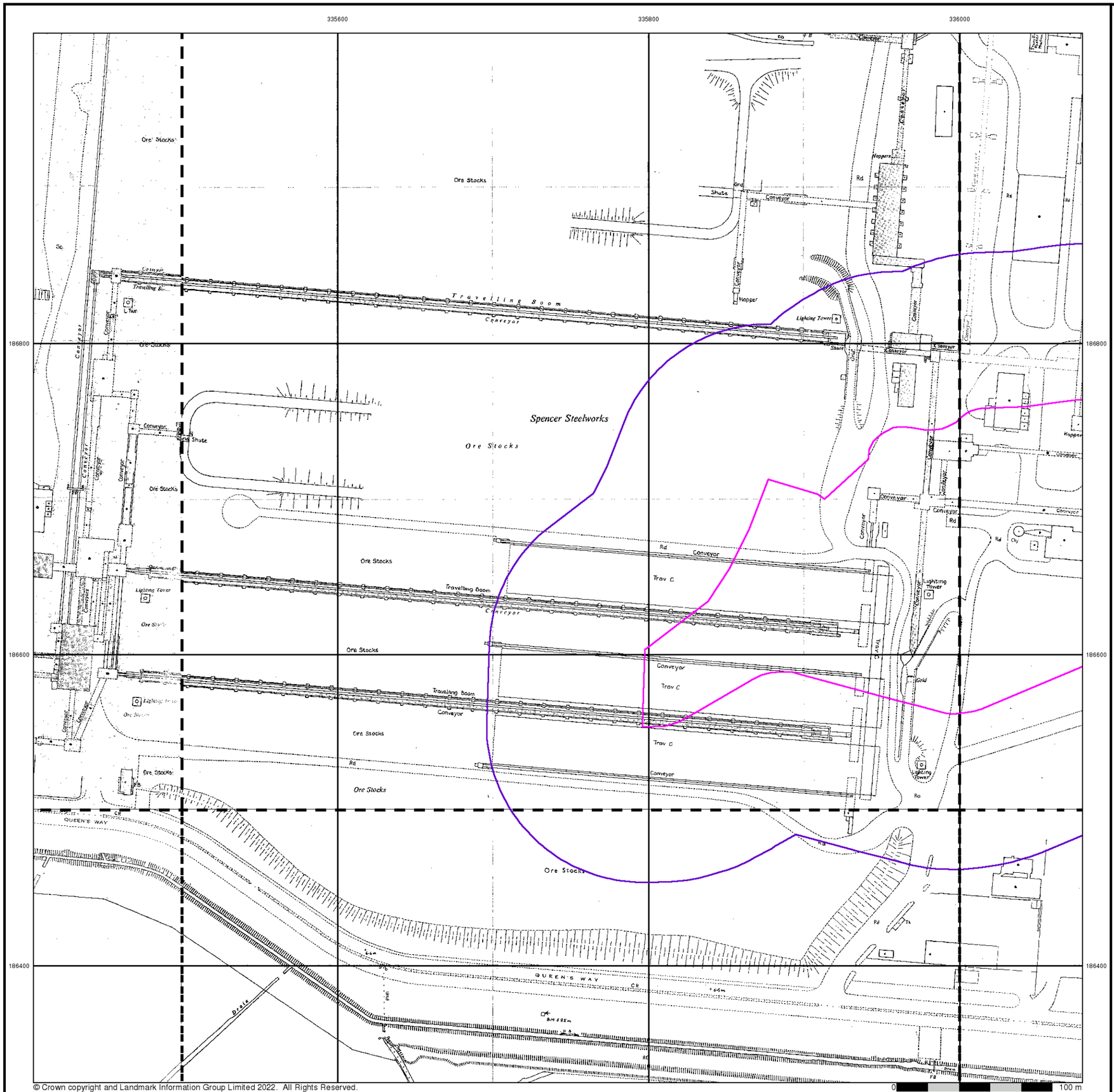
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Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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Additional SIMs

Published 1986

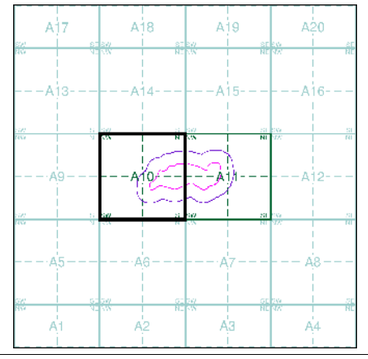
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

ST3586NW 1986 1:1,250	ST3586NE 1986 1:1,250	ST3686NW 1986 1:1,250
ST3586SW 1986 1:1,250	ST3586SE 1986 1:1,250	ST3686SW 1986 1:1,250

Historical Map - Segment A10



Order Details

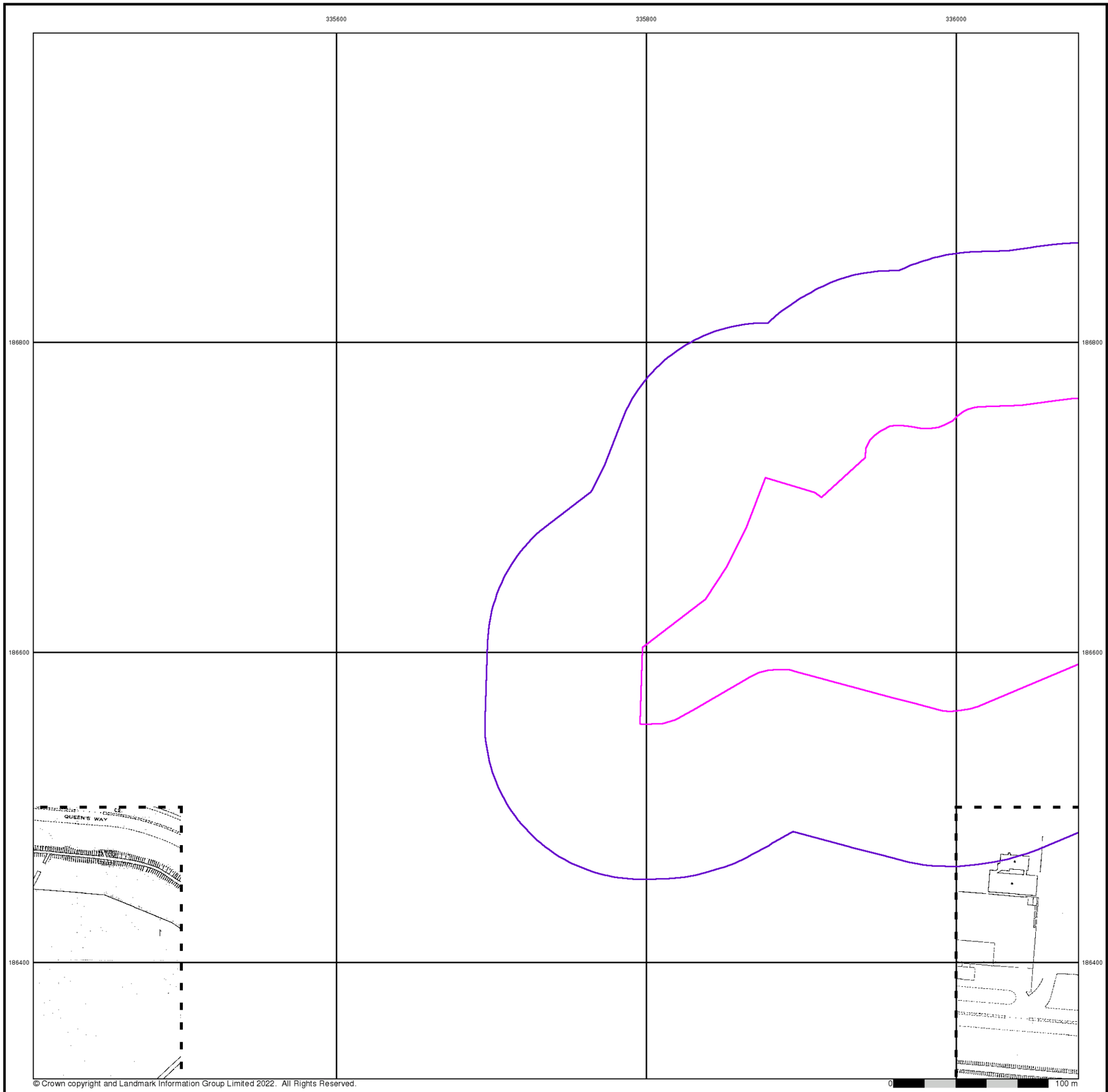
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Customer Ref:	Llanwern 4c 4g 4e
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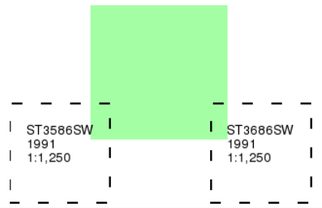
Additional SIMs

Published 1991

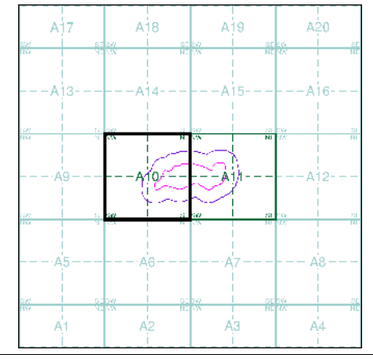
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A10



Order Details

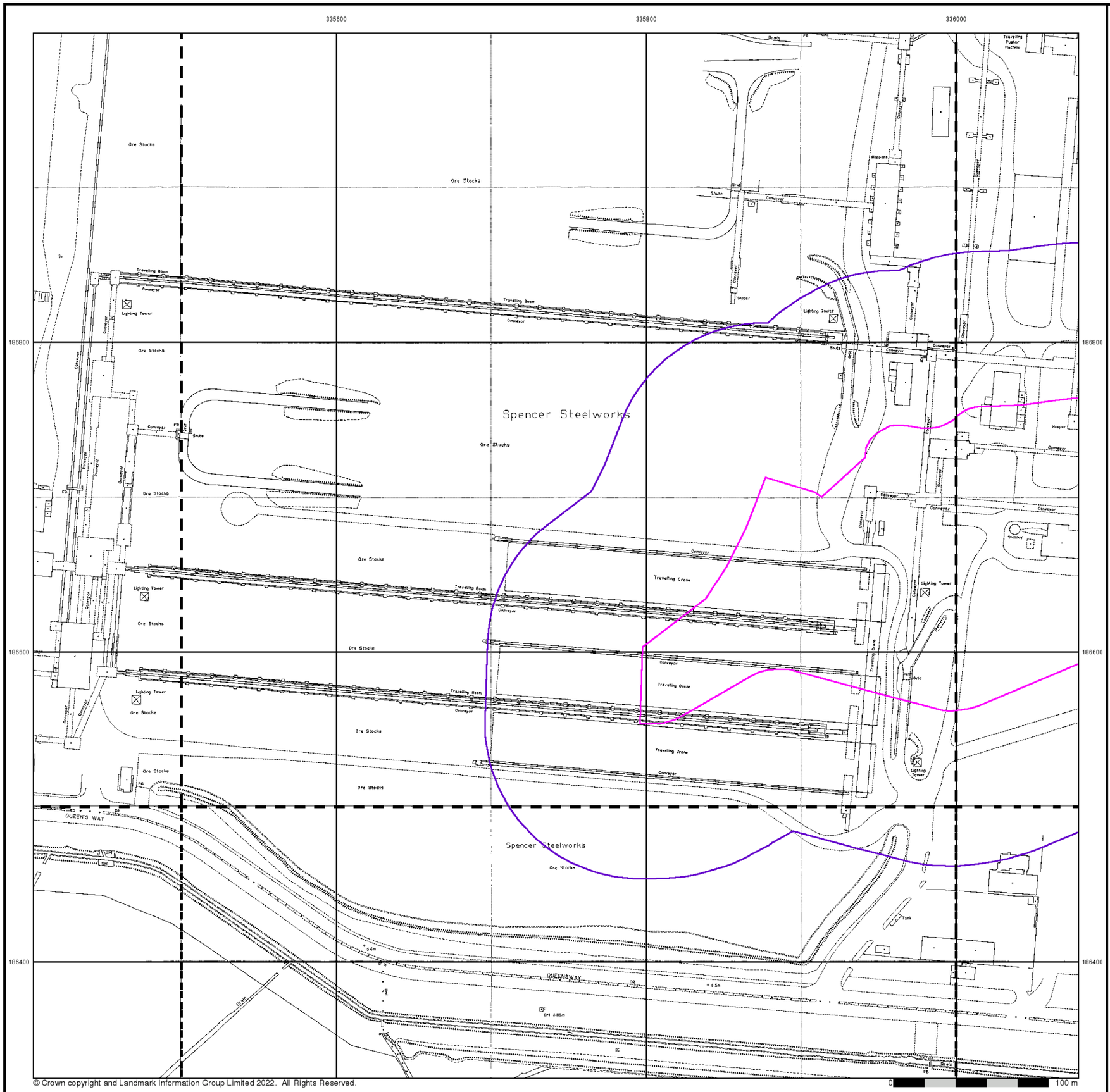
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

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Large-Scale National Grid Data

Published 1992

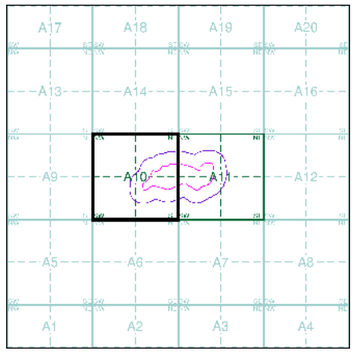
Source map scale - 1:1,250

'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)

ST3586NW 1992 1:1,250	ST3586NE 1992 1:1,250	ST3686NW 1992 1:1,250
ST3586SW 1992 1:1,250	ST3586SE 1992 1:1,250	ST3686SW 1992 1:1,250

Historical Map - Segment A10



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

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335600 335800 336000

186800 186600 186400

Ore Stocks
Travelling Hopper
Conveyor
Lighting Tower
Hopper
Spencer Steelworks
QUEENS WAY
Tank
Slurry
RM 6.85m

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0 100 m

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Large-Scale National Grid Data

Published 1995

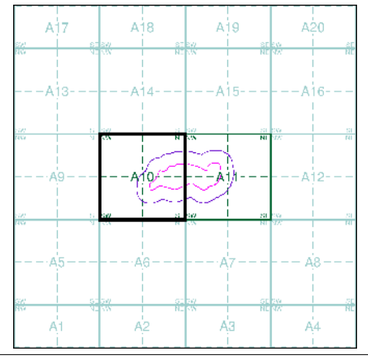
Source map scale - 1:1,250

'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)

ST3586NW 1995 1:1,250		ST3686NW 1995 1:1,250
ST3586SW 1995 1:1,250	ST3586SE 1995 1:1,250	ST3686SW 1995 1:1,250

Historical Map - Segment A10



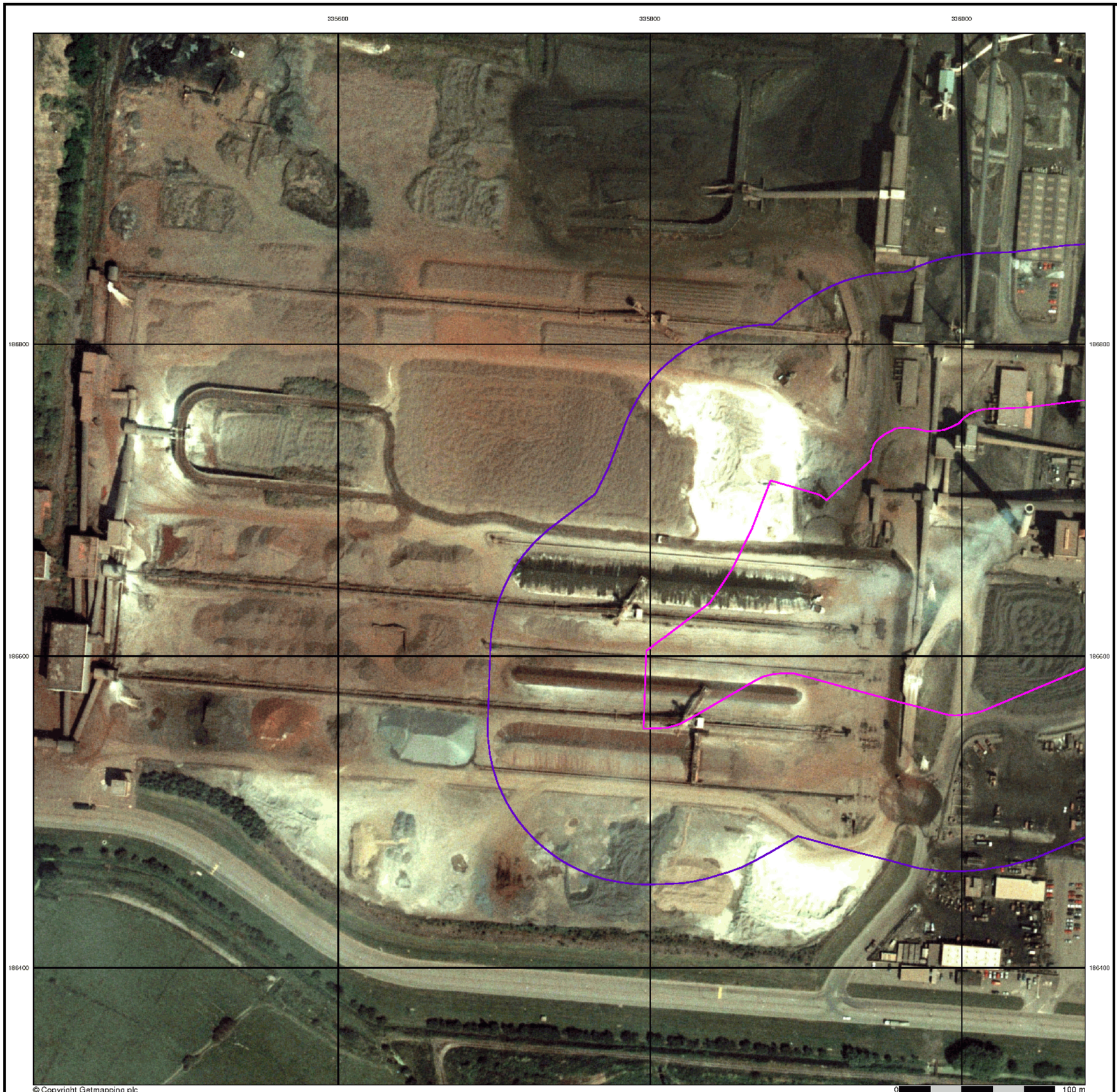
Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

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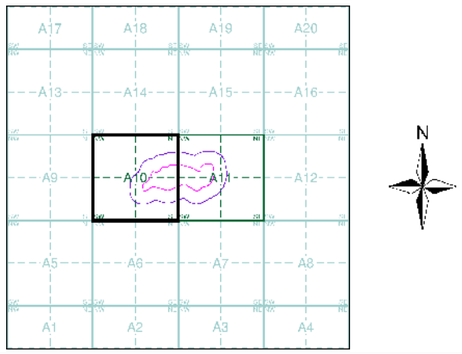
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Historical Aerial Photography

Published 2001

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Segment A10



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

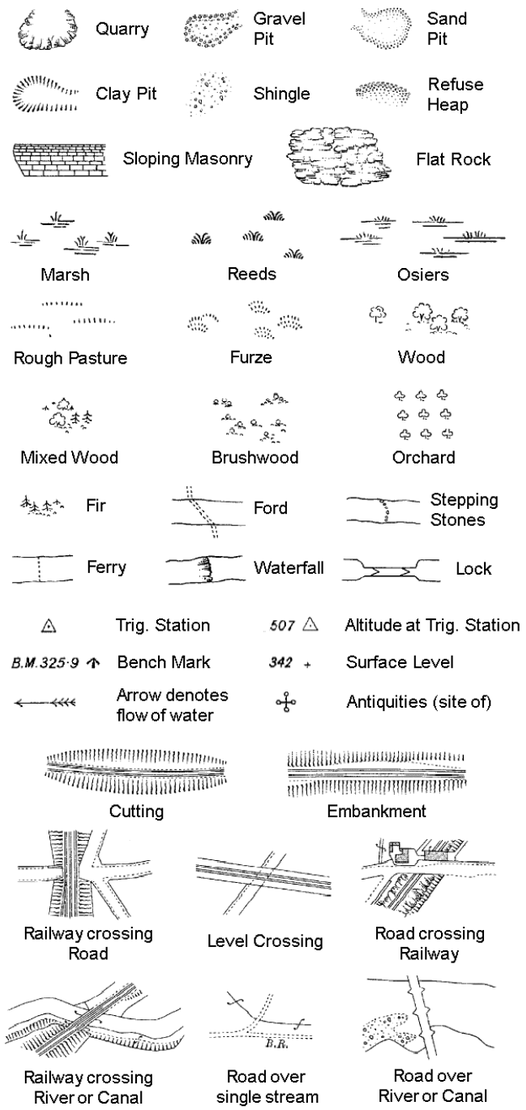
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Historical Mapping Legends

Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



County Boundary (Geographical)

County & Civil Parish Boundary

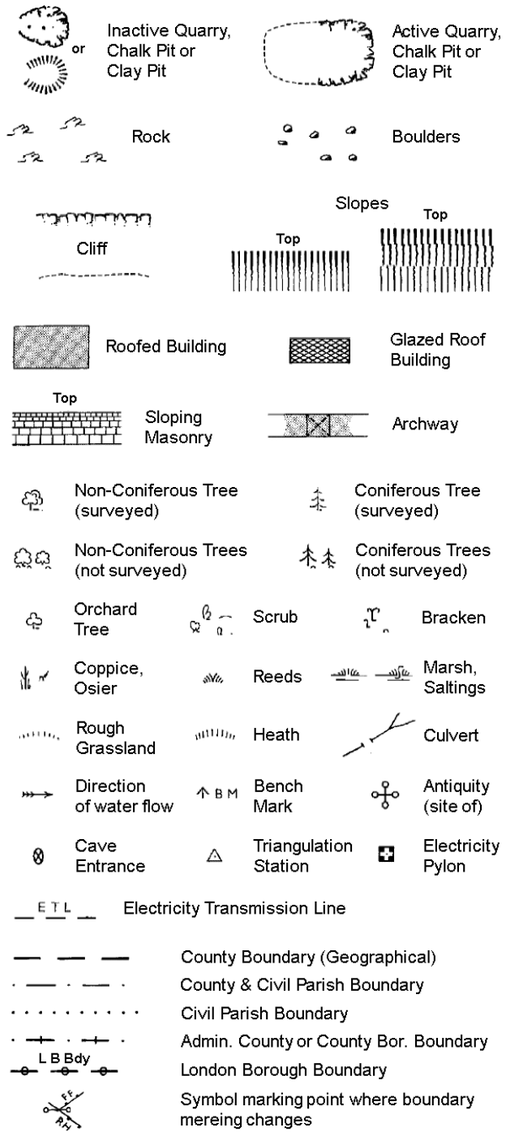
Administrative County & Civil Parish Boundary

Co. Boro. Bdy. County Borough Boundary (England)

Co. Burgh Bdy. County Burgh Boundary (Scotland)

B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	Sl.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



County Boundary (Geographical)

County & Civil Parish Boundary

Civil Parish Boundary

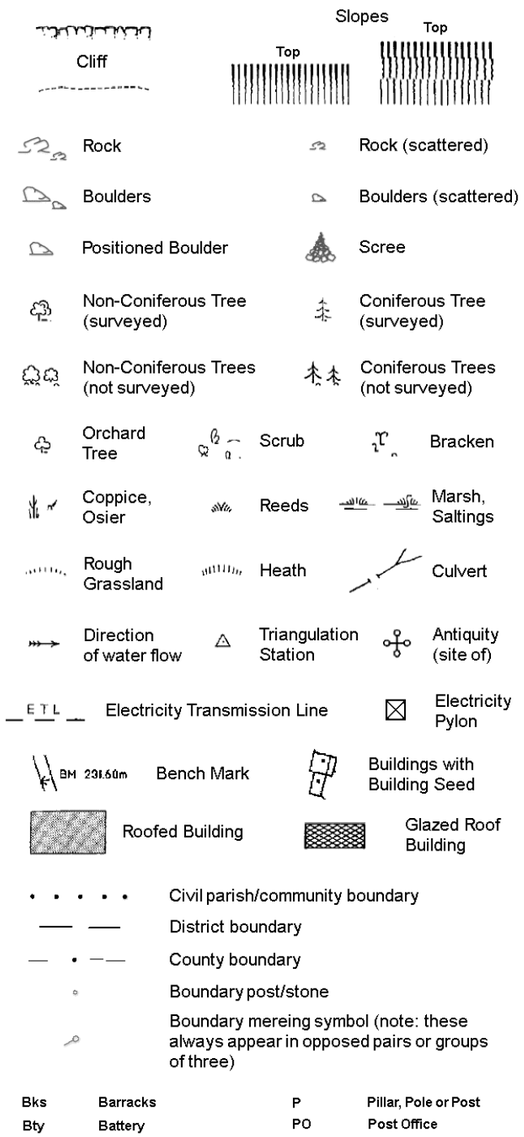
Admin. County or County Bor. Boundary

L B Bdy London Borough Boundary

Symbol marking point where boundary mereing changes

BH	Beer House	P	Pillar, Pole or Post
BP, BS	Boundary Post or Stone	PO	Post Office
Cn, C	Capstan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D Fn	Drinking Fountain	Pp	Pump
El P	Electricity Pillar or Post	SB, S Br	Signal Box or Bridge
FAP	Fire Alarm Pillar	SP, SL	Signal Post or Light
FB	Foot Bridge	Spr	Spring
GP	Guide Post	Tk	Tank or Track
H	Hydrant or Hydraulic	TCB	Telephone Call Box
LC	Level Crossing	TCP	Telephone Call Post
MH	Manhole	Tr	Trough
MP	Mile Post or Mooring Post	Wr Pt, Wr T	Water Point, Water Tap
MS	Mile Stone	W	Well
NTL	Normal Tidal Limit	Wd Pp	Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250



Civil parish/community boundary

District boundary

County boundary

Boundary post/stone

Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Filter Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Track
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governer	Wd Pp	Wind Pump
GP	Guide Post	Wr Pt, Wr T	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

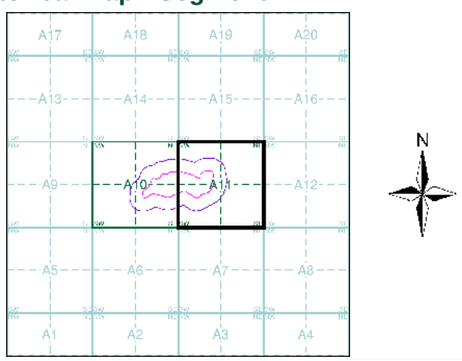
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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Monmouthshire	1:2,500	1883	2
Monmouthshire	1:2,500	1901	3
Monmouthshire	1:2,500	1921	4
Ordnance Survey Plan	1:1,250	1967	5
Ordnance Survey Plan	1:2,500	1968	6
Supply of Unpublished Survey Information	1:1,250	1974	7
Additional SIMs	1:1,250	1986	8
Additional SIMs	1:1,250	1991	9
Large-Scale National Grid Data	1:1,250	1992	10
Large-Scale National Grid Data	1:1,250	1995	11
Historical Aerial Photography	1:2,500	2001	12

Historical Map - Segment A11



Order Details

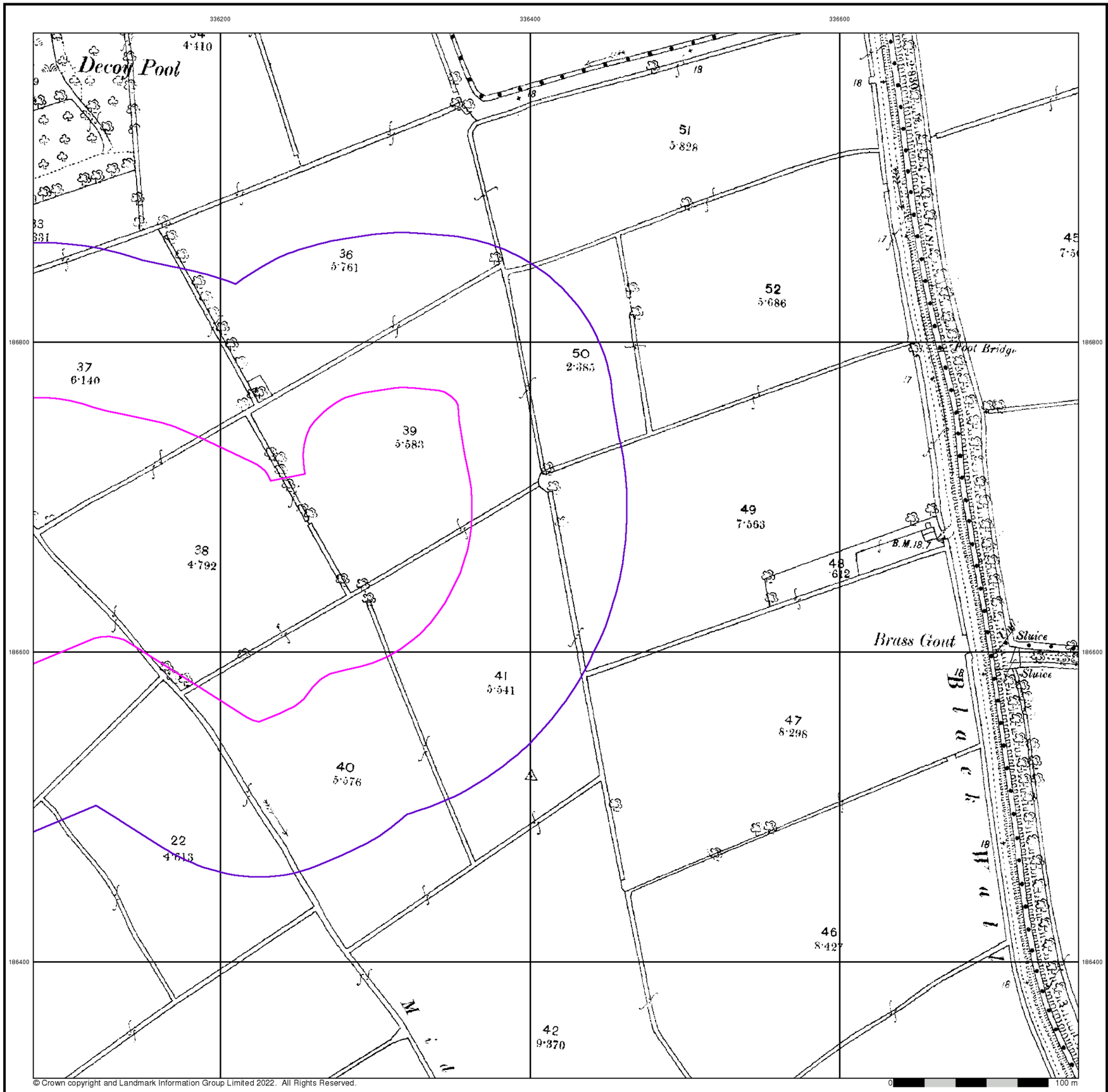
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Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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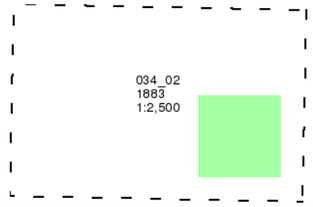
Monmouthshire

Published 1883

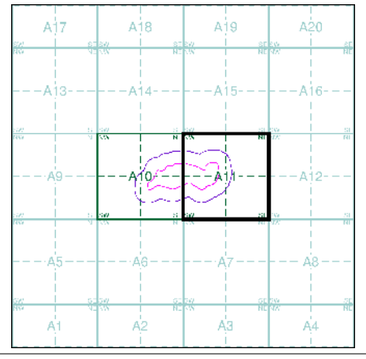
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)



Historical Map - Segment A11



Order Details

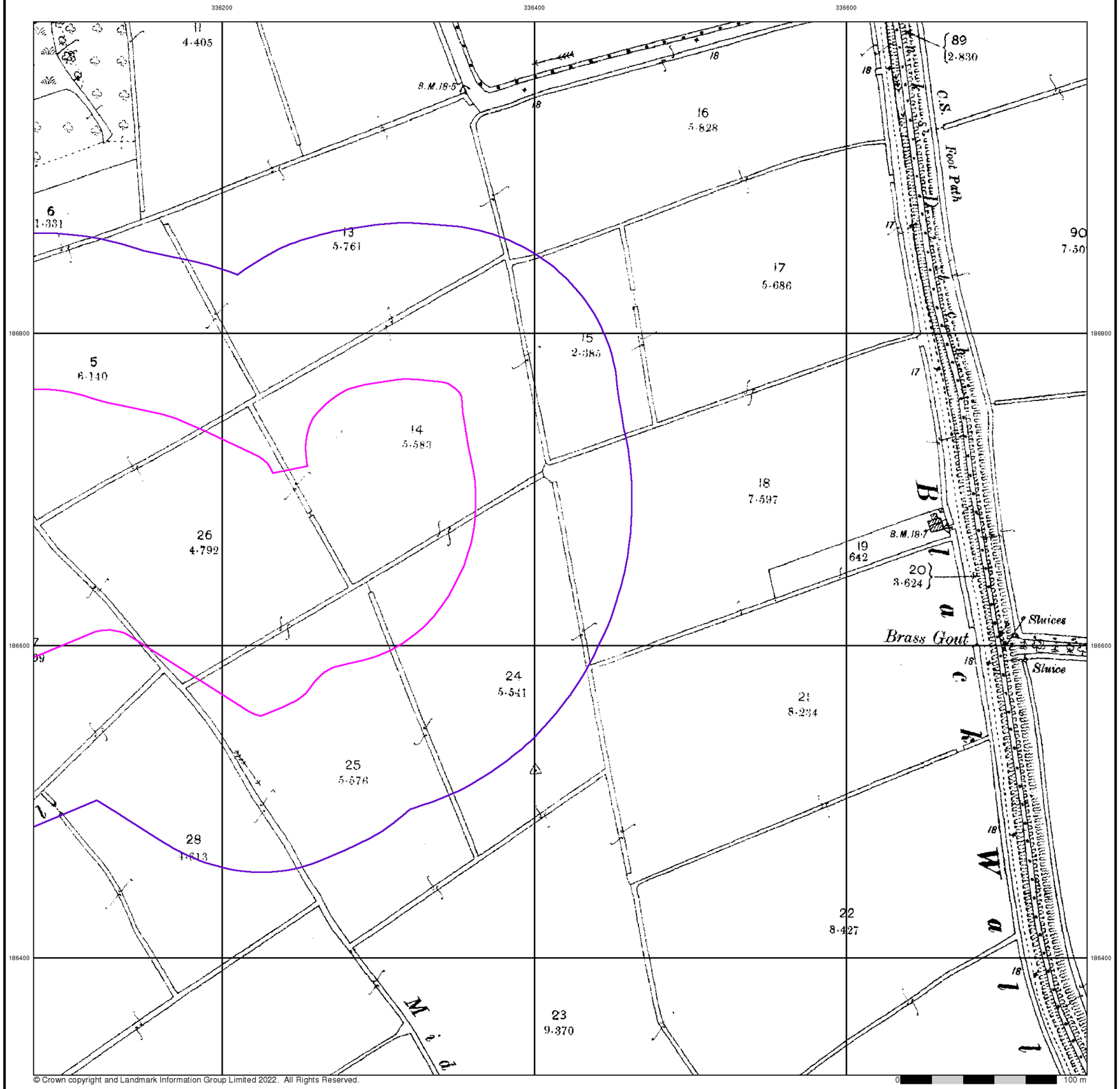
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National Grid Reference:	336080, 186650
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Site Area (Ha):	8.34
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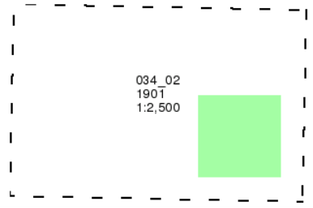
Monmouthshire

Published 1901

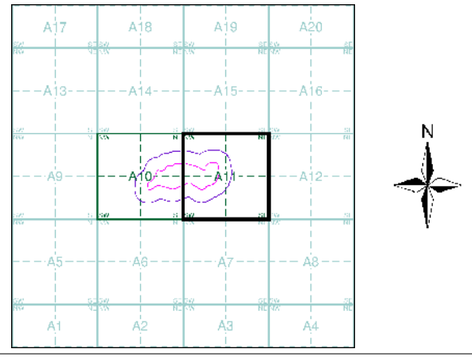
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)



Historical Map - Segment A11



Order Details

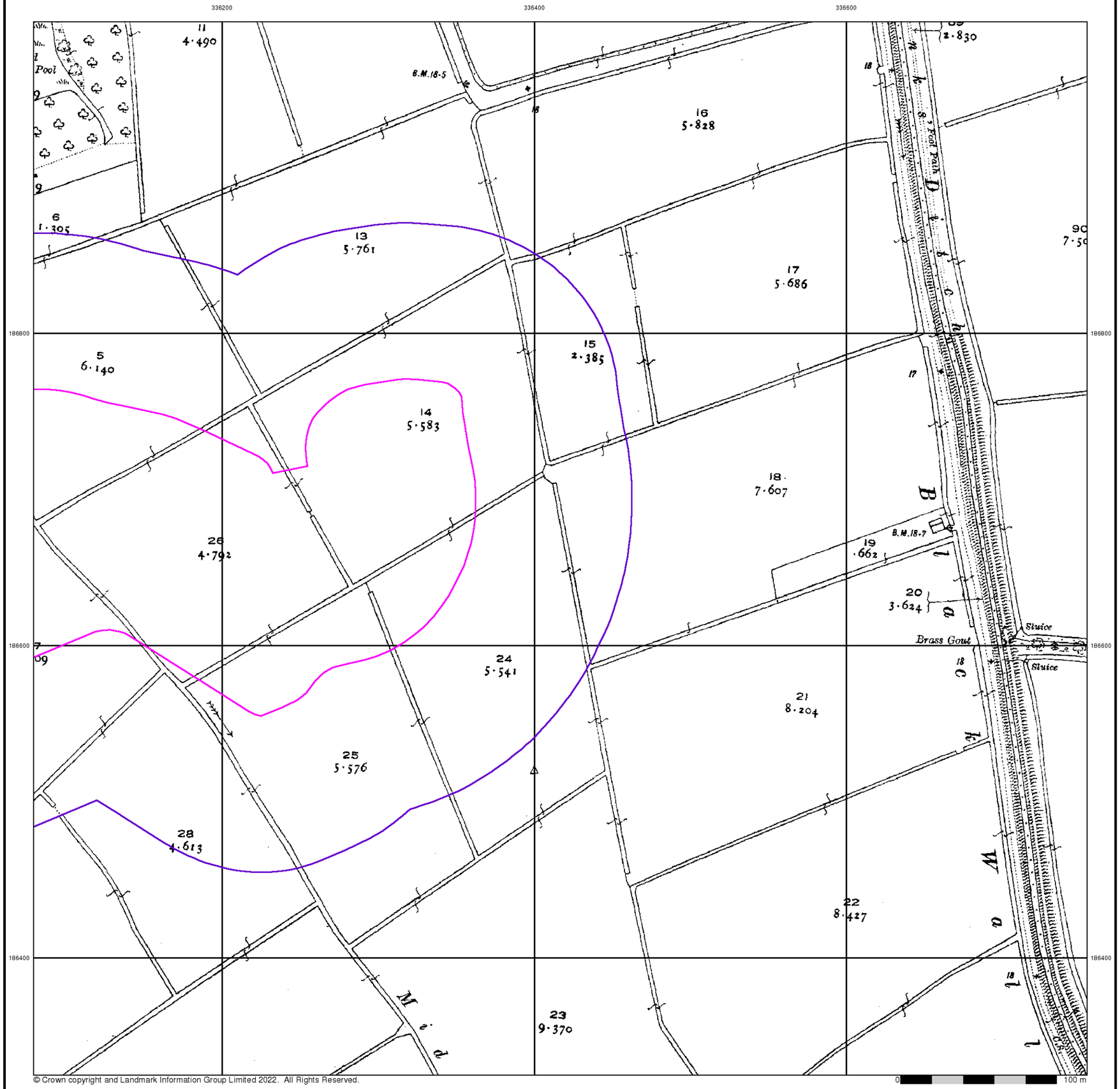
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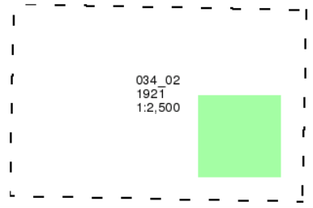
Monmouthshire

Published 1921

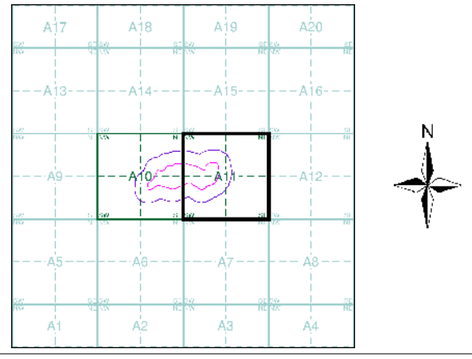
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)



Historical Map - Segment A11



Order Details

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Ordnance Survey Plan

Published 1967

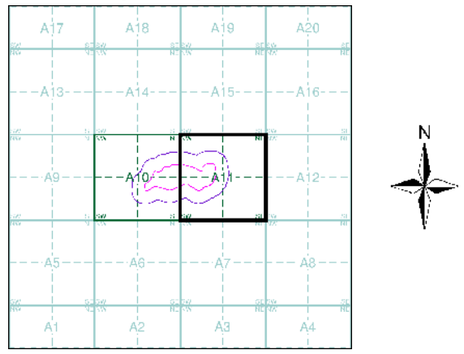
Source map scale - 1:1,250

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)

ST3686NW 1967 1:1,250	ST3686NE 1967 1:1,250
ST3686SW 1967 1:1,250	ST3686SE 1967 1:1,250

Historical Map - Segment A11



Order Details

Order Number:	304885831_1_1
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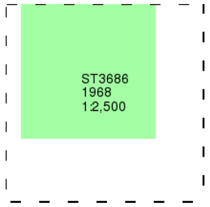
Ordnance Survey Plan

Published 1968

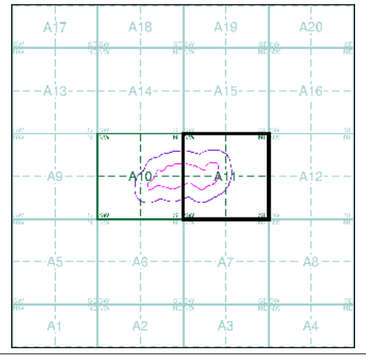
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)



Historical Map - Segment A11



Order Details

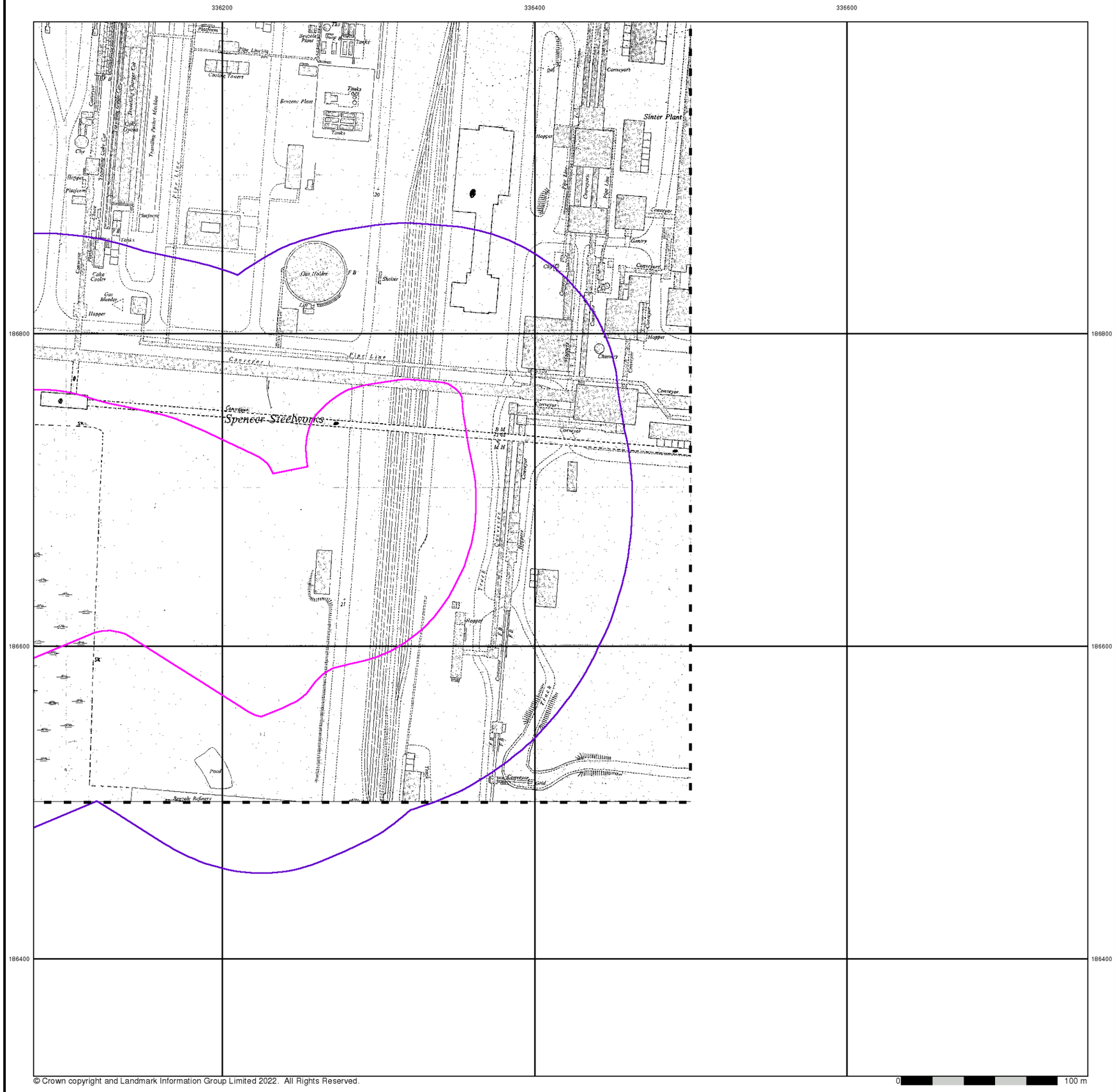
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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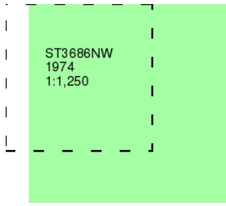
Supply of Unpublished Survey Information

Published 1974

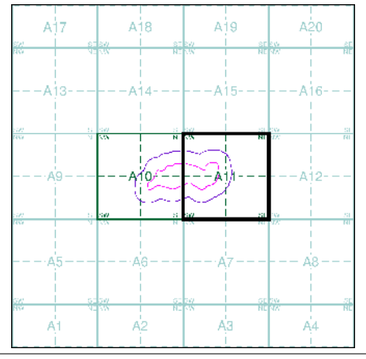
Source map scale - 1:1,250

SUSI maps (Supply of Unpublished Survey Information) were produced between 1972 and 1977, mainly for internal use at Ordnance Survey. These were more of a `work-in-progress' plan as they showed updates of individual areas on a map. These maps were unpublished, and they do not represent a single moment in time. They were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A11



Order Details

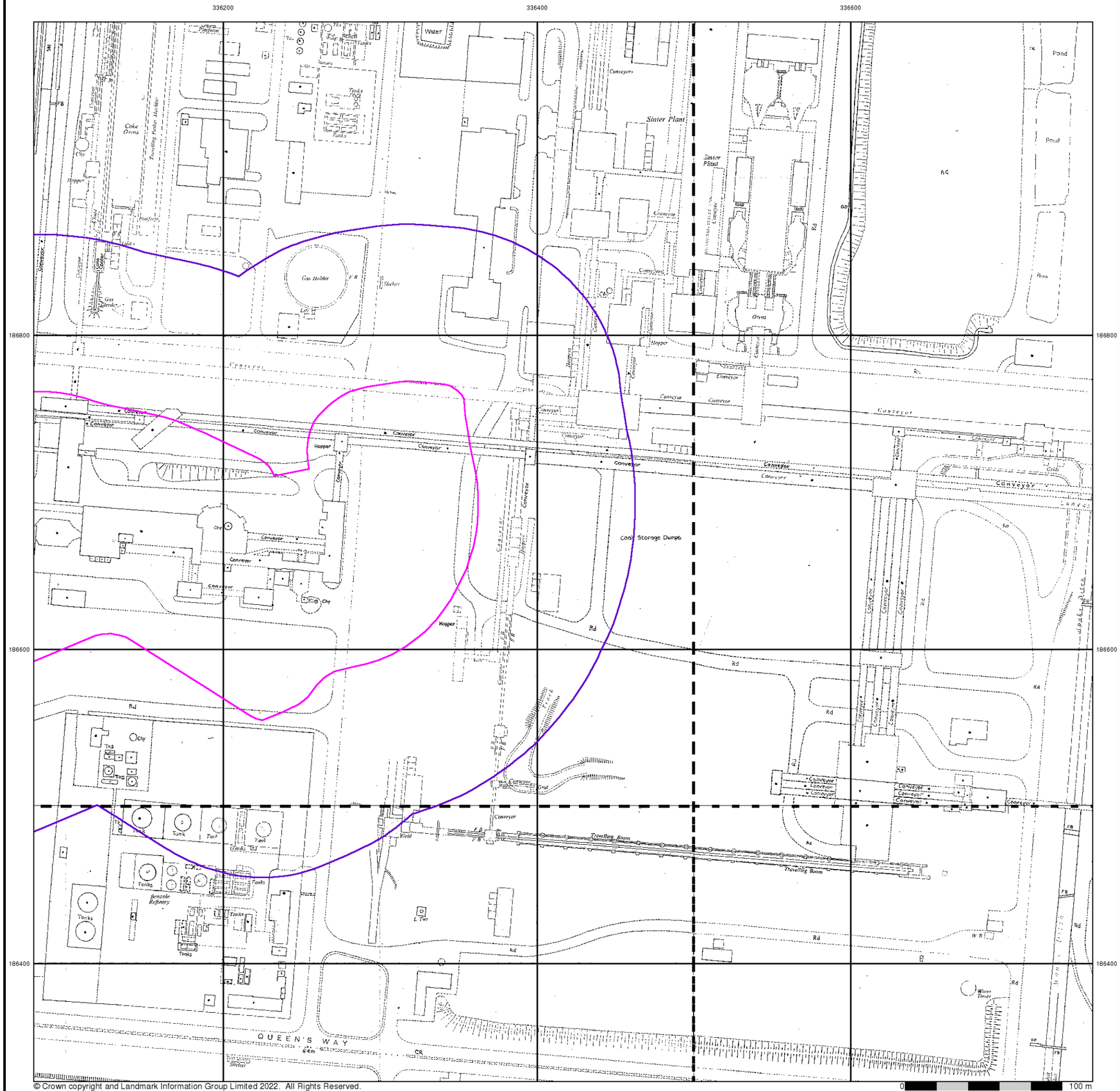
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
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Additional SIMs

Published 1986

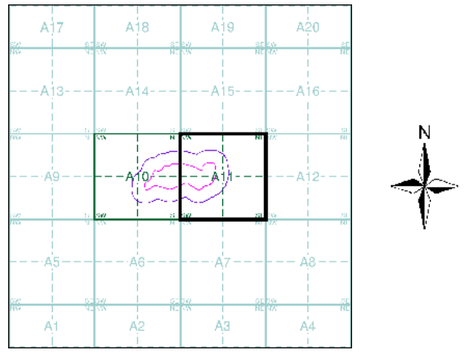
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

ST3686NW 1986 1:1,250	ST3686NE 1986 1:1,250
ST3686SW 1986 1:1,250	ST3686SE 1986 1:1,250

Historical Map - Segment A11



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

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0 100 m

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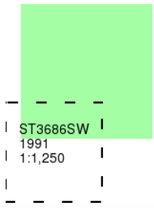
Additional SIMs

Published 1991

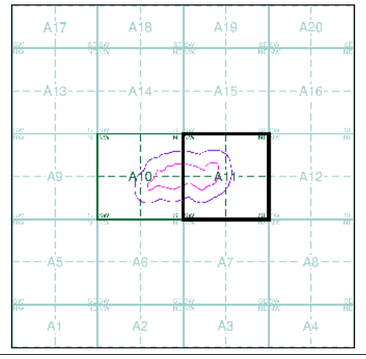
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A11



Order Details

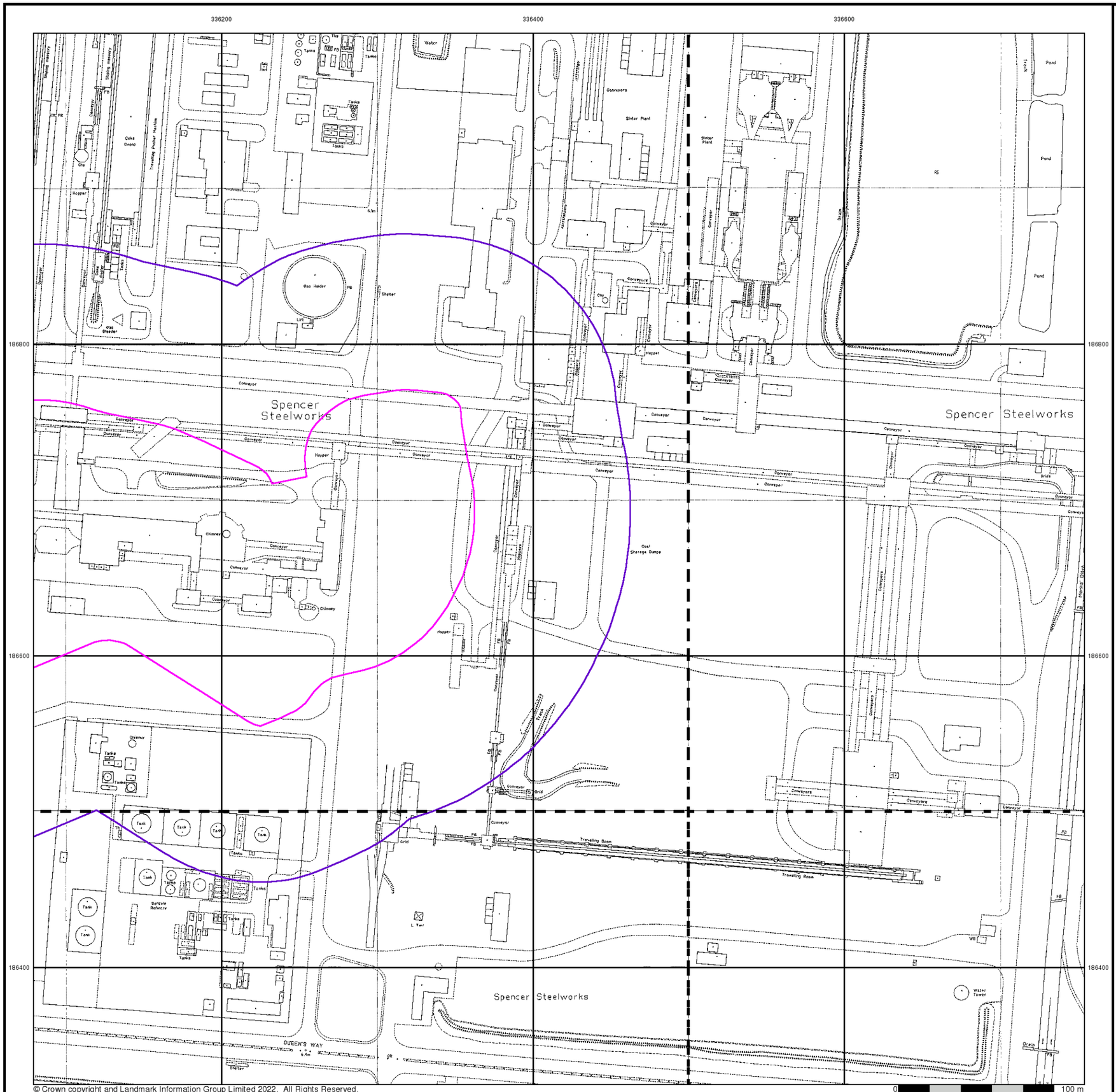
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Slice:	A
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Large-Scale National Grid Data

Published 1992

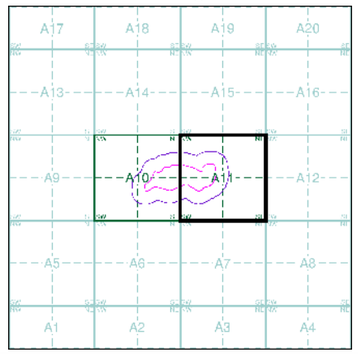
Source map scale - 1:1,250

'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)

ST3686NW 1992 1:1,250	ST3686NE 1992 1:1,250
ST3686SW 1992 1:1,250	ST3686SE 1992 1:1,250

Historical Map - Segment A11



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
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Site Area (Ha):	8.34
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Large-Scale National Grid Data

Published 1995

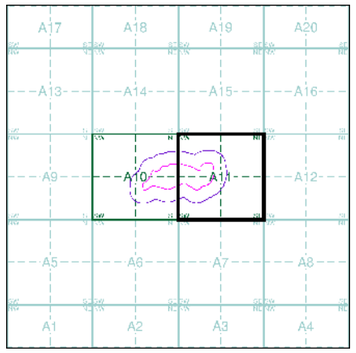
Source map scale - 1:1,250

'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)

ST3686NW 1995 1:1,250	ST3686NE 1995 1:1,250
ST3686SW 1995 1:1,250	ST3686SE 1995 1:1,250

Historical Map - Segment A11



Order Details

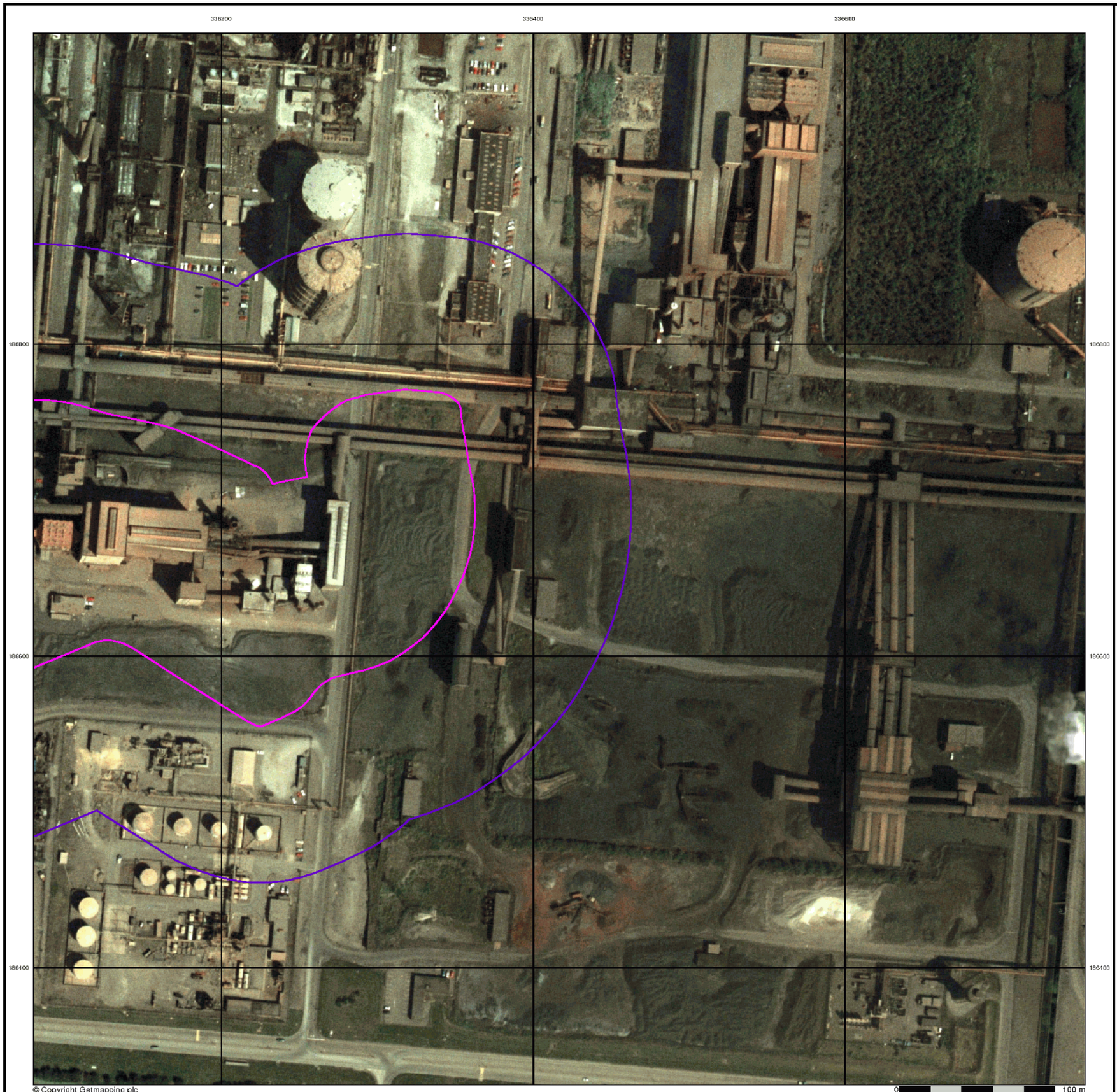
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

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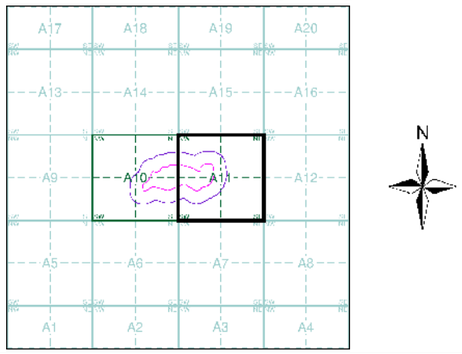
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Historical Aerial Photography

Published 2001

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Segment A11



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	100

Site Details

Site at 336079,186662

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Historical Mapping Legends

Ordnance Survey County Series 1:10,560

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

Ordnance Survey Plan 1:10,000

Chalk Pit, Clay Pit or Quarry
Gravel Pit
Sand Pit
Disused Pit or Quarry
Refuse or Slag Heap
Lake, Loch or Pond
Dunes
Boulders
Coniferous Trees
Non-Coniferous Trees
Orchard
Scrub
Coppice
Bracken
Heath
Rough Grassland
Marsh
Reeds
Saltings
Building
Direction of Flow of Water
Shingle
Sand
Glasshouse
Pylon
Electricity Transmission Line
Pole
Sloping Masonry
Cutting
Embankment
Standard Gauge Multiple Track
Road Under
Road Over
Level Crossing
Foot Bridge
Standard Gauge Single Track
Siding, Tramway or Mineral Line
Narrow Gauge
Geographical County
Administrative County, County Borough or County of City
Municipal Borough, Urban or Rural District, Burgh or District Council
Borough, Burgh or County Constituency
Shown only when not coincident with other boundaries
Civil Parish
Shown alternately when coincidence of boundaries occurs

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

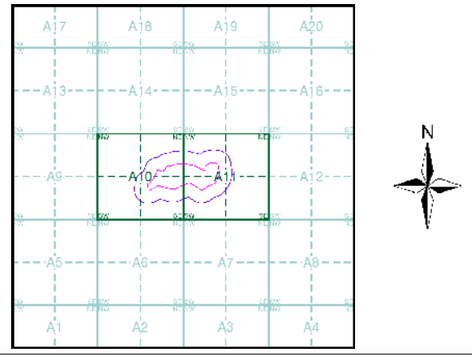
Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or community boundary
District, Unitary, Metropolitan, London Borough boundary
Constituency boundary
Area of wooded vegetation
Non-coniferous trees
Non-coniferous trees (scattered)
Coniferous trees
Coniferous trees (scattered)
Positioned tree
Orchard
Coppice or Osiers
Rough Grassland
Heath
Scrub
Marsh, Salt Marsh or Reeds
Water feature
Flow arrows
MHW(S) Mean high water (springs)
MLW(S) Mean low water (springs)
Telephone line (where shown)
Electricity transmission line (with poles)
BM 123.45 m Bench mark (where shown)
Triangulation station
Point feature (e.g. Guide Post or Mile Stone)
Pylon, flare stack or lighting tower
Site of (antiquity)
Glasshouse
General Building
Important Building

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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Monmouthshire	1:10,560	1886 - 1887	3
Monmouthshire	1:10,560	1902	4
Monmouthshire	1:10,560	1922	5
Monmouthshire	1:10,560	1938 - 1954	6
Historical Aerial Photography	1:10,560	1947	7
Historical Aerial Photography	1:10,560	1947	8
Monmouthshire	1:10,560	1954	9
Ordnance Survey Plan	1:10,000	1965	10
Ordnance Survey Plan	1:10,000	1973	11
Ordnance Survey Plan	1:10,000	1981 - 1989	12
Newport	1:10,000	1983	13
Ordnance Survey Plan	1:10,000	1987	14
10K Raster Mapping	1:10,000	1999	15
10K Raster Mapping	1:10,000	2006	16
VectorMap Local	1:10,000	2022	17

Historical Map - Slice A



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

Site at 336079,186662

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Russian Military Mapping Legends

1:5,000 and 1:10,000 mapping

a. Not drawn to scale b. Drawn to scale

- Government and Administrative Buildings
- Military and Industrial Buildings
- Military and Communication Areas
- Subway Entrance
- Fireproof Building
- Prominent Fireproof Building
- Non-fireproof Building
- Non-fireproof Building (non-dwelling)
- Factory, mill, and flour mill, with chimneys
- Factory, mill, and flour mill, without chimneys
- Power Station, drawn to scale
- Hydroelectric Power Station
- Radio Station, drawn to scale
- Telephone Station, drawn to scale
- Abandoned Open-pit Mine or Quarry
- Open-pit Salt Mine
- Pit
- Oil Deposit or Well
- Oil Seepage
- Tailings Pile
- Fuel Storage Tanks
- Natural Gas Tank
- Bench Mark
- Drill Hole
- Burial Mound
- Triangulation Point on Burial Mound
- Single-track Railroad
- Double-track Railroad and Station Building
- Coniferous Forest
- Deciduous Forest
- Mixed Forest
- Lawns
- Citrus Orchard
- Wet Ground
- Scattered Vegetation

243,8 — Values for prominent elevations

186.0 — Numbers for spot elevations, depth soundings, contour lines, etc.

0,2 — Velocity of the current, width of river bed, depth of river

Fractional terms: length and capacity of bridges; depth of fords and condition of the river bottom; height of forest and the diameter of trees

Russian Alphabet (For reference and phonetic interpretation of map text)

А а (A)	З з (Z)	П п (P)	Ч ч (CH)
Б б (B)	И и (I)	Р р (R)	Ш ш (SH)
В в (V)	Й й (Y)	С с (S)	Щ щ (SHCH)
Г г (G)	К к (K)	Т т (T)	ъ (–)
Д д (D)	Л л (L)	У у (U)	ы (Y)
Е е (E)	М м (M)	Ф ф (F)	ь (')
Ё ё (YO)	Н н (N)	Х х (KH)	Э э (E)
Ж ж (ZH)	О о (O)	Ц ц (TS)	Ю ю (YU or IU)
			Я я (YA or IA)

1:25,000 mapping

a. Not drawn to scale b. Drawn to scale

- Government and Administrative Buildings
- Military and Industrial Buildings
- Military and Communication Areas
- Subway Entrance
- Partly Demolished Buildings
- Demolished Buildings
- Built-Up Area with Fireproof Buildings Predominant
- Built-Up Area with Non-Fireproof Buildings Predominant
- Individual Fireproof Building
- Prominent Industrial Building
- Individual Dwelling, Fireproof
- Ruins of an Individual Dwelling
- Factory or Mill Chimney
- Factory or Mill with Chimney
- Factory or Mill without Chimney
- Mine or Open Pit Mine
- Operating Shaft or Mine
- Non-Operating Shaft or Mine
- Salt Mine
- Tailings Pile
- Pit
- Stone Quarry
- Gas Pump or Service Station
- Fuel Storage or Natural Gas Tank
- Oil or Natural Gas Derrick
- Small Hydroelectric Power Station
- Power Station
- Transformer Station
- Cemetery
- Burial Mound (height in metres)
- Triangulation Point on Burial Mound
- Triangulation Point
- Bench Mark
- Bench Mark (monumented)
- Telegraph Office
- Telephone Station
- Radio Station
- Radio Tower
- Airfield or Seaplane Base
- Landing Strip
- Main Highway
- Highway under Construction
- Improved Dirt Road (former truck road)
- Double-track Railroad with First Class Station
- Dismantled Railroad
- Railroad Under Construction
- Shore Embankment
- River or Ditch with Embankment
- Direction and velocity of current
- Well
- Water Reservoir or Rain Water Pit
- Spring
- Isobath with value
- Heavy (Index) Contour Line
- Contour Line and Value
- Half Contour Line
- Spot Elevation Value
- Coniferous
- Deciduous
- Mixed
- Scrub

Key to Numbers on Mapping

ST38NE_Newport

No.	Description
29	Mill (Steel)
71	Railway Station

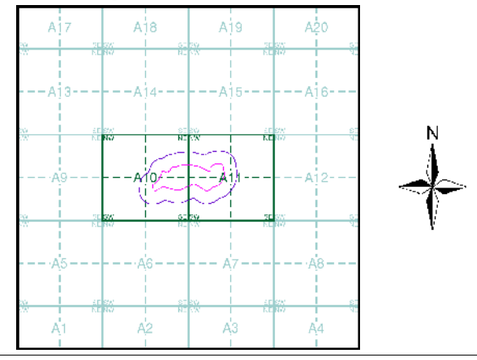
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Historical Mapping & Photography included:

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Monmouthshire	1:10,560	1902	4
Monmouthshire	1:10,560	1922	5
Monmouthshire	1:10,560	1938 - 1954	6
Historical Aerial Photography	1:10,560	1947	7
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Ordnance Survey Plan	1:10,000	1987	14
10K Raster Mapping	1:10,000	1999	15
10K Raster Mapping	1:10,000	2006	16
VectorMap Local	1:10,000	2022	17

Russian Map - Slice A



Order Details

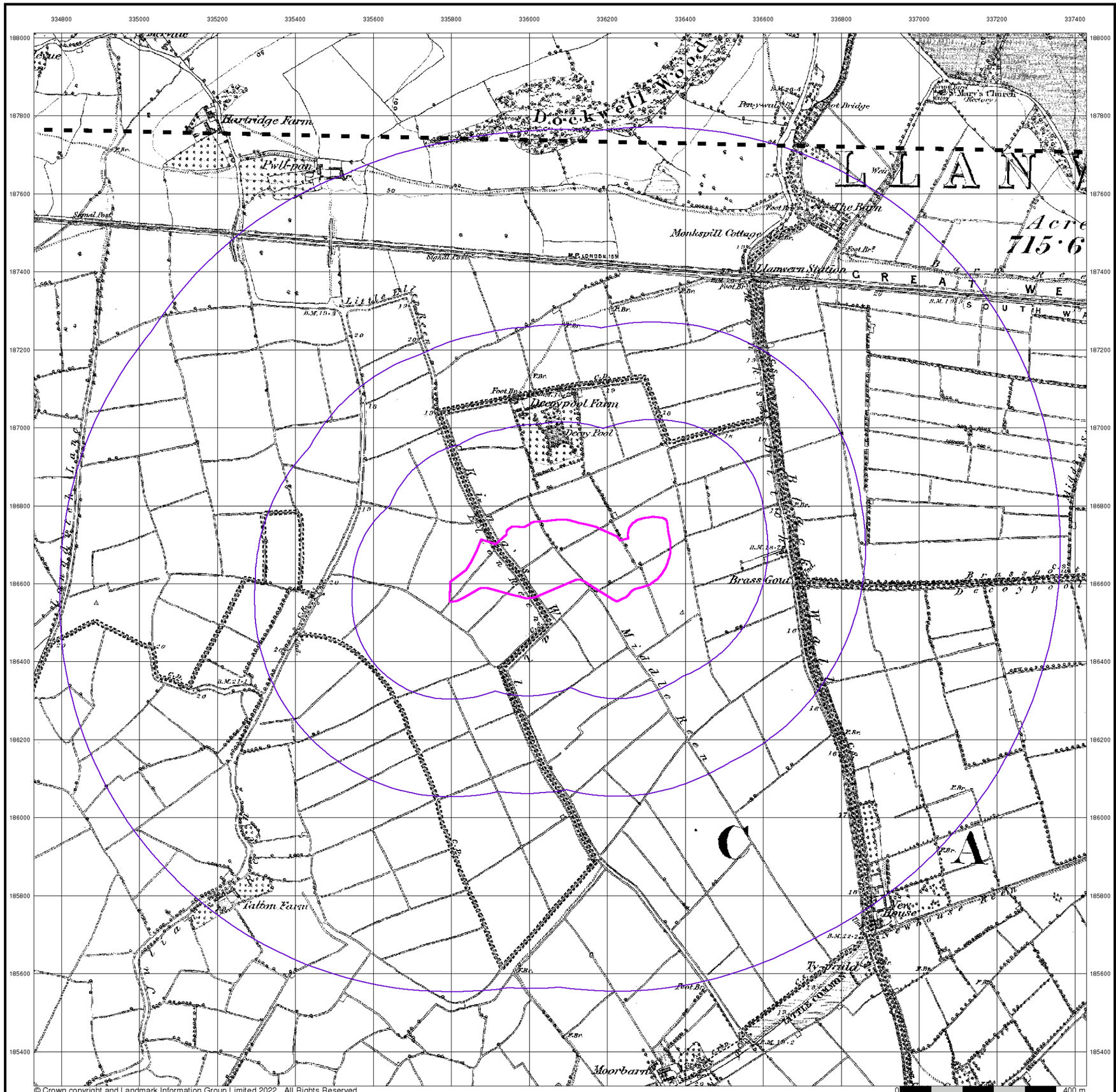
Order Number: 304885831_1_1
Customer Ref: Llanwern 4c 4g 4e
National Grid Reference: 336080, 186650
Slice: A
Site Area (Ha): 8.34
Search Buffer (m): 1000

Site Details

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Monmouthshire

Published 1886 - 1887

Source map scale - 1:10,560

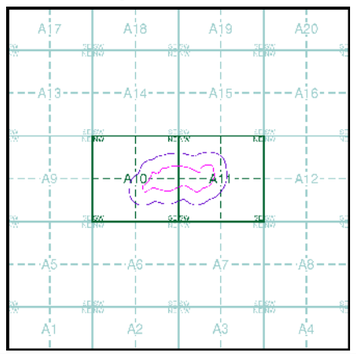
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some 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)

02900
1886
1:10,560

03400
1887
1:10,560

Historical Map - Slice A



Order Details

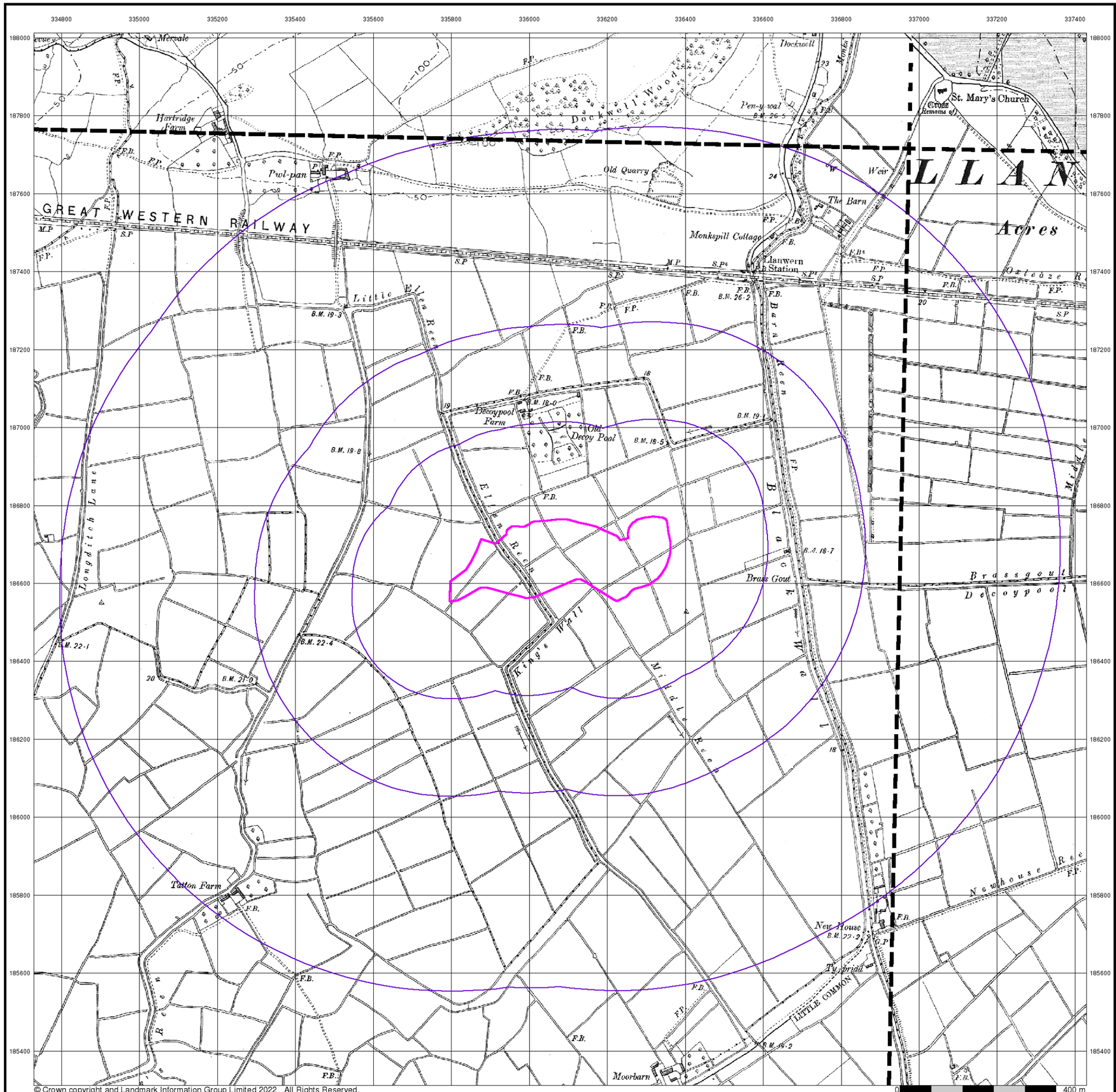
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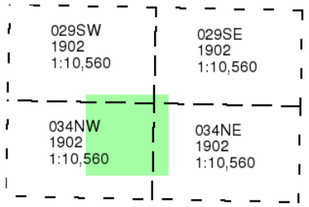
Monmouthshire

Published 1902

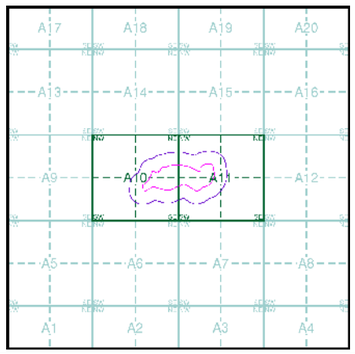
Source map scale - 1:10,560

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

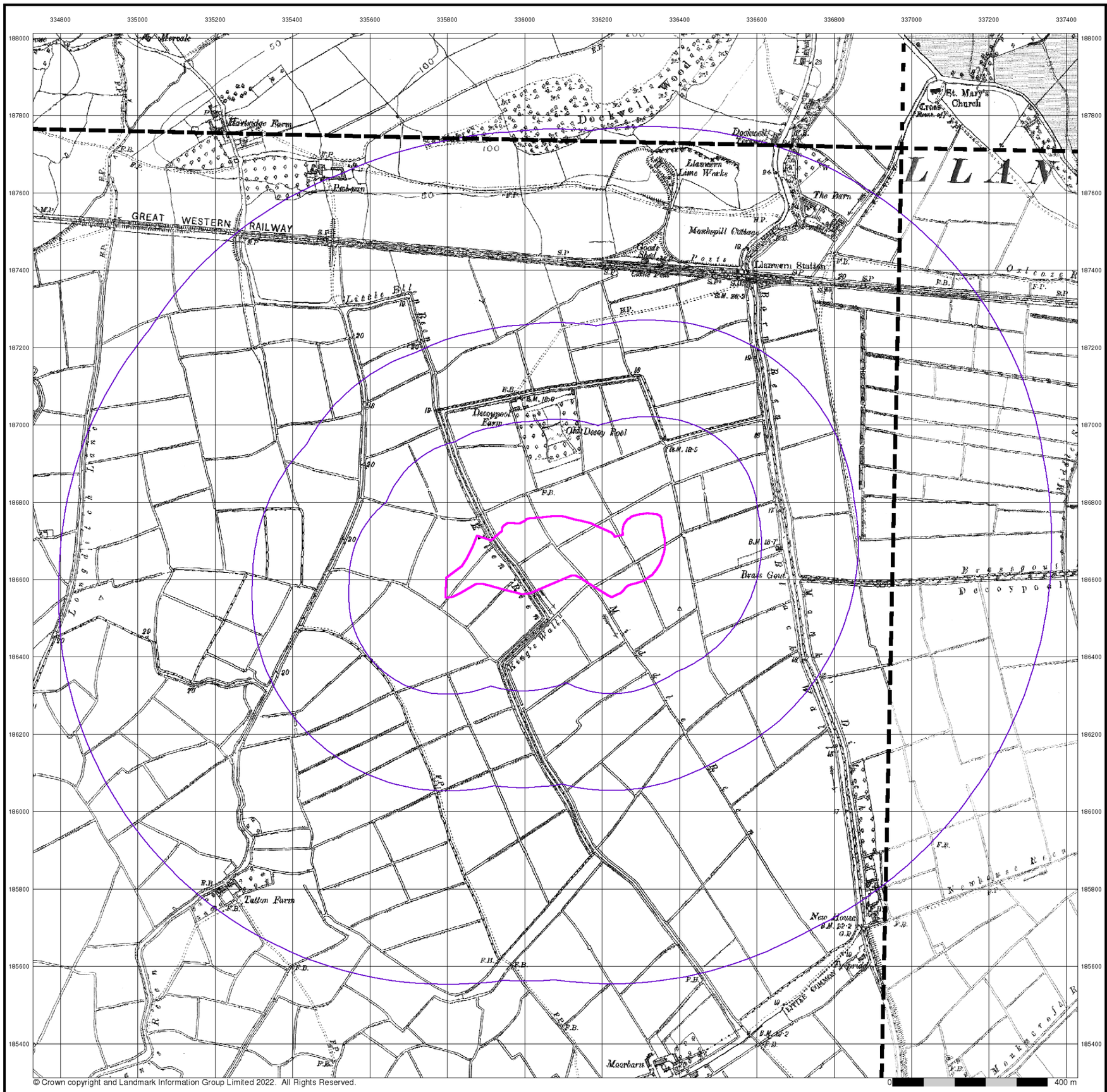
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National Grid Reference:	336080, 186650
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Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

Site at 336079,186662

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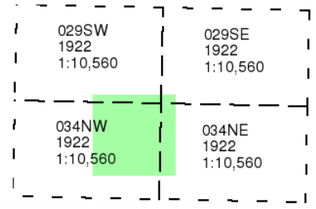
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Published 1922

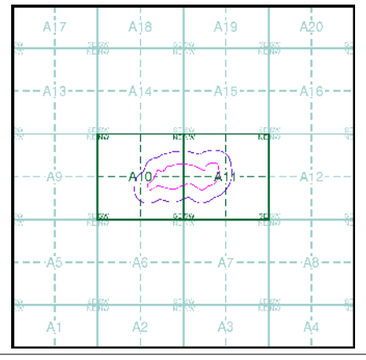
Source map scale - 1:10,560

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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

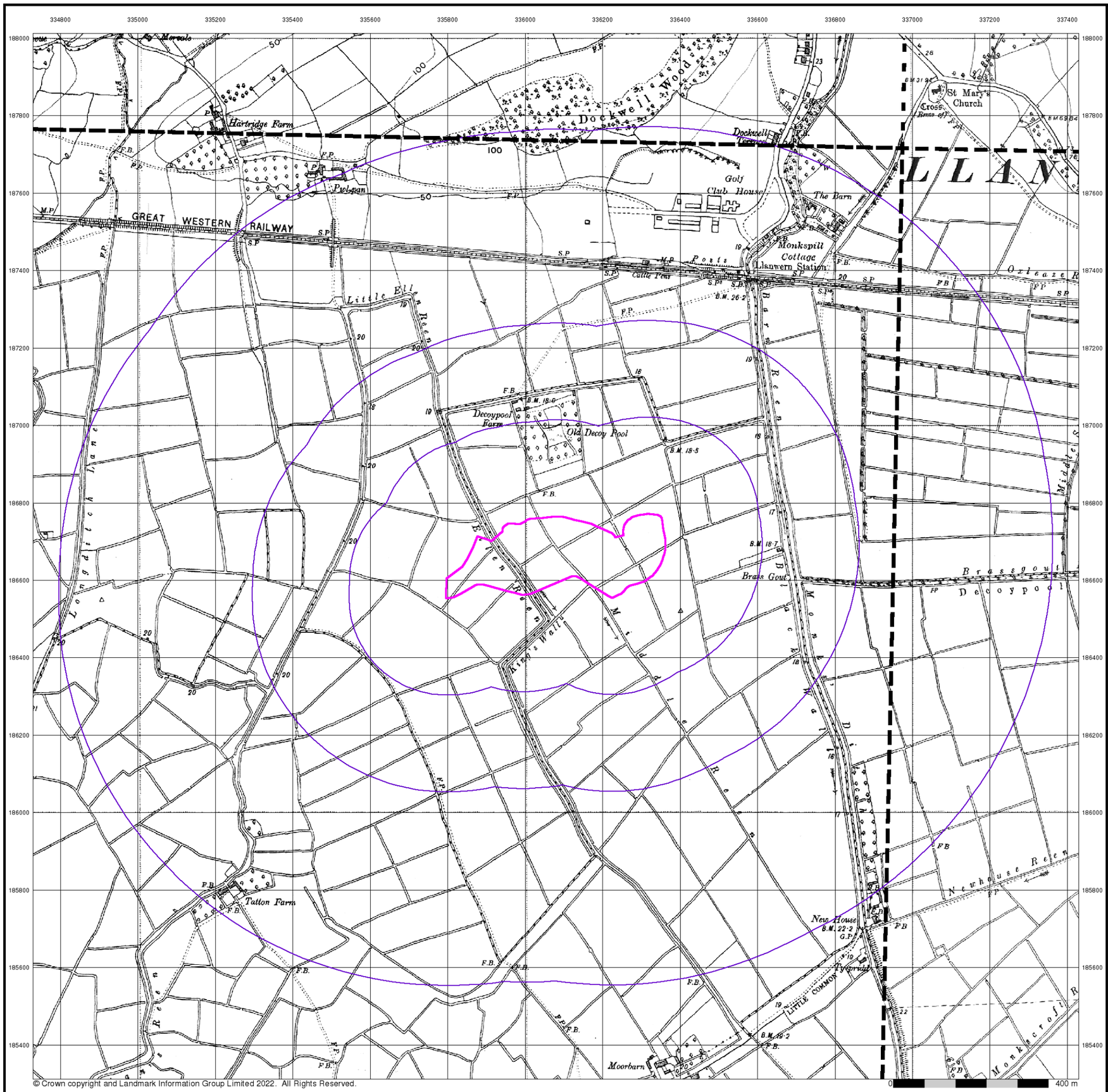
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Monmouthshire

Published 1938 - 1954

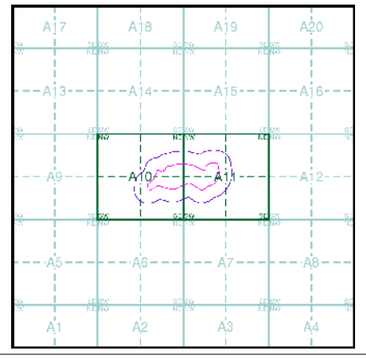
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Map Name(s) and Date(s)

029SW 1938 1:10,560	029SE 1954 1:10,560
034NW 1938 1:10,560	034NE 1954 1:10,560

Historical Map - Slice A



Order Details

Order Number:	304885831_1_1
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Historical Aerial Photography

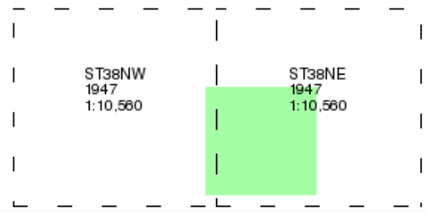
Published 1947

Source map scale - 1:10,560

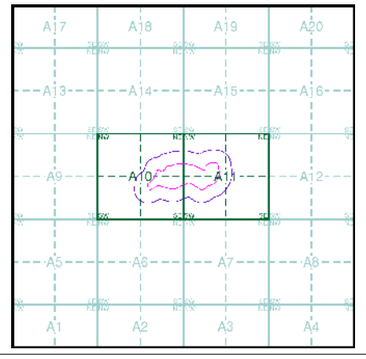
The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 1950's meant that every photograph was re-checked for potentially unsafe information with security sites replaced by fake fields or clouds. The original editions were withdrawn and only later made available after a period of fifty years although due to the accuracy of the editing, without viewing both revisions it is not easy to spot the edits. Where available Landmark have included both revisions.

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Map Name(s) and Date(s)



Historical Aerial Photography - Slice A



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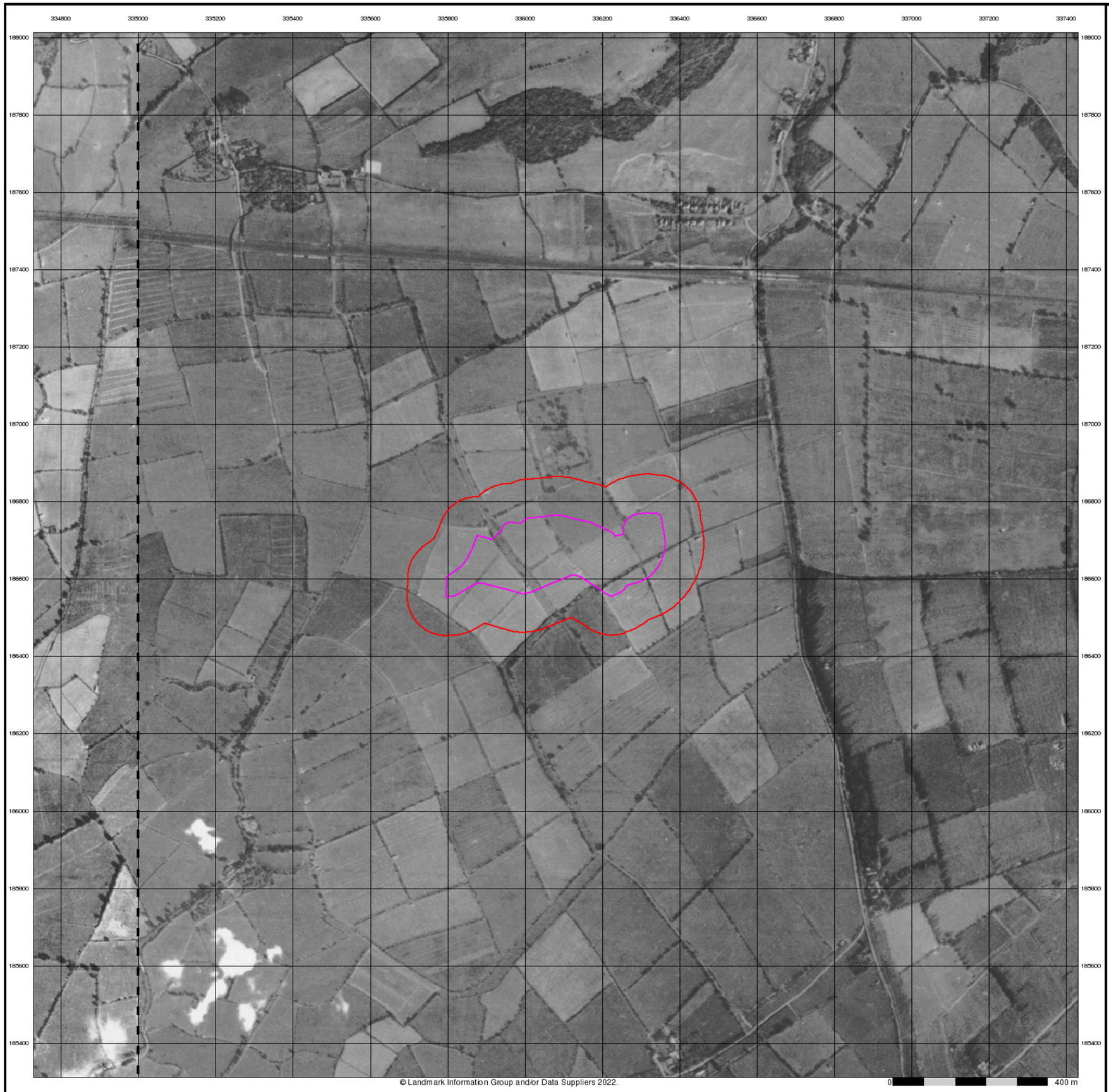
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Historical Aerial Photography

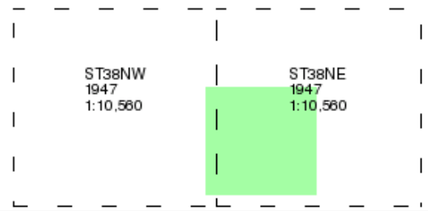
Published 1947

Source map scale - 1:10,560

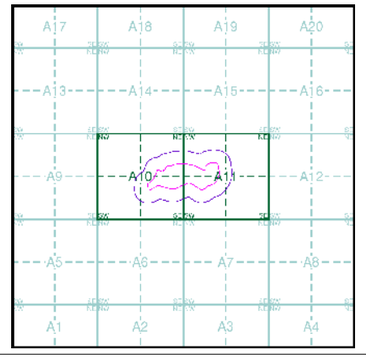
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Map Name(s) and Date(s)



Historical Aerial Photography - Slice A



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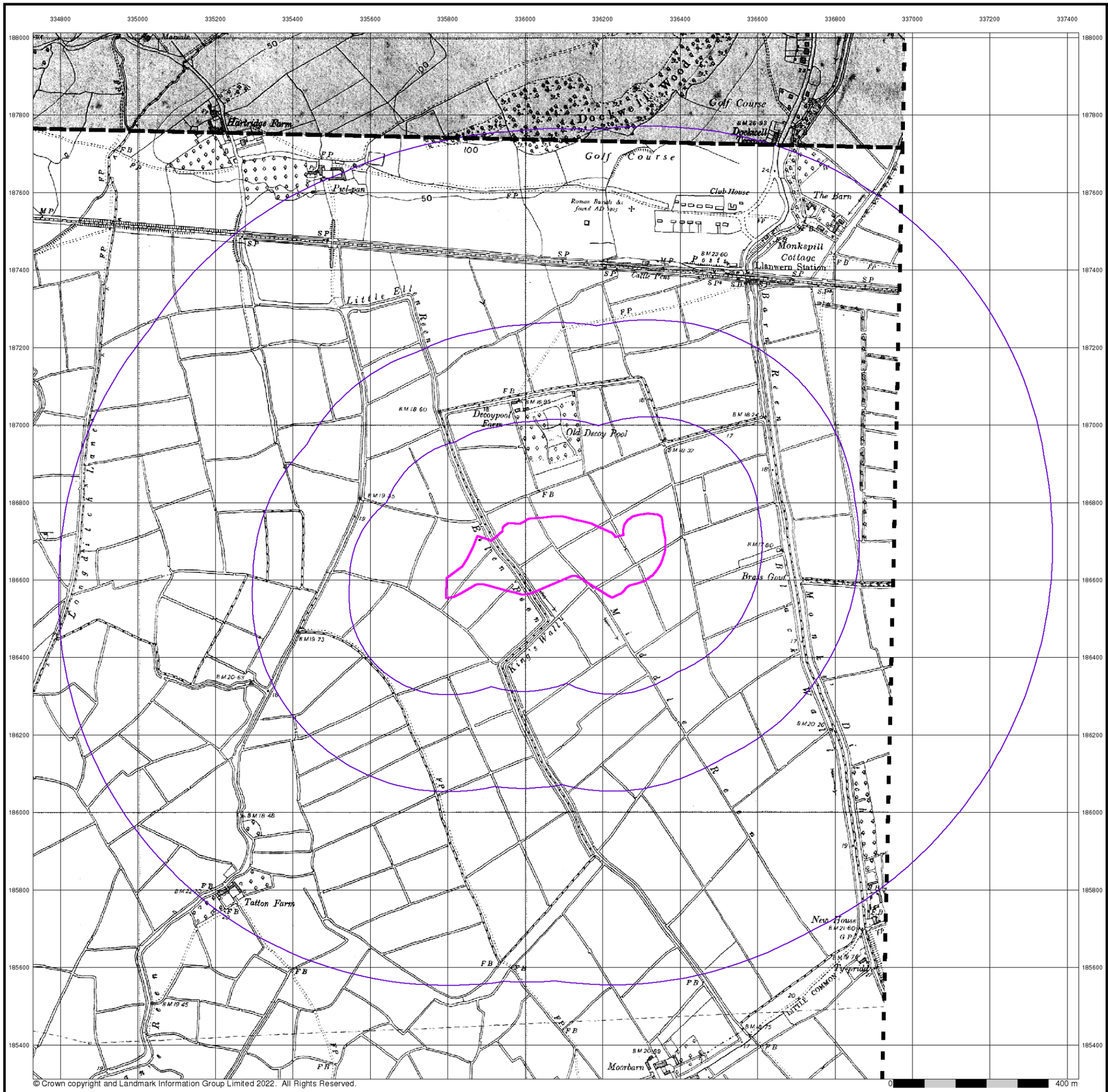
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Monmouthshire

Published 1954

Source map scale - 1:10,560

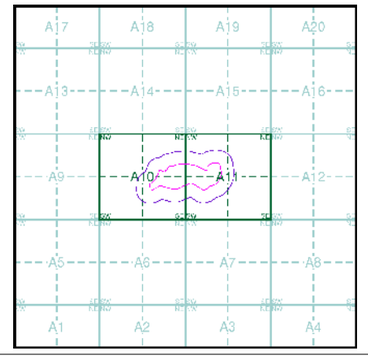
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Map Name(s) and Date(s)

029SW
1954
1:10,560

034NW
1954
1:10,560

Historical Map - Slice A



Order Details

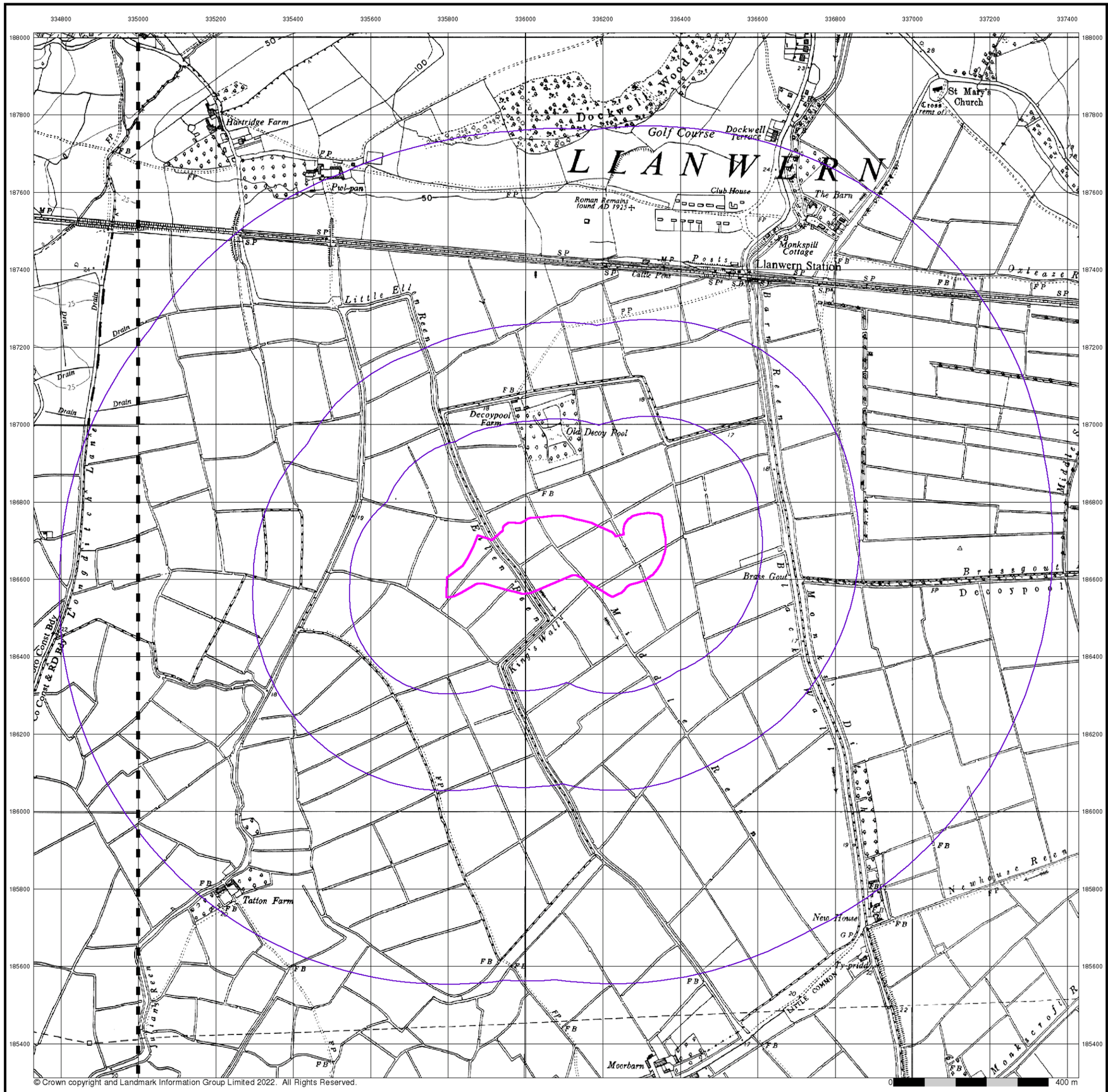
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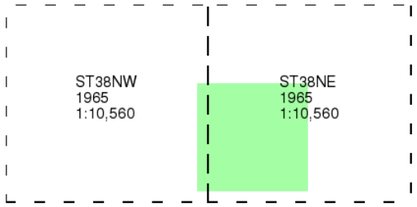
Ordnance Survey Plan

Published 1965

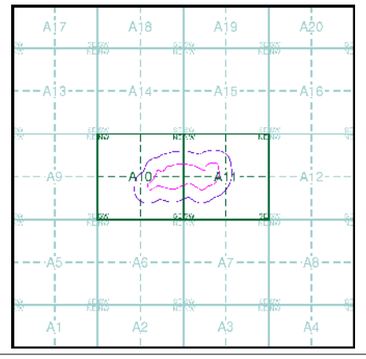
Source map scale - 1:10,000

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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

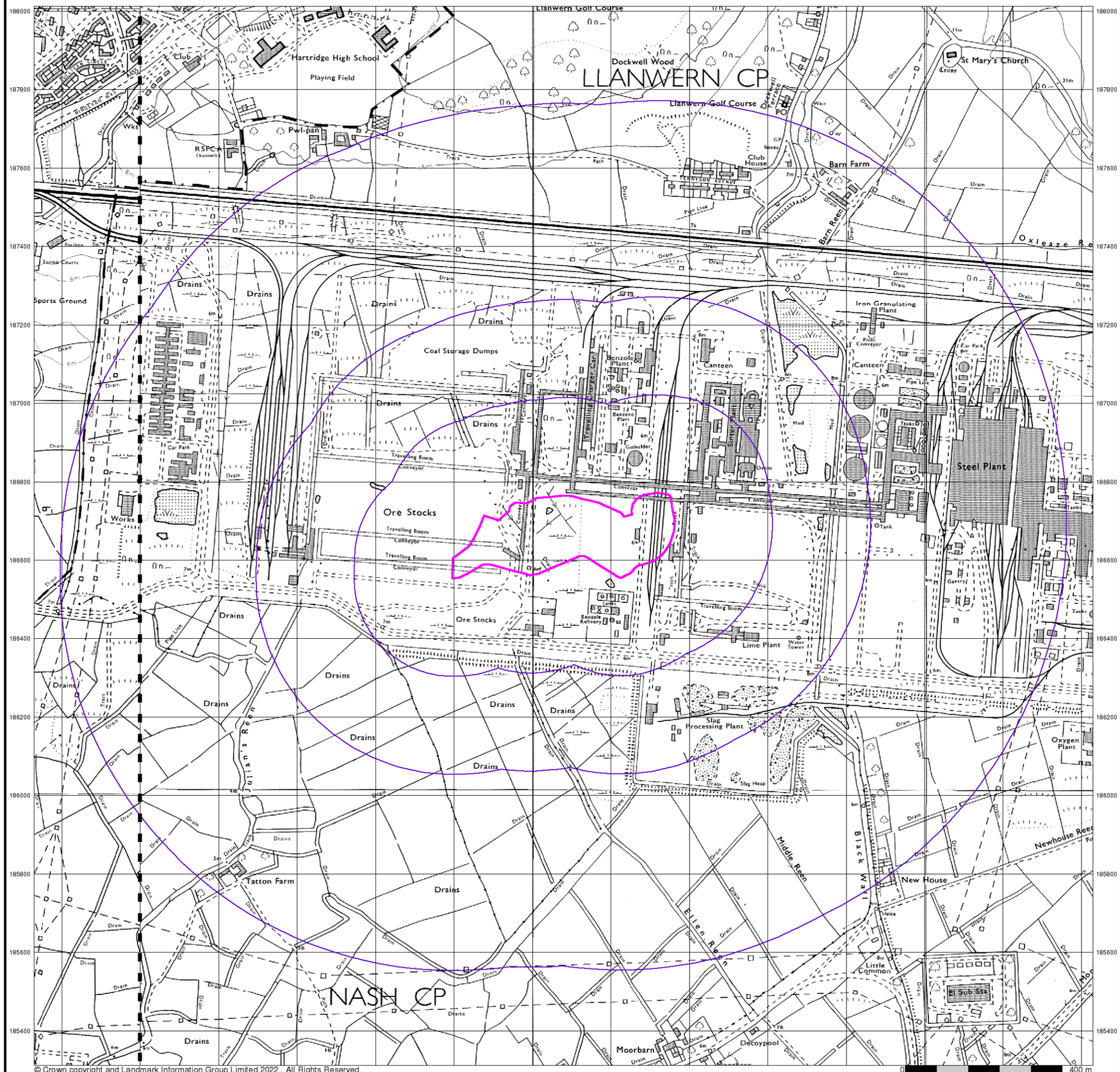
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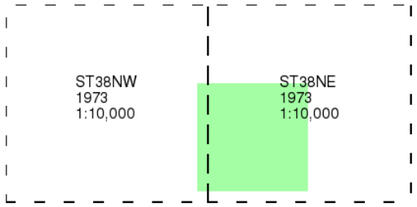
Ordnance Survey Plan

Published 1973

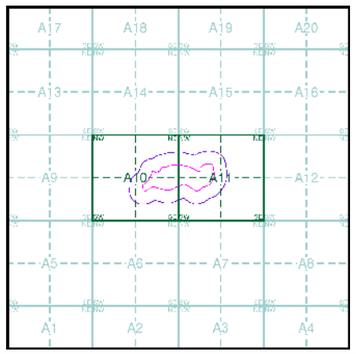
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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

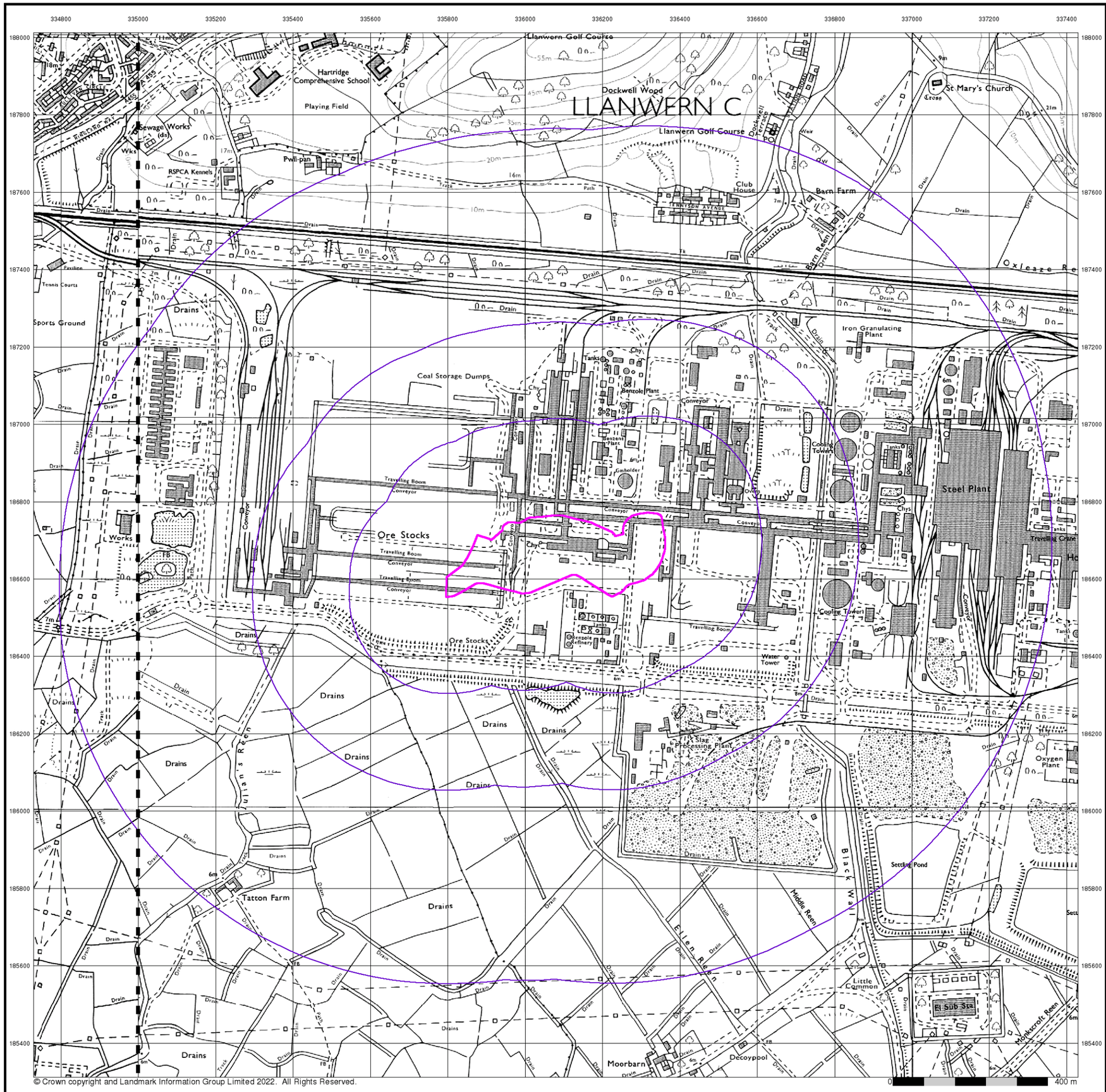
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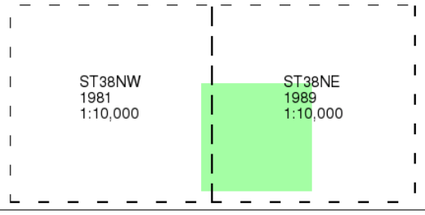
Ordnance Survey Plan

Published 1981 - 1989

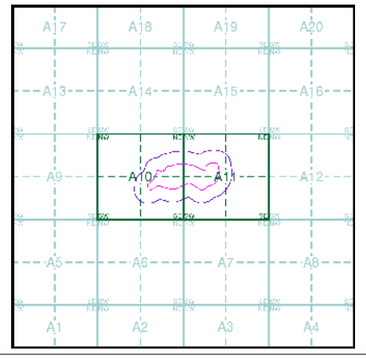
Source map scale - 1:10,000

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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

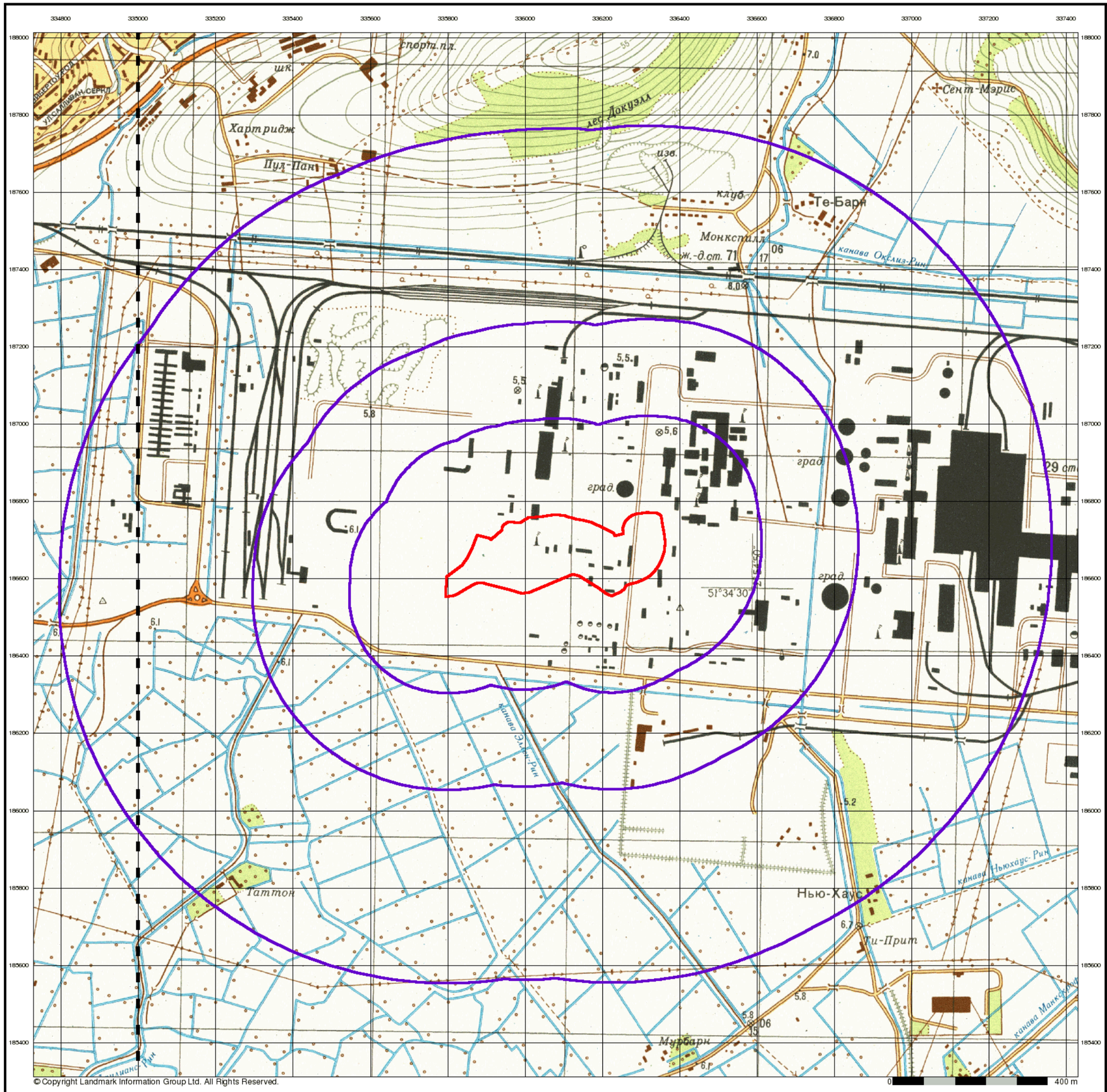
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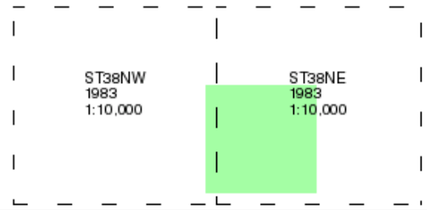
Newport

Published 1983

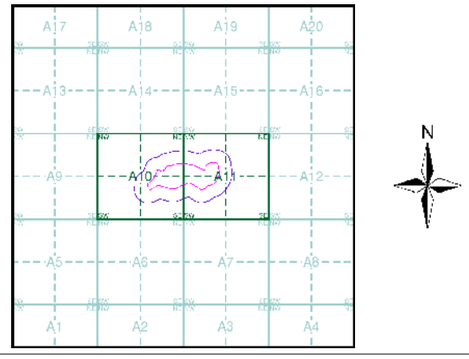
Source map scale - 1:10,000

These maps were produced by the Russian military during the Cold War between 1950 and 1997, and cover 103 towns and cities throughout the U.K. The maps are produced at 1:25,000, 1:10,000 and 1:5,000 scale, and show detailed land use, with colour-coded areas for development, green areas, and non-developed areas. Buildings are coloured black and important building uses (such as hospitals, post offices, factories etc.) are numbered, with a numbered key describing their use.
They were produced by the Russians for the benefit of navigation, as well as strategic military sites and transport hubs, for use if they were to have invaded the U.K. The detailed information provided indicates that the areas were surveyed using land-based personnel, on the ground, in the cities that are mapped.

Map Name(s) and Date(s)



Russian Map - Slice A



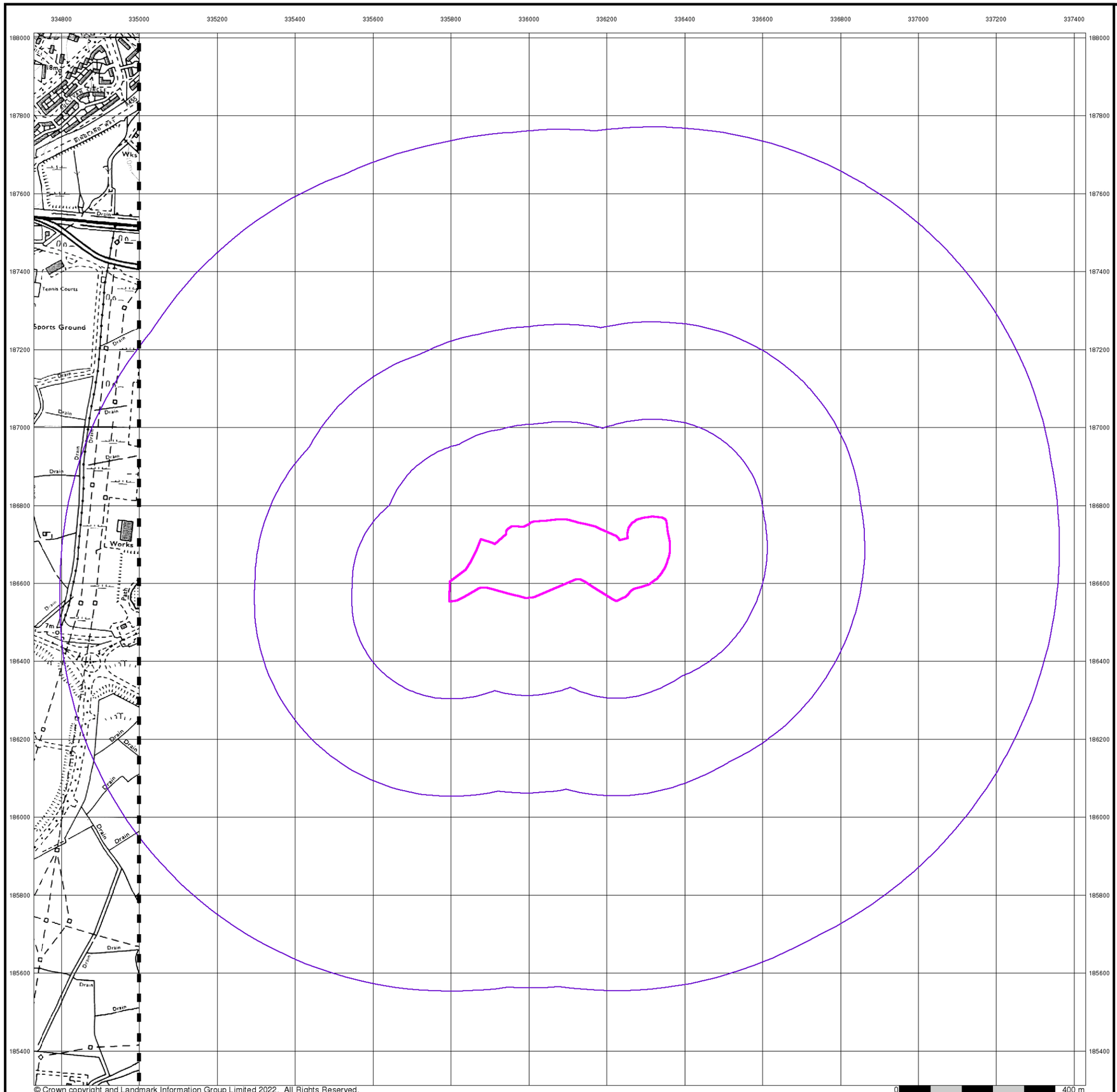
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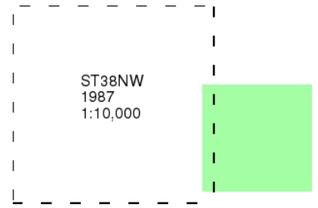
Ordnance Survey Plan

Published 1987

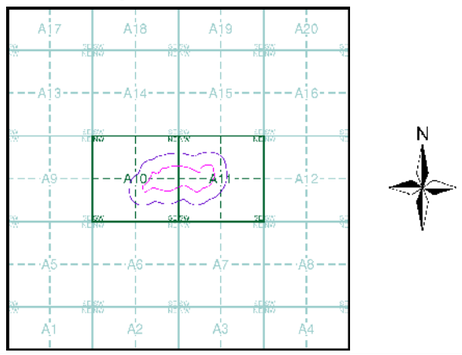
Source map scale - 1:10,000

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

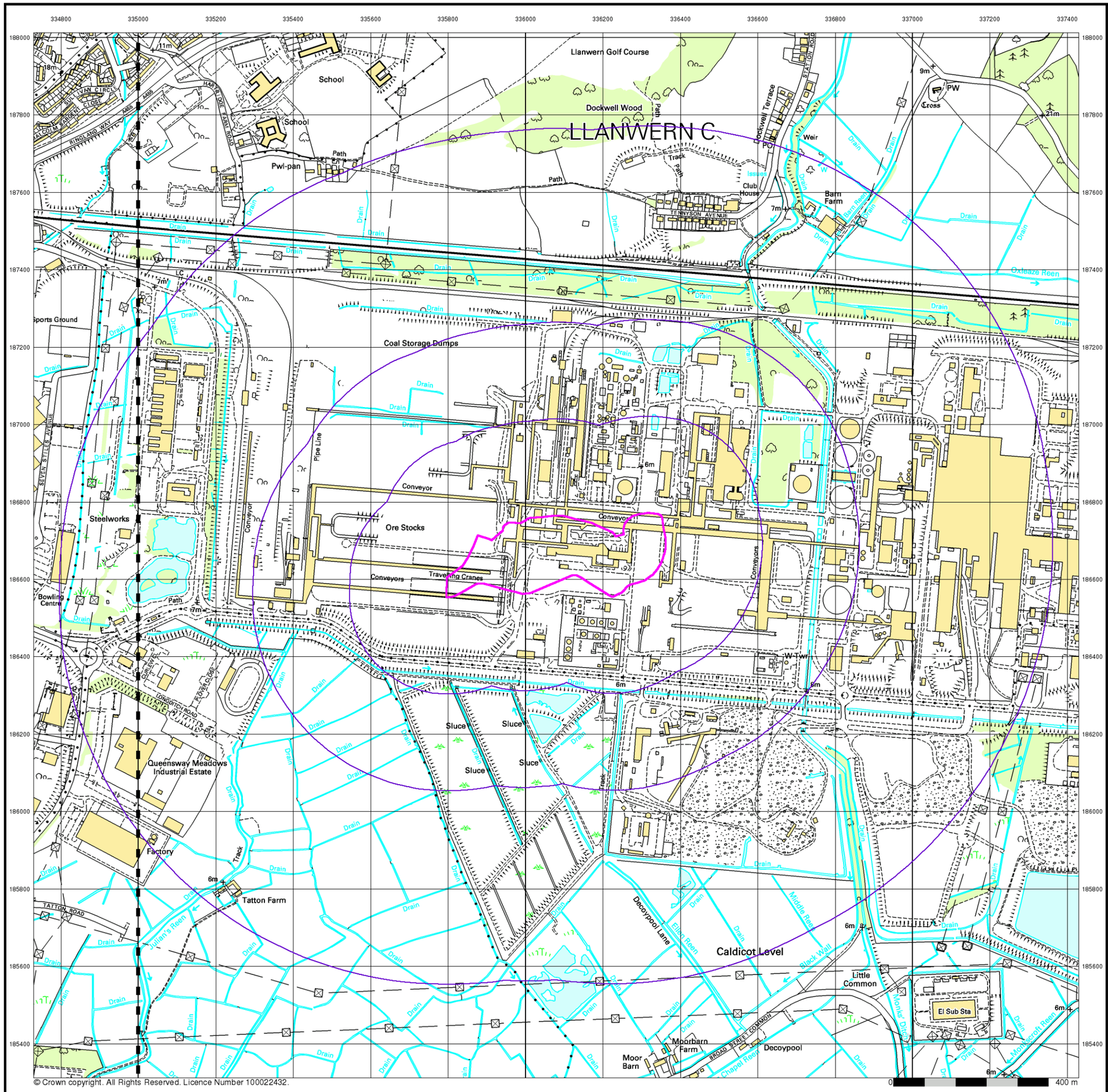
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Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

Site at 336079,186662

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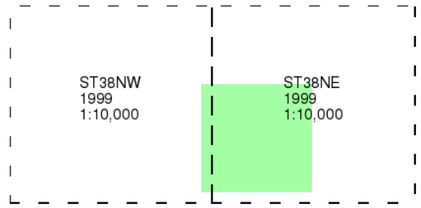
10k Raster Mapping

Published 1999

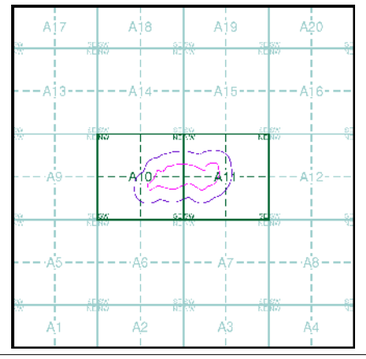
Source map scale - 1:10,000

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

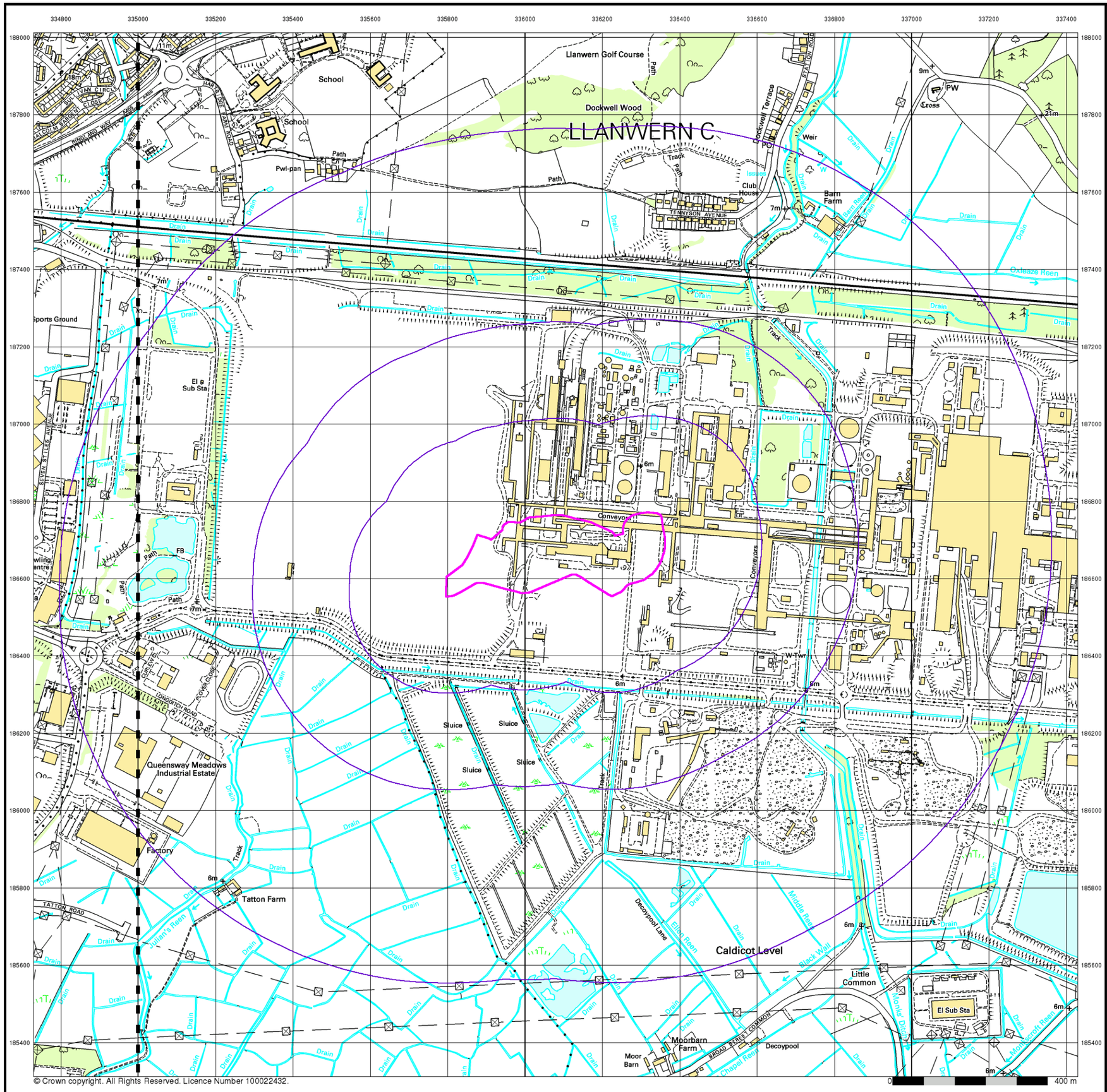
Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

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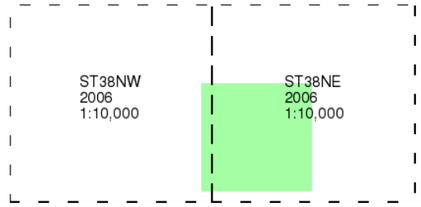
10k Raster Mapping

Published 2006

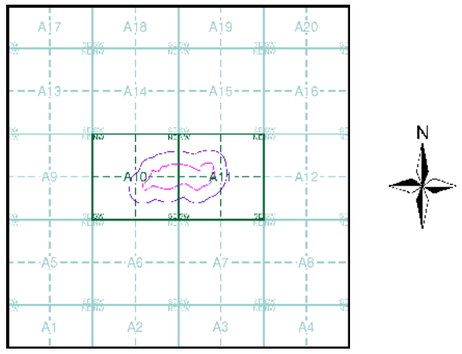
Source map scale - 1:10,000

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



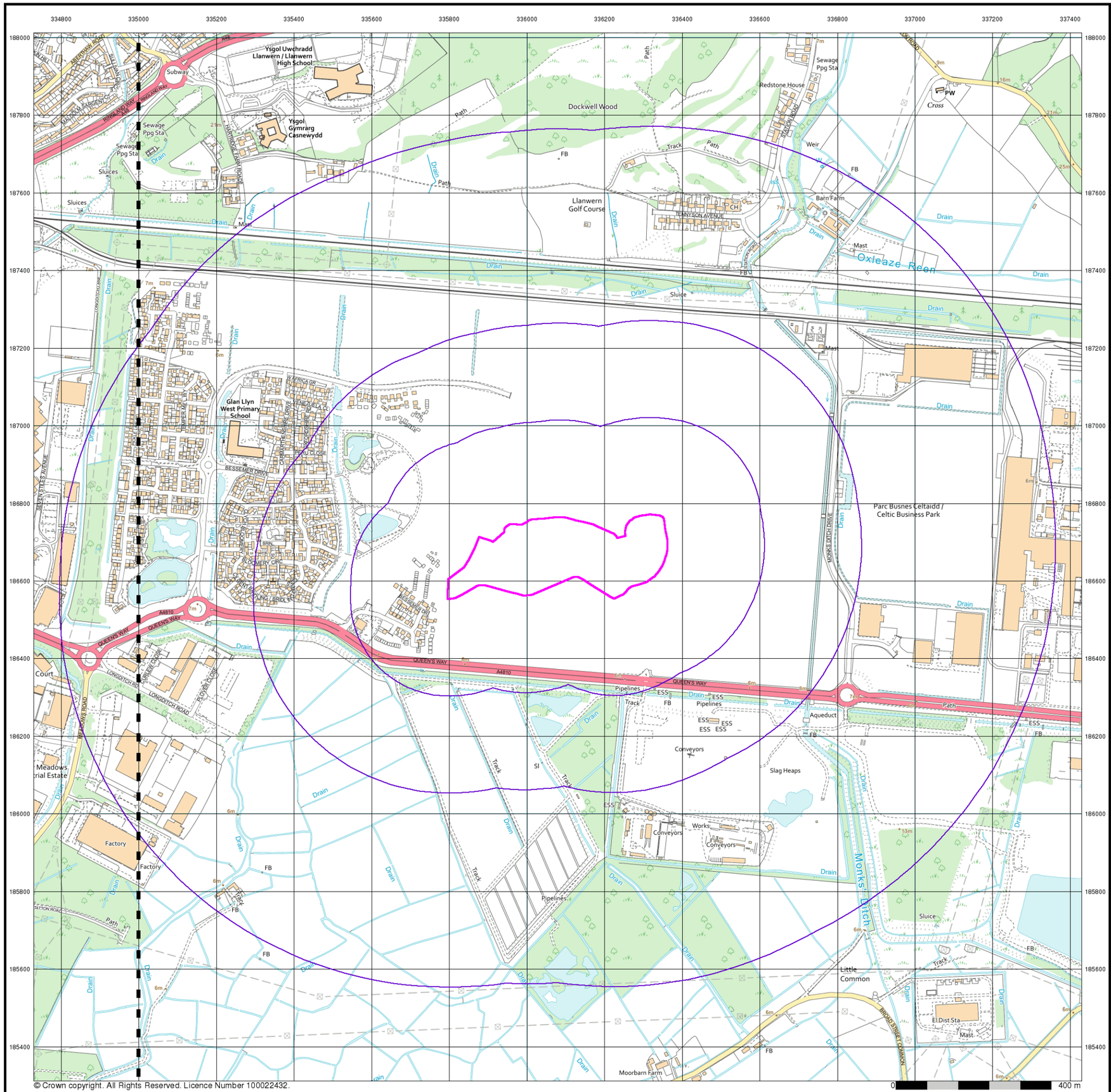
Order Details

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Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details

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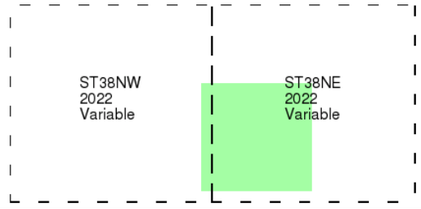
VectorMap Local

Published 2022

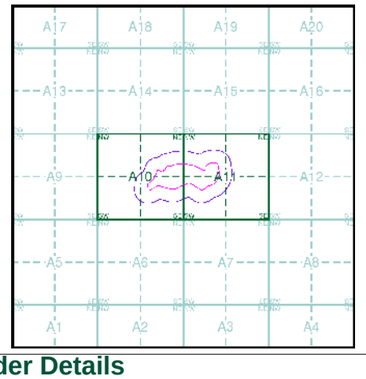
Source map scale - 1:10,000

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number:	304885831_1_1
Customer Ref:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
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Geology 1:50,000 Maps Legends

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	TFD	Tidal Flat Deposits	Clay and Silt	Not Supplied - Holocene
	ALV	Alluvium	Clay, Silt, Sand and Gravel	Not Supplied - Holocene

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	LVN	Lavernock Shales Member	Mudstone	Not Supplied - Hettangian
	PNG	Penarth Group	Mudstone	Not Supplied - Rhaetian
	STM	St Mary's Well Bay Member	Limestone and Mudstone, Interbedded	Not Supplied - Rhaetian
	BAN	Blue Anchor Formation	Mudstone and Siltstone	Not Supplied - Norian
	BAN	Blue Anchor Formation	Mudstone	Not Supplied - Norian
	MMG	Mercia Mudstone Group	Mudstone	Not Supplied - Early Triassic
	SMG	St Maughans Formation	Argillaceous Rocks and [Subequal/Subordinate] Sandstone, Interbedded	Not Supplied - Early Devonian
		Faults		

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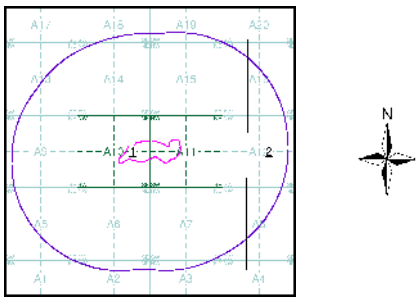
Geology 1:50,000 Maps

This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps.
The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:50,000 Maps Coverage

Map ID:	**2**	**Map ID:**	**1**
Map Sheet No:	**250**	**Map Sheet No:**	**249**
Map Name:	**Chepstow**	**Map Name:**	**Newport**
Map Date:	**1981**	**Map Date:**	**1969**
Bedrock Geology:	**Available**	**Bedrock Geology:**	**Available**
Superficial Geology:	**Available**	**Superficial Geology:**	**Available**
Artificial Geology:	**Not Available**	**Artificial Geology:**	**Available**
Faults:	**Not Supplied**	**Faults:**	**Not Supplied**
Landslip:	**Available**	**Landslip:**	**Available**
Rock Segments:	**Not Supplied**	**Rock Segments:**	**Not Supplied**

Geology 1:50,000 Maps - Slice A



Order Details:

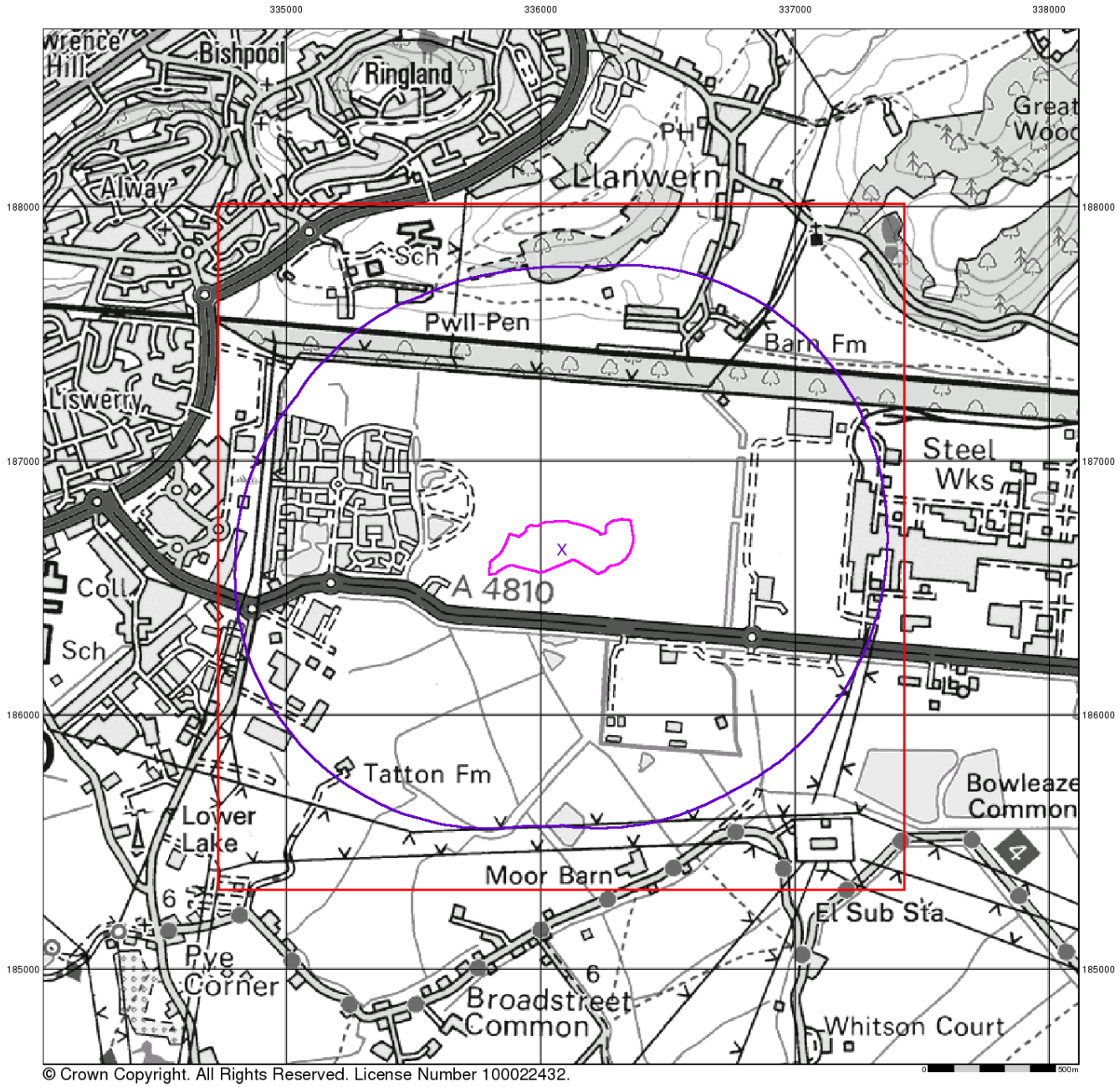
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Customer Reference:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details:

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Artificial Ground and Landslip

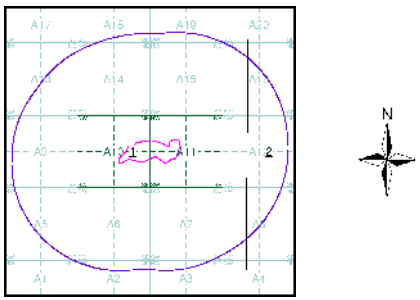
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- Infilled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes foundered strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A



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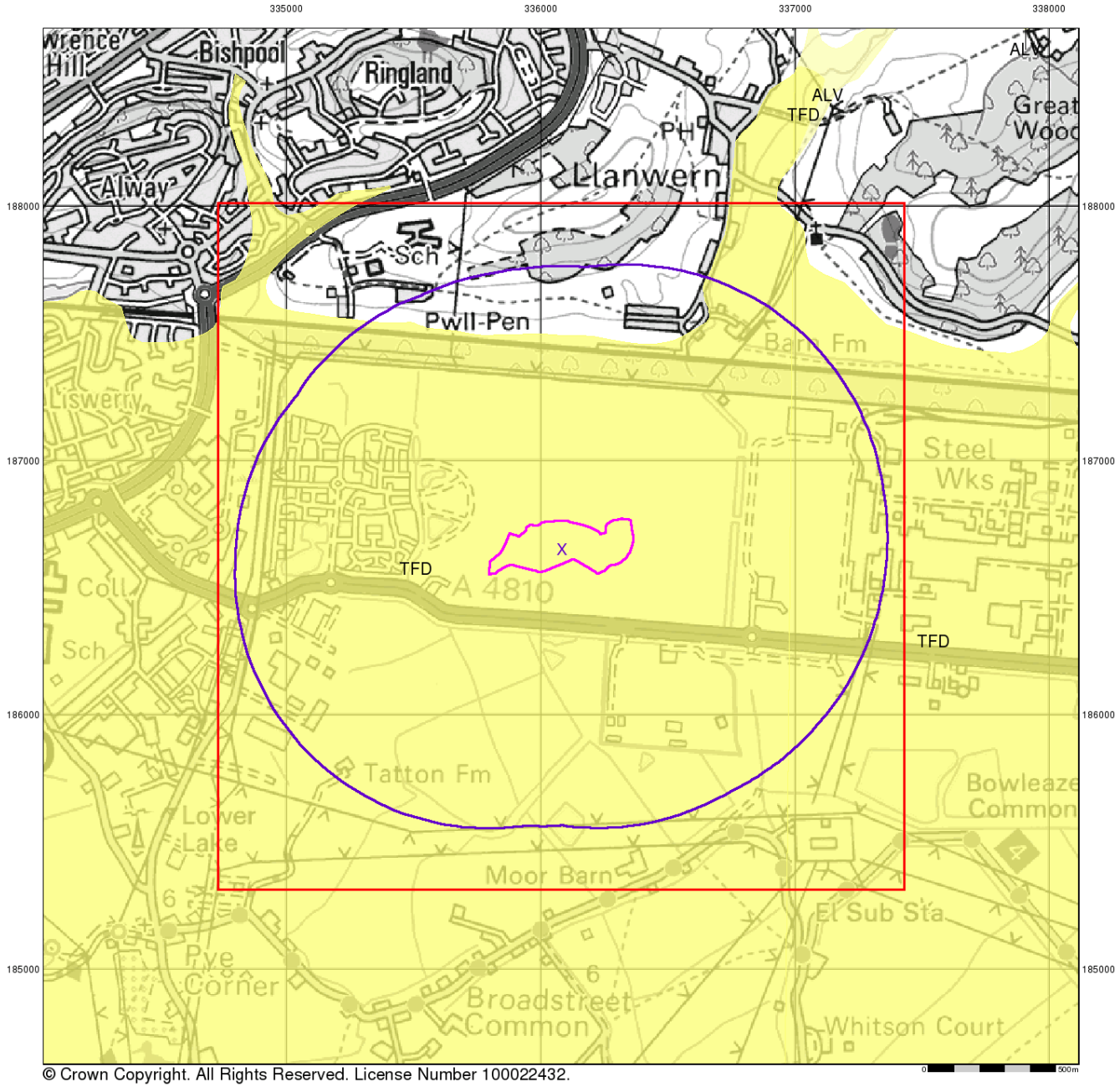
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National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details:

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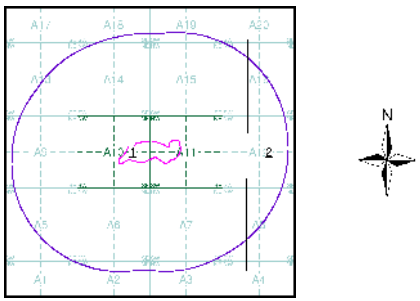
Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

Superficial Geology Map - Slice A



Order Details:

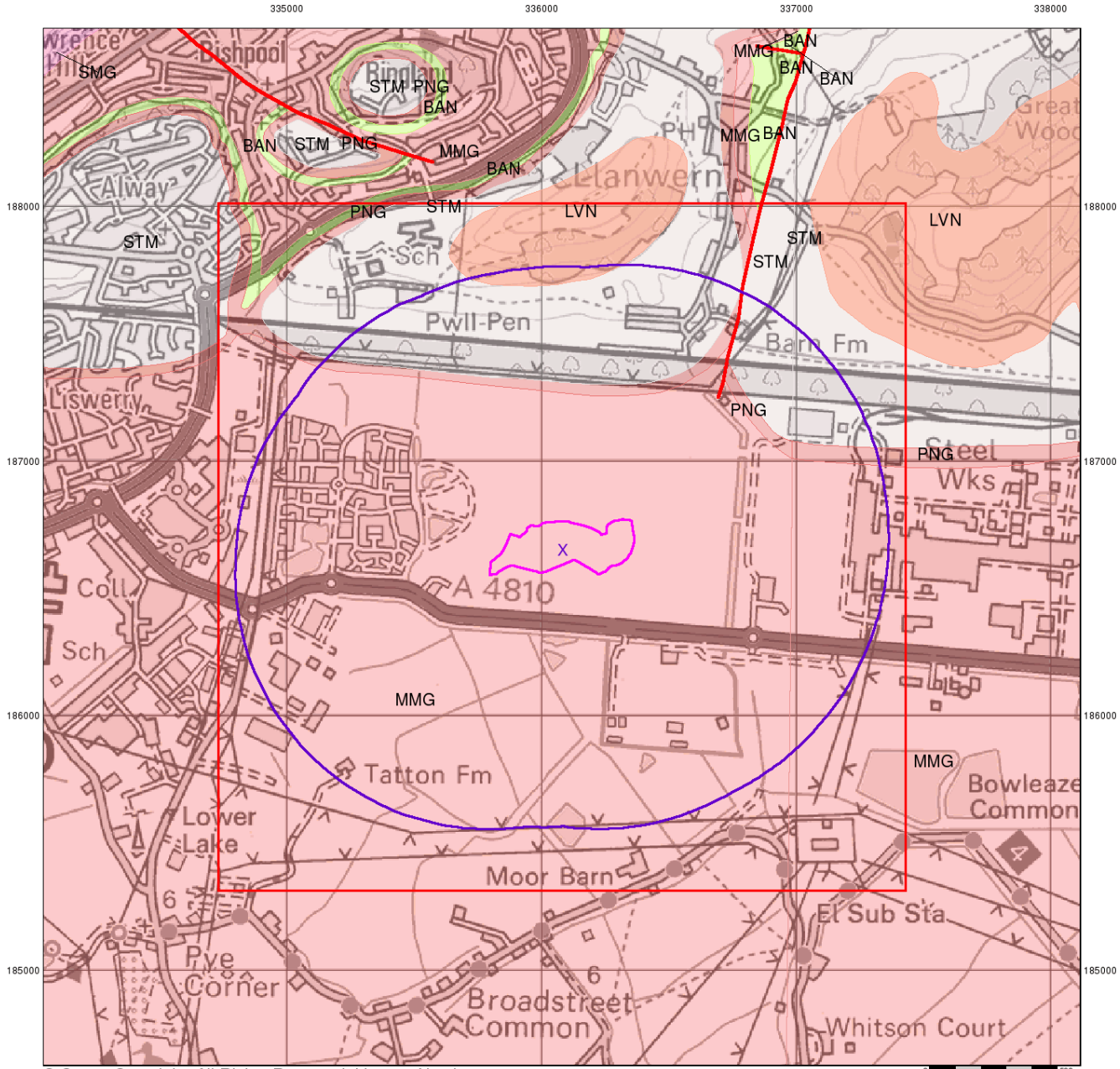
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National Grid Reference:	336080, 186650
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Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details:

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Bedrock and Faults

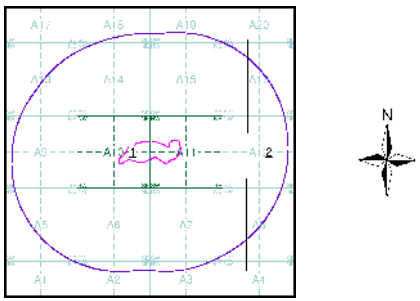
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000 Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.

Bedrock and Faults Map - Slice A



Order Details:

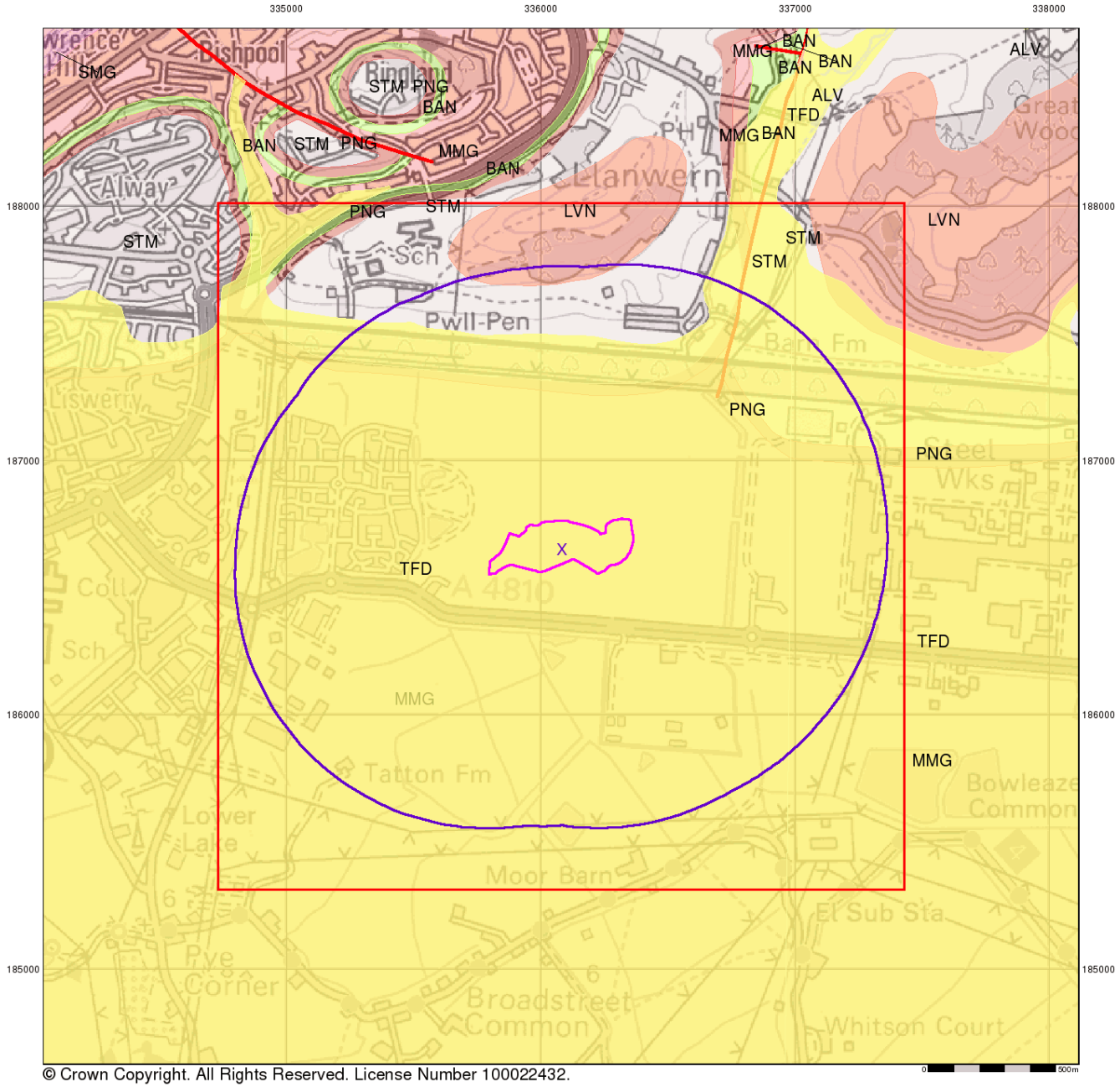
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National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
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Site Details:

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Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

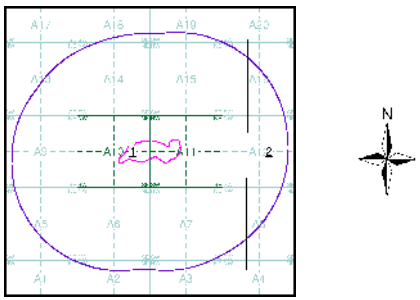
Additional Information

More information on 1:50,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

Contact

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

Combined Geology Map - Slice A



Order Details:

Order Number:	304885831_1_1
Customer Reference:	Llanwern 4c 4g 4e
National Grid Reference:	336080, 186650
Slice:	A
Site Area (Ha):	8.34
Search Buffer (m):	1000

Site Details:

Site at 336079,186662

Appendix E
Flood Risk Map

Cyfoeth Naturiol Cymru
Natural Resources Wales

Flood Risk Maps

Phase 4E

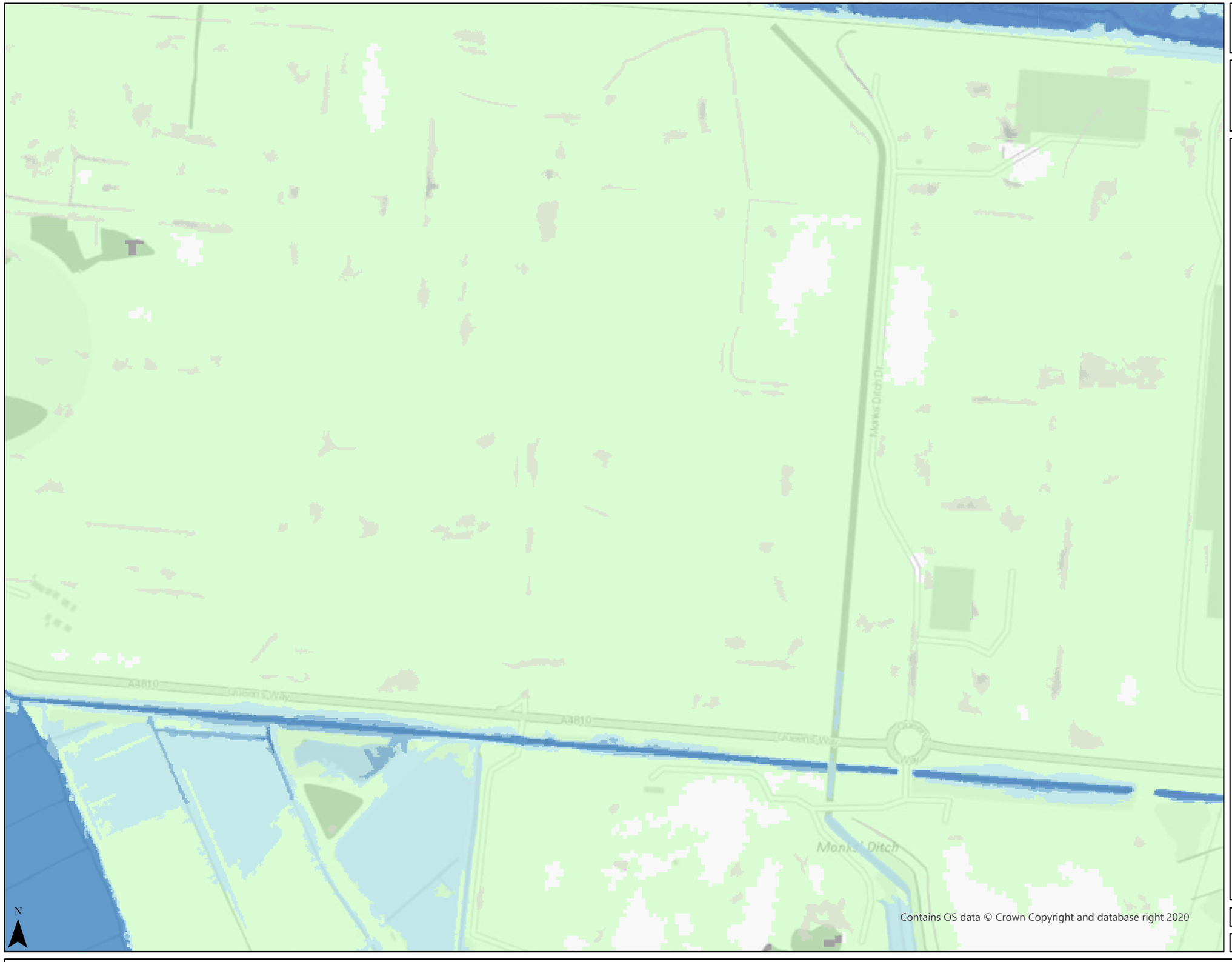
Legend

Flood Risk from Rivers
- High
- Medium
- Low

Flood Risk from the Sea
- High
- Medium
- Low

Flood Risk from Surface Water & Small Watercourses
- High
- Medium
- Low

Risk Level Under Review



Scale at A3: 1:5,000

Date: 26/02/2026

0.2 0.1 0 0.2
km

British National Grid

Disclaimer

https://naturalresources.wales/flooding/disclaimer-for-our-flood-and-coastal-erosion-risk-maps/?lang=en

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Appendix F
UXO Report

UNEXPLODED BOMB RISK MAP

zeticaUXO

SITE LOCATION

Map Centre: 336343,186690



LEGEND

- **High:** Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.
- **Moderate:** Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.
- **Low:** Areas indicated as having 15 bombs per 1000acre or less.

miltary | **industry** | **UXO find**
transport | **dock** | **Luftwaffe targets**
utilities | **Bombing decoy** | **other**

How to use your Unexploded Bomb (UXB) risk map?

The map indicates the potential for Unexploded Bombs (UXB) to be present as a result of World War Two (WWII) bombing.

You can incorporate the map into your preliminary risk assessment* for potential Unexploded Ordnance (UXO) for a site. Using this map, you can make an informed decision as to whether more in-depth detailed risk assessment* is necessary.

What do I do if my site is in a moderate or high risk area?

Generally, we recommend that a detailed UXO desk study and risk assessment is undertaken for sites in a moderate or high UXB risk area.

Similarly, if your site is near to a designated Luftwaffe target or bombing decoy then additional detailed research is recommended.

More often than not, this further detailed research will conclude that the potential for a significant UXO hazard to be present on your site is actually low.

Never plan site work or undertake a risk assessment using these maps alone. More detail is required, particularly where there may be a source of UXO from other military operations which are not reflected on these maps.

If my site is in a low risk area, do I need to do anything?

If both the map and other research confirms that there is a low potential for UXO to be present on your site then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

A low risk really means that there is no greater probability of encountering UXO than anywhere else in the UK.

If you are unsure whether other sources of UXO may be present, you can ask for one of our **pre-desk study assessments (PDSA)**

If I have any questions, who do I contact?

tel: **+44 (0) 1993 886682**

email: **uxo@zetica.com**

web: **www.zeticauxo.com**

The information in this UXB risk map is derived from a number of sources and should be used in conjunction with the accompanying notes on our website: **(https://zeticauxo.com/downloads-and-resources/risk-maps/)**

Zetica cannot guarantee the accuracy or completeness of the information or data used and cannot accept any liability for any use of the maps. These maps can be used as part of a technical report or similar publication, subject to acknowledgment. The copyright remains with Zetica Ltd.

It is important to note that this map is not a UXO risk assessment and should not be reported as such when reproduced.

*Preliminary and detailed UXO risk assessments are advocated as good practice by industry guidance such as CIRIA C681 'Unexploded Ordnance (UXO), a guide for the construction industry'.

Appendix G
Exploratory Hole Logs

IAN FARMER ASSOCIATES
Geotechnical & Environmental Specialists

Contract Name:		Client:			Borehole ID:
Llanwern Site Wide CWRA & Phase 2D		St Modwen Developments Limited			CWCP31
Contract Number:	Date Started:	Logged By:	Checked By:	Status:	Sheet 1 of 2
21561	07/04/2016	HP		DRAFT	
Cable Percussion Borehole Log	Easting:	Northing:	Ground Level: 10.95mOD	Plant Used:	Print Date: 02/06/2016	Scale: 1:50

Weather: | Termination: | SPT Hammer: N/R, Energy Ratio: N/R

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.00 - 1.00	B1					MADE GROUND: Dark brown, sandy gravel. gravel is medium to coarse, angular to subangular slag and brick with occasional concrete		
1.00 - 1.45	B2	SPT(C) 1.00m, N=28 (5,7/7,6,8,7)		(2.50)				
2.00 - 2.45	B3	SPT(C) 2.00m, N=26 (4,6/6,8,7,5)						
2.50	B4			2.50		Soft, brownish grey, silty CLAY (Tidal Flat Deposits)		
3.00 - 3.45	TW1	12 blows 60% recovery		(1.00)				
3.50	B5			3.50		Very soft, dark brown to dark grey, fibrous PEAT (Tidal Flat Deposits)		
3.50	D1							
4.00 - 4.45	D2	SPT(S) 4.00m, N=0 (1,0/0,0,0,0)		(2.00)				
5.00 - 5.45	D3	SPT(S) 5.00m, N=2 (1,0/0,1,1,0)						
5.50	B6			5.50		Very soft, grey SILT (Tidal Flat Deposits)		
6.00 - 6.45	TW2	6 blows 100% recovery						
6.50	D4							
7.50 - 7.95	D5	SPT(S) 7.50m, N=1 (1,0/0,1,0,0)		(4.00)				
9.00 - 9.45	D6	SPT(S) 9.00m, N=2 (1,0/1,0,1,0)						
9.50	B7			9.50		Loose, grey, slightly gravelly, fine to medium SAND. Gravel is fine to medium, angular to subangular sandstone and quartzite (Tidal Flat Deposits)		
10.00	B8			(0.50) 10.00				

Continued next sheet

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)
					10.95	150	10.50	150

Remarks:

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)
10.50	10.50	00:30		0.00	9.50	PLAIN	50
				9.50	10.50	SLOTTED	50

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
9.50	9.50		0		

IAN FARMER ASSOCIATES
Geotechnical & Environmental Specialists

Contract Name:		Client:			Borehole ID:
Llanwern Site Wide CWRA & Phase 2D		St Modwen Developments Limited			CWCP31
Contract Number:	Date Started:	Logged By:	Checked By:	Status:	Sheet 2 of 2
21561	07/04/2016	HP		DRAFT	
Cable Percussion Borehole Log	Easting:	Northing:	Ground Level: 10.95mOD	Plant Used:	Print Date: 02/06/2016 — Scale: 1:50

Weather: | Termination: | SPT Hammer: N/R, Energy Ratio: N/R

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
10.50 - 10.95	D7	SPT(S) 10.50m, 50 (100 for 92mm/50 for 234mm)		(0.50) 10.50		Very stiff, reddish brown mottled grey, silty CLAY (Mercia Mudstone Group Grade IVa)		
						End of Borehole at 10.95m		

11 12 13 14 15 16 17 18 19 20

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)
					10.95	150	10.50	150

Remarks:

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)
10.50	10.50	00:30		0.00	9.50	PLAIN	50
				9.50	10.50	SLOTTED	50

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
9.50	9.50		0		

IAN FARMER ASSOCIATES
Geotechnical & Environmental Specialists

Contract Name:		Client:			Borehole ID:
Llanwern Site Wide CWRA & Phase 2D		St Modwen Developments Limited			CWWS31
Contract Number:	Date Started:	Logged By:	Checked By:	Status:	Sheet 1 of 1
21561	05/04/2016	HB			
Dynamic Sample Borehole Log	Easting:	Northing:	Ground Level:	Plant Used:	Print Date: / Scale:
			3.00mOD		02/06/2016 / 1:40
Weather:		Termination:			

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				(2.20)		MADE GROUND: Soft to firm, dark brown, gravelly clay. Gravel is medium to coarse, angular to subangular brick, concrete, limestone, mudstone, clinker, slag with fragments of metal and glass		
				2.20 (0.50) 2.70		Firm to stiff, greenish grey mottled brown, silty CLAY with occasional rootlets and rare roots (Tidal Flat Deposits)		
				(0.30) 3.00		Soft to firm, bluish grey mottled brown, clayey SILT with occasional rootlets (Tidal Flat Deposits)		
						End of Borehole at 3.00m		

1 2 3 4 5 6 7 8

Borehole Diameter		Installation			
Depth (m)	Dia (m)	Depth Top	Base (m)	Diameter	Pipe Type
		0.00	0.50		PLAIN
		0.50	2.00		SLOTTED

Water Strikes					
Depth Strike	Depth Casing	Depth Sealed	Time (mins)	Rose to (m)	Remarks

Remarks:

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Trial Pit Log

TrialPit No: 4GC1
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336261.25 - 186756.09 Level: 6.07	Date 02/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 2.30	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.40	ES		0.50	5.57		MADE GROUND. Brown gravelly sand. Gravels are fine to coarse, angular to subangular of concrete, mudstone and occasional slag.
▼	1.00 1.00	B ES		1.50	4.57		MADE GROUND. Dark brown/blackish gravelly sand. Gravels are fine to coarse, angular to sub-rounded of slag, concrete, mudstone/siltstone and brick. *Presence of steel cables* MADE GROUND. Light brown gravelly clay. Gravels are fine to coarse, angular to sub-rounded of slag, concrete, mudstone/siltstone and brick.
	2.20	ES		2.20 2.30	3.87 3.77		Firm blue silty CLAY. End of Pit at 2.30m

Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GC2
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336261.34 - 186729.92 Level: 6.01	Date 02/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 2.35	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND. Brown gravelly sand with cobbles. Gravels and cobbles are fine to coarse, angular to sub-angular of concrete, mudstone and occasional slag.
	0.50	ES					
				0.75	5.26		MADE GROUND. Hard dark brown/black gravelly ashy sand with cobbles. Gravels and cobbles are fine to coarse, angular to sub-angular of slag and brick.
	1.00	ES					
	1.20	B					
				1.30	4.71		MADE GROUND. Brown clayey sandy gravel with cobbles. Gravel and cobbles are fine to coarse, angular to subangular of slag, brick, coke and mudstone.
▼							
	2.30	ES		2.25	3.76		Firm blue silty CLAY.
				2.35	3.66		End of Pit at 2.35m

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Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GC3
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336261.57 - 186705.78 Level: 6.11	Date 05/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 1.50	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND. Brown slightly clayey gravelly sand with cobbles. Gravel and cobbles are fine to coarse, angular to sub-rounded of concrete, slag, brick and mudstone.
	0.50	ES					
	0.70	B					
	1.00	ES					
▼				1.30	4.81		MADE GROUND. Brown clayey sandy gravel. Gravels are fine to coarse, angular to sub-angular of concrete, slag, brick and mudstone.
				1.50	4.61		*Refusal. Probably for concrete slab. Pit full of water, difficult to say*
							End of Pit at 1.50m

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Remarks: Refusal in hard ground.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GC4
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336263.43 - 186681.94 Level: 6.01	Date 05/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 2.20	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	ES					MADE GROUND. Dark brown/black gravelly sand with cobbles and boulders. Gravel, cobbles and boulders are fine to very coarse, angular to sub-angular of concrete, slag, brick, mudstone and coke.
	0.50	B					
	0.80	ES					
▼							*Oil sheen coming from N seepages. No HC odour*
	2.10	ES		2.10	3.91		Firm blue silty CLAY.
				2.20	3.81		End of Pit at 2.20m

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Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No
4GC5
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336263.46 - 186657.06 Level: 6.17	Date 05/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 2.00	Logged GR

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.70	ES					MADE GROUND. Black gravelly ashy sand with cobbles. Gravels and cobbles are fine to coarse, angular to subangular of coke, concrete and slag.
	1.00	B					
				1.10	5.07		
	1.20	ES					MADE GROUND. Light grey slightly clayey silty sand.
▼				1.40	4.77		MADE GROUND. Dark brown clayey sandy gravel with cobbles. Gravels and cobbles are fine to coarse, angular to sub-rounded of mudstone, brick and concrete.
	1.90	ES		1.90	4.27		Firm blue silty CLAY.
				2.00	4.17		End of Pit at 2.00m

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Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

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Trial Pit Log

TrialPit No: 4GC6
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336267.24 - 186631.72 Level: 5.98	Date 06/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 2.60	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	5.82		MADE GROUND. Tarmac
	0.40	B					MADE GROUND. Brown gravelly sand. Gravels are medium to coarse, sub-angular to subrounded of slag, concrete, mudstone and tarmac.
	0.50	ES					
				0.60	5.38		MADE GROUND. Dark brown sandy gravel. Gravels are coarse, subangular to subrounded of mudstone, brick and slag.
	0.80	ES					
▼							*Oil sheen in the ground water.*
				1.40	4.58		MADE GROUND. Light brown clayey sandy gravel. Gravels are fine to medium, subangular to subrounded of mudstone, brick and occasional slag.
	2.50	ES		2.50	3.48		Soft to firm blue to brown peaty CLAY.
				2.60	3.38		End of Pit at 2.60m

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Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No
4GD1
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336294.57 - 186762.27 Level: 6.23	Date 06/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 2.15	Logged GR

Water Strike	Samples & In Situ Testing Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.50 0.50	B ES					MADE GROUND. Brown/red sandy gravel with cobbles. Gravels and cobbles are fine to coarse, angular to subrounded of slag, concrete, mudstone, iron ore aggregate.
				0.75	5.48		MADE GROUND. Light brown gravelly sand. Gravels are fine to coarse, angular to sub-rounded of mudstone, slag, brick, limestone, siltstone and occasional concrete.
	1.00	ES					
▼				1.25	4.98		MADE GROUND. Brown coarse, sub-angular to sub-rounded gravel of silstone, sandstone, concrete, slag and mudstone.
	2.10	ES		2.05	4.18		Firm to soft peaty silty CLAY.
				2.15	4.08		End of Pit at 2.15m

Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GD2
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336291.91 - 186729.75 Level: 5.86	Date 07/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 2.00	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.40 0.40	B ES		0.50	5.36		MADE GROUND. Dark brown/black gravelly sand. Gravels are fine to coarse, angular to sub-rounded of coke, slag and brick. *Cables at 0.5m bgl.*
▼	0.80	ES		1.30	4.56		MADE GROUND. Light brown/orange gravelly clayey sand. Gravels are fine to coarse of angular to sub-rounded of mudstone, brick, concrete and occasional slag.
	1.80	ES		1.80	4.06		MADE GROUND. Brown clayey coarse, sub-angular to sub-rounded gravel of mudstone, sandstone, siltstone, brick, concrete and occasional slag.
				2.00	3.86		Firm blue silty CLAY. End of Pit at 2.00m

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Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GD3
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336291.74 - 186706.63 Level: 5.81	Date 13/11/2018
Location: Llanwern, Newport		Dimensions (m): Depth 1.85	Scale 1:20
Client: St Modwen Developments			Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					MADE GROUND. Dark brown clayey gravelly sand. Gravels are fine to coarse, sub-angular to sub-rounded of coke, slag and brick. *Presence of electric cable and brick wall.*
				0.35	5.46		MADE GROUND. Light brown gravelly sand. Gravels are fine to medium, angular of mudstone.
▼	0.50 0.50	B ES					
				1.10	4.71		MADE GROUND. Brown clayey sandy gravel with cobbles and boulders. Gravels, cobbles and boulders are fine to very coarse, angular to sub-rounded of concrete, slag, coke, brick and mudstone.
	1.80	ES		1.75	4.06		Firm blue silty CLAY.
				1.85	3.96		End of Pit at 1.85m

Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No
4GD4
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336290.13 - 186681.54 Level: 5.68	Date 13/11/2018
Location: Llanwern, Newport		Dimensions (m): Depth 1.75	Scale 1:20
Client: St Modwen Developments			Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.30	5.38		MADE GROUND. Dark brown clayey gravelly sand. Gravels are fine to medium, sub-angular to sub-rounded coke, slag and brick. *Presence of electric cable and brick wall.*
	0.50 0.50	B ES		0.65	5.03		MADE GROUND. Light brown/orange gravelly sand. Gravels are fine to coarse, angular to sub-rounded of mudstone.
▼							MADE GROUND. Brown clayey sandy gravel with cobbles and boulders. Gravels, cobbles and boulders are fine to coarse, sub-angular of concrete, slag, coke, brick and mudstone.
	1.70	ES		1.65 1.75	4.03 3.93		Firm blue silty CLAY. End of Pit at 1.75m

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Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GD5
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336288.86 - 186654.31 Level: 5.79	Date 13/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 1.80	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.50 0.50	B ES					MADE GROUND. Dark brown gravelly sand. Gravels are fine to coarse, sub-angular to sub-rounded of concrete, slag, coke, brick and mudstone. *Presence of electric cable and brick wall.*
▼	1.70	ES		1.70 1.80	4.09 3.99		Firm blue silty CLAY. End of Pit at 1.80m

Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GD6
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336288.44 - 186631.31 Level: 5.85	Date 13/11/2018
Location: Llanwern, Newport		Dimensions (m): Depth 1.80	Scale 1:20
Client: St Modwen Developments			Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					MADE GROUND. Brown coarse sandy gravel. Gravels are fine to coarse, angular to sub-rounded of concrete, brick and slag.
	0.50	B		0.50	5.34		MADE GROUND. Dark brown/black gravelly sand. Gravels are fine to coarse, angular to sub-rounded of coke, concrete and slag.
▼	0.60	ES					*Oil sheen in the ground water. Light HC odour.*
				1.00	4.84		MADE GROUND. Dark brown clayey gravel with cobbles. Gravels and cobbles are fine to coarse, angular to rounded of iron ore pellets, concrete, slag and coke.
	1.70	ES		1.70	4.14		Firm blue silty CLAY.
				1.80	4.04		End of Pit at 1.80m

Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GD7
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336286.68 - 186607.15 Level: 6.13	Date 20/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 1.80	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30 0.30	B ES					MADE GROUND. Light/dark brown gravelly sand. Gravels are fine to coarse, sub-angular to sub-rounded of slag, iron ore, concrete and occasional brick.
				0.45	5.68		
	0.60	ES					MADE GROUND. Black gravelly sand. Gravels are fine to coarse, sub-rounded of coke.
				0.80	5.33		
▼							MADE GROUND. Dark grey/brown sandy gravelly clay. Gravels are fine to coarse, angular to sub-rounded of slag, concrete and mudstone.
	1.70	ES		1.70	4.43		Firm blue silty CLAY.
				1.80	4.33		End of Pit at 1.80m

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Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GE1
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336319.40 - 186755.05 Level: 5.76	Date 06/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 3.70	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.50	ES		0.60	5.16		MADE GROUND. Red/black gravelly sand. Gravels are fine to coarse, angular to sub-rounded of iron ore aggregate, brick, mudstone, concrete and coke.
▼	1.00 1.00	B ES		1.40	4.36		MADE GROUND. Light brown/yellow gravelly sand. Gravels are fine to coarse, angular to sub-rounded of slag, brick and concrete.
	3.60	ES		3.60 3.70	2.16 2.06		MADE GROUND. Brown/red gravelly clay. Gravels are medium to coarse, sub-angular ofof iron ore aggregate, slag, brick and concrete. Soft brown PEAT. End of Pit at 3.70m

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Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No
4GE2
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336310.96 - 186731.28 Level: 5.64	Date 07/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 2.00	Logged GR

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
							MADE GROUND. Brown clayey gravelly sand. Gravels are fine to coarse, angular to sub-rounded of mudstone , concrete, sandstone and brick.
							MG too wet from the surface to be sampled.
				0.65	4.99		MADE GROUND. Red to black/dark brown gravelly sand. Gravels are fine to coarse, sub-angular of mudstone, siltstone, brick, coke, slag and concrete.
▼	0.80 0.80	B ES					
				1.30	4.34		MADE GROUND. Light brown clayey gravel with cobbles. Gravels and cobbles are fine to coarse, sub-angular to sub-rounded of mudstone, brick and concrete.
				1.90	3.74		Firm blue silty CLAY.
	1.95	ES		2.00	3.64		End of Pit at 2.00m

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Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GE3
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336314.22 - 186699.69 Level: 5.56	Date 07/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 2.30	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.50	B					MADE GROUND. Brown clayey coarse, sub-angular to sub-rounded gravel of mudstone, sandstone, siltstone, brick, concrete and occasional slag. *MG too wet from the surface to be sampled. Oil sheen in the ground water.*
				0.65	4.90		MADE GROUND. Dark brown/black gravelly sand. Gravels are fine to coarse, angular to sub-rounded of mudstone, coke, concrete, brick and occasional slag.
▼	0.80	ES					
				1.60	3.96		MADE GROUND. Brown clayey coarse, sub-angular to sub-rounded gravel of mudstone, sandstone, siltstone, brick, concrete and occasional slag.
	2.20	ES		2.20	3.36		Firm blue silty CLAY.
				2.30	3.26		End of Pit at 2.30m

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Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GE4
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336311.83 - 186683.76 Level: 5.42	Date 19/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 2.30	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	5.32		MADE GROUND. Light brown sandy clay.
							MADE GROUND. Reddish/brown gravelly sand with cobbles. Gravels and cobbles are fine to coarse, angular to sub-rounded of slag, iron ore aggregate/pellets and coke.
	0.40	ES					
▼				0.50	4.92		MADE GROUND. Dark brown/black clayey sandy gravel with cobbles and boulders. Gravels, cobbles and boulders are fine to coarse, angular to sub-rounded of slag, concrete, mudstone, sandstone and brick.
							Light HC odour.
	1.00	B					
				2.10	3.32		MADE GROUND. Light brown clay.
	2.20	ES		2.20	3.22		Firm blue silty CLAY.
				2.30	3.12		End of Pit at 2.30m

Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GE5
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336314.76 - 186654.57 Level: 5.66	Date 13/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 3.10	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					MADE GROUND. Light/dark brown sandy gravelly clay. Gravels are fine to coarse, angular to sub-rounded of mudstone, brick, concrete, slag and iron ore.
	0.40	B		0.40	5.26		MADE GROUND. Black sandy fine to medium, sub-angular to rounded gravel of coke, concrete, slag and iron ore pellets.
▼	0.60	ES					*Oil sheen in the ground water. Light HC odour.*
				0.80	4.86		MADE GROUND. Brown sandy clayey gravel. Gravels are fine to coarse, sub-angular to sub-rounded mudstone, siltstone and sandstone.
				1.20	4.46		MADE GROUND. Light brown/orange clayey sandy gravel. Gravels are fine, sub-angular of brick and mudstone.
				1.60	4.06		MADE GROUND. Brown sandy gravelly clay with cobbles and boulders. Gravels, cobbles and boulders are fine to very coarse, sub-angular to sub-rounded of mudstone, siltstone, sandstone, brick and concrete.
	3.00	ES		3.00	2.66		Firm blue silty CLAY.
				3.10	2.56		End of Pit at 3.10m

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Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GE6
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336313.35 - 186631.38 Level: 5.77	Date 13/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 2.25	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30 0.30	B ES		0.40	5.37		MADE GROUND. Brown clayey gravelly sand. Gravels are fine to coarse, sub-angular to sub-rounded of concrete, brick, slag and siltstone.
	0.50	ES					MADE GROUND. Black gravelly sand. Gravels are fine to medium, sub-angular of coke.
▼				0.85	4.92		MADE GROUND. Light brown/orange clayey gravelly sand. Gravels are fine to coarse, sub-angular to sub-rounded of mudstone, sandstone and siltstone.
				1.05	4.72		MADE GROUND. Clayey sandy fine to coarse, angular to sub-rounded gravel of mudstone, concrete and slag.
	2.20	ES		2.15 2.25	3.62 3.52		Firm to soft blue silty CLAY. End of Pit at 2.25m

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Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No
4GF1
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336336.62 - 186755.43 Level: 6.03	Date 07/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 2.50	Logged GR

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.50 0.50	B ES					MADE GROUND. Brown/red gravelly sand. Gravels are fine to coarse, angular to sub-rounded of iron ore, slag, concrete, brick and occasional coke.
				0.75	5.28		
	1.00	ES					MADE GROUND. Dark brown/black gravelly sand. Gravels are fine to coarse, angular to sub-rounded of coke, slag, mudstone, brick, concrete and iron ore aggregate.
▼							*Light HC odour.*
				1.70	4.33		MADE GROUND. Light brown clayey silty gravel. Gravels are fine to coarse, subangular to sub-rounded of siltstone/sandstone, mudstone, concrete and occasional slag.
	2.40	ES		2.40	3.63		Firm to soft peaty silty CLAY.
				2.50	3.53		End of Pit at 2.50m

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Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No
4GF2
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336336.17 - 186730.40 Level: 5.70	Date 07/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 2.10	Logged GR

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.50 0.50	B ES		0.60	5.10		MADE GROUND. Light brown/greyish gravelly sand. Gravels are fine to coarse, angular to sub-rounded of slag, concrete and mudstone.
▼							MADE GROUND. Light brown clayey sandy gravel. Gravels are fine to coarse, sub-angular to sub-rounded of mudstone, concrete, bricks, occasional slag and sandstone. *Oil sheen in the ground water. HC odour.*
	2.00	ES		1.95	3.75		Firm blue silty CLAY.
				2.10	3.60		End of Pit at 2.10m

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Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GF3
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336334.47 - 186705.94 Level: 5.55	Date 07/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 2.60	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					MADE GROUND. Black gravelly sand. Gravels are fine to medium, sub-angular of coke.
				0.40	5.15		
▼	0.50	B					MADE GROUND. Hard grey gravelly sand. Gravels are fine to coarse, angular to sub-rounded of slag, concrete, brick and iron ore aggregate.
	0.60	ES					
				1.50	4.05		MADE GROUND. Brown sandy fine to coarse, sub-angular to sub-rounded gravel of sandstone, siltstone and mudstone.
	2.50	ES		2.50	3.05		Firm blue silty CLAY.
				2.60	2.95		End of Pit at 2.60m

Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GF4
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336331.95 - 186681.39 Level: 5.64	Date 19/11/2018
Location: Llanwern, Newport		Dimensions (m): Depth 2.50	Scale 1:20
Client: St Modwen Developments			Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES					MADE GROUND. Brown gravelly sand. Gravels are fine to coarse, sub-angular of slag, coke, iron ore pellets and iron ore aggregate with occasional concrete.
	0.40	ES		0.35	5.29		MADE GROUND. Black gravelly sand. Gravels are fine, aub-angular of coke.
▼				0.55	5.09		MADE GROUND. Brown, fine to coarse, angular gravel of slag, sandstone and concrete. *Light HC odour.*
	1.00	B		0.85	4.79		MADE GROUND. Dark brown/orangy sandy clayey gravel with cobbles. Gravels and cobbles are fine to coarse, angular to sub-rounded of mudstone, sandstone, slag, brick and occasional concrete.
	2.40	ES		2.40	3.24		Firm blue silty CLAY.
				2.50	3.14		End of Pit at 2.50m

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Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GF5
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336326.47 - 186657.38 Level: 5.79	Date 19/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 2.65	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND. Black gravelly sand. Gravels are fine to coarse, angular to sub-rounded of coke, slag and concrete.
	0.50	ES					
▼				0.70	5.09		MADE GROUND. Brown fine to coarse, angular gravel of slag, sandstone and concrete.
				0.85	4.94		*Oil sheen in the ground water. Light HC odour.*
	1.00	B					MADE GROUND. Brown/light brown clayey sandy gravel with cobbles and boulders. Gravels, cobbles and boulders are coarse to very coarse, angular to sub-rounded of mudstone, slag, concrete and brick.
	2.60	ES		2.55	3.24		Firm blue silty CLAY.
				2.65	3.14		End of Pit at 2.65m

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Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GF6
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336338.13 - 186632.30 Level: 6.35	Date 13/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 2.70	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND. Brown gravelly sand. Gravels are fine to coarse, angular to sub-rounded of concrete, brick, limestone and occasional slag.
	0.40	ES					
				0.50	5.85		MADE GROUND. Hard grey/dark brown/black sandy gravel. Gravels and cobbles are fine to coarse, angular to sub-rounded of slag, coke, mudstone and brick.
	0.70	B					
	0.70	ES					
				0.90	5.45		MADE GROUND. Hard brown gravelly sand with cobbles. Gravels and cobbles are fine to coarse, angular to sub-rounded of mudstone, concrete and slag.
▼	1.20	ES					
	2.70	ES		2.70	3.65		Firm blue silty CLAY.
				2.80	3.55		End of Pit at 2.70m

Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GF7
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336339.19 - 186607.04 Level: 6.23	Date 19/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 2.70	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	6.13		MADE GROUND. Tarmac.
	0.40 0.40	B ES					MADE GROUND. Black gravelly sand. Gravels are fine, angular to sub-rounded of coke, concrete, slag and limestone.
				0.55	5.68		MADE GROUND. Brown/reddish sandy gravel. Gravels are fine to coarse, angular to sub-rounded of mudstone, slag, brick and concrete.
▼	0.80	ES					
				1.60	4.63		MADE GROUND. Light brown/grey clayey sandy gravel. Gravels are fine to coarse, angular to sub-angular of sandstone, siltstone, mudstone with occasional brick and concrete.
	2.60	ES		2.60	3.63		Firm blue silty CLAY.
				2.70	3.53		End of Pit at 2.70m

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Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GG5
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336351.73 - 186657.69 Level: 6.34	Date 19/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 3.30	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	6.24		MADE GROUND. Tarmac
				0.20	6.14		MADE GROUND. Light brown gravelly sand. Gravels are fine to coarse, sub-angular to sub-rounded of slag, concrete and mudstone.
				0.30	6.04		MADE GROUND. Hard blue/purple sandy gravel. Gravels are fine to coarse, angular of slag.
	0.40 0.40	B ES					MADE GROUND. Light brown gravelly sand. Gravels are fine to coarse, angular to sub-rounded of slag, concrete and mudstone.
				0.55	5.79		MADE GROUND. Black gravelly sand. Gravels are fine to coarse of coke, slag and concrete.
	0.70	ES					
				0.80	5.54		MADE GROUND. Grey/red/brown slightly clayey gravel with cobbles and boulders. Gravels, cobbles and boulders are fine to very coarse, angular to sub-rounded of slag, concrete, mudstone, bricks and metals fragments.
▼							
	3.20	ES		3.20	3.14		Firm blue silty CLAY.
				3.30	3.04		End of Pit at 3.30m

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Remarks: Pit terminated in the Tidal Flat Deposits.

Stability:

AGS

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Trial Pit Log

TrialPit No: 4GG6
Sheet 1 of 1

Project Name: Llanwern	Project No. 5111373_LLA	Co-ords: 336362.06 - 186629.02 Level: 6.53	Date 13/11/2018
Location: Llanwern, Newport		Dimensions (m):	Scale 1:20
Client: St Modwen Developments		Depth 0.60	Logged GR

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							MADE GROUND. Dark brown gravelly sand. Gravels are fine to coarse, angular to sub-rounded of brick, concrete and slag.
	0.30	B		0.25	6.28		
	0.30	ES					MADE GROUND. Hard light grey gravelly sand. Gravels are fine to coarse, sub-angular of slag and concrete.
				0.40	6.13		
	0.50	ES					MADE GROUND. Hard dark brown/purple/red gravel. Gravels are fine to coarse, angular of slag and iron ore aggregate.
				0.60	5.93		*Refusal. Hard layer of slag/iron ore aggregate.*
							End of Pit at 0.60m

Remarks: Refusal in hard ground.

Stability:

AGS

Appendix H
Chemical Screening

18-669 Llanwern Phase 4E Soil Chemical Screening

Project: P18-669																														
Client: Rodgers Leask Environmental				**Job No.:**		181103-16	181103-16	181103-16	181103-16	181103-16	181103-16	181106-25	181106-25	181106-25	181106-25	181106-25	181106-25	181106-25	181106-25	181108-13	181108-13	181108-13	181108-13	181108-13	181108-13	181108-13	181108-13	181108-13	181108-13	181108-13
Quotation No.: Q21-24056				**Sample ID.:**		4G-C1	4G-C1	4G-C1-V	4G-C2	4G-C2	4G-C2-V	4G-C3	4G-C3	4G-C4	4G-C4	4G-C4-V	4G-C5	4G-C5	4G-C5-V	4G-D2	4G-D2	4G-D2-V	4G-E2	4G-E2-V	4G-E3	4G-E3-V	4G-F1	4G-F1	4G-F1-V	4G-F2	4G-F2-V	4G-F3
Order No.: .				Client Sample Ref.:		18660995	18661004	18661009	18661027	18660971	18660978	18673492	18673554	18673566	18673570	18673574	18673578	18673584	18673593	18689483	18689487	18689421	18689474	18689478	18689430	18689437	18689416	18689455	18689459	18689464	18689468	18689441
				Sample Type:		SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
				Top Depth (m):	**S4UL Generic Assessment Criteria Residential with Homegrown Produce (SOM 1%)**	0.40-0.40	1.00-1.00	2.20-2.20	0.50-0.50	1.00-1.00	2.30-2.30	0.50-0.50	1.00-1.00	0.30-0.30	0.80-0.80	2.10-2.10	0.70-0.70	1.20-1.20	1.90-1.90	0.40-0.40	0.80-0.80	1.80-1.80	0.80-0.80	1.95-1.95	0.80-0.80	2.20-2.20	0.50-0.50	1.00-1.00	2.40-2.40	0.50-0.50	2.00-2.00	0.20-0.20
				Bottom Depth (m):																												
				Date Sampled:		02/11/2018	02/11/2018	02/11/2018	02/11/2018	02/11/2018	02/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018
				Asbestos Lab:																												
Determinand	**Accred.**	**SOP**	**Units**	**LOD**																												
ACM Type	U	2192		N/A			Amosite (Brown) Asbestos											Amosite (Brown) Asbestos													
Asbestos Identification	U	2192		N/A			Detected			Not Detected		Not Detected			Not Detected			Detected		Not Detected			Not Detected		Not Detected		Not Detected			Not Detected		
Asbestos by Gravimetry	U	2192	%	0.001			0.0074											<0.001													
Total Asbestos	U	2192	%	0.001			0.0077											<0.001													
Moisture	N	2030	%	0.020		7.3	10	24	11	8.1	24	7.7	9.5	16	11	24	13	11	23	12	15	22	11	33	12	23	6.1	12	23	6.9	32	11
Soil Colour	N	2040		N/A		Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Grey	Dark Brown	Dark Brown	Black	Dark Brown	Black	Black	Dark Brown	Dark Brown	Black	Dark Brown	Grey	Dark Brown	Dark Brown	Black	Grey	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown
Other Material	N	2040		N/A		Glass & Stones	Stones	None	Stones	Stones	None	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Vegetation	Stones	Stones	None	Vegetation	Vegetation	Stones	None	Vegetation	Vegetation	Vegetation	Vegetation	Vegetation	Stones
Soil Texture	N	2040		N/A		Sandy Loam	Sandy Loam	Clay	Sandy Loam	Sandy Loam	Clay	Loamy Sand	Loamy Sand	Loamy Sand	Sandy Loam	Sandy Clay	Sand	Loamy Sand	Sandy Loam	Sand	Sandy Loam	Clay	Sand	Sandy Loam	Sand	Clay	Sandy Loam	Sandy Loam	Loamy Sand	Sandy Loam	Sandy Loam	Sand
pH	M	2010		4.0		11.6	10.7	7.87	11.3	11.4	7.84	10.9	11.3	11.3	11.2	7	11.4	12	8.12	8.85	8.93	8.08	8.34	6.94	8.63	7.32	9.95	8.57	8.52	10	7.39	9.39
Cyanide (Total)	M	2300	mg/kg	0.5		<1	<2	<1	<1	<1	<1	<1	<1	1.27	1.02	<1	1.64	<1	<1	1.96	<1	<1	<1	<1	1.56	<1	1.5	<1	5.64	<1	<1	<1
Ammoniacal Nitrogen	M	2425	mg/kg	0.5		<12	<12	274	<12	<12	136	<12	<12	<12	20.3	134	<12	<12	79.3	<12	<12	76	<12	702	<12	133	<12	<12	573	<12	661	<12
Iron (Total)	N	2430	mg/kg	100		101000	88200	40000	90200	260000	38700	91600	49500	49100	48100	29900	35600	17200	34400	190000	36800	37800	32900	29700	32300	35700	30300	54100	41100	49400	34200	107000
Arsenic	M	2450	mg/kg	1	37	9.5	<6	11.3	11.7	7.34	14.5	11.6	9.95	9.69	9.25	10.8	10.9	6.62	13.4	14.5	8.79	12.8	16.5	13.1	13.6	13.7	11.6	11.3	9.4	6.18	13.7	10.2
Cadmium	M	2450	mg/kg	0.1	26	1.11	<0.2	0.362	<0.02	<0.2	0.377	<0.2	0.775	0.702	<0.02	0.409	<0.02	0.0249	0.363	2.07	<0.02	<0.02	<0.02	<0.02	0.553	16.9	<0.2	0.821	<0.02	<0.2	<0.02	<0.02
Chromium	M	2450	mg/kg	1	910	139	30.3	34.4	116	114	31.7	256	99.4	104	12.6	40.1	14.4	25.6	33.2	81.7	56.7	29.5	11.2	36	18.7	56.7	<9	1.56	28.9	36.2	34.8	<0.9
Manganese	M	2450	mg/kg	5		12100	3850	1310	10700	13700	1380	1230	9570	10300	2020	535	2070	2930	1270	7160	2960	1530	661	228	1520	342	4750	1400	1820	2990	590	3260
Copper	M	2450	mg/kg	0.5	2400	17.7	16.4	10.8	15.6	<14	11.7	21.6	22	32.8	14.1	24.8	20	8.24	11.4	34.4	23.6	9.12	42.6	14.9	40.8	356	31.6	50.8	9.07	16.9	15.5	<14
Mercury	M	2450	mg/kg	0.1	40	<0.14	<1.4	<0.14	<0.14	<1.4	<0.14	<1.4	<0.14	0.268	<0.14	<0.14	<0.14	<0.14	<1.4	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<1.4	<0.14	<0.14	<1.4	<0.14	<0.14
Nickel	M	2450	mg/kg	0.5	130	30.1	39.5	41.1	14.6	27.6	36.9	12.2	11.5	24.7	17.6	37.8	13.4	7.55	35.8	40.4	20.6	33.4	38.8	28.5	42.5	41.2	60.2	26.3	31.6	14.6	32.2	15
Lead	M	2450	mg/kg	0.5	200	44.7	49.8	27.7	42.5	<7	23.9	40.1	41.4	54.6	27.4	27	38.1	21.6	23.8	103	31.2	21	27.9	31.5	33.1	276	167	36.7	21.2	35.3	24.8	20
Selenium	M	2450	mg/kg	0.2	250	3.67	<10	<1	4.15	<10	<1	<10	3.69	3.92	<1	<1	1.5	2.04	<1	<10	1.7	<1	<1	<1	1.11	<1	<10	1.26	<1	<10	<1	<1
Vanadium	U	2450	mg/kg	5	410	142	41.3	59.2	163	591	56	226	124	170	33.5	63.4	38.7	52.4	58.7	86.4	78.9	53.7	33.3	57	38.2	60.9	179	41.1	51.8	116	59.4	38.1
Zinc	M	2450	mg/kg	0.5	3700	202	92.5	108	471	28.1	101	202	338	165	145	119	173	46.7	103	254	70.3	100	78.5	115	137	1680	250	203	122	106	116	93.6
Organic Matter	M	2625	%	0.4		8.29	28.1	1.2	4.48	<0.35	0.957	1.81	3.83	10.1	1.31	4.5	34.1	12.6	1.3	38.1	6.6	0.741	17.6	5.65	9.28	1.62	11.7	25	1.13	2.95	4.02	40.2
Aliphatic TPH >C5-C6	N	2680	mg/kg	1	42	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.0357	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.033	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatic TPH >C6-C8	N	2680	mg/kg	1	100	0.0755	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.194	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.122	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatic TPH >C8-C10	M	2680	mg/kg	1	27	0.054	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.115	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.137	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatic TPH >C10-C12	M	2680	mg/kg	1	130	0.0583	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.0656	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.057	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatic TPH >C12-C16	M	2680	mg/kg	1	1100	2.61	8.85	0.243	4.2	<0.1	<0.1	2.58	1.93	0.267	0.918	0.443	5.99	1.21	<0.1	<0.1	<0.1	<0.1	0.793	0.216	<0.1	<0.1	<0.1	<0.1	<0.1	0.182	<0.1	<0.1
Aliphatic TPH >C16-C21	M	2680	mg/kg	1	65000	29.4	33.2	0.376	42.4	5.33	<0.1	18.4	17.6	3.07	8.81	<0.1	27.1	7.45	<0.1	10.1	2.95	<0.1	0.835	<0.1	0.195	<0.1	7.64	1.21	<0.1	1.14	<0.1	8.35
Aliphatic TPH >C21-C35	M	2680	mg/kg	1	65000	145	131	2.8	167	43.1	<0.1	198	399	18.7	14.9	1.22	151	21.3	<0.1	86.2	23.3	<0.1	4.1	1.66	4.38	<0.1	26.2	6.45	3.44	16	0.782	34.9
Aliphatic TPH >C35-C44	N	2680	mg/kg	1	65000	29.4	42.5	10.4	48.7	9.87	0.462	37.4	46.3	3.25	3.77	<0.1	43.5	2.38	<0.1	15.9	8.15	<0.1	<0.1	0.537	<0.1	<0.1	7.35	0.948	1.53	5.11	<0.1	13.5
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5		207	215	13.8	262	58.3	0.462	256	465	25.2	28.4	1.67	227	32.3	<0.1	112	34.4	<0.1	5.73	2.42	4.57	<0.1	41.2	8.6	4.98	22.4	0.782	56.8
Aromatic TPH >C5-C7	N	2680	mg/kg	1	70	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatic TPH >C7-C8	N	2680	mg/kg	1	130	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.0449	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatic TPH >C8-C10	M	2680	mg/kg	1	34	0.0356	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.0759	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatic TPH >C10-C12	M	2680	mg/kg	1	74	0.0388	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.0437	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.0375	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatic TPH >C12-C16	M	2680	mg/kg	1	140	7.37	21.4	<0.1	7.44	2.01	0.363	4.04	1.7	1.11	0.302	<0.1	8.94	2.07	<0.1	3.46	1.45	0.608	0.782	<0.1	1.15	<0.1	2.51	1.23	<0.1	0.711	<0.1	1.79
Aromatic TPH >C16-C21	U	2680	mg/kg	1	260	28.9	103	<0.1	54.1	8.83	0.866	21.4	10.9	6.46	2.02	0.212	35.4	10.2	<0.1	19	4.41	1.39	1.36	<0.1	6.67	<0.1	15.3	4.5	<0.1	5.21	0.219	13.9
Aromatic TPH >C21-C35	M	2680	mg/kg	1	1100	107	431	4.53	168	52.6	10.8	133	152	41.3	19.5	7.47	135	32.8	3.2	113	32.7	2.42	4.57	22.7	14.8	3.14	93.7	12.5	5.22	40.9	10.1	64.1
Aromatic TPH >C35-C44	N	2680	mg/kg	1	1100	48.8	128	0.892	70.3	26.9	7.35	63	40.7	14.2	14.3	1.11	40.7	9.99	<0.1	51.2	22	0.267	0.657	6.1	4.75	0.463	40.7	5.9	4.45	16.5	1.09	36.7
Total Aromatic Hydrocarbons	N	2680	mg/kg	5		192	683	5.43	300	90.3	19.4	222	205	63.1	36.1	8.8	220	55.1	3.2	187	60.5	4.69	7.37	28.8	27.4	3.6	152	24.1	9.66	63.3	11.5	117
Total Petroleum Hydrocarbons	N	2680	mg/kg	10		399	899	19.2	562	149	19.8	478	670	88.4	64.5	10.5	448	87.4	3.2	299	94.9	4.69	13.1	31.7	32	3.6	193	32.7	14.6	85.7	12.2	173
Benzene	M	2760	µg/kg	1	87	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<180	<90	<90	<90	<90	<1800	<90	<90	<90	<90	<90	<90	<180
Toluene	M	2760	µg/kg	1	130000	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	108	<70	<70	140	<70	<70	<70	<70	1400	<70	<70	<70	<70	<70	<70	140
Ethylbenzene	M	2760	µg/kg	1	47000	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	80	<40	<40	<40	<40	800	<40	<40	<40	<40	<40	<40	80
m & p-Xylene	M	2760	µg/kg	1	56000.00	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	200	<100	<100	<100	<100	2000	<100	<100	<100	<100	<100	<100	200
o-Xylene	M	2760	µg/kg	1	60000.00	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	200	<100	<100	<100	<100	2000	<100	<100	<100	<100	<100	<100	200
Methyl Tert-Butyl Ether	M	2760	µg/kg	1		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	200	<100	<100	<100	<100	2000	<100	<100	<100	<100	<100	<100	200
Naphthalene	M	2800	mg/kg	0.1	15.00	0.469	0.855	<0.009	0.523	0.0501	0.0167	0.303	<0.09	0.131	0.0492	<0.009	0.909	0.224	<0.009	0.22	0.266	<0.009	0.051	<0.009	0.118	<0.009	0.24	0.106	0.0948	0.0304	<0.009	0.103
Acenaphthylene	N	2800	mg/kg	0.1	170.00	0.195	0.488	<0.012	0.297	0.0155	<0.012	0.212	<0.12	0.0289	0.0145	<0.012	0.218	0.0659	<0.012	0.234	0.0679	<0.012	0.0146	<0.012	0.0864	<0.012	0.913	<0.012	<0.012	0.013	<0.012	0.108
Acenaphthene	M	2800	mg/kg	0.1	210.00	0.0557	0.148	<0.008	<0.04	0.0202	<0.008	0.0515	<0.08	0.0221	<0.008	<0.008	0.0441	0.00959	<0.008	0.0527	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.0168	<0.008	0.0134
Fluorene	M	2800	mg/kg	0.1	170.00	0.153	0.363	<0.01	0.15	0.0161	<0.01	0.16	<0.1	0.0358	<0.01	<0.01	0.157	0.0343	<0.01	0.0843	0.0188	<0.01	<0.01	<0.01	0.013	<0.01	0.0434	<0.01	<0.01	0.0108	<0.01	0.0369
Phenanthrene	M	2800	mg/kg	0.1	95.00	1.34	4.99	<0.015	1.23	0.244	<0.015	1.41	0.276	0.388	0.13	<0.015	1.92	0.517	<0.015	1.78	0.167	<0.015	0.121	<0.015	0.287	<0.015	0.359	0.179	0.0341	0.229	<0.015	0.675
Anthracene	M	2800	mg/kg	0.1	2400.00	0.437	1.32	<0.016	0.345	0.064	<0.016	0.4	<0.16	0.104	0.0347	<0.016	0.472	0.215	<0.016	0.438	0.0409	<0.016	0.0187	<0.016	0.0473	<0.016	0.227	<0.016	<0.016	0.0453	<0.016	0.161
Fluoranthene	M	2800	mg/kg	0.1	280.00	2.5	9.72	<0.017	2.55	0.55	<0.017	3.04	0.391	0.785	0.288	<0.017	3.24	1.07	<0.017	3.14	0.31	<0.017	0.0971	<0.017	0.317	<0.017	2.01	0.101	0.0598	0.508	<0.017	1.47
Pyrene	M	2800	mg/kg	0.1	620.00	2.02	7.88	<0.015	2.33	0.599	<0.015	2.61	0.449	0.707	0.271	<0.015	2.67	0.882	<0.015	2.28	0.266	<0.015	0.0774	<0.015	0.261	<0.015	1.95	0.0877	0.0443	0.443	<0.015	1.1
Benzo[a]anthracene	M	2800	mg/kg	0.1	7.20	1.3	5.81	<0.014	1.47	0.408	<0.014	1.71	0.218	0.646	0.245	<0.014	1.92	0.646	<0.014	1.53	0.214	<0.014	0.0609	<0.014	0.202	<0.014	1.78	0.0558	0.0329	0.274	<0.014	0.674
Chrysene	M	2800	mg/kg	0.1	15.00	1.22	4.83	<0.01	1.48	0.481	<0.01	1.54	0.261	0.647	0.261	<0.01	1.72	0.632	<0.01	1.38	0.231	<0.01	0.0818	<0.01	0.17	<0.01	1.23	0.0669	0.0335	0.327	<0.01	0.594
Benzo[b]fluoranthene	M	2800	mg/kg	0.1	2.60	1.11	7.74	<0.015	2.29	0.718	<0.015	2.04	0.378	1.2	0.505	<0.015	2.94	0.762	<0.015	2.44	0.424	0.0244	0.062	<0.015	0.467	<0.015	4.89	0.115	0.058	0.539	<0.015	1.14
Benzo[k]fluoranthene	M	2800	mg/kg	0.1	77.00	0.569	2.75	<0.014	0.644	0.292	<0.014	0.898	<0.14	0.465	0.167	<0.014	0.959	0.292	<0.014	0.885	0.137	<0.014	0.0251	<0.014	0.157	<0.014	1.35	0.0375	<0.014	0.17	<0.014	0.331
Benzo[a]pyrene	M	2800	mg/kg	0.1	2.20	1.1	5.58	<0.015	1.32	0.465	<0.015	1.85	0.261	0.906	0.364	<0.015	1.8	0.656	<0.015	1.52	0.275	<0.015	0.0531	<0.015	0.267	<0.015	3.08	0.053	0.0356	0.309	<0.015	0.61
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.1	27.00	0.697	3.73	<0.018	0.817	0.296	<0.018	1.15	<0.18	0.589	0.24	<0.018	1.3	0.447	<0.018	1.12	0.206	<0.018	0.0505	<0.018	0.234	<0.018	3.02	0.0441	0.0284	0.247	<0.018	0.449
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.1	0.24	0.203	1.26	<0.023	0.244	0.077	<0.023	0.349	<0.23	0.164	0.0673	<0.023	0.361	0.126	<0.023	0.339	0.0578	<0.023	<0.023	<0.023	0.0631	<0.023	0.72	<0.023	<0.023	0.0635	<0.023	0.143
Benzo[g,h,i]perylene	M	2800	mg/kg	0.1	320.00	0.812	3.95	<0.024	1.04	0.361	<0.024	1.34	<0.24	0.684	0.278	<0.024	1.37	0.503	<0.024	1.22	0.215	<0.024	0.0512	<0.024	0.241	<0.024	3.46	0.0527	<0.024	0.297	<0.024	0.496
Total Of 16 PAH's	N	2800	mg/kg	2		14.2	61.4	<0.118	16.7	4.66	<0.118	19.1	2.23	7.5	2.92	<0.118	22	7.08	<0.118	18.7	2.89	<0.118	0.765	<0.118	2.93	<0.118	25.3	0.899	0.421	3.52	<0.118	8.1
Resorcinol	M	2920	mg/kg	0.02																												
Phenol	M	2920	mg/kg	0.02	280.00	0.0108	<0.01	<0.01	<0.01	<0.01	<0.01	0.0108	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cresols	M	2920	mg/kg	0.02		<0.01	0.0111	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Xylenols	M	2920	mg/kg	0.02		<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.0217	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
1-Naphthol	N	2920	mg/kg	0.02																												
Trimethylphenols	M	2920	mg/kg	0.02																												
Total Phenols	M	2920	mg/kg	0.1		<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035

18-669 Llanwern Phase 4E Soil Chemical Screening

Project: P18-669																												
Client: Rodgers Leask Environmental				**Job No.:**		181108-13	181108-13	181107-11	181107-11	181107-11	181107-11	181107-11	181107-11	181107-11	181107-11	181107-11	181107-11	181107-11	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83
Quotation No.: Q21-24056				**Sample ID.:**		4G-F3	4G-F3-V	4G-C6	4G-C6	4G-C7	4G-C6-V	4G-C7-V	4G-D1	4G-D1	4G-D1-V	4G-E1	4G-E1	4G-E1-V	4G-D3	4G-D3	4G-D4	4G-D4	4G-D5	4G-D6	4G-D6	4G-D3-V	4G-D4-V	4G-D5-V	4G-D6-V	4G-E5
Order No.: .				Client Sample Ref.:	**S4UL Generic Assessment Criteria Residential with Homegrown Produce (SOM 1%)**	18689447	18689451	18681149	18681204	18681222	18681216	18681232	18681178	18681182	18681187	18681194	18681198	18681210	18733119	18733124	18733095	18733099	18733084	18733005	18733106	18733131	18733112	18733089	18733139	18733046
				Sample Type:		SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
				Top Depth (m):		0.60-0.60	2.50-2.50	0.50-0.50	0.80-0.80	0.50-0.50	2.50-2.50	1.80-1.80	0.50-0.50	1.00-1.00	2.10-2.10	0.50-0.50	1.00-1.00	3.60-3.60	0.20-0.20	0.50-0.50	0.20-0.20	0.50-0.50	0.50-0.50	0.20-0.20	0.60-0.60	1.80-1.80	1.70-1.70	1.70-1.70	1.70-1.70	0.20-0.20
				Bottom Depth (m):																									
				Date Sampled:		07/11/2018	07/11/2018	11/6/2018	11/6/2018	11/6/2018	11/6/2018	11/6/2018	11/6/2018	11/6/2018	11/6/2018	11/6/2018	11/6/2018	11/6/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018
				Asbestos Lab:																									
Determinand	**Accred.**	**SOP**	**Units**	**LOD**																									
ACM Type	U	2192		N/A		Amosite (Brown) Asbestos																	Amosite (Brown) Asbestos							Amosite (Brown) Asbestos
Asbestos Identification	U	2192		N/A		Detected		Not Detected		Not Detected			Not Detected				Not Detected			Not Detected		Not Detected	Detected		Not Detected					Detected
Asbestos by Gravimetry	U	2192	%	0.001		<0.001																	0.0034							<0.001
Total Asbestos	U	2192	%	0.001		<0.001																	0.0035							<0.001
Moisture	N	2030	%	0.020		1	26	9.3	8.6	8.7	57	23	6.3	11	31	0	13	73	9	11	8.6	17	11	8.5	21	24	9.4	32	22	14
Soil Colour	N	2040		N/A		Black	Grey	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Light Brown	Light Brown	Dark Brown
Other Material	N	2040		N/A		Stones	None	Stones	Stones	Stones	Vegetation	Vegetation	Stones	Vegetation	Vegetation	Vegetation	Vegetation	Vegetation	Vegetation	Vegetation	Vegetation	Vegetation	Stones	Stones	Vegetation	None	Stones	Stones	None	Vegetation
Soil Texture	N	2040		N/A		Sand	Clay	Sand	Sand	Sand	Clay	Clay	Loamy Sand	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Peat	Sandy Loam	Loamy Sand	Sandy Loam	Sandy Loam	Loamy Sand	Loamy Sand	Sandy Loam	Sandy Clay Loam	Loamy Sand	Clay	Clay	Sandy Loam
pH	M	2010		4.0		12.2	8.18	8.98	8.81	12.4	7.32	8.1	11.1	10.1	7.61	9.25	11.2	7.4	9.04	9.2	8.8	7.99	9	11.5	10.4	8.38	8.69	6.79	8.5	9.99
Cyanide (Total)	M	2300	mg/kg	0.5		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	3.26	<1	<1	<1	<1	<1	<1	2.8	<1	2.41	<1	<1	<1	<1	<1
Ammoniacal Nitrogen	M	2425	mg/kg	0.5		<12	19.6	<12	<12	<12	155	45.6	<12	<12	427	<12	<12	1590	<12	<12	<12	71.6	<12	141	<12	29	20.9	271	48.5	<12
Iron (Total)	N	2430	mg/kg	100		183000	35400	19300	24600	192000	29200	35500	77000	26400	38300	228000	125000	7810	124000	64700	72200	30400	95800	48600	23800	25900	38500	25400	31100	101000
Arsenic	M	2450	mg/kg	1	37	<6	11.6	5.67	6.37	7.49	16.1	11.4	<6	7.6	16.1	8.99	9.44	3.74	9.39	14.3	8.57	12.3	10.5	8.24	7.93	12.2	10.1	15.9	11.2	10.6
Cadmium	M	2450	mg/kg	0.1	26	1.62	<0.02	<0.02	<0.02	<0.2	0.0926	<0.02	<0.2	<0.02	<0.02	<0.2	<0.2	0.0218	<0.2	<0.2	<0.02	<0.02	<0.2	<0.02	0.15	0.277	0.505	<0.02	<0.02	<0.2
Chromium	M	2450	mg/kg	1	910	547	28.4	14.4	24.2	695	23.5	28.6	12.8	14.2	32.7	<9	267	12.6	21	360	2.8	24.7	18.1	43.3	7.04	23.5	10	35	25.2	58.5
Manganese	M	2450	mg/kg	5		39500	723	4470	2650	4710	352	1070	3710	2730	441	4770	207	226	5490	19100	7400	778	3770	4370	574	917	1850	268	1190	4010
Copper	M	2450	mg/kg	0.5	2400	18	11.3	11.1	18	35.8	23	9.1	<14	17.4	16.7	22.9	27.9	16.8	17.2	69.7	17.2	8.2	28	9.53	28.6	10.1	33.2	16.4	8.94	19.6
Mercury	M	2450	mg/kg	0.1	40	<1.4	<0.14	<0.14	<0.14	<1.4	<0.14	<0.14	<1.4	<0.14	<0.14	<1.4	<1.4	<0.14	<1.4	<1.4	<0.14	<0.14	<1.4	<0.14	0.575	<0.14	<0.14	<0.14	<0.14	<1.4
Nickel	M	2450	mg/kg	0.5	130	8.22	31.8	10.2	15	27.2	27.8	32.3	14.2	16.4	27.5	37.4	18	13.7	23.1	32.3	13.1	29.3	27.3	9.47	11.8	29.3	21.9	29.7	31.9	24
Lead	M	2450	mg/kg	0.5	200	47.2	23.5	25.7	18.9	15.9	35	22.2	43.8	44.8	33.5	150	43.7	4.85	39.7	89	47.8	21.5	82.9	32.6	45.2	20.6	31.6	40.2	22.2	84.1
Selenium	M	2450	mg/kg	0.2	250	18.4	<1	3.7	2.13	23	<1	<1	<10	1.83	<1	<10	10.3	2.25	<10	11.6	2.69	<1	<10	1.7	<1	<1	2.57	<1	<1	<10
Vanadium	U	2450	mg/kg	5	410	1270	51.1	35.4	33.7	2400	43.2	51.9	37.4	31.7	57.2	120	271	20.4	50.8	515	27.5	46.1	54.2	73.5	17.5	41.7	34.8	53.1	43.7	85.4
Zinc	M	2450	mg/kg	0.5	3700	91	141	218	63	120	129	96.2	135	86.1	119	228	125	25.5	149	289	156	102	320	398	225	94.3	78.1	139	90.7	353
Organic Matter	M	2625	%	0.4		2.74	1.01	2.02	5.12	0.521	21.4	0.841	17.1	4.41	5.6	23.1	0.521	47.9	20.9	0.459	10.7	3.02	18.8	7.88	>100	0.56	9.1	4.93	0.765	13.7
Aliphatic TPH >C5-C6	N	2680	mg/kg	1	42	<0.02	<0.02	<0.02	<0.02	<0.02	0.0782	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatic TPH >C6-C8	N	2680	mg/kg	1	100	<0.02	<0.02	<0.02	<0.02	<0.02	0.177	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.0244
Aliphatic TPH >C8-C10	M	2680	mg/kg	1	27	<0.02	<0.02	<0.02	<0.02	<0.02	0.244	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.0267
Aliphatic TPH >C10-C12	M	2680	mg/kg	1	130	<0.02	<0.02	<0.02	<0.02	<0.02	1.73	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatic TPH >C12-C16	M	2680	mg/kg	1	1100	<0.1	<0.1	0.809	<0.1	2.27	5.06	<0.1	0.765	<0.1	0.419	1.66	<0.1	<0.1	2.03	<0.1	2.21	<0.1	2.3	2.24	4.56	<0.1	0.525	<0.1	<0.1	2.48
Aliphatic TPH >C16-C21	M	2680	mg/kg	1	65000	1.03	<0.1	4.67	1.7	7.03	2.5	<0.1	5.69	4.2	<0.1	7.21	2.14	<0.1	7.91	2.72	7.77	<0.1	9.98	12.4	103	<0.1	2.48	<0.1	<0.1	15.7
Aliphatic TPH >C21-C35	M	2680	mg/kg	1	65000	17.2	<0.1	33.6	17.4	51.5	23.3	<0.1	45.2	18.6	4.58	25	28	22.9	49	12.1	64.4	<0.1	93.6	67.6	63.3	<0.1	14.2	3.17	<0.1	105
Aliphatic TPH >C35-C44	N	2680	mg/kg	1	65000	2.79	<0.1	17	9.3	17.2	<0.1	<0.1	18.2	6.57	<0.1	5.55	8.66	0.655	12.4	4.06	15.5	<0.1	34.8	31.5	8.84	<0.1	3.23	0.875	<0.1	38.3
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5		21	<0.1	56.1	28.4	78	30.9	<0.1	69.8	29.4	5	39.5	38.8	23.6	71.4	18.9	89.9	<0.1	141	114	179	<0.1	20.4	4.04	<0.1	161
Aromatic TPH >C5-C7	N	2680	mg/kg	1	70	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatic TPH >C7-C8	N	2680	mg/kg	1	130	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatic TPH >C8-C10	M	2680	mg/kg	1	34	<0.02	<0.02	<0.02	<0.02	<0.02	0.161	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatic TPH >C10-C12	M	2680	mg/kg	1	74	<0.02	<0.02	<0.02	<0.02	<0.02	1.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatic TPH >C12-C16	M	2680	mg/kg	1	140	1.29	0.814	1.98	<0.1	1.27	16.6	<0.1	1.08	0.945	0.418	3.2	1.11	3	2.23	0.447	3.42	<0.1	2.55	1.04	16.6	<0.1	1.37	0.858	<0.1	5.86
Aromatic TPH >C16-C21	U	2680	mg/kg	1	260	18.9	1.47	12.9	1.7	11.7	23.8	<0.1	4.97	4.11	1.22	29.5	7.16	9.36	13.2	6.68	15.4	<0.1	12.5	8.13	134	<0.1	2.86	<0.1	<0.1	35.6
Aromatic TPH >C21-C35	M	2680	mg/kg	1	1100	147	3.65	84.9	20.6	68.7	230	<0.1	34	28.5	44.8	155	57.3	217	66.1	24.4	76.4	2.21	84.6	41.9	482	<0.1	9.26	31.8	1.49	114
Aromatic TPH >C35-C44	N	2680	mg/kg	1	1100	43.6	0.537	49.9	17.2	29.5	23.3	<0.1	24.1	21.8	3.13	60.7	26.6	29.3	29.1	9.37	36.7	0.566	56.4	38.2	104	<0.1	3.42	4.3	<0.1	54.6
Total Aromatic Hydrocarbons	N	2680	mg/kg	5		211	6.47	150	39.6	111	294	<0.1	64.2	55.4	49.6	249	92.1	258	111	40.9	132	2.78	156	89.3	736	<0.1	16.9	37	1.49	210
Total Petroleum Hydrocarbons	N	2680	mg/kg	10		232	6.47	206	68	189	328	<0.1	134	84.8	54.6	288	131	282	182	59.8	222	2.78	297	203	915	<0.1	37.3	41	1.49	372
Benzene	M	2760	µg/kg	1	87	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90
Toluene	M	2760	µg/kg	1	130000	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70
Ethylbenzene	M	2760	µg/kg	1	47000	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40
m & p-Xylene	M	2760	µg/kg	1	56000.00	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
o-Xylene	M	2760	µg/kg	1	60000.00	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Methyl Tert-Butyl Ether	M	2760	µg/kg	1		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Naphthalene	M	2800	mg/kg	0.1	15.00	<0.045	<0.009	0.402	0.0605	0.105	0.3	<0.009	0.36	0.0918	0.0226	<0.09	0.0678	<0.009	0.0873	0.0356	0.245	<0.009	0.131	0.116	1.11	<0.009	0.0433	<0.009	<0.009	0.373
Acenaphthylene	N	2800	mg/kg	0.1	170.00	<0.06	<0.012	0.113	<0.012	0.0405	0.0337	<0.012	0.216	0.0369	<0.012	<0.12	0.11	<0.012	0.194	0.049	0.259	<0.012	0.13	0.0642	0.277	<0.012	0.0423	<0.012	<0.012	0.201
Acenaphthene	M	2800	mg/kg	0.1	210.00	<0.04	<0.008	0.018	<0.008	0.0947	1.14	<0.008	0.0315	0.0126	<0.008	<0.08	0.0396	<0.008	0.0102	0.0144	0.0192	<0.008	0.0219	0.0144	0.0665	<0.008	<0.008	<0.008	<0.008	0.0433
Fluorene	M	2800	mg/kg	0.1	170.00	<0.05	<0.01	0.0508	0.0114	0.0742	1.38	<0.01	0.0476	0.0133	<0.01	<0.1	0.0188	<0.01	0.0293	0.0162	0.0823	<0.01	0.0463	0.0319	0.141	<0.01	<0.01	<0.01	<0.01	0.162
Phenanthrene	M	2800	mg/kg	0.1	95.00	<0.075	<0.015	0.611	0.198	0.966	3.61	<0.015	0.776	0.182	0.0327	<0.15	0.256	<0.015	0.343	0.189	0.709	<0.015	0.457	0.322	1.08	<0.015	0.167	<0.015	<0.015	1.75
Anthracene	M	2800	mg/kg	0.1	2400.00	<0.08	<0.016	0.179	0.0364	0.322	0.619	<0.016	0.191	0.0436	<0.016	<0.16	0.0813	<0.016	0.12	0.0883	0.178	<0.016	0.147	0.0973	0.366	<0.016	0.0263	<0.016	<0.016	0.506
Fluoranthene	M	2800	mg/kg	0.1	280.00	<0.085	<0.017	1.25	0.3	2.3	1.45	<0.017	1.63	0.311	0.053	0.359	0.893	<0.017	0.973	1.15	1.6	<0.017	0.895	0.861	2.02	<0.017	0.145	<0.017	<0.017	3.28
Pyrene	M	2800	mg/kg	0.1	620.00	<0.075	<0.015	0.995	0.239	2.1	0.942	<0.015	1.21	0.251	0.0435	0.32	1.04	<0.015	0.78	0.826	1.18	<0.015	0.659	0.83	1.69	<0.015	0.105	<0.015	<0.015	2.47
Benzo[a]anthracene	M	2800	mg/kg	0.1	7.20	<0.07	<0.014	0.75	0.184	1.32	0.222	<0.014	0.849	0.197	<0.014	0.259	0.796	<0.014	0.668	1.38	1.1	<0.014	0.578	0.601	1.74	<0.014	0.0703	<0.014	<0.014	1.63
Chrysene	M	2800	mg/kg	0.1	15.00	<0.05	<0.01	0.636	0.198	1.26	0.278	<0.01	0.737	0.207	0.0243	0.213	0.685	<0.01	0.863	1.45	1.14	<0.01	0.618	0.546	2.08	<0.01	0.084	<0.01	<0.01	1.45
Benzo[b]fluoranthene	M	2800	mg/kg	0.1	2.60	<0.075	<0.015	1.33	0.182	2.31	0.282	<0.015	1.55	0.356	0.0274	0.505	1.65	<0.015	1.45	2.31	1.98	<0.015	0.895	1.17	3.23	<0.015	0.132	<0.015	<0.015	2.44
Benzo[k]fluoranthene	M	2800	mg/kg	0.1	77.00	<0.07	<0.014	0.343	0.0897	0.701	0.0869	<0.014	0.526	0.117	<0.014	0.201	0.554	<0.014	0.472	0.773	0.564	<0.014	0.307	0.284	0.981	<0.014	0.0445	<0.014	<0.014	0.772
Benzo[a]pyrene	M	2800	mg/kg	0.1	2.20	<0.075	<0.015	0.802	0.181	1.51	0.13	<0.015	0.906	0.213	<0.015	0.47	1.14	<0.015	0.836	0.987	1.03	<0.015	0.458	0.955	1.91	<0.015	0.0721	<0.015	<0.015	1.41
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.1	27.00	<0.09	<0.018	0.618	0.116	1.04	0.106	<0.018	0.758	0.168	<0.018	0.391	0.834	<0.018	0.726	0.395	1.05	<0.018	0.504	0.908	1.63	<0.018	0.109	<0.018	<0.018	0.847
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.1	0.24	<0.115	<0.023	0.161	0.0359	0.246	<0.023	<0.023	0.195	0.0473	<0.023	<0.23	0.196	<0.023	0.158	0.102	0.23	<0.023	0.0823	0.204	0.368	<0.023	<0.023	<0.023	<0.023	0.242
Benzo[g,h,i]perylene	M	2800	mg/kg	0.1	320.00	<0.12	<0.024	0.69	0.149	1.19	0.118	<0.024	0.801	0.194	<0.024	0.467	0.903	<0.024	0.685	0.318	0.982	<0.024	0.369	0.882	1.58	<0.024	0.086	<0.024	<0.024	0.971
Total Of 16 PAH's	N	2800	mg/kg	2		<0.59	<0.118	8.94	1.98	15.6	10.7	<0.118	10.8	2.44	0.203	3.19	9.27	<0.118	8.4	10.1	12.4	<0.118	6.3	7.89	20.3	<0.118	1.13	<0.118	<0.118	18.5
Resorcinol	M	2920	mg/kg	0.02																										
Phenol	M	2920	mg/kg	0.02	280.00	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cresols	M	2920	mg/kg	0.02		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Xylenols	M	2920	mg/kg	0.02		<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
1-Naphthol	N	2920	mg/kg	0.02																										
Trimethylphenols	M	2920	mg/kg	0.02																										
Total Phenols	M	2920	mg/kg	0.1		<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035

18-669 Llanwern Phase 4E Soil Chemical Screening

Project: P18-669																															
Client: Rodgers Leask Environmental				**Job No.:**		181114-83	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83	181120-23	181120-23	181120-23	181120-23	181120-23	181120-23	181120-23	181120-23	181120-23	181120-23	181120-23	181120-23	181121-47	181121-47	181121-47
Quotation No.: Q21-24056				**Sample ID.:**		4G-E5	4G-E6	4G-E6	4G-E5-V	4G-E6-V	4G-F6	4G-F6	4G-F6	4G-F6-V	4G-G6	4G-G6	4G-E4	4G-E4-V	4G-F4	4G-F4	4G-F5	4G-F7	4G-F7	4G-F4-V	4G-F5-V	4G-F7-V	4G-G5	4G-G5	4G-G5-V	4G-D7	4G-D7	4G-D7-V
Order No.: .				Client Sample Ref.:		18733057	18733146	18733151	18733071	18733158	18733163	18733168	18733173	18733019	18733028	18733037	18775424	18775457	18775464	18775470	18775478	18775444	18775448	18775474	18775482	18775453	18775486	18775490	18775431	18786553	18786557	18786495
				Sample Type:		SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
				Top Depth (m):	**S4UL Generic Assessment Criteria Residential with Homegrown Produce (SOM 1%)**	0.60-0.60	0.30-0.30	0.50-0.50	3.00-3.00	2.20-2.20	0.40-0.40	0.60-0.60	1.20-1.20	2.70-2.70	0.30-0.30	0.50-0.50	0.40-0.40	2.20-2.20	0.20-0.20	0.40-0.40	0.50-0.50	0.40-0.40	0.80-0.80	2.40-2.40	2.60-2.60	2.60-2.60	0.40-0.40	0.70-0.70	3.20-3.20	0.30-0.30	0.60-0.60	1.70-1.70
				Bottom Depth (m):																												
				Date Sampled:		13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018	20/11/2018	20/11/2018	20/11/2018
				Asbestos Lab:																												
Determinand	**Accred.**	**SOP**	**Units**	**LOD**																												
ACM Type	U	2192		N/A																												
Asbestos Identification	U	2192		N/A			Not Detected				Not Detected		Not Detected		Not Detected		Not Detected			Not Detected	Not Detected	Not Detected					Not Detected			Not Detected		
Asbestos by Gravimetry	U	2192	%	0.001																												
Total Asbestos	U	2192	%	0.001																												
Moisture	N	2030	%	0.020		24	14	25	25	26	6.7	6.7	7.6	25	7.3	6.5	11	29	14	6.7	5.8	3.8	7.8	24	36	23	7.4	8.4	25	5.8	21	18
Soil Colour	N	2040		N/A		Dark Brown	Dark Brown	Dark Brown	Grey	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Light Brown	Dark Brown	Light Brown	Light Brown	Dark Brown	Dark Brown	Dark Brown	Grey	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown
Other Material	N	2040		N/A		Vegetation	Vegetation	Vegetation	None	Vegetation	Vegetation	Vegetation	Vegetation	Vegetation	Vegetation	Vegetation	Stones	Vegetation	Stones	Stones	Stones	Stones	Vegetation	None	None	Vegetation	Vegetation	Vegetation	Vegetation	Stones	Stones	Vegetation
Soil Texture	N	2040		N/A		Sandy Loam	Sandy Loam	Sandy Loam	Clay	Loamy Sand	Loamy Sand	Sandy Loam	Sandy Loam	Loamy Sand	Sandy Loam	Sandy Loam	Loamy Sand	Clay	Loamy Sand	Loamy Sand	Sand	Sand	Sandy Loam	Clay	Clay	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sand	Silty Clay
pH	M	2010		4.0		9.21	11.1	8.61	8.2	7.14	11	12.2	10.7	7.88	10.4	9.82	11.7	7.35	10.7	10.4	9.44	9.55	10.6	8.01	7.14	7.76	9.82	9.91	8.59	11.4	8.55	7.99
Cyanide (Total)	M	2300	mg/kg	0.5		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1.38	7.38	<1
Ammoniacal Nitrogen	M	2425	mg/kg	0.5		<12	<12	<12	105	331	<12	<12	<12	115	<12	<12	38.4	281	20.8	19	<12	30.5	<12	317	412	123	<12	<12	89	<12	<12	47.1
Iron (Total)	N	2430	mg/kg	100		59400	113000	8800	31300	36700	173000	264000	155000	32900	13200	231000	232000	32700	74500	204000	179000	452000	134000	34200	19800	32500	164000	51600	28800	161000	18100	32600
Arsenic	M	2450	mg/kg	1	37	6.73	7.12	5.96	12.8	15.4	8.24	10.1	11.6	12.9	2.38	14.2	<6	14.1	21.9	11.8	11.5	12.8	7.91	13.2	13.4	11.4	11.4	5.48	11.6	6.99	8.13	15.1
Cadmium	M	2450	mg/kg	0.1	26	<0.2	<0.2	<0.02	<0.02	<0.02	<0.2	<0.2	<0.2	<0.02	<0.02	<0.2	<0.2	<0.02	<0.2	<0.2	0.634	<0.2	<0.2	<0.02	<0.02	<0.02	1.6	0.524	0.326	1.39	0.678	<0.02
Chromium	M	2450	mg/kg	1	910	<9	446	3.08	24.9	30.6	<9	<9	19.1	31.9	17.8	<9	137	31.7	47.2	<9	<9	<9	<9	28.8	31.2	29.1	<9	5.37	27.1	210	10.3	27.7
Manganese	M	2450	mg/kg	5		1060	16700	164	1170	472	3380	3880	3530	626	4010	7140	8590	361	4760	2840	7110	4220	3550	1150	282	960	3660	2780	985	17900	1610	954
Copper	M	2450	mg/kg	0.5	2400	<14	18.6	23.2	7.9	11.2	15.8	15.2	17.6	10.8	<1.4	<14	<14	11.4	36.9	<14	<14	22.1	15.9	9.01	20	9.57	<14	6.68	11	52.3	22.6	9.05
Mercury	M	2450	mg/kg	0.1	40	<1.4	<1.4	0.81	<0.14	<0.14	<1.4	<1.4	<1.4	<0.14	<0.14	<1.4	<1.4	<0.14	<1.4	<1.4	<1.4	<1.4	<1.4	<0.14	<0.14	<0.14	<1.4	<0.14	<0.14	<1.4	0.59	<0.14
Nickel	M	2450	mg/kg	0.5	130	11.7	18.1	8.3	30.3	34.7	31	32.8	24.2	37.3	1.36	23.7	44.1	34.3	36.6	12	52.3	37.1	17.9	34.1	24.2	34.3	15.8	6.93	35.2	36.5	10.9	32.6
Lead	M	2450	mg/kg	0.5	200	8.2	58.6	12.2	23	29.3	29.3	32.1	40.9	26.7	3.57	25.1	9.62	30	76.9	24	37.4	21.4	48.9	24.7	45.8	22.4	27.6	17.7	25.5	151	63	22.4
Selenium	M	2450	mg/kg	0.2	250	<10	10.4	<1	<1	<1	<10	<10	<10	<1	3.57	<10	<10	<1	<10	<10	<10	<10	<10	<1	<1	<1	<10	<1	<1	<10	2.02	<1
Vanadium	U	2450	mg/kg	5	410	18	327	8.23	44.3	55	87.7	112	96.1	54.6	40	76.2	106	54.2	70.2	29.4	28.2	93.6	46.1	51	46.7	49.7	38.3	36.7	49.4	1080	31.2	46.8
Zinc	M	2450	mg/kg	0.5	3700	25.1	206	23.7	95.1	107	160	195	167	103	11.8	134	133	107	270	125	95.8	149	89.7	104	146	102	72.8	57.3	105	440	285	95.2
Organic Matter	M	2625	%	0.4		>100	24.8	-	0.94	1.9	18.6	4.93	12.5	1.3	0.712	1.72	5.81	3.88	4.17	8	13.7	4.88	15.3	0.909	8.41	0.962	7.1	7.03	0.91	7.57	>100	0.8
Aliphatic TPH >C5-C6	N	2680	mg/kg	1	42	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatic TPH >C6-C8	N	2680	mg/kg	1	100	0.0694	0.0725	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	0.0239	0.0412	<0.02	0.022	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatic TPH >C8-C10	M	2680	mg/kg	1	27	0.0524	0.069	<0.02	<0.02	0.0459	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	0.0229	0.039	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatic TPH >C10-C12	M	2680	mg/kg	1	130	0.0301	0.0761	<0.02	<0.02	0.023	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	0.0466	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatic TPH >C12-C16	M	2680	mg/kg	1	1100	4.02	4.32	4.96	<0.1	<0.1	2.6	2.28	2.54	<0.1	<0.1	6.29	1.13	<0.1	1.26	<0.1	<0.1	0.888	4.51	<0.1	0.878	<0.1	<0.1	3.09	<0.1	3.42	10.8	<0.1
Aliphatic TPH >C16-C21	M	2680	mg/kg	1	65000	94.9	29.3	140	<0.1	<0.1	13.7	16.4	10.9	<0.1	3.03	23.4	8.1	<0.1	11.3	<0.1	4.37	5.14	16.3	<0.1	1.97	<0.1	3.35	7.46	<0.1	26.3	373	<0.1
Aliphatic TPH >C21-C35	M	2680	mg/kg	1	65000	46.2	110	44.3	<0.1	1.65	70.7	118	71	<0.1	15.8	125	70.6	4.06	60.9	<0.1	20.7	27.7	36.6	2.16	4.16	3.39	34.2	53.2	2.25	99.7	127	<0.1
Aliphatic TPH >C35-C44	N	2680	mg/kg	1	65000	5.19	46.7	3.7	<0.1	<0.1	30.8	23.7	21.4	<0.1	12.1	77.8	15.4	<0.1	19.7	<0.1	5.23	4.18	11.5	<0.1	<0.1	<0.1	6.07	41	<0.1	26.6	19.3	<0.1
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5		150	191	193	<0.1	1.65	118	160	106	<0.1	30.9	233	95.2	4.06	93.1	<0.1	30.3	37.9	69	2.16	7.01	3.39	43.6	105	2.25	156	531	<0.1
Aromatic TPH >C5-C7	N	2680	mg/kg	1	70	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatic TPH >C7-C8	N	2680	mg/kg	1	130	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatic TPH >C8-C10	M	2680	mg/kg	1	34	0.0341	0.0456	<0.02	<0.02	0.0297	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	0.026	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatic TPH >C10-C12	M	2680	mg/kg	1	74	<0.02	0.0503	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	0.0314	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatic TPH >C12-C16	M	2680	mg/kg	1	140	4.19	10.9	12.4	<0.1	<0.1	1.94	0.966	0.973	<0.1	1.13	2.66	0.556	<0.1	1.58	<0.1	1.31	0.216	0.644	<0.1	<0.1	<0.1	0.719	1.23	<0.1	3.13	5.52	<0.1
Aromatic TPH >C16-C21	U	2680	mg/kg	1	260	19.4	74.6	108	<0.1	<0.1	8.2	5.67	4.94	<0.1	1.41	11	8.71	<0.1	8.71	2.14	6.31	1.55	3.9	<0.1	2.07	<0.1	3.83	5.31	<0.1	24.3	72.5	<0.1
Aromatic TPH >C21-C35	M	2680	mg/kg	1	1100	55	206	256	<0.1	5.68	45.7	37.3	33.1	<0.1	10.4	133	37.9	13	48.3	5.55	29	10.8	18.4	1.75	29.2	2.03	23.6	49.2	<0.1	86.5	190	2.55
Aromatic TPH >C35-C44	N	2680	mg/kg	1	1100	9.53	97.6	37.7	<0.1	<0.1	30.9	14.5	18.4	<0.1	19.5	156	11.3	1.26	24.1	0.824	11.7	1.21	7.79	<0.1	2.02	0.615	13.3	73.4	<0.1	30.5	48.3	<0.1
Total Aromatic Hydrocarbons	N	2680	mg/kg	5		88.1	389	414	<0.1	5.68	86.7	58.4	57.4	<0.1	32.4	303	58.5	14.3	82.7	8.51	48.3	13.7	30.7	1.75	33.3	2.65	41.4	129	<0.1	144	317	2.55
Total Petroleum Hydrocarbons	N	2680	mg/kg	10		239	580	607	<0.1	7.48	205	219	163	<0.1	63.3	536	154	18.3	176	8.51	78.6	51.7	99.9	3.91	40.3	6.04	85.1	234	2.25	300	848	2.55
Benzene	M	2760	µg/kg	1	87	<90	<90	314	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	<90	296	<90
Toluene	M	2760	µg/kg	1	130000	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70
Ethylbenzene	M	2760	µg/kg	1	47000	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40
m & p-Xylene	M	2760	µg/kg	1	56000.00	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
o-Xylene	M	2760	µg/kg	1	60000.00	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Methyl Tert-Butyl Ether	M	2760	µg/kg	1		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Naphthalene	M	2800	mg/kg	0.1	15.00	0.407	4.73	5.1	0.0205	<0.009	0.143	0.0479	0.123	<0.009	0.0164	0.0633	0.0963	<0.009	0.167	0.015	0.0778	0.0161	0.0307	<0.009	<0.009	<0.009	0.0265	0.0403	<0.009	0.341	1.08	<0.009
Acenaphthylene	N	2800	mg/kg	0.1	170.00	0.051	1.2	0.252	<0.012	<0.012	0.0919	<0.012	0.0483	<0.012	<0.012	<0.06	0.0284	<0.012	0.0987	<0.012	0.0571	<0.012	0.0133	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	0.219	0.186	<0.012
Acenaphthene	M	2800	mg/kg	0.1	210.00	0.0207	0.448	0.0245	<0.008	<0.008	0.0182	0.0138	0.0138	<0.008	<0.008	0.0474	0.0146	<0.008	0.0191	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.0126	0.0643	<0.008	0.0306	0.0102	<0.008
Fluorene	M	2800	mg/kg	0.1	170.00	0.0385	1.84	0.103	<0.01	<0.01	0.0737	0.0204	0.0271	<0.01	<0.01	<0.05	0.0236	<0.01	0.039	<0.01	0.0231	<0.01	<0.01	<0.01	<0.01	<0.01	0.0109	0.0348	<0.01	0.131	0.0175	<0.01
Phenanthrene	M	2800	mg/kg	0.1	95.00	0.281	9.17	1.03	<0.015	<0.015	0.612	0.168	0.319	<0.015	0.0416	0.207	0.481	<0.015	0.488	0.0726	0.195	0.0454	0.0863	<0.015	0.0414	<0.015	0.118	0.209	<0.015	1.5	0.215	<0.015
Anthracene	M	2800	mg/kg	0.1	2400.00	0.0402	3.03	0.247	<0.016	<0.016	0.137	0.0385	0.113	<0.016	<0.016	<0.08	0.132	<0.016	0.15	<0.016	0.0683	<0.016	0.0231	<0.016	<0.016	<0.016	0.0195	<0.016	<0.016	0.409	0.108	<0.016
Fluoranthene	M	2800	mg/kg	0.1	280.00	0.211	12.8	0.379	<0.017	0.0232	0.778	0.219	0.622	<0.017	0.0501	0.24	1.02	<0.017	1	0.0906	0.402	0.0394	0.167	<0.017	0.0776	<0.017	0.0942	0.269	<0.017	2.68	0.315	<0.017
Pyrene	M	2800	mg/kg	0.1	620.00	0.187	9.83	0.368	<0.015	<0.015	0.607	0.175	0.487	<0.015	0.0374	0.22	0.843	<0.015	0.943	0.0789	0.322	0.0319	0.148	<0.015	0.0633	<0.015	0.0905	0.228	<0.015	2.35	0.249	<0.015
Benzo[a]anthracene	M	2800	mg/kg	0.1	7.20	0.173	5.33	0.192	<0.014	<0.014	0.391	0.0959	0.349	<0.014	0.0282	0.0954	0.513	<0.014	0.602	0.0628	0.277	0.0271	0.098	<0.014	0.0387	<0.014	0.0493	0.13	<0.014	1.41	0.238	<0.014
Chrysene	M	2800	mg/kg	0.1	15.00	0.27	5.37	0.29	<0.01	0.0197	0.433	0.134	0.391	<0.01	0.0293	0.139	0.546	<0.01	0.614	0.0715	0.303	0.0322	0.131	<0.01	0.0428	<0.01	0.0697	0.158	<0.01	1.51	0.313	<0.01
Benzo[b]fluoranthene	M	2800	mg/kg	0.1	2.60	0.379	6.47	0.402	<0.015	0.0235	0.583	0.16	0.511	<0.015	0.039	0.141	0.777	<0.015	1.05	0.1	0.474	0.0505	0.163	<0.015	0.067	<0.015	0.0798	0.175	<0.015	2.33	0.614	<0.015
Benzo[k]fluoranthene	M	2800	mg/kg	0.1	77.00	0.105	2.31	0.122	<0.014	<0.014	0.233	0.0435	0.197	<0.014	<0.014	<0.07	0.191	<0.014	0.343	0.0367	0.163	<0.014	0.0814	<0.014	0.0222	<0.014	0.0255	0.064	<0.014	0.833	0.189	<0.014
Benzo[a]pyrene	M	2800	mg/kg	0.1	2.20	0.179	4.2	0.185	<0.015	<0.015	0.321	0.0759	0.286	<0.015	0.0232	0.0819	0.506	<0.015	0.637	0.0718	0.284	0.0243	0.0802	<0.015	0.0355	<0.015	0.0407	0.121	<0.015	1.36	0.337	<0.015
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.1	27.00	0.161	3.15	0.234	<0.018	<0.018	0.292	0.0738	0.257	<0.018	0.0195	<0.09	0.397	<0.018	0.589	0.0534	0.253	0.0297	0.0769	<0.018	0.0347	<0.018	0.0348	0.0994	<0.018	0.735	0.309	<0.018
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.1	0.24	0.0399	0.706	0.0716	<0.023	<0.023	0.0563	<0.023	0.0467	<0.023	<0.023	<0.115	0.0824	<0.023	0.129	<0.023	0.0593	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	0.213	0.0852	<0.023
Benzo[g,h,i]perylene	M	2800	mg/kg	0.1	320.00	0.167	2.55	0.202	<0.024	<0.024	0.243	0.0756	0.206	<0.024	<0.024	<0.12	0.372	<0.024	0.486	0.0495	0.238	0.026	0.075	<0.024	<0.024	<0.024	0.0406	0.108	<0.024	0.94	0.413	<0.024
Total Of 16 PAH's	N	2800	mg/kg	2		2.71	73.1	9.21	<0.118	<0.118	5.01	1.34	4	<0.118	0.285	1.23	6.03	<0.118	7.35	0.703	3.2	0.322	1.17	<0.118	0.423	<0.118	0.713	1.7	<0.118	17	4.68	<0.118
Resorcinol	M	2920	mg/kg	0.02																												
Phenol	M	2920	mg/kg	0.02	280.00	<0.01	0.0117	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cresols	M	2920	mg/kg	0.02		<0.01	0.0117	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0141	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Xylenols	M	2920	mg/kg	0.02		<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
1-Naphthol	N	2920	mg/kg	0.02																												
Trimethylphenols	M	2920	mg/kg	0.02																												
Total Phenols	M	2920	mg/kg	0.1		<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035

Appendix I

Chemical Test Certificates

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

Atkins Global Ltd
Project Jonah site office
Llan Coed House
Suite 24
Coed Darcy
Llandarcy
SA10 6HJ

Attention: John Fitzgerald

CERTIFICATE OF ANALYSIS

Date:	19 November 2018
Customer:	H_ATKINS_LDC
Sample Delivery Group (SDG):	181103-16
Your Reference:	
Location:	Llanwern
Report No:	481753

This report has been revised and directly supersedes 481519 in its entirety.

We received 11 samples on Saturday November 03, 2018 and 11 of these samples were scheduled for analysis which was completed on Monday November 19, 2018. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:



Sonia McWhan

Operations Manager

ALS Life Sciences Limited. Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18660967	4G-B1		0.20 - 0.20	02/11/2018
18660982	4G-B1		0.70 - 0.70	02/11/2018
18661014	4G-B2		0.70 - 0.70	02/11/2018
18661019	4G-B2		1.30 - 1.30	02/11/2018
18660990	4G-B1-V		1.90 - 1.90	02/11/2018
18660995	4G-C1		0.40 - 0.40	02/11/2018
18661004	4G-C1		1.00 - 1.00	02/11/2018
18661027	4G-C2		0.50 - 0.50	02/11/2018
18660971	4G-C2		1.00 - 1.00	02/11/2018
18661009	4G-C1-V		2.20 - 2.20	02/11/2018
18660978	4G-C2-V		2.30 - 2.30	02/11/2018

Maximum Sample/Coolbox Temperature (°C) : **9.0**

ISO5667-3 Water quality - Sampling - Part3 -
During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	18660967			18660982			18661014			18661019			18660990		18660995			18661004	
			Customer Sample Reference	4G-B1			4G-B1			4G-B2			4G-B2			4G-B1-V		4G-C1			4G-C1	
			AGS Reference																			
			Depth (m)	0.20 - 0.20			0.70 - 0.70			0.70 - 0.70			1.30 - 1.30			1.90 - 1.90		0.40 - 0.40			1.00 - 1.00	
			Container	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)
			Sample Type	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Alkali Metals by iCap-OES (Soil)	All	NDPs: 0 Tests: 4			X									X								X
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 8		X			X			X			X					X			X	
Ammonium Soil by Titration	All	NDPs: 0 Tests: 11			X			X			X			X		X			X			X
Anions by Kone (soil)	All	NDPs: 0 Tests: 4			X									X								X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 4		X									X								X	
Asbestos Quantification - Full	All	NDPs: 0 Tests: 1																			X	
CEN Readings	All	NDPs: 0 Tests: 8		X			X			X			X					X			X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 19		X	X		X	X		X	X		X	X		X		X	X		X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 8		X			X			X			X					X			X	
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 8		X			X			X			X					X			X	
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 11			X			X			X			X		X			X			X
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 8		X			X			X			X					X			X	
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 11			X			X			X			X		X			X			X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 11				X			X			X			X		X			X			
GRO by GC-FID (W)	All	NDPs: 0 Tests: 8		X			X			X			X					X			X	

18660978	4G-C2-V		2.30 - 2.30	60g VOC (ALE215)	S																	X	
				250g Amber Jar (ALE210)	S				X						X				X			X		
18661009	4G-C1-V		2.20 - 2.20	60g VOC (ALE215)	S																	X	
				250g Amber Jar (ALE210)	S				X						X				X			X		
18660971	4G-C2		1.00 - 1.00	60g VOC (ALE215)	S																	X	
				250g Amber Jar (ALE210)	S	X			X	X					X				X			X		
				1kg TUB	S		X				X		X		X	X	X			X				X
18661027	4G-C2		0.50 - 0.50	60g VOC (ALE215)	S																	X	
				250g Amber Jar (ALE210)	S				X						X				X			X		
				1kg TUB	S		X						X		X	X	X			X				X
18661004	4G-C1		1.00 - 1.00	60g VOC (ALE215)	S																	X	

Validated

CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

Results Legend

X Test

N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			18660967			18660982			18661014			18661019			18660990			18660995			18661004	
Customer Sample Reference			4G-B1			4G-B1			4G-B2			4G-B2			4G-B1-V			4G-C1			4G-C1	
AGS Reference																						
Depth (m)			0.20 - 0.20			0.70 - 0.70			0.70 - 0.70			1.30 - 1.30			1.90 - 1.90			0.40 - 0.40			1.00 - 1.00	
Container			1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)
Sample Type			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Mercury Dissolved	All	NDPs: 0 Tests: 8	X			X			X			X					X			X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 11		X			X			X			X		X			X			X	
PAH by GCMS	All	NDPs: 0 Tests: 11		X			X			X			X		X			X			X	
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 8	X			X			X			X					X			X		
pH	All	NDPs: 0 Tests: 11		X			X			X			X		X			X			X	
pH Value	All	NDPs: 0 Tests: 8	X			X			X			X					X			X		
Phenols by HPLC (S)	All	NDPs: 0 Tests: 11		X			X			X			X		X			X			X	
Sample description	All	NDPs: 0 Tests: 11		X			X			X			X		X			X			X	
Total Organic Carbon	All	NDPs: 0 Tests: 11		X			X			X			X		X			X			X	
Total Sulphate	All	NDPs: 0 Tests: 4		X									X									X
Total Sulphur	All	NDPs: 0 Tests: 4		X									X									X
TPH CWG (W)	All	NDPs: 0 Tests: 8	X			X			X			X					X			X		
TPH CWG GC (S)	All	NDPs: 0 Tests: 11		X			X			X			X		X			X			X	
VOC MS (S)	All	NDPs: 0 Tests: 11			X			X			X			X		X			X			

18660978	4G-C2-V		2.30 - 2.30	60g VOC (ALE215)	S														X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X				X	
18661009	4G-C1-V		2.20 - 2.20	60g VOC (ALE215)	S														X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X				X	
18660971	4G-C2		1.00 - 1.00	60g VOC (ALE215)	S														X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X	X	X		X	
				1kg TUB	S	X			X		X						X		
18661027	4G-C2		0.50 - 0.50	60g VOC (ALE215)	S														X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X				X	
				1kg TUB	S	X			X		X						X		
18661004	4G-C1		1.00 - 1.00	60g VOC (ALE215)	S														X

CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
18660967	4G-B1	0.20 - 0.20	Dark Brown	Sandy Loam	Stones	Crushed Brick
18660982	4G-B1	0.70 - 0.70	Dark Brown	Sandy Loam	Stones	N/A
18661014	4G-B2	0.70 - 0.70	Black	Sand	Stones	None
18661019	4G-B2	1.30 - 1.30	Light Brown	Loamy Sand	Stones	None
18660990	4G-B1-V	1.90 - 1.90	Dark Brown	Clay	None	None
18660995	4G-C1	0.40 - 0.40	Dark Brown	Sandy Loam	Glass & Stones	Crushed Brick
18661004	4G-C1	1.00 - 1.00	Dark Brown	Sandy Loam	Stones	N/A
18660971	4G-C2	1.00 - 1.00	Dark Brown	Sandy Loam	Stones	N/A
18661027	4G-C2	0.50 - 0.50	Dark Brown	Sandy Loam	Stones	Concrete/Aggregate
18661009	4G-C1-V	2.20 - 2.20	Dark Brown	Clay	None	None
18660978	4G-C2-V	2.30 - 2.30	Grey	Clay	None	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-B1	4G-B1	4G-B2	4G-B2	4G-B1-V	4G-C1
			Depth (m)	0.20 - 0.20	0.70 - 0.70	0.70 - 0.70	1.30 - 1.30	1.90 - 1.90	0.40 - 0.40
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	02/11/2018	02/11/2018	02/11/2018	02/11/2018	02/11/2018	02/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	03/11/2018	03/11/2018	03/11/2018	03/11/2018	03/11/2018	03/11/2018
			SDG Ref	181103-16	181103-16	181103-16	181103-16	181103-16	181103-16
			Lab Sample No.(s)	18660967	18660982	18661014	18661019	18660990	18660995
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		10	8	7.4	9	33	7.3
Exchangeable Ammonia as N	<12 mg/kg	TM024		<12 M	19.9 M	<12 M	<12 M	720 M	<12 M
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	0.0108 M
Cresols	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M
Sulphur, Total	<0.02 %	TM132		0.2			0.0558		
Sulphate, Total potential	<0.06 %	TM132		0.6			0.167		
Soil Organic Matter (SOM)	<0.35 %	TM132		4.43 #	19.8 #	14.3 #	<0.35 #	4.24 #	8.29 #
pH	1 pH Units	TM133		9.52 M	10.6 M	9.72 M	11.4 M	7.56 M	11.6 M
Cyanide, Total	<1 mg/kg	TM153		<1 M	1.95 M	<1 M	<1 M	<1 M	<1 M
Cyanide, Free	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Arsenic	<0.6 mg/kg	TM181		8.77 M	8.72 M	21.6 M	7.76 M	16.3 M	9.5 M
Cadmium	<0.02 mg/kg	TM181		0.372 M	<0.2 M	<0.2 M	<0.02 M	0.462 M	1.11 M
Chromium	<0.9 mg/kg	TM181		81.3 M	112 M	<9 M	<0.9 M	38.3 M	139 M
Copper	<1.4 mg/kg	TM181		25.9 M	18.9 M	15.7 M	3.21 M	18.9 M	17.7 M
Iron	<1000 mg/kg	TM181		59600 #	221000 #	339000 #	49700 #	38500 #	101000 #
Lead	<0.7 mg/kg	TM181		106 M	134 M	9.11 M	9.73 M	33.2 M	44.7 M
Manganese	<0.13 mg/kg	TM181		4370 M	9310 M	10200 M	467 M	428 M	12100 M
Mercury	<0.14 mg/kg	TM181		<1.4 M	<1.4 M	<1.4 M	<0.14 M	<0.14 M	<0.14 M
Nickel	<0.2 mg/kg	TM181		24.4 M	44.9 M	31.1 M	6.59 M	31.2 M	30.1 M
Selenium	<1 mg/kg	TM181		<10 #	<10 #	<10 #	<1 #	<1 #	3.67 #
Vanadium	<0.2 mg/kg	TM181		89.2 #	137 #	128 #	17.9 #	62.7 #	142 #
Zinc	<1.9 mg/kg	TM181		435 M	221 M	68.5 M	25.9 M	139 M	202 M
Sulphate, acid soluble (total)	<0.02 %	TM221		0.26			0.0713		
Calcium	<21 mg/kg	TM224		147000			273000		
Magnesium	<8 mg/kg	TM224		27500			4540		
Soluble Sulphate 2:1 extract as SO4 BRE	<0.004 g/l	TM243		0.112 M			0.12 M		

CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-C1	4G-C2	4G-C2	4G-C1-V	4G-C2-V
			Depth (m)	1.00 - 1.00	0.50 - 0.50	1.00 - 1.00	2.20 - 2.20	2.30 - 2.30
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	02/11/2018	02/11/2018	02/11/2018	02/11/2018	02/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00
			Date Received	03/11/2018	03/11/2018	03/11/2018	03/11/2018	03/11/2018
			SDG Ref	181103-16	181103-16	181103-16	181103-16	181103-16
			Lab Sample No.(s)	18661004	18661027	18660971	18661009	18660978
			AGS Reference					
Moisture Content Ratio (% of as received sample)	%	PM024		10	11	8.1	24	24
Exchangeable Ammonia as N	<12 mg/kg	TM024		<12 M	<12 M	<12 M	274 M	136 M
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)		0.0111 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M
Sulphur, Total	<0.02 %	TM132		0.208		0.115		
Sulphate, Total potential	<0.06 %	TM132		0.624		0.345		
Soil Organic Matter (SOM)	<0.35 %	TM132		28.1 #	4.48 #	<0.35 #	1.2 #	0.957 #
pH	1 pH Units	TM133		10.7 M	11.3 M	11.4 M	7.87 M	7.84 M
Cyanide, Total	<1 mg/kg	TM153		<2 M	<1 M	<1 M	<1 M	<1 M
Cyanide, Free	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M
Arsenic	<0.6 mg/kg	TM181		<6 M	11.7 M	7.34 M	11.3 M	14.5 M
Cadmium	<0.02 mg/kg	TM181		<0.2 M	<0.02 M	<0.2 M	0.362 M	0.377 M
Chromium	<0.9 mg/kg	TM181		30.3 M	116 M	114 M	34.4 M	31.7 M
Copper	<1.4 mg/kg	TM181		16.4 M	15.6 M	<14 M	10.8 M	11.7 M
Iron	<1000 mg/kg	TM181		88200 #	90200 #	260000 #	40000 #	38700 #
Lead	<0.7 mg/kg	TM181		49.8 M	42.5 M	<7 M	27.7 M	23.9 M
Manganese	<0.13 mg/kg	TM181		3850 M	10700 M	13700 M	1310 M	1380 M
Mercury	<0.14 mg/kg	TM181		<1.4 M	<0.14 M	<1.4 M	<0.14 M	<0.14 M
Nickel	<0.2 mg/kg	TM181		39.5 M	14.6 M	27.6 M	41.1 M	36.9 M
Selenium	<1 mg/kg	TM181		<10 #	4.15 #	<10 #	<1 #	<1 #
Vanadium	<0.2 mg/kg	TM181		41.3 #	163 #	591 #	59.2 #	56 #
Zinc	<1.9 mg/kg	TM181		92.5 M	471 M	28.1 M	108 M	101 M
Sulphate, acid soluble (total)	<0.02 %	TM221		0.166		0.231		
Calcium	<21 mg/kg	TM224		97000		103000		
Magnesium	<8 mg/kg	TM224		18600		3890		
Soluble Sulphate 2:1 extract as SO4 BRE	<0.004 g/l	TM243		0.0411 M		0.0672 M		
Asbestos Quantification - Gravimetric - %	<0.001 %	TM304		0.0074 #				
Asbestos Quantification - PCOM Evaluation - %	<0.001 %	TM304		<0.001 #				
Additional Asbestos Components (Using TM048)		TM304		Chrysotile #				
Analysts Comments		TM304		Loose fibres in soil				
Asbestos Quantification - Total - %	<0.001 %	TM304		0.0077 #				

Validated

CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-B1	4G-B1	4G-B2	4G-B2	4G-B1-V	4G-C1
			Depth (m)	0.20 - 0.20	0.70 - 0.70	0.70 - 0.70	1.30 - 1.30	1.90 - 1.90	0.40 - 0.40
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	02/11/2018	02/11/2018	02/11/2018	02/11/2018	02/11/2018	02/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	03/11/2018	03/11/2018	03/11/2018	03/11/2018	03/11/2018	03/11/2018
			SDG Ref	181103-16	181103-16	181103-16	181103-16	181103-16	181103-16
			Lab Sample No.(s)	18660967	18660982	18661014	18661019	18660990	18660995
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		91.2	94.5	94.3	91.1	94.6	88.3
Acenaphthene-d10 % recovery**	%	TM218		92.7	95.6	93.2	91.3	96.3	89.8
Phenanthrene-d10 % recovery**	%	TM218		99.7	100	95.8	92.9	102	99.4
Chrysene-d12 % recovery**	%	TM218		99.1	95.9	86.4	93.2	101	105
Perylene-d12 % recovery**	%	TM218		91.5	82.3	70.1	88.2	93.6	99.9
Naphthalene	<0.009 mg/kg	TM218		0.361 M	1.22 M	0.171 M	0.029 M	<0.009 M	0.469 M
Acenaphthylene	<0.012 mg/kg	TM218		0.816 M	0.589 M	0.0511 M	<0.012 M	<0.012 M	0.195 M
Acenaphthene	<0.008 mg/kg	TM218		0.0707 M	0.105 M	0.0108 M	<0.008 M	<0.008 M	0.0557 M
Fluorene	<0.01 mg/kg	TM218		1.04 M	0.381 M	0.0507 M	0.0128 M	<0.01 M	0.153 M
Phenanthrene	<0.015 mg/kg	TM218		6.03 M	3.91 M	0.557 M	0.0982 M	<0.015 M	1.34 M
Anthracene	<0.016 mg/kg	TM218		1.56 M	1.29 M	0.113 M	0.0259 M	<0.016 M	0.437 M
Fluoranthene	<0.017 mg/kg	TM218		6.24 M	7.21 M	0.668 M	0.133 M	<0.017 M	2.5 M
Pyrene	<0.015 mg/kg	TM218		4.16 M	5.65 M	0.511 M	0.101 M	<0.015 M	2.02 M
Benz(a)anthracene	<0.014 mg/kg	TM218		2.34 M	3.66 M	0.287 M	0.0587 M	<0.014 M	1.3 M
Chrysene	<0.01 mg/kg	TM218		1.81 M	3.45 M	0.278 M	0.0555 M	<0.01 M	1.22 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		2.39 M	5.11 M	0.328 M	0.0591 M	<0.015 M	1.11 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		0.817 M	2 M	0.104 M	0.0213 M	<0.014 M	0.569 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		1.86 M	3.79 M	0.216 M	0.0476 M	<0.015 M	1.1 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		1.38 M	2.95 M	0.175 M	0.0398 M	<0.018 M	0.697 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		0.301 M	0.7 M	0.0484 M	<0.023 M	<0.023 M	0.203 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		1.28 M	3.08 M	0.194 M	0.0392 M	<0.024 M	0.812 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		32.4	45.1	3.76	0.72	<0.118	14.2

CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-C1	4G-C2	4G-C2	4G-C1-V	4G-C2-V	
			Depth (m)	1.00 - 1.00	0.50 - 0.50	1.00 - 1.00	2.20 - 2.20	2.30 - 2.30	
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	
			Date Sampled	02/11/2018	02/11/2018	02/11/2018	02/11/2018	02/11/2018	
			Sample Time	00:00	00:00	00:00	00:00	00:00	
			Date Received	03/11/2018	03/11/2018	03/11/2018	03/11/2018	03/11/2018	
			SDG Ref	181103-16	181103-16	181103-16	181103-16	181103-16	
			Lab Sample No.(s)	18661004	18661027	18660971	18661009	18660978	
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		88.8	87.5	87.8	95.1	86.8	
Acenaphthene-d10 % recovery**	%	TM218		90.8	84.4	90.4	94.2	89.9	
Phenanthrene-d10 % recovery**	%	TM218		97.7	95.4	97.6	98.6	95.3	
Chrysene-d12 % recovery**	%	TM218		104	100	102	91.8	98.1	
Perylene-d12 % recovery**	%	TM218		102	94.1	98.2	82.4	88.7	
Naphthalene	<0.009 mg/kg	TM218		0.855 M	0.523 M	0.0501 M	<0.009 M	0.0167 M	
Acenaphthylene	<0.012 mg/kg	TM218		0.488 M	0.297 M	0.0155 M	<0.012 M	<0.012 M	
Acenaphthene	<0.008 mg/kg	TM218		0.148 M	<0.04 M	0.0202 M	<0.008 M	<0.008 M	
Fluorene	<0.01 mg/kg	TM218		0.363 M	0.15 M	0.0161 M	<0.01 M	<0.01 M	
Phenanthrene	<0.015 mg/kg	TM218		4.99 M	1.23 M	0.244 M	<0.015 M	<0.015 M	
Anthracene	<0.016 mg/kg	TM218		1.32 M	0.345 M	0.064 M	<0.016 M	<0.016 M	
Fluoranthene	<0.017 mg/kg	TM218		9.72 M	2.55 M	0.55 M	<0.017 M	<0.017 M	
Pyrene	<0.015 mg/kg	TM218		7.88 M	2.33 M	0.599 M	<0.015 M	<0.015 M	
Benz(a)anthracene	<0.014 mg/kg	TM218		5.81 M	1.47 M	0.408 M	<0.014 M	<0.014 M	
Chrysene	<0.01 mg/kg	TM218		4.83 M	1.48 M	0.481 M	<0.01 M	<0.01 M	
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		7.74 M	2.29 M	0.718 M	<0.015 M	<0.015 M	
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		2.75 M	0.644 M	0.292 M	<0.014 M	<0.014 M	
Benzo(a)pyrene	<0.015 mg/kg	TM218		5.58 M	1.32 M	0.465 M	<0.015 M	<0.015 M	
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		3.73 M	0.817 M	0.296 M	<0.018 M	<0.018 M	
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		1.26 M	0.244 M	0.077 M	<0.023 M	<0.023 M	
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		3.95 M	1.04 M	0.361 M	<0.024 M	<0.024 M	
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		61.4	16.7	4.66	<0.118	<0.118	

Validated

CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-B1	4G-B1	4G-B2	4G-B2	4G-B1-V	4G-C1
			Depth (m)	0.20 - 0.20	0.70 - 0.70	0.70 - 0.70	1.30 - 1.30	1.90 - 1.90	0.40 - 0.40
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	02/11/2018	02/11/2018	02/11/2018	02/11/2018	02/11/2018	02/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	03/11/2018	03/11/2018	03/11/2018	03/11/2018	03/11/2018	03/11/2018
			SDG Ref	181103-16	181103-16	181103-16	181103-16	181103-16	181103-16
			Lab Sample No.(s)	18660967	18660982	18661014	18661019	18660990	18660995
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		87	32	86	101	99	57
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089		<0.2 M	0.267 #	<0.2 M	<0.2 M	<0.2 M	0.283 #
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C6-C8	<0.01 mg/kg	TM089		<0.02	0.0652	<0.02	<0.02	0.042	0.0755
Aliphatics >C8-C10	<0.01 mg/kg	TM089		<0.02	0.0576	<0.02	<0.02	0.0405	0.054
Aliphatics >C10-C12	<0.01 mg/kg	TM089		<0.02	0.0489	<0.02	<0.02	0.0405	0.0583
Aliphatics >C12-C16	<0.1 mg/kg	TM173		1.78	0.281	<0.1	4.97	<0.1	2.61
Aliphatics >C16-C21	<0.1 mg/kg	TM173		9.08	26	4.52	20.6	0.861	29.4
Aliphatics >C21-C35	<0.1 mg/kg	TM173		90.1	46.8	42.6	48.3	10.1	145
Aliphatics >C35-C44	<0.1 mg/kg	TM173		34.4	3.82	3.13	13.1	12.1	29.4
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		135	76.9	50.2	87	23	207
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		<0.02	0.038	<0.02	<0.02	0.027	0.0356
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		<0.02	0.0326	<0.02	<0.02	0.027	0.0388
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		3.14	12.1	0.928	0.795	<0.1	7.37
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		11.5	93.2	10.9	4.69	0.543	28.9
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		73.7	245	26.6	9.07	35.7	107
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		45.3	67.6	1.5	1.61	5.18	48.8
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		18.8	22	<0.1	0.533	1.58	19
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		134	418	40	16.2	41.4	192
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		269	495	90.2	103	64.6	399

Validated

CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-C1	4G-C2	4G-C2	4G-C1-V	4G-C2-V
			Depth (m)	1.00 - 1.00	0.50 - 0.50	1.00 - 1.00	2.20 - 2.20	2.30 - 2.30
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	02/11/2018	02/11/2018	02/11/2018	02/11/2018	02/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00
			Date Received	03/11/2018	03/11/2018	03/11/2018	03/11/2018	03/11/2018
			SDG Ref	181103-16	181103-16	181103-16	181103-16	181103-16
			Lab Sample No.(s)	18661004	18661027	18660971	18661009	18660978
			AGS Reference					
GRO Surrogate % recovery**	%	TM089		113	77	87	108	106
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089		<0.2 M	<0.2 M	<0.2 M	<0.2 M	<0.2 M
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C6-C8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C8-C10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C10-C12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C12-C16	<0.1 mg/kg	TM173		8.85	4.2	<0.1	0.243	<0.1
Aliphatics >C16-C21	<0.1 mg/kg	TM173		33.2	42.4	5.33	0.376	<0.1
Aliphatics >C21-C35	<0.1 mg/kg	TM173		131	167	43.1	2.8	<0.1
Aliphatics >C35-C44	<0.1 mg/kg	TM173		42.5	48.7	9.87	10.4	0.462
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		215	262	58.3	13.8	0.462
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		21.4	7.44	2.01	<0.1	0.363
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		103	54.1	8.83	<0.1	0.866
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		431	168	52.6	4.53	10.8
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		128	70.3	26.9	0.892	7.35
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		38.9	27.5	9.92	<0.1	3.43
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		683	300	90.3	5.43	19.4
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		899	562	149	19.2	19.8

Validated

CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-B1	4G-B1	4G-B2	4G-B2	4G-B1-V	4G-C1
			Depth (m)	0.20 - 0.20	0.70 - 0.70	0.70 - 0.70	1.30 - 1.30	1.90 - 1.90	0.40 - 0.40
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	02/11/2018	02/11/2018	02/11/2018	02/11/2018	02/11/2018	02/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	03/11/2018	03/11/2018	03/11/2018	03/11/2018	03/11/2018	03/11/2018
			SDG Ref	181103-16	181103-16	181103-16	181103-16	181103-16	181103-16
			Lab Sample No.(s)	18660967	18660982	18661014	18661019	18660990	18660995
			AGS Reference						
Dibromofluoromethane**	%	TM116		106	90.9	106	108	113	99.1
Toluene-d8**	%	TM116		96.4	89.9	96.2	101	96.6	92.9
4-Bromofluorobenzene**	%	TM116		96.1	70.2	85.1	102	94.6	82.5
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1 M	<0.2 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Benzene	<0.009 mg/kg	TM116		<0.09 M	<0.18 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M
Toluene	<0.007 mg/kg	TM116		<0.07 M	<0.14 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M
Ethylbenzene	<0.004 mg/kg	TM116		<0.04 M	<0.08 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M
p/m-Xylene	<0.01 mg/kg	TM116		<0.1 #	<0.2 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
o-Xylene	<0.01 mg/kg	TM116		<0.1 M	<0.2 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Naphthalene	<0.013 mg/kg	TM116		<0.13 M	<0.26 M	<0.13 M	<0.13 M	<0.13 M	0.155 M
Sum of BTEX	<0.04 mg/kg	TM116		<0.4	<0.8	<0.4	<0.4	<0.4	<0.4

Validated

CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-C1	4G-C2	4G-C2	4G-C1-V	4G-C2-V	
			Depth (m)	1.00 - 1.00	0.50 - 0.50	1.00 - 1.00	2.20 - 2.20	2.30 - 2.30	
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	
			Date Sampled	02/11/2018	02/11/2018	02/11/2018	02/11/2018	02/11/2018	
			Sample Time	00:00	00:00	00:00	00:00	00:00	
			Date Received	03/11/2018	03/11/2018	03/11/2018	03/11/2018	03/11/2018	
			SDG Ref	181103-16	181103-16	181103-16	181103-16	181103-16	
			Lab Sample No.(s)	18661004	18661027	18660971	18661009	18660978	
			AGS Reference						
Dibromofluoromethane**	%	TM116		101	106	106	108	118	
Toluene-d8**	%	TM116		96.6	101	99	102	95.9	
4-Bromofluorobenzene**	%	TM116		79.9	95	85.9	103	97.1	
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	
Benzene	<0.009 mg/kg	TM116		<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M	
Toluene	<0.007 mg/kg	TM116		<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M	
Ethylbenzene	<0.004 mg/kg	TM116		<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M	
p/m-Xylene	<0.01 mg/kg	TM116		<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	
o-Xylene	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	
Naphthalene	<0.013 mg/kg	TM116		<0.13 M	<0.13 M	<0.13 M	<0.13 M	<0.13 M	
Sum of BTEX	<0.04 mg/kg	TM116		<0.4	<0.4	<0.4	<0.4	<0.4	

CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

Asbestos Identification - Solid Samples

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-B1 0.20 - 0.20 SOLID 02/11/2018 00:00:00 03/11/2018 10:11:46 181103-16 18660967 TM048	14/11/2018	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-B2 1.30 - 1.30 SOLID 02/11/2018 00:00:00 03/11/2018 09:29:42 181103-16 18661019 TM048	09/11/2018	Renata Bozhkov	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-C1 1.00 - 1.00 SOLID 02/11/2018 00:00:00 03/11/2018 10:48:02 181103-16 18661004 TM048	14/11/2018	Andrzej Ferfecki	loose fibres in soil	Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-C2 1.00 - 1.00 SOLID 02/11/2018 00:00:00 03/11/2018 09:32:27 181103-16 18660971 TM048	09/11/2018	Marcin Magdziarek	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

Asbestos Quantification - Full

		Additional Asbestos Components (Using TM048)	Analysts Comments	Asbestos Quantification - Gravimetric - %	Asbestos Quantification - PCOM Evaluation - %	Asbestos Quantification - Total - %
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-C1 1.00 - 1.00 SOLID 02/11/2018 00:00:00 03/11/2018 10:47:41 181103-16 18661004 TM304	Chrysotile (#)	Loose fibres in soil	0.0074 (#)	<0.001 (#)	0.0077 (#)

CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.100	**Natural Moisture Content (%)**	11.1
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	90
Particle Size <4mm	>95%		

Case	
SDG	181103-16
Lab Sample Number(s)	18660967
Sampled Date	02-Nov-2018
Customer Sample Ref.	4G-B1
Depth (m)	0.20 - 0.20

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00521	<0.0005	0.0521	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00169	<0.0003	0.0169	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00196	<0.001	0.0196	<0.01	-	-	-
Vanadium	0.0739	<0.001	0.739	<0.01	-	-	-
Zinc	0.00167	<0.001	0.0167	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Acenaphthene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Acenaphthylene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Fluoranthene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Anthracene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Phenanthrene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Fluorene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Chrysene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Pyrene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benz(a)anthracene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benzo(a)pyrene by GCMS	<0.00002	<0.00002	<0.0002	<0.0002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benzo(ghi)perylene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
PAH 16 EPA Total by GCMS	<0.00082	<0.00082	<0.0082	<0.0082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	07-Nov-2018
pH (pH Units)	9.57
Conductivity (µS/cm)	128.00
Temperature (°C)	19.00
Volume Leachant (Litres)	0.890

Mcerts Certification does not apply to leachates

19/11/2018 17:17:50

17:17:34 19/11/2018

CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.100	**Natural Moisture Content (%)**	11.1
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	90
Particle Size <4mm	>95%		

Case	
SDG	181103-16
Lab Sample Number(s)	18660967
Sampled Date	02-Nov-2018
Customer Sample Ref.	4G-B1
Depth (m)	0.20 - 0.20

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	07-Nov-2018
pH (pH Units)	9.57
Conductivity (µS/cm)	128.00
Temperature (°C)	19.00
Volume Leachant (Litres)	0.890

Mcerts Certification does not apply to leachates

19/11/2018 17:17:50

17:17:34 19/11/2018

CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	8.81
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	91.9
Particle Size <4mm	>95%		

Case	
SDG	181103-16
Lab Sample Number(s)	18660971
Sampled Date	02-Nov-2018
Customer Sample Ref.	4G-C2
Depth (m)	1.00 - 1.00

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	0.0000101	<0.00001	0.000101	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.000598	<0.0005	0.00598	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00238	<0.001	0.0238	<0.01	-	-	-
Copper	0.00228	<0.0003	0.0228	<0.003	-	-	-
Lead	0.000984	<0.0002	0.00984	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00145	<0.001	0.0145	<0.01	-	-	-
Vanadium	0.0758	<0.001	0.758	<0.01	-	-	-
Zinc	0.00373	<0.001	0.0373	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000905	<0.00001	0.000905	<0.0001	-	-	-
Acenaphthene by GCMS	0.0000192	<0.000005	0.000192	<0.00005	-	-	-
Acenaphthylene by GCMS	0.00000713	<0.000005	0.0000713	<0.00005	-	-	-
Fluoranthene by GCMS	0.000146	<0.000005	0.00146	<0.00005	-	-	-
Anthracene by GCMS	0.0000131	<0.000005	0.000131	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000675	<0.000005	0.000675	<0.00005	-	-	-
Fluorene by GCMS	0.00000823	<0.000005	0.0000823	<0.00005	-	-	-
Chrysene by GCMS	0.0000199	<0.000005	0.000199	<0.00005	-	-	-
Pyrene by GCMS	0.000187	<0.000005	0.00187	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.0000105	<0.000005	0.000105	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000106	<0.000005	0.000106	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.00000528	<0.000005	0.0000528	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000532	<0.000002	0.0000532	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000591	<0.000082	0.00591	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	08-Nov-2018
pH (pH Units)	11.70
Conductivity (µS/cm)	836.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	8.81
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	91.9
Particle Size <4mm	>95%		

Case	
SDG	181103-16
Lab Sample Number(s)	18660971
Sampled Date	02-Nov-2018
Customer Sample Ref.	4G-C2
Depth (m)	1.00 - 1.00

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	0.039	<0.01	0.39	<0.1	-	-	-
Total Aliphatics >C12-C35	0.039	<0.01	0.39	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	0.039	<0.01	0.39	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	0.039	<0.01	0.39	<0.1	-	-	-

Leach Test Information

Date Prepared	08-Nov-2018
pH (pH Units)	11.70
Conductivity (µS/cm)	836.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	8.7
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92
Particle Size <4mm	>95%		

Case	
SDG	181103-16
Lab Sample Number(s)	18660982
Sampled Date	02-Nov-2018
Customer Sample Ref.	4G-B1
Depth (m)	0.70 - 0.70

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	0.066	<0.05	0.66	<0.5	-	-	-
Arsenic	0.00188	<0.0005	0.0188	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00348	<0.001	0.0348	<0.01	-	-	-
Copper	0.00292	<0.0003	0.0292	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00126	<0.001	0.0126	<0.01	-	-	-
Vanadium	0.0654	<0.001	0.654	<0.01	-	-	-
Zinc	0.0083	<0.001	0.083	<0.01	-	-	-
Iron (Dis.Filt) mg/l	0.493	<0.019	4.93	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Acenaphthene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Acenaphthylene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Fluoranthene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Anthracene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Phenanthrene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Fluorene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Chrysene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Pyrene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benz(a)anthracene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benzo(a)pyrene by GCMS	<0.00002	<0.00002	<0.0002	<0.0002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benzo(ghi)perylene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
PAH 16 EPA Total by GCMS	<0.00082	<0.00082	<0.0082	<0.0082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	07-Nov-2018
pH (pH Units)	10.68
Conductivity (µS/cm)	217.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	8.7
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92
Particle Size <4mm	>95%		

Case	
SDG	181103-16
Lab Sample Number(s)	18660982
Sampled Date	02-Nov-2018
Customer Sample Ref.	4G-B1
Depth (m)	0.70 - 0.70

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	07-Nov-2018
pH (pH Units)	10.68
Conductivity (µS/cm)	217.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.87
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.7
Particle Size <4mm	>95%		

Case	
SDG	181103-16
Lab Sample Number(s)	18660995
Sampled Date	02-Nov-2018
Customer Sample Ref.	4G-C1
Depth (m)	0.40 - 0.40

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	0.0000102	<0.00001	0.000102	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.0016	<0.0005	0.016	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00285	<0.0003	0.0285	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00072	<0.0004	0.0072	<0.004	-	-	-
Selenium	0.00196	<0.001	0.0196	<0.01	-	-	-
Vanadium	0.0991	<0.001	0.991	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Acenaphthene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Acenaphthylene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Fluoranthene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Anthracene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Phenanthrene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Fluorene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Chrysene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Pyrene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benz(a)anthracene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benzo(a)pyrene by GCMS	<0.00002	<0.00002	<0.0002	<0.0002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benzo(ghi)perylene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
PAH 16 EPA Total by GCMS	<0.00082	<0.00082	<0.0082	<0.0082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	07-Nov-2018
pH (pH Units)	10.96
Conductivity (µS/cm)	324.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.87
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.7
Particle Size <4mm	>95%		

Case	
SDG	181103-16
Lab Sample Number(s)	18660995
Sampled Date	02-Nov-2018
Customer Sample Ref.	4G-C1
Depth (m)	0.40 - 0.40

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	07-Nov-2018
pH (pH Units)	10.96
Conductivity (µS/cm)	324.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.100	**Natural Moisture Content (%)**	11.1
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	90
Particle Size <4mm	>95%		

Case	
SDG	181103-16
Lab Sample Number(s)	18661004
Sampled Date	02-Nov-2018
Customer Sample Ref.	4G-C1
Depth (m)	1.00 - 1.00

Eluate Analysis	**C_2** Concⁿ in 10:1 eluate (mg/l)		**A_2** 10:1 concⁿ leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	0.648	<0.2	6.48	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00206	<0.0005	0.0206	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.000849	<0.0003	0.00849	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00199	<0.001	0.0199	<0.01	-	-	-
Vanadium	0.0689	<0.001	0.689	<0.01	-	-	-
Zinc	0.00339	<0.001	0.0339	<0.01	-	-	-
Iron (Dis.Filt) mg/l	0.241	<0.019	2.41	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Acenaphthene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Acenaphthylene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Fluoranthene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Anthracene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Phenanthrene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Fluorene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Chrysene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Pyrene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benz(a)anthracene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benzo(a)pyrene by GCMS	<0.00002	<0.00002	<0.0002	<0.0002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Benzo(ghi)perylene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.00005	<0.00005	<0.0005	<0.0005	-	-	-
PAH 16 EPA Total by GCMS	<0.00082	<0.00082	<0.0082	<0.0082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	07-Nov-2018
pH (pH Units)	10.31
Conductivity (µS/cm)	144.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.890

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.100	**Natural Moisture Content (%)**	11.1
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	90
Particle Size <4mm	>95%		

Case	
SDG	181103-16
Lab Sample Number(s)	18661004
Sampled Date	02-Nov-2018
Customer Sample Ref.	4G-C1
Depth (m)	1.00 - 1.00

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	07-Nov-2018
pH (pH Units)	10.31
Conductivity (µS/cm)	144.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.890

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	7.99
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.6
Particle Size <4mm	>95%		

Case	
SDG	181103-16
Lab Sample Number(s)	18661014
Sampled Date	02-Nov-2018
Customer Sample Ref.	4G-B2
Depth (m)	0.70 - 0.70

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	0.449	<0.2	4.49	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00618	<0.0005	0.0618	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00111	<0.0003	0.0111	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00109	<0.001	0.0109	<0.01	-	-	-
Vanadium	0.0235	<0.001	0.235	<0.01	-	-	-
Zinc	0.0025	<0.001	0.025	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000141	<0.00001	0.000141	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000848	<0.000005	0.000848	<0.00005	-	-	-
Anthracene by GCMS	0.00000996	<0.000005	0.0000996	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000487	<0.000005	0.000487	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	0.0000426	<0.000005	0.000426	<0.00005	-	-	-
Pyrene by GCMS	0.0000733	<0.000005	0.000733	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.0000259	<0.000005	0.000259	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000688	<0.000005	0.000688	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.0000311	<0.000005	0.000311	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.000021	<0.000002	0.00021	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	0.0000322	<0.000005	0.000322	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.0000298	<0.000005	0.000298	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000482	<0.000082	0.00482	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	08-Nov-2018
pH (pH Units)	10.31
Conductivity (µS/cm)	113.00
Temperature (°C)	18.60
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	7.99
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.6
Particle Size <4mm	>95%		

Case	
SDG	181103-16
Lab Sample Number(s)	18661014
Sampled Date	02-Nov-2018
Customer Sample Ref.	4G-B2
Depth (m)	0.70 - 0.70

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	08-Nov-2018
pH (pH Units)	10.31
Conductivity (µS/cm)	113.00
Temperature (°C)	18.60
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.099	**Natural Moisture Content (%)**	9.89
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	91
Particle Size <4mm	>95%		

Case	
SDG	181103-16
Lab Sample Number(s)	18661019
Sampled Date	02-Nov-2018
Customer Sample Ref.	4G-B2
Depth (m)	1.30 - 1.30

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	0.596	<0.2	5.96	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.000602	<0.0005	0.00602	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00158	<0.0003	0.0158	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000445	<0.0004	0.00445	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.02	<0.001	0.2	<0.01	-	-	-
Zinc	0.0027	<0.001	0.027	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000737	<0.00001	0.000737	<0.0001	-	-	-
Acenaphthene by GCMS	0.0000217	<0.000005	0.000217	<0.00005	-	-	-
Acenaphthylene by GCMS	0.0000138	<0.000005	0.000138	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000518	<0.000005	0.000518	<0.00005	-	-	-
Anthracene by GCMS	0.0000146	<0.000005	0.000146	<0.00005	-	-	-
Phenanthrene by GCMS	0.000173	<0.000005	0.00173	<0.00005	-	-	-
Fluorene by GCMS	0.0000435	<0.000005	0.000435	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.0000331	<0.000005	0.000331	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000425	<0.000082	0.00425	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	08-Nov-2018
pH (pH Units)	11.33
Conductivity (µS/cm)	455.00
Temperature (°C)	18.80
Volume Leachant (Litres)	0.891

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.099	**Natural Moisture Content (%)**	9.89
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	91
Particle Size <4mm	>95%		

Case	
SDG	181103-16
Lab Sample Number(s)	18661019
Sampled Date	02-Nov-2018
Customer Sample Ref.	4G-B2
Depth (m)	1.30 - 1.30

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	08-Nov-2018
pH (pH Units)	11.33
Conductivity (µS/cm)	455.00
Temperature (°C)	18.80
Volume Leachant (Litres)	0.891

Mcerts Certification does not apply to leachates

19/11/2018 17:17:50

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CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.101	**Natural Moisture Content (%)**	12.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	89
Particle Size <4mm	>95%		

Case	
SDG	181103-16
Lab Sample Number(s)	18661027
Sampled Date	02-Nov-2018
Customer Sample Ref.	4G-C2
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00197	<0.0005	0.0197	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.0021	<0.001	0.021	<0.01	-	-	-
Copper	0.0065	<0.0003	0.065	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000785	<0.0004	0.00785	<0.004	-	-	-
Selenium	0.00239	<0.001	0.0239	<0.01	-	-	-
Vanadium	0.0641	<0.001	0.641	<0.01	-	-	-
Zinc	0.00451	<0.001	0.0451	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000922	<0.00001	0.000922	<0.0001	-	-	-
Acenaphthene by GCMS	0.0000422	<0.000005	0.000422	<0.00005	-	-	-
Acenaphthylene by GCMS	0.0000663	<0.000005	0.000663	<0.00005	-	-	-
Fluoranthene by GCMS	0.000217	<0.000005	0.00217	<0.00005	-	-	-
Anthracene by GCMS	0.0000365	<0.000005	0.000365	<0.00005	-	-	-
Phenanthrene by GCMS	0.000168	<0.000005	0.00168	<0.00005	-	-	-
Fluorene by GCMS	0.0000626	<0.000005	0.000626	<0.00005	-	-	-
Chrysene by GCMS	0.0000254	<0.000005	0.000254	<0.00005	-	-	-
Pyrene by GCMS	0.000293	<0.000005	0.00293	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.0000227	<0.000005	0.000227	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.000022	<0.000005	0.00022	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.0000088	<0.000005	0.000088	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000989	<0.000002	0.0000989	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.00107	<0.000082	0.0107	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	08-Nov-2018
pH (pH Units)	11.18
Conductivity (µS/cm)	395.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.889

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.101	**Natural Moisture Content (%)**	12.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	89
Particle Size <4mm	>95%		

Case	
SDG	181103-16
Lab Sample Number(s)	18661027
Sampled Date	02-Nov-2018
Customer Sample Ref.	4G-C2
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	08-Nov-2018
pH (pH Units)	11.18
Conductivity (µS/cm)	395.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.889

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Table of Results - Appendix

Method No	Reference	Description
ASB_PREP		
PM001		Preparation of Samples for Metals Analysis
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM024	Method 4500A & B, AWWA/APHA, 20th Ed., 1999	Determination of Exchangeable Ammonium and Ammoniacal Nitrogen as N by titration on solids
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer
TM224	US EPA Method 6010B	Determination of Alkaline Metals by iCap 6500 Duo ICP-OES
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM243		Mixed Anions In Soils By Kone
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM304	HSE Contract research Report no 83/1996	Asbestos Quantification in Soil: Fibres identified by morphology only

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	181103-16	**Client Reference:**		**Report Number:**	481753
Location:	Llanwern	**Order Number:**	LLA507	**Superseded Report:**	481519

Test Completion Dates

Lab Sample No(s)	18660967	18660982	18661014	18661019	18660990	18660995	18661004	18660971	18661027	18661009
Customer Sample Ref.	4G-B1	4G-B1	4G-B2	4G-B2	4G-B1-V	4G-C1	4G-C1	4G-C2	4G-C2	4G-C1-V
AGS Ref.										
Depth	0.20 - 0.20	0.70 - 0.70	0.70 - 0.70	1.30 - 1.30	1.90 - 1.90	0.40 - 0.40	1.00 - 1.00	1.00 - 1.00	0.50 - 0.50	2.20 - 2.20
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Alkali Metals by iCap-OES (Soil)	16-Nov-2018			16-Nov-2018			14-Nov-2018	16-Nov-2018		
Ammoniacal Nitrogen	15-Nov-2018	15-Nov-2018	15-Nov-2018	15-Nov-2018		15-Nov-2018	15-Nov-2018	15-Nov-2018	15-Nov-2018	
Ammonium Soil by Titration	16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018
Anions by Kone (soil)	09-Nov-2018			09-Nov-2018			15-Nov-2018	09-Nov-2018		
Asbestos ID in Solid Samples	14-Nov-2018			09-Nov-2018			14-Nov-2018	09-Nov-2018		
Asbestos Quantification - Full							16-Nov-2018			
CEN 10:1 Leachate (1 Stage)	07-Nov-2018	07-Nov-2018	08-Nov-2018	08-Nov-2018		07-Nov-2018	07-Nov-2018	08-Nov-2018	08-Nov-2018	
CEN Readings	09-Nov-2018	09-Nov-2018	10-Nov-2018	10-Nov-2018		09-Nov-2018	09-Nov-2018	10-Nov-2018	10-Nov-2018	
Cyanide Comp/Free/Total/Thiocyanate	16-Nov-2018	16-Nov-2018	15-Nov-2018	15-Nov-2018	16-Nov-2018	15-Nov-2018	19-Nov-2018	16-Nov-2018	16-Nov-2018	15-Nov-2018
Dissolved Metals by ICP-MS	15-Nov-2018	15-Nov-2018	15-Nov-2018	15-Nov-2018		15-Nov-2018	15-Nov-2018	15-Nov-2018	15-Nov-2018	
EPH CWG (Aliphatic) Aqueous GC (W)	12-Nov-2018	12-Nov-2018	14-Nov-2018	14-Nov-2018		12-Nov-2018	12-Nov-2018	14-Nov-2018	14-Nov-2018	
EPH CWG (Aliphatic) GC (S)	09-Nov-2018	08-Nov-2018	08-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	08-Nov-2018	16-Nov-2018	16-Nov-2018
EPH CWG (Aromatic) Aqueous GC (W)	12-Nov-2018	12-Nov-2018	14-Nov-2018	14-Nov-2018		12-Nov-2018	12-Nov-2018	14-Nov-2018	14-Nov-2018	
EPH CWG (Aromatic) GC (S)	09-Nov-2018	08-Nov-2018	08-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	08-Nov-2018	09-Nov-2018	09-Nov-2018
GRO by GC-FID (S)	10-Nov-2018	13-Nov-2018	10-Nov-2018	09-Nov-2018	10-Nov-2018	13-Nov-2018	12-Nov-2018	12-Nov-2018	09-Nov-2018	12-Nov-2018
GRO by GC-FID (W)	12-Nov-2018	12-Nov-2018	12-Nov-2018	13-Nov-2018		12-Nov-2018	12-Nov-2018	13-Nov-2018	12-Nov-2018	
Mercury Dissolved	16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018		16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	
Metals in solid samples by OES	13-Nov-2018	19-Nov-2018	19-Nov-2018	13-Nov-2018	16-Nov-2018	19-Nov-2018	15-Nov-2018	15-Nov-2018	15-Nov-2018	16-Nov-2018
PAH by GCMS	09-Nov-2018	08-Nov-2018	08-Nov-2018	16-Nov-2018	08-Nov-2018	09-Nov-2018	08-Nov-2018	08-Nov-2018	08-Nov-2018	08-Nov-2018
PAH Spec MS - Aqueous (W)	09-Nov-2018	09-Nov-2018	14-Nov-2018	14-Nov-2018		09-Nov-2018	09-Nov-2018	14-Nov-2018	14-Nov-2018	
pH	14-Nov-2018	14-Nov-2018	13-Nov-2018	14-Nov-2018	14-Nov-2018	14-Nov-2018	14-Nov-2018	14-Nov-2018	15-Nov-2018	14-Nov-2018
pH Value	14-Nov-2018	14-Nov-2018	14-Nov-2018	14-Nov-2018		14-Nov-2018	14-Nov-2018	14-Nov-2018	14-Nov-2018	
Phenols by HPLC (S)	12-Nov-2018	13-Nov-2018	13-Nov-2018	12-Nov-2018	13-Nov-2018	13-Nov-2018	12-Nov-2018	13-Nov-2018	13-Nov-2018	13-Nov-2018
Sample description	03-Nov-2018	03-Nov-2018	03-Nov-2018	03-Nov-2018	03-Nov-2018	03-Nov-2018	03-Nov-2018	03-Nov-2018	03-Nov-2018	03-Nov-2018
Total Organic Carbon	16-Nov-2018	15-Nov-2018	16-Nov-2018	16-Nov-2018	15-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	15-Nov-2018
Total Sulphate	13-Nov-2018			12-Nov-2018			13-Nov-2018	14-Nov-2018		
Total Sulphur	14-Nov-2018			13-Nov-2018			07-Nov-2018	13-Nov-2018		
TPH CWG (W)	12-Nov-2018	12-Nov-2018	14-Nov-2018	14-Nov-2018		12-Nov-2018	12-Nov-2018	14-Nov-2018	14-Nov-2018	
TPH CWG GC (S)	10-Nov-2018	13-Nov-2018	10-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	12-Nov-2018	16-Nov-2018	16-Nov-2018
VOC MS (S)	12-Nov-2018	14-Nov-2018	12-Nov-2018	12-Nov-2018	12-Nov-2018	12-Nov-2018	14-Nov-2018	12-Nov-2018	12-Nov-2018	12-Nov-2018

Lab Sample No(s)	18660978
Customer Sample Ref.	4G-C2-V
AGS Ref.	
Depth	2.30 - 2.30
Type	Soil/Solid (S)
Ammonium Soil by Titration	16-Nov-2018
Cyanide Comp/Free/Total/Thiocyanate	16-Nov-2018
EPH CWG (Aliphatic) GC (S)	16-Nov-2018
EPH CWG (Aromatic) GC (S)	09-Nov-2018
GRO by GC-FID (S)	10-Nov-2018
Metals in solid samples by OES	16-Nov-2018
PAH by GCMS	09-Nov-2018
pH	14-Nov-2018
Phenols by HPLC (S)	12-Nov-2018
Sample description	03-Nov-2018
Total Organic Carbon	16-Nov-2018
TPH CWG GC (S)	16-Nov-2018
VOC MS (S)	12-Nov-2018

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
5	**Samples exceeded holding time before presevation was performed**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

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Manor Road (off Manor Lane)
Hawarden
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Fax: (01244) 528701
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Website: www.alsenvironmental.co.uk

Atkins Global Ltd
Project Jonah site office
Llan Coed House
Suite 24
Coed Darcy
Llandarcy
SA10 6HJ

Attention: John Fitzgerald

CERTIFICATE OF ANALYSIS

Date:	20 November 2018
Customer:	H_ATKINS_LDC
Sample Delivery Group (SDG):	181106-25
Your Reference:	
Location:	Llanwern
Report No:	481875

We received 20 samples on Tuesday November 06, 2018 and 20 of these samples were scheduled for analysis which was completed on Tuesday November 20, 2018. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager

ALS Life Sciences Limited. Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18673542	4G-A6		0.50 - 0.50	05/11/2018
18673546	4G-A6		0.70 - 0.70	05/11/2018
18673558	4G-A6-V		2.80 - 2.80	05/11/2018
18673562	4G-B3		0.50 - 0.50	05/11/2018
18673517	4G-B4		0.30 - 0.30	05/11/2018
18673521	4G-B4		0.60 - 0.60	05/11/2018
18673497	4G-B5		0.50 - 0.50	05/11/2018
18673509	4G-B5		1.00 - 1.00	05/11/2018
18673527	4G-B6		0.50 - 0.50	05/11/2018
18673532	4G-B6		0.90 - 0.90	05/11/2018
18673513	4G-B5-V		2.10 - 2.10	05/11/2018
18673538	4G-B6-V		1.80 - 1.80	05/11/2018
18673492	4G-C3		0.50 - 0.50	05/11/2018
18673554	4G-C3		1.00 - 1.00	05/11/2018
18673566	4G-C4		0.30 - 0.30	05/11/2018
18673570	4G-C4		0.80 - 0.80	05/11/2018
18673578	4G-C5		0.70 - 0.70	05/11/2018
18673584	4G-C5		1.20 - 1.20	05/11/2018
18673574	4G-C4-V		2.10 - 2.10	05/11/2018
18673593	4G-C5-V		1.90 - 1.90	05/11/2018

Maximum Sample/Coolbox Temperature (°C) : **10.0**

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
			18673542	4G-A6		0.50 - 0.50	1kg TUB	S
							250g Amber Jar (ALE210)	S
							60g VOC (ALE215)	S
			18673546	4G-A6		0.70 - 0.70	1kg TUB	S
							250g Amber Jar (ALE210)	S
							60g VOC (ALE215)	S
			18673558	4G-A6-V		2.80 - 2.80	250g Amber Jar (ALE210)	S
							60g VOC (ALE215)	S
			18673562	4G-B3		0.50 - 0.50	1kg TUB	S
							250g Amber Jar (ALE210)	S
							60g VOC (ALE215)	S
			18673517	4G-B4		0.30 - 0.30	1kg TUB	S
							250g Amber Jar (ALE210)	S
							60g VOC (ALE215)	S
			18673521	4G-B4		0.60 - 0.60	1kg TUB	S
							250g Amber Jar (ALE210)	S
							60g VOC (ALE215)	S
			18673497	4G-B5		0.50 - 0.50	1kg TUB	S
							250g Amber Jar (ALE210)	S
Alkali Metals by iCap-OES (Soil)	All	NDPs: 0 Tests: 8						
							X	
							X	
							X	
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 15						
			X			X		
			X			X		
			X			X		
Ammonium Soil by Titration	All	NDPs: 0 Tests: 20						
				X			X	
				X			X	
				X			X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 8						
							X	
							X	
							X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 8						
							X	
							X	
							X	
Asbestos Quantification - Full	All	NDPs: 0 Tests: 3						
							X	
							X	
CEN Readings	All	NDPs: 0 Tests: 15						
			X			X		
			X			X		
			X			X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 35						
			X	X		X	X	
			X	X		X	X	
			X	X		X	X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 15						
			X			X		
			X			X		
			X			X		
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 15						
			X			X		
			X			X		
			X			X		
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 20						
				X			X	
				X			X	
				X			X	
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 15						
			X			X		
			X			X		
			X			X		
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 20						
				X			X	
				X			X	
				X			X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 20						
					X			X
					X			X
					X			X
GRO by GC-FID (W)	All	NDPs: 0 Tests: 15						
			X			X		
			X			X		
			X			X		

18673566	4G-C4		0.30 - 0.30	1kg TUB	S			x						x		x		x			x				x
18673554	4G-C3		1.00 - 1.00	60g VOC (ALE215)	S																			x	
				250g Amber Jar (ALE210)	S					x						x					x			x		
				1kg TUB	S			x						x		x		x			x				x
18673492	4G-C3		0.50 - 0.50	60g VOC (ALE215)	S																			x	
				250g Amber Jar (ALE210)	S		x			x		x				x					x			x		
				1kg TUB	S			x						x		x		x			x				x
18673538	4G-B6-V		1.80 - 1.80	60g VOC (ALE215)	S																			x	
				250g Amber Jar (ALE210)	S					x						x					x			x		
18673513	4G-B5-V		2.10 - 2.10	60g VOC (ALE215)	S																			x	
				250g Amber Jar (ALE210)	S					x						x					x			x		
18673532	4G-B6		0.90 - 0.90	60g VOC (ALE215)	S																			x	
				250g Amber Jar (ALE210)	S		x			x		x				x					x			x		
				1kg TUB	S			x				x		x		x		x			x				x
18673527	4G-B6		0.50 - 0.50	60g VOC (ALE215)	S																			x	
				250g Amber Jar (ALE210)	S					x						x					x			x		
				1kg TUB	S			x						x		x		x			x				x
18673509	4G-B5		1.00 - 1.00	60g VOC (ALE215)	S																			x	
				250g Amber Jar (ALE210)	S		x			x		x				x					x			x		
				1kg TUB	S			x				x		x		x		x			x				x
18673497	4G-B5		0.50 - 0.50	60g VOC (ALE215)	S																			x	

Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			18673542			18673546			18673558		18673562			18673517			18673521			18673497
Customer Sample Reference			4G-A6			4G-A6			4G-A6-V		4G-B3			4G-B4			4G-B4			4G-B5
AGS Reference																				
Depth (m)			0.50 - 0.50			0.70 - 0.70			2.80 - 2.80		0.50 - 0.50			0.30 - 0.30			0.60 - 0.60			0.50 - 0.50
Container			1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)
Sample Type			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Mercury Dissolved	All	NDPs: 0 Tests: 15	X			X					X			X			X			X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 20		X			X		X			X			X			X			X
PAH by GCMS	All	NDPs: 0 Tests: 20		X			X		X			X			X			X			X
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 15	X			X					X			X			X			X	
pH	All	NDPs: 0 Tests: 20		X			X		X			X			X			X			X
pH Value	All	NDPs: 0 Tests: 15	X			X					X			X			X			X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 20		X			X		X			X			X			X			X
Sample description	All	NDPs: 0 Tests: 20		X			X		X			X			X			X			X
Total Organic Carbon	All	NDPs: 0 Tests: 20		X			X		X			X			X			X			X
Total Sulphate	All	NDPs: 0 Tests: 8					X					X			X						
Total Sulphur	All	NDPs: 0 Tests: 8					X					X			X						
TPH CWG (W)	All	NDPs: 0 Tests: 15	X			X					X			X			X			X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 20		X			X		X			X			X			X			X
VOC MS (S)	All	NDPs: 0 Tests: 20			X			X		X			X			X			X		

18673566	4G-C4		0.30 - 0.30	1kg TUB	S	X			X		X						X		
18673554	4G-C3		1.00 - 1.00	60g VOC (ALE215)	S														X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X				X	
				1kg TUB	S	X			X		X						X		
18673492	4G-C3		0.50 - 0.50	60g VOC (ALE215)	S														X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X	X	X		X	
				1kg TUB	S	X			X		X						X		
18673538	4G-B6-V		1.80 - 1.80	60g VOC (ALE215)	S														X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X				X	
18673513	4G-B5-V		2.10 - 2.10	60g VOC (ALE215)	S														X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X				X	
18673532	4G-B6		0.90 - 0.90	60g VOC (ALE215)	S														X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X	X	X		X	
				1kg TUB	S	X			X		X						X		
18673527	4G-B6		0.50 - 0.50	60g VOC (ALE215)	S														X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X				X	
				1kg TUB	S	X			X		X						X		
18673509	4G-B5		1.00 - 1.00	60g VOC (ALE215)	S														X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X	X	X		X	
				1kg TUB	S	X			X		X						X		
18673497	4G-B5		0.50 - 0.50	60g VOC (ALE215)	S														X

Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			18673566		18673570			18673578			18673584			18673574		18673593	
Customer Sample Reference			4G-C4		4G-C4			4G-C5			4G-C5			4G-C4-V		4G-C5-V	
AGS Reference																	
Depth (m)			0.30 - 0.30		0.80 - 0.80			0.70 - 0.70			1.20 - 1.20			2.10 - 2.10		1.90 - 1.90	
Container			250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Type			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Alkali Metals by iCap-OES (Soil)	All	NDPs: 0 Tests: 8				X						X					
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 15			X			X			X						
Ammonium Soil by Titration	All	NDPs: 0 Tests: 20	X			X			X			X		X		X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 8				X						X					
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 8			X						X						
Asbestos Quantification - Full	All	NDPs: 0 Tests: 3									X						
CEN Readings	All	NDPs: 0 Tests: 15			X			X			X						
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 35	X		X	X		X	X		X	X		X		X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 15			X			X			X						
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 15			X			X			X						
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 20	X			X			X			X		X		X	
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 15			X			X			X						
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 20	X			X			X			X		X		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 20		X			X			X			X		X		X
GRO by GC-FID (W)	All	NDPs: 0 Tests: 15			X			X			X						

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

Results Legend

- X — Test
- N — No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			18673566		18673570			18673578			18673584			18673574		18673593	
Customer Sample Reference			4G-C4		4G-C4			4G-C5			4G-C5			4G-C4-V		4G-C5-V	
AGS Reference																	
Depth (m)			0.30 - 0.30		0.80 - 0.80			0.70 - 0.70			1.20 - 1.20			2.10 - 2.10		1.90 - 1.90	
Container			250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Type			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Mercury Dissolved	All	NDPs: 0 Tests: 15			X			X			X						
Metals in solid samples by OES	All	NDPs: 0 Tests: 20	X			X			X			X		X		X	
PAH by GCMS	All	NDPs: 0 Tests: 20	X			X			X			X		X		X	
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 15			X			X			X						
pH	All	NDPs: 0 Tests: 20	X			X			X			X		X		X	
pH Value	All	NDPs: 0 Tests: 15			X			X			X						
Phenols by HPLC (S)	All	NDPs: 0 Tests: 20	X			X			X			X		X		X	
Sample description	All	NDPs: 0 Tests: 20	X			X			X			X		X		X	
Total Organic Carbon	All	NDPs: 0 Tests: 20	X			X			X			X		X		X	
Total Sulphate	All	NDPs: 0 Tests: 8				X						X					
Total Sulphur	All	NDPs: 0 Tests: 8				X						X					
TPH CWG (W)	All	NDPs: 0 Tests: 15			X			X			X						
TPH CWG GC (S)	All	NDPs: 0 Tests: 20	X			X			X			X		X		X	
VOC MS (S)	All	NDPs: 0 Tests: 20		X			X			X			X		X		X

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
18673542	4G-A6	0.50 - 0.50	Dark Brown	Sand	Stones	None
18673546	4G-A6	0.70 - 0.70	Dark Brown	Sandy Clay	Stones	None
18673558	4G-A6-V	2.80 - 2.80	Dark Brown	Loamy Sand	Vegetation	None
18673562	4G-B3	0.50 - 0.50	Dark Brown	Loamy Sand	Stones	Vegetation
18673517	4G-B4	0.30 - 0.30	Dark Brown	Loamy Sand	Stones	Vegetation
18673521	4G-B4	0.60 - 0.60	Dark Brown	Loamy Sand	Stones	Vegetation
18673497	4G-B5	0.50 - 0.50	Dark Brown	Sand	Stones	Vegetation
18673509	4G-B5	1.00 - 1.00	Dark Brown	Loamy Sand	Stones	None
18673527	4G-B6	0.50 - 0.50	Dark Brown	Sandy Loam	Vegetation	Stones
18673532	4G-B6	0.90 - 0.90	Dark Brown	Sandy Loam	Vegetation	Stones
18673513	4G-B5-V	2.10 - 2.10	Dark Brown	Silty Clay	None	None
18673538	4G-B6-V	1.80 - 1.80	Dark Brown	Sandy Loam	Vegetation	Stones
18673492	4G-C3	0.50 - 0.50	Dark Brown	Loamy Sand	Stones	Vegetation
18673554	4G-C3	1.00 - 1.00	Dark Brown	Loamy Sand	Stones	Vegetation
18673566	4G-C4	0.30 - 0.30	Black	Loamy Sand	Stones	Vegetation
18673570	4G-C4	0.80 - 0.80	Dark Brown	Sandy Loam	Stones	Vegetation
18673578	4G-C5	0.70 - 0.70	Black	Sand	Stones	None
18673584	4G-C5	1.20 - 1.20	Dark Brown	Loamy Sand	Stones	Vegetation
18673574	4G-C4-V	2.10 - 2.10	Black	Sandy Clay	Stones	Vegetation
18673593	4G-C5-V	1.90 - 1.90	Dark Brown	Sandy Loam	Vegetation	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-A6	4G-A6	4G-A6-V	4G-B3	4G-B4	4G-B4
			Depth (m)	0.50 - 0.50	0.70 - 0.70	2.80 - 2.80	0.50 - 0.50	0.30 - 0.30	0.60 - 0.60
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
			SDG Ref	181106-25	181106-25	181106-25	181106-25	181106-25	181106-25
			Lab Sample No.(s)	18673542	18673546	18673558	18673562	18673517	18673521
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		14	14	72	7.7	8.6	6.9
Exchangeable Ammonia as N	<12 mg/kg	TM024		22.7 M	<12 M	97.3 M	<12 M	<12 M	<12 M
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M
Sulphur, Total	<0.02 %	TM132			0.208		0.31	0.414	
Sulphate, Total potential	<0.06 %	TM132			0.624		0.93	1.24	
Soil Organic Matter (SOM)	<0.35 %	TM132		5.69 #	3.22 #	59.8 #	<0.35 #	0.378 #	3.65 #
pH	1 pH Units	TM133		11.9 M	11.6 M	6.85 M	11 M	10.9 M	9.26 M
Cyanide, Total	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Cyanide, Free	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Arsenic	<0.6 mg/kg	TM181		13.8 M	<6 M	10.2 M	8.77 M	8.77 M	27.1 M
Cadmium	<0.02 mg/kg	TM181		1.19 M	<0.2 M	0.222 M	<0.2 M	<0.02 M	1.15 M
Chromium	<0.9 mg/kg	TM181		240 M	533 M	3.2 M	22.5 M	56.3 M	6.54 M
Copper	<1.4 mg/kg	TM181		32.3 M	15.9 M	15.6 M	17.6 M	10.9 M	31.3 M
Iron	<1000 mg/kg	TM181		165000 #	159000 #	13200 #	131000 #	53600 #	105000 #
Lead	<0.7 mg/kg	TM181		30.1 M	14.3 M	4.61 M	46.4 M	59.6 M	39.1 M
Manganese	<0.13 mg/kg	TM181		23700 M	30100 M	292 M	3380 M	67.6 M	3760 M
Mercury	<0.14 mg/kg	TM181		<0.14 M	<1.4 M	<0.14 M	<1.4 M	<0.14 M	<0.14 M
Nickel	<0.2 mg/kg	TM181		22.3 M	12.7 M	9.29 M	26.7 M	10.9 M	26.5 M
Selenium	<1 mg/kg	TM181		6.38 #	15.5 #	1.55 #	<10 #	3.23 #	<1 #
Vanadium	<0.2 mg/kg	TM181		430 #	985 #	10.5 #	64.8 #	90.7 #	43 #
Zinc	<1.9 mg/kg	TM181		99.3 M	50.6 M	47.1 M	200 M	233 M	130 M
Sulphate, acid soluble (total)	<0.02 %	TM221			0.316		0.381	1.59	
Calcium	<21 mg/kg	TM224			157000		131000	83100	
Magnesium	<8 mg/kg	TM224			8180		7540	12700	
Soluble Sulphate 2:1 extract as SO4 BRE	<0.004 g/l	TM243			0.0858 M		0.169 M	0.172 M	
Asbestos Quantification - Gravimetric - %	<0.001 %	TM304					<0.001 #	0.0047 #	
Asbestos Quantification - PCOM Evaluation - %	<0.001 %	TM304					<0.001 #	<0.001 #	
Additional Asbestos Components (Using TM048)		TM304					None #	None #	
Analysts Comments		TM304					N/A	N/A	
Asbestos Quantification - Total - %	<0.001 %	TM304					<0.001 #	0.0047 #	

Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-B5	4G-B5	4G-B6	4G-B6	4G-B5-V	4G-B6-V
			Depth (m)	0.50 - 0.50	1.00 - 1.00	0.50 - 0.50	0.90 - 0.90	2.10 - 2.10	1.80 - 1.80
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
			SDG Ref	181106-25	181106-25	181106-25	181106-25	181106-25	181106-25
			Lab Sample No.(s)	18673497	18673509	18673527	18673532	18673513	18673538
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		7.7	7.1	9.7	9.4	21	24
Exchangeable Ammonia as N	<12 mg/kg	TM024		<12 M	<12 M	15.6 M	<12 M	<12 M	200 M
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M	0.0323 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M
Sulphur, Total	<0.02 %	TM132			0.177		0.667		
Sulphate, Total potential	<0.06 %	TM132			0.531		2		
Soil Organic Matter (SOM)	<0.35 %	TM132		9.03 #	1.08 #	6.47 #	4.26 #	0.926 #	1.86 #
pH	1 pH Units	TM133		8.81 M	12.3 M	10.5 M	11.9 M	8.16 M	7.58 M
Cyanide, Total	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Cyanide, Free	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Arsenic	<0.6 mg/kg	TM181		8.81 M	<6 M	10.7 M	<6 M	141 M	11.8 M
Cadmium	<0.02 mg/kg	TM181		0.245 M	<0.2 M	0.932 M	<0.2 M	0.408 M	0.317 M
Chromium	<0.9 mg/kg	TM181		21.7 M	763 M	79.1 M	421 M	26.9 M	38.6 M
Copper	<1.4 mg/kg	TM181		26.5 M	28.3 M	23 M	16.1 M	66 M	11.5 M
Iron	<1000 mg/kg	TM181		25000 #	207000 #	58700 #	115000 #	31500 #	33400 #
Lead	<0.7 mg/kg	TM181		25.2 M	19.4 M	54.8 M	18.3 M	29.4 M	28 M
Manganese	<0.13 mg/kg	TM181		1110 M	4310 M	6010 M	2070 M	1050 M	688 M
Mercury	<0.14 mg/kg	TM181		<0.14 M	<1.4 M	<0.14 M	<1.4 M	<0.14 M	<0.14 M
Nickel	<0.2 mg/kg	TM181		24.5 M	12 M	17.5 M	12.2 M	33 M	36.1 M
Selenium	<1 mg/kg	TM181		<1 #	24.3 #	2.33 #	12 #	<1 #	<1 #
Vanadium	<0.2 mg/kg	TM181		40.4 #	702 #	113 #	286 #	48.4 #	62.5 #
Zinc	<1.9 mg/kg	TM181		45.1 M	51.8 M	332 M	75.2 M	130 M	97.7 M
Sulphate, acid soluble (total)	<0.02 %	TM221			0.454		1.2		
Calcium	<21 mg/kg	TM224			168000		190000		
Magnesium	<8 mg/kg	TM224			23000		11600		
Soluble Sulphate 2:1 extract as SO4 BRE	<0.004 g/l	TM243			0.041 M		0.177 M		

Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-C3	4G-C3	4G-C4	4G-C4	4G-C5	4G-C5
			Depth (m)	0.50 - 0.50	1.00 - 1.00	0.30 - 0.30	0.80 - 0.80	0.70 - 0.70	1.20 - 1.20
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
			SDG Ref	181106-25	181106-25	181106-25	181106-25	181106-25	181106-25
			Lab Sample No.(s)	18673492	18673554	18673566	18673570	18673578	18673584
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		7.7	9.5	16	11	13	11
Exchangeable Ammonia as N	<12 mg/kg	TM024		<12 M	<12 M	<12 M	20.3 M	<12 M	<12 M
Phenol	<0.01 mg/kg	TM062 (S)		0.0108 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Xylenols	<0.015 mg/kg	TM062 (S)		0.0217 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M
Sulphur, Total	<0.02 %	TM132		0.233			0.26		0.291
Sulphate, Total potential	<0.06 %	TM132		0.699			0.78		0.873
Soil Organic Matter (SOM)	<0.35 %	TM132		1.81 #	3.83 #	10.1 #	1.31 #	34.1 #	12.6 #
pH	1 pH Units	TM133		10.9 M	11.3 M	11.3 M	11.2 M	11.4 M	12 M
Cyanide, Total	<1 mg/kg	TM153		<1 M	<1 M	1.27 M	1.02 M	1.64 M	<1 M
Cyanide, Free	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Arsenic	<0.6 mg/kg	TM181		11.6 M	9.95 M	9.69 M	9.25 M	10.9 M	6.62 M
Cadmium	<0.02 mg/kg	TM181		<0.2 M	0.775 M	0.702 M	<0.02 M	<0.02 M	0.0249 M
Chromium	<0.9 mg/kg	TM181		256 M	99.4 M	104 M	12.6 M	14.4 M	25.6 M
Copper	<1.4 mg/kg	TM181		21.6 M	22 M	32.8 M	14.1 M	20 M	8.24 M
Iron	<1000 mg/kg	TM181		91600 #	49500 #	49100 #	48100 #	35600 #	17200 #
Lead	<0.7 mg/kg	TM181		40.1 M	41.4 M	54.6 M	27.4 M	38.1 M	21.6 M
Manganese	<0.13 mg/kg	TM181		1230 M	9570 M	10300 M	2020 M	2070 M	2930 M
Mercury	<0.14 mg/kg	TM181		<1.4 M	<0.14 M	0.268 M	<0.14 M	<0.14 M	<0.14 M
Nickel	<0.2 mg/kg	TM181		12.2 M	11.5 M	24.7 M	17.6 M	13.4 M	7.55 M
Selenium	<1 mg/kg	TM181		<10 #	3.69 #	3.92 #	<1 #	1.5 #	2.04 #
Vanadium	<0.2 mg/kg	TM181		226 #	124 #	170 #	33.5 #	38.7 #	52.4 #
Zinc	<1.9 mg/kg	TM181		202 M	338 M	165 M	145 M	173 M	46.7 M
Sulphate, acid soluble (total)	<0.02 %	TM221		0.427			0.812		1.37
Calcium	<21 mg/kg	TM224		187000			121000		212000
Magnesium	<8 mg/kg	TM224		9200			30400		8010
Soluble Sulphate 2:1 extract as SO4 BRE	<0.004 g/l	TM243		0.204 M			0.261 M		0.215 M
Asbestos Quantification - Gravimetric - %	<0.001 %	TM304							<0.001 #
Asbestos Quantification - PCOM Evaluation - %	<0.001 %	TM304							<0.001 #
Additional Asbestos Components (Using TM048)		TM304							None #
Analysts Comments		TM304							N/C
Asbestos Quantification - Total - %	<0.001 %	TM304							<0.001 #

Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-C4-V	4G-C5-V				
			Depth (m)	2.10 - 2.10	1.90 - 1.90				
			Sample Type	Soil/Solid (S)	Soil/Solid (S)				
			Date Sampled	05/11/2018	05/11/2018				
			Sample Time	00:00	00:00				
			Date Received	06/11/2018	06/11/2018				
			SDG Ref	181106-25	181106-25				
			Lab Sample No.(s)	18673574	18673593				
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		24	23				
Exchangeable Ammonia as N	<12 mg/kg	TM024		134 M	79.3 M				
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M				
Cresols	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M				
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M	<0.015 M				
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035 M	<0.035 M				
Soil Organic Matter (SOM)	<0.35 %	TM132		4.5 #	1.3 #				
pH	1 pH Units	TM133		7 M	8.12 M				
Cyanide, Total	<1 mg/kg	TM153		<1 M	<1 M				
Cyanide, Free	<1 mg/kg	TM153		<1 M	<1 M				
Arsenic	<0.6 mg/kg	TM181		10.8 M	13.4 M				
Cadmium	<0.02 mg/kg	TM181		0.409 M	0.363 M				
Chromium	<0.9 mg/kg	TM181		40.1 M	33.2 M				
Copper	<1.4 mg/kg	TM181		24.8 M	11.4 M				
Iron	<1000 mg/kg	TM181		29900 #	34400 #				
Lead	<0.7 mg/kg	TM181		27 M	23.8 M				
Manganese	<0.13 mg/kg	TM181		535 M	1270 M				
Mercury	<0.14 mg/kg	TM181		<0.14 M	<0.14 M				
Nickel	<0.2 mg/kg	TM181		37.8 M	35.8 M				
Selenium	<1 mg/kg	TM181		<1 #	<1 #				
Vanadium	<0.2 mg/kg	TM181		63.4 #	58.7 #				
Zinc	<1.9 mg/kg	TM181		119 M	103 M				

Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-A6	4G-A6	4G-A6-V	4G-B3	4G-B4	4G-B4
			Depth (m)	0.50 - 0.50	0.70 - 0.70	2.80 - 2.80	0.50 - 0.50	0.30 - 0.30	0.60 - 0.60
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
			SDG Ref	181106-25	181106-25	181106-25	181106-25	181106-25	181106-25
			Lab Sample No.(s)	18673542	18673546	18673558	18673562	18673517	18673521
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		97.9	98.5	90.7	91.3	86.6	95.7
Acenaphthene-d10 % recovery**	%	TM218		98.1	97.5	87.2	85.2	92.5	97.6
Phenanthrene-d10 % recovery**	%	TM218		99.8	100	92.7	91.4	100	96.7
Chrysene-d12 % recovery**	%	TM218		101	102	87	91	101	94.3
Perylene-d12 % recovery**	%	TM218		96.4	95.7	85.2	91.5	94	83.5
Naphthalene	<0.009 mg/kg	TM218		0.0835 M	0.0332 M	<0.09 M	0.115 M	0.22 M	0.0337 M
Acenaphthylene	<0.012 mg/kg	TM218		0.0272 M	<0.012 M	<0.12 M	0.0476 M	0.116 M	<0.012 M
Acenaphthene	<0.008 mg/kg	TM218		0.0511 M	0.0303 M	<0.08 M	0.00961 M	0.0447 M	<0.008 M
Fluorene	<0.01 mg/kg	TM218		0.033 M	0.0139 M	<0.1 M	0.0261 M	0.0936 M	<0.01 M
Phenanthrene	<0.015 mg/kg	TM218		0.464 M	0.276 M	<0.15 M	0.234 M	0.778 M	0.0976 M
Anthracene	<0.016 mg/kg	TM218		0.111 M	0.0463 M	<0.16 M	0.0686 M	0.261 M	<0.016 M
Fluoranthene	<0.017 mg/kg	TM218		1.79 M	1.2 M	<0.17 M	0.431 M	1.67 M	0.145 M
Pyrene	<0.015 mg/kg	TM218		1.84 M	1.26 M	<0.15 M	0.358 M	1.33 M	0.127 M
Benz(a)anthracene	<0.014 mg/kg	TM218		1.46 M	1.04 M	<0.14 M	0.287 M	0.846 M	0.0943 M
Chrysene	<0.01 mg/kg	TM218		1.47 M	1.14 M	<0.1 M	0.296 M	0.779 M	0.107 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		1.62 M	1.07 M	<0.15 M	0.532 M	0.658 M	0.122 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		0.914 M	0.695 M	<0.14 M	0.197 M	0.398 M	0.0515 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		1.96 M	1.39 M	<0.15 M	0.347 M	0.742 M	0.113 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		1.34 M	0.875 M	<0.18 M	0.254 M	0.474 M	0.0935 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		0.283 M	0.207 M	<0.23 M	0.0736 M	0.132 M	0.0266 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		1.32 M	0.946 M	<0.24 M	0.279 M	0.556 M	0.101 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		14.8	10.2	<1.18	3.56	9.1	1.11

Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-B5	4G-B5	4G-B6	4G-B6	4G-B5-V	4G-B6-V
			Depth (m)	0.50 - 0.50	1.00 - 1.00	0.50 - 0.50	0.90 - 0.90	2.10 - 2.10	1.80 - 1.80
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
			SDG Ref	181106-25	181106-25	181106-25	181106-25	181106-25	181106-25
			Lab Sample No.(s)	18673497	18673509	18673527	18673532	18673513	18673538
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		86.9	86.5	85.7	97	99.3	93.1
Acenaphthene-d10 % recovery**	%	TM218		83.5	91.9	89.9	96.3	97	89.4
Phenanthrene-d10 % recovery**	%	TM218		82	98.6	99.2	95.6	97.8	89.7
Chrysene-d12 % recovery**	%	TM218		79.3	104	101	97.2	99.3	90.5
Perylene-d12 % recovery**	%	TM218		74.2	99.7	94.7	90.9	92.9	92.6
Naphthalene	<0.009 mg/kg	TM218		0.136 M	0.0272 M	0.243 M	0.141 M	<0.009 M	<0.009 M
Acenaphthylene	<0.012 mg/kg	TM218		0.0501 M	<0.012 M	0.21 M	0.0648 M	<0.012 M	<0.012 M
Acenaphthene	<0.008 mg/kg	TM218		0.00892 M	0.0342 M	0.0287 M	0.0184 M	<0.008 M	<0.008 M
Fluorene	<0.01 mg/kg	TM218		0.0357 M	0.0126 M	0.126 M	0.0337 M	<0.01 M	<0.01 M
Phenanthrene	<0.015 mg/kg	TM218		0.306 M	0.616 M	0.999 M	0.393 M	<0.015 M	<0.015 M
Anthracene	<0.016 mg/kg	TM218		0.0824 M	0.0602 M	0.374 M	0.119 M	<0.016 M	<0.016 M
Fluoranthene	<0.017 mg/kg	TM218		0.445 M	1.52 M	2.13 M	0.966 M	<0.017 M	<0.017 M
Pyrene	<0.015 mg/kg	TM218		0.379 M	1.45 M	1.67 M	0.88 M	<0.015 M	<0.015 M
Benz(a)anthracene	<0.014 mg/kg	TM218		0.328 M	1.22 M	1.15 M	0.662 M	<0.014 M	<0.014 M
Chrysene	<0.01 mg/kg	TM218		0.305 M	1.29 M	1.05 M	0.714 M	<0.01 M	<0.01 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		0.519 M	1.61 M	1.24 M	0.747 M	<0.015 M	<0.015 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		0.201 M	0.718 M	0.47 M	0.373 M	<0.014 M	<0.014 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		0.316 M	1.63 M	1.13 M	0.775 M	<0.015 M	<0.015 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		0.227 M	0.96 M	0.729 M	0.614 M	<0.018 M	<0.018 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		0.0744 M	0.264 M	0.209 M	0.135 M	<0.023 M	<0.023 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		0.24 M	1.11 M	0.862 M	0.638 M	<0.024 M	<0.024 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		3.65	12.5	12.6	7.27	<0.118	<0.118

Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-C3	4G-C3	4G-C4	4G-C4	4G-C5	4G-C5
			Depth (m)	0.50 - 0.50	1.00 - 1.00	0.30 - 0.30	0.80 - 0.80	0.70 - 0.70	1.20 - 1.20
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
			SDG Ref	181106-25	181106-25	181106-25	181106-25	181106-25	181106-25
			Lab Sample No.(s)	18673492	18673554	18673566	18673570	18673578	18673584
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		85.7	86.5	91.2	87.9	93.3	85.4
Acenaphthene-d10 % recovery**	%	TM218		90.8	77.7	89.4	86.8	93.6	89.7
Phenanthrene-d10 % recovery**	%	TM218		101	84.6	87.4	87.5	94	97.4
Chrysene-d12 % recovery**	%	TM218		101	92.7	89.1	91.1	93.8	100
Perylene-d12 % recovery**	%	TM218		95.8	93.5	91.7	94.4	87.5	94.3
Naphthalene	<0.009 mg/kg	TM218		0.303 M	<0.09 M	0.131 M	0.0492 M	0.909 M	0.224 M
Acenaphthylene	<0.012 mg/kg	TM218		0.212 M	<0.12 M	0.0289 M	0.0145 M	0.218 M	0.0659 M
Acenaphthene	<0.008 mg/kg	TM218		0.0515 M	<0.08 M	0.0221 M	<0.008 M	0.0441 M	0.00959 M
Fluorene	<0.01 mg/kg	TM218		0.16 M	<0.1 M	0.0358 M	<0.01 M	0.157 M	0.0343 M
Phenanthrene	<0.015 mg/kg	TM218		1.41 M	0.276 M	0.388 M	0.13 M	1.92 M	0.517 M
Anthracene	<0.016 mg/kg	TM218		0.4 M	<0.16 M	0.104 M	0.0347 M	0.472 M	0.215 M
Fluoranthene	<0.017 mg/kg	TM218		3.04 M	0.391 M	0.785 M	0.288 M	3.24 M	1.07 M
Pyrene	<0.015 mg/kg	TM218		2.61 M	0.449 M	0.707 M	0.271 M	2.67 M	0.882 M
Benz(a)anthracene	<0.014 mg/kg	TM218		1.71 M	0.218 M	0.646 M	0.245 M	1.92 M	0.646 M
Chrysene	<0.01 mg/kg	TM218		1.54 M	0.261 M	0.647 M	0.261 M	1.72 M	0.632 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		2.04 M	0.378 M	1.2 M	0.505 M	2.94 M	0.762 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		0.898 M	<0.14 M	0.465 M	0.167 M	0.959 M	0.292 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		1.85 M	0.261 M	0.906 M	0.364 M	1.8 M	0.656 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		1.15 M	<0.18 M	0.589 M	0.24 M	1.3 M	0.447 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		0.349 M	<0.23 M	0.164 M	0.0673 M	0.361 M	0.126 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		1.34 M	<0.24 M	0.684 M	0.278 M	1.37 M	0.503 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		19.1	2.23	7.5	2.92	22	7.08

Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-C4-V	4G-C5-V				
			Depth (m)	2.10 - 2.10	1.90 - 1.90				
			Sample Type	Soil/Solid (S)	Soil/Solid (S)				
			Date Sampled	05/11/2018	05/11/2018				
			Sample Time	00:00	00:00				
			Date Received	06/11/2018	06/11/2018				
			SDG Ref	181106-25	181106-25				
			Lab Sample No.(s)	18673574	18673593				
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		99.3	98.7				
Acenaphthene-d10 % recovery**	%	TM218		97.6	97.3				
Phenanthrene-d10 % recovery**	%	TM218		94.6	95.8				
Chrysene-d12 % recovery**	%	TM218		100	98				
Perylene-d12 % recovery**	%	TM218		89	87				
Naphthalene	<0.009 mg/kg	TM218		<0.009 M	<0.009 M				
Acenaphthylene	<0.012 mg/kg	TM218		<0.012 M	<0.012 M				
Acenaphthene	<0.008 mg/kg	TM218		<0.008 M	<0.008 M				
Fluorene	<0.01 mg/kg	TM218		<0.01 M	<0.01 M				
Phenanthrene	<0.015 mg/kg	TM218		<0.015 M	<0.015 M				
Anthracene	<0.016 mg/kg	TM218		<0.016 M	<0.016 M				
Fluoranthene	<0.017 mg/kg	TM218		<0.017 M	<0.017 M				
Pyrene	<0.015 mg/kg	TM218		<0.015 M	<0.015 M				
Benz(a)anthracene	<0.014 mg/kg	TM218		<0.014 M	<0.014 M				
Chrysene	<0.01 mg/kg	TM218		<0.01 M	<0.01 M				
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		<0.015 M	<0.015 M				
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		<0.014 M	<0.014 M				
Benzo(a)pyrene	<0.015 mg/kg	TM218		<0.015 M	<0.015 M				
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		<0.018 M	<0.018 M				
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		<0.023 M	<0.023 M				
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		<0.024 M	<0.024 M				
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		<0.118	<0.118				

Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-A6	4G-A6	4G-A6-V	4G-B3	4G-B4	4G-B4
			Depth (m)	0.50 - 0.50	0.70 - 0.70	2.80 - 2.80	0.50 - 0.50	0.30 - 0.30	0.60 - 0.60
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
			SDG Ref	181106-25	181106-25	181106-25	181106-25	181106-25	181106-25
			Lab Sample No.(s)	18673542	18673546	18673558	18673562	18673517	18673521
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		88	126	78.2	75	92	85.6
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089		<0.2 M	<0.2 M	<0.2 M	<0.2 M	<0.2 M	<0.2 M
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C6-C8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C8-C10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C10-C12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C12-C16	<0.1 mg/kg	TM173		2.03	1.5	0.546	<0.1	2.89	1.18
Aliphatics >C16-C21	<0.1 mg/kg	TM173		8.87	3.86	<0.1	6.48	11.6	6.52
Aliphatics >C21-C35	<0.1 mg/kg	TM173		53.5	21.9	42.8	39.3	79.1	23.3
Aliphatics >C35-C44	<0.1 mg/kg	TM173		25.2	15.1	<0.1	7.93	24.9	8.51
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		89.6	42.3	43.3	53.7	118	39.5
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		1.41	<0.1	2.52	7.26	1.74	<0.1
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		12.4	5.95	8	72.8	10.1	1.17
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		98	57	159	3310	49.4	19.4
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		41	20	32.5	74.4	24.8	15.8
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		15	6.7	11.9	24.6	9.64	6.88
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		153	82.9	202	3470	86.1	36.3
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		242	125	245	3520	205	75.8

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-B5	4G-B5	4G-B6	4G-B6	4G-B5-V	4G-B6-V
			Depth (m)	0.50 - 0.50	1.00 - 1.00	0.50 - 0.50	0.90 - 0.90	2.10 - 2.10	1.80 - 1.80
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
			SDG Ref	181106-25	181106-25	181106-25	181106-25	181106-25	181106-25
			Lab Sample No.(s)	18673497	18673509	18673527	18673532	18673513	18673538
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		65	92	84.5	80.9	99.8	98
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089		<0.2 #	<0.2 M	<0.2 M	<0.2 M	<0.2 M	<0.2 M
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C6-C8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C8-C10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C10-C12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C12-C16	<0.1 mg/kg	TM173		1.67	1.61	15	2.03	<0.1	<0.1
Aliphatics >C16-C21	<0.1 mg/kg	TM173		4.36	7.42	13.4	9.5	<0.1	<0.1
Aliphatics >C21-C35	<0.1 mg/kg	TM173		11.9	51.5	121	74.1	<0.1	2.07
Aliphatics >C35-C44	<0.1 mg/kg	TM173		1.46	8.9	91.6	47.5	<0.1	<0.1
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		19.4	69.4	241	133	<0.1	2.07
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		1.18	0.435	5.94	2.16	<0.1	<0.1
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		5.16	13.2	13.9	10.7	0.34	<0.1
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		18.6	108	229	108	3.05	5.95
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		6.72	35.5	228	74.8	0.95	0.607
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		2.43	12.6	90.1	32.3	<0.1	<0.1
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		31.6	157	476	196	4.34	6.55
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		51.1	226	717	329	4.34	8.62

Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-C3	4G-C3	4G-C4	4G-C4	4G-C5	4G-C5
			Depth (m)	0.50 - 0.50	1.00 - 1.00	0.30 - 0.30	0.80 - 0.80	0.70 - 0.70	1.20 - 1.20
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
			SDG Ref	181106-25	181106-25	181106-25	181106-25	181106-25	181106-25
			Lab Sample No.(s)	18673492	18673554	18673566	18673570	18673578	18673584
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		73.6	94.2	38.4	88	18.4	83.9
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089		<0.2 M	<0.2 M	<0.2 #	<0.2 M	0.576 #	<0.2 M
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	0.0357	<0.02
Aliphatics >C6-C8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	0.194	<0.02
Aliphatics >C8-C10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	0.115	<0.02
Aliphatics >C10-C12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	0.0656	<0.02
Aliphatics >C12-C16	<0.1 mg/kg	TM173		2.58	1.93	0.267	0.918	5.99	1.21
Aliphatics >C16-C21	<0.1 mg/kg	TM173		18.4	17.6	3.07	8.81	27.1	7.45
Aliphatics >C21-C35	<0.1 mg/kg	TM173		198	399	18.7	14.9	151	21.3
Aliphatics >C35-C44	<0.1 mg/kg	TM173		37.4	46.3	3.25	3.77	43.5	2.38
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		256	465	25.2	28.4	227	32.3
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	0.0449	<0.02
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	0.0759	<0.02
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	0.0437	<0.02
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		4.04	1.7	1.11	0.302	8.94	2.07
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		21.4	10.9	6.46	2.02	35.4	10.2
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		133	152	41.3	19.5	135	32.8
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		63	40.7	14.2	14.3	40.7	9.99
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		25.4	15.7	5.18	6.23	13.7	3.64
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		222	205	63.1	36.1	220	55.1
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		478	670	88.4	64.5	448	87.4

Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-C4-V	4G-C5-V				
			Depth (m)	2.10 - 2.10	1.90 - 1.90				
			Sample Type	Soil/Solid (S)	Soil/Solid (S)				
			Date Sampled	05/11/2018	05/11/2018				
			Sample Time	00:00	00:00				
			Date Received	06/11/2018	06/11/2018				
			SDG Ref	181106-25	181106-25				
			Lab Sample No.(s)	18673574	18673593				
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		90	103				
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089		<0.2 M	<0.2 M				
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.02	<0.02				
Aliphatics >C6-C8	<0.01 mg/kg	TM089		<0.02	<0.02				
Aliphatics >C8-C10	<0.01 mg/kg	TM089		<0.02	<0.02				
Aliphatics >C10-C12	<0.01 mg/kg	TM089		<0.02	<0.02				
Aliphatics >C12-C16	<0.1 mg/kg	TM173		0.443	<0.1				
Aliphatics >C16-C21	<0.1 mg/kg	TM173		<0.1	<0.1				
Aliphatics >C21-C35	<0.1 mg/kg	TM173		1.22	<0.1				
Aliphatics >C35-C44	<0.1 mg/kg	TM173		<0.1	<0.1				
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		1.67	<0.1				
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.02	<0.02				
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.02	<0.02				
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		<0.02	<0.02				
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		<0.02	<0.02				
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		<0.1	<0.1				
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		0.212	<0.1				
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		7.47	3.2				
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		1.11	<0.1				
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		<0.1	<0.1				
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		8.8	3.2				
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		10.5	3.2				

Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-A6	4G-A6	4G-A6-V	4G-B3	4G-B4	4G-B4
			Depth (m)	0.50 - 0.50	0.70 - 0.70	2.80 - 2.80	0.50 - 0.50	0.30 - 0.30	0.60 - 0.60
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
			SDG Ref	181106-25	181106-25	181106-25	181106-25	181106-25	181106-25
			Lab Sample No.(s)	18673542	18673546	18673558	18673562	18673517	18673521
			AGS Reference						
Dibromofluoromethane**	%	TM116		112	108	112	105	108	109
Toluene-d8**	%	TM116		98.7	99.8	93.6	113	101	97.8
4-Bromofluorobenzene**	%	TM116		91.2	108	74.4	94.6	97.5	85.2
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Benzene	<0.009 mg/kg	TM116		<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M
Toluene	<0.007 mg/kg	TM116		<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M
Ethylbenzene	<0.004 mg/kg	TM116		<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M
p/m-Xylene	<0.01 mg/kg	TM116		<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
o-Xylene	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Naphthalene	<0.013 mg/kg	TM116		<0.13 M	<0.13 M	<0.13 M	<0.13 M	<0.13 M	<0.13 M
Sum of BTEX	<0.04 mg/kg	TM116		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-B5	4G-B5	4G-B6	4G-B6	4G-B5-V	4G-B6-V
			Depth (m)	0.50 - 0.50	1.00 - 1.00	0.50 - 0.50	0.90 - 0.90	2.10 - 2.10	1.80 - 1.80
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
			SDG Ref	181106-25	181106-25	181106-25	181106-25	181106-25	181106-25
			Lab Sample No.(s)	18673497	18673509	18673527	18673532	18673513	18673538
			AGS Reference						
Dibromofluoromethane**	%	TM116		105	107	104	104	110	111
Toluene-d8**	%	TM116		96.9	115	108	101	99	98.6
4-Bromofluorobenzene**	%	TM116		80.1	100	91.9	93.7	91.9	96.7
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Benzene	<0.009 mg/kg	TM116		<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M
Toluene	<0.007 mg/kg	TM116		<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M
Ethylbenzene	<0.004 mg/kg	TM116		<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M
p/m-Xylene	<0.01 mg/kg	TM116		<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
o-Xylene	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Naphthalene	<0.013 mg/kg	TM116		<0.13 M	<0.13 M	<0.13 M	0.534 M	<0.13 M	<0.13 M
Sum of BTEX	<0.04 mg/kg	TM116		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-C3	4G-C3	4G-C4	4G-C4	4G-C5	4G-C5
			Depth (m)	0.50 - 0.50	1.00 - 1.00	0.30 - 0.30	0.80 - 0.80	0.70 - 0.70	1.20 - 1.20
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
			SDG Ref	181106-25	181106-25	181106-25	181106-25	181106-25	181106-25
			Lab Sample No.(s)	18673492	18673554	18673566	18673570	18673578	18673584
			AGS Reference						
Dibromofluoromethane**	%	TM116		109	108	97.1	108	84.2	103
Toluene-d8**	%	TM116		97	96.8	93.6	98.5	77.4	94.5
4-Bromofluorobenzene**	%	TM116		83.1	86.7	70	109	64.7	80
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Benzene	<0.009 mg/kg	TM116		<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M
Toluene	<0.007 mg/kg	TM116		<0.07 M	<0.07 M	<0.07 M	<0.07 M	0.108 M	<0.07 M
Ethylbenzene	<0.004 mg/kg	TM116		<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M
p/m-Xylene	<0.01 mg/kg	TM116		<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
o-Xylene	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Naphthalene	<0.013 mg/kg	TM116		<0.13 M	<0.13 M	<0.13 M	<0.13 M	0.364 M	<0.13 M
Sum of BTEX	<0.04 mg/kg	TM116		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-C4-V	4G-C5-V				
			Depth (m)	2.10 - 2.10	1.90 - 1.90				
			Sample Type	Soil/Solid (S)	Soil/Solid (S)				
			Date Sampled	05/11/2018	05/11/2018				
			Sample Time	00:00	00:00				
			Date Received	06/11/2018	06/11/2018				
			SDG Ref	181106-25	181106-25				
			Lab Sample No.(s)	18673574	18673593				
			AGS Reference						
Dibromofluoromethane**	%	TM116		108	133				
Toluene-d8**	%	TM116		101	91.2				
4-Bromofluorobenzene**	%	TM116		99.8	103				
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1 M	<0.1 M				
Benzene	<0.009 mg/kg	TM116		<0.09 M	<0.09 M				
Toluene	<0.007 mg/kg	TM116		<0.07 M	<0.07 M				
Ethylbenzene	<0.004 mg/kg	TM116		<0.04 M	<0.04 M				
p/m-Xylene	<0.01 mg/kg	TM116		<0.1 #	<0.1 #				
o-Xylene	<0.01 mg/kg	TM116		<0.1 M	<0.1 M				
Naphthalene	<0.013 mg/kg	TM116		<0.13 M	<0.13 M				
Sum of BTEX	<0.04 mg/kg	TM116		<0.4	<0.4				

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

Asbestos Identification - Solid Samples

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-A6 0.70 - 0.70 SOLID 05/11/2018 00:00:00 06/11/2018 14:50:01 181106-25 18673546 TM048	09/11/2018	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-B3 0.50 - 0.50 SOLID 05/11/2018 00:00:00 06/11/2018 16:19:11 181106-25 18673562 TM048	14/11/2018	Lucy Caroe	Soil containing ACM debris	Not Detected (#)	Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-B4 0.30 - 0.30 SOLID 05/11/2018 00:00:00 07/11/2018 08:02:05 181106-25 18673517 TM048	14/11/2018	James Richards	Fibre bundles in soil	Not Detected (#)	Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-B5 1.00 - 1.00 SOLID 05/11/2018 00:00:00 06/11/2018 17:14:40 181106-25 18673509 TM048	14/11/2018	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-B6 0.90 - 0.90 SOLID 05/11/2018 00:00:00 06/11/2018 13:49:41 181106-25 18673532 TM048	09/11/2018	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-C3 0.50 - 0.50 SOLID 05/11/2018 00:00:00 06/11/2018 16:20:52 181106-25 18673492 TM048	14/11/2018	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

Validated

CERTIFICATE OF ANALYSIS

SDG: 181106-25 **Client Reference:** **Report Number:** 481875
Location: Llanwern **Order Number:** LLA508 **Superseded Report:**

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-C4 0.80 - 0.80 SOLID 05/11/2018 00:00:00 06/11/2018 15:38:49 181106-25 18673570 TM048	09/11/2018	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-C5 1.20 - 1.20 SOLID 05/11/2018 00:00:00 06/11/2018 14:42:56 181106-25 18673584 TM048	09/11/2018	Barbara Urbanek-Walsh	Loose fibres in soil.	Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

Asbestos Quantification - Full

		Additional Asbestos Components (Using TM048)	Analysts Comments	Asbestos Quantification - Gravimetric - %	Asbestos Quantification - PCOM Evaluation - %	Asbestos Quantification - Total - %
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-B3 0.50 - 0.50 SOLID 05/11/2018 00:00:00 06/11/2018 16:19:57 181106-25 18673562 TM304	None (#)	N/A	<0.001 (#)	<0.001 (#)	<0.001 (#)
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-B4 0.30 - 0.30 SOLID 05/11/2018 00:00:00 07/11/2018 08:03:05 181106-25 18673517 TM304	None (#)	N/A	0.0047 (#)	<0.001 (#)	0.0047 (#)
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-C5 1.20 - 1.20 SOLID 05/11/2018 00:00:00 06/11/2018 14:45:43 181106-25 18673584 TM304	None (#)	N/C	<0.001 (#)	<0.001 (#)	<0.001 (#)

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	8.34
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.3
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673492
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-C3
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00141	<0.0005	0.0141	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00196	<0.001	0.0196	<0.01	-	-	-
Copper	0.00519	<0.0003	0.0519	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000593	<0.0004	0.00593	<0.004	-	-	-
Selenium	0.00134	<0.001	0.0134	<0.01	-	-	-
Vanadium	0.0728	<0.001	0.728	<0.01	-	-	-
Zinc	0.0147	<0.001	0.147	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.000372	<0.00001	0.00372	<0.0001	-	-	-
Acenaphthene by GCMS	0.0000837	<0.000005	0.000837	<0.00005	-	-	-
Acenaphthylene by GCMS	0.000035	<0.000005	0.00035	<0.00005	-	-	-
Fluoranthene by GCMS	0.000216	<0.000005	0.00216	<0.00005	-	-	-
Anthracene by GCMS	0.0000482	<0.000005	0.000482	<0.00005	-	-	-
Phenanthrene by GCMS	0.000294	<0.000005	0.00294	<0.00005	-	-	-
Fluorene by GCMS	0.00015	<0.000005	0.0015	<0.00005	-	-	-
Chrysene by GCMS	0.0000172	<0.000005	0.000172	<0.00005	-	-	-
Pyrene by GCMS	0.0002	<0.000005	0.002	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.0000106	<0.000005	0.000106	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.00000998	<0.000005	0.0000998	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000527	<0.000002	0.0000527	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.00144	<0.000082	0.0144	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	10.83
Conductivity (µS/cm)	372.00
Temperature (°C)	17.40
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	8.34
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.3
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673492
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-C3
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Concⁿ in 10:1 eluate (mg/l)		**A_2** 10:1 concⁿ leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	10.83
Conductivity (µS/cm)	372.00
Temperature (°C)	17.40
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	8.34
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.3
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673497
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-B5
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Concⁿ in 10:1 eluate (mg/l)		**A_2** 10:1 concⁿ leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	0.217	<0.2	2.17	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.0104	<0.0005	0.104	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.000409	<0.0003	0.00409	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00156	<0.001	0.0156	<0.01	-	-	-
Vanadium	0.0353	<0.001	0.353	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.000739	<0.0001	0.00739	<0.001	-	-	-
Acenaphthene by GCMS	0.0000578	<0.00005	0.000578	<0.0005	-	-	-
Acenaphthylene by GCMS	0.000297	<0.00005	0.00297	<0.0005	-	-	-
Fluoranthene by GCMS	0.00384	<0.00005	0.0384	<0.0005	-	-	-
Anthracene by GCMS	0.000776	<0.00005	0.00776	<0.0005	-	-	-
Phenanthrene by GCMS	0.00289	<0.00005	0.0289	<0.0005	-	-	-
Fluorene by GCMS	0.000245	<0.00005	0.00245	<0.0005	-	-	-
Chrysene by GCMS	0.00255	<0.00005	0.0255	<0.0005	-	-	-
Pyrene by GCMS	0.00293	<0.00005	0.0293	<0.0005	-	-	-
Benz(a)anthracene by GCMS	0.00194	<0.00005	0.0194	<0.0005	-	-	-
Benzo(b)fluoranthene by GCMS	0.00284	<0.00005	0.0284	<0.0005	-	-	-
Benzo(k)fluoranthene by GCMS	0.00195	<0.00005	0.0195	<0.0005	-	-	-
Benzo(a)pyrene by GCMS	0.00205	<0.00002	0.0205	<0.0002	-	-	-
Dibenzo(ah)anthracene by GCMS	0.000423	<0.00005	0.00423	<0.0005	-	-	-
Benzo(ghi)perylene by GCMS	0.00152	<0.00005	0.0152	<0.0005	-	-	-
Indeno(123cd)pyrene by GCMS	0.00133	<0.00005	0.0133	<0.0005	-	-	-
PAH 16 EPA Total by GCMS	0.0264	<0.00082	0.264	<0.0082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	8.43
Conductivity (µS/cm)	99.80
Temperature (°C)	18.80
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	8.34
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.3
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673497
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-B5
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.1	<0.1	<1	<1	-	-	-
Aliphatics >C16-C21	<0.1	<0.1	<1	<1	-	-	-
Aliphatics >C21-C35	<0.1	<0.1	<1	<1	-	-	-
Total Aliphatics >C12-C35	<0.1	<0.1	<1	<1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.1	<0.1	<1	<1	-	-	-
Aromatics >EC16-EC21	<0.1	<0.1	<1	<1	-	-	-
Aromatics >EC21-EC35	<0.1	<0.1	<1	<1	-	-	-
Total Aromatics >EC12-EC35	<0.1	<0.1	<1	<1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.1	<0.1	<1	<1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	8.43
Conductivity (µS/cm)	99.80
Temperature (°C)	18.80
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

20/11/2018 16:34:57

16:34:34 20/11/2018

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.64
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.9
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673509
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-B5
Depth (m)	1.00 - 1.00

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00285	<0.001	0.0285	<0.01	-	-	-
Copper	0.00169	<0.0003	0.0169	<0.003	-	-	-
Lead	0.0017	<0.0002	0.017	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.00583	<0.001	0.0583	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000997	<0.00001	0.000997	<0.0001	-	-	-
Acenaphthene by GCMS	0.0000586	<0.000005	0.000586	<0.00005	-	-	-
Acenaphthylene by GCMS	0.00000796	<0.000005	0.0000796	<0.00005	-	-	-
Fluoranthene by GCMS	0.000756	<0.000005	0.00756	<0.00005	-	-	-
Anthracene by GCMS	0.0000534	<0.000005	0.000534	<0.00005	-	-	-
Phenanthrene by GCMS	0.000697	<0.000005	0.00697	<0.00005	-	-	-
Fluorene by GCMS	0.0000187	<0.000005	0.000187	<0.00005	-	-	-
Chrysene by GCMS	0.0000577	<0.000005	0.000577	<0.00005	-	-	-
Pyrene by GCMS	0.000626	<0.000005	0.00626	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.0000267	<0.000005	0.000267	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000238	<0.000005	0.000238	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.00001	<0.000005	0.0001	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000824	<0.000002	0.0000824	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.00244	<0.000082	0.0244	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	11.93
Conductivity (µS/cm)	440.00
Temperature (°C)	18.60
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.64
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.9
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673509
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-B5
Depth (m)	1.00 - 1.00

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	11.93
Conductivity (µS/cm)	440.00
Temperature (°C)	18.60
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.099	**Natural Moisture Content (%)**	9.41
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	91.4
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673517
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-B4
Depth (m)	0.30 - 0.30

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00153	<0.0005	0.0153	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.0011	<0.001	0.011	<0.01	-	-	-
Copper	0.00397	<0.0003	0.0397	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000467	<0.0004	0.00467	<0.004	-	-	-
Selenium	0.00128	<0.001	0.0128	<0.01	-	-	-
Vanadium	0.0825	<0.001	0.825	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.000106	<0.00001	0.00106	<0.0001	-	-	-
Acenaphthene by GCMS	0.0000492	<0.000005	0.000492	<0.00005	-	-	-
Acenaphthylene by GCMS	0.0000151	<0.000005	0.000151	<0.00005	-	-	-
Fluoranthene by GCMS	0.000162	<0.000005	0.00162	<0.00005	-	-	-
Anthracene by GCMS	0.000023	<0.000005	0.00023	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000698	<0.000005	0.000698	<0.00005	-	-	-
Fluorene by GCMS	0.000021	<0.000005	0.00021	<0.00005	-	-	-
Chrysene by GCMS	0.0000253	<0.000005	0.000253	<0.00005	-	-	-
Pyrene by GCMS	0.000181	<0.000005	0.00181	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.0000153	<0.000005	0.000153	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000126	<0.000005	0.000126	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.00000692	<0.000005	0.0000692	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000726	<0.000002	0.0000726	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000694	<0.000082	0.00694	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	10.73
Conductivity (µS/cm)	287.00
Temperature (°C)	18.20
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.099	**Natural Moisture Content (%)**	9.41
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	91.4
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673517
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-B4
Depth (m)	0.30 - 0.30

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	10.73
Conductivity (µS/cm)	287.00
Temperature (°C)	18.20
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.41
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	93.1
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673521
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-B4
Depth (m)	0.60 - 0.60

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.0135	<0.0005	0.135	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00148	<0.001	0.0148	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00171	<0.001	0.0171	<0.01	-	-	-
Vanadium	0.0572	<0.001	0.572	<0.01	-	-	-
Zinc	0.00104	<0.001	0.0104	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000135	<0.000005	0.000135	<0.00005	-	-	-
Anthracene by GCMS	0.0000128	<0.000005	0.000128	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000171	<0.000005	0.000171	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	0.00000612	<0.000005	0.0000612	<0.00005	-	-	-
Pyrene by GCMS	0.0000106	<0.000005	0.000106	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000169	<0.000005	0.000169	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.00000669	<0.000005	0.0000669	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000799	<0.000002	0.0000799	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.0000916	<0.000082	0.000916	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	9.44
Conductivity (µS/cm)	106.00
Temperature (°C)	18.40
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.41
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	93.1
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673521
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-B4
Depth (m)	0.60 - 0.60

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	9.44
Conductivity (µS/cm)	106.00
Temperature (°C)	18.40
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.100	**Natural Moisture Content (%)**	10.7
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	90.3
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673527
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-B6
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Concⁿ in 10:1 eluate (mg/l)		**A_2** 10:1 concⁿ leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00293	<0.0005	0.0293	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.0015	<0.001	0.015	<0.01	-	-	-
Copper	0.00353	<0.0003	0.0353	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.0021	<0.001	0.021	<0.01	-	-	-
Vanadium	0.0738	<0.001	0.738	<0.01	-	-	-
Zinc	0.00319	<0.001	0.0319	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000448	<0.00001	0.000448	<0.0001	-	-	-
Acenaphthene by GCMS	0.000013	<0.000005	0.00013	<0.00005	-	-	-
Acenaphthylene by GCMS	0.0000181	<0.000005	0.000181	<0.00005	-	-	-
Fluoranthene by GCMS	0.000115	<0.000005	0.00115	<0.00005	-	-	-
Anthracene by GCMS	0.000029	<0.000005	0.00029	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000688	<0.000005	0.000688	<0.00005	-	-	-
Fluorene by GCMS	0.0000194	<0.000005	0.000194	<0.00005	-	-	-
Chrysene by GCMS	0.0000384	<0.000005	0.000384	<0.00005	-	-	-
Pyrene by GCMS	0.0001	<0.000005	0.001	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.0000268	<0.000005	0.000268	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000466	<0.000005	0.000466	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.0000233	<0.000005	0.000233	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.0000274	<0.000002	0.000274	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	0.0000165	<0.000005	0.000165	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.000017	<0.000005	0.00017	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000604	<0.000082	0.00604	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	08-Nov-2018
pH (pH Units)	10.23
Conductivity (µS/cm)	197.00
Temperature (°C)	17.50
Volume Leachant (Litres)	0.890

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.100	**Natural Moisture Content (%)**	10.7
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	90.3
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673527
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-B6
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	08-Nov-2018
pH (pH Units)	10.23
Conductivity (µS/cm)	197.00
Temperature (°C)	17.50
Volume Leachant (Litres)	0.890

Mcerts Certification does not apply to leachates

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Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.099	**Natural Moisture Content (%)**	10.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	90.6
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673532
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-B6
Depth (m)	0.90 - 0.90

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	0.000023	<0.00001	0.00023	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00603	<0.001	0.0603	<0.01	-	-	-
Copper	0.00171	<0.0003	0.0171	<0.003	-	-	-
Lead	0.000954	<0.0002	0.00954	<0.002	-	-	-
Manganese	0.0259	<0.003	0.259	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.00543	<0.001	0.0543	<0.01	-	-	-
Zinc	0.0133	<0.001	0.133	<0.01	-	-	-
Iron (Dis.Filt) mg/l	0.669	<0.019	6.69	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000282	<0.00001	0.000282	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000262	<0.000005	0.000262	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000145	<0.000005	0.000145	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.000031	<0.000005	0.00031	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.0000999	<0.000082	0.000999	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	11.71
Conductivity (µS/cm)	1,280.00
Temperature (°C)	18.20
Volume Leachant (Litres)	0.891

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.099	**Natural Moisture Content (%)**	10.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	90.6
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673532
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-B6
Depth (m)	0.90 - 0.90

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	11.71
Conductivity (µS/cm)	1,280.00
Temperature (°C)	18.20
Volume Leachant (Litres)	0.891

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.105	**Natural Moisture Content (%)**	16.3
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	86
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673542
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-A6
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	0.61	<0.2	6.1	<2	-	-	-
Mercury Dissolved (CVAF)	0.0000117	<0.00001	0.000117	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00199	<0.0005	0.0199	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00297	<0.001	0.0297	<0.01	-	-	-
Copper	0.00988	<0.0003	0.0988	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00181	<0.0004	0.0181	<0.004	-	-	-
Selenium	0.00114	<0.001	0.0114	<0.01	-	-	-
Vanadium	0.0298	<0.001	0.298	<0.01	-	-	-
Zinc	0.00524	<0.001	0.0524	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000539	<0.00001	0.000539	<0.0001	-	-	-
Acenaphthene by GCMS	0.0000514	<0.000005	0.000514	<0.00005	-	-	-
Acenaphthylene by GCMS	0.0000109	<0.000005	0.000109	<0.00005	-	-	-
Fluoranthene by GCMS	0.000249	<0.000005	0.00249	<0.00005	-	-	-
Anthracene by GCMS	0.0000252	<0.000005	0.000252	<0.00005	-	-	-
Phenanthrene by GCMS	0.000167	<0.000005	0.00167	<0.00005	-	-	-
Fluorene by GCMS	0.0000272	<0.000005	0.000272	<0.00005	-	-	-
Chrysene by GCMS	0.0000254	<0.000005	0.000254	<0.00005	-	-	-
Pyrene by GCMS	0.000206	<0.000005	0.00206	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.0000161	<0.000005	0.000161	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.00000947	<0.000005	0.0000947	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000472	<0.000002	0.0000472	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000846	<0.000082	0.00846	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	11.58
Conductivity (µS/cm)	715.00
Temperature (°C)	17.70
Volume Leachant (Litres)	0.885

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.105	**Natural Moisture Content (%)**	16.3
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	86
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673542
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-A6
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Concⁿ in 10:1 eluate (mg/l)		**A_2** 10:1 concⁿ leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	11.58
Conductivity (µS/cm)	715.00
Temperature (°C)	17.70
Volume Leachant (Litres)	0.885

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.105	**Natural Moisture Content (%)**	16.3
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	86
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673546
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-A6
Depth (m)	0.70 - 0.70

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	1.74	<0.2	17.4	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00649	<0.0005	0.0649	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00162	<0.001	0.0162	<0.01	-	-	-
Copper	0.0183	<0.0003	0.183	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	0.00395	<0.003	0.0395	<0.03	-	-	-
Nickel	0.00272	<0.0004	0.0272	<0.004	-	-	-
Selenium	0.00616	<0.001	0.0616	<0.01	-	-	-
Vanadium	0.104	<0.001	1.04	<0.01	-	-	-
Zinc	0.00266	<0.001	0.0266	<0.01	-	-	-
Iron (Dis.Filt) mg/l	0.56	<0.019	5.6	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000333	<0.00001	0.000333	<0.0001	-	-	-
Acenaphthene by GCMS	0.0000232	<0.000005	0.000232	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.000115	<0.000005	0.00115	<0.00005	-	-	-
Anthracene by GCMS	0.0000152	<0.000005	0.000152	<0.00005	-	-	-
Phenanthrene by GCMS	0.000119	<0.000005	0.00119	<0.00005	-	-	-
Fluorene by GCMS	0.0000121	<0.000005	0.000121	<0.00005	-	-	-
Chrysene by GCMS	0.00000586	<0.000005	0.0000586	<0.00005	-	-	-
Pyrene by GCMS	0.0000969	<0.000005	0.000969	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.00042	<0.000082	0.0042	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Nov-2018
pH (pH Units)	11.44
Conductivity (µS/cm)	542.00
Temperature (°C)	18.20
Volume Leachant (Litres)	0.885

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.105	**Natural Moisture Content (%)**	16.3
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	86
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673546
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-A6
Depth (m)	0.70 - 0.70

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Nov-2018
pH (pH Units)	11.44
Conductivity (µS/cm)	542.00
Temperature (°C)	18.20
Volume Leachant (Litres)	0.885

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.099	**Natural Moisture Content (%)**	10.5
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	90.5
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673554
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-C3
Depth (m)	1.00 - 1.00

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00149	<0.0005	0.0149	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00238	<0.001	0.0238	<0.01	-	-	-
Copper	0.00507	<0.0003	0.0507	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00049	<0.0004	0.0049	<0.004	-	-	-
Selenium	0.00128	<0.001	0.0128	<0.01	-	-	-
Vanadium	0.0735	<0.001	0.735	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.000111	<0.00001	0.00111	<0.0001	-	-	-
Acenaphthene by GCMS	0.0000714	<0.000005	0.000714	<0.00005	-	-	-
Acenaphthylene by GCMS	0.0000313	<0.000005	0.000313	<0.00005	-	-	-
Fluoranthene by GCMS	0.000153	<0.000005	0.00153	<0.00005	-	-	-
Anthracene by GCMS	0.0000362	<0.000005	0.000362	<0.00005	-	-	-
Phenanthrene by GCMS	0.000163	<0.000005	0.00163	<0.00005	-	-	-
Fluorene by GCMS	0.0000559	<0.000005	0.000559	<0.00005	-	-	-
Chrysene by GCMS	0.0000138	<0.000005	0.000138	<0.00005	-	-	-
Pyrene by GCMS	0.000147	<0.000005	0.00147	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.00000722	<0.000005	0.0000722	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000107	<0.000005	0.000107	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000717	<0.000002	0.0000717	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000807	<0.000082	0.00807	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	10.79
Conductivity (µS/cm)	331.00
Temperature (°C)	18.10
Volume Leachant (Litres)	0.891

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.099	**Natural Moisture Content (%)**	10.5
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	90.5
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673554
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-C3
Depth (m)	1.00 - 1.00

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	10.79
Conductivity (µS/cm)	331.00
Temperature (°C)	18.10
Volume Leachant (Litres)	0.891

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	8.34
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.3
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673562
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-B3
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00291	<0.0005	0.0291	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00221	<0.001	0.0221	<0.01	-	-	-
Copper	0.00157	<0.0003	0.0157	<0.003	-	-	-
Lead	0.000463	<0.0002	0.00463	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00131	<0.001	0.0131	<0.01	-	-	-
Vanadium	0.074	<0.001	0.74	<0.01	-	-	-
Zinc	0.00165	<0.001	0.0165	<0.01	-	-	-
Iron (Dis.Filt) mg/l	0.0506	<0.019	0.506	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000279	<0.00001	0.000279	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000369	<0.000005	0.000369	<0.00005	-	-	-
Anthracene by GCMS	0.00000661	<0.000005	0.0000661	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000236	<0.000005	0.000236	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	0.0000169	<0.000005	0.000169	<0.00005	-	-	-
Pyrene by GCMS	0.0000302	<0.000005	0.000302	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.0000104	<0.000005	0.000104	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000241	<0.000005	0.000241	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.0000122	<0.000005	0.000122	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.0000138	<0.000002	0.000138	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	0.0000115	<0.000005	0.000115	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.0000133	<0.000005	0.000133	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000227	<0.000082	0.00227	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	10.57
Conductivity (µS/cm)	229.00
Temperature (°C)	18.10
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	8.34
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.3
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673562
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-B3
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	10.57
Conductivity (µS/cm)	229.00
Temperature (°C)	18.10
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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Validated

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.107	**Natural Moisture Content (%)**	19
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	84
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673566
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-C4
Depth (m)	0.30 - 0.30

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	0.0000101	<0.00001	0.000101	<0.0001	-	-	-
Total Cyanide (W)	1.29	<0.05	12.9	<0.5	-	-	-
Arsenic	0.00278	<0.0005	0.0278	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00271	<0.001	0.0271	<0.01	-	-	-
Copper	0.0036	<0.0003	0.036	<0.003	-	-	-
Lead	0.000565	<0.0002	0.00565	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00194	<0.001	0.0194	<0.01	-	-	-
Vanadium	0.0486	<0.001	0.486	<0.01	-	-	-
Zinc	0.00759	<0.001	0.0759	<0.01	-	-	-
Iron (Dis.Filt) mg/l	0.544	<0.019	5.44	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000163	<0.00001	0.000163	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	0.00000665	<0.000005	0.0000665	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000949	<0.000005	0.000949	<0.00005	-	-	-
Anthracene by GCMS	0.0000114	<0.000005	0.000114	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000441	<0.000005	0.000441	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	0.0000557	<0.000005	0.000557	<0.00005	-	-	-
Pyrene by GCMS	0.0000774	<0.000005	0.000774	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.0000441	<0.000005	0.000441	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.00009	<0.000005	0.0009	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.0000408	<0.000005	0.000408	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.0000479	<0.000002	0.000479	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	0.00000968	<0.000005	0.0000968	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	0.0000488	<0.000005	0.000488	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.000035	<0.000005	0.00035	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000623	<0.000082	0.00623	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	9.61
Conductivity (µS/cm)	213.00
Temperature (°C)	18.10
Volume Leachant (Litres)	0.883

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.107	**Natural Moisture Content (%)**	19
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	84
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673566
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-C4
Depth (m)	0.30 - 0.30

Eluate Analysis	**C_2** Concⁿ in 10:1 eluate (mg/l)		**A_2** 10:1 concⁿ leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	9.61
Conductivity (µS/cm)	213.00
Temperature (°C)	18.10
Volume Leachant (Litres)	0.883

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.101	**Natural Moisture Content (%)**	12.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	89
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673570
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-C4
Depth (m)	0.80 - 0.80

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00118	<0.0005	0.0118	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00424	<0.001	0.0424	<0.01	-	-	-
Copper	0.00119	<0.0003	0.0119	<0.003	-	-	-
Lead	0.000478	<0.0002	0.00478	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.0509	<0.001	0.509	<0.01	-	-	-
Zinc	0.0156	<0.001	0.156	<0.01	-	-	-
Iron (Dis.Filt) mg/l	0.39	<0.019	3.9	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000104	<0.00001	0.000104	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000118	<0.000005	0.000118	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.00000802	<0.000005	0.0000802	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.0000123	<0.000005	0.000123	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.00000694	<0.000005	0.0000694	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000617	<0.000002	0.0000617	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	<0.000082	<0.000082	<0.00082	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	10.88
Conductivity (µS/cm)	399.00
Temperature (°C)	17.70
Volume Leachant (Litres)	0.889

Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.101	**Natural Moisture Content (%)**	12.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	89
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673570
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-C4
Depth (m)	0.80 - 0.80

Eluate Analysis	**C_2** Concⁿ in 10:1 eluate (mg/l)		**A_2** 10:1 concⁿ leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	10.88
Conductivity (µS/cm)	399.00
Temperature (°C)	17.70
Volume Leachant (Litres)	0.889

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.103	**Natural Moisture Content (%)**	14.9
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	87
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673578
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-C5
Depth (m)	0.70 - 0.70

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	0.0000277	<0.00001	0.000277	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00971	<0.001	0.0971	<0.01	-	-	-
Copper	0.00501	<0.0003	0.0501	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000935	<0.0004	0.00935	<0.004	-	-	-
Selenium	0.00124	<0.001	0.0124	<0.01	-	-	-
Vanadium	0.00659	<0.001	0.0659	<0.01	-	-	-
Zinc	0.00259	<0.001	0.0259	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000339	<0.00001	0.000339	<0.0001	-	-	-
Acenaphthene by GCMS	0.00000616	<0.000005	0.0000616	<0.00005	-	-	-
Acenaphthylene by GCMS	0.00000638	<0.000005	0.0000638	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000239	<0.000005	0.000239	<0.00005	-	-	-
Anthracene by GCMS	0.0000059	<0.000005	0.000059	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000213	<0.000005	0.000213	<0.00005	-	-	-
Fluorene by GCMS	0.00000501	<0.000005	0.0000501	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.0000258	<0.000005	0.000258	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000128	<0.000082	0.00128	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	11.37
Conductivity (µS/cm)	818.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.887

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.103	**Natural Moisture Content (%)**	14.9
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	87
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673578
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-C5
Depth (m)	0.70 - 0.70

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	11.37
Conductivity (µS/cm)	818.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.887

Mcerts Certification does not apply to leachates

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16:34:34 20/11/2018

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.101	**Natural Moisture Content (%)**	12.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	89
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673584
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-C5
Depth (m)	1.20 - 1.20

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	0.277	<0.2	2.77	<2	-	-	-
Mercury Dissolved (CVAF)	0.0000215	<0.00001	0.000215	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.0167	<0.001	0.167	<0.01	-	-	-
Copper	0.00308	<0.0003	0.0308	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000606	<0.0004	0.00606	<0.004	-	-	-
Selenium	0.0013	<0.001	0.013	<0.01	-	-	-
Vanadium	0.00426	<0.001	0.0426	<0.01	-	-	-
Zinc	0.00385	<0.001	0.0385	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000195	<0.00001	0.000195	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000348	<0.000005	0.000348	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000176	<0.000005	0.000176	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.000042	<0.000005	0.00042	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.00000619	<0.000005	0.0000619	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000415	<0.000002	0.0000415	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000124	<0.000082	0.00124	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	11.47
Conductivity (µS/cm)	1,060.00
Temperature (°C)	18.20
Volume Leachant (Litres)	0.889

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.101	**Natural Moisture Content (%)**	12.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	89
Particle Size <4mm	>95%		

Case	
SDG	181106-25
Lab Sample Number(s)	18673584
Sampled Date	05-Nov-2018
Customer Sample Ref.	4G-C5
Depth (m)	1.20 - 1.20

Eluate Analysis	**C_2** Concⁿ in 10:1 eluate (mg/l)		**A_2** 10:1 concⁿ leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	09-Nov-2018
pH (pH Units)	11.47
Conductivity (µS/cm)	1,060.00
Temperature (°C)	18.20
Volume Leachant (Litres)	0.889

Mcerts Certification does not apply to leachates

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Table of Results - Appendix

Method No	Reference	Description
PM001		Preparation of Samples for Metals Analysis
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM024	Method 4500A & B, AWWA/APHA, 20th Ed., 1999	Determination of Exchangeable Ammonium and Ammoniacal Nitrogen as N by titration on solids
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer
TM224	US EPA Method 6010B	Determination of Alkaline Metals by iCap 6500 Duo ICP-OES
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM243		Mixed Anions In Soils By Kone
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM304	HSE Contract research Report no 83/1996	Asbestos Quantification in Soil: Fibres identified by morphology only

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	181106-25	**Client Reference:**		**Report Number:**	481875
Location:	Llanwern	**Order Number:**	LLA508	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	18673542	18673546	18673558	18673562	18673517	18673521	18673497	18673509	18673527	18673532
Customer Sample Ref.	4G-A6	4G-A6	4G-A6-V	4G-B3	4G-B4	4G-B4	4G-B5	4G-B5	4G-B6	4G-B6
AGS Ref.										
Depth	0.50 - 0.50	0.70 - 0.70	2.80 - 2.80	0.50 - 0.50	0.30 - 0.30	0.60 - 0.60	0.50 - 0.50	1.00 - 1.00	0.50 - 0.50	0.90 - 0.90
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Alkali Metals by iCap-OES (Soil)		15-Nov-2018		16-Nov-2018	16-Nov-2018			16-Nov-2018		16-Nov-2018
Ammoniacal Nitrogen	19-Nov-2018	19-Nov-2018		19-Nov-2018	19-Nov-2018	20-Nov-2018	20-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018
Ammonium Soil by Titration	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018
Anions by Kone (soil)		15-Nov-2018		20-Nov-2018	20-Nov-2018			20-Nov-2018		20-Nov-2018
Asbestos ID in Solid Samples		09-Nov-2018		14-Nov-2018	14-Nov-2018			14-Nov-2018		09-Nov-2018
Asbestos Quantification - Full				20-Nov-2018	20-Nov-2018					
CEN 10:1 Leachate (1 Stage)	09-Nov-2018	10-Nov-2018		09-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	08-Nov-2018	09-Nov-2018
CEN Readings	14-Nov-2018	15-Nov-2018		15-Nov-2018	15-Nov-2018	13-Nov-2018	13-Nov-2018	13-Nov-2018	14-Nov-2018	15-Nov-2018
Cyanide Comp/Free/Total/Thiocyanate	20-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	20-Nov-2018	20-Nov-2018
Dissolved Metals by ICP-MS	20-Nov-2018	20-Nov-2018		20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
EPH CWG (Aliphatic) Aqueous GC (W)	16-Nov-2018	16-Nov-2018		16-Nov-2018	16-Nov-2018	15-Nov-2018	15-Nov-2018	14-Nov-2018	16-Nov-2018	16-Nov-2018
EPH CWG (Aliphatic) GC (S)	09-Nov-2018	20-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	08-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018
EPH CWG (Aromatic) Aqueous GC (W)	16-Nov-2018	16-Nov-2018		16-Nov-2018	16-Nov-2018	15-Nov-2018	15-Nov-2018	14-Nov-2018	16-Nov-2018	16-Nov-2018
EPH CWG (Aromatic) GC (S)	09-Nov-2018	20-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	08-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018
GRO by GC-FID (S)	16-Nov-2018	15-Nov-2018	16-Nov-2018	15-Nov-2018	15-Nov-2018	17-Nov-2018	16-Nov-2018	15-Nov-2018	15-Nov-2018	15-Nov-2018
GRO by GC-FID (W)	15-Nov-2018	17-Nov-2018		15-Nov-2018	17-Nov-2018	13-Nov-2018	13-Nov-2018	13-Nov-2018	17-Nov-2018	15-Nov-2018
Mercury Dissolved	19-Nov-2018	20-Nov-2018		19-Nov-2018	19-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	19-Nov-2018	19-Nov-2018
Metals in solid samples by OES	19-Nov-2018	19-Nov-2018	14-Nov-2018	13-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	19-Nov-2018	16-Nov-2018
PAH by GCMS	09-Nov-2018	20-Nov-2018	14-Nov-2018	08-Nov-2018	09-Nov-2018	09-Nov-2018	08-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018
PAH Spec MS - Aqueous (W)	16-Nov-2018	16-Nov-2018		16-Nov-2018	16-Nov-2018	14-Nov-2018	14-Nov-2018	14-Nov-2018	16-Nov-2018	16-Nov-2018
pH	19-Nov-2018	20-Nov-2018	13-Nov-2018	20-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	20-Nov-2018	19-Nov-2018	20-Nov-2018
pH Value	16-Nov-2018	16-Nov-2018		15-Nov-2018	15-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	15-Nov-2018	16-Nov-2018
Phenols by HPLC (S)	16-Nov-2018	16-Nov-2018	14-Nov-2018	14-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018
Sample description	06-Nov-2018	06-Nov-2018	06-Nov-2018	06-Nov-2018	06-Nov-2018	06-Nov-2018	06-Nov-2018	06-Nov-2018	06-Nov-2018	06-Nov-2018
Total Organic Carbon	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
Total Sulphate		14-Nov-2018		14-Nov-2018	14-Nov-2018			14-Nov-2018		14-Nov-2018
Total Sulphur		16-Nov-2018		19-Nov-2018	19-Nov-2018			15-Nov-2018		15-Nov-2018
TPH CWG (W)	16-Nov-2018	17-Nov-2018		16-Nov-2018	17-Nov-2018	15-Nov-2018	15-Nov-2018	14-Nov-2018	17-Nov-2018	16-Nov-2018
TPH CWG GC (S)	16-Nov-2018	20-Nov-2018	16-Nov-2018	15-Nov-2018	15-Nov-2018	17-Nov-2018	16-Nov-2018	15-Nov-2018	15-Nov-2018	15-Nov-2018
VOC MS (S)	16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	15-Nov-2018	15-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018

Lab Sample No(s)	18673513	18673538	18673492	18673554	18673566	18673570	18673578	18673584	18673574	18673593
Customer Sample Ref.	4G-B5-V	4G-B6-V	4G-C3	4G-C3	4G-C4	4G-C4	4G-C5	4G-C5	4G-C4-V	4G-C5-V
AGS Ref.										
Depth	2.10 - 2.10	1.80 - 1.80	0.50 - 0.50	1.00 - 1.00	0.30 - 0.30	0.80 - 0.80	0.70 - 0.70	1.20 - 1.20	2.10 - 2.10	1.90 - 1.90
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Alkali Metals by iCap-OES (Soil)			16-Nov-2018			16-Nov-2018		16-Nov-2018		
Ammoniacal Nitrogen			19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018		
Ammonium Soil by Titration	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018
Anions by Kone (soil)			20-Nov-2018			09-Nov-2018		09-Nov-2018		
Asbestos ID in Solid Samples			14-Nov-2018			09-Nov-2018		09-Nov-2018		
Asbestos Quantification - Full								20-Nov-2018		
CEN 10:1 Leachate (1 Stage)			09-Nov-2018	09-Nov-2018	17-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018		
CEN Readings			14-Nov-2018	15-Nov-2018	15-Nov-2018	14-Nov-2018	13-Nov-2018	15-Nov-2018		
Cyanide Comp/Free/Total/Thiocyanate	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	20-Nov-2018	19-Nov-2018	20-Nov-2018	19-Nov-2018	19-Nov-2018	20-Nov-2018
Dissolved Metals by ICP-MS			20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018		
EPH CWG (Aliphatic) Aqueous GC (W)			16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	15-Nov-2018	16-Nov-2018		
EPH CWG (Aliphatic) GC (S)	08-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018
EPH CWG (Aromatic) Aqueous GC (W)			16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	15-Nov-2018	16-Nov-2018		
EPH CWG (Aromatic) GC (S)	08-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018
GRO by GC-FID (S)	17-Nov-2018	15-Nov-2018	15-Nov-2018	15-Nov-2018	17-Nov-2018	15-Nov-2018	16-Nov-2018	15-Nov-2018	15-Nov-2018	15-Nov-2018
GRO by GC-FID (W)			15-Nov-2018	17-Nov-2018	19-Nov-2018	17-Nov-2018	15-Nov-2018	17-Nov-2018		
Mercury Dissolved			19-Nov-2018	19-Nov-2018	19-Nov-2018	20-Nov-2018	20-Nov-2018	19-Nov-2018		
Metals in solid samples by OES	16-Nov-2018	16-Nov-2018	16-Nov-2018	19-Nov-2018	20-Nov-2018	14-Nov-2018	14-Nov-2018	14-Nov-2018	16-Nov-2018	16-Nov-2018
PAH by GCMS	09-Nov-2018	08-Nov-2018	09-Nov-2018	08-Nov-2018	08-Nov-2018	08-Nov-2018	08-Nov-2018	09-Nov-2018	09-Nov-2018	09-Nov-2018
PAH Spec MS - Aqueous (W)			16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	14-Nov-2018	16-Nov-2018		
pH	19-Nov-2018	19-Nov-2018	20-Nov-2018	19-Nov-2018	19-Nov-2018	20-Nov-2018	19-Nov-2018	20-Nov-2018	20-Nov-2018	19-Nov-2018
pH Value			16-Nov-2018	15-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018		
Phenols by HPLC (S)	14-Nov-2018	16-Nov-2018	16-Nov-2018	14-Nov-2018	14-Nov-2018	14-Nov-2018	14-Nov-2018	14-Nov-2018	14-Nov-2018	16-Nov-2018
Sample description	06-Nov-2018	06-Nov-2018	06-Nov-2018	06-Nov-2018	06-Nov-2018	06-Nov-2018	06-Nov-2018	06-Nov-2018	06-Nov-2018	06-Nov-2018
Total Organic Carbon	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
Total Sulphate			14-Nov-2018			14-Nov-2018		14-Nov-2018		
Total Sulphur			16-Nov-2018			20-Nov-2018		20-Nov-2018		
TPH CWG (W)			16-Nov-2018	17-Nov-2018	19-Nov-2018	17-Nov-2018	15-Nov-2018	17-Nov-2018		
TPH CWG GC (S)	17-Nov-2018	15-Nov-2018	15-Nov-2018	15-Nov-2018	17-Nov-2018	15-Nov-2018	16-Nov-2018	15-Nov-2018	15-Nov-2018	15-Nov-2018
VOC MS (S)	15-Nov-2018	16-Nov-2018	15-Nov-2018	15-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	15-Nov-2018	15-Nov-2018	16-Nov-2018

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
5	**Samples exceeded holding time before presevation was performed**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

ALS

	Customer Sample ID	4G-E1	4G-E1
	Depth	0.50-0.50	1.00-1.00
SDG(s): 181107-11	**AGS Id**		
Customer: Atkins Global Ltd Llandarcy (7158)	**Sample Type**	SOLID	SOLID
Client Reference / Location: Llanwern	**Sampled Date**	11/6/2018	11/6/2018
Order no: LLA510	**Sample Received Date**	11/7/2018	11/7/2018
	Final Instruction Date	11/7/2018	11/7/2018
All results expressed on a dry weight basis	**Report Completed Date**	11/26/2018	11/26/2018
	SDG	181107-11	181107-11
	Lab Sample Number	18681194	18681198
	Sample Temperature	8.6	8.6

Analysis	Test	Method	Units	LOD		
Waste Acceptance Crit						
	CEN 10:1 - Temperature	PM115	°C		18.2	18.5
	CEN 10:1 - pH	PM115	pH Units		8.65	11.18
	CEN 10:1 - Conductivity @ 20 deg.C	PM115	µS/cm		95.1	521
Inorganics						
	CEN 10:1 - Ammoniacal Nitrogen as N	TM099	mg/kg	<2	<2	<2
	CEN 10:1 - Ammoniacal Nitrogen as N	TM099	mg/l	<0.2	<0.2	<0.2
	CEN 10:1 - pH	TM256	pH Units	<1	9.32	11.42
	CEN 10:1 - Cyanide, Total	TM227	mg/kg	<0.5	<0.5	<0.5
	CEN 10:1 - Cyanide, Total	TM227	mg/l	<0.05	<0.05	<0.05
Filtered (Dissolved) Me						
	CEN 10:1 - Mercury (diss.filt)	TM183	mg/kg	<0.0001	<0.0001	0.00021
	CEN 10:1 - Mercury (diss.filt)	TM183	mg/l	<0.00001	<0.00001	0.000021
	CEN 10:1 - Arsenic (diss.filt)	TM152	mg/kg	<0.005	0.0574	0.00511
	CEN 10:1 - Arsenic (diss.filt)	TM152	mg/l	<0.0005	0.00574	0.000511
	CEN 10:1 - Cadmium (diss.filt)	TM152	mg/kg	<0.0008	<0.0008	<0.0008
	CEN 10:1 - Cadmium (diss.filt)	TM152	mg/l	<0.00008	<0.00008	<0.00008
	CEN 10:1 - Chromium (diss.filt)	TM152	mg/kg	<0.01	0.0129	0.0152
	CEN 10:1 - Chromium (diss.filt)	TM152	mg/l	<0.001	0.00129	0.00152

CEN 10:1 - Copper (diss.filt)	TM152	mg/kg	<0.003	0.00757	0.0228
CEN 10:1 - Copper (diss.filt)	TM152	mg/l	<0.0003	0.000757	0.00228
CEN 10:1 - Lead (diss.filt)	TM152	mg/kg	<0.002	0.005	<0.002
CEN 10:1 - Lead (diss.filt)	TM152	mg/l	<0.0002	0.0005	<0.0002
CEN 10:1 - Manganese (diss.filt)	TM152	mg/kg	<0.03	<0.03	<0.03
CEN 10:1 - Manganese (diss.filt)	TM152	mg/l	<0.003	<0.003	<0.003
CEN 10:1 - Nickel (diss.filt)	TM152	mg/kg	<0.004	<0.004	0.00449
CEN 10:1 - Nickel (diss.filt)	TM152	mg/l	<0.0004	<0.0004	0.000449
CEN 10:1 - Selenium (diss.filt)	TM152	mg/kg	<0.01	<0.01	<0.01
CEN 10:1 - Selenium (diss.filt)	TM152	mg/l	<0.001	<0.001	<0.001
CEN 10:1 - Vanadium (diss.filt)	TM152	mg/kg	<0.01	0.303	0.98
CEN 10:1 - Vanadium (diss.filt)	TM152	mg/l	<0.001	0.0303	0.098
CEN 10:1 - Zinc (diss.filt)	TM152	mg/kg	<0.01	0.0209	<0.01
CEN 10:1 - Zinc (diss.filt)	TM152	mg/l	<0.001	0.00209	<0.001
CEN 10:1 - Iron (Dis.Filt)	TM152	mg/kg	<0.19	2.48	<0.19
CEN 10:1 - Iron (Dis.Filt)	TM152	mg/l	<0.019	0.248	<0.019
TPH Criteria Working C					
CEN 10:1 - GRO Surrogate % recovery**	TM245	%		99	103
CEN 10:1 - GRO >C5-C12	TM245	mg/kg	<0.5	<0.5	<0.5
CEN 10:1 - GRO >C5-C12	TM245	mg/l	<0.05	<0.05	<0.05
CEN 10:1 - Methyl tertiary butyl ether (MTBE)	TM245	mg/kg	<0.03	<0.03	<0.03
CEN 10:1 - Methyl tertiary butyl ether (MTBE)	TM245	mg/l	<0.003	<0.003	<0.003
CEN 10:1 - Benzene	TM245	mg/kg	<0.07	<0.07	<0.07
CEN 10:1 - Benzene	TM245	mg/l	<0.007	<0.007	<0.007
CEN 10:1 - Toluene	TM245	mg/kg	<0.04	<0.04	<0.04
CEN 10:1 - Toluene	TM245	mg/l	<0.004	<0.004	<0.004
CEN 10:1 - Ethylbenzene	TM245	mg/kg	<0.05	<0.05	<0.05
CEN 10:1 - Ethylbenzene	TM245	mg/l	<0.005	<0.005	<0.005
CEN 10:1 - m,p-Xylene	TM245	mg/kg	<0.08	<0.08	<0.08
CEN 10:1 - m,p-Xylene	TM245	mg/l	<0.008	<0.008	<0.008
CEN 10:1 - o-Xylene	TM245	mg/kg	<0.03	<0.03	<0.03
CEN 10:1 - o-Xylene	TM245	mg/l	<0.003	<0.003	<0.003

CEN 10:1 - Sum of detected Xylenes	TM245	mg/kg	<0.11	<0.11	<0.11
CEN 10:1 - Sum of detected Xylenes	TM245	mg/l	<0.011	<0.011	<0.011
CEN 10:1 - Sum of detected BTEX	TM245	mg/kg	<0.28	<0.28	<0.28
CEN 10:1 - Sum of detected BTEX	TM245	mg/l	<0.028	<0.028	<0.028
CEN 10:1 - Aliphatics >C5-C6	TM245	mg/kg	<0.1	<0.1	<0.1
CEN 10:1 - Aliphatics >C5-C6	TM245	mg/l	<0.01	<0.01	<0.01
CEN 10:1 - Aliphatics >C6-C8	TM245	mg/kg	<0.1	<0.1	<0.1
CEN 10:1 - Aliphatics >C6-C8	TM245	mg/l	<0.01	<0.01	<0.01
CEN 10:1 - Aliphatics >C8-C10	TM245	mg/kg	<0.1	<0.1	<0.1
CEN 10:1 - Aliphatics >C8-C10	TM245	mg/l	<0.01	<0.01	<0.01
CEN 10:1 - Aliphatics >C10-C12	TM245	mg/kg	<0.1	<0.1	<0.1
CEN 10:1 - Aliphatics >C10-C12	TM245	mg/l	<0.01	<0.01	<0.01
CEN 10:1 - Aliphatics >C12-C16 (aq)	TM174	mg/kg	<0.1	<0.1	<0.1
CEN 10:1 - Aliphatics >C12-C16 (aq)	TM174	mg/l	<0.01	<0.01	<0.01
CEN 10:1 - Aliphatics >C16-C21 (aq)	TM174	mg/kg	<0.1	<0.1	<0.1
CEN 10:1 - Aliphatics >C16-C21 (aq)	TM174	mg/l	<0.01	<0.01	<0.01
CEN 10:1 - Aliphatics >C21-C35 (aq)	TM174	mg/kg	<0.1	<0.1	<0.1
CEN 10:1 - Aliphatics >C21-C35 (aq)	TM174	mg/l	<0.01	<0.01	<0.01
CEN 10:1 - Total Aliphatics >C12-C35 (aq)	TM174	mg/kg	<0.1	<0.1	<0.1
CEN 10:1 - Total Aliphatics >C12-C35 (aq)	TM174	mg/l	<0.01	<0.01	<0.01
CEN 10:1 - Aromatics >EC5-EC7	TM245	mg/kg	<0.1	<0.1	<0.1
CEN 10:1 - Aromatics >EC5-EC7	TM245	mg/l	<0.01	<0.01	<0.01
CEN 10:1 - Aromatics >EC7-EC8	TM245	mg/kg	<0.1	<0.1	<0.1
CEN 10:1 - Aromatics >EC7-EC8	TM245	mg/l	<0.01	<0.01	<0.01
CEN 10:1 - Aromatics >EC8-EC10	TM245	mg/kg	<0.1	<0.1	<0.1
CEN 10:1 - Aromatics >EC8-EC10	TM245	mg/l	<0.01	<0.01	<0.01
CEN 10:1 - Aromatics >EC10-EC12	TM245	mg/kg	<0.1	<0.1	<0.1
CEN 10:1 - Aromatics >EC10-EC12	TM245	mg/l	<0.01	<0.01	<0.01
CEN 10:1 - Aromatics >EC12-EC16 (aq)	TM174	mg/kg	<0.1	<0.1	<0.1
CEN 10:1 - Aromatics >EC12-EC16 (aq)	TM174	mg/l	<0.01	<0.01	<0.01
CEN 10:1 - Aromatics >EC16-EC21 (aq)	TM174	mg/kg	<0.1	<0.1	<0.1
CEN 10:1 - Aromatics >EC16-EC21 (aq)	TM174	mg/l	<0.01	<0.01	<0.01

CEN 10:1 - Aromatics >EC21-EC35 (aq)	TM174	mg/kg	<0.1	<0.1	<0.1
CEN 10:1 - Aromatics >EC21-EC35 (aq)	TM174	mg/l	<0.01	<0.01	<0.01
CEN 10:1 - Total Aromatics >EC12-EC35 (aq)	TM174	mg/kg	<0.1	<0.1	<0.1
CEN 10:1 - Total Aromatics >EC12-EC35 (aq)	TM174	mg/l	<0.01	<0.01	<0.01
CEN 10:1 - Total Aliphatics & Aromatics >C5-35 (aq)	TM174	mg/kg	<0.1	<0.1	<0.1
CEN 10:1 - Total Aliphatics & Aromatics >C5-35 (aq)	TM174	mg/l	<0.01	<0.01	<0.01
Polyaromatic Hydrocar					
CEN 10:1 - Naphthalene (aq)	TM178	mg/kg	<0.0001	0.000281	0.000686
CEN 10:1 - Naphthalene (aq)	TM178	mg/l	<0.00001	0.0000281	0.0000686
CEN 10:1 - Acenaphthene (aq)	TM178	mg/kg	<0.00005	<0.00005	0.000301
CEN 10:1 - Acenaphthene (aq)	TM178	mg/l	<0.000005	<0.000005	0.0000301
CEN 10:1 - Acenaphthylene (aq)	TM178	mg/kg	<0.00005	0.00282	0.0000667
CEN 10:1 - Acenaphthylene (aq)	TM178	mg/l	<0.000005	0.000282	0.00000667
CEN 10:1 - Fluoranthene (aq)	TM178	mg/kg	<0.00005	0.00627	0.00144
CEN 10:1 - Fluoranthene (aq)	TM178	mg/l	<0.000005	0.000627	0.000144
CEN 10:1 - Anthracene (aq)	TM178	mg/kg	<0.00005	0.000447	0.000194
CEN 10:1 - Anthracene (aq)	TM178	mg/l	<0.000005	0.0000447	0.0000194
CEN 10:1 - Phenanthrene (aq)	TM178	mg/kg	<0.00005	0.000631	0.00115
CEN 10:1 - Phenanthrene (aq)	TM178	mg/l	<0.000005	0.0000631	0.000115
CEN 10:1 - Fluorene (aq)	TM178	mg/kg	<0.00005	0.0000843	0.000122
CEN 10:1 - Fluorene (aq)	TM178	mg/l	<0.000005	0.00000843	0.0000122
CEN 10:1 - Chrysene (aq)	TM178	mg/kg	<0.00005	0.00647	0.000293
CEN 10:1 - Chrysene (aq)	TM178	mg/l	<0.000005	0.000647	0.0000293
CEN 10:1 - Pyrene (aq)	TM178	mg/kg	<0.00005	0.00587	0.00334
CEN 10:1 - Pyrene (aq)	TM178	mg/l	<0.000005	0.000587	0.000334
CEN 10:1 - Benzo(a)anthracene (aq)	TM178	mg/kg	<0.00005	0.00424	0.000147
CEN 10:1 - Benzo(a)anthracene (aq)	TM178	mg/l	<0.000005	0.000424	0.0000147
CEN 10:1 - Benzo(b)fluoranthene (aq)	TM178	mg/kg	<0.00005	0.0207	0.000146
CEN 10:1 - Benzo(b)fluoranthene (aq)	TM178	mg/l	<0.000005	0.00207	0.0000146
CEN 10:1 - Benzo(k)fluoranthene (aq)	TM178	mg/kg	<0.00005	0.00882	<0.00005
CEN 10:1 - Benzo(k)fluoranthene (aq)	TM178	mg/l	<0.000005	0.000882	<0.000005
CEN 10:1 - Benzo(a)pyrene (aq)	TM178	mg/kg	<0.00002	0.013	0.0000411

CEN 10:1 - Benzo(a)pyrene (aq)	TM178	mg/l	<0.000002	0.0013	0.00000411
CEN 10:1 - Dibenzo(a,h)anthracene (aq)	TM178	mg/kg	<0.00005	0.00311	<0.00005
CEN 10:1 - Dibenzo(a,h)anthracene (aq)	TM178	mg/l	<0.000005	0.000311	<0.000005
CEN 10:1 - Benzo(g,h,i)perylene (aq)	TM178	mg/kg	<0.00005	0.0251	<0.00005
CEN 10:1 - Benzo(g,h,i)perylene (aq)	TM178	mg/l	<0.000005	0.00251	<0.000005
CEN 10:1 - Indeno(1,2,3-cd)pyrene (aq)	TM178	mg/kg	<0.00005	0.0161	<0.00005
CEN 10:1 - Indeno(1,2,3-cd)pyrene (aq)	TM178	mg/l	<0.000005	0.00161	<0.000005
CEN 10:1 - PAH, Total Detected USEPA 16 (aq)	TM178	mg/kg	<0.00082	0.114	0.00792
CEN 10:1 - PAH, Total Detected USEPA 16 (aq)	TM178	mg/l	<0.000082	0.0114	0.000792
EPH CWG (Speciated)					
CEN 10:1 - Aliphatics >C16-C35 Aqueous	TM174	mg/kg	<0.1	<0.1	<0.1
CEN 10:1 - Aliphatics >C16-C35 Aqueous	TM174	mg/l	<0.01	<0.01	<0.01

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Tel: (01244) 528700
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Website: www.alsenvironmental.co.uk

Atkins Global Ltd
Project Jonah site office
Llan Coed House
Suite 24
Coed Darcy
Llandarcy
SA10 6HJ

Attention: John Fitzgerald

CERTIFICATE OF ANALYSIS

Date:	23 November 2018
Customer:	H_ATKINS_LDC
Sample Delivery Group (SDG):	181108-13
Your Reference:	
Location:	Llanwern
Report No:	482369

We received 15 samples on Thursday November 08, 2018 and 15 of these samples were scheduled for analysis which was completed on Friday November 23, 2018. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager

ALS Life Sciences Limited. Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18689483	4G-D2		0.40 - 0.40	07/11/2018
18689487	4G-D2		0.80 - 0.80	07/11/2018
18689421	4G-D2-V		1.80 - 1.80	07/11/2018
18689474	4G-E2		0.80 - 0.80	07/11/2018
18689430	4G-E3		0.80 - 0.80	07/11/2018
18689478	4G-E2-V		1.95 - 1.95	07/11/2018
18689437	4G-E3-V		2.20 - 2.20	07/11/2018
18689416	4G-F1		0.50 - 0.50	07/11/2018
18689455	4G-F1		1.00 - 1.00	07/11/2018
18689464	4G-F2		0.50 - 0.50	07/11/2018
18689441	4G-F3		0.20 - 0.20	07/11/2018
18689447	4G-F3		0.60 - 0.60	07/11/2018
18689459	4G-F1-V		2.40 - 2.40	07/11/2018
18689468	4G-F2-V		2.00 - 2.00	07/11/2018
18689451	4G-F3-V		2.50 - 2.50	07/11/2018

Maximum Sample/Coolbox Temperature (°C) : **10.4**

ISO5667-3 Water quality - Sampling - Part3 -
During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			18689483			18689487			18689421			18689474			18689430			18689478			18689437			18689416
Customer Sample Reference			4G-D2			4G-D2			4G-D2-V			4G-E2			4G-E3			4G-E2-V			4G-E3-V			4G-F1
AGS Reference																								
Depth (m)			0.40 - 0.40			0.80 - 0.80			1.80 - 1.80			0.80 - 0.80			0.80 - 0.80			1.95 - 1.95			2.20 - 2.20			0.50 - 0.50
Container			1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB
Sample Type			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Alkali Metals by iCap-OES (Soil)	All	NDPs: 0 Tests: 6		X								X			X								
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 9	X			X					X			X									X
Ammonium Soil by Titration	All	NDPs: 0 Tests: 15		X			X		X			X			X		X		X				
Anions by Kone (soil)	All	NDPs: 0 Tests: 6		X								X			X								
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 6	X								X			X									X
Asbestos Quantification - Full	All	NDPs: 0 Tests: 1																					
CEN Readings	All	NDPs: 0 Tests: 9	X			X					X			X									X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 24	X	X		X	X		X		X	X		X	X		X		X				X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 9	X			X					X			X									X
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 9	X			X					X			X									X
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 15		X			X		X			X			X		X		X				
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 9	X			X					X			X									X
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 15		X			X		X			X			X		X		X				
GRO by GC-FID (S)	All	NDPs: 0 Tests: 15			X			X		X			X			X		X		X			
GRO by GC-FID (W)	All	NDPs: 0 Tests: 9	X			X					X			X									X

18689451	4G-F3-V		2.50 - 2.50	60g VOC (ALE215)	S														X	
				250g Amber Jar (ALE210)	S			X					X			X		X		
18689468	4G-F2-V		2.00 - 2.00	60g VOC (ALE215)	S														X	
				250g Amber Jar (ALE210)	S			X					X			X		X		
18689459	4G-F1-V		2.40 - 2.40	60g VOC (ALE215)	S														X	
				250g Amber Jar (ALE210)	S			X					X			X		X		
18689447	4G-F3		0.60 - 0.60	60g VOC (ALE215)	S														X	
				250g Amber Jar (ALE210)	S	X		X	X				X			X		X		
				1kg TUB	S		X			X	X	X	X	X	X		X			X
18689441	4G-F3		0.20 - 0.20	60g VOC (ALE215)	S														X	
				250g Amber Jar (ALE210)	S			X					X			X		X		
				1kg TUB	S		X					X	X	X	X		X			X
18689464	4G-F2		0.50 - 0.50	60g VOC (ALE215)	S														X	
				250g Amber Jar (ALE210)	S	X		X	X				X			X		X		
				1kg TUB	S		X			X		X	X	X	X		X			X
18689455	4G-F1		1.00 - 1.00	60g VOC (ALE215)	S														X	
				250g Amber Jar (ALE210)	S			X					X			X		X		
				1kg TUB	S		X					X	X	X	X		X			X
18689416	4G-F1		0.50 - 0.50	60g VOC (ALE215)	S														X	
				250g Amber Jar (ALE210)	S	X		X	X				X			X		X		

CERTIFICATE OF ANALYSIS

SDG: 181108-13	**Client Reference:**	**Report Number:** 482369	
Location: Llanwern	**Order Number:** LLA512	**Superseded Report:**	

Results Legend

- X — Test
- N — No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			18689483			18689487			18689421		18689474			18689430			18689478		18689437		18689416
Customer Sample Reference			4G-D2			4G-D2			4G-D2-V		4G-E2			4G-E3			4G-E2-V		4G-E3-V		4G-F1
AGS Reference																					
Depth (m)			0.40 - 0.40			0.80 - 0.80			1.80 - 1.80		0.80 - 0.80			0.80 - 0.80			1.95 - 1.95		2.20 - 2.20		0.50 - 0.50
Container			1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB
Sample Type			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Mercury Dissolved	All	NDPs: 0 Tests: 9	X			X					X			X							X
Metals in solid samples by OES	All	NDPs: 0 Tests: 15		X			X		X			X			X		X		X		
PAH by GCMS	All	NDPs: 0 Tests: 15		X			X		X			X			X		X		X		
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 9	X			X					X			X							X
pH	All	NDPs: 0 Tests: 15		X			X		X			X			X		X		X		
pH Value	All	NDPs: 0 Tests: 9	X			X					X			X							X
Phenols by HPLC (S)	All	NDPs: 0 Tests: 15		X			X		X			X			X		X		X		
Sample description	All	NDPs: 0 Tests: 15		X			X		X			X			X		X		X		
Total Organic Carbon	All	NDPs: 0 Tests: 15		X			X		X			X			X		X		X		
Total Sulphate	All	NDPs: 0 Tests: 6		X								X			X						
Total Sulphur	All	NDPs: 0 Tests: 6		X								X			X						
TPH CWG (W)	All	NDPs: 0 Tests: 9	X			X					X			X							X
TPH CWG GC (S)	All	NDPs: 0 Tests: 15		X			X		X			X			X		X		X		
VOC MS (S)	All	NDPs: 0 Tests: 15			X			X		X			X			X		X		X	

18689451	4G-F3-V		2.50 - 2.50	60g VOC (ALE215)	S																		X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X					X				
18689468	4G-F2-V		2.00 - 2.00	60g VOC (ALE215)	S																		X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X					X				
18689459	4G-F1-V		2.40 - 2.40	60g VOC (ALE215)	S																		X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X					X				
18689447	4G-F3		0.60 - 0.60	60g VOC (ALE215)	S																		X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X	X	X			X				
				1kg TUB	S	X			X		X							X					
18689441	4G-F3		0.20 - 0.20	60g VOC (ALE215)	S																		X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X					X				
				1kg TUB	S	X			X		X							X					
18689464	4G-F2		0.50 - 0.50	60g VOC (ALE215)	S																		X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X	X	X			X				
				1kg TUB	S	X			X		X							X					
18689455	4G-F1		1.00 - 1.00	60g VOC (ALE215)	S																		X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X					X				
				1kg TUB	S	X			X		X							X					
18689416	4G-F1		0.50 - 0.50	60g VOC (ALE215)	S																		X
				250g Amber Jar (ALE210)	S		X	X		X		X	X	X	X	X			X				

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
18689483	4G-D2	0.40 - 0.40	Black	Sand	Stones	None
18689487	4G-D2	0.80 - 0.80	Dark Brown	Sandy Loam	Stones	None
18689421	4G-D2-V	1.80 - 1.80	Grey	Clay	None	None
18689474	4G-E2	0.80 - 0.80	Dark Brown	Sand	Vegetation	Stones
18689430	4G-E3	0.80 - 0.80	Black	Sand	Stones	Brick
18689478	4G-E2-V	1.95 - 1.95	Dark Brown	Sandy Loam	Vegetation	Stones
18689437	4G-E3-V	2.20 - 2.20	Grey	Clay	None	None
18689416	4G-F1	0.50 - 0.50	Dark Brown	Sandy Loam	Vegetation	Stones
18689455	4G-F1	1.00 - 1.00	Dark Brown	Sandy Loam	Vegetation	Stones
18689464	4G-F2	0.50 - 0.50	Dark Brown	Sandy Loam	Vegetation	Stones
18689441	4G-F3	0.20 - 0.20	Dark Brown	Sand	Stones	None
18689447	4G-F3	0.60 - 0.60	Black	Sand	Stones	None
18689459	4G-F1-V	2.40 - 2.40	Dark Brown	Loamy Sand	Vegetation	Stones
18689468	4G-F2-V	2.00 - 2.00	Dark Brown	Sandy Loam	Vegetation	Stones
18689451	4G-F3-V	2.50 - 2.50	Grey	Clay	None	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-D2	4G-D2	4G-D2-V	4G-E2	4G-E3	4G-E2-V
			Depth (m)	0.40 - 0.40	0.80 - 0.80	1.80 - 1.80	0.80 - 0.80	0.80 - 0.80	1.95 - 1.95
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	08/11/2018	08/11/2018	08/11/2018	08/11/2018	08/11/2018	08/11/2018
			SDG Ref	181108-13	181108-13	181108-13	181108-13	181108-13	181108-13
			Lab Sample No.(s)	18689483	18689487	18689421	18689474	18689430	18689478
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		12	15	22	11	12	33
Exchangeable Ammonia as N	<12 mg/kg	TM024		<12 M	<12 M	76 M	<12 M	<12 M	702 M
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M
Sulphur, Total	<0.02 %	TM132		0.183			0.201	0.155	
Sulphate, Total potential	<0.06 %	TM132		0.549			0.603	0.465	
Soil Organic Matter (SOM)	<0.35 %	TM132		38.1 #	6.6 #	0.741 #	17.6 #	9.28 #	5.65 #
pH	1 pH Units	TM133		8.85 M	8.93 M	8.08 M	8.34 M	8.63 M	6.94 M
Cyanide, Total	<1 mg/kg	TM153		1.96 M	<1 M	<1 M	<1 M	1.56 M	<1 M
Cyanide, Free	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Arsenic	<0.6 mg/kg	TM181		14.5 M	8.79 M	12.8 M	16.5 M	13.6 M	13.1 M
Cadmium	<0.02 mg/kg	TM181		2.07 M	<0.02 M	<0.02 M	<0.02 M	0.553 M	<0.02 M
Chromium	<0.9 mg/kg	TM181		81.7 M	56.7 M	29.5 M	11.2 M	18.7 M	36 M
Copper	<1.4 mg/kg	TM181		34.4 M	23.6 M	9.12 M	42.6 M	40.8 M	14.9 M
Iron	<1000 mg/kg	TM181		190000 #	36800 #	37800 #	32900 #	32300 #	29700 #
Lead	<0.7 mg/kg	TM181		103 M	31.2 M	21 M	27.9 M	33.1 M	31.5 M
Manganese	<0.13 mg/kg	TM181		7160 M	2960 M	1530 M	661 M	1520 M	228 M
Mercury	<0.14 mg/kg	TM181		<1.4 M	<0.14 M	<0.14 M	<0.14 M	<0.14 M	<0.14 M
Nickel	<0.2 mg/kg	TM181		40.4 M	20.6 M	33.4 M	38.8 M	42.5 M	28.5 M
Selenium	<1 mg/kg	TM181		<10 #	1.7 #	<1 #	<1 #	1.11 #	<1 #
Vanadium	<0.2 mg/kg	TM181		86.4 #	78.9 #	53.7 #	33.3 #	38.2 #	57 #
Zinc	<1.9 mg/kg	TM181		254 M	70.3 M	100 M	78.5 M	137 M	115 M
Sulphate, acid soluble (total)	<0.02 %	TM221		0.149			0.256	0.214	
Calcium	<21 mg/kg	TM224		95500			3230	16000	
Magnesium	<8 mg/kg	TM224		13700			2530	4690	
Soluble Sulphate 2:1 extract as SO4 BRE	<0.004 g/l	TM243		0.0518 M			0.0394 M	0.0549 M	

Validated

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-E3-V	4G-F1	4G-F1	4G-F2	4G-F3	4G-F3
			Depth (m)	2.20 - 2.20	0.50 - 0.50	1.00 - 1.00	0.50 - 0.50	0.20 - 0.20	0.60 - 0.60
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	08/11/2018	08/11/2018	08/11/2018	08/11/2018	08/11/2018	08/11/2018
			SDG Ref	181108-13	181108-13	181108-13	181108-13	181108-13	181108-13
			Lab Sample No.(s)	18689437	18689416	18689455	18689464	18689441	18689447
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		23	6.1	12	6.9	11	1
Exchangeable Ammonia as N	<12 mg/kg	TM024		133 M	<12 M	<12 M	<12 M	<12 M	<12 M
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M
Sulphur, Total	<0.02 %	TM132			0.14		0.154		0.495
Sulphate, Total potential	<0.06 %	TM132			0.42		0.462		1.49
Soil Organic Matter (SOM)	<0.35 %	TM132		1.62 #	11.7 #	25 #	2.95 #	40.2 #	2.74 #
pH	1 pH Units	TM133		7.32 M	9.95 M	8.57 M	10 M	9.39 M	12.2 M
Cyanide, Total	<1 mg/kg	TM153		<1 M	1.5 M	<1 M	<1 M	<1 M	<1 M
Cyanide, Free	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Arsenic	<0.6 mg/kg	TM181		13.7 M	11.6 M	11.3 M	6.18 M	10.2 M	<6 M
Cadmium	<0.02 mg/kg	TM181		16.9 M	<0.2 M	0.821 M	<0.2 M	<0.02 M	1.62 M
Chromium	<0.9 mg/kg	TM181		56.7 M	<9 M	1.56 M	36.2 M	<0.9 M	547 M
Copper	<1.4 mg/kg	TM181		356 M	31.6 M	50.8 M	16.9 M	<14 M	18 M
Iron	<1000 mg/kg	TM181		35700 #	30300 #	54100 #	49400 #	107000 #	183000 #
Lead	<0.7 mg/kg	TM181		276 M	167 M	36.7 M	35.3 M	20 M	47.2 M
Manganese	<0.13 mg/kg	TM181		342 M	4750 M	1400 M	2990 M	3260 M	39500 M
Mercury	<0.14 mg/kg	TM181		<0.14 M	<1.4 M	<0.14 M	<1.4 M	<0.14 M	<1.4 M
Nickel	<0.2 mg/kg	TM181		41.2 M	60.2 M	26.3 M	14.6 M	15 M	8.22 M
Selenium	<1 mg/kg	TM181		<1 #	<10 #	1.26 #	<10 #	<1 #	18.4 #
Vanadium	<0.2 mg/kg	TM181		60.9 #	179 #	41.1 #	116 #	38.1 #	1270 #
Zinc	<1.9 mg/kg	TM181		1680 M	250 M	203 M	106 M	93.6 M	91 M
Sulphate, acid soluble (total)	<0.02 %	TM221			0.068		0.374		1.33
Calcium	<21 mg/kg	TM224			67200		274000		222000
Magnesium	<8 mg/kg	TM224			7520		8030		6830
Soluble Sulphate 2:1 extract as SO4 BRE	<0.004 g/l	TM243			0.0377 M		0.0829 M		0.123 M
Asbestos Quantification - Gravimetric - %	<0.001 %	TM304							<0.001 #
Asbestos Quantification - PCOM Evaluation - %	<0.001 %	TM304							<0.001 #
Additional Asbestos Components (Using TM048)		TM304							None #
Analysts Comments		TM304							N/A
Asbestos Quantification - Total - %	<0.001 %	TM304							<0.001 #

Validated

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Customer Sample Ref.	4G-F1-V	4G-F2-V	4G-F3-V			
Depth (m)	2.40 - 2.40	2.00 - 2.00	2.50 - 2.50			
Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
Date Sampled	07/11/2018	07/11/2018	07/11/2018			
Sample Time	00:00	00:00	00:00			
Date Received	08/11/2018	08/11/2018	08/11/2018			
SDG Ref	181108-13	181108-13	181108-13			
Lab Sample No.(s)	18689459	18689468	18689451			
AGS Reference						

Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	23	32	26			
Exchangeable Ammonia as N	<12 mg/kg	TM024	573 M	661 M	19.6 M			
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M	<0.01 M			
Cresols	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M	<0.01 M			
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M	<0.015 M			
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)	<0.035 M	<0.035 M	<0.035 M			
Soil Organic Matter (SOM)	<0.35 %	TM132	1.13 #	4.02 #	1.01 #			
pH	1 pH Units	TM133	8.52 M	7.39 M	8.18 M			
Cyanide, Total	<1 mg/kg	TM153	5.64 M	<1 M	<1 M			
Cyanide, Free	<1 mg/kg	TM153	<1 M	<1 M	<1 M			
Arsenic	<0.6 mg/kg	TM181	9.4 M	13.7 M	11.6 M			
Cadmium	<0.02 mg/kg	TM181	<0.02 M	<0.02 M	<0.02 M			
Chromium	<0.9 mg/kg	TM181	28.9 M	34.8 M	28.4 M			
Copper	<1.4 mg/kg	TM181	9.07 M	15.5 M	11.3 M			
Iron	<1000 mg/kg	TM181	41100 #	34200 #	35400 #			
Lead	<0.7 mg/kg	TM181	21.2 M	24.8 M	23.5 M			
Manganese	<0.13 mg/kg	TM181	1820 M	590 M	723 M			
Mercury	<0.14 mg/kg	TM181	<0.14 M	<0.14 M	<0.14 M			
Nickel	<0.2 mg/kg	TM181	31.6 M	32.2 M	31.8 M			
Selenium	<1 mg/kg	TM181	<1 #	<1 #	<1 #			
Vanadium	<0.2 mg/kg	TM181	51.8 #	59.4 #	51.1 #			
Zinc	<1.9 mg/kg	TM181	122 M	116 M	141 M			

Validated

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-D2	4G-D2	4G-D2-V	4G-E2	4G-E3	4G-E2-V
			Depth (m)	0.40 - 0.40	0.80 - 0.80	1.80 - 1.80	0.80 - 0.80	0.80 - 0.80	1.95 - 1.95
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	08/11/2018	08/11/2018	08/11/2018	08/11/2018	08/11/2018	08/11/2018
			SDG Ref	181108-13	181108-13	181108-13	181108-13	181108-13	181108-13
			Lab Sample No.(s)	18689483	18689487	18689421	18689474	18689430	18689478
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		93.7	95.5	99.4	96.5	85	93.2
Acenaphthene-d10 % recovery**	%	TM218		90	90	96.3	95.7	81.2	88.7
Phenanthrene-d10 % recovery**	%	TM218		90.8	89.5	94.7	94.3	75.8	88.5
Chrysene-d12 % recovery**	%	TM218		82.1	84.2	86.3	88.2	69.9	84.1
Perylene-d12 % recovery**	%	TM218		74.7	83.9	87.1	76.3	65.7	84.9
Naphthalene	<0.009 mg/kg	TM218		0.22 M	0.266 M	<0.009 M	0.051 M	0.118 M	<0.009 M
Acenaphthylene	<0.012 mg/kg	TM218		0.234 M	0.0679 M	<0.012 M	0.0146 M	0.0864 M	<0.012 M
Acenaphthene	<0.008 mg/kg	TM218		0.0527 M	<0.008 M	<0.008 M	<0.008 M	<0.008 M	<0.008 M
Fluorene	<0.01 mg/kg	TM218		0.0843 M	0.0188 M	<0.01 M	<0.01 M	0.013 M	<0.01 M
Phenanthrene	<0.015 mg/kg	TM218		1.78 M	0.167 M	<0.015 M	0.121 M	0.287 M	<0.015 M
Anthracene	<0.016 mg/kg	TM218		0.438 M	0.0409 M	<0.016 M	0.0187 M	0.0473 M	<0.016 M
Fluoranthene	<0.017 mg/kg	TM218		3.14 M	0.31 M	<0.017 M	0.0971 M	0.317 M	<0.017 M
Pyrene	<0.015 mg/kg	TM218		2.28 M	0.266 M	<0.015 M	0.0774 M	0.261 M	<0.015 M
Benz(a)anthracene	<0.014 mg/kg	TM218		1.53 M	0.214 M	<0.014 M	0.0609 M	0.202 M	<0.014 M
Chrysene	<0.01 mg/kg	TM218		1.38 M	0.231 M	<0.01 M	0.0818 M	0.17 M	<0.01 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		2.44 M	0.424 M	0.0244 M	0.062 M	0.467 M	<0.015 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		0.885 M	0.137 M	<0.014 M	0.0251 M	0.157 M	<0.014 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		1.52 M	0.275 M	<0.015 M	0.0531 M	0.267 M	<0.015 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		1.12 M	0.206 M	<0.018 M	0.0505 M	0.234 M	<0.018 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		0.339 M	0.0578 M	<0.023 M	<0.023 M	0.0631 M	<0.023 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		1.22 M	0.215 M	<0.024 M	0.0512 M	0.241 M	<0.024 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		18.7	2.89	<0.118	0.765	2.93	<0.118

Validated

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-E3-V	4G-F1	4G-F1	4G-F2	4G-F3	4G-F3
			Depth (m)	2.20 - 2.20	0.50 - 0.50	1.00 - 1.00	0.50 - 0.50	0.20 - 0.20	0.60 - 0.60
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	08/11/2018	08/11/2018	08/11/2018	08/11/2018	08/11/2018	08/11/2018
			SDG Ref	181108-13	181108-13	181108-13	181108-13	181108-13	181108-13
			Lab Sample No.(s)	18689437	18689416	18689455	18689464	18689441	18689447
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		89.8	94.5	92	97.3	93.4	92.6
Acenaphthene-d10 % recovery**	%	TM218		84.6	93.3	89	93.1	92.7	80.9
Phenanthrene-d10 % recovery**	%	TM218		87.8	91.2	83.5	94.1	92.1	88.7
Chrysene-d12 % recovery**	%	TM218		83.2	89.2	72.4	85.7	77.2	82.1
Perylene-d12 % recovery**	%	TM218		82.3	88.3	62.4	84.6	72.4	82.9
Naphthalene	<0.009 mg/kg	TM218		<0.009 M	0.24 M	0.106 M	0.0304 M	0.103 M	<0.045 M
Acenaphthylene	<0.012 mg/kg	TM218		<0.012 M	0.913 M	<0.012 M	0.013 M	0.108 M	<0.06 M
Acenaphthene	<0.008 mg/kg	TM218		<0.008 M	<0.008 M	<0.008 M	0.0168 M	0.0134 M	<0.04 M
Fluorene	<0.01 mg/kg	TM218		<0.01 M	0.0434 M	<0.01 M	0.0108 M	0.0369 M	<0.05 M
Phenanthrene	<0.015 mg/kg	TM218		<0.015 M	0.359 M	0.179 M	0.229 M	0.675 M	<0.075 M
Anthracene	<0.016 mg/kg	TM218		<0.016 M	0.227 M	<0.016 M	0.0453 M	0.161 M	<0.08 M
Fluoranthene	<0.017 mg/kg	TM218		<0.017 M	2.01 M	0.101 M	0.508 M	1.47 M	<0.085 M
Pyrene	<0.015 mg/kg	TM218		<0.015 M	1.95 M	0.0877 M	0.443 M	1.1 M	<0.075 M
Benz(a)anthracene	<0.014 mg/kg	TM218		<0.014 M	1.78 M	0.0558 M	0.274 M	0.674 M	<0.07 M
Chrysene	<0.01 mg/kg	TM218		<0.01 M	1.23 M	0.0669 M	0.327 M	0.594 M	<0.05 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		<0.015 M	4.89 M	0.115 M	0.539 M	1.14 M	<0.075 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		<0.014 M	1.35 M	0.0375 M	0.17 M	0.331 M	<0.07 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		<0.015 M	3.08 M	0.053 M	0.309 M	0.61 M	<0.075 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		<0.018 M	3.02 M	0.0441 M	0.247 M	0.449 M	<0.09 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		<0.023 M	0.72 M	<0.023 M	0.0635 M	0.143 M	<0.115 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		<0.024 M	3.46 M	0.0527 M	0.297 M	0.496 M	<0.12 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		<0.118	25.3	0.899	3.52	8.1	<0.59

Validated

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-F1-V	4G-F2-V	4G-F3-V			
			Depth (m)	2.40 - 2.40	2.00 - 2.00	2.50 - 2.50			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	07/11/2018	07/11/2018	07/11/2018			
			Sample Time	00:00	00:00	00:00			
			Date Received	08/11/2018	08/11/2018	08/11/2018			
			SDG Ref	181108-13	181108-13	181108-13			
			Lab Sample No.(s)	18689459	18689468	18689451			
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		92.5	93.8	99.5			
Acenaphthene-d10 % recovery**	%	TM218		86.5	88.4	101			
Phenanthrene-d10 % recovery**	%	TM218		88.7	89.5	104			
Chrysene-d12 % recovery**	%	TM218		85.1	85.4	106			
Perylene-d12 % recovery**	%	TM218		83.7	85.6	98.5			
Naphthalene	<0.009 mg/kg	TM218		0.0948 M	<0.009 M	<0.009 M			
Acenaphthylene	<0.012 mg/kg	TM218		<0.012 M	<0.012 M	<0.012 M			
Acenaphthene	<0.008 mg/kg	TM218		<0.008 M	<0.008 M	<0.008 M			
Fluorene	<0.01 mg/kg	TM218		<0.01 M	<0.01 M	<0.01 M			
Phenanthrene	<0.015 mg/kg	TM218		0.0341 M	<0.015 M	<0.015 M			
Anthracene	<0.016 mg/kg	TM218		<0.016 M	<0.016 M	<0.016 M			
Fluoranthene	<0.017 mg/kg	TM218		0.0598 M	<0.017 M	<0.017 M			
Pyrene	<0.015 mg/kg	TM218		0.0443 M	<0.015 M	<0.015 M			
Benz(a)anthracene	<0.014 mg/kg	TM218		0.0329 M	<0.014 M	<0.014 M			
Chrysene	<0.01 mg/kg	TM218		0.0335 M	<0.01 M	<0.01 M			
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		0.058 M	<0.015 M	<0.015 M			
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		<0.014 M	<0.014 M	<0.014 M			
Benzo(a)pyrene	<0.015 mg/kg	TM218		0.0356 M	<0.015 M	<0.015 M			
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		0.0284 M	<0.018 M	<0.018 M			
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		<0.023 M	<0.023 M	<0.023 M			
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		<0.024 M	<0.024 M	<0.024 M			
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		0.421	<0.118	<0.118			

Validated

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-D2	4G-D2	4G-D2-V	4G-E2	4G-E3	4G-E2-V
			Depth (m)	0.40 - 0.40	0.80 - 0.80	1.80 - 1.80	0.80 - 0.80	0.80 - 0.80	1.95 - 1.95
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	08/11/2018	08/11/2018	08/11/2018	08/11/2018	08/11/2018	08/11/2018
			SDG Ref	181108-13	181108-13	181108-13	181108-13	181108-13	181108-13
			Lab Sample No.(s)	18689483	18689487	18689421	18689474	18689430	18689478
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		76.1	92	98.6	54.9	74.5	125
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089		<0.2 M	<0.2 M	<0.2 M	<0.2 #	<0.2 M	0.476 M
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	0.033
Aliphatics >C6-C8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	0.122
Aliphatics >C8-C10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	0.137
Aliphatics >C10-C12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	0.057
Aliphatics >C12-C16	<0.1 mg/kg	TM173		<0.1	<0.1	<0.1	0.793	<0.1	0.216
Aliphatics >C16-C21	<0.1 mg/kg	TM173		10.1	2.95	<0.1	0.835	0.195	<0.1
Aliphatics >C21-C35	<0.1 mg/kg	TM173		86.2	23.3	<0.1	4.1	4.38	1.66
Aliphatics >C35-C44	<0.1 mg/kg	TM173		15.9	8.15	<0.1	<0.1	<0.1	0.537
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		112	34.4	<0.1	5.73	4.57	2.42
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	0.09
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	0.0375
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		3.46	1.45	0.608	0.782	1.15	<0.1
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		19	4.41	1.39	1.36	6.67	<0.1
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		113	32.7	2.42	4.57	14.8	22.7
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		51.2	22	0.267	0.657	4.75	6.1
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		18.9	9	<0.1	<0.1	1.6	2.33
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		187	60.5	4.69	7.37	27.4	28.8
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		299	94.9	4.69	13.1	32	31.7

Validated

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-E3-V	4G-F1	4G-F1	4G-F2	4G-F3	4G-F3
			Depth (m)	2.20 - 2.20	0.50 - 0.50	1.00 - 1.00	0.50 - 0.50	0.20 - 0.20	0.60 - 0.60
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	08/11/2018	08/11/2018	08/11/2018	08/11/2018	08/11/2018	08/11/2018
			SDG Ref	181108-13	181108-13	181108-13	181108-13	181108-13	181108-13
			Lab Sample No.(s)	18689437	18689416	18689455	18689464	18689441	18689447
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		82	93.5	77.5	90.1	73.3	98.9
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089		<0.2 M	<0.2 M	<0.2 M	<0.2 M	<0.2 M	<0.2 M
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C6-C8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C8-C10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C10-C12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C12-C16	<0.1 mg/kg	TM173		<0.1	<0.1	<0.1	0.182	<0.1	<0.1
Aliphatics >C16-C21	<0.1 mg/kg	TM173		<0.1	7.64	1.21	1.14	8.35	1.03
Aliphatics >C21-C35	<0.1 mg/kg	TM173		<0.1	26.2	6.45	16	34.9	17.2
Aliphatics >C35-C44	<0.1 mg/kg	TM173		<0.1	7.35	0.948	5.11	13.5	2.79
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		<0.1	41.2	8.6	22.4	56.8	21
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		<0.1	2.51	1.23	0.711	1.79	1.29
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		<0.1	15.3	4.5	5.21	13.9	18.9
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		3.14	93.7	12.5	40.9	64.1	147
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		0.463	40.7	5.9	16.5	36.7	43.6
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		<0.1	14.5	2.8	6.02	15.8	14
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		3.6	152	24.1	63.3	117	211
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		3.6	193	32.7	85.7	173	232

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-F1-V	4G-F2-V	4G-F3-V			
			Depth (m)	2.40 - 2.40	2.00 - 2.00	2.50 - 2.50			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	07/11/2018	07/11/2018	07/11/2018			
			Sample Time	00:00	00:00	00:00			
			Date Received	08/11/2018	08/11/2018	08/11/2018			
			SDG Ref	181108-13	181108-13	181108-13			
			Lab Sample No.(s)	18689459	18689468	18689451			
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		98.2	102	97			
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089		<0.2 M	<0.2 M	<0.2 M			
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02			
Aliphatics >C6-C8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02			
Aliphatics >C8-C10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02			
Aliphatics >C10-C12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02			
Aliphatics >C12-C16	<0.1 mg/kg	TM173		<0.1	<0.1	<0.1			
Aliphatics >C16-C21	<0.1 mg/kg	TM173		<0.1	<0.1	<0.1			
Aliphatics >C21-C35	<0.1 mg/kg	TM173		3.44	0.782	<0.1			
Aliphatics >C35-C44	<0.1 mg/kg	TM173		1.53	<0.1	<0.1			
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		4.98	0.782	<0.1			
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02			
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02			
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02			
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02			
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		<0.1	<0.1	0.814			
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		<0.1	0.219	1.47			
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		5.22	10.1	3.65			
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		4.45	1.09	0.537			
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		1.76	<0.1	<0.1			
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		9.66	11.5	6.47			
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		14.6	12.2	6.47			

Validated

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-D2	4G-D2	4G-D2-V	4G-E2	4G-E3	4G-E2-V
			Depth (m)	0.40 - 0.40	0.80 - 0.80	1.80 - 1.80	0.80 - 0.80	0.80 - 0.80	1.95 - 1.95
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	08/11/2018	08/11/2018	08/11/2018	08/11/2018	08/11/2018	08/11/2018
			SDG Ref	181108-13	181108-13	181108-13	181108-13	181108-13	181108-13
			Lab Sample No.(s)	18689483	18689487	18689421	18689474	18689430	18689478
			AGS Reference						
Dibromofluoromethane**	%	TM116		116	125	126	117	115	125
Toluene-d8**	%	TM116		97.5	100	101	99.9	98.6	96.6
4-Bromofluorobenzene**	%	TM116		74.4	76.9	84.7	75.7	84	78.7
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.2 M	<0.1 M	<0.1 M	<0.1 M	<2 M	<0.1 M
Benzene	<0.009 mg/kg	TM116		<0.18 M	<0.09 M	<0.09 M	<0.09 M	<1.8 M	<0.09 M
Toluene	<0.007 mg/kg	TM116		<0.14 M	<0.07 M	<0.07 M	<0.07 M	<1.4 M	<0.07 M
Ethylbenzene	<0.004 mg/kg	TM116		<0.08 M	<0.04 M	<0.04 M	<0.04 M	<0.8 M	<0.04 M
p/m-Xylene	<0.01 mg/kg	TM116		<0.2 #	<0.1 #	<0.1 #	<0.1 #	<2 #	<0.1 #
o-Xylene	<0.01 mg/kg	TM116		<0.2 M	<0.1 M	<0.1 M	<0.1 M	<2 M	<0.1 M
Naphthalene	<0.013 mg/kg	TM116		<0.26 M	<0.13 M	<0.13 M	<0.13 M	<2.6 M	<0.13 M
Sum of BTEX	<0.04 mg/kg	TM116		<0.8	<0.4	<0.4	<0.4	<8	<0.4

Validated

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-E3-V	4G-F1	4G-F1	4G-F2	4G-F3	4G-F3
			Depth (m)	2.20 - 2.20	0.50 - 0.50	1.00 - 1.00	0.50 - 0.50	0.20 - 0.20	0.60 - 0.60
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018	07/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	08/11/2018	08/11/2018	08/11/2018	08/11/2018	08/11/2018	08/11/2018
			SDG Ref	181108-13	181108-13	181108-13	181108-13	181108-13	181108-13
			Lab Sample No.(s)	18689437	18689416	18689455	18689464	18689441	18689447
			AGS Reference						
Dibromofluoromethane**	%	TM116		123	112	115	126	117	133
Toluene-d8**	%	TM116		101	98.6	98.9	100	96.2	100
4-Bromofluorobenzene**	%	TM116		83.1	79.2	70.4	81.1	70	84.5
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.2 M	<0.1 M
Benzene	<0.009 mg/kg	TM116		<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.18 M	<0.09 M
Toluene	<0.007 mg/kg	TM116		<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.14 M	<0.07 M
Ethylbenzene	<0.004 mg/kg	TM116		<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.08 M	<0.04 M
p/m-Xylene	<0.01 mg/kg	TM116		<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.2 #	<0.1 #
o-Xylene	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.2 M	<0.1 M
Naphthalene	<0.013 mg/kg	TM116		<0.13 M	<0.13 M	<0.13 M	<0.13 M	<0.26 M	<0.13 M
Sum of BTEX	<0.04 mg/kg	TM116		<0.4	<0.4	<0.4	<0.4	<0.8	<0.4

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-F1-V	4G-F2-V	4G-F3-V			
			Depth (m)	2.40 - 2.40	2.00 - 2.00	2.50 - 2.50			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	07/11/2018	07/11/2018	07/11/2018			
			Sample Time	00:00	00:00	00:00			
			Date Received	08/11/2018	08/11/2018	08/11/2018			
			SDG Ref	181108-13	181108-13	181108-13			
			Lab Sample No.(s)	18689459	18689468	18689451			
			AGS Reference						
Dibromofluoromethane**	%	TM116		125	115	128			
Toluene-d8**	%	TM116		101	99.3	100			
4-Bromofluorobenzene**	%	TM116		88	82.1	82.3			
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M			
Benzene	<0.009 mg/kg	TM116		<0.09 M	<0.09 M	<0.09 M			
Toluene	<0.007 mg/kg	TM116		<0.07 M	<0.07 M	<0.07 M			
Ethylbenzene	<0.004 mg/kg	TM116		<0.04 M	<0.04 M	<0.04 M			
p/m-Xylene	<0.01 mg/kg	TM116		<0.1 #	<0.1 #	<0.1 #			
o-Xylene	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M			
Naphthalene	<0.013 mg/kg	TM116		<0.13 M	<0.13 M	<0.13 M			
Sum of BTEX	<0.04 mg/kg	TM116		<0.4	<0.4	<0.4			

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

Asbestos Identification - Solid Samples

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-D2 0.40 - 0.40 SOLID 07/11/2018 00:00:00 08/11/2018 13:37:48 181108-13 18689483 TM048	09/11/2018	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-E2 0.80 - 0.80 SOLID 07/11/2018 00:00:00 08/11/2018 10:49:42 181108-13 18689474 TM048	09/11/2018	Lucy Caroe	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-E3 0.80 - 0.80 SOLID 07/11/2018 00:00:00 08/11/2018 09:19:07 181108-13 18689430 TM048	09/11/2018	Lucy Caroe	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-F1 0.50 - 0.50 SOLID 07/11/2018 00:00:00 08/11/2018 14:28:18 181108-13 18689416 TM048	09/11/2018	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-F2 0.50 - 0.50 SOLID 07/11/2018 00:00:00 08/11/2018 10:59:43 181108-13 18689464 TM048	09/11/2018	Lucy Caroe	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-F3 0.60 - 0.60 SOLID 07/11/2018 00:00:00 08/11/2018 09:14:57 181108-13 18689447 TM048	09/11/2018	Barbara Urbanek-Walsh	Loose fibres in soil.	Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

Asbestos Quantification - Full

		Additional Asbestos Components (Using TM048)	Analysts Comments	Asbestos Quantification - Gravimetric - %	Asbestos Quantification - PCOM Evaluation - %	Asbestos Quantification - Total - %
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-F3 0.60 - 0.60 SOLID 07/11/2018 00:00:00 08/11/2018 09:16:52 181108-13 18689447 TM304	None (#)	N/A	<0.001 (#)	<0.001 (#)	<0.001 (#)

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.096	**Natural Moisture Content (%)**	6.5
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	93.9
Particle Size <4mm	>95%		

Case	
SDG	181108-13
Lab Sample Number(s)	18689416
Sampled Date	07-Nov-2018
Customer Sample Ref.	4G-F1
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	0.0000215	<0.00001	0.000215	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00795	<0.0005	0.0795	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00173	<0.001	0.0173	<0.01	-	-	-
Copper	0.00208	<0.0003	0.0208	<0.003	-	-	-
Lead	0.00204	<0.0002	0.0204	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000546	<0.0004	0.00546	<0.004	-	-	-
Selenium	0.00127	<0.001	0.0127	<0.01	-	-	-
Vanadium	0.0606	<0.001	0.606	<0.01	-	-	-
Zinc	0.0015	<0.001	0.015	<0.01	-	-	-
Iron (Dis.Filt) mg/l	0.792	<0.019	7.92	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000249	<0.00001	0.000249	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	0.00014	<0.000005	0.0014	<0.00005	-	-	-
Fluoranthene by GCMS	0.00023	<0.000005	0.0023	<0.00005	-	-	-
Anthracene by GCMS	0.0000244	<0.000005	0.000244	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000442	<0.000005	0.000442	<0.00005	-	-	-
Fluorene by GCMS	0.00000622	<0.000005	0.0000622	<0.00005	-	-	-
Chrysene by GCMS	0.000214	<0.000005	0.00214	<0.00005	-	-	-
Pyrene by GCMS	0.000243	<0.000005	0.00243	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.000156	<0.000005	0.00156	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.000736	<0.000005	0.00736	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.000301	<0.000005	0.00301	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.000441	<0.000002	0.00441	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	0.000173	<0.000005	0.00173	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	0.00116	<0.000005	0.0116	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.000751	<0.000005	0.00751	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.00465	<0.000082	0.0465	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Nov-2018
pH (pH Units)	8.78
Conductivity (µS/cm)	97.10
Temperature (°C)	18.70
Volume Leachant (Litres)	0.894

Mcerts Certification does not apply to leachates

23/11/2018 15:54:02

15:53:36 23/11/2018

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.096	**Natural Moisture Content (%)**	6.5
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	93.9
Particle Size <4mm	>95%		

Case	
SDG	181108-13
Lab Sample Number(s)	18689416
Sampled Date	07-Nov-2018
Customer Sample Ref.	4G-F1
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Nov-2018
pH (pH Units)	8.78
Conductivity (µS/cm)	97.10
Temperature (°C)	18.70
Volume Leachant (Litres)	0.894

Mcerts Certification does not apply to leachates

23/11/2018 15:54:02

15:53:36 23/11/2018

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.102	**Natural Moisture Content (%)**	13.6
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	88
Particle Size <4mm	>95%		

Case	
SDG	181108-13
Lab Sample Number(s)	18689430
Sampled Date	07-Nov-2018
Customer Sample Ref.	4G-E3
Depth (m)	0.80 - 0.80

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00853	<0.0005	0.0853	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00175	<0.0003	0.0175	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	0.0145	<0.003	0.145	<0.03	-	-	-
Nickel	0.000743	<0.0004	0.00743	<0.004	-	-	-
Selenium	0.00124	<0.001	0.0124	<0.01	-	-	-
Vanadium	0.0226	<0.001	0.226	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.000015	<0.00001	0.00015	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000178	<0.000005	0.000178	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000204	<0.000005	0.000204	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	0.00000807	<0.000005	0.0000807	<0.00005	-	-	-
Pyrene by GCMS	0.0000169	<0.000005	0.000169	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.00000711	<0.000005	0.0000711	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000174	<0.000005	0.000174	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.00000797	<0.000005	0.0000797	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000992	<0.000002	0.0000992	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000121	<0.000082	0.00121	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Nov-2018
pH (pH Units)	8.25
Conductivity (µS/cm)	91.90
Temperature (°C)	18.40
Volume Leachant (Litres)	0.888

Mcerts Certification does not apply to leachates

23/11/2018 15:54:02

15:53:36 23/11/2018

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.102	**Natural Moisture Content (%)**	13.6
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	88
Particle Size <4mm	>95%		

Case	
SDG	181108-13
Lab Sample Number(s)	18689430
Sampled Date	07-Nov-2018
Customer Sample Ref.	4G-E3
Depth (m)	0.80 - 0.80

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Nov-2018
pH (pH Units)	8.25
Conductivity (µS/cm)	91.90
Temperature (°C)	18.40
Volume Leachant (Litres)	0.888

Mcerts Certification does not apply to leachates

23/11/2018 15:54:02

15:53:36 23/11/2018

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.101	**Natural Moisture Content (%)**	12.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	89
Particle Size <4mm	>95%		

Case	
SDG	181108-13
Lab Sample Number(s)	18689441
Sampled Date	07-Nov-2018
Customer Sample Ref.	4G-F3
Depth (m)	0.20 - 0.20

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00242	<0.0005	0.0242	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.000587	<0.0003	0.00587	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.0151	<0.001	0.151	<0.01	-	-	-
Zinc	0.00381	<0.001	0.0381	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.000029	<0.000005	0.00029	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000163	<0.000005	0.000163	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	0.0000109	<0.000005	0.000109	<0.00005	-	-	-
Pyrene by GCMS	0.0000328	<0.000005	0.000328	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000186	<0.000005	0.000186	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.00000744	<0.000005	0.0000744	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.0000086	<0.000002	0.000086	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000124	<0.000082	0.00124	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Nov-2018
pH (pH Units)	9.63
Conductivity (µS/cm)	84.70
Temperature (°C)	18.50
Volume Leachant (Litres)	0.889

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.101	**Natural Moisture Content (%)**	12.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	89
Particle Size <4mm	>95%		

Case	
SDG	181108-13
Lab Sample Number(s)	18689441
Sampled Date	07-Nov-2018
Customer Sample Ref.	4G-F3
Depth (m)	0.20 - 0.20

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Nov-2018
pH (pH Units)	9.63
Conductivity (µS/cm)	84.70
Temperature (°C)	18.50
Volume Leachant (Litres)	0.889

Mcerts Certification does not apply to leachates

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15:53:36 23/11/2018

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.091	**Natural Moisture Content (%)**	1.01
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	99
Particle Size <4mm	>95%		

Case	
SDG	181108-13
Lab Sample Number(s)	18689447
Sampled Date	07-Nov-2018
Customer Sample Ref.	4G-F3
Depth (m)	0.60 - 0.60

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	0.0000119	<0.00001	0.000119	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00067	<0.0005	0.0067	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00635	<0.001	0.0635	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	0.000934	<0.0002	0.00934	<0.002	-	-	-
Manganese	0.00973	<0.003	0.0973	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.021	<0.001	0.21	<0.01	-	-	-
Zinc	0.00368	<0.001	0.0368	<0.01	-	-	-
Iron (Dis.Filt) mg/l	0.34	<0.019	3.4	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000898	<0.00001	0.000898	<0.0001	-	-	-
Acenaphthene by GCMS	0.000145	<0.000005	0.00145	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.000773	<0.000005	0.00773	<0.00005	-	-	-
Anthracene by GCMS	0.0000813	<0.000005	0.000813	<0.00005	-	-	-
Phenanthrene by GCMS	0.000555	<0.000005	0.00555	<0.00005	-	-	-
Fluorene by GCMS	0.0000257	<0.000005	0.000257	<0.00005	-	-	-
Chrysene by GCMS	0.0000908	<0.000005	0.000908	<0.00005	-	-	-
Pyrene by GCMS	0.000866	<0.000005	0.00866	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.000056	<0.000005	0.00056	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000482	<0.000005	0.000482	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.0000196	<0.000005	0.000196	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.000012	<0.000002	0.00012	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	0.00000861	<0.000005	0.0000861	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	0.0000222	<0.000005	0.000222	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.00000778	<0.000005	0.0000778	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.0028	<0.000082	0.028	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	15-Nov-2018
pH (pH Units)	11.49
Conductivity (µS/cm)	1,220.00
Temperature (°C)	17.90
Volume Leachant (Litres)	0.899

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.091	**Natural Moisture Content (%)**	1.01
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	99
Particle Size <4mm	>95%		

Case	
SDG	181108-13
Lab Sample Number(s)	18689447
Sampled Date	07-Nov-2018
Customer Sample Ref.	4G-F3
Depth (m)	0.60 - 0.60

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	15-Nov-2018
pH (pH Units)	11.49
Conductivity (µS/cm)	1,220.00
Temperature (°C)	17.90
Volume Leachant (Litres)	0.899

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.102	**Natural Moisture Content (%)**	13.6
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	88
Particle Size <4mm	>95%		

Case	
SDG	181108-13
Lab Sample Number(s)	18689455
Sampled Date	07-Nov-2018
Customer Sample Ref.	4G-F1
Depth (m)	1.00 - 1.00

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.0125	<0.0005	0.125	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00128	<0.0003	0.0128	<0.003	-	-	-
Lead	0.00051	<0.0002	0.0051	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00067	<0.0004	0.0067	<0.004	-	-	-
Selenium	0.00337	<0.001	0.0337	<0.01	-	-	-
Vanadium	0.0709	<0.001	0.709	<0.01	-	-	-
Zinc	0.0012	<0.001	0.012	<0.01	-	-	-
Iron (Dis.Filt) mg/l	0.606	<0.019	6.06	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000118	<0.00001	0.000118	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000121	<0.000005	0.000121	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000199	<0.000005	0.000199	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.0000101	<0.000005	0.000101	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	<0.000082	<0.000082	<0.00082	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Nov-2018
pH (pH Units)	7.52
Conductivity (µS/cm)	86.60
Temperature (°C)	18.50
Volume Leachant (Litres)	0.888

Mcerts Certification does not apply to leachates

23/11/2018 15:54:02

15:53:36 23/11/2018

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.102	**Natural Moisture Content (%)**	13.6
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	88
Particle Size <4mm	>95%		

Case	
SDG	181108-13
Lab Sample Number(s)	18689455
Sampled Date	07-Nov-2018
Customer Sample Ref.	4G-F1
Depth (m)	1.00 - 1.00

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Nov-2018
pH (pH Units)	7.52
Conductivity (µS/cm)	86.60
Temperature (°C)	18.50
Volume Leachant (Litres)	0.888

Mcerts Certification does not apply to leachates

23/11/2018 15:54:02

15:53:36 23/11/2018

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.41
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	93.1
Particle Size <4mm	>95%		

Case	
SDG	181108-13
Lab Sample Number(s)	18689464
Sampled Date	07-Nov-2018
Customer Sample Ref.	4G-F2
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	0.0000127	<0.00001	0.000127	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.000544	<0.0005	0.00544	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00193	<0.001	0.0193	<0.01	-	-	-
Copper	0.00135	<0.0003	0.0135	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00111	<0.001	0.0111	<0.01	-	-	-
Vanadium	0.0772	<0.001	0.772	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000124	<0.00001	0.000124	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.000032	<0.000005	0.00032	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000251	<0.000005	0.000251	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.0000307	<0.000005	0.000307	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.0001	<0.000082	0.001	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Nov-2018
pH (pH Units)	10.94
Conductivity (µS/cm)	364.00
Temperature (°C)	18.30
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates

23/11/2018 15:54:02

15:53:36 23/11/2018

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.41
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	93.1
Particle Size <4mm	>95%		

Case	
SDG	181108-13
Lab Sample Number(s)	18689464
Sampled Date	07-Nov-2018
Customer Sample Ref.	4G-F2
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Nov-2018
pH (pH Units)	10.94
Conductivity (µS/cm)	364.00
Temperature (°C)	18.30
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates

23/11/2018 15:54:02

15:53:36 23/11/2018

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.101	**Natural Moisture Content (%)**	12.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	89
Particle Size <4mm	>95%		

Case	
SDG	181108-13
Lab Sample Number(s)	18689474
Sampled Date	07-Nov-2018
Customer Sample Ref.	4G-E2
Depth (m)	0.80 - 0.80

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.0026	<0.0005	0.026	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00204	<0.0003	0.0204	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00108	<0.001	0.0108	<0.01	-	-	-
Vanadium	0.00233	<0.001	0.0233	<0.01	-	-	-
Zinc	0.0084	<0.001	0.084	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.00000903	<0.000005	0.0000903	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000121	<0.000005	0.000121	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.00000591	<0.000005	0.0000591	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	<0.000082	<0.000082	<0.00082	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Nov-2018
pH (pH Units)	12.35
Conductivity (µS/cm)	111.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.889

Mcerts Certification does not apply to leachates

23/11/2018 15:54:02

15:53:36 23/11/2018

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.101	**Natural Moisture Content (%)**	12.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	89
Particle Size <4mm	>95%		

Case	
SDG	181108-13
Lab Sample Number(s)	18689474
Sampled Date	07-Nov-2018
Customer Sample Ref.	4G-E2
Depth (m)	0.80 - 0.80

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Nov-2018
pH (pH Units)	12.35
Conductivity (µS/cm)	111.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.889

Mcerts Certification does not apply to leachates

23/11/2018 15:54:02

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CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.102	**Natural Moisture Content (%)**	13.6
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	88
Particle Size <4mm	>95%		

Case	
SDG	181108-13
Lab Sample Number(s)	18689483
Sampled Date	07-Nov-2018
Customer Sample Ref.	4G-D2
Depth (m)	0.40 - 0.40

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	0.0000124	<0.00001	0.000124	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00577	<0.0005	0.0577	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00265	<0.001	0.0265	<0.01	-	-	-
Copper	0.00117	<0.0003	0.0117	<0.003	-	-	-
Lead	0.000249	<0.0002	0.00249	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.0319	<0.001	0.319	<0.01	-	-	-
Zinc	0.00194	<0.001	0.0194	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	0.0000166	<0.000005	0.000166	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000593	<0.000005	0.000593	<0.00005	-	-	-
Anthracene by GCMS	0.0000074	<0.000005	0.000074	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000259	<0.000005	0.000259	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	0.0000501	<0.000005	0.000501	<0.00005	-	-	-
Pyrene by GCMS	0.0000454	<0.000005	0.000454	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.0000324	<0.000005	0.000324	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.000105	<0.000005	0.00105	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.0000404	<0.000005	0.000404	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.0000372	<0.000002	0.000372	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	0.0000196	<0.000005	0.000196	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	0.0000737	<0.000005	0.000737	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.0000518	<0.000005	0.000518	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000565	<0.000082	0.00565	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Nov-2018
pH (pH Units)	9.02
Conductivity (µS/cm)	95.60
Temperature (°C)	18.20
Volume Leachant (Litres)	0.888

Mcerts Certification does not apply to leachates

23/11/2018 15:54:02

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CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.102	**Natural Moisture Content (%)**	13.6
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	88
Particle Size <4mm	>95%		

Case	
SDG	181108-13
Lab Sample Number(s)	18689483
Sampled Date	07-Nov-2018
Customer Sample Ref.	4G-D2
Depth (m)	0.40 - 0.40

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Nov-2018
pH (pH Units)	9.02
Conductivity (µS/cm)	95.60
Temperature (°C)	18.20
Volume Leachant (Litres)	0.888

Mcerts Certification does not apply to leachates

23/11/2018 15:54:02

15:53:36 23/11/2018

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.106	**Natural Moisture Content (%)**	17.6
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	85
Particle Size <4mm	>95%		

Case	
SDG	181108-13
Lab Sample Number(s)	18689487
Sampled Date	07-Nov-2018
Customer Sample Ref.	4G-D2
Depth (m)	0.80 - 0.80

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	0.0000103	<0.00001	0.000103	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00684	<0.0005	0.0684	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00126	<0.001	0.0126	<0.01	-	-	-
Copper	0.000961	<0.0003	0.00961	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00106	<0.001	0.0106	<0.01	-	-	-
Vanadium	0.0314	<0.001	0.314	<0.01	-	-	-
Zinc	0.00274	<0.001	0.0274	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000162	<0.000005	0.000162	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000122	<0.000005	0.000122	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	0.00000608	<0.000005	0.0000608	<0.00005	-	-	-
Pyrene by GCMS	0.0000142	<0.000005	0.000142	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.000029	<0.000005	0.00029	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.00000879	<0.000005	0.0000879	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000853	<0.000002	0.0000853	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.0000949	<0.000082	0.000949	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Nov-2018
pH (pH Units)	9.18
Conductivity (µS/cm)	88.40
Temperature (°C)	18.50
Volume Leachant (Litres)	0.884

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.106	**Natural Moisture Content (%)**	17.6
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	85
Particle Size <4mm	>95%		

Case	
SDG	181108-13
Lab Sample Number(s)	18689487
Sampled Date	07-Nov-2018
Customer Sample Ref.	4G-D2
Depth (m)	0.80 - 0.80

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	10-Nov-2018
pH (pH Units)	9.18
Conductivity (µS/cm)	88.40
Temperature (°C)	18.50
Volume Leachant (Litres)	0.884

Mcerts Certification does not apply to leachates

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Table of Results - Appendix

Method No	Reference	Description
PM001		Preparation of Samples for Metals Analysis
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM024	Method 4500A & B, AWWA/APHA, 20th Ed., 1999	Determination of Exchangeable Ammonium and Ammoniacal Nitrogen as N by titration on solids
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer
TM224	US EPA Method 6010B	Determination of Alkaline Metals by iCap 6500 Duo ICP-OES
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM243		Mixed Anions In Soils By Kone
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM304	HSE Contract research Report no 83/1996	Asbestos Quantification in Soil: Fibres identified by morphology only

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	181108-13	**Client Reference:**		**Report Number:**	482369
Location:	Llanwern	**Order Number:**	LLA512	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	18689483	18689487	18689421	18689474	18689430	18689478	18689437	18689416	18689455	18689464
Customer Sample Ref.	4G-D2	4G-D2	4G-D2-V	4G-E2	4G-E3	4G-E2-V	4G-E3-V	4G-F1	4G-F1	4G-F2
AGS Ref.										
Depth	0.40 - 0.40	0.80 - 0.80	1.80 - 1.80	0.80 - 0.80	0.80 - 0.80	1.95 - 1.95	2.20 - 2.20	0.50 - 0.50	1.00 - 1.00	0.50 - 0.50
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Alkali Metals by iCap-OES (Soil)	15-Nov-2018			13-Nov-2018	15-Nov-2018			16-Nov-2018		16-Nov-2018
Ammoniacal Nitrogen	21-Nov-2018	21-Nov-2018		21-Nov-2018	21-Nov-2018			21-Nov-2018	21-Nov-2018	21-Nov-2018
Ammonium Soil by Titration	23-Nov-2018	23-Nov-2018	23-Nov-2018	22-Nov-2018	22-Nov-2018	23-Nov-2018	23-Nov-2018	22-Nov-2018	22-Nov-2018	22-Nov-2018
Anions by Kone (soil)	20-Nov-2018			20-Nov-2018	12-Nov-2018			12-Nov-2018		12-Nov-2018
Asbestos ID in Solid Samples	09-Nov-2018			09-Nov-2018	09-Nov-2018			09-Nov-2018		09-Nov-2018
CEN 10:1 Leachate (1 Stage)	10-Nov-2018	10-Nov-2018		10-Nov-2018	10-Nov-2018			10-Nov-2018	10-Nov-2018	10-Nov-2018
CEN Readings	17-Nov-2018	17-Nov-2018		17-Nov-2018	17-Nov-2018			20-Nov-2018	20-Nov-2018	17-Nov-2018
Cyanide Comp/Free/Total/Thiocyanate	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018
Dissolved Metals by ICP-MS	22-Nov-2018	22-Nov-2018		22-Nov-2018	22-Nov-2018			22-Nov-2018	22-Nov-2018	22-Nov-2018
EPH CWG (Aliphatic) Aqueous GC (W)	16-Nov-2018	16-Nov-2018		17-Nov-2018	16-Nov-2018			16-Nov-2018	16-Nov-2018	17-Nov-2018
EPH CWG (Aliphatic) GC (S)	13-Nov-2018	13-Nov-2018	13-Nov-2018	12-Nov-2018	12-Nov-2018	12-Nov-2018	16-Nov-2018	13-Nov-2018	12-Nov-2018	12-Nov-2018
EPH CWG (Aromatic) Aqueous GC (W)	16-Nov-2018	16-Nov-2018		17-Nov-2018	16-Nov-2018			16-Nov-2018	16-Nov-2018	17-Nov-2018
EPH CWG (Aromatic) GC (S)	13-Nov-2018	13-Nov-2018	13-Nov-2018	12-Nov-2018	12-Nov-2018	12-Nov-2018	15-Nov-2018	13-Nov-2018	12-Nov-2018	12-Nov-2018
GRO by GC-FID (S)	20-Nov-2018	20-Nov-2018	20-Nov-2018	21-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	18-Nov-2018	18-Nov-2018	21-Nov-2018
GRO by GC-FID (W)	21-Nov-2018	21-Nov-2018		21-Nov-2018	18-Nov-2018			18-Nov-2018	18-Nov-2018	21-Nov-2018
Mercury Dissolved	19-Nov-2018	19-Nov-2018		19-Nov-2018	19-Nov-2018			19-Nov-2018	19-Nov-2018	19-Nov-2018
Metals in solid samples by OES	16-Nov-2018	22-Nov-2018	22-Nov-2018	14-Nov-2018	14-Nov-2018	22-Nov-2018	22-Nov-2018	14-Nov-2018	23-Nov-2018	13-Nov-2018
PAH by GCMS	12-Nov-2018	12-Nov-2018	12-Nov-2018	12-Nov-2018	12-Nov-2018	12-Nov-2018	12-Nov-2018	12-Nov-2018	12-Nov-2018	12-Nov-2018
PAH Spec MS - Aqueous (W)	16-Nov-2018	16-Nov-2018		16-Nov-2018	15-Nov-2018			16-Nov-2018	15-Nov-2018	16-Nov-2018
pH	22-Nov-2018	22-Nov-2018	22-Nov-2018	22-Nov-2018	22-Nov-2018	22-Nov-2018	21-Nov-2018	22-Nov-2018	22-Nov-2018	22-Nov-2018
pH Value	15-Nov-2018	15-Nov-2018		21-Nov-2018	15-Nov-2018			15-Nov-2018	15-Nov-2018	21-Nov-2018
Phenols by HPLC (S)	19-Nov-2018	19-Nov-2018	20-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	20-Nov-2018	19-Nov-2018	19-Nov-2018
Sample description	08-Nov-2018	08-Nov-2018	08-Nov-2018	08-Nov-2018	08-Nov-2018	08-Nov-2018	08-Nov-2018	08-Nov-2018	08-Nov-2018	08-Nov-2018
Total Organic Carbon	22-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018
Total Sulphate	14-Nov-2018			16-Nov-2018	14-Nov-2018			16-Nov-2018		16-Nov-2018
Total Sulphur	16-Nov-2018			20-Nov-2018	20-Nov-2018			20-Nov-2018		20-Nov-2018
TPH CWG (W)	21-Nov-2018	21-Nov-2018		21-Nov-2018	18-Nov-2018			18-Nov-2018	18-Nov-2018	21-Nov-2018
TPH CWG GC (S)	20-Nov-2018	20-Nov-2018	20-Nov-2018	21-Nov-2018	20-Nov-2018	20-Nov-2018	21-Nov-2018	18-Nov-2018	18-Nov-2018	21-Nov-2018
VOC MS (S)	21-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	22-Nov-2018	20-Nov-2018	21-Nov-2018	18-Nov-2018	18-Nov-2018	20-Nov-2018

Lab Sample No(s)	18689441	18689447	18689459	18689468	18689451
Customer Sample Ref.	4G-F3	4G-F3	4G-F1-V	4G-F2-V	4G-F3-V
AGS Ref.					
Depth	0.20 - 0.20	0.60 - 0.60	2.40 - 2.40	2.00 - 2.00	2.50 - 2.50
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Alkali Metals by iCap-OES (Soil)		16-Nov-2018			
Ammoniacal Nitrogen	21-Nov-2018	20-Nov-2018			
Ammonium Soil by Titration	22-Nov-2018	22-Nov-2018	22-Nov-2018	23-Nov-2018	23-Nov-2018
Anions by Kone (soil)		12-Nov-2018			
Asbestos ID in Solid Samples		09-Nov-2018			
Asbestos Quantification - Full		20-Nov-2018			
CEN 10:1 Leachate (1 Stage)	10-Nov-2018	15-Nov-2018			
CEN Readings	20-Nov-2018	16-Nov-2018			
Cyanide Comp/Free/Total/Thiocyanate	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018
Dissolved Metals by ICP-MS	22-Nov-2018	22-Nov-2018			
EPH CWG (Aliphatic) Aqueous GC (W)	16-Nov-2018	21-Nov-2018			
EPH CWG (Aliphatic) GC (S)	16-Nov-2018	13-Nov-2018	12-Nov-2018	19-Nov-2018	13-Nov-2018
EPH CWG (Aromatic) Aqueous GC (W)	16-Nov-2018	21-Nov-2018			
EPH CWG (Aromatic) GC (S)	15-Nov-2018	13-Nov-2018	12-Nov-2018	19-Nov-2018	13-Nov-2018
GRO by GC-FID (S)	20-Nov-2018	20-Nov-2018	22-Nov-2018	18-Nov-2018	20-Nov-2018
GRO by GC-FID (W)	13-Nov-2018	18-Nov-2018			
Mercury Dissolved	19-Nov-2018	19-Nov-2018			
Metals in solid samples by OES	23-Nov-2018	16-Nov-2018	23-Nov-2018	23-Nov-2018	22-Nov-2018
PAH by GCMS	12-Nov-2018	12-Nov-2018	14-Nov-2018	12-Nov-2018	12-Nov-2018
PAH Spec MS - Aqueous (W)	15-Nov-2018	20-Nov-2018			
pH	21-Nov-2018	22-Nov-2018	22-Nov-2018	22-Nov-2018	22-Nov-2018
pH Value	15-Nov-2018	22-Nov-2018			
Phenols by HPLC (S)	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018	19-Nov-2018
Sample description	08-Nov-2018	08-Nov-2018	08-Nov-2018	08-Nov-2018	08-Nov-2018
Total Organic Carbon	21-Nov-2018	22-Nov-2018	21-Nov-2018	21-Nov-2018	22-Nov-2018
Total Sulphate		14-Nov-2018			
Total Sulphur		21-Nov-2018			
TPH CWG (W)	16-Nov-2018	21-Nov-2018			
TPH CWG GC (S)	20-Nov-2018	20-Nov-2018	22-Nov-2018	19-Nov-2018	20-Nov-2018
VOC MS (S)	21-Nov-2018	20-Nov-2018	21-Nov-2018	18-Nov-2018	20-Nov-2018

Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
5	**Samples exceeded holding time before presevation was performed**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

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Hawarden
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Tel: (01244) 528700
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Website: www.alsenvironmental.co.uk

Atkins Global Ltd
Project Jonah site office
Llan Coed House
Suite 24
Coed Darcy
Llandarcy
SA10 6HJ

Attention: John Fitzgerald

CERTIFICATE OF ANALYSIS

Date:	05 December 2018
Customer:	H_ATKINS_LDC
Sample Delivery Group (SDG):	181114-83
Your Reference:	
Location:	Llanwern
Report No:	484045

We received 23 samples on Wednesday November 14, 2018 and 23 of these samples were scheduled for analysis which was completed on Wednesday December 05, 2018. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:



Sonia McWhan

Operations Manager

ALS Life Sciences Limited. Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18733119	4G-D3		0.20 - 0.20	13/11/2018
18733124	4G-D3		0.50 - 0.50	13/11/2018
18733095	4G-D4		0.20 - 0.20	13/11/2018
18733099	4G-D4		0.50 - 0.50	13/11/2018
18733084	4G-D5		0.50 - 0.50	13/11/2018
18733005	4G-D6		0.20 - 0.20	13/11/2018
18733106	4G-D6		0.60 - 0.60	13/11/2018
18733131	4G-D3-V		1.80 - 1.80	13/11/2018
18733112	4G-D4-V		1.70 - 1.70	13/11/2018
18733089	4G-D5-V		1.70 - 1.70	13/11/2018
18733139	4G-D6-V		1.70 - 1.70	13/11/2018
18733046	4G-E5		0.20 - 0.20	13/11/2018
18733057	4G-E5		0.60 - 0.60	13/11/2018
18733146	4G-E6		0.30 - 0.30	13/11/2018
18733151	4G-E6		0.50 - 0.50	13/11/2018
18733071	4G-E5-V		3.00 - 3.00	13/11/2018
18733158	4G-E6-V		2.20 - 2.20	13/11/2018
18733163	4G-F6		0.40 - 0.40	13/11/2018
18733168	4G-F6		0.60 - 0.60	13/11/2018
18733173	4G-F6		1.20 - 1.20	13/11/2018
18733019	4G-F6-V		2.70 - 2.70	13/11/2018
18733028	4G-G6		0.30 - 0.30	13/11/2018
18733037	4G-G6		0.50 - 0.50	13/11/2018

Maximum Sample/Coolbox Temperature (°C) :

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

9.2

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	18733119			18733124			18733095			18733099			18733084			18733005			18733106
			Customer Sample Reference	4G-D3			4G-D3			4G-D4			4G-D4			4G-D5			4G-D6			4G-D6
			AGS Reference																			
			Depth (m)	0.20 - 0.20			0.50 - 0.50			0.20 - 0.20			0.50 - 0.50			0.50 - 0.50			0.20 - 0.20			0.60 - 0.60
			Container	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB
			Sample Type	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Alkali Metals by iCap-OES (Soil)	All	NDPs: 0 Tests: 9						X						X			X					
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 16		X			X			X			X			X			X			X
Ammonium Soil by Titration	All	NDPs: 0 Tests: 23			X			X			X			X			X			X		
Anions by Kone (soil)	All	NDPs: 0 Tests: 9						X						X			X					
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 9					X						X			X						X
Asbestos Quantification - Full	All	NDPs: 0 Tests: 2														X						
Calorific Value (S)*	All	NDPs: 0 Tests: 1																				
CEN Readings	All	NDPs: 0 Tests: 16		X			X			X			X			X			X			X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 39		X	X		X	X		X	X		X	X		X	X		X	X		X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 16		X			X			X			X			X			X			X
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 16		X			X			X			X			X			X			X
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 23			X			X			X			X			X			X		
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 16		X			X			X			X			X			X			X
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 23			X			X			X			X			X			X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 23				X			X			X			X			X				X	

18733151	4G-E6		0.50 - 0.50	250g Amber Jar (ALE210)	S			X				X		X			X		X	
				1kg TUB	S		X						X	X	X	X		X		
18733146	4G-E6		0.30 - 0.30	60g VOC (ALE215)	S															X
				250g Amber Jar (ALE210)	S	X		X	X					X			X		X	
				1kg TUB	S		X			X			X	X	X	X		X		
18733057	4G-E5		0.60 - 0.60	60g VOC (ALE215)	S															X
				250g Amber Jar (ALE210)	S			X						X			X		X	
				1kg TUB	S		X						X	X	X	X		X		
18733046	4G-E5		0.20 - 0.20	60g VOC (ALE215)	S															X
				250g Amber Jar (ALE210)	S	X		X	X					X			X		X	
				1kg TUB	S		X			X	X		X	X	X	X		X		
18733139	4G-D6-V		1.70 - 1.70	60g VOC (ALE215)	S															X
				250g Amber Jar (ALE210)	S			X						X			X		X	
18733089	4G-D5-V		1.70 - 1.70	60g VOC (ALE215)	S															X
				250g Amber Jar (ALE210)	S			X						X			X		X	
18733112	4G-D4-V		1.70 - 1.70	60g VOC (ALE215)	S															X
				250g Amber Jar (ALE210)	S			X						X			X		X	
18733131	4G-D3-V		1.80 - 1.80	60g VOC (ALE215)	S															X
				250g Amber Jar (ALE210)	S			X						X			X		X	
18733106	4G-D6		0.60 - 0.60	60g VOC (ALE215)	S															X
				250g Amber Jar (ALE210)	S	X		X	X					X			X		X	

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)																			
			18733119			18733124			18733095			18733099			18733084			18733005			18733106	
			Customer Sample Reference																			
			4G-D3			4G-D3			4G-D4			4G-D4			4G-D5			4G-D6			4G-D6	
			AGS Reference																			
			Depth (m)			0.20 - 0.20			0.50 - 0.50			0.20 - 0.20			0.50 - 0.50			0.50 - 0.50			0.20 - 0.20		
			Container	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB
			Sample Type	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
GRO by GC-FID (W)	All	NDPs: 0 Tests: 16		X			X			X			X			X			X			X
Mercury Dissolved	All	NDPs: 0 Tests: 16		X			X			X			X			X			X			X
Metals in solid samples by OES	All	NDPs: 0 Tests: 23			X			X			X			X			X			X		
PAH by GCMS	All	NDPs: 0 Tests: 23			X			X			X			X			X			X		
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 16		X			X			X			X			X			X			X
pH	All	NDPs: 0 Tests: 23			X			X			X			X			X			X		
pH Value	All	NDPs: 0 Tests: 16		X			X			X			X			X			X			X
Phenols by HPLC (S)	All	NDPs: 0 Tests: 23			X			X			X			X			X			X		
Sample description	All	NDPs: 0 Tests: 23			X			X			X			X			X			X		
Total Organic Carbon	All	NDPs: 1 Tests: 22			X			X			X			X			X			X		
Total Sulphate	All	NDPs: 0 Tests: 9						X						X			X					
Total Sulphur	All	NDPs: 0 Tests: 9						X						X			X					
TPH CWG (W)	All	NDPs: 0 Tests: 16		X			X			X			X			X			X			X
TPH CWG GC (S)	All	NDPs: 0 Tests: 23			X			X			X			X			X			X		
VOC MS (S)	All	NDPs: 0 Tests: 23				X			X			X			X			X			X		

18733151	4G-E6		0.50 - 0.50	250g Amber Jar (ALE210)	S			X	X		X		X	X	N					X	
				1kg TUB	S	X	X			X		X							X		
18733146	4G-E6		0.30 - 0.30	60g VOC (ALE215)	S																X
				250g Amber Jar (ALE210)	S			X	X		X		X	X		X	X	X		X	
				1kg TUB	S	X	X			X		X							X		
18733057	4G-E5		0.60 - 0.60	60g VOC (ALE215)	S																X
				250g Amber Jar (ALE210)	S			X	X		X		X	X		X				X	
				1kg TUB	S	X	X			X		X							X		
18733046	4G-E5		0.20 - 0.20	60g VOC (ALE215)	S																X
				250g Amber Jar (ALE210)	S			X	X		X		X	X		X	X	X		X	
				1kg TUB	S	X	X			X		X							X		
18733139	4G-D6-V		1.70 - 1.70	60g VOC (ALE215)	S																X
				250g Amber Jar (ALE210)	S			X	X		X		X	X		X				X	
18733089	4G-D5-V		1.70 - 1.70	60g VOC (ALE215)	S																X
				250g Amber Jar (ALE210)	S			X	X		X		X	X		X				X	
18733112	4G-D4-V		1.70 - 1.70	60g VOC (ALE215)	S																X
				250g Amber Jar (ALE210)	S			X	X		X		X	X		X				X	
18733131	4G-D3-V		1.80 - 1.80	60g VOC (ALE215)	S																X
				250g Amber Jar (ALE210)	S			X	X		X		X	X		X				X	
18733106	4G-D6		0.60 - 0.60	60g VOC (ALE215)	S																X
				250g Amber Jar (ALE210)	S			X	X		X		X	X		X	X	X		X	

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			18733151	18733071		18733158		18733163			18733168			18733173			18733019		18733028	
Customer Sample Reference			4G-E6	4G-E5-V		4G-E6-V		4G-F6			4G-F6			4G-F6			4G-F6-V		4G-G6	
AGS Reference																				
Depth (m)			0.50 - 0.50	3.00 - 3.00		2.20 - 2.20		0.40 - 0.40			0.60 - 0.60			1.20 - 1.20			2.70 - 2.70		0.30 - 0.30	
Container			60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Type			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Alkali Metals by iCap-OES (Soil)	All	NDPs: 0 Tests: 9							X						X					X	
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 16						X			X			X					X		
Ammonium Soil by Titration	All	NDPs: 0 Tests: 23		X		X			X			X			X		X			X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 9							X						X					X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 9						X						X					X		
CEN Readings	All	NDPs: 0 Tests: 16						X			X			X					X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 39		X		X		X	X		X	X		X	X		X		X	X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 16						X			X			X					X		
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 16						X			X			X					X		
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 23		X		X			X			X			X		X			X	
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 16						X			X			X					X		
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 23		X		X			X			X			X		X			X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 23	X		X		X			X			X			X		X			X
GRO by GC-FID (W)	All	NDPs: 0 Tests: 16						X			X			X					X		
Mercury Dissolved	All	NDPs: 0 Tests: 16						X			X			X					X		

18733037	4G-G6		0.50 - 0.50	60g VOC (ALE215)	S																									X					
				250g Amber Jar (ALE210)	S						X								X						X				X						
				1kg TUB	S				X								X		X		X		X				X						X		X

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
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UNL - Unspecified Liquid
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G - Gas
OTH - Other

Lab Sample No(s)			18733151	18733071		18733158		18733163			18733168			18733173			18733019		18733028	
Customer Sample Reference			4G-E6	4G-E5-V		4G-E6-V		4G-F6			4G-F6			4G-F6			4G-F6-V		4G-G6	
AGS Reference																				
Depth (m)			0.50 - 0.50	3.00 - 3.00		2.20 - 2.20		0.40 - 0.40			0.60 - 0.60			1.20 - 1.20			2.70 - 2.70		0.30 - 0.30	
Container			60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Type			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Metals in solid samples by OES	All	NDPs: 0 Tests: 23		X		X			X			X			X		X			X	
PAH by GCMS	All	NDPs: 0 Tests: 23		X		X			X			X			X		X			X	
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 16						X			X			X					X		
pH	All	NDPs: 0 Tests: 23		X		X			X			X			X		X			X	
pH Value	All	NDPs: 0 Tests: 16						X			X			X					X		
Phenols by HPLC (S)	All	NDPs: 0 Tests: 23		X		X			X			X			X		X			X	
Sample description	All	NDPs: 0 Tests: 23		X		X			X			X			X		X			X	
Total Organic Carbon	All	NDPs: 1 Tests: 22		X		X			X			X			X		X			X	
Total Sulphate	All	NDPs: 0 Tests: 9							X						X					X	
Total Sulphur	All	NDPs: 0 Tests: 9							X						X					X	
TPH CWG (W)	All	NDPs: 0 Tests: 16						X			X			X					X		
TPH CWG GC (S)	All	NDPs: 0 Tests: 23		X		X			X			X			X		X			X	
VOC MS (S)	All	NDPs: 0 Tests: 23	X		X		X			X			X			X		X			X

18733037	4G-G6		0.50 - 0.50	60g VOC (ALE215)	S																										X
				250g Amber Jar (ALE210)	S		X		X				X				X		X		X								X		
				1kg TUB	S						X				X												X				

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
18733119	4G-D3	0.20 - 0.20	Dark Brown	Sandy Loam	Vegetation	Stones
18733124	4G-D3	0.50 - 0.50	Dark Brown	Loamy Sand	Vegetation	Stones
18733095	4G-D4	0.20 - 0.20	Dark Brown	Sandy Loam	Vegetation	Stones
18733099	4G-D4	0.50 - 0.50	Dark Brown	Sandy Loam	Vegetation	Stones
18733084	4G-D5	0.50 - 0.50	Dark Brown	Loamy Sand	Stones	None
18733005	4G-D6	0.20 - 0.20	Dark Brown	Loamy Sand	Stones	None
18733106	4G-D6	0.60 - 0.60	Dark Brown	Sandy Loam	Vegetation	Stones
18733131	4G-D3-V	1.80 - 1.80	Dark Brown	Sandy Clay Loam	None	None
18733112	4G-D4-V	1.70 - 1.70	Dark Brown	Loamy Sand	Stones	Concrete/Aggregate
18733089	4G-D5-V	1.70 - 1.70	Light Brown	Clay	Stones	None
18733139	4G-D6-V	1.70 - 1.70	Light Brown	Clay	None	None
18733046	4G-E5	0.20 - 0.20	Dark Brown	Sandy Loam	Vegetation	Stones
18733057	4G-E5	0.60 - 0.60	Dark Brown	Sandy Loam	Vegetation	Stones
18733146	4G-E6	0.30 - 0.30	Dark Brown	Sandy Loam	Vegetation	Stones
18733151	4G-E6	0.50 - 0.50	Dark Brown	Sandy Loam	Vegetation	Stones
18733071	4G-E5-V	3.00 - 3.00	Grey	Clay	None	None
18733158	4G-E6-V	2.20 - 2.20	Dark Brown	Loamy Sand	Vegetation	Stones
18733163	4G-F6	0.40 - 0.40	Dark Brown	Loamy Sand	Vegetation	Stones
18733168	4G-F6	0.60 - 0.60	Dark Brown	Sandy Loam	Vegetation	Stones
18733173	4G-F6	1.20 - 1.20	Dark Brown	Sandy Loam	Vegetation	Stones
18733019	4G-F6-V	2.70 - 2.70	Dark Brown	Loamy Sand	Vegetation	Stones
18733028	4G-G6	0.30 - 0.30	Dark Brown	Sandy Loam	Vegetation	Stones
18733037	4G-G6	0.50 - 0.50	Dark Brown	Sandy Loam	Vegetation	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-D3	4G-D3	4G-D4	4G-D4	4G-D5	4G-D6
			Depth (m)	0.20 - 0.20	0.50 - 0.50	0.20 - 0.20	0.50 - 0.50	0.50 - 0.50	0.20 - 0.20
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018
			SDG Ref	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83
			Lab Sample No.(s)	18733119	18733124	18733095	18733099	18733084	18733005
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		9	11	8.6	17	11	8.5
Exchangeable Ammonia as N	<12 mg/kg	TM024		<12 M	<12 M	<12 M	71.6 M	<12 M	141 M
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M
Sulphur, Total	<0.02 %	TM132			0.128		<0.02	0.212	
Sulphate, Total potential	<0.06 %	TM132			0.384		0.06	0.636	
Soil Organic Matter (SOM)	<0.35 %	TM132		20.9 #	0.459 #	10.7 #	3.02 #	18.8 #	7.88 #
pH	1 pH Units	TM133		9.04 M	9.2 M	8.8 M	7.99 M	9 M	11.5 M
Cyanide, Total	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	2.8 M	<1 M
Cyanide, Free	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Arsenic	<0.6 mg/kg	TM181		9.39 M	14.3 M	8.57 M	12.3 M	10.5 M	8.24 M
Cadmium	<0.02 mg/kg	TM181		<0.2 M	<0.2 M	<0.02 M	<0.02 M	<0.2 M	<0.02 M
Chromium	<0.9 mg/kg	TM181		21 M	360 M	2.8 M	24.7 M	18.1 M	43.3 M
Copper	<1.4 mg/kg	TM181		17.2 M	69.7 M	17.2 M	8.2 M	28 M	9.53 M
Iron	<1000 mg/kg	TM181		124000 #	64700 #	72200 #	30400 #	95800 #	48600 #
Lead	<0.7 mg/kg	TM181		39.7 M	89 M	47.8 M	21.5 M	82.9 M	32.6 M
Manganese	<0.13 mg/kg	TM181		5490 M	19100 M	7400 M	778 M	3770 M	4370 M
Mercury	<0.14 mg/kg	TM181		<1.4 M	<1.4 M	<0.14 M	<0.14 M	<1.4 M	<0.14 M
Nickel	<0.2 mg/kg	TM181		23.1 M	32.3 M	13.1 M	29.3 M	27.3 M	9.47 M
Selenium	<1 mg/kg	TM181		<10 #	11.6 #	2.69 #	<1 #	<10 #	1.7 #
Vanadium	<0.2 mg/kg	TM181		50.8 #	515 #	27.5 #	46.1 #	54.2 #	73.5 #
Zinc	<1.9 mg/kg	TM181		149 M	289 M	156 M	102 M	320 M	398 M
Sulphate, acid soluble (total)	<0.02 %	TM221			0.0815		0.0317	0.207	
Calcium	<21 mg/kg	TM224			113000		43300	109000	
Magnesium	<8 mg/kg	TM224			9540		9360	14400	
Soluble Sulphate 2:1 extract as SO4 BRE	<0.004 g/l	TM243			0.0402 M		0.0211 M	0.0717 M	
Asbestos Quantification - Gravimetric - %	<0.001 %	TM304						0.0034 #	
Asbestos Quantification - PCOM Evaluation - %	<0.001 %	TM304						<0.001 #	
Additional Asbestos Components (Using TM048)		TM304						Chrysotile detected. #	
Analysts Comments		TM304						Loose fibres in soil.	
Asbestos Quantification - Total - %	<0.001 %	TM304						0.0035 #	

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-D6	4G-D3-V	4G-D4-V	4G-D5-V	4G-D6-V	4G-E5
			Depth (m)	0.60 - 0.60	1.80 - 1.80	1.70 - 1.70	1.70 - 1.70	1.70 - 1.70	0.20 - 0.20
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018
			SDG Ref	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83
			Lab Sample No.(s)	18733106	18733131	18733112	18733089	18733139	18733046
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		21	24	9.4	32	22	14
Exchangeable Ammonia as N	<12 mg/kg	TM024		<12 M	29 M	20.9 M	271 M	48.5 M	<12 M
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M
Sulphur, Total	<0.02 %	TM132		0.534					0.189
Sulphate, Total potential	<0.06 %	TM132		1.6					0.567
Soil Organic Matter (SOM)	<0.35 %	TM132		>100 #	0.56 #	9.1 #	4.93 #	0.765 #	13.7 #
pH	1 pH Units	TM133		10.4 M	8.38 M	8.69 M	6.79 M	8.5 M	9.99 M
Cyanide, Total	<1 mg/kg	TM153		2.41 M	<1 M	<1 M	<1 M	<1 M	<1 M
Cyanide, Free	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Arsenic	<0.6 mg/kg	TM181		7.93 M	12.2 M	10.1 M	15.9 M	11.2 M	10.6 M
Cadmium	<0.02 mg/kg	TM181		0.15 M	0.277 M	0.505 M	<0.02 M	<0.02 M	<0.2 M
Chromium	<0.9 mg/kg	TM181		7.04 M	23.5 M	10 M	35 M	25.2 M	58.5 M
Copper	<1.4 mg/kg	TM181		28.6 M	10.1 M	33.2 M	16.4 M	8.94 M	19.6 M
Iron	<1000 mg/kg	TM181		23800 #	25900 #	38500 #	25400 #	31100 #	101000 #
Lead	<0.7 mg/kg	TM181		45.2 M	20.6 M	31.6 M	40.2 M	22.2 M	84.1 M
Manganese	<0.13 mg/kg	TM181		574 M	917 M	1850 M	268 M	1190 M	4010 M
Mercury	<0.14 mg/kg	TM181		0.575 M	<0.14 M	<0.14 M	<0.14 M	<0.14 M	<1.4 M
Nickel	<0.2 mg/kg	TM181		11.8 M	29.3 M	21.9 M	29.7 M	31.9 M	24 M
Selenium	<1 mg/kg	TM181		<1 #	<1 #	2.57 #	<1 #	<1 #	<10 #
Vanadium	<0.2 mg/kg	TM181		17.5 #	41.7 #	34.8 #	53.1 #	43.7 #	85.4 #
Zinc	<1.9 mg/kg	TM181		225 M	94.3 M	78.1 M	139 M	90.7 M	353 M
Sulphate, acid soluble (total)	<0.02 %	TM221		0.0633					<0.2
Calcium	<21 mg/kg	TM224		14700					130000
Magnesium	<8 mg/kg	TM224		1570					17600
Soluble Sulphate 2:1 extract as SO4 BRE	<0.004 g/l	TM243		0.0339 M					0.103 M
Asbestos Quantification - Gravimetric - %	<0.001 %	TM304							<0.001 #
Asbestos Quantification - PCOM Evaluation - %	<0.001 %	TM304							<0.001 #
Additional Asbestos Components (Using TM048)		TM304							None #
Analysts Comments		TM304							No
Asbestos Quantification - Total - %	<0.001 %	TM304							<0.001 #

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-E5	4G-E6	4G-E6	4G-E5-V	4G-E6-V	4G-F6
			Depth (m)	0.60 - 0.60	0.30 - 0.30	0.50 - 0.50	3.00 - 3.00	2.20 - 2.20	0.40 - 0.40
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018
			SDG Ref	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83
			Lab Sample No.(s)	18733057	18733146	18733151	18733071	18733158	18733163
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		24	14	25	25	26	6.7
Gross Calorific Value in Dry Matter Q(V/gr/d)	<0.5 MJ/kg	SUB				9.54			
Gross Calorific Value Original Q(V/gr/ar)	<0.5 MJ/kg	SUB				8.52			
Net Calorific Value in Dry Matter Q(V/net/d)	<0.5 MJ/kg	SUB				9.41			
Net Calorific Value in Original Q(V/net/ar)	<0.5 MJ/kg	SUB				8.16			
Water Analytical M (ad)	<0.5 %	SUB				0.69			
Water Gross M(ex)	<0.5 %	SUB				10			
Water Total M(ar)	<0.5 %	SUB				10.7			
Exchangeable Ammonia as N	<12 mg/kg	TM024		<12 M	<12 M	<12 M	105 M	331 M	<12 M
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M	0.0117 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)		<0.01 M	0.0117 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M
Sulphur, Total	<0.02 %	TM132			0.284				0.182
Sulphate, Total potential	<0.06 %	TM132			0.852				0.546
Soil Organic Matter (SOM)	<0.35 %	TM132		>100 #	24.8 #		0.94 #	1.9 #	18.6 #
pH	1 pH Units	TM133		9.21 M	11.1 M	8.61 M	8.2 M	7.14 M	11 M
Cyanide, Total	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Cyanide, Free	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Arsenic	<0.6 mg/kg	TM181		6.73 M	7.12 M	5.96 M	12.8 M	15.4 M	8.24 M
Cadmium	<0.02 mg/kg	TM181		<0.2 M	<0.2 M	<0.02 M	<0.02 M	<0.02 M	<0.2 M
Chromium	<0.9 mg/kg	TM181		<9 M	446 M	3.08 M	24.9 M	30.6 M	<9 M
Copper	<1.4 mg/kg	TM181		<14 M	18.6 M	23.2 M	7.9 M	11.2 M	15.8 M
Iron	<1000 mg/kg	TM181		59400 #	113000 #	8800 #	31300 #	36700 #	173000 #
Lead	<0.7 mg/kg	TM181		8.2 M	58.6 M	12.2 M	23 M	29.3 M	29.3 M
Manganese	<0.13 mg/kg	TM181		1060 M	16700 M	164 M	1170 M	472 M	3380 M
Mercury	<0.14 mg/kg	TM181		<1.4 M	<1.4 M	0.81 M	<0.14 M	<0.14 M	<1.4 M
Nickel	<0.2 mg/kg	TM181		11.7 M	18.1 M	8.3 M	30.3 M	34.7 M	31 M
Selenium	<1 mg/kg	TM181		<10 #	10.4 #	<1 #	<1 #	<1 #	<10 #
Vanadium	<0.2 mg/kg	TM181		18 #	327 #	8.23 #	44.3 #	55 #	87.7 #
Zinc	<1.9 mg/kg	TM181		25.1 M	206 M	23.7 M	95.1 M	107 M	160 M
Sulphate, acid soluble (total)	<0.02 %	TM221			0.375				0.213
Calcium	<21 mg/kg	TM224			160000				142000

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			4G-E5	0.60 - 0.60	Soil/Solid (S)	13/11/2018	00:00	14/11/2018	181114-83	18733057	
			4G-E6	0.30 - 0.30	Soil/Solid (S)	13/11/2018	00:00	14/11/2018	181114-83	18733146	
			4G-E6	0.50 - 0.50	Soil/Solid (S)	13/11/2018	00:00	14/11/2018	181114-83	18733151	
			4G-E5-V	3.00 - 3.00	Soil/Solid (S)	13/11/2018	00:00	14/11/2018	181114-83	18733071	
			4G-E6-V	2.20 - 2.20	Soil/Solid (S)	13/11/2018	00:00	14/11/2018	181114-83	18733158	
			4G-F6	0.40 - 0.40	Soil/Solid (S)	13/11/2018	00:00	14/11/2018	181114-83	18733163	
Magnesium	<8 mg/kg	TM224			18700					11000	
Soluble Sulphate 2:1 extract as SO4 BRE	<0.004 g/l	TM243			0.169 M					0.108 M	

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-F6	4G-F6	4G-F6-V	4G-G6	4G-G6
			Depth (m)	0.60 - 0.60	1.20 - 1.20	2.70 - 2.70	0.30 - 0.30	0.50 - 0.50
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00
			Date Received	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018
			SDG Ref	181114-83	181114-83	181114-83	181114-83	181114-83
			Lab Sample No.(s)	18733168	18733173	18733019	18733028	18733037
			AGS Reference					
Moisture Content Ratio (% of as received sample)	%	PM024		6.7	7.6	25	7.3	6.5
Exchangeable Ammonia as N	<12 mg/kg	TM024		<12 M	<12 M	115 M	<12 M	<12 M
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M
Sulphur, Total	<0.02 %	TM132			0.265		0.916	
Sulphate, Total potential	<0.06 %	TM132			0.795		2.75	
Soil Organic Matter (SOM)	<0.35 %	TM132		4.93 #	12.5 #	1.3 #	0.712 #	1.72 #
pH	1 pH Units	TM133		12.2 M	10.7 M	7.88 M	10.4 M	9.82 M
Cyanide, Total	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M
Cyanide, Free	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M
Arsenic	<0.6 mg/kg	TM181		10.1 M	11.6 M	12.9 M	2.38 M	14.2 M
Cadmium	<0.02 mg/kg	TM181		<0.2 M	<0.2 M	<0.02 M	<0.02 M	<0.2 M
Chromium	<0.9 mg/kg	TM181		<9 M	19.1 M	31.9 M	17.8 M	<9 M
Copper	<1.4 mg/kg	TM181		15.2 M	17.6 M	10.8 M	<1.4 M	<14 M
Iron	<1000 mg/kg	TM181		264000 #	155000 #	32900 #	13200 #	231000 #
Lead	<0.7 mg/kg	TM181		32.1 M	40.9 M	26.7 M	3.57 M	25.1 M
Manganese	<0.13 mg/kg	TM181		3880 M	3530 M	626 M	4010 M	7140 M
Mercury	<0.14 mg/kg	TM181		<1.4 M	<1.4 M	<0.14 M	<0.14 M	<1.4 M
Nickel	<0.2 mg/kg	TM181		32.8 M	24.2 M	37.3 M	1.36 M	23.7 M
Selenium	<1 mg/kg	TM181		<10 #	<10 #	<1 #	3.57 #	<10 #
Vanadium	<0.2 mg/kg	TM181		112 #	96.1 #	54.6 #	40 #	76.2 #
Zinc	<1.9 mg/kg	TM181		195 M	167 M	103 M	11.8 M	134 M
Sulphate, acid soluble (total)	<0.02 %	TM221			0.212		0.736	
Calcium	<21 mg/kg	TM224			157000		263000	
Magnesium	<8 mg/kg	TM224			31700		41800	
Soluble Sulphate 2:1 extract as SO4 BRE	<0.004 g/l	TM243			0.0796 M		1.51 M	

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-D3	4G-D3	4G-D4	4G-D4	4G-D5	4G-D6
			Depth (m)	0.20 - 0.20	0.50 - 0.50	0.20 - 0.20	0.50 - 0.50	0.50 - 0.50	0.20 - 0.20
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018
			SDG Ref	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83
			Lab Sample No.(s)	18733119	18733124	18733095	18733099	18733084	18733005
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		75.4	76.2	74.1	83.2	73.4	89.2
Acenaphthene-d10 % recovery**	%	TM218		81.2	79.6	79.9	90.8	78.7	85.7
Phenanthrene-d10 % recovery**	%	TM218		89.8	86.8	86	90.3	80.2	86.2
Chrysene-d12 % recovery**	%	TM218		99.6	102	97.5	88.4	73	85.1
Perylene-d12 % recovery**	%	TM218		91.8	95.6	90.2	73.6	58.2	82
Naphthalene	<0.009 mg/kg	TM218		0.0873 M	0.0356 M	0.245 M	<0.009 M	0.131 M	0.116 M
Acenaphthylene	<0.012 mg/kg	TM218		0.194 M	0.049 M	0.259 M	<0.012 M	0.13 M	0.0642 M
Acenaphthene	<0.008 mg/kg	TM218		0.0102 M	0.0144 M	0.0192 M	<0.008 M	0.0219 M	0.0144 M
Fluorene	<0.01 mg/kg	TM218		0.0293 M	0.0162 M	0.0823 M	<0.01 M	0.0463 M	0.0319 M
Phenanthrene	<0.015 mg/kg	TM218		0.343 M	0.189 M	0.709 M	<0.015 M	0.457 M	0.322 M
Anthracene	<0.016 mg/kg	TM218		0.12 M	0.0883 M	0.178 M	<0.016 M	0.147 M	0.0973 M
Fluoranthene	<0.017 mg/kg	TM218		0.973 M	1.15 M	1.6 M	<0.017 M	0.895 M	0.861 M
Pyrene	<0.015 mg/kg	TM218		0.78 M	0.826 M	1.18 M	<0.015 M	0.659 M	0.83 M
Benz(a)anthracene	<0.014 mg/kg	TM218		0.668 M	1.38 M	1.1 M	<0.014 M	0.578 M	0.601 M
Chrysene	<0.01 mg/kg	TM218		0.863 M	1.45 M	1.14 M	<0.01 M	0.618 M	0.546 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		1.45 M	2.31 M	1.98 M	<0.015 M	0.895 M	1.17 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		0.472 M	0.773 M	0.564 M	<0.014 M	0.307 M	0.284 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		0.836 M	0.987 M	1.03 M	<0.015 M	0.458 M	0.955 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		0.726 M	0.395 M	1.05 M	<0.018 M	0.504 M	0.908 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		0.158 M	0.102 M	0.23 M	<0.023 M	0.0823 M	0.204 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		0.685 M	0.318 M	0.982 M	<0.024 M	0.369 M	0.882 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		8.4	10.1	12.4	<0.118	6.3	7.89

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-D6	4G-D3-V	4G-D4-V	4G-D5-V	4G-D6-V	4G-E5
			Depth (m)	0.60 - 0.60	1.80 - 1.80	1.70 - 1.70	1.70 - 1.70	1.70 - 1.70	0.20 - 0.20
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018
			SDG Ref	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83
			Lab Sample No.(s)	18733106	18733131	18733112	18733089	18733139	18733046
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		67.7	89.7	90.4	86.3	91.2	88.6
Acenaphthene-d10 % recovery**	%	TM218		75.4	88	91	88.8	88.1	88
Phenanthrene-d10 % recovery**	%	TM218		74.4	86.5	96.5	92.9	87.8	95
Chrysene-d12 % recovery**	%	TM218		71.5	79.4	85.9	111	78.6	105
Perylene-d12 % recovery**	%	TM218		56.6	75.7	81.8	101	76.3	103
Naphthalene	<0.009 mg/kg	TM218		1.11 M	<0.009 M	0.0433 M	<0.009 M	<0.009 M	0.373 M
Acenaphthylene	<0.012 mg/kg	TM218		0.277 M	<0.012 M	0.0423 M	<0.012 M	<0.012 M	0.201 M
Acenaphthene	<0.008 mg/kg	TM218		0.0665 M	<0.008 M	<0.008 M	<0.008 M	<0.008 M	0.0433 M
Fluorene	<0.01 mg/kg	TM218		0.141 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	0.162 M
Phenanthrene	<0.015 mg/kg	TM218		1.08 M	<0.015 M	0.167 M	<0.015 M	<0.015 M	1.75 M
Anthracene	<0.016 mg/kg	TM218		0.366 M	<0.016 M	0.0263 M	<0.016 M	<0.016 M	0.506 M
Fluoranthene	<0.017 mg/kg	TM218		2.02 M	<0.017 M	0.145 M	<0.017 M	<0.017 M	3.28 M
Pyrene	<0.015 mg/kg	TM218		1.69 M	<0.015 M	0.105 M	<0.015 M	<0.015 M	2.47 M
Benz(a)anthracene	<0.014 mg/kg	TM218		1.74 M	<0.014 M	0.0703 M	<0.014 M	<0.014 M	1.63 M
Chrysene	<0.01 mg/kg	TM218		2.08 M	<0.01 M	0.084 M	<0.01 M	<0.01 M	1.45 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		3.23 M	<0.015 M	0.132 M	<0.015 M	<0.015 M	2.44 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		0.981 M	<0.014 M	0.0445 M	<0.014 M	<0.014 M	0.772 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		1.91 M	<0.015 M	0.0721 M	<0.015 M	<0.015 M	1.41 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		1.63 M	<0.018 M	0.109 M	<0.018 M	<0.018 M	0.847 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		0.368 M	<0.023 M	<0.023 M	<0.023 M	<0.023 M	0.242 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		1.58 M	<0.024 M	0.086 M	<0.024 M	<0.024 M	0.971 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		20.3	<0.118	1.13	<0.118	<0.118	18.5

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-E5	4G-E6	4G-E6	4G-E5-V	4G-E6-V	4G-F6
			Depth (m)	0.60 - 0.60	0.30 - 0.30	0.50 - 0.50	3.00 - 3.00	2.20 - 2.20	0.40 - 0.40
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018
			SDG Ref	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83
			Lab Sample No.(s)	18733057	18733146	18733151	18733071	18733158	18733163
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		63.9	85.5	82.4	88	70.3	82.8
Acenaphthene-d10 % recovery**	%	TM218		69.1	91	91.4	91.4	73.8	89.5
Phenanthrene-d10 % recovery**	%	TM218		64.7	96.2	93	94.7	78.6	93.3
Chrysene-d12 % recovery**	%	TM218		47.4	89.5	57.6	92.9	89.7	86.4
Perylene-d12 % recovery**	%	TM218		35.5	78.5	43.4	81.2	88.9	71.9
Naphthalene	<0.009 mg/kg	TM218		0.407 M	4.73 M	5.1 M	0.0205 M	<0.009 M	0.143 M
Acenaphthylene	<0.012 mg/kg	TM218		0.051 M	1.2 M	0.252 M	<0.012 M	<0.012 M	0.0919 M
Acenaphthene	<0.008 mg/kg	TM218		0.0207 M	0.448 M	0.0245 M	<0.008 M	<0.008 M	0.0182 M
Fluorene	<0.01 mg/kg	TM218		0.0385 M	1.84 M	0.103 M	<0.01 M	<0.01 M	0.0737 M
Phenanthrene	<0.015 mg/kg	TM218		0.281 M	9.17 M	1.03 M	<0.015 M	<0.015 M	0.612 M
Anthracene	<0.016 mg/kg	TM218		0.0402 M	3.03 M	0.247 M	<0.016 M	<0.016 M	0.137 M
Fluoranthene	<0.017 mg/kg	TM218		0.211 M	12.8 M	0.379 M	<0.017 M	0.0232 M	0.778 M
Pyrene	<0.015 mg/kg	TM218		0.187 M	9.83 M	0.368 M	<0.015 M	<0.015 M	0.607 M
Benz(a)anthracene	<0.014 mg/kg	TM218		0.173 M	5.33 M	0.192 M	<0.014 M	<0.014 M	0.391 M
Chrysene	<0.01 mg/kg	TM218		0.27 M	5.37 M	0.29 M	<0.01 M	0.0197 M	0.433 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		0.379 M	6.47 M	0.402 M	<0.015 M	0.0235 M	0.583 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		0.105 M	2.31 M	0.122 M	<0.014 M	<0.014 M	0.233 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		0.179 M	4.2 M	0.185 M	<0.015 M	<0.015 M	0.321 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		0.161 M	3.15 M	0.234 M	<0.018 M	<0.018 M	0.292 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		0.0399 M	0.706 M	0.0716 M	<0.023 M	<0.023 M	0.0563 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		0.167 M	2.55 M	0.202 M	<0.024 M	<0.024 M	0.243 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		2.71	73.1	9.21	<0.118	<0.118	5.01

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-F6	4G-F6	4G-F6-V	4G-G6	4G-G6	
			Depth (m)	0.60 - 0.60	1.20 - 1.20	2.70 - 2.70	0.30 - 0.30	0.50 - 0.50	
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	
			Date Sampled	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	
			Sample Time	00:00	00:00	00:00	00:00	00:00	
			Date Received	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018	
			SDG Ref	181114-83	181114-83	181114-83	181114-83	181114-83	
			Lab Sample No.(s)	18733168	18733173	18733019	18733028	18733037	
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		75.6	84.5	84.4	84	81.1	
Acenaphthene-d10 % recovery**	%	TM218		78.9	90.5	89.7	88.5	80.6	
Phenanthrene-d10 % recovery**	%	TM218		84.2	93.5	94.6	93.6	93.3	
Chrysene-d12 % recovery**	%	TM218		89.8	85.9	90.3	93.2	98.1	
Perylene-d12 % recovery**	%	TM218		85.3	72.8	78.6	79.9	83.2	
Naphthalene	<0.009 mg/kg	TM218		0.0479 M	0.123 M	<0.009 M	0.0164 M	0.0633 M	
Acenaphthylene	<0.012 mg/kg	TM218		<0.012 M	0.0483 M	<0.012 M	<0.012 M	<0.06 M	
Acenaphthene	<0.008 mg/kg	TM218		0.0138 M	0.0138 M	<0.008 M	<0.008 M	0.0474 M	
Fluorene	<0.01 mg/kg	TM218		0.0204 M	0.0271 M	<0.01 M	<0.01 M	<0.05 M	
Phenanthrene	<0.015 mg/kg	TM218		0.168 M	0.319 M	<0.015 M	0.0416 M	0.207 M	
Anthracene	<0.016 mg/kg	TM218		0.0385 M	0.113 M	<0.016 M	<0.016 M	<0.08 M	
Fluoranthene	<0.017 mg/kg	TM218		0.219 M	0.622 M	<0.017 M	0.0501 M	0.24 M	
Pyrene	<0.015 mg/kg	TM218		0.175 M	0.487 M	<0.015 M	0.0374 M	0.22 M	
Benz(a)anthracene	<0.014 mg/kg	TM218		0.0959 M	0.349 M	<0.014 M	0.0282 M	0.0954 M	
Chrysene	<0.01 mg/kg	TM218		0.134 M	0.391 M	<0.01 M	0.0293 M	0.139 M	
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		0.16 M	0.511 M	<0.015 M	0.039 M	0.141 M	
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		0.0435 M	0.197 M	<0.014 M	<0.014 M	<0.07 M	
Benzo(a)pyrene	<0.015 mg/kg	TM218		0.0759 M	0.286 M	<0.015 M	0.0232 M	0.0819 M	
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		0.0738 M	0.257 M	<0.018 M	0.0195 M	<0.09 M	
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		<0.023 M	0.0467 M	<0.023 M	<0.023 M	<0.115 M	
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		0.0756 M	0.206 M	<0.024 M	<0.024 M	<0.12 M	
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		1.34	4	<0.118	0.285	1.23	

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-D3	4G-D3	4G-D4	4G-D4	4G-D5	4G-D6
			Depth (m)	0.20 - 0.20	0.50 - 0.50	0.20 - 0.20	0.50 - 0.50	0.50 - 0.50	0.20 - 0.20
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018
			SDG Ref	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83
			Lab Sample No.(s)	18733119	18733124	18733095	18733099	18733084	18733005
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		72.2	89.1	75.4	99.5	70.8	90.5
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089		<0.2 M	<0.2 M	<0.2 M	<0.2 M	<0.2 M	<0.2 M
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C6-C8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C8-C10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C10-C12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C12-C16	<0.1 mg/kg	TM173		2.03	<0.1	2.21	<0.1	2.3	2.24
Aliphatics >C16-C21	<0.1 mg/kg	TM173		7.91	2.72	7.77	<0.1	9.98	12.4
Aliphatics >C21-C35	<0.1 mg/kg	TM173		49	12.1	64.4	<0.1	93.6	67.6
Aliphatics >C35-C44	<0.1 mg/kg	TM173		12.4	4.06	15.5	<0.1	34.8	31.5
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		71.4	18.9	89.9	<0.1	141	114
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		2.23	0.447	3.42	<0.1	2.55	1.04
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		13.2	6.68	15.4	<0.1	12.5	8.13
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		66.1	24.4	76.4	2.21	84.6	41.9
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		29.1	9.37	36.7	0.566	56.4	38.2
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		10.3	3.32	14.1	<0.1	23.1	17
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		111	40.9	132	2.78	156	89.3
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		182	59.8	222	2.78	297	203

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-D6	4G-D3-V	4G-D4-V	4G-D5-V	4G-D6-V	4G-E5
			Depth (m)	0.60 - 0.60	1.80 - 1.80	1.70 - 1.70	1.70 - 1.70	1.70 - 1.70	0.20 - 0.20
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018
			SDG Ref	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83
			Lab Sample No.(s)	18733106	18733131	18733112	18733089	18733139	18733046
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		71	99.1	96.2	96.8	102	59.5
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089		<0.2 M	<0.2 M	<0.2 M	<0.2 M	<0.2 M	<0.2 #
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C6-C8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	0.0244
Aliphatics >C8-C10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	0.0267
Aliphatics >C10-C12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C12-C16	<0.1 mg/kg	TM173		4.56	<0.1	0.525	<0.1	<0.1	2.48
Aliphatics >C16-C21	<0.1 mg/kg	TM173		103	<0.1	2.48	<0.1	<0.1	15.7
Aliphatics >C21-C35	<0.1 mg/kg	TM173		63.3	<0.1	14.2	3.17	<0.1	105
Aliphatics >C35-C44	<0.1 mg/kg	TM173		8.84	<0.1	3.23	0.875	<0.1	38.3
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		179	<0.1	20.4	4.04	<0.1	161
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		16.6	<0.1	1.37	0.858	<0.1	5.86
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		134	<0.1	2.86	<0.1	<0.1	35.6
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		482	<0.1	9.26	31.8	1.49	114
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		104	<0.1	3.42	4.3	<0.1	54.6
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		29.9	<0.1	1.08	1.1	<0.1	21.7
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		736	<0.1	16.9	37	1.49	210
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		915	<0.1	37.3	41	1.49	372

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-E5	4G-E6	4G-E6	4G-E5-V	4G-E6-V	4G-F6
			Depth (m)	0.60 - 0.60	0.30 - 0.30	0.50 - 0.50	3.00 - 3.00	2.20 - 2.20	0.40 - 0.40
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018
			SDG Ref	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83
			Lab Sample No.(s)	18733057	18733146	18733151	18733071	18733158	18733163
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		80.9	96.3	70.6	101	108	82.1
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089		<0.2 M	0.338 M	<0.2 M	<0.2 M	<0.2 M	<0.2 M
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C6-C8	<0.01 mg/kg	TM089		0.0694	0.0725	<0.02	<0.02	0.05	<0.02
Aliphatics >C8-C10	<0.01 mg/kg	TM089		0.0524	0.069	<0.02	<0.02	0.0459	<0.02
Aliphatics >C10-C12	<0.01 mg/kg	TM089		0.0301	0.0761	<0.02	<0.02	0.023	<0.02
Aliphatics >C12-C16	<0.1 mg/kg	TM173		4.02	4.32	4.96	<0.1	<0.1	2.6
Aliphatics >C16-C21	<0.1 mg/kg	TM173		94.9	29.3	140	<0.1	<0.1	13.7
Aliphatics >C21-C35	<0.1 mg/kg	TM173		46.2	110	44.3	<0.1	1.65	70.7
Aliphatics >C35-C44	<0.1 mg/kg	TM173		5.19	46.7	3.7	<0.1	<0.1	30.8
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		150	191	193	<0.1	1.65	118
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		0.0341	0.0456	<0.02	<0.02	0.0297	<0.02
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		<0.02	0.0503	<0.02	<0.02	<0.02	<0.02
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		4.19	10.9	12.4	<0.1	<0.1	1.94
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		19.4	74.6	108	<0.1	<0.1	8.2
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		55	206	256	<0.1	5.68	45.7
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		9.53	97.6	37.7	<0.1	<0.1	30.9
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		2.85	35.3	11.3	<0.1	<0.1	13.1
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		88.1	389	414	<0.1	5.68	86.7
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		239	580	607	<0.1	7.48	205

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-F6	4G-F6	4G-F6-V	4G-G6	4G-G6
			Depth (m)	0.60 - 0.60	1.20 - 1.20	2.70 - 2.70	0.30 - 0.30	0.50 - 0.50
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00
			Date Received	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018
			SDG Ref	181114-83	181114-83	181114-83	181114-83	181114-83
			Lab Sample No.(s)	18733168	18733173	18733019	18733028	18733037
			AGS Reference					
GRO Surrogate % recovery**	%	TM089		88.6	88.8	97	96.3	90.1
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089		<0.2 M	<0.2 M	<0.2 M	<0.2 M	<0.2 M
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C6-C8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C8-C10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C10-C12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C12-C16	<0.1 mg/kg	TM173		2.28	2.54	<0.1	<0.1	6.29
Aliphatics >C16-C21	<0.1 mg/kg	TM173		16.4	10.9	<0.1	3.03	23.4
Aliphatics >C21-C35	<0.1 mg/kg	TM173		118	71	<0.1	15.8	125
Aliphatics >C35-C44	<0.1 mg/kg	TM173		23.7	21.4	<0.1	12.1	77.8
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		160	106	<0.1	30.9	233
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		0.966	0.973	<0.1	1.13	2.66
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		5.67	4.94	<0.1	1.41	11
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		37.3	33.1	<0.1	10.4	133
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		14.5	18.4	<0.1	19.5	156
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		5.3	6.88	<0.1	9.65	71.8
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		58.4	57.4	<0.1	32.4	303
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		219	163	<0.1	63.3	536

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-D3	4G-D3	4G-D4	4G-D4	4G-D5	4G-D6
			Depth (m)	0.20 - 0.20	0.50 - 0.50	0.20 - 0.20	0.50 - 0.50	0.50 - 0.50	0.20 - 0.20
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018
			SDG Ref	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83
			Lab Sample No.(s)	18733119	18733124	18733095	18733099	18733084	18733005
			AGS Reference						
Dibromofluoromethane**	%	TM116		106	99.4	95.6	102	104	102
Toluene-d8**	%	TM116		99.5	98.2	94.6	98.8	96.7	98.5
4-Bromofluorobenzene**	%	TM116		94.4	99.2	84.6	102	89.1	89.5
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Benzene	<0.009 mg/kg	TM116		<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M
Toluene	<0.007 mg/kg	TM116		<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M
Ethylbenzene	<0.004 mg/kg	TM116		<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M
p/m-Xylene	<0.01 mg/kg	TM116		<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
o-Xylene	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Naphthalene	<0.013 mg/kg	TM116		<0.13 M	<0.13 M	<0.13 M	<0.13 M	<0.13 M	<0.13 M
Sum of BTEX	<0.04 mg/kg	TM116		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-D6	4G-D3-V	4G-D4-V	4G-D5-V	4G-D6-V	4G-E5
			Depth (m)	0.60 - 0.60	1.80 - 1.80	1.70 - 1.70	1.70 - 1.70	1.70 - 1.70	0.20 - 0.20
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018
			SDG Ref	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83
			Lab Sample No.(s)	18733106	18733131	18733112	18733089	18733139	18733046
			AGS Reference						
Dibromofluoromethane**	%	TM116		99.5	104	109	102	105	96.8
Toluene-d8**	%	TM116		95.8	99.2	98.1	98.7	99.8	95.3
4-Bromofluorobenzene**	%	TM116		76.1	97.6	98.6	93.3	94.5	76.5
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Benzene	<0.009 mg/kg	TM116		<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M
Toluene	<0.007 mg/kg	TM116		<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M
Ethylbenzene	<0.004 mg/kg	TM116		<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M
p/m-Xylene	<0.01 mg/kg	TM116		<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
o-Xylene	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Naphthalene	<0.013 mg/kg	TM116		0.311 M	<0.13 M	<0.13 M	<0.13 M	<0.13 M	0.184 M
Sum of BTEX	<0.04 mg/kg	TM116		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-E5	4G-E6	4G-E6	4G-E5-V	4G-E6-V	4G-F6
			Depth (m)	0.60 - 0.60	0.30 - 0.30	0.50 - 0.50	3.00 - 3.00	2.20 - 2.20	0.40 - 0.40
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018
			SDG Ref	181114-83	181114-83	181114-83	181114-83	181114-83	181114-83
			Lab Sample No.(s)	18733057	18733146	18733151	18733071	18733158	18733163
			AGS Reference						
Dibromofluoromethane**	%	TM116		93.6	132	102	107	122	103
Toluene-d8**	%	TM116		95.5	97.4	96.6	99.9	98.5	97.1
4-Bromofluorobenzene**	%	TM116		75.1	97.7	80.6	95	100	94.2
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Benzene	<0.009 mg/kg	TM116		<0.09 M	<0.09 M	0.314 M	<0.09 M	<0.09 M	<0.09 M
Toluene	<0.007 mg/kg	TM116		<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M
Ethylbenzene	<0.004 mg/kg	TM116		<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M
p/m-Xylene	<0.01 mg/kg	TM116		<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
o-Xylene	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Naphthalene	<0.013 mg/kg	TM116		0.423 M	0.621 M	0.376 M	<0.13 M	<0.13 M	<0.13 M
Sum of BTEX	<0.04 mg/kg	TM116		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-F6	4G-F6	4G-F6-V	4G-G6	4G-G6	
			Depth (m)	0.60 - 0.60	1.20 - 1.20	2.70 - 2.70	0.30 - 0.30	0.50 - 0.50	
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	
			Date Sampled	13/11/2018	13/11/2018	13/11/2018	13/11/2018	13/11/2018	
			Sample Time	00:00	00:00	00:00	00:00	00:00	
			Date Received	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018	
			SDG Ref	181114-83	181114-83	181114-83	181114-83	181114-83	
			Lab Sample No.(s)	18733168	18733173	18733019	18733028	18733037	
			AGS Reference						
Dibromofluoromethane**	%	TM116		108	105	121	114	106	
Toluene-d8**	%	TM116		96.8	98.5	97.8	99.4	96.4	
4-Bromofluorobenzene**	%	TM116		90	91.2	107	108	97	
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	
Benzene	<0.009 mg/kg	TM116		<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M	
Toluene	<0.007 mg/kg	TM116		<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M	
Ethylbenzene	<0.004 mg/kg	TM116		<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M	
p/m-Xylene	<0.01 mg/kg	TM116		<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	
o-Xylene	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	
Naphthalene	<0.013 mg/kg	TM116		<0.13 M	<0.13 M	<0.13 M	<0.13 M	<0.13 M	
Sum of BTEX	<0.04 mg/kg	TM116		<0.4	<0.4	<0.4	<0.4	<0.4	

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

Asbestos Identification - Solid Samples

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-D3 0.50 - 0.50 SOLID 13/11/2018 00:00:00 21/11/2018 16:29:58 181114-83 18733124 TM048	26/11/2018	Marcin Magdziarek	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-D4 0.50 - 0.50 SOLID 13/11/2018 00:00:00 21/11/2018 16:27:10 181114-83 18733099 TM048	26/11/2018	Marcin Magdziarek	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-D5 0.50 - 0.50 SOLID 13/11/2018 00:00:00 15/11/2018 11:24:22 181114-83 18733084 TM048	19/11/2018	Lucy Caroe	Fibre bundles in soil	Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-D6 0.60 - 0.60 SOLID 13/11/2018 00:00:00 15/11/2018 11:21:51 181114-83 18733106 TM048	19/11/2018	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-E5 0.20 - 0.20 SOLID 13/11/2018 00:00:00 15/11/2018 11:26:11 181114-83 18733046 TM048	19/11/2018	Lucy Caroe	Loose fibres in soil	Trace (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-E6 0.30 - 0.30 SOLID 13/11/2018 00:00:00 16/11/2018 14:25:01 181114-83 18733146 TM048	27/11/2018	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

Validated

CERTIFICATE OF ANALYSIS

SDG: 181114-83 **Client Reference:** **Report Number:** 484045
Location: Llanwern **Order Number:** LLA515 **Superseded Report:**

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-F6 0.40 - 0.40 SOLID 13/11/2018 00:00:00 16/11/2018 14:23:15 181114-83 18733163 TM048	26/11/2018	Marcin Magdziarek	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-F6 1.20 - 1.20 SOLID 13/11/2018 00:00:00 16/11/2018 14:21:04 181114-83 18733173 TM048	26/11/2018	Marcin Magdziarek	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-G6 0.30 - 0.30 SOLID 13/11/2018 00:00:00 15/11/2018 10:09:23 181114-83 18733028 TM048	19/11/2018	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

Asbestos Quantification - Full

		Additional Asbestos Components (Using TM048)	Analysts Comments	Asbestos Quantification - Gravimetric - %	Asbestos Quantification - PCOM Evaluation - %	Asbestos Quantification - Total - %
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-D5 0.50 - 0.50 SOLID 13/11/2018 00:00:00 15/11/2018 11:25:12 181114-83 18733084 TM304	Chrysotile detected. (#)	Loose fibres in soil.	0.0034 (#)	<0.001 (#)	0.0035 (#)
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-E5 0.20 - 0.20 SOLID 13/11/2018 00:00:00 15/11/2018 11:26:59 181114-83 18733046 TM304	None (#)	No	<0.001 (#)	<0.001 (#)	<0.001 (#)

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	9.29
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	91.5
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733005
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-D6
Depth (m)	0.20 - 0.20

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.000658	<0.0005	0.00658	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00158	<0.001	0.0158	<0.01	-	-	-
Copper	0.00415	<0.0003	0.0415	<0.003	-	-	-
Lead	0.000266	<0.0002	0.00266	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000676	<0.0004	0.00676	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.0372	<0.001	0.372	<0.01	-	-	-
Zinc	0.00137	<0.001	0.0137	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000709	<0.00001	0.000709	<0.0001	-	-	-
Acenaphthene by GCMS	0.0000157	<0.000005	0.000157	<0.00005	-	-	-
Acenaphthylene by GCMS	0.0000125	<0.000005	0.000125	<0.00005	-	-	-
Fluoranthene by GCMS	0.000214	<0.000005	0.00214	<0.00005	-	-	-
Anthracene by GCMS	0.0000195	<0.000005	0.000195	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000806	<0.000005	0.000806	<0.00005	-	-	-
Fluorene by GCMS	0.0000163	<0.000005	0.000163	<0.00005	-	-	-
Chrysene by GCMS	0.0000226	<0.000005	0.000226	<0.00005	-	-	-
Pyrene by GCMS	0.000245	<0.000005	0.00245	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.00000949	<0.000005	0.0000949	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000119	<0.000005	0.000119	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.00000535	<0.000005	0.0000535	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000489	<0.000002	0.0000489	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000729	<0.000082	0.00729	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	17-Nov-2018
pH (pH Units)	11.02
Conductivity (µS/cm)	469.00
Temperature (°C)	19.20
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

05/12/2018 14:15:02

14:14:31 05/12/2018

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	9.29
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	91.5
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733005
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-D6
Depth (m)	0.20 - 0.20

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	17-Nov-2018
pH (pH Units)	11.02
Conductivity (µS/cm)	469.00
Temperature (°C)	19.20
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

05/12/2018 14:15:02

14:14:31 05/12/2018

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.87
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.7
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733028
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-G6
Depth (m)	0.30 - 0.30

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	0.0000148	<0.00001	0.000148	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.000635	<0.0003	0.00635	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.028	<0.001	0.28	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000252	<0.00001	0.000252	<0.0001	-	-	-
Acenaphthene by GCMS	0.0000179	<0.000005	0.000179	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000219	<0.000005	0.000219	<0.00005	-	-	-
Anthracene by GCMS	0.00000815	<0.000005	0.0000815	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000336	<0.000005	0.000336	<0.00005	-	-	-
Fluorene by GCMS	0.00000582	<0.000005	0.0000582	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.0000159	<0.000005	0.000159	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000129	<0.000082	0.00129	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	17-Nov-2018
pH (pH Units)	10.47
Conductivity (µS/cm)	782.00
Temperature (°C)	19.00
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates

05/12/2018 14:15:02

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.87
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.7
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733028
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-G6
Depth (m)	0.30 - 0.30

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	17-Nov-2018
pH (pH Units)	10.47
Conductivity (µS/cm)	782.00
Temperature (°C)	19.00
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates

05/12/2018 14:15:02

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.096	**Natural Moisture Content (%)**	6.95
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	93.5
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733037
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-G6
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	0.0000212	<0.00001	0.000212	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.000916	<0.0003	0.00916	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00229	<0.001	0.0229	<0.01	-	-	-
Vanadium	0.0478	<0.001	0.478	<0.01	-	-	-
Zinc	0.00101	<0.001	0.0101	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.000185	<0.00001	0.00185	<0.0001	-	-	-
Acenaphthene by GCMS	0.000136	<0.000005	0.00136	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000624	<0.000005	0.000624	<0.00005	-	-	-
Anthracene by GCMS	0.000025	<0.000005	0.00025	<0.00005	-	-	-
Phenanthrene by GCMS	0.000178	<0.000005	0.00178	<0.00005	-	-	-
Fluorene by GCMS	0.0000315	<0.000005	0.000315	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.0000532	<0.000005	0.000532	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.00067	<0.000082	0.0067	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	17-Nov-2018
pH (pH Units)	11.43
Conductivity (µS/cm)	696.00
Temperature (°C)	19.20
Volume Leachant (Litres)	0.894

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.096	**Natural Moisture Content (%)**	6.95
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	93.5
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733037
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-G6
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	17-Nov-2018
pH (pH Units)	11.43
Conductivity (µS/cm)	696.00
Temperature (°C)	19.20
Volume Leachant (Litres)	0.894

Mcerts Certification does not apply to leachates

05/12/2018 14:15:02

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.105	**Natural Moisture Content (%)**	16.3
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	86
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733046
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-E5
Depth (m)	0.20 - 0.20

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00527	<0.0005	0.0527	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00424	<0.0003	0.0424	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.0006	<0.0004	0.006	<0.004	-	-	-
Selenium	0.00199	<0.001	0.0199	<0.01	-	-	-
Vanadium	0.0843	<0.001	0.843	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000353	<0.00001	0.000353	<0.0001	-	-	-
Acenaphthene by GCMS	0.00000865	<0.000005	0.0000865	<0.00005	-	-	-
Acenaphthylene by GCMS	0.0000175	<0.000005	0.000175	<0.00005	-	-	-
Fluoranthene by GCMS	0.000205	<0.000005	0.00205	<0.00005	-	-	-
Anthracene by GCMS	0.0000356	<0.000005	0.000356	<0.00005	-	-	-
Phenanthrene by GCMS	0.000098	<0.000005	0.00098	<0.00005	-	-	-
Fluorene by GCMS	0.0000197	<0.000005	0.000197	<0.00005	-	-	-
Chrysene by GCMS	0.000117	<0.000005	0.00117	<0.00005	-	-	-
Pyrene by GCMS	0.000157	<0.000005	0.00157	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.0000836	<0.000005	0.000836	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.000155	<0.000005	0.00155	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.0000802	<0.000005	0.000802	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00009	<0.000002	0.0009	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	0.0000229	<0.000005	0.000229	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	0.0000886	<0.000005	0.000886	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.0000771	<0.000005	0.000771	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.00129	<0.000082	0.0129	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	9.93
Conductivity (µS/cm)	153.00
Temperature (°C)	18.60
Volume Leachant (Litres)	0.885

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.105	**Natural Moisture Content (%)**	16.3
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	86
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733046
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-E5
Depth (m)	0.20 - 0.20

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	9.93
Conductivity (µS/cm)	153.00
Temperature (°C)	18.60
Volume Leachant (Litres)	0.885

Mcerts Certification does not apply to leachates

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14:14:31 05/12/2018

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.118	**Natural Moisture Content (%)**	31.6
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	76
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733057
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-E5
Depth (m)	0.60 - 0.60

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00352	<0.0005	0.0352	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.000979	<0.0003	0.00979	<0.003	-	-	-
Lead	0.000218	<0.0002	0.00218	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.0235	<0.001	0.235	<0.01	-	-	-
Zinc	0.00118	<0.001	0.0118	<0.01	-	-	-
Iron (Dis.Filt) mg/l	0.0369	<0.019	0.369	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000205	<0.00001	0.000205	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000487	<0.000005	0.000487	<0.00005	-	-	-
Anthracene by GCMS	0.0000073	<0.000005	0.000073	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000518	<0.000005	0.000518	<0.00005	-	-	-
Fluorene by GCMS	0.00000597	<0.000005	0.0000597	<0.00005	-	-	-
Chrysene by GCMS	0.0000541	<0.000005	0.000541	<0.00005	-	-	-
Pyrene by GCMS	0.0000447	<0.000005	0.000447	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.0000317	<0.000005	0.000317	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.000078	<0.000005	0.00078	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.0000291	<0.000005	0.000291	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.0000211	<0.000002	0.000211	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	0.0000198	<0.000005	0.000198	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	0.0000521	<0.000005	0.000521	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.0000429	<0.000005	0.000429	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000508	<0.000082	0.00508	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	7.57
Conductivity (µS/cm)	54.70
Temperature (°C)	18.80
Volume Leachant (Litres)	0.872

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.118	**Natural Moisture Content (%)**	31.6
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	76
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733057
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-E5
Depth (m)	0.60 - 0.60

Eluate Analysis	**C_2** Concⁿ in 10:1 eluate (mg/l)		**A_2** 10:1 concⁿ leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	7.57
Conductivity (µS/cm)	54.70
Temperature (°C)	18.80
Volume Leachant (Litres)	0.872

Mcerts Certification does not apply to leachates

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Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.101	**Natural Moisture Content (%)**	12.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	89
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733084
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-D5
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00524	<0.0005	0.0524	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00234	<0.0003	0.0234	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00132	<0.001	0.0132	<0.01	-	-	-
Vanadium	0.0682	<0.001	0.682	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000562	<0.00001	0.000562	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	0.00000637	<0.000005	0.0000637	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000286	<0.000005	0.000286	<0.00005	-	-	-
Anthracene by GCMS	0.0000052	<0.000005	0.000052	<0.00005	-	-	-
Phenanthrene by GCMS	0.000015	<0.000005	0.00015	<0.00005	-	-	-
Fluorene by GCMS	0.00000507	<0.000005	0.0000507	<0.00005	-	-	-
Chrysene by GCMS	0.0000063	<0.000005	0.000063	<0.00005	-	-	-
Pyrene by GCMS	0.0000231	<0.000005	0.000231	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000153	<0.000005	0.000153	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.00000774	<0.000005	0.0000774	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000797	<0.000002	0.0000797	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.0000106	<0.000005	0.000106	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000187	<0.000082	0.00187	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	10.10
Conductivity (µS/cm)	124.00
Temperature (°C)	18.80
Volume Leachant (Litres)	0.889

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.101	**Natural Moisture Content (%)**	12.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	89
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733084
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-D5
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	10.10
Conductivity (µS/cm)	124.00
Temperature (°C)	18.80
Volume Leachant (Litres)	0.889

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.099	**Natural Moisture Content (%)**	9.41
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	91.4
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733095
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-D4
Depth (m)	0.20 - 0.20

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00621	<0.0005	0.0621	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00226	<0.0003	0.0226	<0.003	-	-	-
Lead	0.000303	<0.0002	0.00303	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00111	<0.001	0.0111	<0.01	-	-	-
Vanadium	0.0312	<0.001	0.312	<0.01	-	-	-
Zinc	0.00123	<0.001	0.0123	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.000015	<0.00001	0.00015	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	0.0000279	<0.000005	0.000279	<0.00005	-	-	-
Fluoranthene by GCMS	0.000153	<0.000005	0.00153	<0.00005	-	-	-
Anthracene by GCMS	0.0000187	<0.000005	0.000187	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000844	<0.000005	0.000844	<0.00005	-	-	-
Fluorene by GCMS	0.00000673	<0.000005	0.0000673	<0.00005	-	-	-
Chrysene by GCMS	0.000119	<0.000005	0.00119	<0.00005	-	-	-
Pyrene by GCMS	0.000112	<0.000005	0.00112	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.0000744	<0.000005	0.000744	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.000272	<0.000005	0.00272	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.0000934	<0.000005	0.000934	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.0000888	<0.000002	0.000888	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	0.0000441	<0.000005	0.000441	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	0.000227	<0.000005	0.00227	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.000167	<0.000005	0.00167	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.0015	<0.000082	0.015	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	8.98
Conductivity (µS/cm)	94.80
Temperature (°C)	18.60
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

05/12/2018 14:15:02

14:14:31 05/12/2018

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.099	**Natural Moisture Content (%)**	9.41
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	91.4
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733095
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-D4
Depth (m)	0.20 - 0.20

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	0.012	<0.01	0.12	<0.1	-	-	-
Total Aliphatics >C12-C35	0.012	<0.01	0.12	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	0.012	<0.01	0.12	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	0.012	<0.01	0.12	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	8.98
Conductivity (µS/cm)	94.80
Temperature (°C)	18.60
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.108	**Natural Moisture Content (%)**	20.5
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	83
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733099
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-D4
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	2.2	<0.2	22	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00137	<0.0005	0.0137	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00161	<0.0003	0.0161	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	0.0321	<0.003	0.321	<0.03	-	-	-
Nickel	0.000503	<0.0004	0.00503	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	0.22	<0.019	2.2	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.000974	<0.00001	0.00974	<0.0001	-	-	-
Acenaphthene by GCMS	0.00000734	<0.000005	0.0000734	<0.00005	-	-	-
Acenaphthylene by GCMS	0.0000532	<0.000005	0.000532	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000146	<0.000005	0.000146	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000216	<0.000005	0.000216	<0.00005	-	-	-
Fluorene by GCMS	0.0000164	<0.000005	0.000164	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.0000163	<0.000005	0.000163	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.0011	<0.000082	0.011	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	7.90
Conductivity (µS/cm)	166.00
Temperature (°C)	18.90
Volume Leachant (Litres)	0.882

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.108	**Natural Moisture Content (%)**	20.5
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	83
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733099
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-D4
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	7.90
Conductivity (µS/cm)	166.00
Temperature (°C)	18.90
Volume Leachant (Litres)	0.882

Mcerts Certification does not apply to leachates

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Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.114	**Natural Moisture Content (%)**	26.6
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	79
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733106
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-D6
Depth (m)	0.60 - 0.60

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	0.238	<0.2	2.38	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	0.117	<0.05	1.17	<0.5	-	-	-
Arsenic	0.0013	<0.0005	0.013	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00284	<0.0003	0.0284	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	0.00385	<0.003	0.0385	<0.03	-	-	-
Nickel	0.000542	<0.0004	0.00542	<0.004	-	-	-
Selenium	0.0026	<0.001	0.026	<0.01	-	-	-
Vanadium	0.00251	<0.001	0.0251	<0.01	-	-	-
Zinc	0.00158	<0.001	0.0158	<0.01	-	-	-
Iron (Dis.Filt) mg/l	0.0647	<0.019	0.647	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.000117	<0.00001	0.00117	<0.0001	-	-	-
Acenaphthene by GCMS	0.0000103	<0.000005	0.000103	<0.00005	-	-	-
Acenaphthylene by GCMS	0.0000393	<0.000005	0.000393	<0.00005	-	-	-
Fluoranthene by GCMS	0.00042	<0.000005	0.0042	<0.00005	-	-	-
Anthracene by GCMS	0.0000476	<0.000005	0.000476	<0.00005	-	-	-
Phenanthrene by GCMS	0.000184	<0.000005	0.00184	<0.00005	-	-	-
Fluorene by GCMS	0.0000225	<0.000005	0.000225	<0.00005	-	-	-
Chrysene by GCMS	0.000291	<0.000005	0.00291	<0.00005	-	-	-
Pyrene by GCMS	0.000338	<0.000005	0.00338	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.000232	<0.000005	0.00232	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.000526	<0.000005	0.00526	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.00027	<0.000005	0.0027	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.000365	<0.000002	0.00365	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	0.0000944	<0.000005	0.000944	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	0.000383	<0.000005	0.00383	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.000305	<0.000005	0.00305	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.00364	<0.000082	0.0364	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	15-Nov-2018
pH (pH Units)	8.65
Conductivity (µS/cm)	167.00
Temperature (°C)	18.40
Volume Leachant (Litres)	0.876

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.114	**Natural Moisture Content (%)**	26.6
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	79
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733106
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-D6
Depth (m)	0.60 - 0.60

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	0.01	<0.01	0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	0.01	<0.007	0.1	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	0.016	<0.01	0.16	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	15-Nov-2018
pH (pH Units)	8.65
Conductivity (µS/cm)	167.00
Temperature (°C)	18.40
Volume Leachant (Litres)	0.876

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.099	**Natural Moisture Content (%)**	9.89
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	91
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733119
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-D3
Depth (m)	0.20 - 0.20

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00637	<0.0005	0.0637	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00115	<0.001	0.0115	<0.01	-	-	-
Copper	0.000879	<0.0003	0.00879	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00111	<0.001	0.0111	<0.01	-	-	-
Vanadium	0.0338	<0.001	0.338	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.000197	<0.00001	0.00197	<0.0001	-	-	-
Acenaphthene by GCMS	0.00000546	<0.000005	0.0000546	<0.00005	-	-	-
Acenaphthylene by GCMS	0.0000589	<0.000005	0.000589	<0.00005	-	-	-
Fluoranthene by GCMS	0.000282	<0.000005	0.00282	<0.00005	-	-	-
Anthracene by GCMS	0.0000402	<0.000005	0.000402	<0.00005	-	-	-
Phenanthrene by GCMS	0.000208	<0.000005	0.00208	<0.00005	-	-	-
Fluorene by GCMS	0.0000378	<0.000005	0.000378	<0.00005	-	-	-
Chrysene by GCMS	0.000208	<0.000005	0.00208	<0.00005	-	-	-
Pyrene by GCMS	0.00021	<0.000005	0.0021	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.000143	<0.000005	0.00143	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.00042	<0.000005	0.0042	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.000208	<0.000005	0.00208	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.000207	<0.000002	0.00207	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	0.0000799	<0.000005	0.000799	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	0.000346	<0.000005	0.00346	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.000279	<0.000005	0.00279	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.00293	<0.000082	0.0293	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	17-Nov-2018
pH (pH Units)	8.83
Conductivity (µS/cm)	0.01
Temperature (°C)	18.70
Volume Leachant (Litres)	0.891

Mcerts Certification does not apply to leachates

05/12/2018 14:15:02

14:14:31 05/12/2018

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.099	**Natural Moisture Content (%)**	9.89
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	91
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733119
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-D3
Depth (m)	0.20 - 0.20

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	17-Nov-2018
pH (pH Units)	8.83
Conductivity (µS/cm)	0.01
Temperature (°C)	18.70
Volume Leachant (Litres)	0.891

Mcerts Certification does not apply to leachates

05/12/2018 14:15:02

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.101	**Natural Moisture Content (%)**	12.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	89
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733124
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-D3
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00583	<0.0005	0.0583	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00405	<0.001	0.0405	<0.01	-	-	-
Copper	0.00148	<0.0003	0.0148	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.0816	<0.001	0.816	<0.01	-	-	-
Zinc	0.00109	<0.001	0.0109	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000151	<0.00001	0.000151	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	0.00000694	<0.000005	0.0000694	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000197	<0.000005	0.000197	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000117	<0.000005	0.000117	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	0.00000903	<0.000005	0.0000903	<0.00005	-	-	-
Pyrene by GCMS	0.0000178	<0.000005	0.000178	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.00000748	<0.000005	0.0000748	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000207	<0.000005	0.000207	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.0000105	<0.000005	0.000105	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000896	<0.000002	0.0000896	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.00000917	<0.000005	0.0000917	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000137	<0.000082	0.00137	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	8.70
Conductivity (µS/cm)	95.70
Temperature (°C)	18.50
Volume Leachant (Litres)	0.889

Mcerts Certification does not apply to leachates

05/12/2018 14:15:02

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.101	**Natural Moisture Content (%)**	12.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	89
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733124
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-D3
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	8.70
Conductivity (µS/cm)	95.70
Temperature (°C)	18.50
Volume Leachant (Litres)	0.889

Mcerts Certification does not apply to leachates

05/12/2018 14:15:02

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.105	**Natural Moisture Content (%)**	16.3
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	86
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733146
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-E6
Depth (m)	0.30 - 0.30

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00225	<0.0005	0.0225	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00166	<0.001	0.0166	<0.01	-	-	-
Copper	0.00633	<0.0003	0.0633	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.00161	<0.0004	0.0161	<0.004	-	-	-
Selenium	0.00169	<0.001	0.0169	<0.01	-	-	-
Vanadium	0.0845	<0.001	0.845	<0.01	-	-	-
Zinc	0.00107	<0.001	0.0107	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000138	<0.00001	0.000138	<0.0001	-	-	-
Acenaphthene by GCMS	0.0000224	<0.000005	0.000224	<0.00005	-	-	-
Acenaphthylene by GCMS	0.0000511	<0.000005	0.000511	<0.00005	-	-	-
Fluoranthene by GCMS	0.000108	<0.000005	0.00108	<0.00005	-	-	-
Anthracene by GCMS	0.0000179	<0.000005	0.000179	<0.00005	-	-	-
Phenanthrene by GCMS	0.000055	<0.000005	0.00055	<0.00005	-	-	-
Fluorene by GCMS	0.0000412	<0.000005	0.000412	<0.00005	-	-	-
Chrysene by GCMS	0.0000207	<0.000005	0.000207	<0.00005	-	-	-
Pyrene by GCMS	0.000171	<0.000005	0.00171	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.0000197	<0.000005	0.000197	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000206	<0.000005	0.000206	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.0000103	<0.000005	0.000103	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.0000104	<0.000002	0.000104	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.00000879	<0.000005	0.0000879	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000571	<0.000082	0.00571	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	11.03
Conductivity (µS/cm)	318.00
Temperature (°C)	18.80
Volume Leachant (Litres)	0.885

Mcerts Certification does not apply to leachates

05/12/2018 14:15:02

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.105	**Natural Moisture Content (%)**	16.3
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	86
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733146
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-E6
Depth (m)	0.30 - 0.30

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	11.03
Conductivity (µS/cm)	318.00
Temperature (°C)	18.80
Volume Leachant (Litres)	0.885

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.120	**Natural Moisture Content (%)**	33.3
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	75
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733151
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-E6
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	0.0000701	<0.00001	0.000701	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00468	<0.0005	0.0468	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00185	<0.0003	0.0185	<0.003	-	-	-
Lead	0.000824	<0.0002	0.00824	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000424	<0.0004	0.00424	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.0141	<0.001	0.141	<0.01	-	-	-
Zinc	0.00364	<0.001	0.0364	<0.01	-	-	-
Iron (Dis.Filt) mg/l	0.548	<0.019	5.48	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000589	<0.00001	0.000589	<0.0001	-	-	-
Acenaphthene by GCMS	0.0000141	<0.000005	0.000141	<0.00005	-	-	-
Acenaphthylene by GCMS	0.000236	<0.000005	0.00236	<0.00005	-	-	-
Fluoranthene by GCMS	0.000098	<0.000005	0.00098	<0.00005	-	-	-
Anthracene by GCMS	0.0000383	<0.000005	0.000383	<0.00005	-	-	-
Phenanthrene by GCMS	0.000283	<0.000005	0.00283	<0.00005	-	-	-
Fluorene by GCMS	0.000165	<0.000005	0.00165	<0.00005	-	-	-
Chrysene by GCMS	0.0000448	<0.000005	0.000448	<0.00005	-	-	-
Pyrene by GCMS	0.0000736	<0.000005	0.000736	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.000025	<0.000005	0.00025	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.000088	<0.000005	0.00088	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.0000405	<0.000005	0.000405	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.0000282	<0.000002	0.000282	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	0.0000178	<0.000005	0.000178	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	0.0000419	<0.000005	0.000419	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.0000345	<0.000005	0.000345	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.00129	<0.000082	0.0129	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	9.05
Conductivity (µS/cm)	65.20
Temperature (°C)	18.70
Volume Leachant (Litres)	0.870

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.120	**Natural Moisture Content (%)**	33.3
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	75
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733151
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-E6
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	9.05
Conductivity (µS/cm)	65.20
Temperature (°C)	18.70
Volume Leachant (Litres)	0.870

Mcerts Certification does not apply to leachates

05/12/2018 14:15:02

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.18
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	93.3
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733163
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-F6
Depth (m)	0.40 - 0.40

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	0.0000175	<0.00001	0.000175	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00147	<0.0005	0.0147	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00129	<0.001	0.0129	<0.01	-	-	-
Copper	0.00238	<0.0003	0.0238	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00111	<0.001	0.0111	<0.01	-	-	-
Vanadium	0.0691	<0.001	0.691	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.000146	<0.00001	0.00146	<0.0001	-	-	-
Acenaphthene by GCMS	0.0000652	<0.000005	0.000652	<0.00005	-	-	-
Acenaphthylene by GCMS	0.000224	<0.000005	0.00224	<0.00005	-	-	-
Fluoranthene by GCMS	0.000144	<0.000005	0.00144	<0.00005	-	-	-
Anthracene by GCMS	0.0000556	<0.000005	0.000556	<0.00005	-	-	-
Phenanthrene by GCMS	0.000332	<0.000005	0.00332	<0.00005	-	-	-
Fluorene by GCMS	0.000137	<0.000005	0.00137	<0.00005	-	-	-
Chrysene by GCMS	0.0000105	<0.000005	0.000105	<0.00005	-	-	-
Pyrene by GCMS	0.00011	<0.000005	0.0011	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.000007	<0.000005	0.00007	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000154	<0.000005	0.000154	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.00000878	<0.000005	0.0000878	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000633	<0.000002	0.0000633	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	0.0000147	<0.000005	0.000147	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	0.0000238	<0.000005	0.000238	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.00000614	<0.000005	0.0000614	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.00131	<0.000082	0.0131	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	10.77
Conductivity (µS/cm)	244.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.894

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.18
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	93.3
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733163
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-F6
Depth (m)	0.40 - 0.40

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	10.77
Conductivity (µS/cm)	244.00
Temperature (°C)	18.70
Volume Leachant (Litres)	0.894

Mcerts Certification does not apply to leachates

05/12/2018 14:15:02

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.18
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	93.3
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733168
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-F6
Depth (m)	0.60 - 0.60

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00259	<0.001	0.0259	<0.01	-	-	-
Copper	0.00109	<0.0003	0.0109	<0.003	-	-	-
Lead	0.000585	<0.0002	0.00585	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.0258	<0.001	0.258	<0.01	-	-	-
Zinc	0.0177	<0.001	0.177	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000221	<0.00001	0.000221	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000155	<0.000005	0.000155	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.0000144	<0.000005	0.000144	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	<0.000082	<0.000082	<0.00082	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	11.52
Conductivity (µS/cm)	1,230.00
Temperature (°C)	18.30
Volume Leachant (Litres)	0.894

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.18
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	93.3
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733168
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-F6
Depth (m)	0.60 - 0.60

Eluate Analysis	**C_2** Concⁿ in 10:1 eluate (mg/l)		**A_2** 10:1 concⁿ leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	11.52
Conductivity (µS/cm)	1,230.00
Temperature (°C)	18.30
Volume Leachant (Litres)	0.894

Mcerts Certification does not apply to leachates

05/12/2018 14:15:02

14:14:31 05/12/2018

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	8.23
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.4
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733173
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-F6
Depth (m)	1.20 - 1.20

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00206	<0.0005	0.0206	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.0012	<0.001	0.012	<0.01	-	-	-
Copper	0.00146	<0.0003	0.0146	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00145	<0.001	0.0145	<0.01	-	-	-
Vanadium	0.0668	<0.001	0.668	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000184	<0.00001	0.000184	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.000017	<0.000005	0.00017	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.000016	<0.000005	0.00016	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.0000164	<0.000005	0.000164	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.00000788	<0.000005	0.0000788	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000352	<0.000002	0.0000352	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	<0.000082	<0.000082	<0.00082	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	10.73
Conductivity (µS/cm)	178.00
Temperature (°C)	18.90
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates

05/12/2018 14:15:02

14:14:31 05/12/2018

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	8.23
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.4
Particle Size <4mm	>95%		

Case	
SDG	181114-83
Lab Sample Number(s)	18733173
Sampled Date	13-Nov-2018
Customer Sample Ref.	4G-F6
Depth (m)	1.20 - 1.20

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	16-Nov-2018
pH (pH Units)	10.73
Conductivity (µS/cm)	178.00
Temperature (°C)	18.90
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Mcerts Certification does not apply to leachates

05/12/2018 14:15:02

14:14:31 05/12/2018

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

Notification of NDPs (No determination possible)

Date Received : 14/11/2018 15:46:28

Sample No	Customer Sample Ref.	Depth (m)	Test	Comment
18733151	4G-E6	0.50 - 0.50	Total Organic Carbon	Unsuitable for Analysis

Table of Results - Appendix

Method No	Reference	Description
ASB_PREP		
PM001		Preparation of Samples for Metals Analysis
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
SUB		Subcontracted Test
TM024	Method 4500A & B, AWWA/APHA, 20th Ed., 1999	Determination of Exchangeable Ammonium and Ammoniacal Nitrogen as N by titration on solids
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer
TM224	US EPA Method 6010B	Determination of Alkaline Metals by iCap 6500 Duo ICP-OES
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM243		Mixed Anions In Soils By Kone
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM304	HSE Contract research Report no 83/1996	Asbestos Quantification in Soil: Fibres identified by morphology only

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	18733119	18733124	18733095	18733099	18733084	18733005	18733106	18733131	18733112	18733089
Customer Sample Ref.	4G-D3	4G-D3	4G-D4	4G-D4	4G-D5	4G-D6	4G-D6	4G-D3-V	4G-D4-V	4G-D5-V
AGS Ref.										
Depth	0.20 - 0.20	0.50 - 0.50	0.20 - 0.20	0.50 - 0.50	0.50 - 0.50	0.20 - 0.20	0.60 - 0.60	1.80 - 1.80	1.70 - 1.70	1.70 - 1.70
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Alkali Metals by iCap-OES (Soil)		19-Nov-2018		19-Nov-2018	26-Nov-2018		19-Nov-2018			
Ammoniacal Nitrogen	24-Nov-2018	28-Nov-2018	24-Nov-2018	28-Nov-2018	24-Nov-2018	26-Nov-2018	24-Nov-2018			
Ammonium Soil by Titration	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018
Anions by Kone (soil)		29-Nov-2018		29-Nov-2018	29-Nov-2018		29-Nov-2018			
Asbestos ID in Solid Samples		26-Nov-2018		26-Nov-2018	19-Nov-2018		19-Nov-2018			
Asbestos Quantification - Full					28-Nov-2018					
CEN 10:1 Leachate (1 Stage)	17-Nov-2018	27-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018	17-Nov-2018	15-Nov-2018			
CEN Readings	21-Nov-2018	28-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	21-Nov-2018	20-Nov-2018			
Cyanide Comp/Free/Total/Thiocyanate	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	26-Nov-2018	27-Nov-2018	27-Nov-2018
Dissolved Metals by ICP-MS	27-Nov-2018	28-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	28-Nov-2018			
EPH CWG (Aliphatic) Aqueous GC (W)	27-Nov-2018	29-Nov-2018	28-Nov-2018	27-Nov-2018	27-Nov-2018	28-Nov-2018	27-Nov-2018			
EPH CWG (Aliphatic) GC (S)	22-Nov-2018	19-Nov-2018	19-Nov-2018	22-Nov-2018	19-Nov-2018	22-Nov-2018	19-Nov-2018	22-Nov-2018	26-Nov-2018	19-Nov-2018
EPH CWG (Aromatic) Aqueous GC (W)	27-Nov-2018	29-Nov-2018	28-Nov-2018	27-Nov-2018	27-Nov-2018	28-Nov-2018	27-Nov-2018			
EPH CWG (Aromatic) GC (S)	22-Nov-2018	19-Nov-2018	19-Nov-2018	22-Nov-2018	19-Nov-2018	22-Nov-2018	19-Nov-2018	22-Nov-2018	26-Nov-2018	19-Nov-2018
GRO by GC-FID (S)	24-Nov-2018	24-Nov-2018	24-Nov-2018	24-Nov-2018	24-Nov-2018	24-Nov-2018	26-Nov-2018	24-Nov-2018	24-Nov-2018	24-Nov-2018
GRO by GC-FID (W)	27-Nov-2018	27-Nov-2018	27-Nov-2018	24-Nov-2018	24-Nov-2018	27-Nov-2018	24-Nov-2018			
Mercury Dissolved	26-Nov-2018	26-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	26-Nov-2018			
Metals in solid samples by OES	23-Nov-2018	22-Nov-2018	23-Nov-2018	21-Nov-2018	22-Nov-2018	23-Nov-2018	21-Nov-2018	27-Nov-2018	27-Nov-2018	22-Nov-2018
PAH by GCMS	19-Nov-2018	19-Nov-2018	19-Nov-2018	21-Nov-2018	19-Nov-2018	23-Nov-2018	19-Nov-2018	23-Nov-2018	26-Nov-2018	21-Nov-2018
PAH Spec MS - Aqueous (W)	27-Nov-2018	27-Nov-2018	28-Nov-2018	27-Nov-2018	26-Nov-2018	27-Nov-2018	27-Nov-2018			
pH	26-Nov-2018	27-Nov-2018	26-Nov-2018	27-Nov-2018	27-Nov-2018	26-Nov-2018	26-Nov-2018	26-Nov-2018	27-Nov-2018	26-Nov-2018
pH Value	26-Nov-2018	26-Nov-2018	26-Nov-2018	26-Nov-2018	26-Nov-2018	26-Nov-2018	26-Nov-2018			
Phenols by HPLC (S)	27-Nov-2018	27-Nov-2018	27-Nov-2018	26-Nov-2018	27-Nov-2018	27-Nov-2018	26-Nov-2018	21-Nov-2018	26-Nov-2018	27-Nov-2018
Sample description	15-Nov-2018	14-Nov-2018	15-Nov-2018	14-Nov-2018	15-Nov-2018	16-Nov-2018	14-Nov-2018	18-Nov-2018	21-Nov-2018	15-Nov-2018
Total Organic Carbon	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	27-Nov-2018	28-Nov-2018	28-Nov-2018
Total Sulphate		16-Nov-2018		16-Nov-2018	22-Nov-2018		16-Nov-2018			
Total Sulphur		27-Nov-2018		27-Nov-2018	27-Nov-2018		23-Nov-2018			
TPH CWG (W)	27-Nov-2018	29-Nov-2018	28-Nov-2018	27-Nov-2018	27-Nov-2018	28-Nov-2018	27-Nov-2018			
TPH CWG GC (S)	24-Nov-2018	24-Nov-2018	24-Nov-2018	24-Nov-2018	24-Nov-2018	24-Nov-2018	26-Nov-2018	24-Nov-2018	26-Nov-2018	24-Nov-2018
VOC MS (S)	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018

Lab Sample No(s)	18733139	18733046	18733057	18733146	18733151	18733071	18733158	18733163	18733168	18733173
Customer Sample Ref.	4G-D6-V	4G-E5	4G-E5	4G-E6	4G-E6	4G-E5-V	4G-E6-V	4G-F6	4G-F6	4G-F6
AGS Ref.										
Depth	1.70 - 1.70	0.20 - 0.20	0.60 - 0.60	0.30 - 0.30	0.50 - 0.50	3.00 - 3.00	2.20 - 2.20	0.40 - 0.40	0.60 - 0.60	1.20 - 1.20
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Alkali Metals by iCap-OES (Soil)		26-Nov-2018		26-Nov-2018				26-Nov-2018		26-Nov-2018
Ammoniacal Nitrogen		24-Nov-2018	24-Nov-2018	26-Nov-2018	26-Nov-2018			24-Nov-2018	26-Nov-2018	26-Nov-2018
Ammonium Soil by Titration	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018
Anions by Kone (soil)		22-Nov-2018		22-Nov-2018				29-Nov-2018		29-Nov-2018
Asbestos ID in Solid Samples		19-Nov-2018		27-Nov-2018				26-Nov-2018		26-Nov-2018
Asbestos Quantification - Full		27-Nov-2018								
Calorific Value (S)*					05-Dec-2018					
CEN 10:1 Leachate (1 Stage)		16-Nov-2018	16-Nov-2018	16-Nov-2018	16-Nov-2018			16-Nov-2018	16-Nov-2018	16-Nov-2018
CEN Readings		20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018			20-Nov-2018	20-Nov-2018	20-Nov-2018
Cyanide Comp/Free/Total/Thiocyanate	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018
Dissolved Metals by ICP-MS		28-Nov-2018	27-Nov-2018	28-Nov-2018	27-Nov-2018			28-Nov-2018	28-Nov-2018	28-Nov-2018
EPH CWG (Aliphatic) Aqueous GC (W)		28-Nov-2018	28-Nov-2018	27-Nov-2018	28-Nov-2018			27-Nov-2018	28-Nov-2018	27-Nov-2018
EPH CWG (Aliphatic) GC (S)	19-Nov-2018	19-Nov-2018	19-Nov-2018	29-Nov-2018	19-Nov-2018	23-Nov-2018	19-Nov-2018	19-Nov-2018	22-Nov-2018	22-Nov-2018
EPH CWG (Aromatic) Aqueous GC (W)		28-Nov-2018	28-Nov-2018	27-Nov-2018	28-Nov-2018			27-Nov-2018	28-Nov-2018	27-Nov-2018
EPH CWG (Aromatic) GC (S)	19-Nov-2018	19-Nov-2018	19-Nov-2018	28-Nov-2018	19-Nov-2018	23-Nov-2018	19-Nov-2018	19-Nov-2018	22-Nov-2018	22-Nov-2018
GRO by GC-FID (S)	24-Nov-2018	26-Nov-2018	24-Nov-2018	26-Nov-2018	26-Nov-2018	24-Nov-2018	24-Nov-2018	24-Nov-2018	24-Nov-2018	24-Nov-2018
GRO by GC-FID (W)		27-Nov-2018	24-Nov-2018	26-Nov-2018	24-Nov-2018			26-Nov-2018	26-Nov-2018	26-Nov-2018
Mercury Dissolved		28-Nov-2018	26-Nov-2018	28-Nov-2018	26-Nov-2018			29-Nov-2018	28-Nov-2018	28-Nov-2018
Metals in solid samples by OES	22-Nov-2018	22-Nov-2018	23-Nov-2018	23-Nov-2018	21-Nov-2018	22-Nov-2018	23-Nov-2018	22-Nov-2018	23-Nov-2018	22-Nov-2018
PAH by GCMS	23-Nov-2018	28-Nov-2018	19-Nov-2018	21-Nov-2018	26-Nov-2018	21-Nov-2018	19-Nov-2018	21-Nov-2018	19-Nov-2018	21-Nov-2018
PAH Spec MS - Aqueous (W)		27-Nov-2018	28-Nov-2018	29-Nov-2018	27-Nov-2018			29-Nov-2018	27-Nov-2018	29-Nov-2018
pH	26-Nov-2018	27-Nov-2018	26-Nov-2018	27-Nov-2018	26-Nov-2018	26-Nov-2018	26-Nov-2018	27-Nov-2018	26-Nov-2018	27-Nov-2018
pH Value		26-Nov-2018	26-Nov-2018	26-Nov-2018	26-Nov-2018			26-Nov-2018	26-Nov-2018	26-Nov-2018
Phenols by HPLC (S)	27-Nov-2018	27-Nov-2018	26-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018	27-Nov-2018
Sample description	15-Nov-2018	15-Nov-2018	14-Nov-2018	15-Nov-2018	15-Nov-2018	15-Nov-2018	15-Nov-2018	15-Nov-2018	15-Nov-2018	15-Nov-2018
Total Organic Carbon	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018		28-Nov-2018	28-Nov-2018	27-Nov-2018	28-Nov-2018	27-Nov-2018
Total Sulphate		22-Nov-2018		21-Nov-2018				21-Nov-2018		21-Nov-2018
Total Sulphur		27-Nov-2018		27-Nov-2018				23-Nov-2018		27-Nov-2018
TPH CWG (W)		28-Nov-2018	28-Nov-2018	27-Nov-2018	28-Nov-2018			27-Nov-2018	28-Nov-2018	27-Nov-2018
TPH CWG GC (S)	24-Nov-2018	26-Nov-2018	24-Nov-2018	29-Nov-2018	26-Nov-2018	24-Nov-2018	24-Nov-2018	24-Nov-2018	24-Nov-2018	24-Nov-2018
VOC MS (S)	28-Nov-2018	26-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	26-Nov-2018

Validated

CERTIFICATE OF ANALYSIS

SDG:	181114-83	**Client Reference:**		**Report Number:**	484045
Location:	Llanwern	**Order Number:**	LLA515	**Superseded Report:**	

Lab Sample No(s)	18733019	18733028	18733037
Customer Sample Ref.	4G-F6-V	4G-G6	4G-G6
AGS Ref.			
Depth	2.70 - 2.70	0.30 - 0.30	0.50 - 0.50
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Alkali Metals by iCap-OES (Soil)		28-Nov-2018	
Ammoniacal Nitrogen		26-Nov-2018	24-Nov-2018
Ammonium Soil by Titration	27-Nov-2018	27-Nov-2018	27-Nov-2018
Anions by Kone (soil)		29-Nov-2018	
Asbestos ID in Solid Samples		19-Nov-2018	
CEN 10:1 Leachate (1 Stage)		17-Nov-2018	17-Nov-2018
CEN Readings		21-Nov-2018	21-Nov-2018
Cyanide Comp/Free/Total/Thiocyanate	27-Nov-2018	27-Nov-2018	26-Nov-2018
Dissolved Metals by ICP-MS		27-Nov-2018	27-Nov-2018
EPH CWG (Aliphatic) Aqueous GC (W)		27-Nov-2018	28-Nov-2018
EPH CWG (Aliphatic) GC (S)	19-Nov-2018	19-Nov-2018	19-Nov-2018
EPH CWG (Aromatic) Aqueous GC (W)		27-Nov-2018	28-Nov-2018
EPH CWG (Aromatic) GC (S)	19-Nov-2018	19-Nov-2018	19-Nov-2018
GRO by GC-FID (S)	24-Nov-2018	24-Nov-2018	24-Nov-2018
GRO by GC-FID (W)		27-Nov-2018	27-Nov-2018
Mercury Dissolved		26-Nov-2018	26-Nov-2018
Metals in solid samples by OES	22-Nov-2018	22-Nov-2018	23-Nov-2018
PAH by GCMS	21-Nov-2018	21-Nov-2018	21-Nov-2018
PAH Spec MS - Aqueous (W)		27-Nov-2018	27-Nov-2018
pH	26-Nov-2018	26-Nov-2018	26-Nov-2018
pH Value		26-Nov-2018	26-Nov-2018
Phenols by HPLC (S)	27-Nov-2018	26-Nov-2018	27-Nov-2018
Sample description	15-Nov-2018	15-Nov-2018	15-Nov-2018
Total Organic Carbon	28-Nov-2018	28-Nov-2018	28-Nov-2018
Total Sulphate		22-Nov-2018	
Total Sulphur		28-Nov-2018	
TPH CWG (W)		27-Nov-2018	28-Nov-2018
TPH CWG GC (S)	24-Nov-2018	24-Nov-2018	24-Nov-2018
VOC MS (S)	28-Nov-2018	28-Nov-2018	28-Nov-2018

CERTIFICATE OF ANALYSIS

Work Order	: **PR18C4975**	Issue Date	: 05-Dec-2018
Customer	: **ALS Life Sciences Ltd**	Laboratory	: ALS Czech Republic, s.r.o.
Contact	: Reporting	Contact	: Client Service
Address	: Unit 7-8 Hawarden Business Park Manor Road, Hawarden CH5 3US Deeside United Kingdom	Address	: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00
E-mail	: euhdnsubconresults@ALSGlobal.com	E-mail	: customer.support@alsglobal.com
Telephone	: ----	Telephone	: +420 226 226 228
Project	: 181114-83	Page	: 1 of 2
Order number	: 181114-83	Date Samples Received	: 22-Nov-2018
		Quote number	: PR2018ALSAL-GB0001 (CZ-256-17-1008)
Site	: ----	Date of test	: 26-Nov-2018 - 05-Dec-2018
Sampled by	: client	QC Level	: ALS CR Standard Quality Control Schedule

General Comments

This report shall not be reproduced except in full, without prior written approval from the laboratory.
The laboratory declares that the test results relate only to the listed samples.
The IC determination of chlorides, fluorides, sulfates and nitrates, as needed for the calculation of reported results, was performed using an accredited method of a subcontractor.

Responsible for accuracy

Testing Laboratory No. 1163
Accredited by CAI according to
CSN EN ISO/IEC 17025:2005

Signatories		*Position*
Zdeněk Jirák		Environmental Business Unit Manager

L 1163

Analytical Results

Sub-Matrix: SOIL	Client sample ID	18741780 4G-E6	----	----
	Laboratory sample ID	PR18C4975-001	----	----
	Client sampling date / time	13-Nov-2018 00:00	----	----

Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU
Physical Parameters									
Gross Calorific Value in Dry Matter Q(V/gr/d)	I-CV-CALS	0.50	MJ/kg DW	**9.54**	± 10.6%	----	----	----	----
Gross Calorific Value Original Q(V/gr/ar)	I-CV-CALS	0.50	MJ/kg	**8.52**	± 10.7%	----	----	----	----
Net Calorific Value in Dry Matter Q(V/net/d)	I-CV-CALS	0.50	MJ/kg DW	**9.41**	± 10.6%	----	----	----	----
Net Calorific Value Original Q(V/net/ar)	I-CV-CALS	0.50	MJ/kg	**8.16**	± 10.8%	----	----	----	----
Water Analytical M(ad)	I-WA-GR	0.50	%	**0.69**	± 52.3%	----	----	----	----
Water Gross M(ex)	I-WG-GR	0.50	%	**10.0**	± 20.3%	----	----	----	----
Water Total M(ar)	I-WT-CC	0.50	%	**10.7**	----	----	----	----	----

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, delivery date in brackets without a time component will be displayed instead. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor k = 2, representing 95% confidence level.
Key: LOR = Limit of reporting; MU = Measurement Uncertainty

The end of result part of the certificate of analysis

Brief Method Summaries

Analytical Methods	Method Descriptions
Location of test performance: Bendlova 1687/7 Ceska Lipa Czech Republic 470 01	
I-CV-CALS	CZ_SOP_D06_07_124.A (CSN ISO 1928, CSN EN ISO 18125, CSN EN 15400, CSN EN 15170, CSN DIN 51900-1, CSN DIN 51900-2, CSN DIN 51900-3, CSN P CEN/TS 16023) Determination of gross calorific value by calorimetric method and calculation of net calorific value and emission factor by calculation from measured values.
I-WA-GR	CZ_SOP_D06_07_041 (CSN 44 1377, CSN EN ISO 18134-1, CSN EN ISO 18134-2, CSN EN ISO 18134-3, CSN P CEN/TS 15414-1, CSN P CEN/TS 15414-2, CSN EN 15414-3, CSN EN12880, CSN EN14346, CSN EN 15002) Determination of analytical water and gross water by gravimetry and determination of total water by calculation from measured values.
I-WG-GR	CZ_SOP_D06_07_041 (CSN 44 1377, CSN EN ISO 18134-1, CSN EN ISO 18134-2, CSN EN ISO 18134-3, CSN P CEN/TS 15414-1, CSN P CEN/TS 15414-2, CSN EN 15414-3, CSN EN12880, CSN EN14346, CSN EN 15002) Determination of analytical water and gross water by gravimetry and determination of total water by calculation from measured values.
I-WT-CC	CZ_SOP_D06_07_041 (CSN 44 1377, CSN EN ISO 18134-1, CSN EN ISO 18134-2, CSN EN ISO 18134-3, CSN P CEN/TS 15414-1, CSN P CEN/TS 15414-2, CSN EN 15414-3, CSN EN12880, CSN EN14346, CSN EN 15002) Determination of analytical water and gross water by gravimetry and determination of total water by calculation from measured values.

Preparation Methods	Method Descriptions
Location of test performance: Bendlova 1687/7 Ceska Lipa Czech Republic 470 01	
I-PPBURN	CZ_SOP_D06_07_124.A (CSN ISO 1928, CSN EN 14918, CSN EN 15400, CSN EN 15170) Determination of gross calorific value by calorimetric method and calculation of net calorific value.
* S-PPHOM.07	CZ_SOP_D06_07_P01 Preparation of solid samples for analysis (crushing, milling and pulverizing).
* S-PPHOM0.3	CZ_SOP_D06_07_P01 Preparation of solid samples for analysis (crushing, milling and pulverizing).

A `*` symbol preceding any method indicates laboratory or subcontractor non-accredited test. In the case when a procedure belonging to an accredited method was used for non-accredited matrix, would apply that the reported results are non-accredited. Please refer to General Comment section on front page for information. If the report contains subcontracted analysis, those are made in a subcontracted laboratory outside the laboratories ALS Czech Republic, s.r.o.
The calculation methods of summation parameters are available on request in the client service.

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
5	**Samples exceeded holding time before presevation was performed**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

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Website: www.alsenvironmental.co.uk

Atkins Global Ltd
Project Jonah site office
Llan Coed House
Suite 24
Coed Darcy
Llandarcy
SA10 6HJ

Attention: John Fitzgerald

CERTIFICATE OF ANALYSIS

Date:	07 December 2018
Customer:	H_ATKINS_LDC
Sample Delivery Group (SDG):	181120-23
Your Reference:	
Location:	Llanwern
Report No:	484420

We received 15 samples on Tuesday November 20, 2018 and 15 of these samples were scheduled for analysis which was completed on Friday December 07, 2018. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:



Sonia McWhan

Operations Manager

ALS Life Sciences Limited. Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18775424	4G-E4		0.40 - 0.40	19/11/2018
18775457	4G-E4-V		2.20 - 2.20	19/11/2018
18775464	4G-F4		0.20 - 0.20	19/11/2018
18775470	4G-F4		0.40 - 0.40	19/11/2018
18775478	4G-F5		0.50 - 0.50	19/11/2018
18775444	4G-F7		0.40 - 0.40	19/11/2018
18775448	4G-F7		0.80 - 0.80	19/11/2018
18775474	4G-F4-V		2.40 - 2.40	19/11/2018
18775482	4G-F5-V		2.60 - 2.60	19/11/2018
18775453	4G-F7-V		2.60 - 2.60	19/11/2018
18775486	4G-G5		0.40 - 0.40	19/11/2018
18775490	4G-G5		0.70 - 0.70	19/11/2018
18775436	4G-G7		0.50 - 0.50	19/11/2018
18775440	4G-G7		1.00 - 1.00	19/11/2018
18775431	4G-G5-V		3.20 - 3.20	19/11/2018

Maximum Sample/Coolbox Temperature (°C) : **10.0**

ISO5667-3 Water quality - Sampling - Part3 -
During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			18775424		18775457		18775464			18775470			18775478			18775444			18775448		
Customer Sample Reference			4G-E4		4G-E4-V		4G-F4			4G-F4			4G-F5			4G-F7			4G-F7		
AGS Reference																					
Depth (m)			0.40 - 0.40		2.20 - 2.20		0.20 - 0.20			0.40 - 0.40			0.50 - 0.50			0.40 - 0.40			0.80 - 0.80		
Container			1kg TUB	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Type			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Alkali Metals by iCap-OES (Soil)	All	NDPs: 0 Tests: 6		X							X			X			X				
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 10	X				X			X			X			X			X		
Ammonium Soil by Titration	All	NDPs: 0 Tests: 15		X	X			X			X			X			X			X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 6		X							X			X			X				
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 6	X							X			X			X					
CEN Readings	All	NDPs: 0 Tests: 10	X				X			X			X			X			X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 25	X	X	X		X	X		X	X		X	X		X	X		X	X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 10	X				X			X			X			X			X		
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 10	X				X			X			X			X			X		
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 15		X	X			X			X			X			X			X	
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 10	X				X			X			X			X			X		
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 15		X	X			X			X			X			X			X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 15		X		X			X			X			X			X				X
GRO by GC-FID (W)	All	NDPs: 0 Tests: 10	X				X			X			X			X			X		
Mercury Dissolved	All	NDPs: 0 Tests: 10	X				X			X			X			X			X		

18775431	4G-G5-V		3.20 - 3.20	60g VOC (ALE215)	S																X			
				250g Amber Jar (ALE210)	S				X				X				X			X				
18775440	4G-G7		1.00 - 1.00	60g VOC (ALE215)	S																X			
				250g Amber Jar (ALE210)	S				X				X				X			X				
				1kg TUB	S			X				X	X		X	X			X				X	X
18775436	4G-G7		0.50 - 0.50	60g VOC (ALE215)	S																X			
				250g Amber Jar (ALE210)	S	X			X	X			X				X			X				
				1kg TUB	S			X			X	X	X		X	X			X				X	X
18775490	4G-G5		0.70 - 0.70	60g VOC (ALE215)	S																X			
				250g Amber Jar (ALE210)	S				X				X				X			X				
				1kg TUB	S			X				X	X		X	X			X				X	X
18775486	4G-G5		0.40 - 0.40	60g VOC (ALE215)	S																X			
				250g Amber Jar (ALE210)	S	X			X	X			X				X			X				
				1kg TUB	S			X			X	X	X		X	X			X				X	X
18775453	4G-F7-V		2.60 - 2.60	60g VOC (ALE215)	S																X			
				250g Amber Jar (ALE210)	S				X				X				X			X				
18775482	4G-F5-V		2.60 - 2.60	60g VOC (ALE215)	S																X			
				250g Amber Jar (ALE210)	S				X				X				X			X				
18775474	4G-F4-V		2.40 - 2.40	60g VOC (ALE215)	S																X			
				250g Amber Jar (ALE210)	S				X				X				X			X				

Validated

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			18775424				18775457			18775464			18775470			18775478			18775444			18775448		
Customer Sample Reference			4G-E4				4G-E4-V			4G-F4			4G-F4			4G-F5			4G-F7			4G-F7		
AGS Reference																								
Depth (m)			0.40 - 0.40				2.20 - 2.20			0.20 - 0.20			0.40 - 0.40			0.50 - 0.50			0.40 - 0.40			0.80 - 0.80		
Container			1kg TUB	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Type			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Metals in solid samples by OES	All	NDPs: 0 Tests: 15		X	X			X			X			X			X			X			X	
PAH by GCMS	All	NDPs: 0 Tests: 15		X	X			X			X			X			X			X			X	
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 10	X				X			X			X			X			X			X		
pH	All	NDPs: 0 Tests: 15		X	X			X			X			X			X			X			X	
pH Value	All	NDPs: 0 Tests: 10	X				X			X			X			X			X			X		
Phenols by HPLC (S)	All	NDPs: 0 Tests: 15		X	X			X			X			X			X			X			X	
Sample description	All	NDPs: 0 Tests: 15		X	X			X			X			X			X			X			X	
Total Organic Carbon	All	NDPs: 0 Tests: 15		X	X			X			X			X			X			X			X	
Total Sulphate	All	NDPs: 0 Tests: 6		X										X			X			X				
Total Sulphur	All	NDPs: 0 Tests: 6		X										X			X			X				
TPH CWG (W)	All	NDPs: 0 Tests: 10	X				X			X			X			X			X			X		
TPH CWG GC (S)	All	NDPs: 0 Tests: 15		X	X			X			X			X			X			X			X	
VOC MS (S)	All	NDPs: 0 Tests: 15		X		X			X			X			X			X			X			X	

18775431	4G-G5-V		3.20 - 3.20	60g VOC (ALE215)	S													X
				250g Amber Jar (ALE210)	S	X	X		X		X	X	X				X	
18775440	4G-G7		1.00 - 1.00	60g VOC (ALE215)	S													X
				250g Amber Jar (ALE210)	S	X	X		X		X	X	X				X	
				1kg TUB	S			X		X						X		
18775436	4G-G7		0.50 - 0.50	60g VOC (ALE215)	S													X
				250g Amber Jar (ALE210)	S	X	X		X		X	X	X	X	X		X	
				1kg TUB	S			X		X						X		
18775490	4G-G5		0.70 - 0.70	60g VOC (ALE215)	S													X
				250g Amber Jar (ALE210)	S	X	X		X		X	X	X				X	
				1kg TUB	S			X		X						X		
18775486	4G-G5		0.40 - 0.40	60g VOC (ALE215)	S													X
				250g Amber Jar (ALE210)	S	X	X		X		X	X	X	X	X		X	
				1kg TUB	S			X		X						X		
18775453	4G-F7-V		2.60 - 2.60	60g VOC (ALE215)	S													X
				250g Amber Jar (ALE210)	S	X	X		X		X	X	X				X	
18775482	4G-F5-V		2.60 - 2.60	60g VOC (ALE215)	S													X
				250g Amber Jar (ALE210)	S	X	X		X		X	X	X				X	
18775474	4G-F4-V		2.40 - 2.40	60g VOC (ALE215)	S													X
				250g Amber Jar (ALE210)	S	X	X		X		X	X	X				X	

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
18775424	4G-E4	0.40 - 0.40	Light Brown	Loamy Sand	Stones	None
18775457	4G-E4-V	2.20 - 2.20	Dark Brown	Clay	Vegetation	None
18775464	4G-F4	0.20 - 0.20	Light Brown	Loamy Sand	Stones	None
18775470	4G-F4	0.40 - 0.40	Light Brown	Loamy Sand	Stones	Vegetation
18775478	4G-F5	0.50 - 0.50	Dark Brown	Sand	Stones	None
18775444	4G-F7	0.40 - 0.40	Dark Brown	Sand	Stones	Vegetation
18775448	4G-F7	0.80 - 0.80	Dark Brown	Sandy Loam	Vegetation	Stones
18775474	4G-F4-V	2.40 - 2.40	Grey	Clay	None	None
18775482	4G-F5-V	2.60 - 2.60	Dark Brown	Clay	None	None
18775453	4G-F7-V	2.60 - 2.60	Dark Brown	Sandy Loam	Vegetation	Stones
18775486	4G-G5	0.40 - 0.40	Dark Brown	Sandy Loam	Vegetation	Stones
18775490	4G-G5	0.70 - 0.70	Dark Brown	Sandy Loam	Vegetation	Stones
18775436	4G-G7	0.50 - 0.50	Dark Brown	Sandy Loam	Vegetation	Stones
18775440	4G-G7	1.00 - 1.00	Dark Brown	Sandy Loam	Vegetation	Stones
18775431	4G-G5-V	3.20 - 3.20	Dark Brown	Sandy Loam	Vegetation	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-E4	4G-E4-V	4G-F4	4G-F4	4G-F5	4G-F7
			Depth (m)	0.40 - 0.40	2.20 - 2.20	0.20 - 0.20	0.40 - 0.40	0.50 - 0.50	0.40 - 0.40
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018
			SDG Ref	181120-23	181120-23	181120-23	181120-23	181120-23	181120-23
			Lab Sample No.(s)	18775424	18775457	18775464	18775470	18775478	18775444
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		11	29	14	6.7	5.8	3.8
Exchangeable Ammonia as N	<12 mg/kg	TM024		38.4 M	281 M	20.8 M	19 M	<12 M	30.5 M
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)		<0.01 M	0.0141 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M
Sulphur, Total	<0.02 %	TM132		0.194			0.0816	0.115	0.0708
Sulphate, Total potential	<0.06 %	TM132		0.582			0.245	0.345	0.212
Soil Organic Matter (SOM)	<0.35 %	TM132		5.81 #	3.88 #	4.17 #	8 #	13.7 #	4.88 #
pH	1 pH Units	TM133		11.7 M	7.35 M	10.7 M	10.4 M	9.44 M	9.55 M
Cyanide, Total	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 ♦ M	<1 M
Cyanide, Free	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 ♦ M	<1 M
Arsenic	<0.6 mg/kg	TM181		<6 M	14.1 M	21.9 M	11.8 M	11.5 M	12.8 M
Cadmium	<0.02 mg/kg	TM181		<0.2 M	<0.02 M	<0.2 M	<0.2 M	0.634 M	<0.2 M
Chromium	<0.9 mg/kg	TM181		137 M	31.7 M	47.2 M	<9 M	<9 M	<9 M
Copper	<1.4 mg/kg	TM181		<14 M	11.4 M	36.9 M	<14 M	<14 M	22.1 M
Iron	<1000 mg/kg	TM181		232000 #	32700 #	74500 #	204000 #	179000 #	452000 #
Lead	<0.7 mg/kg	TM181		9.62 M	30 M	76.9 M	24 M	37.4 M	21.4 M
Manganese	<0.13 mg/kg	TM181		8590 M	361 M	4760 M	2840 M	7110 M	4220 M
Mercury	<0.14 mg/kg	TM181		<1.4 M	<0.14 M	<1.4 M	<1.4 M	<1.4 M	<1.4 M
Nickel	<0.2 mg/kg	TM181		44.1 M	34.3 M	36.6 M	12 M	52.3 M	37.1 M
Selenium	<1 mg/kg	TM181		<10 #	<1 #	<10 #	<10 #	<10 #	<10 #
Vanadium	<0.2 mg/kg	TM181		106 #	54.2 #	70.2 #	29.4 #	28.2 #	93.6 #
Zinc	<1.9 mg/kg	TM181		133 M	107 M	270 M	125 M	95.8 M	149 M
Sulphate, acid soluble (total)	<0.02 %	TM221		0.39			0.0473	0.0715	0.0387
Calcium	<21 mg/kg	TM224		95800			134000	126000	94500
Magnesium	<8 mg/kg	TM224		17000			35200	16100	8570
Soluble Sulphate 2:1 extract as SO4 BRE	<0.004 g/l	TM243		0.104 M			0.028 M	0.0283 M	0.0232 M

Validated

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-F7	4G-F4-V	4G-F5-V	4G-F7-V	4G-G5	4G-G5
			Depth (m)	0.80 - 0.80	2.40 - 2.40	2.60 - 2.60	2.60 - 2.60	0.40 - 0.40	0.70 - 0.70
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018
			SDG Ref	181120-23	181120-23	181120-23	181120-23	181120-23	181120-23
			Lab Sample No.(s)	18775448	18775474	18775482	18775453	18775486	18775490
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		7.8	24	36	23	7.4	8.4
Exchangeable Ammonia as N	<12 mg/kg	TM024		<12 M	317 M	412 M	123 M	<12 M	<12 M
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M
Sulphur, Total	<0.02 %	TM132						0.26	
Sulphate, Total potential	<0.06 %	TM132						0.78	
Soil Organic Matter (SOM)	<0.35 %	TM132		15.3 #	0.909 #	8.41 #	0.962 #	7.1 #	7.03 #
pH	1 pH Units	TM133		10.6 M	8.01 M	7.14 M	7.76 M	9.82 M	9.91 M
Cyanide, Total	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Cyanide, Free	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Arsenic	<0.6 mg/kg	TM181		7.91 M	13.2 M	13.4 M	11.4 M	11.4 M	5.48 M
Cadmium	<0.02 mg/kg	TM181		<0.2 M	<0.02 M	<0.02 M	<0.02 M	1.6 M	0.524 M
Chromium	<0.9 mg/kg	TM181		<9 M	28.8 M	31.2 M	29.1 M	<9 M	5.37 M
Copper	<1.4 mg/kg	TM181		15.9 M	9.01 M	20 M	9.57 M	<14 M	6.68 M
Iron	<1000 mg/kg	TM181		134000 #	34200 #	19800 #	32500 #	164000 #	51600 #
Lead	<0.7 mg/kg	TM181		48.9 M	24.7 M	45.8 M	22.4 M	27.6 M	17.7 M
Manganese	<0.13 mg/kg	TM181		3550 M	1150 M	282 M	960 M	3660 M	2780 M
Mercury	<0.14 mg/kg	TM181		<1.4 M	<0.14 M	<0.14 M	<0.14 M	<1.4 M	<0.14 M
Nickel	<0.2 mg/kg	TM181		17.9 M	34.1 M	24.2 M	34.3 M	15.8 M	6.93 M
Selenium	<1 mg/kg	TM181		<10 #	<1 #	<1 #	<1 #	<10 #	<1 #
Vanadium	<0.2 mg/kg	TM181		46.1 #	51 #	46.7 #	49.7 #	38.3 #	36.7 #
Zinc	<1.9 mg/kg	TM181		89.7 M	104 M	146 M	102 M	72.8 M	57.3 M
Sulphate, acid soluble (total)	<0.02 %	TM221						0.683	
Calcium	<21 mg/kg	TM224						133000	
Magnesium	<8 mg/kg	TM224						27200	
Soluble Sulphate 2:1 extract as SO4 BRE	<0.004 g/l	TM243						0.254 M	

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-G7	4G-G7	4G-G5-V			
			Depth (m)	0.50 - 0.50	1.00 - 1.00	3.20 - 3.20			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	19/11/2018	19/11/2018	19/11/2018			
			Sample Time	00:00	00:00	00:00			
			Date Received	20/11/2018	20/11/2018	20/11/2018			
			SDG Ref	181120-23	181120-23	181120-23			
			Lab Sample No.(s)	18775436	18775440	18775431			
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		6.3	7.7	25			
Exchangeable Ammonia as N	<12 mg/kg	TM024		14.3 M	<12 M	89 M			
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M			
Cresols	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M			
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M	<0.015 M	<0.015 M			
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035 M	<0.035 M	<0.035 M			
Sulphur, Total	<0.02 %	TM132		0.236					
Sulphate, Total potential	<0.06 %	TM132		0.708					
Soil Organic Matter (SOM)	<0.35 %	TM132		45.3 #	10.5 #	0.91 #			
pH	1 pH Units	TM133		9.4 M	9.3 M	8.59 M			
Cyanide, Total	<1 mg/kg	TM153		<1 M	<1 M	<1 M			
Cyanide, Free	<1 mg/kg	TM153		<1 M	<1 M	<1 M			
Arsenic	<0.6 mg/kg	TM181		11.9 M	8.44 M	11.6 M			
Cadmium	<0.02 mg/kg	TM181		<0.2 M	<0.2 M	0.326 M			
Chromium	<0.9 mg/kg	TM181		<9 M	<9 M	27.1 M			
Copper	<1.4 mg/kg	TM181		22.1 M	16 M	11 M			
Iron	<1000 mg/kg	TM181		243000 #	216000 #	28800 #			
Lead	<0.7 mg/kg	TM181		33.4 M	47 M	25.5 M			
Manganese	<0.13 mg/kg	TM181		3430 M	4820 M	985 M			
Mercury	<0.14 mg/kg	TM181		<1.4 M	<1.4 M	<0.14 M			
Nickel	<0.2 mg/kg	TM181		40.4 M	30.6 M	35.2 M			
Selenium	<1 mg/kg	TM181		<10 #	<10 #	<1 #			
Vanadium	<0.2 mg/kg	TM181		155 #	87.3 #	49.4 #			
Zinc	<1.9 mg/kg	TM181		170 M	129 M	105 M			
Sulphate, acid soluble (total)	<0.02 %	TM221		0.228					
Calcium	<21 mg/kg	TM224		63300					
Magnesium	<8 mg/kg	TM224		7020					
Soluble Sulphate 2:1 extract as SO4 BRE	<0.004 g/l	TM243		0.14 M					

Validated

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-E4	4G-E4-V	4G-F4	4G-F4	4G-F5	4G-F7
			Depth (m)	0.40 - 0.40	2.20 - 2.20	0.20 - 0.20	0.40 - 0.40	0.50 - 0.50	0.40 - 0.40
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018
			SDG Ref	181120-23	181120-23	181120-23	181120-23	181120-23	181120-23
			Lab Sample No.(s)	18775424	18775457	18775464	18775470	18775478	18775444
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		82.7	88.7	88.9	86.1	85.5	92.4
Acenaphthene-d10 % recovery**	%	TM218		85.9	86.5	86.9	64.1	88.9	90.9
Phenanthrene-d10 % recovery**	%	TM218		83	85.5	87.5	83.7	85	90.1
Chrysene-d12 % recovery**	%	TM218		76.9	85.7	83	79.3	80.7	84.1
Perylene-d12 % recovery**	%	TM218		74.1	88.1	79.9	73.6	76.8	81.7
Naphthalene	<0.009 mg/kg	TM218		0.0963 M	<0.009 M	0.167 M	0.015 M	0.0778 M	0.0161 M
Acenaphthylene	<0.012 mg/kg	TM218		0.0284 M	<0.012 M	0.0987 M	<0.012 M	0.0571 M	<0.012 M
Acenaphthene	<0.008 mg/kg	TM218		0.0146 M	<0.008 M	0.0191 M	<0.008 M	<0.008 M	<0.008 M
Fluorene	<0.01 mg/kg	TM218		0.0236 M	<0.01 M	0.039 M	<0.01 M	0.0231 M	<0.01 M
Phenanthrene	<0.015 mg/kg	TM218		0.481 M	<0.015 M	0.488 M	0.0726 M	0.195 M	0.0454 M
Anthracene	<0.016 mg/kg	TM218		0.132 M	<0.016 M	0.15 M	<0.016 M	0.0683 M	<0.016 M
Fluoranthene	<0.017 mg/kg	TM218		1.02 M	<0.017 M	1 M	0.0906 M	0.402 M	0.0394 M
Pyrene	<0.015 mg/kg	TM218		0.843 M	<0.015 M	0.943 M	0.0789 M	0.322 M	0.0319 M
Benz(a)anthracene	<0.014 mg/kg	TM218		0.513 M	<0.014 M	0.602 M	0.0628 M	0.277 M	0.0271 M
Chrysene	<0.01 mg/kg	TM218		0.546 M	<0.01 M	0.614 M	0.0715 M	0.303 M	0.0322 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		0.777 M	<0.015 M	1.05 M	0.1 M	0.474 M	0.0505 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		0.191 M	<0.014 M	0.343 M	0.0367 M	0.163 M	<0.014 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		0.506 M	<0.015 M	0.637 M	0.0718 M	0.284 M	0.0243 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		0.397 M	<0.018 M	0.589 M	0.0534 M	0.253 M	0.0297 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		0.0824 M	<0.023 M	0.129 M	<0.023 M	0.0593 M	<0.023 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		0.372 M	<0.024 M	0.486 M	0.0495 M	0.238 M	0.026 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		6.03	<0.118	7.35	0.703	3.2	0.322

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-F7	4G-F4-V	4G-F5-V	4G-F7-V	4G-G5	4G-G5
			Depth (m)	0.80 - 0.80	2.40 - 2.40	2.60 - 2.60	2.60 - 2.60	0.40 - 0.40	0.70 - 0.70
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018
			SDG Ref	181120-23	181120-23	181120-23	181120-23	181120-23	181120-23
			Lab Sample No.(s)	18775448	18775474	18775482	18775453	18775486	18775490
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		85.2	91.5	83.7	91.9	87.6	84.2
Acenaphthene-d10 % recovery**	%	TM218		87.1	92.8	85.8	93.9	89.9	89
Phenanthrene-d10 % recovery**	%	TM218		92.6	101	85.4	93.9	92.8	84.9
Chrysene-d12 % recovery**	%	TM218		82.6	113	81.3	84.5	83.3	79
Perylene-d12 % recovery**	%	TM218		78.8	102	80.7	78	75	74.2
Naphthalene	<0.009 mg/kg	TM218		0.0307 M	<0.009 M	<0.009 M	<0.009 M	0.0265 M	0.0403 M
Acenaphthylene	<0.012 mg/kg	TM218		0.0133 M	<0.012 M	<0.012 M	<0.012 M	<0.012 M	<0.012 M
Acenaphthene	<0.008 mg/kg	TM218		<0.008 M	<0.008 M	<0.008 M	<0.008 M	0.0126 M	0.0643 M
Fluorene	<0.01 mg/kg	TM218		<0.01 M	<0.01 M	<0.01 M	<0.01 M	0.0109 M	0.0348 M
Phenanthrene	<0.015 mg/kg	TM218		0.0863 M	<0.015 M	0.0414 M	<0.015 M	0.118 M	0.209 M
Anthracene	<0.016 mg/kg	TM218		0.0231 M	<0.016 M	<0.016 M	<0.016 M	0.0195 M	<0.016 M
Fluoranthene	<0.017 mg/kg	TM218		0.167 M	<0.017 M	0.0776 M	<0.017 M	0.0942 M	0.269 M
Pyrene	<0.015 mg/kg	TM218		0.148 M	<0.015 M	0.0633 M	<0.015 M	0.0905 M	0.228 M
Benz(a)anthracene	<0.014 mg/kg	TM218		0.098 M	<0.014 M	0.0387 M	<0.014 M	0.0493 M	0.13 M
Chrysene	<0.01 mg/kg	TM218		0.131 M	<0.01 M	0.0428 M	<0.01 M	0.0697 M	0.158 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		0.163 M	<0.015 M	0.067 M	<0.015 M	0.0798 M	0.175 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		0.0814 M	<0.014 M	0.0222 M	<0.014 M	0.0255 M	0.064 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		0.0802 M	<0.015 M	0.0355 M	<0.015 M	0.0407 M	0.121 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		0.0769 M	<0.018 M	0.0347 M	<0.018 M	0.0348 M	0.0994 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		<0.023 M	<0.023 M	<0.023 M	<0.023 M	<0.023 M	<0.023 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		0.075 M	<0.024 M	<0.024 M	<0.024 M	0.0406 M	0.108 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		1.17	<0.118	0.423	<0.118	0.713	1.7

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-G7	4G-G7	4G-G5-V			
			Depth (m)	0.50 - 0.50	1.00 - 1.00	3.20 - 3.20			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	19/11/2018	19/11/2018	19/11/2018			
			Sample Time	00:00	00:00	00:00			
			Date Received	20/11/2018	20/11/2018	20/11/2018			
			SDG Ref	181120-23	181120-23	181120-23			
			Lab Sample No.(s)	18775436	18775440	18775431			
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		85.3	77.2	84.7			
Acenaphthene-d10 % recovery**	%	TM218		69.9	0	87.3			
Phenanthrene-d10 % recovery**	%	TM218		82.7	83.4	88.7			
Chrysene-d12 % recovery**	%	TM218		71.2	93.8	83.7			
Perylene-d12 % recovery**	%	TM218		59.4	74.7	82.3			
Naphthalene	<0.009 mg/kg	TM218		0.0455 M	<0.09 M	<0.009 M			
Acenaphthylene	<0.012 mg/kg	TM218		0.017 M	<0.12 M	<0.012 M			
Acenaphthene	<0.008 mg/kg	TM218		<0.008 M	<0.08 M	<0.008 M			
Fluorene	<0.01 mg/kg	TM218		0.0116 M	<0.1 M	<0.01 M			
Phenanthrene	<0.015 mg/kg	TM218		0.181 M	<0.15 M	<0.015 M			
Anthracene	<0.016 mg/kg	TM218		<0.016 M	<0.16 M	<0.016 M			
Fluoranthene	<0.017 mg/kg	TM218		0.0906 M	0.649 M	<0.017 M			
Pyrene	<0.015 mg/kg	TM218		0.0824 M	0.492 M	<0.015 M			
Benz(a)anthracene	<0.014 mg/kg	TM218		0.0567 M	0.453 M	<0.014 M			
Chrysene	<0.01 mg/kg	TM218		0.0663 M	0.372 M	<0.01 M			
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		0.0797 M	0.439 M	<0.015 M			
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		0.0193 M	0.177 M	<0.014 M			
Benzo(a)pyrene	<0.015 mg/kg	TM218		0.0363 M	0.25 M	<0.015 M			
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		0.0369 M	<0.18 M	<0.018 M			
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		<0.023 M	<0.23 M	<0.023 M			
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		0.0392 M	<0.24 M	<0.024 M			
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		0.763	2.83	<0.118			

Validated

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-E4	4G-E4-V	4G-F4	4G-F4	4G-F5	4G-F7
			Depth (m)	0.40 - 0.40	2.20 - 2.20	0.20 - 0.20	0.40 - 0.40	0.50 - 0.50	0.40 - 0.40
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018
			SDG Ref	181120-23	181120-23	181120-23	181120-23	181120-23	181120-23
			Lab Sample No.(s)	18775424	18775457	18775464	18775470	18775478	18775444
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		90 2	91.9 ♦	126	91.3 ♦	91.1	70.1 ♦
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089		<0.1 2 M	<0.2 ♦ M	<0.2 M	<0.2 ♦ M	<0.2 M	<0.2 ♦ M
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.01 2	<0.02 ♦	<0.02	<0.02 ♦	<0.02	<0.02 ♦
Aliphatics >C6-C8	<0.01 mg/kg	TM089		<0.01 2	<0.02 ♦	<0.02	<0.02 ♦	<0.02	0.0239 ♦
Aliphatics >C8-C10	<0.01 mg/kg	TM089		<0.01 2	<0.02 ♦	<0.02	<0.02 ♦	<0.02	0.0229 ♦
Aliphatics >C10-C12	<0.01 mg/kg	TM089		<0.01 2	<0.02 ♦	<0.02	<0.02 ♦	<0.02	<0.02 ♦
Aliphatics >C12-C16	<0.1 mg/kg	TM173		1.13	<0.1	1.26	<0.1	<0.1	0.888
Aliphatics >C16-C21	<0.1 mg/kg	TM173		8.1	<0.1	11.3	<0.1	4.37	5.14
Aliphatics >C21-C35	<0.1 mg/kg	TM173		70.6	4.06	60.9	<0.1	20.7	27.7
Aliphatics >C35-C44	<0.1 mg/kg	TM173		15.4	<0.1	19.7	<0.1	5.23	4.18
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		95.2	4.06	93.1	<0.1	30.3	37.9
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.01 2	<0.02 ♦	<0.02	<0.02 ♦	<0.02	<0.02 ♦
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.01 2	<0.02 ♦	<0.02	<0.02 ♦	<0.02	<0.02 ♦
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		<0.01 2	<0.02 ♦	<0.02	<0.02 ♦	<0.02	<0.02 ♦
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		<0.01 2	<0.02 ♦	<0.02	<0.02 ♦	<0.02	<0.02 ♦
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		0.556	<0.1	1.58	<0.1	1.31	0.216
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		8.71	<0.1	8.71	2.14	6.31	1.55
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		37.9	13	48.3	5.55	29	10.8
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		11.3	1.26	24.1	0.824	11.7	1.21
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		3.79	<0.1	9.38	<0.1	4.52	<0.1
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		58.5	14.3	82.7	8.51	48.3	13.7
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		154	18.3	176	8.51	78.6	51.7

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-F7	4G-F4-V	4G-F5-V	4G-F7-V	4G-G5	4G-G5
			Depth (m)	0.80 - 0.80	2.40 - 2.40	2.60 - 2.60	2.60 - 2.60	0.40 - 0.40	0.70 - 0.70
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018
			SDG Ref	181120-23	181120-23	181120-23	181120-23	181120-23	181120-23
			Lab Sample No.(s)	18775448	18775474	18775482	18775453	18775486	18775490
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		85.3 ♦	97.8 ♦	88.6	92.8 ♦	127	94
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089		<0.2 ♦ M	<0.2 ♦ M	<0.2 M	<0.2 ♦ M	<0.2 M	<0.2 M
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.02 ♦	<0.02 ♦	<0.02	<0.02 ♦	<0.02	<0.02
Aliphatics >C6-C8	<0.01 mg/kg	TM089		0.0412 ♦	<0.02 ♦	0.022	<0.02 ♦	<0.02	<0.02
Aliphatics >C8-C10	<0.01 mg/kg	TM089		0.039 ♦	<0.02 ♦	<0.02	<0.02 ♦	<0.02	<0.02
Aliphatics >C10-C12	<0.01 mg/kg	TM089		0.0466 ♦	<0.02 ♦	<0.02	<0.02 ♦	<0.02	<0.02
Aliphatics >C12-C16	<0.1 mg/kg	TM173		4.51	<0.1	0.878	<0.1	<0.1	3.09
Aliphatics >C16-C21	<0.1 mg/kg	TM173		16.3	<0.1	1.97	<0.1	3.35	7.46
Aliphatics >C21-C35	<0.1 mg/kg	TM173		36.6	2.16	4.16	3.39	34.2	53.2
Aliphatics >C35-C44	<0.1 mg/kg	TM173		11.5	<0.1	<0.1	<0.1	6.07	41
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		69	2.16	7.01	3.39	43.6	105
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.02 ♦	<0.02 ♦	<0.02	<0.02 ♦	<0.02	<0.02
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.02 ♦	<0.02 ♦	<0.02	<0.02 ♦	<0.02	<0.02
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		0.026 ♦	<0.02 ♦	<0.02	<0.02 ♦	<0.02	<0.02
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		0.0314 ♦	<0.02 ♦	<0.02	<0.02 ♦	<0.02	<0.02
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		0.644	<0.1	<0.1	<0.1	0.719	1.23
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		3.9	<0.1	2.07	<0.1	3.83	5.31
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		18.4	1.75	29.2	2.03	23.6	49.2
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		7.79	<0.1	2.02	0.615	13.3	73.4
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		2.56	<0.1	<0.1	<0.1	5.81	34.8
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		30.7	1.75	33.3	2.65	41.4	129
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		99.9	3.91	40.3	6.04	85.1	234

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-G7	4G-G7	4G-G5-V			
			Depth (m)	0.50 - 0.50	1.00 - 1.00	3.20 - 3.20			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	19/11/2018	19/11/2018	19/11/2018			
			Sample Time	00:00	00:00	00:00			
			Date Received	20/11/2018	20/11/2018	20/11/2018			
			SDG Ref	181120-23	181120-23	181120-23			
			Lab Sample No.(s)	18775436	18775440	18775431			
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		87	81.5 ♦	117			
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089		<0.2 M	<0.2 ♦ M	<0.2 M			
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.02	<0.02 ♦	<0.02			
Aliphatics >C6-C8	<0.01 mg/kg	TM089		<0.02	<0.02 ♦	<0.02			
Aliphatics >C8-C10	<0.01 mg/kg	TM089		<0.02	<0.02 ♦	<0.02			
Aliphatics >C10-C12	<0.01 mg/kg	TM089		<0.02	<0.02 ♦	<0.02			
Aliphatics >C12-C16	<0.1 mg/kg	TM173		2.35	1.33	<0.1			
Aliphatics >C16-C21	<0.1 mg/kg	TM173		12.3	4.58	<0.1			
Aliphatics >C21-C35	<0.1 mg/kg	TM173		50.8	24.5	2.25			
Aliphatics >C35-C44	<0.1 mg/kg	TM173		17.9	10.6	<0.1			
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		83.3	40.9	2.25			
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.02	<0.02 ♦	<0.02			
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.02	<0.02 ♦	<0.02			
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		<0.02	<0.02 ♦	<0.02			
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		<0.02	<0.02 ♦	<0.02			
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		1	<0.1	<0.1			
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		6.01	2.15	<0.1			
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		26.1	14.8	<0.1			
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		16.1	14.1	<0.1			
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		6.65	6.05	<0.1			
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		49.3	31	<0.1			
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		133	72	2.25			

Validated

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-E4	4G-E4-V	4G-F4	4G-F4	4G-F5	4G-F7
			Depth (m)	0.40 - 0.40	2.20 - 2.20	0.20 - 0.20	0.40 - 0.40	0.50 - 0.50	0.40 - 0.40
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018
			SDG Ref	181120-23	181120-23	181120-23	181120-23	181120-23	181120-23
			Lab Sample No.(s)	18775424	18775457	18775464	18775470	18775478	18775444
			AGS Reference						
Dibromofluoromethane**	%	TM116		107 2	121	113	115	110	111
Toluene-d8**	%	TM116		94.3 2	103	102	104	102	102
4-Bromofluorobenzene**	%	TM116		91.9 2	85.2	79.8	83.3	85.4	72.8
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1 2 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Benzene	<0.009 mg/kg	TM116		<0.09 2 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M
Toluene	<0.007 mg/kg	TM116		<0.07 2 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M
Ethylbenzene	<0.004 mg/kg	TM116		<0.04 2 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M
p/m-Xylene	<0.01 mg/kg	TM116		<0.1 2 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
o-Xylene	<0.01 mg/kg	TM116		<0.1 2 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Naphthalene	<0.013 mg/kg	TM116		<0.13 2 M	<0.13 M	<0.13 M	<0.13 M	<0.13 M	<0.13 M
Sum of BTEX	<0.04 mg/kg	TM116		<0.4 2	<0.4	<0.4	<0.4	<0.4	<0.4

Validated

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-F7	4G-F4-V	4G-F5-V	4G-F7-V	4G-G5	4G-G5
			Depth (m)	0.80 - 0.80	2.40 - 2.40	2.60 - 2.60	2.60 - 2.60	0.40 - 0.40	0.70 - 0.70
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018	19/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018
			SDG Ref	181120-23	181120-23	181120-23	181120-23	181120-23	181120-23
			Lab Sample No.(s)	18775448	18775474	18775482	18775453	18775486	18775490
			AGS Reference						
Dibromofluoromethane**	%	TM116		115	122	111	137	108	113
Toluene-d8**	%	TM116		103	103	99	102	99.1	102
4-Bromofluorobenzene**	%	TM116		83.6	86.6	80.8	85.2	95.8	85.3
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Benzene	<0.009 mg/kg	TM116		<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M
Toluene	<0.007 mg/kg	TM116		<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M
Ethylbenzene	<0.004 mg/kg	TM116		<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M
p/m-Xylene	<0.01 mg/kg	TM116		<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
o-Xylene	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Naphthalene	<0.013 mg/kg	TM116		<0.13 M	<0.13 M	<0.13 M	<0.13 M	<0.13 M	<0.13 M
Sum of BTEX	<0.04 mg/kg	TM116		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-G7	4G-G7	4G-G5-V			
			Depth (m)	0.50 - 0.50	1.00 - 1.00	3.20 - 3.20			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	19/11/2018	19/11/2018	19/11/2018			
			Sample Time	00:00	00:00	00:00			
			Date Received	20/11/2018	20/11/2018	20/11/2018			
			SDG Ref	181120-23	181120-23	181120-23			
			Lab Sample No.(s)	18775436	18775440	18775431			
			AGS Reference						
Dibromofluoromethane**	%	TM116		112	105	114			
Toluene-d8**	%	TM116		101	97.4	102			
4-Bromofluorobenzene**	%	TM116		80.2	94.1	88.2			
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M			
Benzene	<0.009 mg/kg	TM116		<0.09 M	<0.09 M	<0.09 M			
Toluene	<0.007 mg/kg	TM116		<0.07 M	<0.07 M	<0.07 M			
Ethylbenzene	<0.004 mg/kg	TM116		<0.04 M	<0.04 M	<0.04 M			
p/m-Xylene	<0.01 mg/kg	TM116		<0.1 #	<0.1 #	<0.1 #			
o-Xylene	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M			
Naphthalene	<0.013 mg/kg	TM116		<0.13 M	<0.13 M	<0.13 M			
Sum of BTEX	<0.04 mg/kg	TM116		<0.4	<0.4	<0.4			

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

Asbestos Identification - Solid Samples

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-E4 0.40 - 0.40 SOLID 19/11/2018 00:00:00 20/11/2018 11:07:41 181120-23 18775424 TM048	30/11/2018	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-F4 0.40 - 0.40 SOLID 19/11/2018 00:00:00 20/11/2018 12:48:54 181120-23 18775470 TM048	30/11/2018	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-F5 0.50 - 0.50 SOLID 19/11/2018 00:00:00 20/11/2018 11:11:23 181120-23 18775478 TM048	30/11/2018	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-F7 0.40 - 0.40 SOLID 19/11/2018 00:00:00 20/11/2018 11:42:05 181120-23 18775444 TM048	30/11/2018	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-G5 0.40 - 0.40 SOLID 19/11/2018 00:00:00 20/11/2018 11:46:28 181120-23 18775486 TM048	30/11/2018	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-G7 0.50 - 0.50 SOLID 19/11/2018 00:00:00 20/11/2018 13:48:57 181120-23 18775436 TM048	30/11/2018	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.101	**Natural Moisture Content (%)**	12.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	89
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775424
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-E4
Depth (m)	0.40 - 0.40

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00114	<0.0005	0.0114	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00406	<0.001	0.0406	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.0011	<0.001	0.011	<0.01	-	-	-
Vanadium	0.0205	<0.001	0.205	<0.01	-	-	-
Zinc	0.00565	<0.001	0.0565	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000222	<0.00001	0.000222	<0.0001	-	-	-
Acenaphthene by GCMS	0.00000557	<0.000005	0.0000557	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000223	<0.000005	0.000223	<0.00005	-	-	-
Anthracene by GCMS	0.00000568	<0.000005	0.0000568	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000225	<0.000005	0.000225	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.0000269	<0.000005	0.000269	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000105	<0.000082	0.00105	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	11.62
Conductivity (µS/cm)	792.00
Temperature (°C)	18.30
Volume Leachant (Litres)	0.889

Mcerts Certification does not apply to leachates

07/12/2018 15:59:29

15:58:39 07/12/2018

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.101	**Natural Moisture Content (%)**	12.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	89
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775424
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-E4
Depth (m)	0.40 - 0.40

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	11.62
Conductivity (µS/cm)	792.00
Temperature (°C)	18.30
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Mcerts Certification does not apply to leachates

07/12/2018 15:59:29

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CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.096	**Natural Moisture Content (%)**	6.72
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	93.7
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775436
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-G7
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	1.45	<0.2	14.5	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00414	<0.0005	0.0414	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.000725	<0.0003	0.00725	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.0019	<0.001	0.019	<0.01	-	-	-
Vanadium	0.34	<0.001	3.4	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000174	<0.00001	0.000174	<0.0001	-	-	-
Acenaphthene by GCMS	0.0000246	<0.000005	0.000246	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000069	<0.000005	0.000069	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000111	<0.000005	0.000111	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.00000548	<0.000005	0.0000548	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	<0.000082	<0.000082	<0.00082	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	10.09
Conductivity (µS/cm)	241.00
Temperature (°C)	18.20
Volume Leachant (Litres)	0.894

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.096	**Natural Moisture Content (%)**	6.72
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	93.7
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775436
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-G7
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	10.09
Conductivity (µS/cm)	241.00
Temperature (°C)	18.20
Volume Leachant (Litres)	0.894

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	8.34
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.3
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775440
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-G7
Depth (m)	1.00 - 1.00

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.0104	<0.0005	0.104	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00113	<0.001	0.0113	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00114	<0.001	0.0114	<0.01	-	-	-
Vanadium	0.0965	<0.001	0.965	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.000024	<0.000005	0.00024	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000288	<0.000005	0.000288	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.0000178	<0.000005	0.000178	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.00000881	<0.000005	0.0000881	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000234	<0.000002	0.0000234	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	<0.000082	<0.000082	<0.00082	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	9.83
Conductivity (µS/cm)	98.90
Temperature (°C)	18.30
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	8.34
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.3
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775440
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-G7
Depth (m)	1.00 - 1.00

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	9.83
Conductivity (µS/cm)	98.90
Temperature (°C)	18.30
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.094	**Natural Moisture Content (%)**	3.95
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	96.2
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775444
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-F7
Depth (m)	0.40 - 0.40

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00639	<0.0005	0.0639	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.141	<0.001	1.41	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.00000685	<0.000005	0.0000685	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000104	<0.000005	0.000104	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.00000535	<0.000005	0.0000535	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	<0.000082	<0.000082	<0.00082	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	10.25
Conductivity (µS/cm)	94.00
Temperature (°C)	18.30
Volume Leachant (Litres)	0.896

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.094	**Natural Moisture Content (%)**	3.95
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	96.2
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775444
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-F7
Depth (m)	0.40 - 0.40

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	10.25
Conductivity (µS/cm)	94.00
Temperature (°C)	18.30
Volume Leachant (Litres)	0.896

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	8.46
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.2
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775448
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-F7
Depth (m)	0.80 - 0.80

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00153	<0.0005	0.0153	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00702	<0.001	0.0702	<0.01	-	-	-
Vanadium	0.0523	<0.001	0.523	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000623	<0.00001	0.000623	<0.0001	-	-	-
Acenaphthene by GCMS	0.00000831	<0.000005	0.0000831	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000538	<0.000005	0.000538	<0.00005	-	-	-
Anthracene by GCMS	0.0000147	<0.000005	0.000147	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000842	<0.000005	0.000842	<0.00005	-	-	-
Fluorene by GCMS	0.0000133	<0.000005	0.000133	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.0000533	<0.000005	0.000533	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.00029	<0.000082	0.0029	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	10.36
Conductivity (µS/cm)	213.00
Temperature (°C)	18.00
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	8.46
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.2
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775448
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-F7
Depth (m)	0.80 - 0.80

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	10.36
Conductivity (µS/cm)	213.00
Temperature (°C)	18.00
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.105	**Natural Moisture Content (%)**	16.3
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	86
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775464
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-F4
Depth (m)	0.20 - 0.20

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	0.0000271	<0.00001	0.000271	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00174	<0.0005	0.0174	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00146	<0.001	0.0146	<0.01	-	-	-
Copper	0.00221	<0.0003	0.0221	<0.003	-	-	-
Lead	0.000904	<0.0002	0.00904	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000677	<0.0004	0.00677	<0.004	-	-	-
Selenium	0.00156	<0.001	0.0156	<0.01	-	-	-
Vanadium	0.0333	<0.001	0.333	<0.01	-	-	-
Zinc	0.00244	<0.001	0.0244	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000397	<0.00001	0.000397	<0.0001	-	-	-
Acenaphthene by GCMS	0.0000103	<0.000005	0.000103	<0.00005	-	-	-
Acenaphthylene by GCMS	0.00000673	<0.000005	0.0000673	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000521	<0.000005	0.000521	<0.00005	-	-	-
Anthracene by GCMS	0.000011	<0.000005	0.00011	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000294	<0.000005	0.000294	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	0.00000776	<0.000005	0.0000776	<0.00005	-	-	-
Pyrene by GCMS	0.000106	<0.000005	0.00106	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.00000839	<0.000005	0.0000839	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000271	<0.000082	0.00271	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	11.20
Conductivity (µS/cm)	566.00
Temperature (°C)	18.20
Volume Leachant (Litres)	0.885

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.105	**Natural Moisture Content (%)**	16.3
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	86
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775464
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-F4
Depth (m)	0.20 - 0.20

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	11.20
Conductivity (µS/cm)	566.00
Temperature (°C)	18.20
Volume Leachant (Litres)	0.885

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.18
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	93.3
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775470
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-F4
Depth (m)	0.40 - 0.40

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00201	<0.0005	0.0201	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.0201	<0.001	0.201	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.00000621	<0.000005	0.0000621	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000166	<0.000005	0.000166	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	<0.000082	<0.000082	<0.00082	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	10.52
Conductivity (µS/cm)	158.00
Temperature (°C)	17.90
Volume Leachant (Litres)	0.894

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.18
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	93.3
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775470
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-F4
Depth (m)	0.40 - 0.40

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	10.52
Conductivity (µS/cm)	158.00
Temperature (°C)	17.90
Volume Leachant (Litres)	0.894

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.096	**Natural Moisture Content (%)**	6.16
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	94.2
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775478
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-F5
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00375	<0.0005	0.0375	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00126	<0.001	0.0126	<0.01	-	-	-
Vanadium	0.035	<0.001	0.35	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000126	<0.000005	0.000126	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000109	<0.000005	0.000109	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	0.00000706	<0.000005	0.0000706	<0.00005	-	-	-
Pyrene by GCMS	0.0000113	<0.000005	0.000113	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.00000998	<0.000005	0.0000998	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.0000059	<0.000005	0.000059	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000483	<0.000002	0.0000483	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	0.000017	<0.000005	0.00017	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	<0.000082	<0.000082	<0.00082	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	9.09
Conductivity (µS/cm)	77.80
Temperature (°C)	17.90
Volume Leachant (Litres)	0.894

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.096	**Natural Moisture Content (%)**	6.16
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	94.2
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775478
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-F5
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	9.09
Conductivity (µS/cm)	77.80
Temperature (°C)	17.90
Volume Leachant (Litres)	0.894

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.99
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.6
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775486
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-G5
Depth (m)	0.40 - 0.40

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00147	<0.0005	0.0147	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.0039	<0.001	0.039	<0.01	-	-	-
Vanadium	0.0159	<0.001	0.159	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Acenaphthene by GCMS	0.00000592	<0.000005	0.0000592	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000189	<0.000005	0.000189	<0.00005	-	-	-
Anthracene by GCMS	0.00000521	<0.000005	0.0000521	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000595	<0.000005	0.000595	<0.00005	-	-	-
Fluorene by GCMS	0.0000116	<0.000005	0.000116	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.0000124	<0.000005	0.000124	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000114	<0.000082	0.00114	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	9.50
Conductivity (µS/cm)	131.00
Temperature (°C)	17.90
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.99
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.6
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775486
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-G5
Depth (m)	0.40 - 0.40

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	9.50
Conductivity (µS/cm)	131.00
Temperature (°C)	17.90
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	9.17
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	91.6
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775490
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-G5
Depth (m)	0.70 - 0.70

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.0015	<0.0005	0.015	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00277	<0.001	0.0277	<0.01	-	-	-
Vanadium	0.0374	<0.001	0.374	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000938	<0.00001	0.000938	<0.0001	-	-	-
Acenaphthene by GCMS	0.000842	<0.000005	0.00842	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000591	<0.000005	0.000591	<0.00005	-	-	-
Anthracene by GCMS	0.0000171	<0.000005	0.000171	<0.00005	-	-	-
Phenanthrene by GCMS	0.000244	<0.000005	0.00244	<0.00005	-	-	-
Fluorene by GCMS	0.000117	<0.000005	0.00117	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.0000492	<0.000005	0.000492	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.00142	<0.000082	0.0142	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	10.16
Conductivity (µS/cm)	152.00
Temperature (°C)	18.40
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	9.17
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	91.6
Particle Size <4mm	>95%		

Case	
SDG	181120-23
Lab Sample Number(s)	18775490
Sampled Date	19-Nov-2018
Customer Sample Ref.	4G-G5
Depth (m)	0.70 - 0.70

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	21-Nov-2018
pH (pH Units)	10.16
Conductivity (µS/cm)	152.00
Temperature (°C)	18.40
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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Table of Results - Appendix

Method No	Reference	Description
PM001		Preparation of Samples for Metals Analysis
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM024	Method 4500A & B, AWWA/APHA, 20th Ed., 1999	Determination of Exchangeable Ammonium and Ammoniacal Nitrogen as N by titration on solids
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer
TM224	US EPA Method 6010B	Determination of Alkaline Metals by iCap 6500 Duo ICP-OES
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM243		Mixed Anions In Soils By Kone
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	181120-23	**Client Reference:**		**Report Number:**	484420
Location:	Llanwern	**Order Number:**	LLA521	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	18775424	18775457	18775464	18775470	18775478	18775444	18775448	18775474	18775482	18775453
Customer Sample Ref.	4G-E4	4G-E4-V	4G-F4	4G-F4	4G-F5	4G-F7	4G-F7	4G-F4-V	4G-F5-V	4G-F7-V
AGS Ref.										
Depth	0.40 - 0.40	2.20 - 2.20	0.20 - 0.20	0.40 - 0.40	0.50 - 0.50	0.40 - 0.40	0.80 - 0.80	2.40 - 2.40	2.60 - 2.60	2.60 - 2.60
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Alkali Metals by iCap-OES (Soil)	27-Nov-2018			27-Nov-2018	28-Nov-2018	27-Nov-2018				
Ammoniacal Nitrogen	29-Nov-2018		29-Nov-2018	29-Nov-2018	29-Nov-2018	29-Nov-2018	29-Nov-2018			
Ammonium Soil by Titration	30-Nov-2018	30-Nov-2018	30-Nov-2018	30-Nov-2018	30-Nov-2018	30-Nov-2018	30-Nov-2018	30-Nov-2018	30-Nov-2018	30-Nov-2018
Anions by Kone (soil)	03-Dec-2018			03-Dec-2018	03-Dec-2018	03-Dec-2018				
Asbestos ID in Solid Samples	30-Nov-2018			30-Nov-2018	30-Nov-2018	30-Nov-2018				
CEN 10:1 Leachate (1 Stage)	21-Nov-2018		21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018			
CEN Readings	22-Nov-2018		22-Nov-2018	22-Nov-2018	22-Nov-2018	23-Nov-2018	23-Nov-2018			
Cyanide Comp/Free/Total/Thiocyanate	29-Nov-2018	29-Nov-2018	29-Nov-2018	30-Nov-2018	07-Dec-2018	29-Nov-2018	29-Nov-2018	30-Nov-2018	29-Nov-2018	29-Nov-2018
Dissolved Metals by ICP-MS	03-Dec-2018		03-Dec-2018	03-Dec-2018	03-Dec-2018	03-Dec-2018	03-Dec-2018			
EPH CWG (Aliphatic) Aqueous GC (W)	01-Dec-2018		01-Dec-2018	01-Dec-2018	01-Dec-2018	01-Dec-2018	01-Dec-2018			
EPH CWG (Aliphatic) GC (S)	26-Nov-2018	22-Nov-2018	26-Nov-2018	22-Nov-2018	26-Nov-2018	26-Nov-2018	22-Nov-2018	26-Nov-2018	26-Nov-2018	22-Nov-2018
EPH CWG (Aromatic) Aqueous GC (W)	01-Dec-2018		01-Dec-2018	01-Dec-2018	01-Dec-2018	01-Dec-2018	01-Dec-2018			
EPH CWG (Aromatic) GC (S)	26-Nov-2018	22-Nov-2018	26-Nov-2018	22-Nov-2018	26-Nov-2018	26-Nov-2018	22-Nov-2018	26-Nov-2018	26-Nov-2018	22-Nov-2018
GRO by GC-FID (S)	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018
GRO by GC-FID (W)	03-Dec-2018		03-Dec-2018	03-Dec-2018	03-Dec-2018	03-Dec-2018	03-Dec-2018			
Mercury Dissolved	30-Nov-2018		30-Nov-2018	30-Nov-2018	30-Nov-2018	30-Nov-2018	30-Nov-2018			
Metals in solid samples by OES	26-Nov-2018	26-Nov-2018	26-Nov-2018	26-Nov-2018	29-Nov-2018	26-Nov-2018	26-Nov-2018	04-Dec-2018	26-Nov-2018	04-Dec-2018
PAH by GCMS	04-Dec-2018	04-Dec-2018	30-Nov-2018	04-Dec-2018	04-Dec-2018	30-Nov-2018	04-Dec-2018	03-Dec-2018	30-Nov-2018	29-Nov-2018
PAH Spec MS - Aqueous (W)	03-Dec-2018		03-Dec-2018	03-Dec-2018	03-Dec-2018	03-Dec-2018	03-Dec-2018			
pH	30-Nov-2018	03-Dec-2018	03-Dec-2018	30-Nov-2018	30-Nov-2018	30-Nov-2018	03-Dec-2018	03-Dec-2018	03-Dec-2018	03-Dec-2018
pH Value	29-Nov-2018		23-Nov-2018	23-Nov-2018	23-Nov-2018	23-Nov-2018	23-Nov-2018			
Phenols by HPLC (S)	03-Dec-2018	03-Dec-2018	04-Dec-2018	03-Dec-2018	03-Dec-2018	04-Dec-2018	03-Dec-2018	03-Dec-2018	03-Dec-2018	03-Dec-2018
Sample description	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
Total Organic Carbon	04-Dec-2018	30-Nov-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018
Total Sulphate	22-Nov-2018			22-Nov-2018	29-Nov-2018	22-Nov-2018				
Total Sulphur	23-Nov-2018			23-Nov-2018	03-Dec-2018	23-Nov-2018				
TPH CWG (W)	03-Dec-2018		03-Dec-2018	03-Dec-2018	03-Dec-2018	03-Dec-2018	03-Dec-2018			
TPH CWG GC (S)	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018
VOC MS (S)	04-Dec-2018	01-Dec-2018	01-Dec-2018	01-Dec-2018	04-Dec-2018	01-Dec-2018	01-Dec-2018	01-Dec-2018	04-Dec-2018	01-Dec-2018

Lab Sample No(s)	18775486	18775490	18775436	18775440	18775431
Customer Sample Ref.	4G-G5	4G-G5	4G-G7	4G-G7	4G-G5-V
AGS Ref.					
Depth	0.40 - 0.40	0.70 - 0.70	0.50 - 0.50	1.00 - 1.00	3.20 - 3.20
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Alkali Metals by iCap-OES (Soil)	28-Nov-2018		27-Nov-2018		
Ammoniacal Nitrogen	29-Nov-2018	29-Nov-2018	29-Nov-2018	29-Nov-2018	
Ammonium Soil by Titration	30-Nov-2018	30-Nov-2018	30-Nov-2018	30-Nov-2018	30-Nov-2018
Anions by Kone (soil)	03-Dec-2018		03-Dec-2018		
Asbestos ID in Solid Samples	30-Nov-2018		30-Nov-2018		
CEN 10:1 Leachate (1 Stage)	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	
CEN Readings	23-Nov-2018	22-Nov-2018	22-Nov-2018	23-Nov-2018	
Cyanide Comp/Free/Total/Thiocyanate	05-Dec-2018	05-Dec-2018	06-Dec-2018	29-Nov-2018	05-Dec-2018
Dissolved Metals by ICP-MS	03-Dec-2018	03-Dec-2018	04-Dec-2018	03-Dec-2018	
EPH CWG (Aliphatic) Aqueous GC (W)	01-Dec-2018	01-Dec-2018	01-Dec-2018	01-Dec-2018	
EPH CWG (Aliphatic) GC (S)	26-Nov-2018	22-Nov-2018	22-Nov-2018	22-Nov-2018	22-Nov-2018
EPH CWG (Aromatic) Aqueous GC (W)	01-Dec-2018	01-Dec-2018	01-Dec-2018	01-Dec-2018	
EPH CWG (Aromatic) GC (S)	26-Nov-2018	22-Nov-2018	22-Nov-2018	22-Nov-2018	22-Nov-2018
GRO by GC-FID (S)	03-Dec-2018	04-Dec-2018	03-Dec-2018	04-Dec-2018	03-Dec-2018
GRO by GC-FID (W)	03-Dec-2018	03-Dec-2018	03-Dec-2018	03-Dec-2018	
Mercury Dissolved	30-Nov-2018	30-Nov-2018	03-Dec-2018	30-Nov-2018	
Metals in solid samples by OES	26-Nov-2018	27-Nov-2018	26-Nov-2018	26-Nov-2018	27-Nov-2018
PAH by GCMS	04-Dec-2018	04-Dec-2018	04-Dec-2018	03-Dec-2018	04-Dec-2018
PAH Spec MS - Aqueous (W)	03-Dec-2018	03-Dec-2018	03-Dec-2018	03-Dec-2018	
pH	30-Nov-2018	03-Dec-2018	30-Nov-2018	03-Dec-2018	03-Dec-2018
pH Value	23-Nov-2018	25-Nov-2018	04-Dec-2018	23-Nov-2018	
Phenols by HPLC (S)	03-Dec-2018	03-Dec-2018	03-Dec-2018	03-Dec-2018	03-Dec-2018
Sample description	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
Total Organic Carbon	04-Dec-2018	30-Nov-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018
Total Sulphate	04-Dec-2018		04-Dec-2018		
Total Sulphur	03-Dec-2018		23-Nov-2018		
TPH CWG (W)	03-Dec-2018	03-Dec-2018	03-Dec-2018	03-Dec-2018	
TPH CWG GC (S)	03-Dec-2018	04-Dec-2018	03-Dec-2018	04-Dec-2018	03-Dec-2018
VOC MS (S)	01-Dec-2018	01-Dec-2018	01-Dec-2018	02-Dec-2018	01-Dec-2018

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
5	**Samples exceeded holding time before presevation was performed**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

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Hawarden
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Website: www.alsenvironmental.co.uk

Atkins Global Ltd
Project Jonah site office
Llan Coed House
Suite 24
Coed Darcy
Llandarcy
SA10 6HJ

Attention: John Fitzgerald

CERTIFICATE OF ANALYSIS

Date:	06 December 2018
Customer:	H_ATKINS_LDC
Sample Delivery Group (SDG):	181121-47
Your Reference:	
Location:	Llanwern
Report No:	484278

We received 13 samples on Wednesday November 21, 2018 and 13 of these samples were scheduled for analysis which was completed on Thursday December 06, 2018. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:



Sonia McWhan

Operations Manager

ALS Life Sciences Limited. Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18786527	4G-A7		0.50 - 0.50	20/11/2018
18786511	4G-A8		0.40 - 0.40	20/11/2018
18786517	4G-A8		0.70 - 0.70	20/11/2018
18786535	4G-A7-V		1.80 - 1.80	20/11/2018
18786522	4G-A8-V		2.10 - 2.10	20/11/2018
18786500	4G-B9		0.50 - 0.50	20/11/2018
18786505	4G-B9-V		1.60 - 1.60	20/11/2018
18786553	4G-D7		0.30 - 0.30	20/11/2018
18786557	4G-D7		0.60 - 0.60	20/11/2018
18786495	4G-D7-V		1.70 - 1.70	20/11/2018
18786486	4G-F8		0.50 - 0.50	20/11/2018
18786540	4G-F8		1.00 - 1.00	20/11/2018
18786545	4G-F8-V		2.60 - 2.60	20/11/2018

Maximum Sample/Coolbox Temperature (°C) : **9.2**

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	18786527			18786511			18786517		18786535		18786522		18786500			18786505		18786553
			Customer Sample Reference	4G-A7			4G-A8			4G-A8		4G-A7-V		4G-A8-V		4G-B9			4G-B9-V		4G-D7
			AGS Reference																		
			Depth (m)	0.50 - 0.50			0.40 - 0.40			0.70 - 0.70		1.80 - 1.80		2.10 - 2.10		0.50 - 0.50			1.60 - 1.60		0.30 - 0.30
			Container	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB
			Sample Type	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Alkali Metals by iCap-OES (Soil)	All	NDPs: 0 Tests: 5			X			X									X				
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 8		X			X			X						X					X
Ammonium Soil by Titration	All	NDPs: 0 Tests: 13			X			X			X		X		X		X			X	
Anions by Kone (soil)	All	NDPs: 0 Tests: 5			X			X									X				
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 5		X			X									X					X
CEN Readings	All	NDPs: 0 Tests: 8		X			X			X						X					X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 21		X	X		X	X		X	X		X		X		X	X		X		X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 8		X			X			X						X					X
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 8		X			X			X						X					X
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 13			X			X			X		X		X		X			X	
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 8		X			X			X						X					X
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 13			X			X			X		X		X		X			X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 13				X			X			X		X		X			X			X
GRO by GC-FID (W)	All	NDPs: 0 Tests: 8		X			X			X						X					X
Mercury Dissolved	All	NDPs: 0 Tests: 8		X			X			X						X					X

18786545	4G-F8-V		2.60 - 2.60	60g VOC (ALE215)	S																X			
				250g Amber Jar (ALE210)	S				X				X				X			X				
18786540	4G-F8		1.00 - 1.00	60g VOC (ALE215)	S																X			
				250g Amber Jar (ALE210)	S				X				X				X			X				
				1kg TUB	S			X				X	X		X	X			X				X	X
18786486	4G-F8		0.50 - 0.50	60g VOC (ALE215)	S																X			
				250g Amber Jar (ALE210)	S	X			X	X			X				X			X				
				1kg TUB	S			X			X	X	X		X	X			X				X	X
18786495	4G-D7-V		1.70 - 1.70	60g VOC (ALE215)	S																X			
				250g Amber Jar (ALE210)	S				X				X				X			X				
18786557	4G-D7		0.60 - 0.60	60g VOC (ALE215)	S																X			
				250g Amber Jar (ALE210)	S				X				X				X			X				
				1kg TUB	S			X				X	X		X	X			X				X	X
18786553	4G-D7		0.30 - 0.30	60g VOC (ALE215)	S																X			
				250g Amber Jar (ALE210)	S	X			X	X			X				X			X				

Validated

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			18786527			18786511			18786517			18786535		18786522		18786500			18786505		18786553
Customer Sample Reference			4G-A7			4G-A8			4G-A8			4G-A7-V		4G-A8-V		4G-B9			4G-B9-V		4G-D7
AGS Reference																					
Depth (m)			0.50 - 0.50			0.40 - 0.40			0.70 - 0.70			1.80 - 1.80		2.10 - 2.10		0.50 - 0.50			1.60 - 1.60		0.30 - 0.30
Container			1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB
Sample Type			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Metals in solid samples by OES	All	NDPs: 0 Tests: 13		X			X			X		X		X			X		X		
PAH by GCMS	All	NDPs: 0 Tests: 13		X			X			X		X		X			X		X		
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 8	X			X			X							X					X
pH	All	NDPs: 0 Tests: 13		X			X			X		X		X			X		X		
pH Value	All	NDPs: 0 Tests: 8	X			X			X							X					X
Phenols by HPLC (S)	All	NDPs: 0 Tests: 13		X			X			X		X		X			X		X		
Sample description	All	NDPs: 0 Tests: 13		X			X			X		X		X			X		X		
Total Organic Carbon	All	NDPs: 0 Tests: 13		X			X			X		X		X			X		X		
Total Sulphate	All	NDPs: 0 Tests: 5		X			X										X				
Total Sulphur	All	NDPs: 0 Tests: 5		X			X										X				
TPH CWG (W)	All	NDPs: 0 Tests: 8	X			X			X							X					X
TPH CWG GC (S)	All	NDPs: 0 Tests: 13		X			X			X		X		X			X		X		
VOC MS (S)	All	NDPs: 0 Tests: 13			X			X			X		X		X			X		X	

18786545	4G-F8-V		2.60 - 2.60	60g VOC (ALE215)	S
				250g Amber Jar (ALE210)	S
18786540	4G-F8		1.00 - 1.00	60g VOC (ALE215)	S
				250g Amber Jar (ALE210)	S
				1kg TUB	S
18786486	4G-F8		0.50 - 0.50	60g VOC (ALE215)	S
				250g Amber Jar (ALE210)	S
				1kg TUB	S
18786495	4G-D7-V		1.70 - 1.70	60g VOC (ALE215)	S
				250g Amber Jar (ALE210)	S
18786557	4G-D7		0.60 - 0.60	60g VOC (ALE215)	S
				250g Amber Jar (ALE210)	S
				1kg TUB	S
18786553	4G-D7		0.30 - 0.30	60g VOC (ALE215)	S
				250g Amber Jar (ALE210)	S

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
18786527	4G-A7	0.50 - 0.50	Dark Brown	Sandy Loam	Stones	None
18786511	4G-A8	0.40 - 0.40	Light Brown	Loamy Sand	Stones	Vegetation
18786517	4G-A8	0.70 - 0.70	Dark Brown	Sand	Stones	None
18786535	4G-A7-V	1.80 - 1.80	Grey	Clay	None	None
18786522	4G-A8-V	2.10 - 2.10	Grey	Clay	None	None
18786500	4G-B9	0.50 - 0.50	Dark Brown	Sandy Loam	Stones	N/A
18786505	4G-B9-V	1.60 - 1.60	Dark Brown	Silty Clay Loam	Stones	Vegetation
18786553	4G-D7	0.30 - 0.30	Dark Brown	Sandy Loam	Stones	None
18786557	4G-D7	0.60 - 0.60	Dark Brown	Sand	Stones	None
18786495	4G-D7-V	1.70 - 1.70	Dark Brown	Silty Clay	Vegetation	None
18786486	4G-F8	0.50 - 0.50	Dark Brown	Sand	Stones	None
18786540	4G-F8	1.00 - 1.00	Dark Brown	Sandy Loam	Vegetation	Stones
18786545	4G-F8-V	2.60 - 2.60	Dark Brown	Clay	None	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-A7	4G-A8	4G-A8	4G-A7-V	4G-A8-V	4G-B9
			Depth (m)	0.50 - 0.50	0.40 - 0.40	0.70 - 0.70	1.80 - 1.80	2.10 - 2.10	0.50 - 0.50
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	21/11/2018	21/11/2018	21/11/2018	21/11/2018	21/11/2018	21/11/2018
			SDG Ref	181121-47	181121-47	181121-47	181121-47	181121-47	181121-47
			Lab Sample No.(s)	18786527	18786511	18786517	18786535	18786522	18786500
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		9.2	8.2	4.6	22	28	7.6
Exchangeable Ammonia as N	<12 mg/kg	TM024		<12 M	<12 M	<12 M	59.7 M	202 M	<12 M
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M
Sulphur, Total	<0.02 %	TM132		0.159	0.389				0.498
Sulphate, Total potential	<0.06 %	TM132		0.477	1.17				1.49
Soil Organic Matter (SOM)	<0.35 %	TM132		24.8 #	6.1 #	10.8 #	1.56 #	4.14 #	9.64 #
pH	1 pH Units	TM133		10.7 M	10.1 M	11.4 M	8.76 M	7.48 M	11.7 M
Cyanide, Total	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Cyanide, Free	<1 mg/kg	TM153		<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Arsenic	<0.6 mg/kg	TM181		6.83 M	7.85 M	2.33 M	12.4 M	11 M	7.56 M
Cadmium	<0.02 mg/kg	TM181		<0.02 M	0.686 M	0.604 M	0.267 M	0.264 M	1.84 M
Chromium	<0.9 mg/kg	TM181		33 M	245 M	49.4 M	74.3 M	33.1 M	403 M
Copper	<1.4 mg/kg	TM181		10.7 M	19.2 M	4.82 M	12 M	14.7 M	62.8 M
Iron	<1000 mg/kg	TM181		43400 #	91800 #	26700 #	38300 #	22300 #	196000 #
Lead	<0.7 mg/kg	TM181		32.4 M	37.2 M	28.5 M	24.8 M	29.7 M	30.4 M
Manganese	<0.13 mg/kg	TM181		4350 M	15700 M	2950 M	2710 M	328 M	3380 M
Mercury	<0.14 mg/kg	TM181		<0.14 M	<1.4 M	<0.14 M	<0.14 M	<0.14 M	<1.4 M
Nickel	<0.2 mg/kg	TM181		13.1 M	18.9 M	2.88 M	36 M	30.9 M	24.3 M
Selenium	<1 mg/kg	TM181		1.3 #	<10 #	<1 #	1.04 #	<1 #	15.6 #
Vanadium	<0.2 mg/kg	TM181		58.8 #	225 #	38.8 #	89.4 #	54.1 #	453 #
Zinc	<1.9 mg/kg	TM181		114 M	112 M	109 M	97.8 M	108 M	69.1 M
Sulphate, acid soluble (total)	<0.02 %	TM221		<0.02	0.731				0.0292
Calcium	<21 mg/kg	TM224		136000	175000				190000
Magnesium	<8 mg/kg	TM224		14000	19900				10300
Soluble Sulphate 2:1 extract as SO4 BRE	<0.004 g/l	TM243		0.125 M	0.0917 M				0.103 M

Validated

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Customer Sample Ref.	4G-B9-V	4G-D7	4G-D7	4G-D7-V	4G-F8	4G-F8
Depth (m)	1.60 - 1.60	0.30 - 0.30	0.60 - 0.60	1.70 - 1.70	0.50 - 0.50	1.00 - 1.00
Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Date Sampled	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018
Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
Date Received	21/11/2018	21/11/2018	21/11/2018	21/11/2018	21/11/2018	21/11/2018
SDG Ref	181121-47	181121-47	181121-47	181121-47	181121-47	181121-47
Lab Sample No.(s)	18786505	18786553	18786557	18786495	18786486	18786540
AGS Reference						

Component	LOD/Units	Method											
Moisture Content Ratio (% of as received sample)	%	PM024	22		5.8		21		18		4.4		7.2	
Exchangeable Ammonia as N	<12 mg/kg	TM024	113	M	<12	M	<12	M	47.1	M	<12	M	<12	M
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M	<0.01	M	<0.01	M	<0.01	M	<0.01	M	<0.01	M
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M	<0.01	M	<0.01	M	<0.01	M	<0.01	M	<0.01	M
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M	<0.015	M	<0.015	M	<0.015	M	<0.015	M	<0.015	M
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)	<0.035	M	<0.035	M	<0.035	M	<0.035	M	<0.035	M	<0.035	M
Sulphur, Total	<0.02 %	TM132			0.187						0.0711			
Sulphate, Total potential	<0.06 %	TM132			0.561						0.213			
Soil Organic Matter (SOM)	<0.35 %	TM132	0.85	#	7.57	#	>100	#	0.8	#	12.2	#	2.78	#
pH	1 pH Units	TM133	8.48	M	11.4	M	8.55	M	7.99	M	10.3	M	9.7	M
Cyanide, Total	<1 mg/kg	TM153	<1	M	1.38	M	7.38	M	<1	M	<1	M	<1	M
Cyanide, Free	<1 mg/kg	TM153	<1	M	<1	M	<1	M	<1	M	<1	M	<1	M
Arsenic	<0.6 mg/kg	TM181	8.08	M	6.99	M	8.13	M	15.1	M	11.9	M	10	M
Cadmium	<0.02 mg/kg	TM181	<0.02	M	1.39	M	0.678	M	<0.02	M	<0.2	M	<0.02	M
Chromium	<0.9 mg/kg	TM181	25.9	M	210	M	10.3	M	27.7	M	<9	M	3.57	M
Copper	<1.4 mg/kg	TM181	7.73	M	52.3	M	22.6	M	9.05	M	21.7	M	11.4	M
Iron	<1000 mg/kg	TM181	23600	#	161000	#	18100	#	32600	#	337000	#	149000	#
Lead	<0.7 mg/kg	TM181	20	M	151	M	63	M	22.4	M	21.6	M	24	M
Manganese	<0.13 mg/kg	TM181	650	M	17900	M	1610	M	954	M	4030	M	3670	M
Mercury	<0.14 mg/kg	TM181	<0.14	M	<1.4	M	0.59	M	<0.14	M	<1.4	M	<0.14	M
Nickel	<0.2 mg/kg	TM181	31.1	M	36.5	M	10.9	M	32.6	M	27	M	13.9	M
Selenium	<1 mg/kg	TM181	<1	#	<10	#	2.02	#	<1	#	<10	#	<1	#
Vanadium	<0.2 mg/kg	TM181	43.3	#	1080	#	31.2	#	46.8	#	47.1	#	68.9	#
Zinc	<1.9 mg/kg	TM181	83.5	M	440	M	285	M	95.2	M	136	M	59.5	M
Sulphate, acid soluble (total)	<0.02 %	TM221			<0.02						0.0319			
Calcium	<21 mg/kg	TM224			144000						44900			
Magnesium	<8 mg/kg	TM224			9380						5890			
Soluble Sulphate 2:1 extract as SO4 BRE	<0.004 g/l	TM243			0.0581	M					0.0188	M		

Validated

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Customer Sample Ref.	4G-F8-V
Depth (m)	2.60 - 2.60
Sample Type	Soil/Solid (S)
Date Sampled	20/11/2018
Sample Time	00:00
Date Received	21/11/2018
SDG Ref	181121-47
Lab Sample No.(s)	18786545
AGS Reference	

Component	LOD/Units	Method	
Moisture Content Ratio (% of as received sample)	%	PM024	23
Exchangeable Ammonia as N	<12 mg/kg	TM024	140 M
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)	<0.01 M
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015 M
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)	<0.035 M
Soil Organic Matter (SOM)	<0.35 %	TM132	1.21 #
pH	1 pH Units	TM133	6.96 M
Cyanide, Total	<1 mg/kg	TM153	<1 M
Cyanide, Free	<1 mg/kg	TM153	<1 M
Arsenic	<0.6 mg/kg	TM181	16.5 M
Cadmium	<0.02 mg/kg	TM181	<0.02 M
Chromium	<0.9 mg/kg	TM181	34.4 M
Copper	<1.4 mg/kg	TM181	11 M
Iron	<1000 mg/kg	TM181	33500 #
Lead	<0.7 mg/kg	TM181	28.5 M
Manganese	<0.13 mg/kg	TM181	459 M
Mercury	<0.14 mg/kg	TM181	<0.14 M
Nickel	<0.2 mg/kg	TM181	40.2 M
Selenium	<1 mg/kg	TM181	<1 #
Vanadium	<0.2 mg/kg	TM181	58.9 #
Zinc	<1.9 mg/kg	TM181	104 M

Validated

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-A7	4G-A8	4G-A8	4G-A7-V	4G-A8-V	4G-B9
			Depth (m)	0.50 - 0.50	0.40 - 0.40	0.70 - 0.70	1.80 - 1.80	2.10 - 2.10	0.50 - 0.50
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	21/11/2018	21/11/2018	21/11/2018	21/11/2018	21/11/2018	21/11/2018
			SDG Ref	181121-47	181121-47	181121-47	181121-47	181121-47	181121-47
			Lab Sample No.(s)	18786527	18786511	18786517	18786535	18786522	18786500
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		73.8	71	86.8	88.1	68.9	84.1
Acenaphthene-d10 % recovery**	%	TM218		73.6	68.2	87.4	83	71.2	90
Phenanthrene-d10 % recovery**	%	TM218		74.5	72.8	89.6	81.4	69.7	98.2
Chrysene-d12 % recovery**	%	TM218		71	72.7	85.4	86.3	72.8	90.8
Perylene-d12 % recovery**	%	TM218		72.2	75.1	84.1	94.8	74.4	95.2
Naphthalene	<0.009 mg/kg	TM218		0.105 M	0.167 M	0.0268 M	<0.009 M	<0.009 M	0.0951 M
Acenaphthylene	<0.012 mg/kg	TM218		0.0402 M	<0.12 M	<0.012 M	<0.012 M	<0.012 M	0.0328 M
Acenaphthene	<0.008 mg/kg	TM218		0.0159 M	<0.08 M	0.0113 M	<0.008 M	<0.008 M	0.124 M
Fluorene	<0.01 mg/kg	TM218		0.0223 M	<0.1 M	0.0178 M	<0.01 M	<0.01 M	0.0574 M
Phenanthrene	<0.015 mg/kg	TM218		0.239 M	0.432 M	0.186 M	<0.015 M	<0.015 M	1.13 M
Anthracene	<0.016 mg/kg	TM218		0.0897 M	0.254 M	0.0357 M	<0.016 M	<0.016 M	0.247 M
Fluoranthene	<0.017 mg/kg	TM218		0.497 M	1.06 M	0.221 M	0.0387 M	<0.017 M	3.18 M
Pyrene	<0.015 mg/kg	TM218		0.408 M	0.903 M	0.216 M	0.0401 M	<0.015 M	3.43 M
Benz(a)anthracene	<0.014 mg/kg	TM218		0.333 M	0.486 M	0.178 M	0.0383 M	<0.014 M	2.57 M
Chrysene	<0.01 mg/kg	TM218		0.375 M	0.608 M	0.189 M	0.0441 M	<0.01 M	2.73 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		0.582 M	0.95 M	0.355 M	0.0658 M	<0.015 M	4.91 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		0.219 M	0.318 M	0.0971 M	0.0198 M	<0.014 M	1.73 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		0.371 M	0.58 M	0.214 M	0.0669 M	<0.015 M	3.19 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		0.19 M	0.328 M	0.149 M	0.0378 M	<0.018 M	2.58 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		0.0599 M	<0.23 M	0.0391 M	<0.023 M	<0.023 M	0.539 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		0.25 M	0.435 M	0.158 M	0.0502 M	<0.024 M	2.24 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		3.8	6.52	2.09	0.402	<0.118	28.8

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-B9-V	4G-D7	4G-D7	4G-D7-V	4G-F8	4G-F8
			Depth (m)	1.60 - 1.60	0.30 - 0.30	0.60 - 0.60	1.70 - 1.70	0.50 - 0.50	1.00 - 1.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	21/11/2018	21/11/2018	21/11/2018	21/11/2018	21/11/2018	21/11/2018
			SDG Ref	181121-47	181121-47	181121-47	181121-47	181121-47	181121-47
			Lab Sample No.(s)	18786505	18786553	18786557	18786495	18786486	18786540
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		86.4	73.2	70.2	85.8	77.5	81
Acenaphthene-d10 % recovery**	%	TM218		83.4	74	70.6	82.8	75.7	85.5
Phenanthrene-d10 % recovery**	%	TM218		83.8	73.5	66.9	84	75.5	94.7
Chrysene-d12 % recovery**	%	TM218		84.9	70.8	39.1	89	73.2	83.2
Perylene-d12 % recovery**	%	TM218		89.7	70.5	29	94	75.1	85.7
Naphthalene	<0.009 mg/kg	TM218		<0.009 M	0.341 M	1.08 M	<0.009 M	0.0352 M	0.0191 M
Acenaphthylene	<0.012 mg/kg	TM218		<0.012 M	0.219 M	0.186 M	<0.012 M	0.0204 M	0.0136 M
Acenaphthene	<0.008 mg/kg	TM218		<0.008 M	0.0306 M	0.0102 M	<0.008 M	0.009 M	<0.008 M
Fluorene	<0.01 mg/kg	TM218		<0.01 M	0.131 M	0.0175 M	<0.01 M	0.0124 M	0.0155 M
Phenanthrene	<0.015 mg/kg	TM218		<0.015 M	1.5 M	0.215 M	<0.015 M	0.148 M	0.132 M
Anthracene	<0.016 mg/kg	TM218		<0.016 M	0.409 M	0.108 M	<0.016 M	0.062 M	0.0313 M
Fluoranthene	<0.017 mg/kg	TM218		<0.017 M	2.68 M	0.315 M	<0.017 M	0.275 M	0.172 M
Pyrene	<0.015 mg/kg	TM218		<0.015 M	2.35 M	0.249 M	<0.015 M	0.201 M	0.136 M
Benz(a)anthracene	<0.014 mg/kg	TM218		<0.014 M	1.41 M	0.238 M	<0.014 M	0.161 M	0.0908 M
Chrysene	<0.01 mg/kg	TM218		<0.01 M	1.51 M	0.313 M	<0.01 M	0.179 M	0.0961 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		<0.015 M	2.33 M	0.614 M	<0.015 M	0.27 M	0.151 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		<0.014 M	0.833 M	0.189 M	<0.014 M	0.093 M	0.0463 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		<0.015 M	1.36 M	0.337 M	<0.015 M	0.144 M	0.0883 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		<0.018 M	0.735 M	0.309 M	<0.018 M	0.0919 M	0.0694 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		<0.023 M	0.213 M	0.0852 M	<0.023 M	0.0286 M	<0.023 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		<0.024 M	0.94 M	0.413 M	<0.024 M	0.116 M	0.0773 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		<0.118	17	4.68	<0.118	1.85	1.14

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-F8-V
			Depth (m)	2.60 - 2.60
			Sample Type	Soil/Solid (S)
			Date Sampled	20/11/2018
			Sample Time	00:00
			Date Received	21/11/2018
			SDG Ref	181121-47
			Lab Sample No.(s)	18786545
			AGS Reference	
Naphthalene-d8 % recovery**	%	TM218		71.4
Acenaphthene-d10 % recovery**	%	TM218		73.4
Phenanthrene-d10 % recovery**	%	TM218		69.7
Chrysene-d12 % recovery**	%	TM218		70.8
Perylene-d12 % recovery**	%	TM218		74
Naphthalene	<0.009 mg/kg	TM218		<0.009 M
Acenaphthylene	<0.012 mg/kg	TM218		<0.012 M
Acenaphthene	<0.008 mg/kg	TM218		<0.008 M
Fluorene	<0.01 mg/kg	TM218		<0.01 M
Phenanthrene	<0.015 mg/kg	TM218		<0.015 M
Anthracene	<0.016 mg/kg	TM218		<0.016 M
Fluoranthene	<0.017 mg/kg	TM218		<0.017 M
Pyrene	<0.015 mg/kg	TM218		<0.015 M
Benz(a)anthracene	<0.014 mg/kg	TM218		<0.014 M
Chrysene	<0.01 mg/kg	TM218		<0.01 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		<0.015 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		<0.014 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		<0.015 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		<0.018 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		<0.023 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		<0.024 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		<0.118

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

TPH CWG (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-A7	4G-A8	4G-A8	4G-A7-V	4G-A8-V	4G-B9
			Depth (m)	0.50 - 0.50	0.40 - 0.40	0.70 - 0.70	1.80 - 1.80	2.10 - 2.10	0.50 - 0.50
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	21/11/2018	21/11/2018	21/11/2018	21/11/2018	21/11/2018	21/11/2018
			SDG Ref	181121-47	181121-47	181121-47	181121-47	181121-47	181121-47
			Lab Sample No.(s)	18786527	18786511	18786517	18786535	18786522	18786500
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		82.6	74.7	93	97.3	81	88
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089		<0.2 M	<0.2 M	<0.2 M	<0.2 M	<0.2 M	<0.2 M
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C6-C8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C8-C10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C10-C12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C12-C16	<0.1 mg/kg	TM173		0.793	2.71	0.593	<0.1	0.156	1.85
Aliphatics >C16-C21	<0.1 mg/kg	TM173		4.98	26.9	5.21	<0.1	<0.1	9.2
Aliphatics >C21-C35	<0.1 mg/kg	TM173		60.5	167	24.7	<0.1	0.692	60.7
Aliphatics >C35-C44	<0.1 mg/kg	TM173		17.2	45.8	4.74	<0.1	0.235	13.7
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		83.5	242	35.2	<0.1	1.08	85.4
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		1.82	2.11	0.867	<0.1	0.122	1.44
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		7.24	11.8	6.21	<0.1	<0.1	17.7
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		50.3	109	16.8	4.61	3.67	130
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		22.5	60.2	4.96	0.547	0.395	42.1
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		10.5	27.9	1.75	<0.1	<0.1	17.8
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		81.8	183	28.9	5.16	4.18	192
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		165	425	64.1	5.16	5.27	277

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
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*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-B9-V	4G-D7	4G-D7	4G-D7-V	4G-F8	4G-F8
			Depth (m)	1.60 - 1.60	0.30 - 0.30	0.60 - 0.60	1.70 - 1.70	0.50 - 0.50	1.00 - 1.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	21/11/2018	21/11/2018	21/11/2018	21/11/2018	21/11/2018	21/11/2018
			SDG Ref	181121-47	181121-47	181121-47	181121-47	181121-47	181121-47
			Lab Sample No.(s)	18786505	18786553	18786557	18786495	18786486	18786540
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		93	78.8	82.2	95.9	97	90.4
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089		<0.2 M	<0.2 M	<0.2 M	<0.2 M	<0.2 M	<0.2 M
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C6-C8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C8-C10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C10-C12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aliphatics >C12-C16	<0.1 mg/kg	TM173		<0.1	3.42	10.8	<0.1	<0.1	<0.1
Aliphatics >C16-C21	<0.1 mg/kg	TM173		<0.1	26.3	373	<0.1	<0.1	3.02
Aliphatics >C21-C35	<0.1 mg/kg	TM173		<0.1	99.7	127	<0.1	13.9	12
Aliphatics >C35-C44	<0.1 mg/kg	TM173		<0.1	26.6	19.3	<0.1	1.25	3.42
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		<0.1	156	531	<0.1	15.2	18.5
Aromatics >EC5-EC7	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		<0.1	3.13	5.52	<0.1	<0.1	<0.1
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		<0.1	24.3	72.5	<0.1	<0.1	0.971
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		<0.1	86.5	190	2.55	6.57	8.16
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		<0.1	30.5	48.3	<0.1	5.17	3.63
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		<0.1	10.7	13.3	<0.1	2.77	1.75
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		<0.1	144	317	2.55	11.7	12.8
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		<0.1	300	848	2.55	26.9	31.2

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref. 4G-F8-V				
			Depth (m) 2.60 - 2.60				
			Sample Type Soil/Solid (S)				
			Date Sampled 20/11/2018				
			Sample Time 00:00				
			Date Received 21/11/2018				
			SDG Ref 181121-47				
			Lab Sample No.(s) 18786545				
			AGS Reference				
GRO Surrogate % recovery**	%	TM089	101				
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089	<0.2 M				
Aliphatics >C5-C6	<0.01 mg/kg	TM089	<0.02				
Aliphatics >C6-C8	<0.01 mg/kg	TM089	<0.02				
Aliphatics >C8-C10	<0.01 mg/kg	TM089	<0.02				
Aliphatics >C10-C12	<0.01 mg/kg	TM089	<0.02				
Aliphatics >C12-C16	<0.1 mg/kg	TM173	<0.1				
Aliphatics >C16-C21	<0.1 mg/kg	TM173	<0.1				
Aliphatics >C21-C35	<0.1 mg/kg	TM173	<0.1				
Aliphatics >C35-C44	<0.1 mg/kg	TM173	<0.1				
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173	<0.1				
Aromatics >EC5-EC7	<0.01 mg/kg	TM089	<0.02				
Aromatics >EC7-EC8	<0.01 mg/kg	TM089	<0.02				
Aromatics >EC8-EC10	<0.01 mg/kg	TM089	<0.02				
Aromatics >EC10-EC12	<0.01 mg/kg	TM089	<0.02				
Aromatics >EC12-EC16	<0.1 mg/kg	TM173	<0.1				
Aromatics >EC16-EC21	<0.1 mg/kg	TM173	<0.1				
Aromatics >EC21-EC35	<0.1 mg/kg	TM173	<0.1				
Aromatics >EC35-EC44	<0.1 mg/kg	TM173	<0.1				
Aromatics >EC40-EC44	<0.1 mg/kg	TM173	<0.1				
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173	<0.1				
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173	<0.1				

Validated

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-A7	4G-A8	4G-A8	4G-A7-V	4G-A8-V	4G-B9
			Depth (m)	0.50 - 0.50	0.40 - 0.40	0.70 - 0.70	1.80 - 1.80	2.10 - 2.10	0.50 - 0.50
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	21/11/2018	21/11/2018	21/11/2018	21/11/2018	21/11/2018	21/11/2018
			SDG Ref	181121-47	181121-47	181121-47	181121-47	181121-47	181121-47
			Lab Sample No.(s)	18786527	18786511	18786517	18786535	18786522	18786500
			AGS Reference						
Dibromofluoromethane**	%	TM116		107	109	109	108	108	108
Toluene-d8**	%	TM116		101	98.2	102	97.5	101	100
4-Bromofluorobenzene**	%	TM116		81.1	76.5	85.6	100	85.2	82
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Benzene	<0.009 mg/kg	TM116		<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M	<0.09 M
Toluene	<0.007 mg/kg	TM116		<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M
Ethylbenzene	<0.004 mg/kg	TM116		<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M
p/m-Xylene	<0.01 mg/kg	TM116		<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
o-Xylene	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Naphthalene	<0.013 mg/kg	TM116		<0.13 M	<0.13 M	<0.13 M	<0.13 M	<0.13 M	<0.13 M
Sum of BTEX	<0.04 mg/kg	TM116		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Validated

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	4G-B9-V	4G-D7	4G-D7	4G-D7-V	4G-F8	4G-F8
			Depth (m)	1.60 - 1.60	0.30 - 0.30	0.60 - 0.60	1.70 - 1.70	0.50 - 0.50	1.00 - 1.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018	20/11/2018
			Sample Time	00:00	00:00	00:00	00:00	00:00	00:00
			Date Received	21/11/2018	21/11/2018	21/11/2018	21/11/2018	21/11/2018	21/11/2018
			SDG Ref	181121-47	181121-47	181121-47	181121-47	181121-47	181121-47
			Lab Sample No.(s)	18786505	18786553	18786557	18786495	18786486	18786540
			AGS Reference						
Dibromofluoromethane**	%	TM116		108	105	112	108	109	110
Toluene-d8**	%	TM116		102	99.7	101	103	102	103
4-Bromofluorobenzene**	%	TM116		85.2	75.1	79.2	85.8	86.2	85
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Benzene	<0.009 mg/kg	TM116		<0.09 M	<0.09 M	0.296 M	<0.09 M	<0.09 M	<0.09 M
Toluene	<0.007 mg/kg	TM116		<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M	<0.07 M
Ethylbenzene	<0.004 mg/kg	TM116		<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M
p/m-Xylene	<0.01 mg/kg	TM116		<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
o-Xylene	<0.01 mg/kg	TM116		<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Naphthalene	<0.013 mg/kg	TM116		<0.13 M	<0.13 M	0.201 M	<0.13 M	<0.13 M	<0.13 M
Sum of BTEX	<0.04 mg/kg	TM116		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Validated

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			4G-F8-V	2.60 - 2.60	Soil/Solid (S)	20/11/2018	00:00	21/11/2018	181121-47	18786545	
Dibromofluoromethane**	%	TM116	110								
Toluene-d8**	%	TM116	101								
4-Bromofluorobenzene**	%	TM116	86.1								
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116	<0.1 M								
Benzene	<0.009 mg/kg	TM116	<0.09 M								
Toluene	<0.007 mg/kg	TM116	<0.07 M								
Ethylbenzene	<0.004 mg/kg	TM116	<0.04 M								
p/m-Xylene	<0.01 mg/kg	TM116	<0.1 #								
o-Xylene	<0.01 mg/kg	TM116	<0.1 M								
Naphthalene	<0.013 mg/kg	TM116	<0.13 M								
Sum of BTEX	<0.04 mg/kg	TM116	<0.4								

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

Asbestos Identification - Solid Samples

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-A7 0.50 - 0.50 SOLID 20/11/2018 00:00:00 21/11/2018 20:45:23 181121-47 18786527 TM048	03/12/2018	Christian Hallam	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-A8 0.40 - 0.40 SOLID 20/11/2018 00:00:00 21/11/2018 16:12:14 181121-47 18786511 TM048	03/12/2018	Christian Hallam	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-B9 0.50 - 0.50 SOLID 20/11/2018 00:00:00 21/11/2018 20:48:03 181121-47 18786500 TM048	03/12/2018	Christian Hallam	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-D7 0.30 - 0.30 SOLID 20/11/2018 00:00:00 21/11/2018 13:26:46 181121-47 18786553 TM048	03/12/2018	Christian Hallam	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	4G-F8 0.50 - 0.50 SOLID 20/11/2018 00:00:00 22/11/2018 20:36:54 181121-47 18786486 TM048	03/12/2018	Christian Hallam	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.094	**Natural Moisture Content (%)**	4.6
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	95.6
Particle Size <4mm	>95%		

Case	
SDG	181121-47
Lab Sample Number(s)	18786486
Sampled Date	20-Nov-2018
Customer Sample Ref.	4G-F8
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.0074	<0.0005	0.074	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.000552	<0.0003	0.00552	<0.003	-	-	-
Lead	0.00146	<0.0002	0.0146	<0.002	-	-	-
Manganese	0.0141	<0.003	0.141	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.0357	<0.001	0.357	<0.01	-	-	-
Zinc	0.00731	<0.001	0.0731	<0.01	-	-	-
Iron (Dis.Filt) mg/l	0.403	<0.019	4.03	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.00002	<0.000005	0.0002	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000189	<0.000005	0.000189	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.0000178	<0.000005	0.000178	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000179	<0.000005	0.000179	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.00000588	<0.000005	0.0000588	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000768	<0.000002	0.0000768	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.0000881	<0.000082	0.000881	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	22-Nov-2018
pH (pH Units)	9.69
Conductivity (µS/cm)	97.80
Temperature (°C)	18.10
Volume Leachant (Litres)	0.896

Mcerts Certification does not apply to leachates
06/12/2018 16:59:30

16:59:11 06/12/2018

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.094	**Natural Moisture Content (%)**	4.6
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	95.6
Particle Size <4mm	>95%		

Case	
SDG	181121-47
Lab Sample Number(s)	18786486
Sampled Date	20-Nov-2018
Customer Sample Ref.	4G-F8
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	22-Nov-2018
pH (pH Units)	9.69
Conductivity (µS/cm)	97.80
Temperature (°C)	18.10
Volume Leachant (Litres)	0.896

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	8.23
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.4
Particle Size <4mm	>95%		

Case	
SDG	181121-47
Lab Sample Number(s)	18786500
Sampled Date	20-Nov-2018
Customer Sample Ref.	4G-B9
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.000515	<0.0005	0.00515	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.0116	<0.001	0.116	<0.01	-	-	-
Copper	0.00211	<0.0003	0.0211	<0.003	-	-	-
Lead	0.0143	<0.0002	0.143	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Vanadium	0.012	<0.001	0.12	<0.01	-	-	-
Zinc	0.00679	<0.001	0.0679	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.000039	<0.00001	0.00039	<0.0001	-	-	-
Acenaphthene by GCMS	0.0000297	<0.000005	0.000297	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.000207	<0.000005	0.00207	<0.00005	-	-	-
Anthracene by GCMS	0.000023	<0.000005	0.00023	<0.00005	-	-	-
Phenanthrene by GCMS	0.000108	<0.000005	0.00108	<0.00005	-	-	-
Fluorene by GCMS	0.00000812	<0.000005	0.0000812	<0.00005	-	-	-
Chrysene by GCMS	0.0000328	<0.000005	0.000328	<0.00005	-	-	-
Pyrene by GCMS	0.000283	<0.000005	0.00283	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.000016	<0.000005	0.00016	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.00000756	<0.000005	0.0000756	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000331	<0.000002	0.0000331	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000758	<0.000082	0.00758	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	23-Nov-2018
pH (pH Units)	11.36
Conductivity (µS/cm)	1,090.00
Temperature (°C)	18.20
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	8.23
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.4
Particle Size <4mm	>95%		

Case	
SDG	181121-47
Lab Sample Number(s)	18786500
Sampled Date	20-Nov-2018
Customer Sample Ref.	4G-B9
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	23-Nov-2018
pH (pH Units)	11.36
Conductivity (µS/cm)	1,090.00
Temperature (°C)	18.20
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	8.93
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	91.8
Particle Size <4mm	>95%		

Case	
SDG	181121-47
Lab Sample Number(s)	18786511
Sampled Date	20-Nov-2018
Customer Sample Ref.	4G-A8
Depth (m)	0.40 - 0.40

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	5.95	<0.2	59.5	<2	-	-	-
Mercury Dissolved (CVAF)	0.0000116	<0.00001	0.000116	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.000901	<0.0005	0.00901	<0.005	-	-	-
Cadmium	0.000191	<0.00008	0.00191	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00215	<0.0003	0.0215	<0.003	-	-	-
Lead	0.0156	<0.0002	0.156	<0.002	-	-	-
Manganese	0.321	<0.003	3.21	<0.03	-	-	-
Nickel	0.000775	<0.0004	0.00775	<0.004	-	-	-
Selenium	0.00327	<0.001	0.0327	<0.01	-	-	-
Vanadium	0.0591	<0.001	0.591	<0.01	-	-	-
Zinc	0.0449	<0.001	0.449	<0.01	-	-	-
Iron (Dis.Filt) mg/l	0.428	<0.019	4.28	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000287	<0.00001	0.000287	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000938	<0.000005	0.000938	<0.00005	-	-	-
Anthracene by GCMS	0.0000101	<0.000005	0.000101	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000609	<0.000005	0.000609	<0.00005	-	-	-
Fluorene by GCMS	0.00000948	<0.000005	0.0000948	<0.00005	-	-	-
Chrysene by GCMS	0.0000269	<0.000005	0.000269	<0.00005	-	-	-
Pyrene by GCMS	0.0000791	<0.000005	0.000791	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.0000245	<0.000005	0.000245	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000451	<0.000005	0.000451	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.0000219	<0.000005	0.000219	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.0000185	<0.000002	0.000185	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	0.0000257	<0.000005	0.000257	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.000023	<0.000005	0.00023	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000468	<0.000082	0.00468	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	22-Nov-2018
pH (pH Units)	10.23
Conductivity (µS/cm)	142.00
Temperature (°C)	18.40
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.098	**Natural Moisture Content (%)**	8.93
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	91.8
Particle Size <4mm	>95%		

Case	
SDG	181121-47
Lab Sample Number(s)	18786511
Sampled Date	20-Nov-2018
Customer Sample Ref.	4G-A8
Depth (m)	0.40 - 0.40

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	22-Nov-2018
pH (pH Units)	10.23
Conductivity (µS/cm)	142.00
Temperature (°C)	18.40
Volume Leachant (Litres)	0.892

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.094	**Natural Moisture Content (%)**	4.82
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	95.4
Particle Size <4mm	>95%		

Case	
SDG	181121-47
Lab Sample Number(s)	18786517
Sampled Date	20-Nov-2018
Customer Sample Ref.	4G-A8
Depth (m)	0.70 - 0.70

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.000814	<0.0005	0.00814	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00249	<0.001	0.0249	<0.01	-	-	-
Copper	0.00252	<0.0003	0.0252	<0.003	-	-	-
Lead	0.000278	<0.0002	0.00278	<0.002	-	-	-
Manganese	0.0051	<0.003	0.051	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00103	<0.001	0.0103	<0.01	-	-	-
Vanadium	0.0247	<0.001	0.247	<0.01	-	-	-
Zinc	0.00127	<0.001	0.0127	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.000011	<0.000005	0.00011	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.00000947	<0.000005	0.0000947	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.00000824	<0.000005	0.0000824	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	<0.000082	<0.000082	<0.00082	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	22-Nov-2018
pH (pH Units)	11.04
Conductivity (µS/cm)	575.00
Temperature (°C)	18.50
Volume Leachant (Litres)	0.896

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.094	**Natural Moisture Content (%)**	4.82
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	95.4
Particle Size <4mm	>95%		

Case	
SDG	181121-47
Lab Sample Number(s)	18786517
Sampled Date	20-Nov-2018
Customer Sample Ref.	4G-A8
Depth (m)	0.70 - 0.70

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	22-Nov-2018
pH (pH Units)	11.04
Conductivity (µS/cm)	575.00
Temperature (°C)	18.50
Volume Leachant (Litres)	0.896

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.099	**Natural Moisture Content (%)**	10.1
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	90.8
Particle Size <4mm	>95%		

Case	
SDG	181121-47
Lab Sample Number(s)	18786527
Sampled Date	20-Nov-2018
Customer Sample Ref.	4G-A7
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00208	<0.0005	0.0208	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00407	<0.0003	0.0407	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000784	<0.0004	0.00784	<0.004	-	-	-
Selenium	0.00127	<0.001	0.0127	<0.01	-	-	-
Vanadium	0.0572	<0.001	0.572	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000253	<0.00001	0.000253	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000418	<0.000005	0.000418	<0.00005	-	-	-
Anthracene by GCMS	0.00000933	<0.000005	0.0000933	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000271	<0.000005	0.000271	<0.00005	-	-	-
Fluorene by GCMS	0.00000584	<0.000005	0.0000584	<0.00005	-	-	-
Chrysene by GCMS	0.0000133	<0.000005	0.000133	<0.00005	-	-	-
Pyrene by GCMS	0.0000287	<0.000005	0.000287	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.0000166	<0.000005	0.000166	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.0000152	<0.000005	0.000152	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.0000121	<0.000005	0.000121	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.00000876	<0.000002	0.0000876	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.00000864	<0.000005	0.0000864	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000213	<0.000082	0.00213	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	23-Nov-2018
pH (pH Units)	10.71
Conductivity (µS/cm)	257.00
Temperature (°C)	17.40
Volume Leachant (Litres)	0.891

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.099	**Natural Moisture Content (%)**	10.1
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	90.8
Particle Size <4mm	>95%		

Case	
SDG	181121-47
Lab Sample Number(s)	18786527
Sampled Date	20-Nov-2018
Customer Sample Ref.	4G-A7
Depth (m)	0.50 - 0.50

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	0.016	<0.01	0.16	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	23-Nov-2018
pH (pH Units)	10.71
Conductivity (µS/cm)	257.00
Temperature (°C)	17.40
Volume Leachant (Litres)	0.891

Mcerts Certification does not apply to leachates

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Validated

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.76
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.8
Particle Size <4mm	>95%		

Case	
SDG	181121-47
Lab Sample Number(s)	18786540
Sampled Date	20-Nov-2018
Customer Sample Ref.	4G-F8
Depth (m)	1.00 - 1.00

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00433	<0.0005	0.0433	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	<0.0003	<0.0003	<0.003	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00291	<0.001	0.0291	<0.01	-	-	-
Vanadium	0.0261	<0.001	0.261	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Fluoranthene by GCMS	0.000019	<0.000005	0.00019	<0.00005	-	-	-
Anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000163	<0.000005	0.000163	<0.00005	-	-	-
Fluorene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.0000152	<0.000005	0.000152	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	<0.000082	<0.000082	<0.00082	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	24-Nov-2018
pH (pH Units)	9.83
Conductivity (µS/cm)	92.30
Temperature (°C)	18.10
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.097	**Natural Moisture Content (%)**	7.76
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	92.8
Particle Size <4mm	>95%		

Case	
SDG	181121-47
Lab Sample Number(s)	18786540
Sampled Date	20-Nov-2018
Customer Sample Ref.	4G-F8
Depth (m)	1.00 - 1.00

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	24-Nov-2018
pH (pH Units)	9.83
Conductivity (µS/cm)	92.30
Temperature (°C)	18.10
Volume Leachant (Litres)	0.893

Mcerts Certification does not apply to leachates

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Validated

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.095	**Natural Moisture Content (%)**	6.16
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	94.2
Particle Size <4mm	>95%		

Case	
SDG	181121-47
Lab Sample Number(s)	18786553
Sampled Date	20-Nov-2018
Customer Sample Ref.	4G-D7
Depth (m)	0.30 - 0.30

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Arsenic	0.00151	<0.0005	0.0151	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	0.00293	<0.001	0.0293	<0.01	-	-	-
Copper	0.00263	<0.0003	0.0263	<0.003	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	0.00214	<0.001	0.0214	<0.01	-	-	-
Vanadium	0.221	<0.001	2.21	<0.01	-	-	-
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
Iron (Dis.Filt) mg/l	<0.019	<0.019	<0.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000118	<0.00001	0.000118	<0.0001	-	-	-
Acenaphthene by GCMS	0.00000981	<0.000005	0.0000981	<0.00005	-	-	-
Acenaphthylene by GCMS	0.00000886	<0.000005	0.0000886	<0.00005	-	-	-
Fluoranthene by GCMS	0.0000853	<0.000005	0.000853	<0.00005	-	-	-
Anthracene by GCMS	0.00000738	<0.000005	0.0000738	<0.00005	-	-	-
Phenanthrene by GCMS	0.00000867	<0.000005	0.0000867	<0.00005	-	-	-
Fluorene by GCMS	0.00000843	<0.000005	0.0000843	<0.00005	-	-	-
Chrysene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Pyrene by GCMS	0.000127	<0.000005	0.00127	<0.00005	-	-	-
Benz(a)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.000267	<0.000082	0.00267	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	22-Nov-2018
pH (pH Units)	11.24
Conductivity (µS/cm)	412.00
Temperature (°C)	17.30
Volume Leachant (Litres)	0.894

Mcerts Certification does not apply to leachates

06/12/2018 16:59:30

16:59:11 06/12/2018

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.095	**Natural Moisture Content (%)**	6.16
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	94.2
Particle Size <4mm	>95%		

Case	
SDG	181121-47
Lab Sample Number(s)	18786553
Sampled Date	20-Nov-2018
Customer Sample Ref.	4G-D7
Depth (m)	0.30 - 0.30

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	22-Nov-2018
pH (pH Units)	11.24
Conductivity (µS/cm)	412.00
Temperature (°C)	17.30
Volume Leachant (Litres)	0.894

Mcerts Certification does not apply to leachates

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16:59:11 06/12/2018

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.114	**Natural Moisture Content (%)**	26.6
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	79
Particle Size <4mm	>95%		

Case	
SDG	181121-47
Lab Sample Number(s)	18786557
Sampled Date	20-Nov-2018
Customer Sample Ref.	4G-D7
Depth (m)	0.60 - 0.60

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Ammoniacal Nitrogen as N	<0.2	<0.2	<2	<2	-	-	-
Mercury Dissolved (CVAF)	0.0000145	<0.00001	0.000145	<0.0001	-	-	-
Total Cyanide (W)	0.06	<0.05	0.6	<0.5	-	-	-
Arsenic	0.00323	<0.0005	0.0323	<0.005	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Copper	0.00138	<0.0003	0.0138	<0.003	-	-	-
Lead	0.000822	<0.0002	0.00822	<0.002	-	-	-
Manganese	<0.003	<0.003	<0.03	<0.03	-	-	-
Nickel	0.000497	<0.0004	0.00497	<0.004	-	-	-
Selenium	0.00215	<0.001	0.0215	<0.01	-	-	-
Vanadium	0.00447	<0.001	0.0447	<0.01	-	-	-
Zinc	0.002	<0.001	0.02	<0.01	-	-	-
Iron (Dis.Filt) mg/l	0.919	<0.019	9.19	<0.19	-	-	-
PAH Spec MS - Aqueous (W)							
Naphthalene by GCMS	0.0000239	<0.00001	0.000239	<0.0001	-	-	-
Acenaphthene by GCMS	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Acenaphthylene by GCMS	0.0000244	<0.000005	0.000244	<0.00005	-	-	-
Fluoranthene by GCMS	0.000145	<0.000005	0.00145	<0.00005	-	-	-
Anthracene by GCMS	0.0000259	<0.000005	0.000259	<0.00005	-	-	-
Phenanthrene by GCMS	0.0000311	<0.000005	0.000311	<0.00005	-	-	-
Fluorene by GCMS	0.00000531	<0.000005	0.0000531	<0.00005	-	-	-
Chrysene by GCMS	0.0000612	<0.000005	0.000612	<0.00005	-	-	-
Pyrene by GCMS	0.000114	<0.000005	0.00114	<0.00005	-	-	-
Benz(a)anthracene by GCMS	0.0000403	<0.000005	0.000403	<0.00005	-	-	-
Benzo(b)fluoranthene by GCMS	0.000159	<0.000005	0.00159	<0.00005	-	-	-
Benzo(k)fluoranthene by GCMS	0.0000722	<0.000005	0.000722	<0.00005	-	-	-
Benzo(a)pyrene by GCMS	0.0000891	<0.000002	0.000891	<0.00002	-	-	-
Dibenzo(ah)anthracene by GCMS	0.0000275	<0.000005	0.000275	<0.00005	-	-	-
Benzo(ghi)perylene by GCMS	0.000227	<0.000005	0.00227	<0.00005	-	-	-
Indeno(123cd)pyrene by GCMS	0.000126	<0.000005	0.00126	<0.00005	-	-	-
PAH 16 EPA Total by GCMS	0.00117	<0.000082	0.0117	<0.00082	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	22-Nov-2018
pH (pH Units)	8.87
Conductivity (µS/cm)	81.20
Temperature (°C)	15.90
Volume Leachant (Litres)	0.876

Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Llanwern
Mass Sample taken (kg)	0.114	**Natural Moisture Content (%)**	26.6
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	79
Particle Size <4mm	>95%		

Case	
SDG	181121-47
Lab Sample Number(s)	18786557
Sampled Date	20-Nov-2018
Customer Sample Ref.	4G-D7
Depth (m)	0.60 - 0.60

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)				
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
TPH CWG (W)							
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-
Aliphatics >C16-C35	<0.01	<0.01	<0.1	<0.1	-	-	-

Leach Test Information

Date Prepared	22-Nov-2018
pH (pH Units)	8.87
Conductivity (µS/cm)	81.20
Temperature (°C)	15.90
Volume Leachant (Litres)	0.876

Mcerts Certification does not apply to leachates

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Table of Results - Appendix

Method No	Reference	Description
PM001		Preparation of Samples for Metals Analysis
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM024	Method 4500A & B, AWWA/APHA, 20th Ed., 1999	Determination of Exchangeable Ammonium and Ammoniacal Nitrogen as N by titration on solids
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer
TM224	US EPA Method 6010B	Determination of Alkaline Metals by iCap 6500 Duo ICP-OES
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM243		Mixed Anions In Soils By Kone
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	181121-47	**Client Reference:**		**Report Number:**	484278
Location:	Llanwern	**Order Number:**	LLA523	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	18786527	18786511	18786517	18786535	18786522	18786500	18786505	18786553	18786557	18786495
Customer Sample Ref.	4G-A7	4G-A8	4G-A8	4G-A7-V	4G-A8-V	4G-B9	4G-B9-V	4G-D7	4G-D7	4G-D7-V
AGS Ref.										
Depth	0.50 - 0.50	0.40 - 0.40	0.70 - 0.70	1.80 - 1.80	2.10 - 2.10	0.50 - 0.50	1.60 - 1.60	0.30 - 0.30	0.60 - 0.60	1.70 - 1.70
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Alkali Metals by iCap-OES (Soil)	28-Nov-2018	28-Nov-2018				28-Nov-2018		28-Nov-2018		
Ammoniacal Nitrogen	30-Nov-2018	30-Nov-2018	30-Nov-2018			30-Nov-2018		30-Nov-2018	30-Nov-2018	
Ammonium Soil by Titration	05-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018
Anions by Kone (soil)	04-Dec-2018	04-Dec-2018				04-Dec-2018		04-Dec-2018		
Asbestos ID in Solid Samples	03-Dec-2018	03-Dec-2018				03-Dec-2018		03-Dec-2018		
CEN 10:1 Leachate (1 Stage)	23-Nov-2018	04-Dec-2018	22-Nov-2018			23-Nov-2018		23-Nov-2018	23-Nov-2018	
CEN Readings	24-Nov-2018	28-Nov-2018	28-Nov-2018			28-Nov-2018		24-Nov-2018	24-Nov-2018	
Cyanide Comp/Free/Total/Thiocyanate	05-Dec-2018	05-Dec-2018	05-Dec-2018	05-Dec-2018	05-Dec-2018	05-Dec-2018	05-Dec-2018	05-Dec-2018	05-Dec-2018	05-Dec-2018
Dissolved Metals by ICP-MS	04-Dec-2018	04-Dec-2018	04-Dec-2018			04-Dec-2018		04-Dec-2018	04-Dec-2018	
EPH CWG (Aliphatic) Aqueous GC (W)	03-Dec-2018	03-Dec-2018	01-Dec-2018			01-Dec-2018		03-Dec-2018	03-Dec-2018	
EPH CWG (Aliphatic) GC (S)	03-Dec-2018	03-Dec-2018	03-Dec-2018	26-Nov-2018	04-Dec-2018	03-Dec-2018	04-Dec-2018	26-Nov-2018	03-Dec-2018	26-Nov-2018
EPH CWG (Aromatic) Aqueous GC (W)	03-Dec-2018	03-Dec-2018	01-Dec-2018			01-Dec-2018		03-Dec-2018	03-Dec-2018	
EPH CWG (Aromatic) GC (S)	03-Dec-2018	03-Dec-2018	03-Dec-2018	26-Nov-2018	04-Dec-2018	03-Dec-2018	04-Dec-2018	26-Nov-2018	03-Dec-2018	26-Nov-2018
GRO by GC-FID (S)	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018
GRO by GC-FID (W)	04-Dec-2018	04-Dec-2018	04-Dec-2018			04-Dec-2018		04-Dec-2018	04-Dec-2018	
Mercury Dissolved	03-Dec-2018	03-Dec-2018	03-Dec-2018			03-Dec-2018		03-Dec-2018	03-Dec-2018	
Metals in solid samples by OES	27-Nov-2018	29-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	27-Nov-2018	04-Dec-2018	29-Nov-2018	28-Nov-2018	04-Dec-2018
PAH by GCMS	04-Dec-2018	04-Dec-2018	04-Dec-2018	03-Dec-2018	04-Dec-2018	04-Dec-2018	03-Dec-2018	04-Dec-2018	04-Dec-2018	03-Dec-2018
PAH Spec MS - Aqueous (W)	03-Dec-2018	03-Dec-2018	03-Dec-2018			03-Dec-2018		03-Dec-2018	03-Dec-2018	
pH	04-Dec-2018	04-Dec-2018	03-Dec-2018	03-Dec-2018	03-Dec-2018	04-Dec-2018	03-Dec-2018	04-Dec-2018	03-Dec-2018	03-Dec-2018
pH Value	29-Nov-2018	29-Nov-2018	29-Nov-2018			29-Nov-2018		29-Nov-2018	29-Nov-2018	
Phenols by HPLC (S)	05-Dec-2018	05-Dec-2018	05-Dec-2018	05-Dec-2018	05-Dec-2018	05-Dec-2018	05-Dec-2018	05-Dec-2018	05-Dec-2018	05-Dec-2018
Sample description	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018	21-Nov-2018
Total Organic Carbon	05-Dec-2018	06-Dec-2018	05-Dec-2018	05-Dec-2018	05-Dec-2018	05-Dec-2018	28-Nov-2018	05-Dec-2018	05-Dec-2018	04-Dec-2018
Total Sulphate	05-Dec-2018	05-Dec-2018				05-Dec-2018		05-Dec-2018		
Total Sulphur	04-Dec-2018	30-Nov-2018				04-Dec-2018		29-Nov-2018		
TPH CWG (W)	04-Dec-2018	04-Dec-2018	04-Dec-2018			04-Dec-2018		04-Dec-2018	04-Dec-2018	
TPH CWG GC (S)	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018
VOC MS (S)	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018	04-Dec-2018

Lab Sample No(s)	18786486	18786540	18786545
Customer Sample Ref.	4G-F8	4G-F8	4G-F8-V
AGS Ref.			
Depth	0.50 - 0.50	1.00 - 1.00	2.60 - 2.60
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Alkali Metals by iCap-OES (Soil)	06-Dec-2018		
Ammoniacal Nitrogen	30-Nov-2018	30-Nov-2018	
Ammonium Soil by Titration	04-Dec-2018	04-Dec-2018	04-Dec-2018
Anions by Kone (soil)	05-Dec-2018		
Asbestos ID in Solid Samples	03-Dec-2018		
CEN 10:1 Leachate (1 Stage)	22-Nov-2018	24-Nov-2018	
CEN Readings	28-Nov-2018	28-Nov-2018	
Cyanide Comp/Free/Total/Thiocyanate	05-Dec-2018	05-Dec-2018	05-Dec-2018
Dissolved Metals by ICP-MS	04-Dec-2018	04-Dec-2018	
EPH CWG (Aliphatic) Aqueous GC (W)	03-Dec-2018	03-Dec-2018	
EPH CWG (Aliphatic) GC (S)	03-Dec-2018	03-Dec-2018	26-Nov-2018
EPH CWG (Aromatic) Aqueous GC (W)	03-Dec-2018	03-Dec-2018	
EPH CWG (Aromatic) GC (S)	03-Dec-2018	03-Dec-2018	26-Nov-2018
GRO by GC-FID (S)	04-Dec-2018	04-Dec-2018	05-Dec-2018
GRO by GC-FID (W)	04-Dec-2018	04-Dec-2018	
Mercury Dissolved	03-Dec-2018	03-Dec-2018	
Metals in solid samples by OES	03-Dec-2018	04-Dec-2018	04-Dec-2018
PAH by GCMS	05-Dec-2018	04-Dec-2018	04-Dec-2018
PAH Spec MS - Aqueous (W)	03-Dec-2018	03-Dec-2018	
pH	04-Dec-2018	03-Dec-2018	03-Dec-2018
pH Value	29-Nov-2018	29-Nov-2018	
Phenols by HPLC (S)	05-Dec-2018	05-Dec-2018	05-Dec-2018
Sample description	21-Nov-2018	23-Nov-2018	21-Nov-2018
Total Organic Carbon	06-Dec-2018	05-Dec-2018	06-Dec-2018
Total Sulphate	04-Dec-2018		
Total Sulphur	03-Dec-2018		
TPH CWG (W)	04-Dec-2018	04-Dec-2018	
TPH CWG GC (S)	04-Dec-2018	04-Dec-2018	05-Dec-2018
VOC MS (S)	04-Dec-2018	04-Dec-2018	04-Dec-2018

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
5	**Samples exceeded holding time before presevation was performed**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Appendix J
Geotechnical Screening

Soil ID	Compaction				General	Particle Distribution							BRE								
						Fines															
	Optimum Moisture Content (%)	Max Dry Density (Mg/m3)	Natural Moisture Content (%)	Assumed/ Measured Particle Density (Mg/m3)	Water Content (%)	Clay % (<0.004m m)	Silt % (0.004 - 0.062mm)	% Fines (<0.062)	Sand % (0.062 - 2mm)	Gravel % (2-63mm)	Cobbles % (64-124mm)	Total	Initial Moisture Content %	Wet Density in Mould (Mg/m3)	Dry Density in Mould (Mg/m3)	Total Expansion (%)	Initial Moisture Content %	Density on a saturated and surface-dried basis (Mg/m3)	Partilcle density on an oven-dried basis (Mg/m3)	Apparent Particle Density	Total Expansio n (%)
4G-C1	10	2.11		2.85	12.3			10.6	14.4	75	0	100		2.5	2.43	0.10					
4G-C2	12	2.33		3.35	11.6			4.2	14.8	73	8	100		2.25	2.14	-0.10					
4G-3C	11	2.12		2.9	7.9			15.6	28.4	56	0	100		2.54	2.44	-0.40					
4G-D1	9.8	2.18		2.9	9.5			6	11	79	4	100		2.39	2.32	0.60					
4G-D2	11	1.94		2.65	12.7			3.9	20.1	66	10	100		2.75	2.64	1.10					
4G-C4	12	1.95		2.7	16.6			4.2	17.8	78	0	100		2.45	2.34	0.60					
4G-C5	12	1.73		2.3	19			5.3	27.7	67	0	100		1.59	1.48	-0.20					
4G-C6	11	2.03		2.75	13			6	9	85	0	100		2.38	2.3	0.30					
4G-E2	10	2.11		2.8	13.2			11.5	32.5	56	0	100		2.48	2.4	0.20					
4G-D3	8.5	2.10		2.7	15			12	24	64	0	100		2.54	2.48	0.10					
4G-E3	7.7	2.18		2.8	13.5			3.2	18.80	78	0	100		2.89	2.89	0.60					
4G-D4	11	1.99		2.7	17.3			13.5	29.5	57	0	100		2.4	2.31	0.50					
4G-D5	10	1.99		2.75	14.8			13.3	19.7	67	0	100		2.45	2.38	0.90					
4G-D6	13	1.83		2.5	21.5			14.2	24.8	61	0	100		2.55	2.41	0.20					
4G-E1	11	2.24		3.1	14.9			7.7	12.3	80	0	100		2.78	2.67	-0.60					
4G-F1	6.7	2.93		4	16.5			0.1	37.9	62	0	100		3.3	3.29	0.40					
4G-F2	7	2.80		2.26	8.9			14.3	48.7	37	0	100		2.44	2.36	1.20					
4G-F3	12	2.31		3.3	11.6			4.1	13.9	71	11	100		2.81	2.68	0.70					
4G-E5	12	1.73		2.75	7.6			6.8	19.2	74	0	100		2.62	2.54	0.40					
4G-E6	11	1.95		2.7	14.3			12.3	18.7	51	18	100		2.49	2.41	0.20					
4G-F6	11	2.13		2.95	9.7			6.2	19.8	74	0	100		2.7	2.64	-0.50					
4G-G6	12	2.00		2.75	11.6			6.2	32.8	61	0	100		2.32	2.19	0.50					
AJ21-1 (0.3)	11	2.03		2.8	11.1			5.3	32.7	59	3	100						2.4	2.32	2.53	0.24
AF22-1 (0.2)	8.7	1.97		2.8	11			1.9	21.1	57	20	100				0.28					
Number of Tests:	24	24		24	24			24	24	24	24	24	0	22	22	23	0	1	1	1	1
Max	13.00	2.93		4.00	21.50			15.60	48.70	85.00	20.00	100.00	0.00	3.30	3.29	1.20	0.00	2.40	2.32	2.53	0.24
Min	6.70	1.73		2.26	7.60			0.10	9.00	37.00	0.00	100.00	0.00	1.59	1.48	-0.60	0.00	2.40	2.32	2.53	0.24
Av	10.48	2.11		2.84	13.13			7.85	22.90	66.17	3.08	100.00	#DIV/0!	2.53	2.44	0.31	#DIV/0!	2.40	2.32	2.53	0.24

Appendix K
Geotechnical Test Certificates

celtest
INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 04 January 2019
Test Report Ref: TR 639917

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

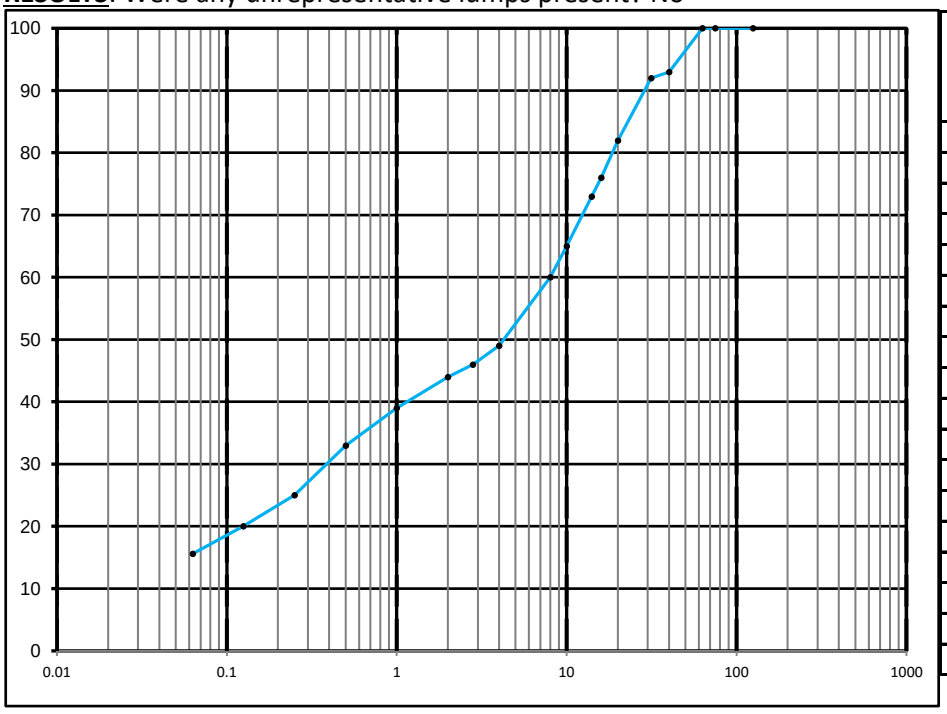
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G 3C - 0.7m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G 3C - 0.7m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	100	
40.0 mm	93	
31.5 mm	92	
20.0 mm	82	
16.0 mm	76	
14.0 mm	73	
10.0 mm	65	
8.0 mm	60	
4.0 mm	49	
2.8 mm	46	
2.0 mm	44	
1.0 mm	39	
0.500 mm	33	
0.250 mm	25	
0.125 mm	20	
0.063 mm	15.6	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640025

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G 3C - 0.7m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G 3C - 0.7m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) = **7.9**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 14 January 2019
Test Report Ref: TR 640138

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G 3C - 0.7m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**10/01/2019**
Sampling Location:	**4G 3C - 0.7m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.44 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.54 Mg/m³**
Apparent Particle density =	**2.69 Mg/m³**
Water absorption (of dry mass) =	**3.8%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 13 February 2019
Test Report Ref: TR 640252

Order No: Bacs-Former Llanwern Steelworks

LABORATORY TEST REPORT

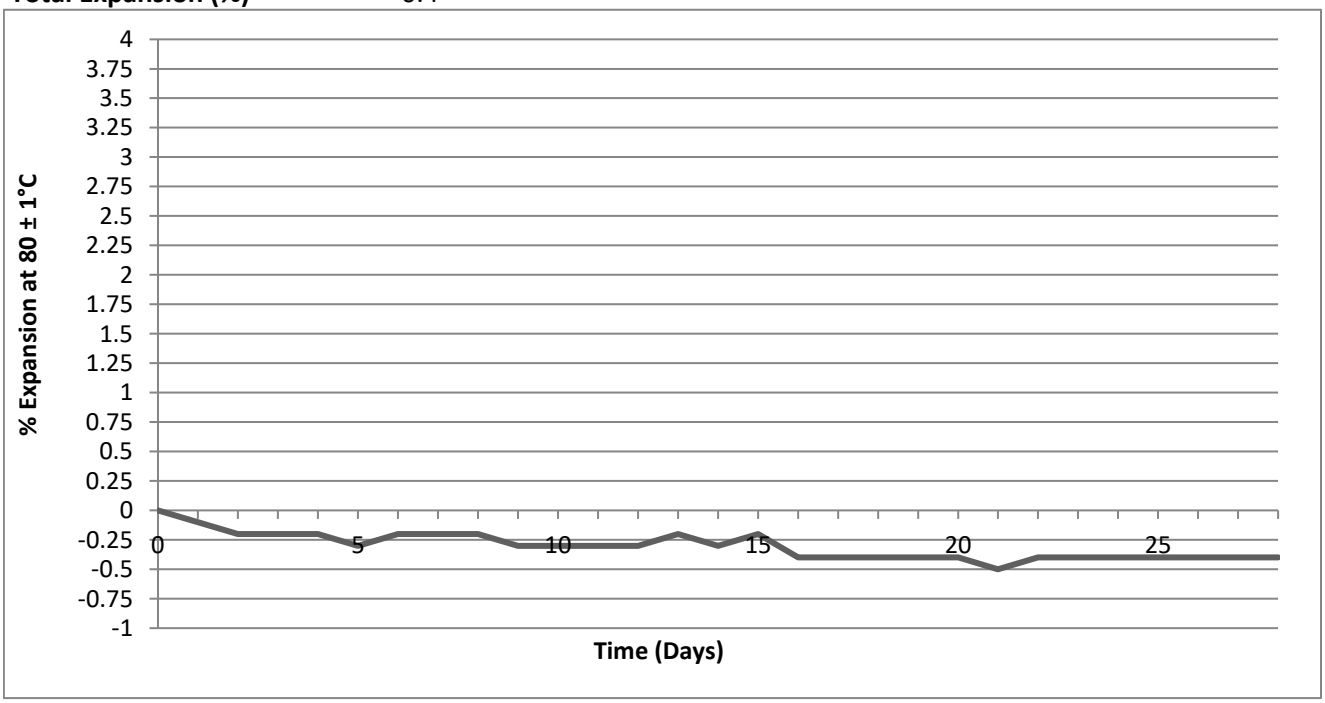
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G 3C - 0.7m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**16/01/2019**
Sampling Location:	**4G 3C - 0.7m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = -0.4



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 06 February 2019
Test Report Ref: TR 640377

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

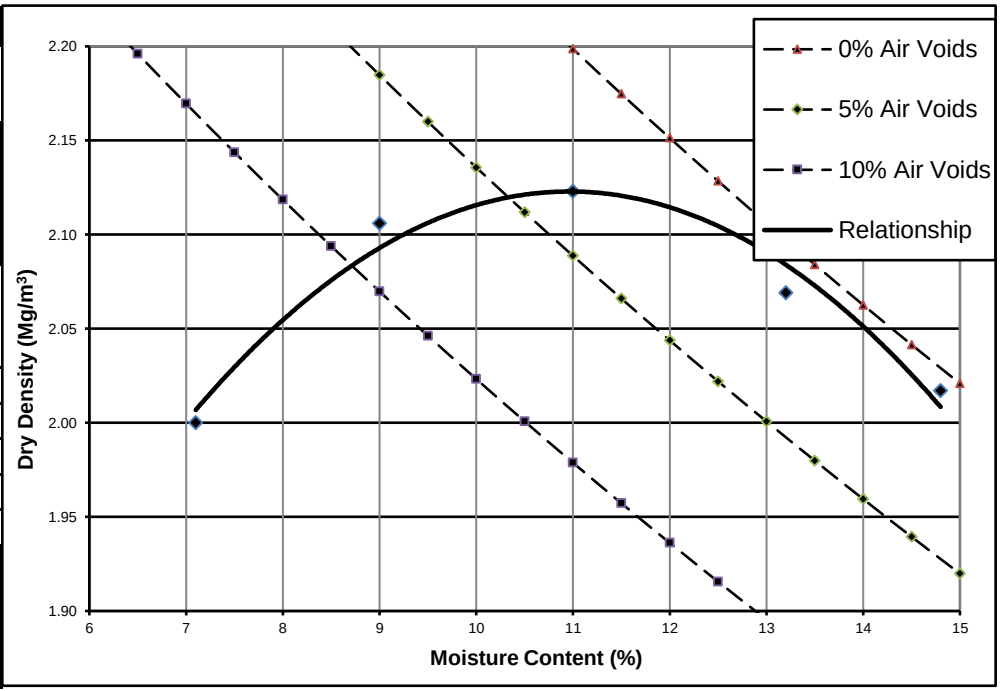
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G 3C - 0.7m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**25/01/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G 3C - 0.7m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 2.9Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	10 %
Retained on 20mm Sieve:	25 %

Moisture Content (%)	Dry Density Mg/m^3
7.1	2.00
9.0	2.11
11.0	2.12
13.2	2.07
14.8	2.02
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
11.0	**2.12**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

celtest
INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 04 January 2019
Test Report Ref: TR 639914

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

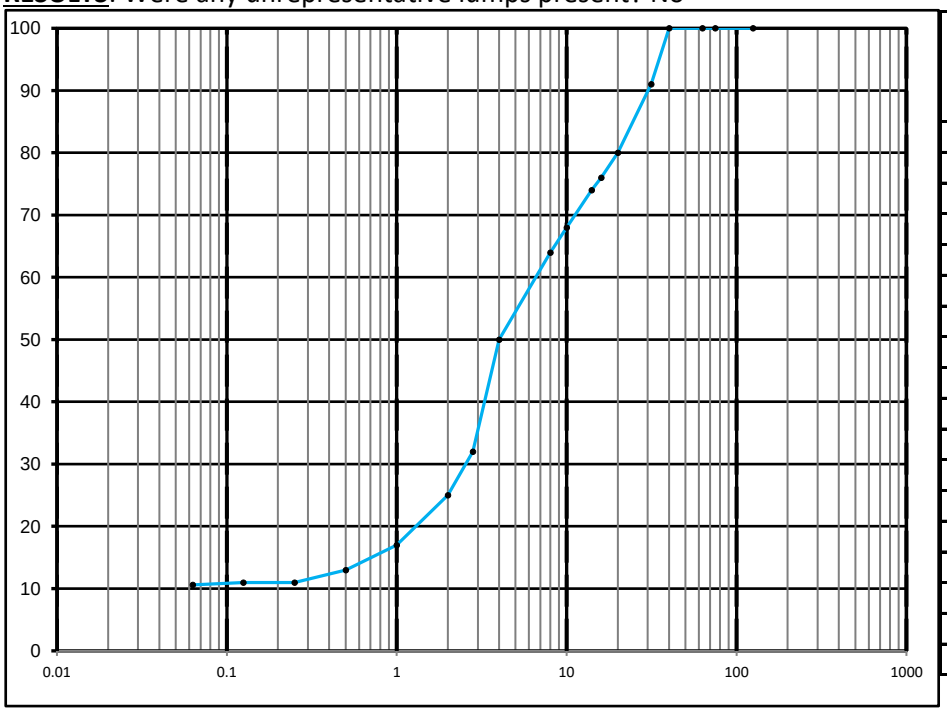
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G C1 - 1.0m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G C1 - 1.0m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	100	
40.0 mm	100	
31.5 mm	91	
20.0 mm	80	
16.0 mm	76	
14.0 mm	74	
10.0 mm	68	
8.0 mm	64	
4.0 mm	50	
2.8 mm	32	
2.0 mm	25	
1.0 mm	17	
0.500 mm	13	
0.250 mm	11	
0.125 mm	11	
0.063 mm	10.6	

Comments:
None

Report checked and approved by:
S Parry-Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640022

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G C1 - 1.0m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G C1 - 1.0m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) =	**12.3**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 14 January 2019
Test Report Ref: TR 640135

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G C1 - 1.0m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**11/01/2019**
Sampling Location:	**4G C1 - 1.0m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.43 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.50 Mg/m³**
Apparent Particle density =	**2.61 Mg/m³**
Water absorption (of dry mass) =	**2.8%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 13 February 2019
Test Report Ref: TR 640249

Order No: Bacs-Former Llanwern Steelworks

LABORATORY TEST REPORT

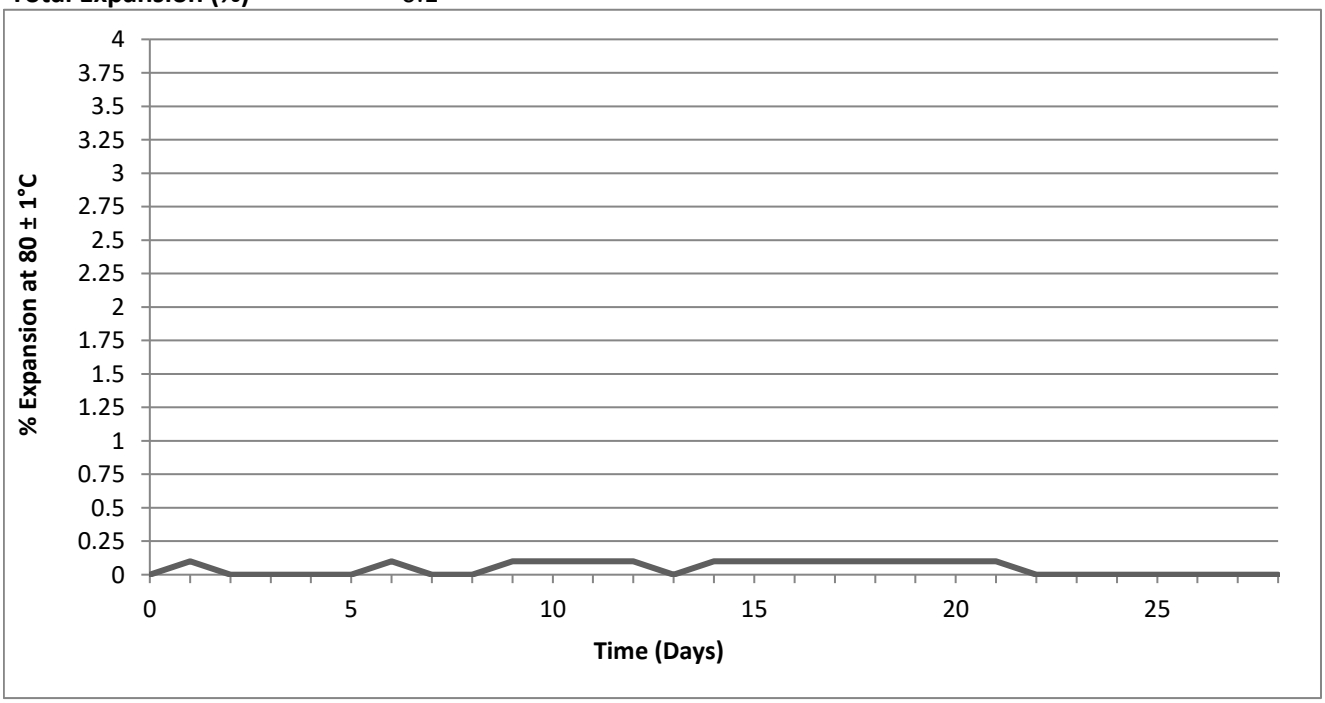
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G C1 - 1.0m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**16/01/2019**
Sampling Location:	**4G C1 - 1.0m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = 0.1



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 13 February 2019
Test Report Ref: TR 640374

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

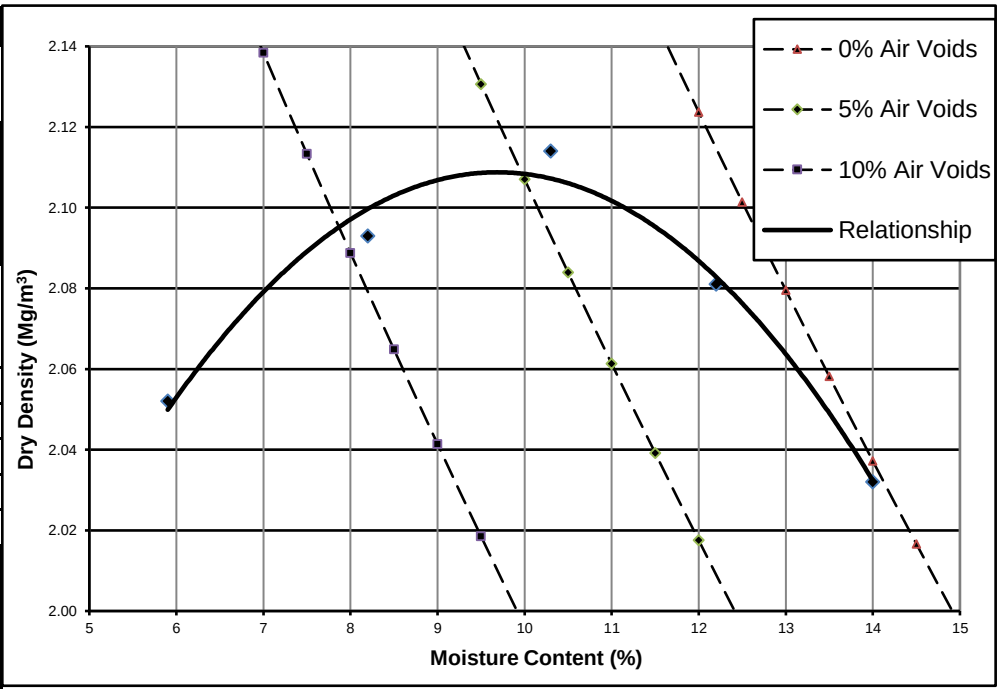
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G C1 - 1.0m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**31/01/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G C1 - 1.0m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 2.85Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	1 %
Retained on 20mm Sieve:	21 %

Moisture Content (%)	Dry Density Mg/m^3
5.9	2.05
8.2	2.09
10.3	2.11
12.2	2.08
14.0	2.03
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
10.0	**2.11**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

celtest
INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 04 January 2019
Test Report Ref: TR 639916

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

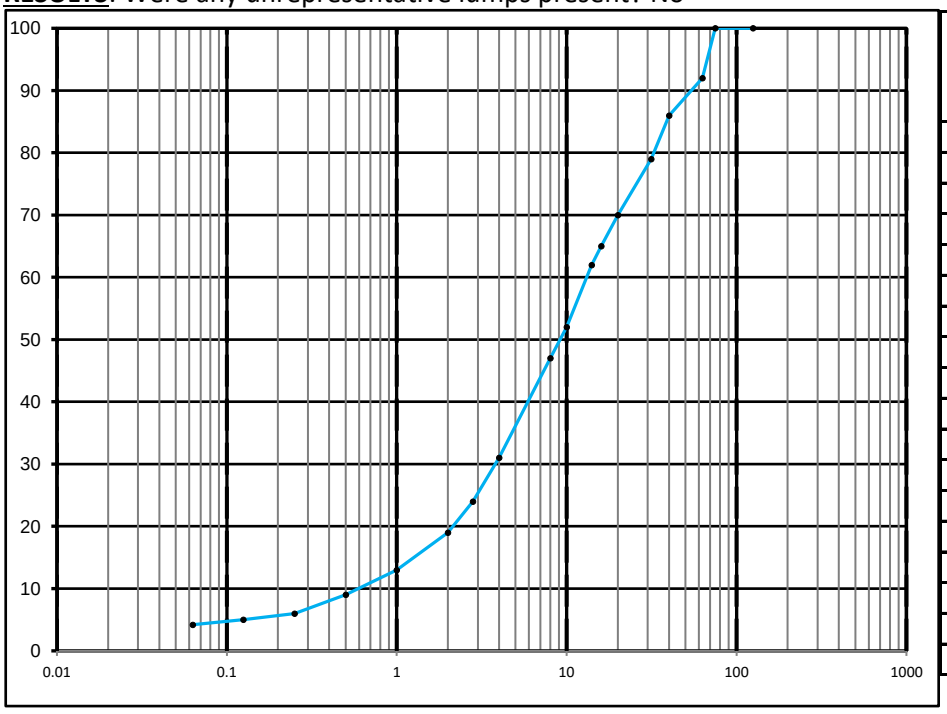
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G C2 - 1.2m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G C2 - 1.2m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	92	
40.0 mm	86	
31.5 mm	79	
20.0 mm	70	
16.0 mm	65	
14.0 mm	62	
10.0 mm	52	
8.0 mm	47	
4.0 mm	31	
2.8 mm	24	
2.0 mm	19	
1.0 mm	13	
0.500 mm	9	
0.250 mm	6	
0.125 mm	5	
0.063 mm	4.2	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640024

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G C2 - 1.2m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G C2 - 1.2m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) =	**11.6**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 09 May 2019
Test Report Ref: TR 640137

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G C2 - 1.2m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**18/01/2019**
Sampling Location:	**4G C2 - 1.2m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.14 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.25 Mg/m³**
Apparent Particle density =	**2.39 Mg/m³**
Water absorption (of dry mass) =	**4.9%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

celtest
INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 13 February 2019
Test Report Ref: TR 640251

Order No: Bacs-Former Llanwern Steelworks

LABORATORY TEST REPORT

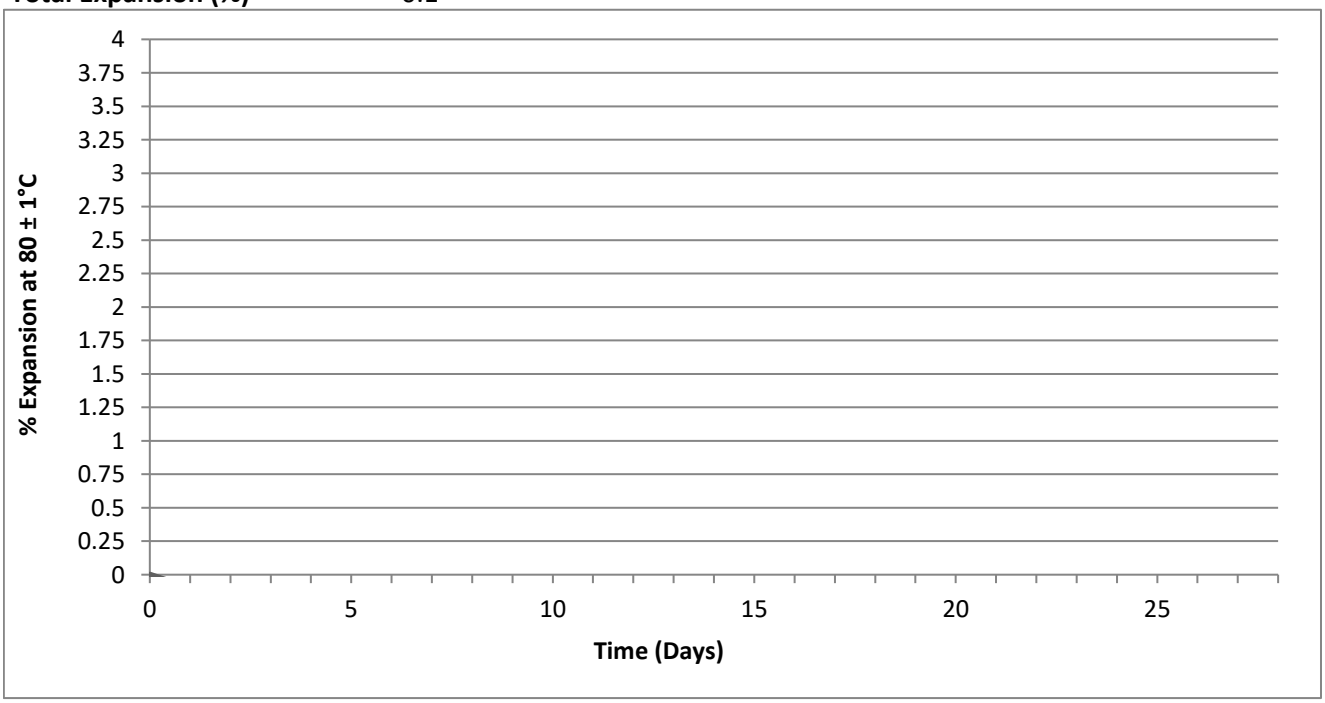
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G C2 - 1.2m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**16/01/2019**
Sampling Location:	**4G C2 - 1.2m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = -0.1



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 13 February 2019
Test Report Ref: TR 640376

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

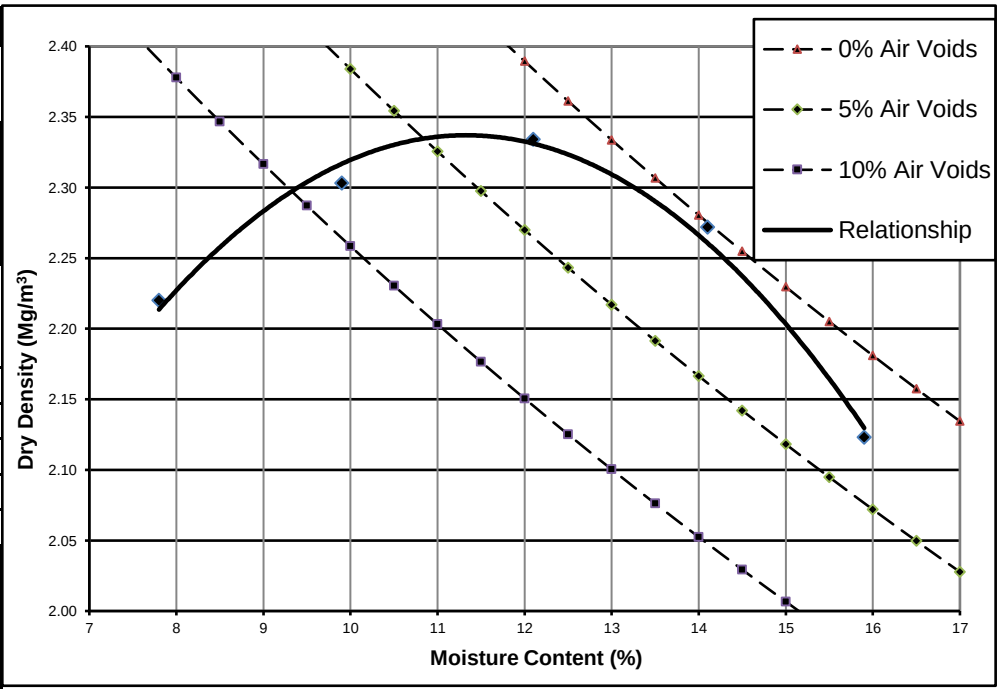
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G C2 - 1.2m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**31/01/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G C2 - 1.2m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 3.35Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	7 %
Retained on 20mm Sieve:	26 %

Moisture Content (%)	Dry Density Mg/m^3
7.8	2.22
9.9	2.30
12.1	2.33
14.1	2.27
15.9	2.12
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
12.0	**2.33**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 04 January 2019
Test Report Ref: TR 639919

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

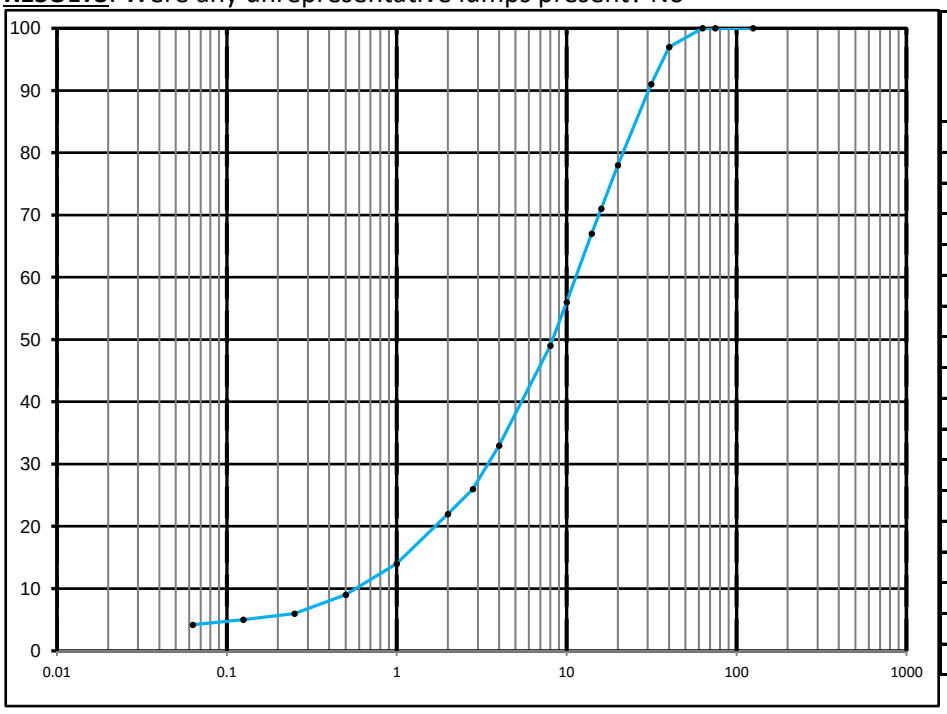
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G C4 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G C4 - 0.5m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	100	
40.0 mm	97	
31.5 mm	91	
20.0 mm	78	
16.0 mm	71	
14.0 mm	67	
10.0 mm	56	
8.0 mm	49	
4.0 mm	33	
2.8 mm	26	
2.0 mm	22	
1.0 mm	14	
0.500 mm	9	
0.250 mm	6	
0.125 mm	5	
0.063 mm	4.2	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640027

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G C4 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G C4 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) =	**16.6**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 14 January 2019
Test Report Ref: TR 640140

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G C4 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**11/01/2019**
Sampling Location:	**4G C4 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.34 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.45 Mg/m³**
Apparent Particle density =	**2.62 Mg/m³**
Water absorption (of dry mass) =	**4.6%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 22 January 2019
Test Report Ref: TR 640379

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

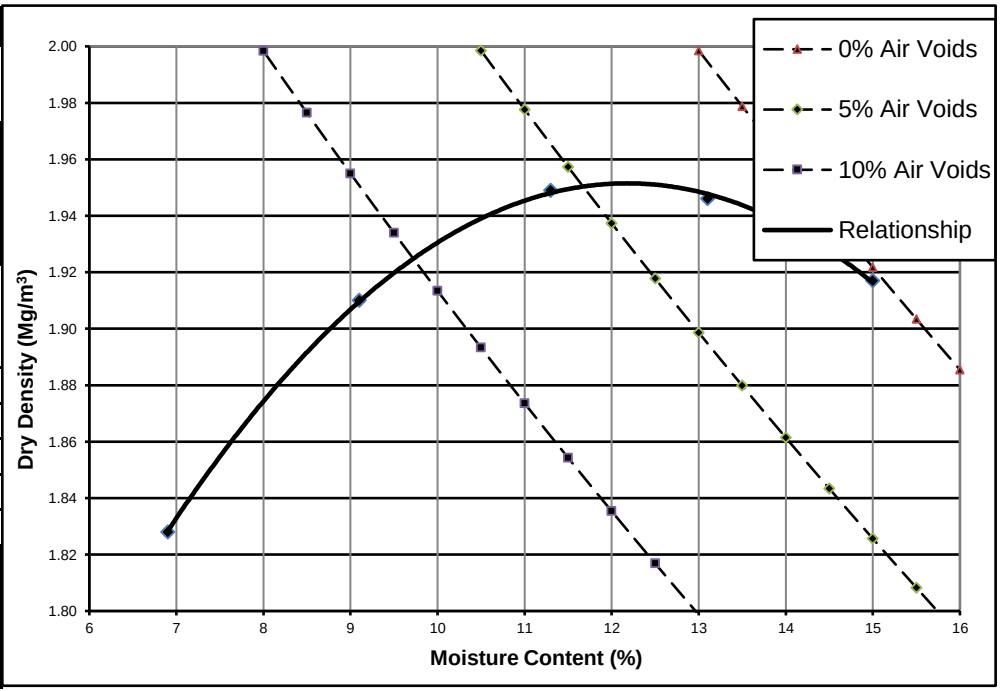
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G C4 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**18/01/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G C4 - 0.5m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 2.7Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	12 %
Retained on 20mm Sieve:	25 %

Moisture Content (%)	Dry Density Mg/m^3
6.9	1.83
9.1	1.91
11.3	1.95
13.1	1.95
15.0	1.92
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
12.0	**1.95**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 18 January 2019
Test Report Ref: TR 640254

Order No: BACS-Former Llanwern Steelworks

LABORATORY TEST REPORT

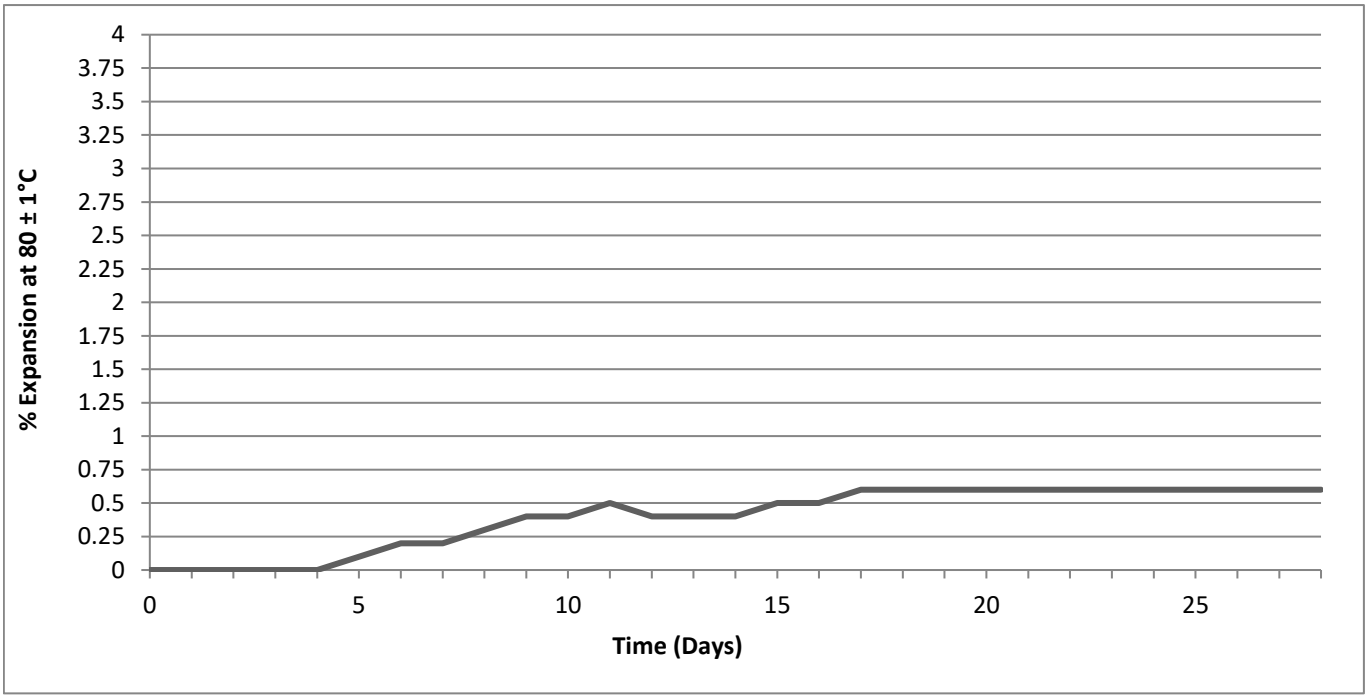
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G C4 0.5m**
Date and Time of Sampling:	**01/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**Former Llanwern Steelworks**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = 0.6



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:

S Parry-Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 07 January 2019
Test Report Ref: TR 639920

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

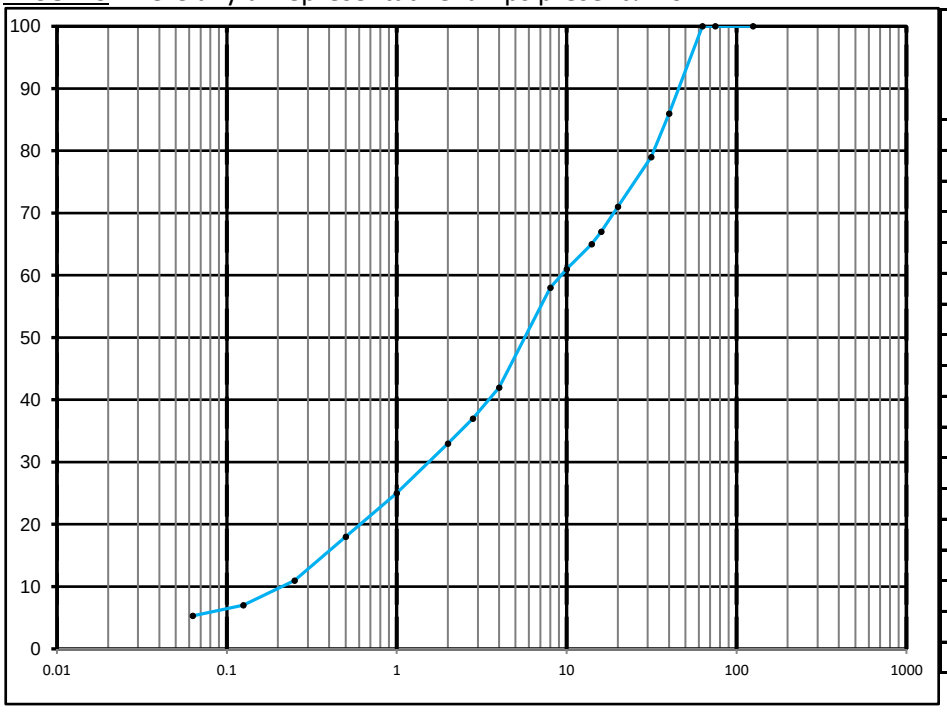
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G C5 - 1.0m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G C5 - 1.0m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	100	
40.0 mm	86	
31.5 mm	79	
20.0 mm	71	
16.0 mm	67	
14.0 mm	65	
10.0 mm	61	
8.0 mm	58	
4.0 mm	42	
2.8 mm	37	
2.0 mm	33	
1.0 mm	25	
0.500 mm	18	
0.250 mm	11	
0.125 mm	7	
0.063 mm	5.3	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640028

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G C5 - 1.0m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G C5 - 1.0m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) = **19.0**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 14 January 2019
Test Report Ref: TR 640141

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G C5 - 1.0m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**11/01/2019**
Sampling Location:	**4G C5 - 1.0m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**1.48 Mg/m³**
Particle density on a saturated and surface-dried basis =	**1.59 Mg/m³**
Apparent Particle density =	**1.66 Mg/m³**
Water absorption (of dry mass) =	**7.4%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

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INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 13 February 2019
Test Report Ref: TR 640255

Order No: Bacs-Former Llanwern Steelworks

LABORATORY TEST REPORT

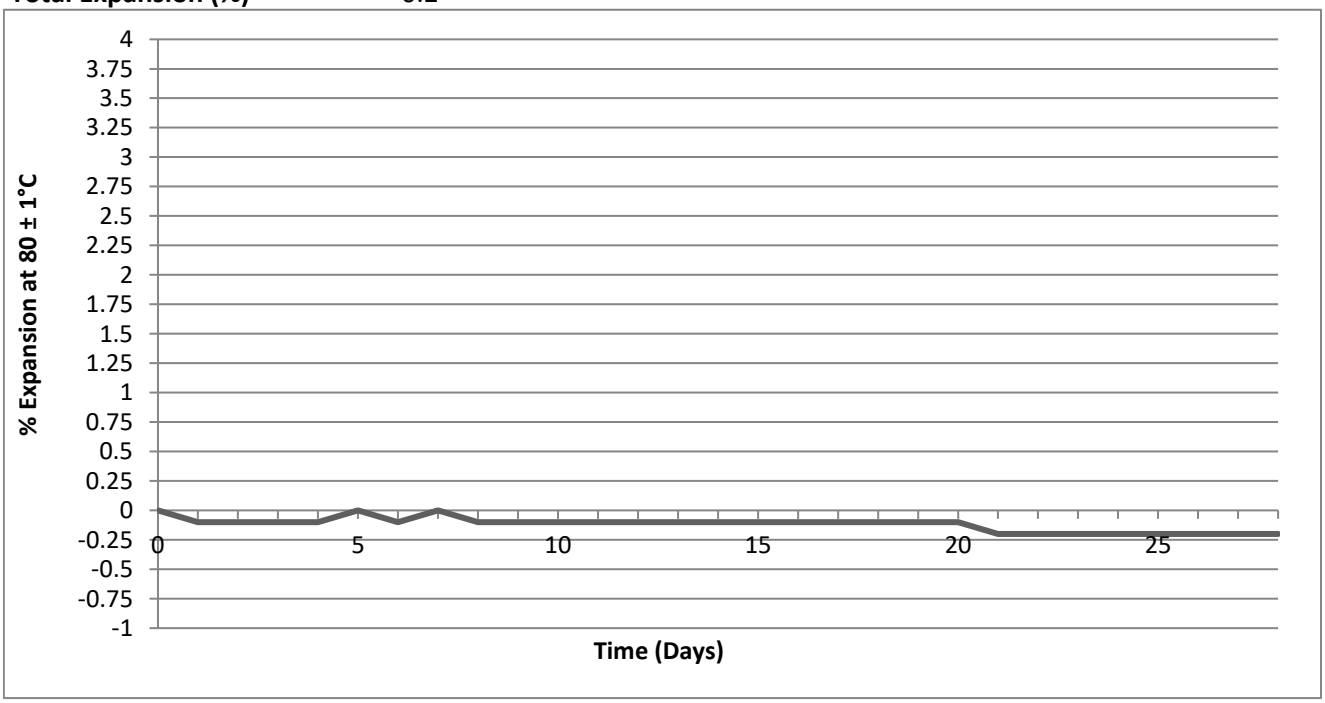
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G C5 - 1.0m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**16/01/2019**
Sampling Location:	**4G C5 - 1.0m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = -0.2



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 06 February 2019
Test Report Ref: TR 640380

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

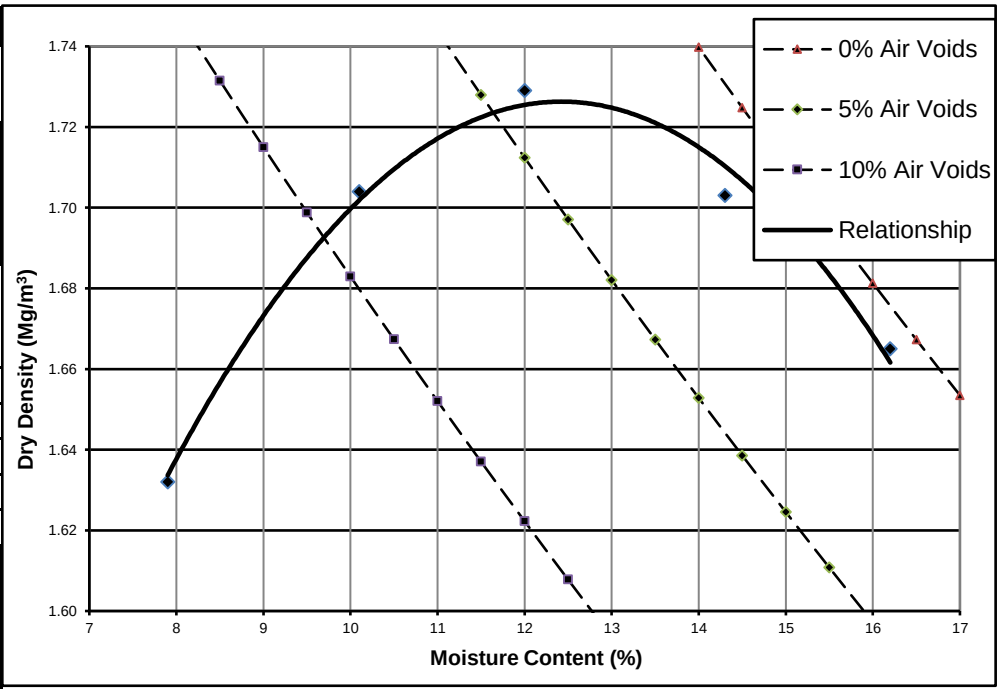
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G C5 - 1.0m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**29/01/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G C5 - 1.0m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 2.3Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	24 %
Retained on 20mm Sieve:	32 %

Moisture Content (%)	Dry Density Mg/m^3
7.9	1.63
10.1	1.70
12.0	1.73
14.3	1.70
16.2	1.67
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
12.0	**1.73**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 04 January 2019
Test Report Ref: TR 639924

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

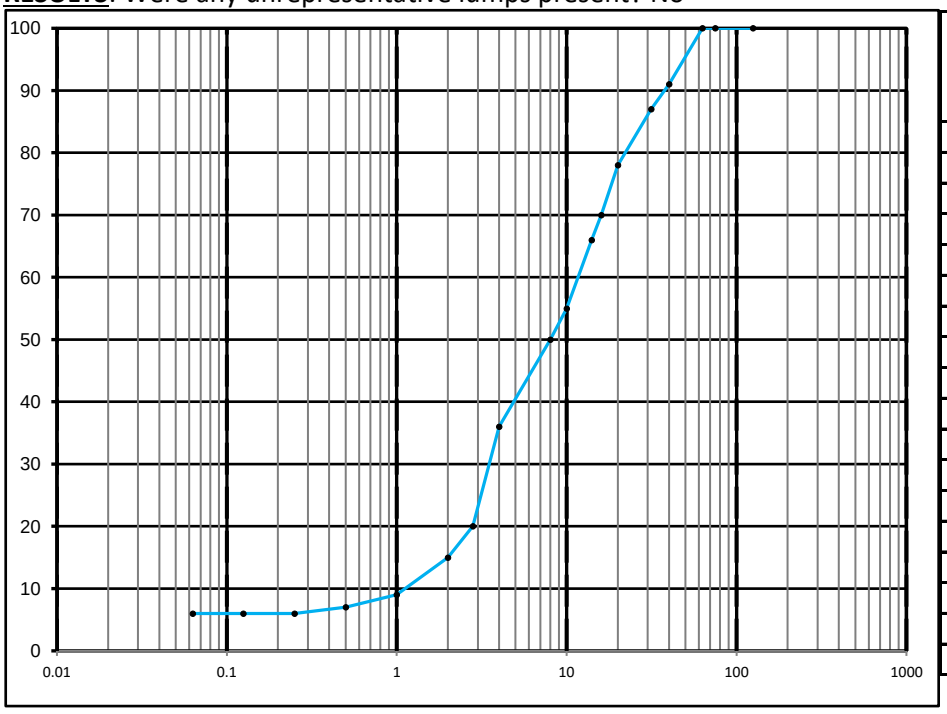
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G C6 - 0.4m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G C6 - 0.4m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	100	
40.0 mm	91	
31.5 mm	87	
20.0 mm	78	
16.0 mm	70	
14.0 mm	66	
10.0 mm	55	
8.0 mm	50	
4.0 mm	36	
2.8 mm	20	
2.0 mm	15	
1.0 mm	9	
0.500 mm	7	
0.250 mm	6	
0.125 mm	6	
0.063 mm	6	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640033

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G C6 - 0.4m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G C6 - 0.4m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) = **13.0**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 14 January 2019
Test Report Ref: TR 640147

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G C6 - 0.4m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**11/01/2019**
Sampling Location:	**4G C6 - 0.4m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.30 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.38 Mg/m³**
Apparent Particle density =	**2.51 Mg/m³**
Water absorption (of dry mass) =	**3.7%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 18 February 2019
Test Report Ref: TR 640385

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

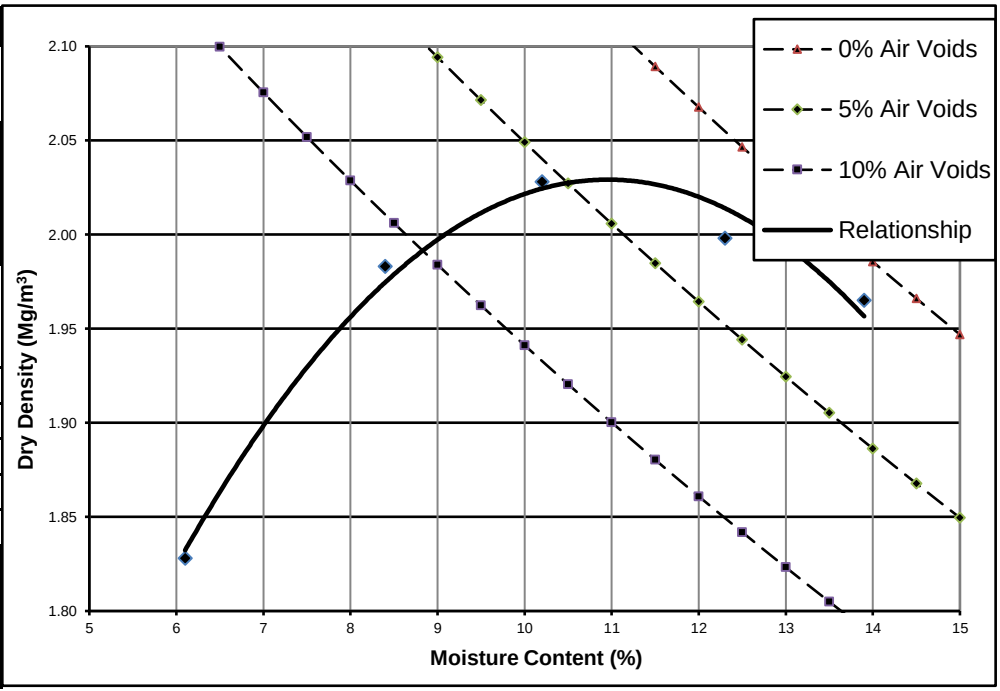
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G C6 - 0.4m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**04/02/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G C6 - 0.4m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 2.75Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	13 %
Retained on 20mm Sieve:	30 %

Moisture Content (%)	Dry Density Mg/m^3
6.1	1.83
8.4	1.98
10.2	2.03
12.3	2.00
13.9	1.97
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
11.0	**2.03**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

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INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 18 January 2019
Test Report Ref: TR 640260

Order No: BACS-Former Llanwern Steelworks

LABORATORY TEST REPORT

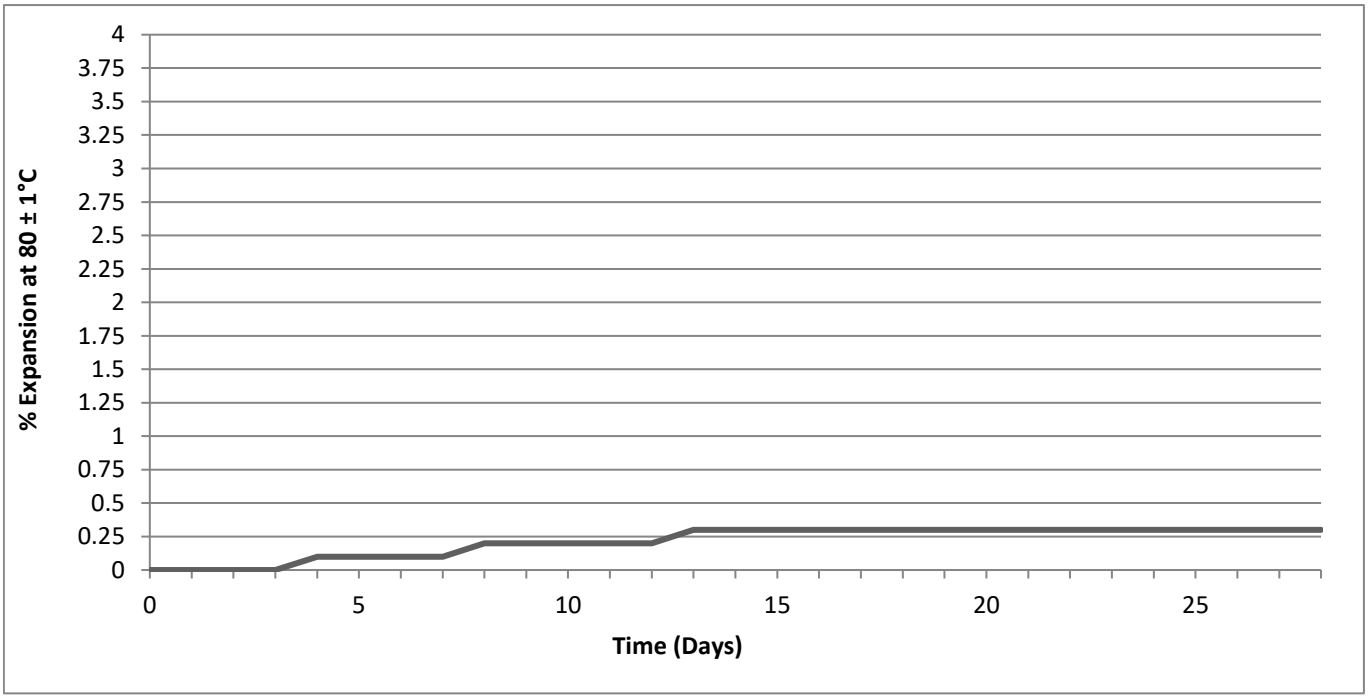
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G C6 0.4m**
Date and Time of Sampling:	**01/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**14/12/2018**
Sampling Location:	**Former Llanwern Steelworks**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = 0.3



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:

S Parry-Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 04 January 2019
Test Report Ref: TR 639929

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

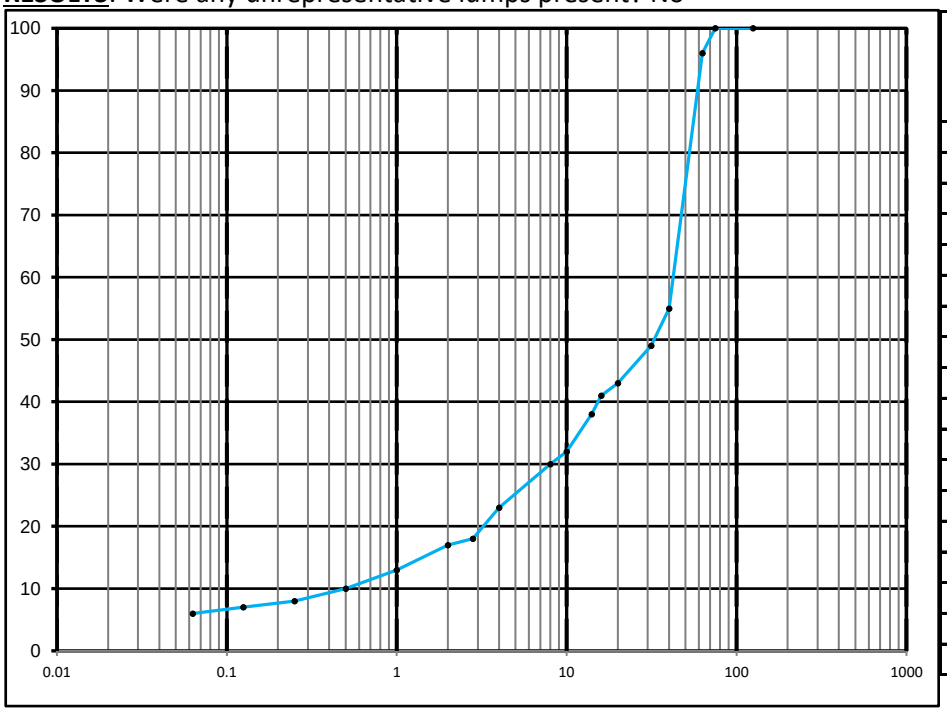
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G D1 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G D1 - 0.5m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	96	
40.0 mm	55	
31.5 mm	49	
20.0 mm	43	
16.0 mm	41	
14.0 mm	38	
10.0 mm	32	
8.0 mm	30	
4.0 mm	23	
2.8 mm	18	
2.0 mm	17	
1.0 mm	13	
0.500 mm	10	
0.250 mm	8	
0.125 mm	7	
0.063 mm	6	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640038

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G D1 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G D1 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) =	**9.5**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 14 January 2019
Test Report Ref: TR 640152

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G D1 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**11/01/2019**
Sampling Location:	**4G D1 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.32 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.39 Mg/m³**
Apparent Particle density =	**2.48 Mg/m³**
Water absorption (of dry mass) =	**2.8%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 24 January 2019
Test Report Ref: TR 640390

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

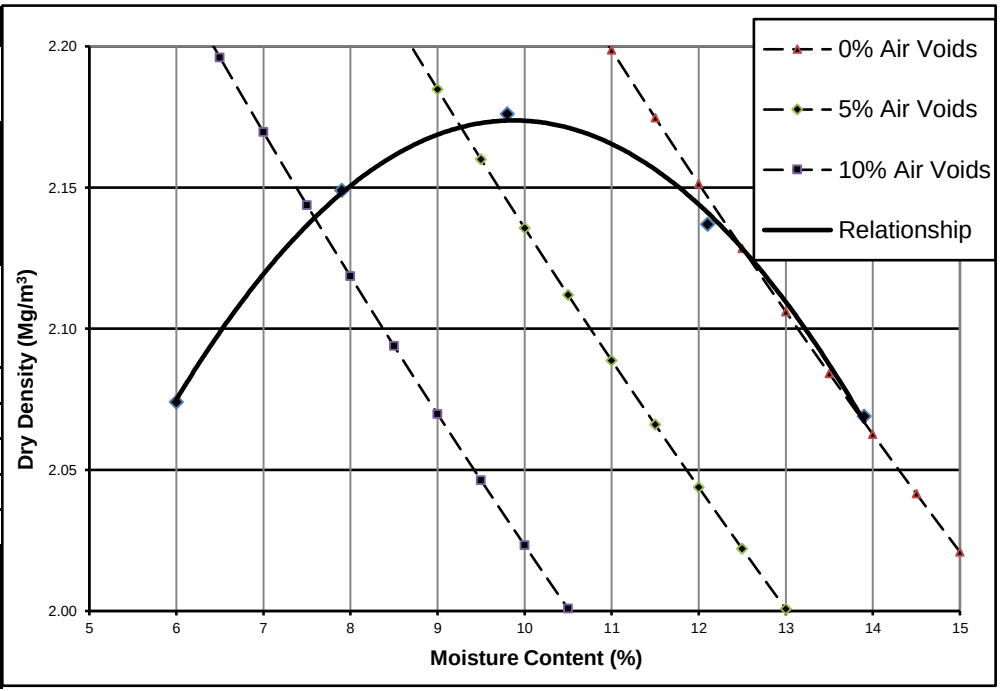
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G D1 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**22/01/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G D1 - 0.5m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 2.9Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	20 %
Retained on 20mm Sieve:	34 %

Moisture Content (%)	Dry Density Mg/m^3
6.0	2.07
7.9	2.15
9.8	2.18
12.1	2.14
13.9	2.07
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
9.8	**2.18**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 18 January 2019
Test Report Ref: TR 640265

Order No: BACS-Former Llanwern Steelworks

LABORATORY TEST REPORT

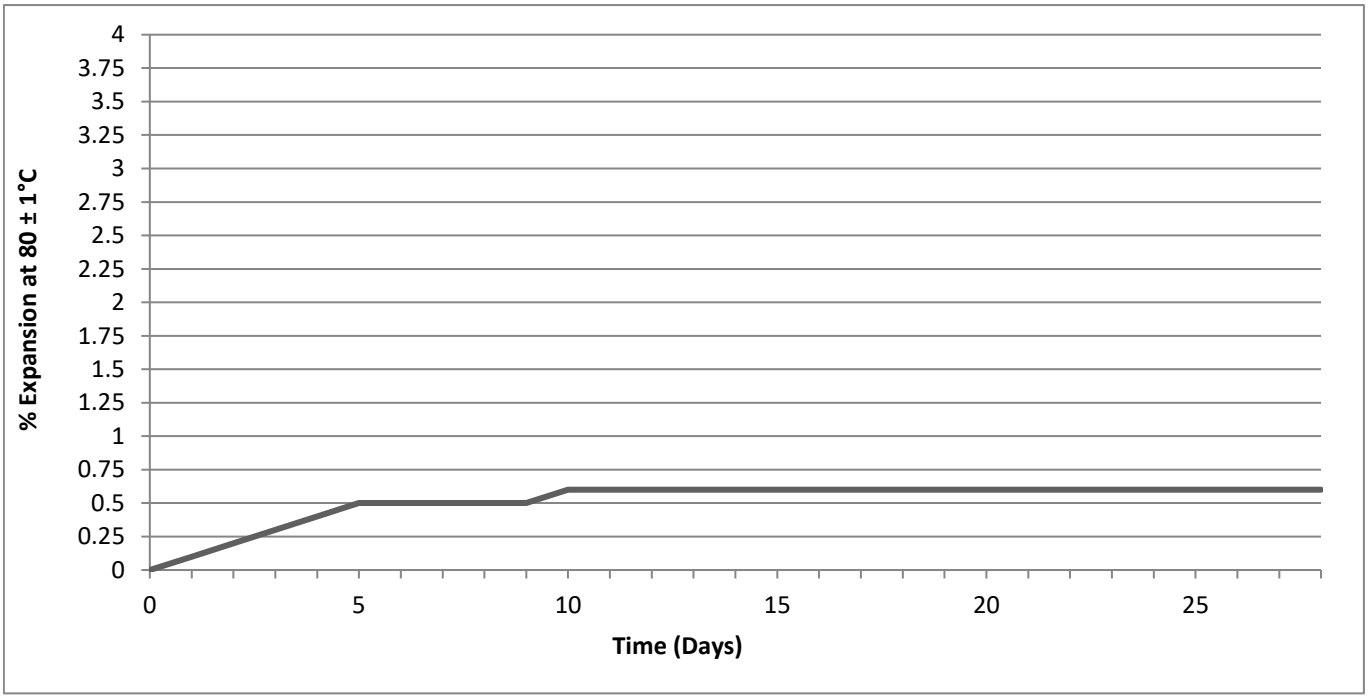
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G D1 0.5m**
Date and Time of Sampling:	**01/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**14/12/2018**
Sampling Location:	**Former Llanwern Steelworks**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = 0.6



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:

S Parry-Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 04 January 2019
Test Report Ref: TR 639934

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

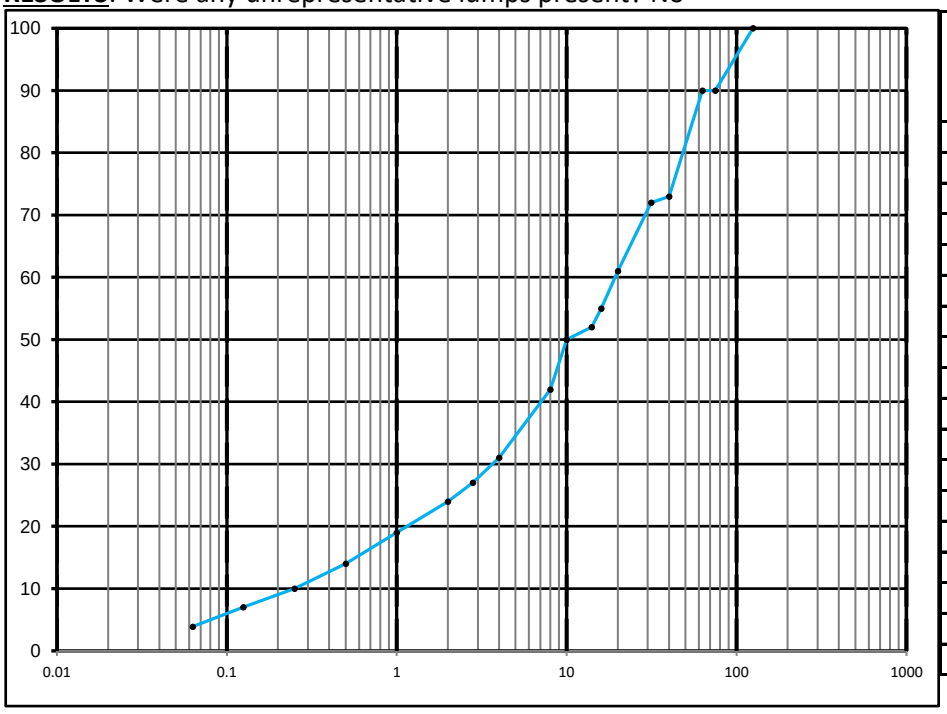
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G D2 - 0.4m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G D2 - 0.4m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	90	
63.0 mm	90	
40.0 mm	73	
31.5 mm	72	
20.0 mm	61	
16.0 mm	55	
14.0 mm	52	
10.0 mm	50	
8.0 mm	42	
4.0 mm	31	
2.8 mm	27	
2.0 mm	24	
1.0 mm	19	
0.500 mm	14	
0.250 mm	10	
0.125 mm	7	
0.063 mm	3.9	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640043

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G D2 - 0.4m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G D2 - 0.4m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) = 12.7

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 14 January 2019
Test Report Ref: TR 640157

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G D2 - 0.4m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**11/01/2019**
Sampling Location:	**4G D2 - 0.4m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.64 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.75 Mg/m³**
Apparent Particle density =	**2.98 Mg/m³**
Water absorption (of dry mass) =	**4.3%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 06 February 2019
Test Report Ref: TR 640395

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

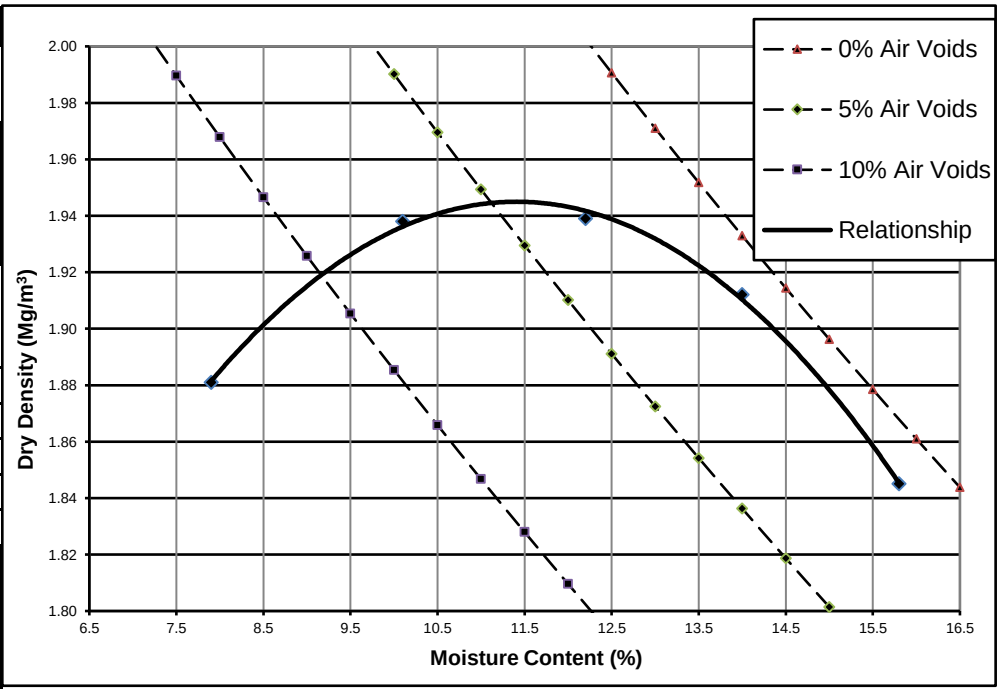
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G D2 - 0.4m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**28/01/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G D2 - 0.4m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 2.65Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	1.94 %
Retained on 20mm Sieve:	11 %

Moisture Content (%)	Dry Density Mg/m^3
7.9	1.88
10.1	1.94
12.2	1.94
14.0	1.91
15.8	1.85
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
11.0	**1.94**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 18 January 2019
Test Report Ref: TR 640270

Order No: BACS-Former Llanwern Steelworks

LABORATORY TEST REPORT

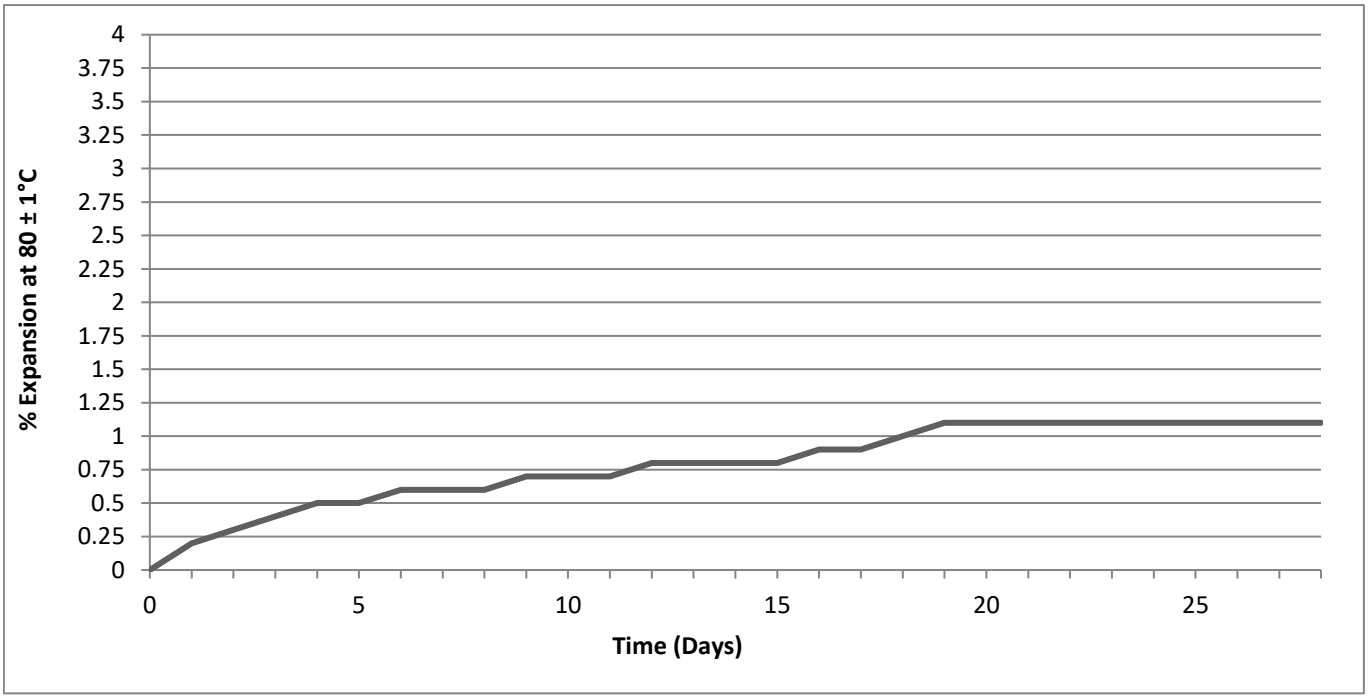
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G D2 0.4m**
Date and Time of Sampling:	**01/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**14/12/2018**
Sampling Location:	**Former Llanwern Steelworks**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) =



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 07 January 2019
Test Report Ref: TR 639943

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

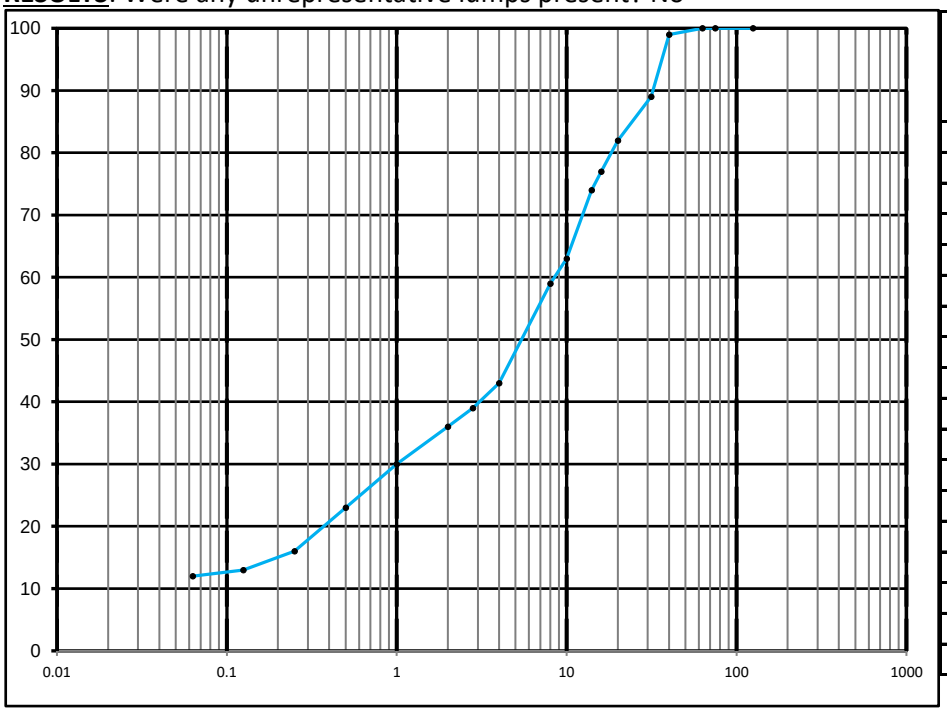
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G D3 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G D3 - 0.5m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	100	
40.0 mm	99	
31.5 mm	89	
20.0 mm	82	
16.0 mm	77	
14.0 mm	74	
10.0 mm	63	
8.0 mm	59	
4.0 mm	43	
2.8 mm	39	
2.0 mm	36	
1.0 mm	30	
0.500 mm	23	
0.250 mm	16	
0.125 mm	13	
0.063 mm	12	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640052

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G D3 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G D3 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) = **15.0**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 14 January 2019
Test Report Ref: TR 640166

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G D3 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**11/01/2019**
Sampling Location:	**4G D3 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.48 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.54 Mg/m³**
Apparent Particle density =	**2.66 Mg/m³**
Water absorption (of dry mass) =	**2.8%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 18 February 2019
Test Report Ref: TR 640404

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

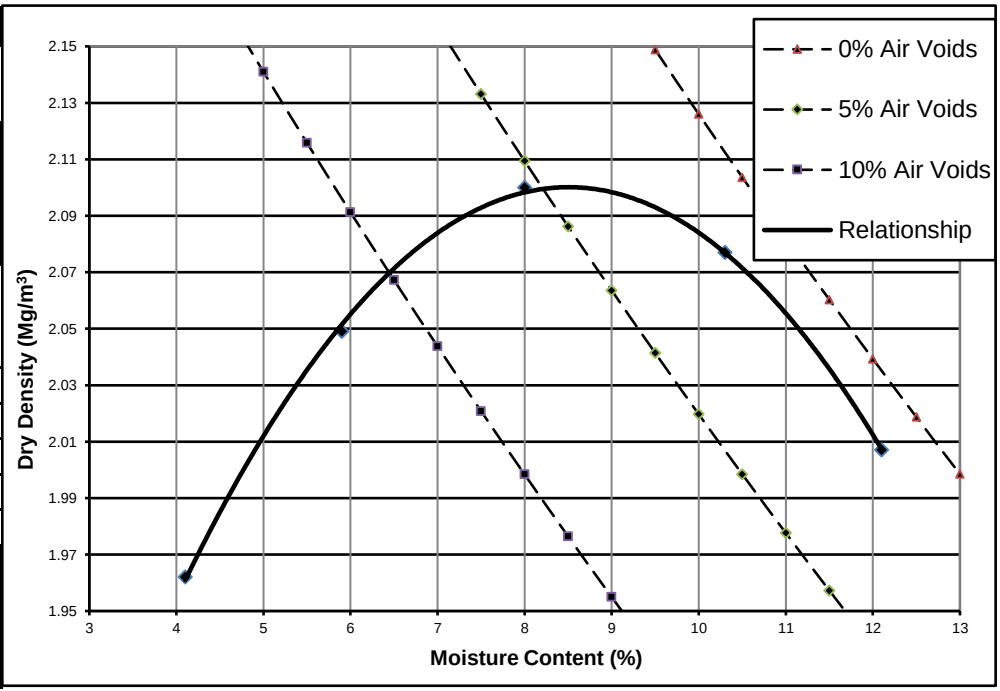
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G D3 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**13/02/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G D3 - 0.5m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 2.7Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	7 %
Retained on 20mm Sieve:	18 %

Moisture Content (%)	Dry Density Mg/m^3
4.1	1.96
5.9	2.05
8.0	2.10
10.3	2.08
12.1	2.01
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
8.5	**2.10**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 18 January 2019
Test Report Ref: TR 640279

Order No: BACS-Former Llanwern Steelworks

LABORATORY TEST REPORT

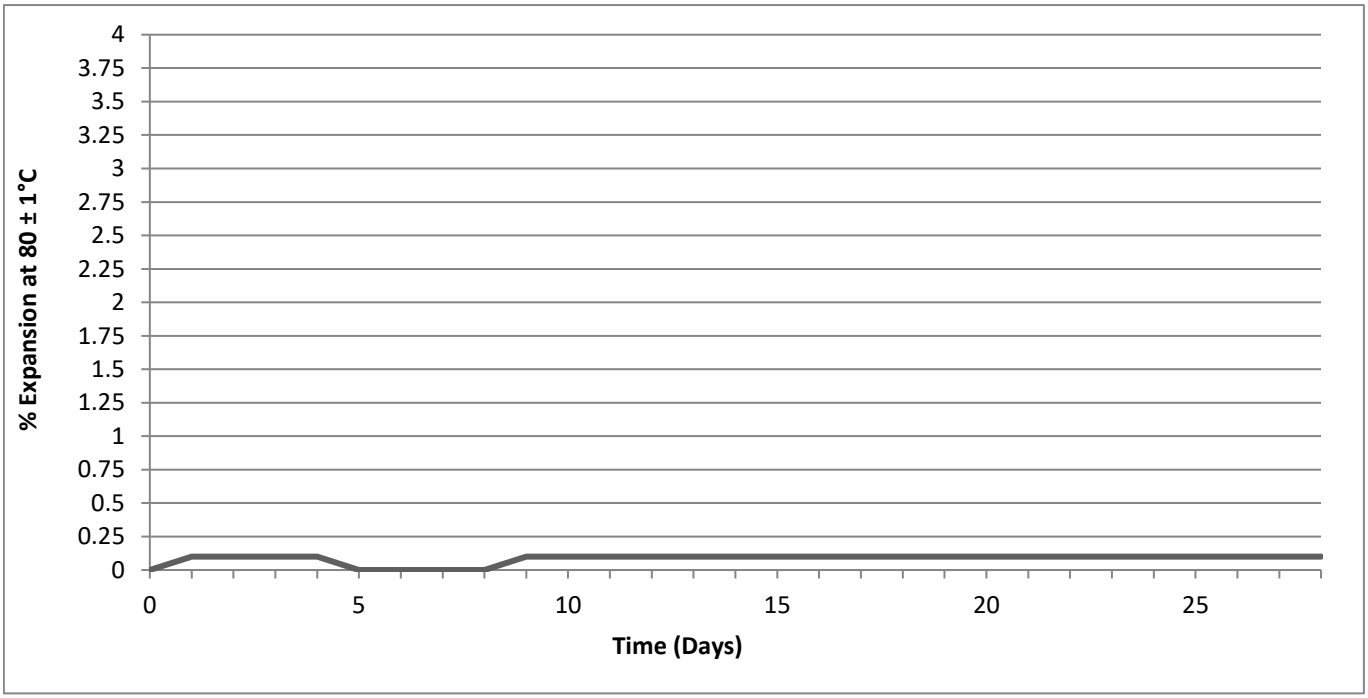
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G D3 0.5m**
Date and Time of Sampling:	**01/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**17/12/2018**
Sampling Location:	**Former Llanwern Steelworks**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = 0.1



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

celtest
INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 07 January 2019
Test Report Ref: TR 639942

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

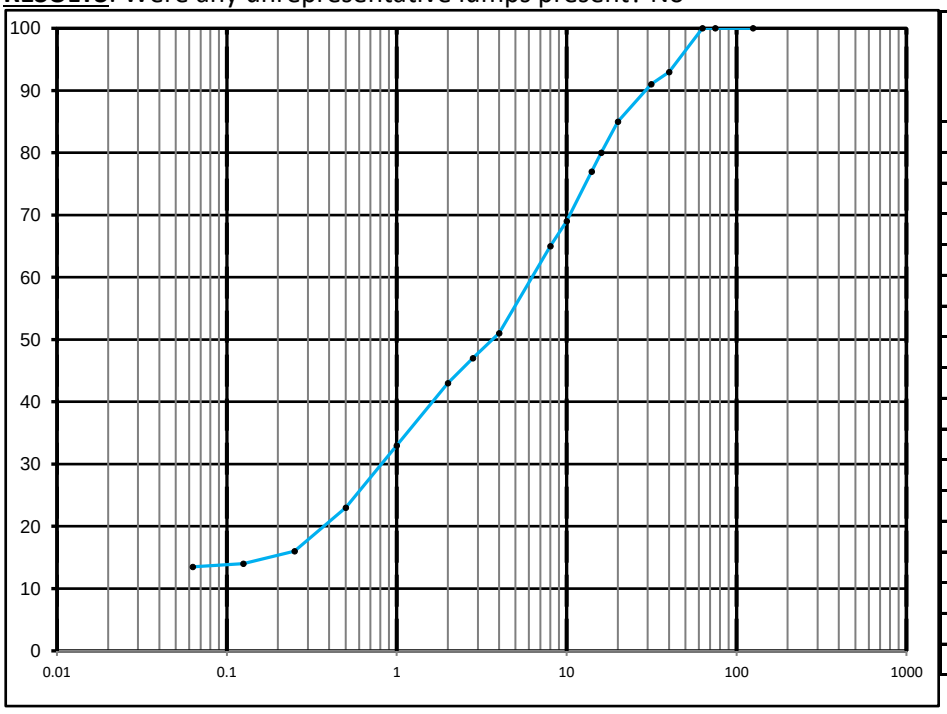
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G D4 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G D4 - 0.5m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	100	
40.0 mm	93	
31.5 mm	91	
20.0 mm	85	
16.0 mm	80	
14.0 mm	77	
10.0 mm	69	
8.0 mm	65	
4.0 mm	51	
2.8 mm	47	
2.0 mm	43	
1.0 mm	33	
0.500 mm	23	
0.250 mm	16	
0.125 mm	14	
0.063 mm	13.5	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640051

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G D4 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G D4 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) = 17.3

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 14 January 2019
Test Report Ref: TR 640165

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G D4 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**11/01/2019**
Sampling Location:	**4G D4 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.31 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.40 Mg/m³**
Apparent Particle density =	**2.54 Mg/m³**
Water absorption (of dry mass) =	**3.8%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 06 February 2019
Test Report Ref: TR 640403

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

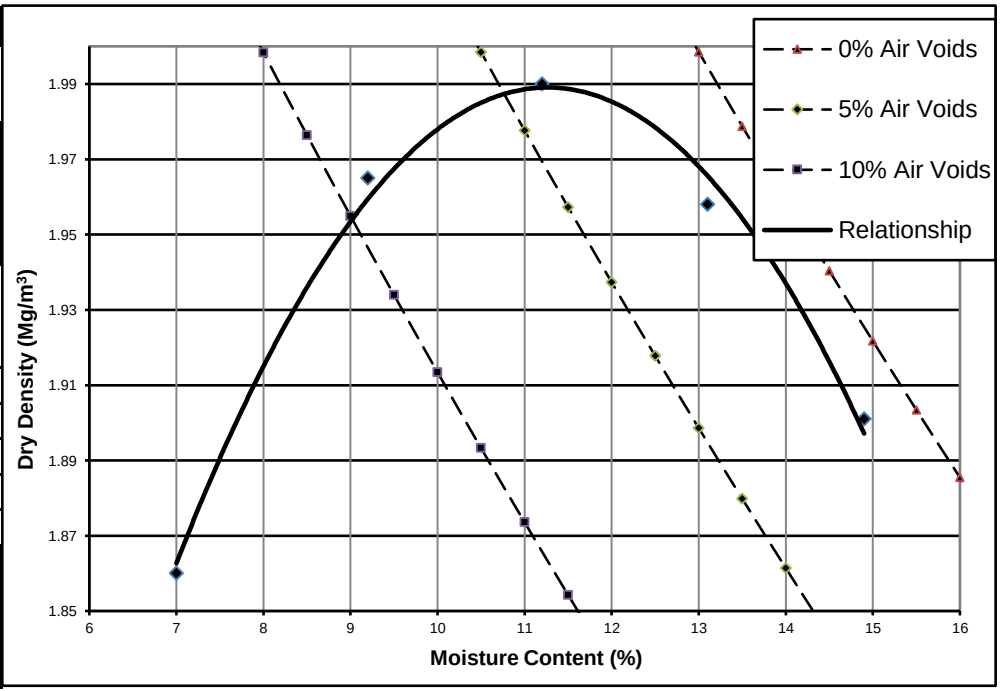
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G D4 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**25/01/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G D4 - 0.5m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 2.7Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	7 %
Retained on 20mm Sieve:	18 %

Moisture Content (%)	Dry Density Mg/m^3
7.0	1.86
9.2	1.97
11.2	1.99
13.1	1.96
14.9	1.90
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
11.0	**1.99**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 18 January 2019
Test Report Ref: TR 640278

Order No: BACS-Former Llanwern Steelworks

LABORATORY TEST REPORT

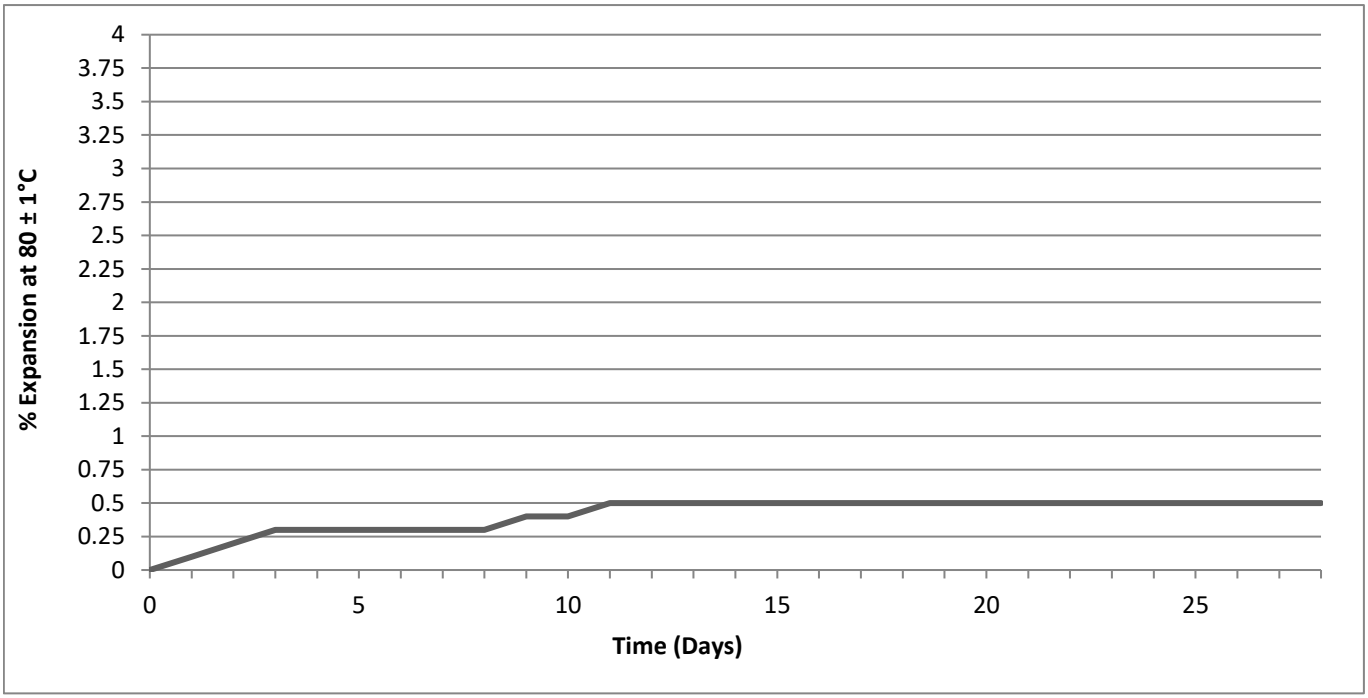
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G D4 0.5m**
Date and Time of Sampling:	**01/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**17/12/2018**
Sampling Location:	**Former Llanwern Steelworks**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = 0.5



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 04 January 2019
Test Report Ref: TR 639941

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

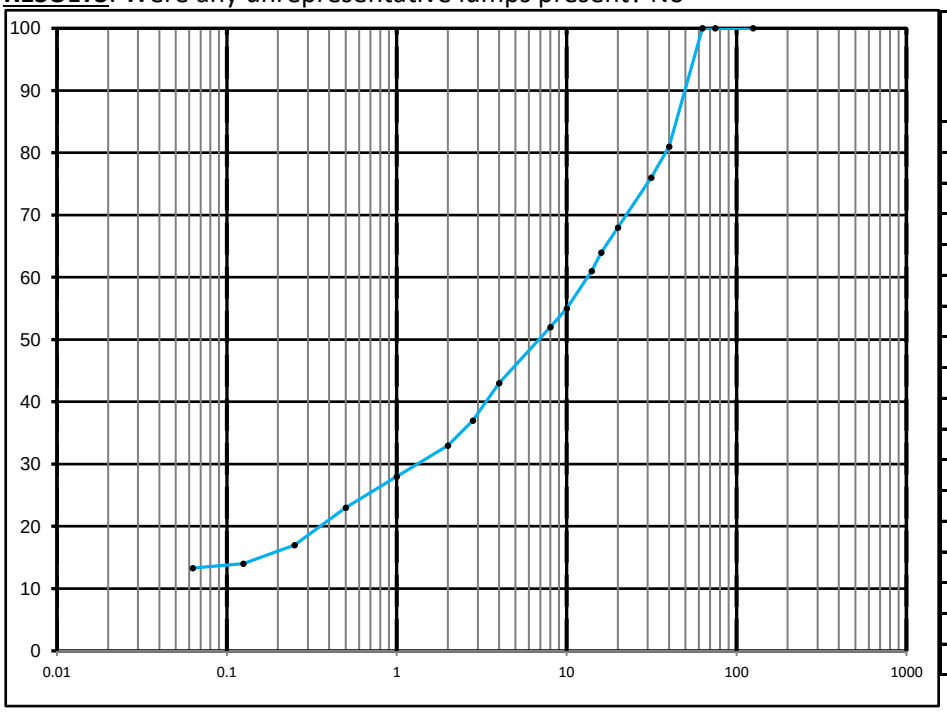
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G D5 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G D5 - 0.5m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	100	
40.0 mm	81	
31.5 mm	76	
20.0 mm	68	
16.0 mm	64	
14.0 mm	61	
10.0 mm	55	
8.0 mm	52	
4.0 mm	43	
2.8 mm	37	
2.0 mm	33	
1.0 mm	28	
0.500 mm	23	
0.250 mm	17	
0.125 mm	14	
0.063 mm	13.3	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640050

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G D5 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G D5 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) = 14.8

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 14 January 2019
Test Report Ref: TR 640164

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G D5 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**11/01/2019**
Sampling Location:	**4G D5 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.38 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.45 Mg/m³**
Apparent Particle density =	**2.56 Mg/m³**
Water absorption (of dry mass) =	**3.0%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 06 February 2019
Test Report Ref: TR 640402

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

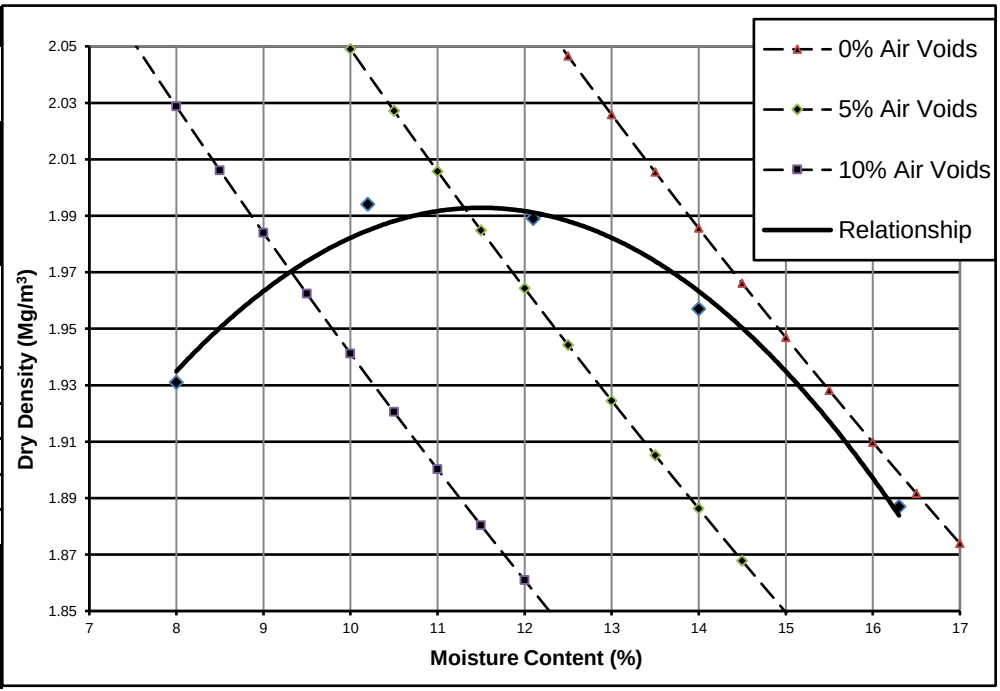
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G D5 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**28/01/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G D5 - 0.5m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 2.75Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	14 %
Retained on 20mm Sieve:	25 %

Moisture Content (%)	Dry Density Mg/m^3
8.0	1.93
10.2	1.99
12.1	1.99
14.0	1.96
16.3	1.89
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
10.0	**1.99**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 18 January 2019
Test Report Ref: TR 640277

Order No: BACS-Former Llanwern Steelworks

LABORATORY TEST REPORT

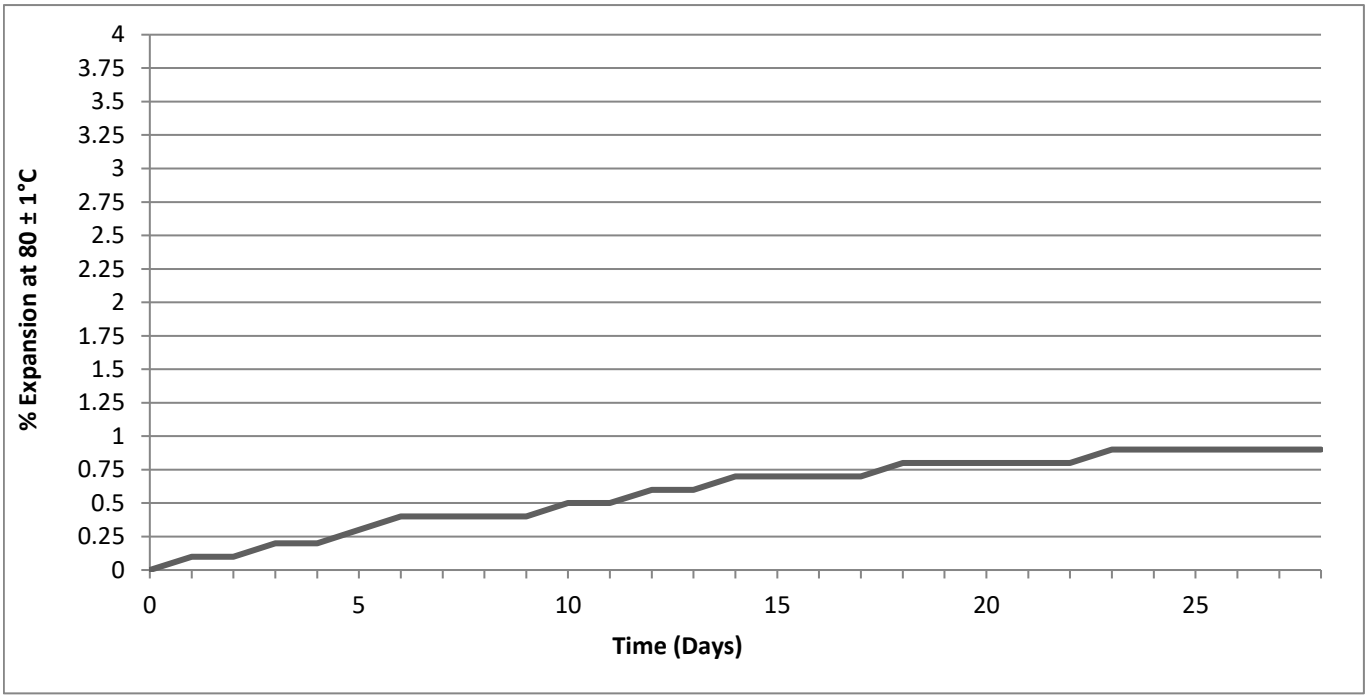
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G D5 0.5m**
Date and Time of Sampling:	**01/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**17/12/2018**
Sampling Location:	**Former Llanwern Steelworks**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = 0.9



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 04 January 2019
Test Report Ref: TR 639937

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

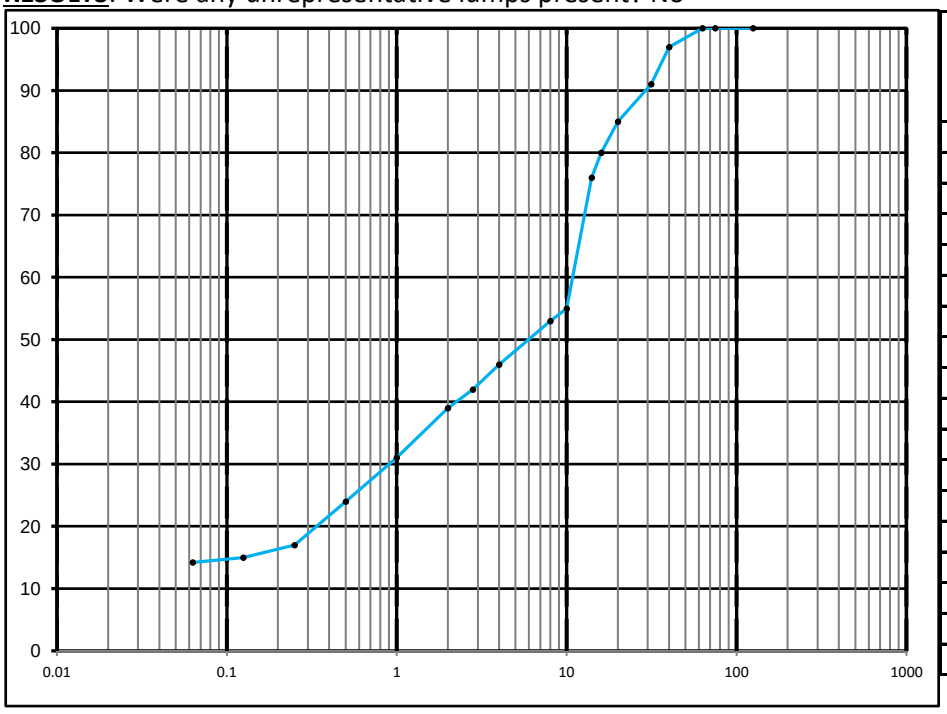
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G D6 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G D6 - 0.5m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	100	
40.0 mm	97	
31.5 mm	91	
20.0 mm	85	
16.0 mm	80	
14.0 mm	76	
10.0 mm	55	
8.0 mm	53	
4.0 mm	46	
2.8 mm	42	
2.0 mm	39	
1.0 mm	31	
0.500 mm	24	
0.250 mm	17	
0.125 mm	15	
0.063 mm	14.2	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640046

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G D6 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G D6 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) =	**21.5**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 15 January 2019
Test Report Ref: TR 640160

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G D6 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**14/01/2019**
Sampling Location:	**4G D6 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.41 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.55 Mg/m³**
Apparent Particle density =	**2.78 Mg/m³**
Water absorption (of dry mass) =	**5.4%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

celtest
INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 22 January 2019
Test Report Ref: TR 640398

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

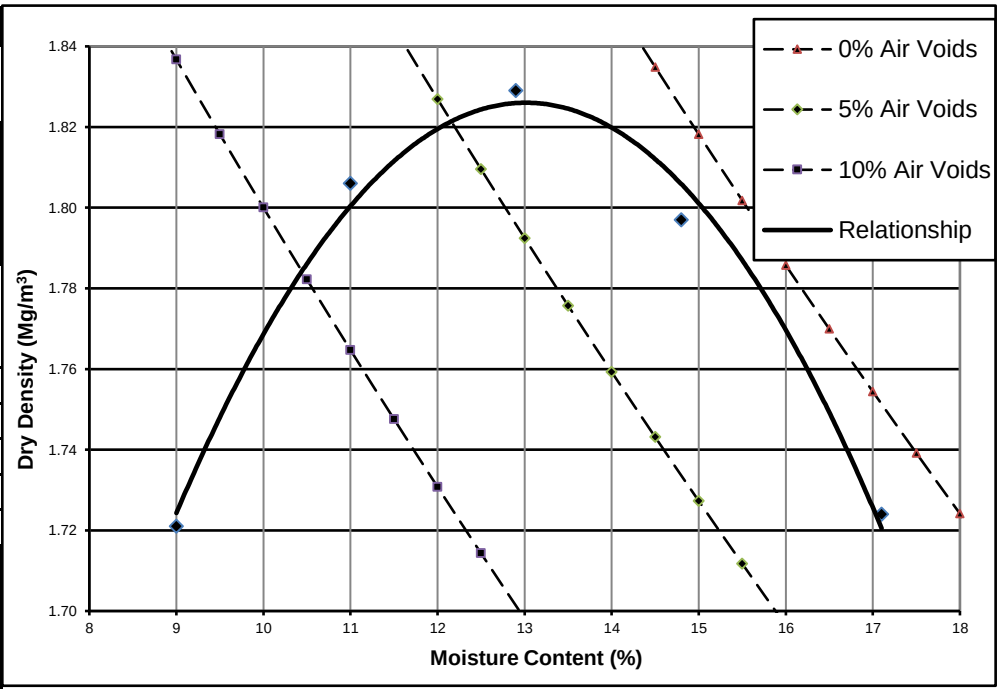
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G D6 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**21/01/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G D6 - 0.5m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 2.5Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	9 %
Retained on 20mm Sieve:	17 %

Moisture Content (%)	Dry Density Mg/m^3
9.0	1.72
11.0	1.81
12.9	1.83
14.8	1.80
17.1	1.72
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
13.0	**1.83**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 18 January 2019
Test Report Ref: TR 640273

Order No: BACS-Former Llanwern Steelworks

LABORATORY TEST REPORT

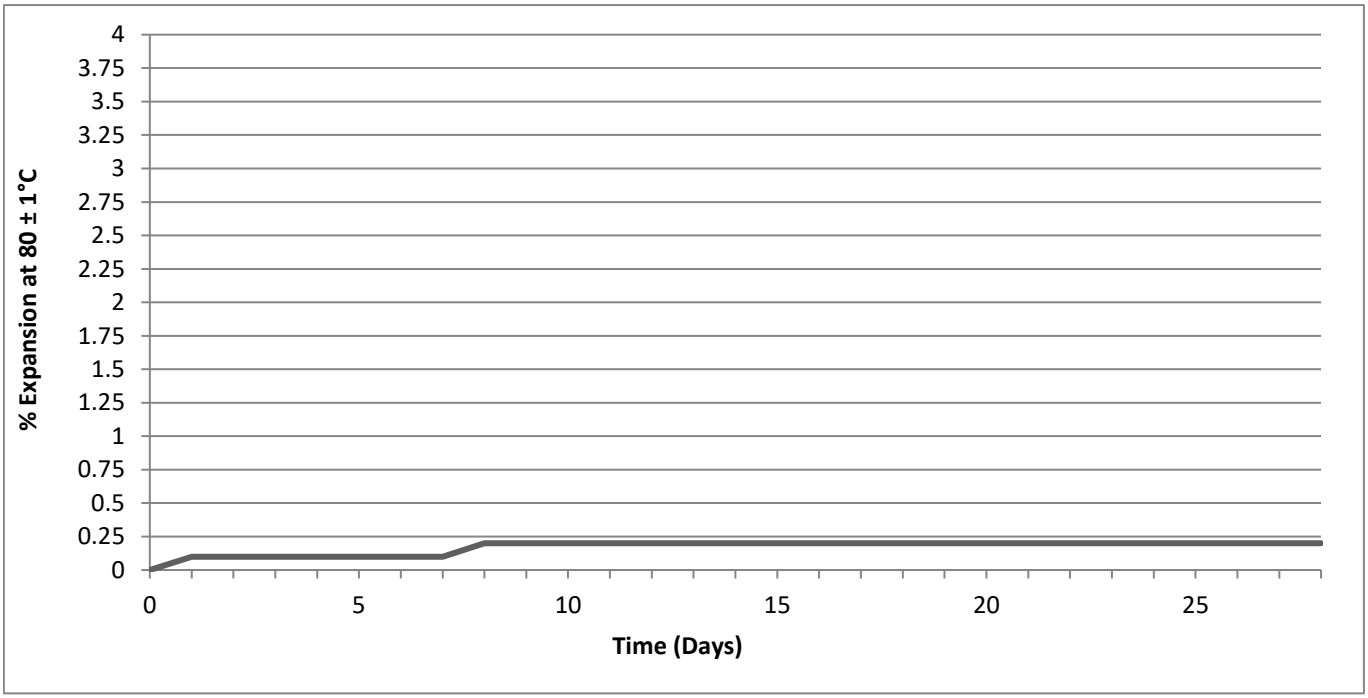
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G D6 0.5m**
Date and Time of Sampling:	**01/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**17/12/2018**
Sampling Location:	**Former Llanwern Steelworks**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = 0.2



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

celtest
INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 04 January 2019
Test Report Ref: TR 639930

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

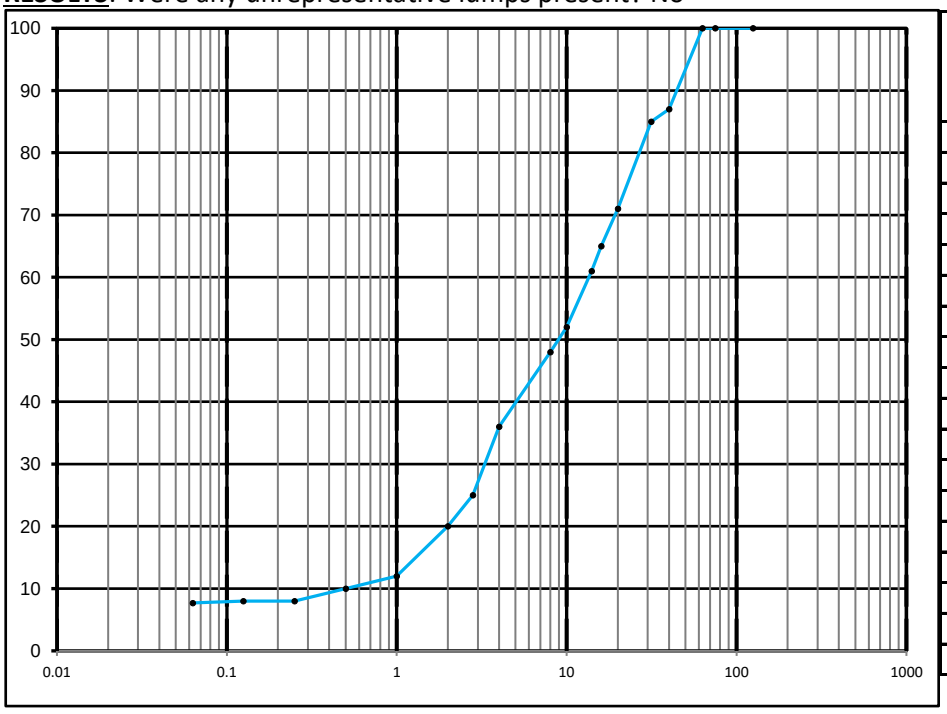
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G E1 - 0.7m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G E1 - 0.7m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	100	
40.0 mm	87	
31.5 mm	85	
20.0 mm	71	
16.0 mm	65	
14.0 mm	61	
10.0 mm	52	
8.0 mm	48	
4.0 mm	36	
2.8 mm	25	
2.0 mm	20	
1.0 mm	12	
0.500 mm	10	
0.250 mm	8	
0.125 mm	8	
0.063 mm	7.7	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640039

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G E1 - 0.7m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G E1 - 0.7m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) =	**14.9**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 15 January 2019
Test Report Ref: TR 640153

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G E1 - 0.7m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**14/01/2019**
Sampling Location:	**4G E1 - 0.7m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.67 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.78 Mg/m³**
Apparent Particle density =	**3.00 Mg/m³**
Water absorption (of dry mass) =	**4.2%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

celtest
INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 13 March 2019
Test Report Ref: TR 640266

Order No: Bacs-Former Llanwern Steelworks

LABORATORY TEST REPORT

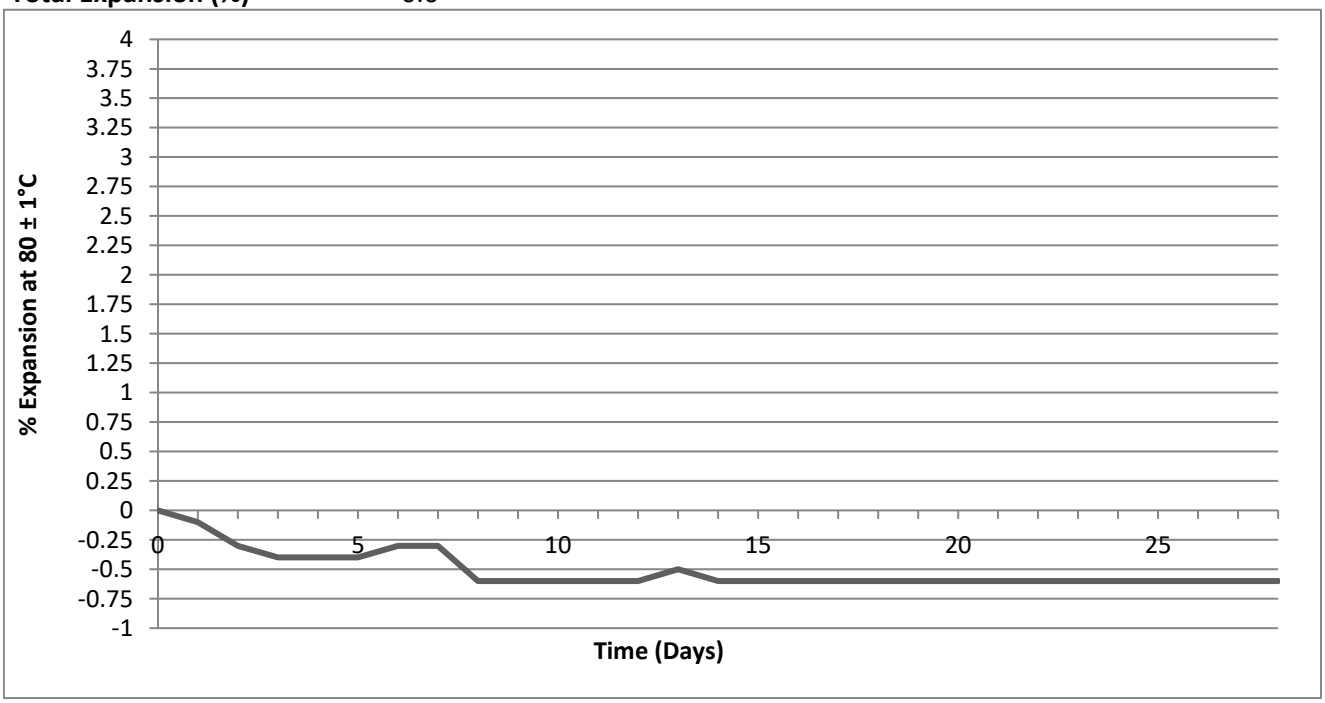
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G E1 - 0.7m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**16/01/2019**
Sampling Location:	**4G E1 - 0.7m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = -0.6



Comments:
Material crushed to pass 20mm

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 06 February 2019
Test Report Ref: TR 640391

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

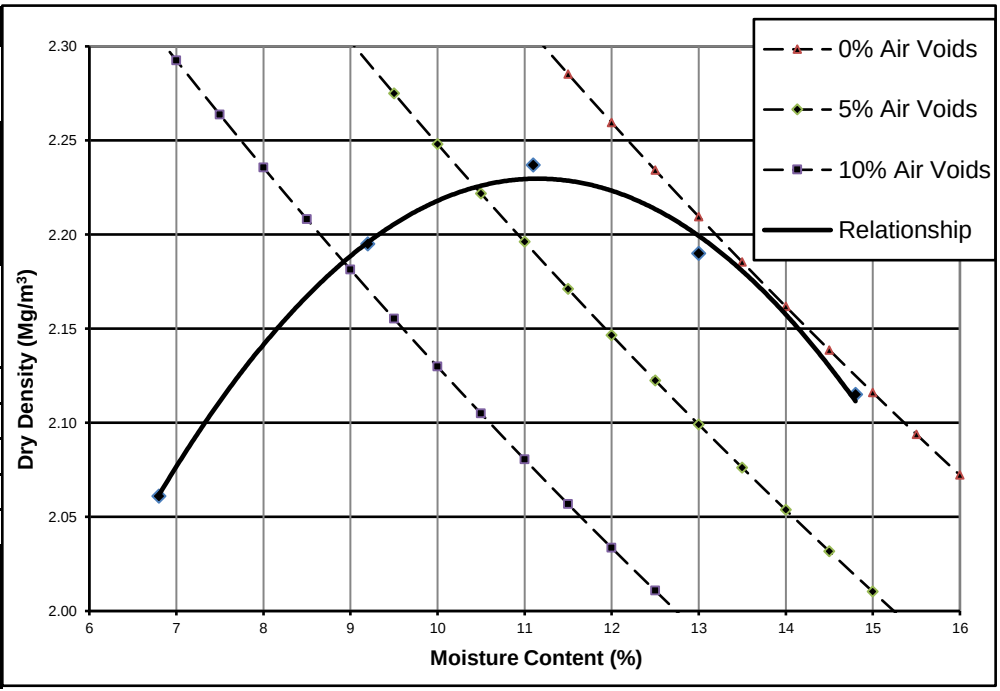
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G E1 - 0.7m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**24/01/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G E1 - 0.7m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 3.1Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	4 %
Retained on 20mm Sieve:	19 %

Moisture Content (%)	Dry Density Mg/m^3
6.8	2.06
9.2	2.20
11.1	2.24
13.0	2.19
14.8	2.12
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
11.0	**2.24**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 04 January 2019
Test Report Ref: TR 639933

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

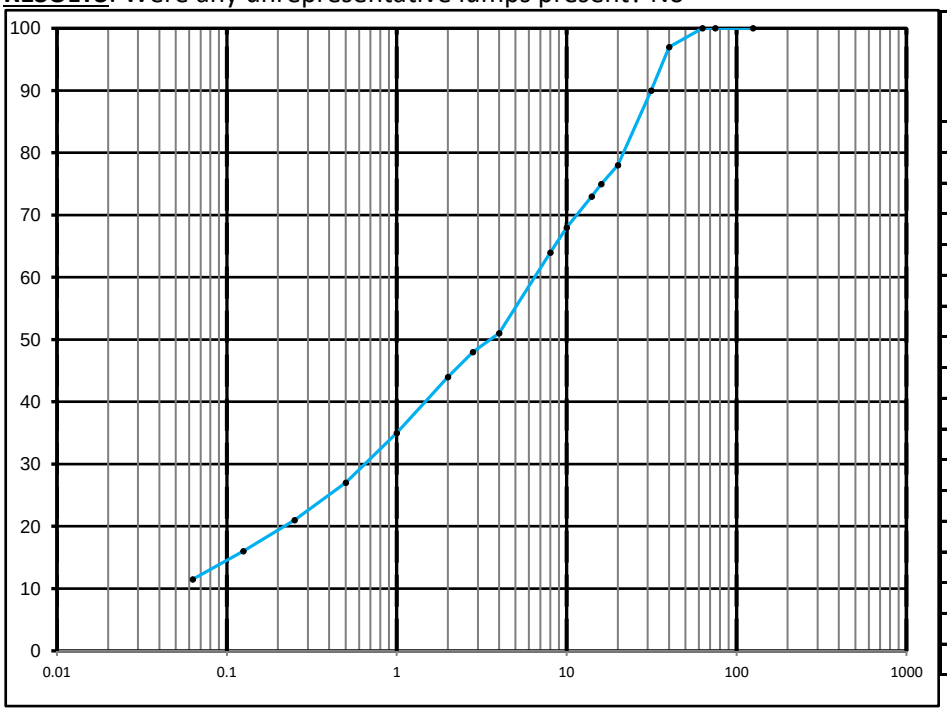
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G E2 - 0.8m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G E2 - 0.8m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	100	
40.0 mm	97	
31.5 mm	90	
20.0 mm	78	
16.0 mm	75	
14.0 mm	73	
10.0 mm	68	
8.0 mm	64	
4.0 mm	51	
2.8 mm	48	
2.0 mm	44	
1.0 mm	35	
0.500 mm	27	
0.250 mm	21	
0.125 mm	16	
0.063 mm	11.5	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640042

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G E2 - 0.8m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G E2 - 0.8m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) = 13.2

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 15 January 2019
Test Report Ref: TR 640156

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G E2 - 0.8m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**14/01/2019**
Sampling Location:	**4G E2 - 0.8m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.40 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.48 Mg/m³**
Apparent Particle density =	**2.61 Mg/m³**
Water absorption (of dry mass) =	**3.2%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

celtest
INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 25 February 2019
Test Report Ref: TR 640269

Order No: Bacs-Former Llanwern Steelworks

LABORATORY TEST REPORT

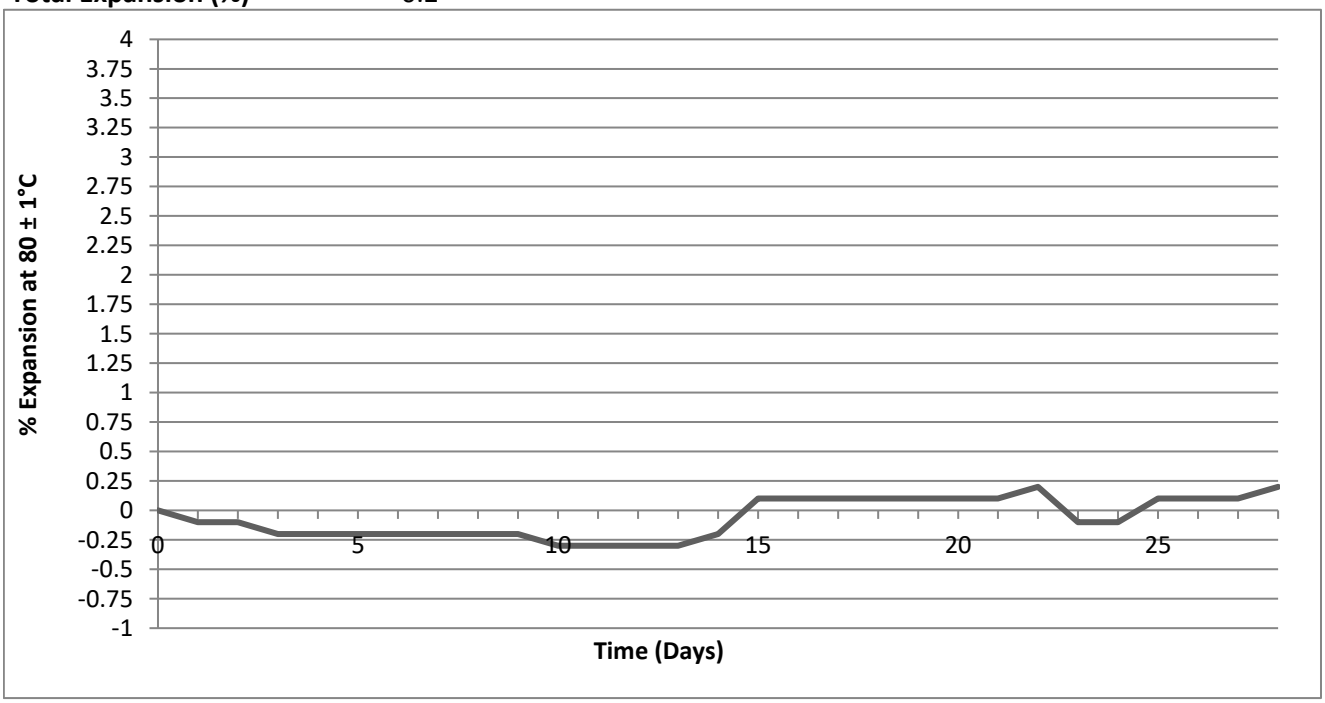
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G E2 - 0.8m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**28/01/2019**
Sampling Location:	**4G E2 - 0.8m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = 0.2



Comments:
Material crushed to pass 20mm

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

celtest
INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 18 February 2019
Test Report Ref: TR 640394

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

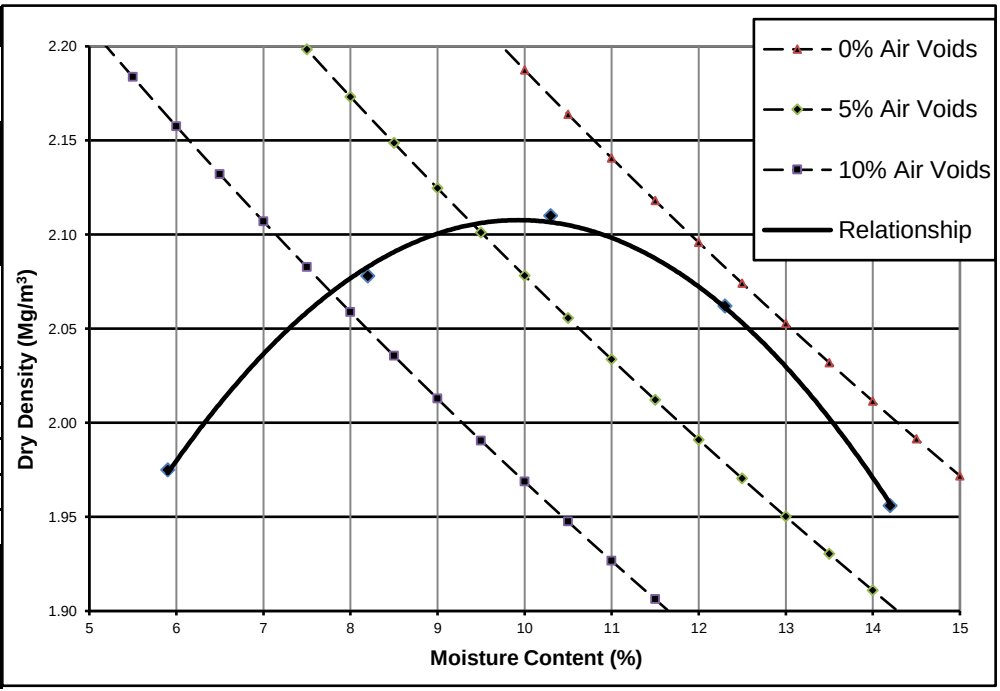
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G E2 - 0.8m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**05/02/2019**	Sample Preparation Procedure:	**Szone X**
Sampling Location:	**4G E2 - 0.8m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 2.8Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	18 %
Retained on 20mm Sieve:	44 %

Moisture Content (%)	Dry Density Mg/m^3
5.9	1.98
8.2	2.08
10.3	2.11
12.3	2.06
14.2	1.96
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
10.0	**2.11**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 04 January 2019
Test Report Ref: TR 639935

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

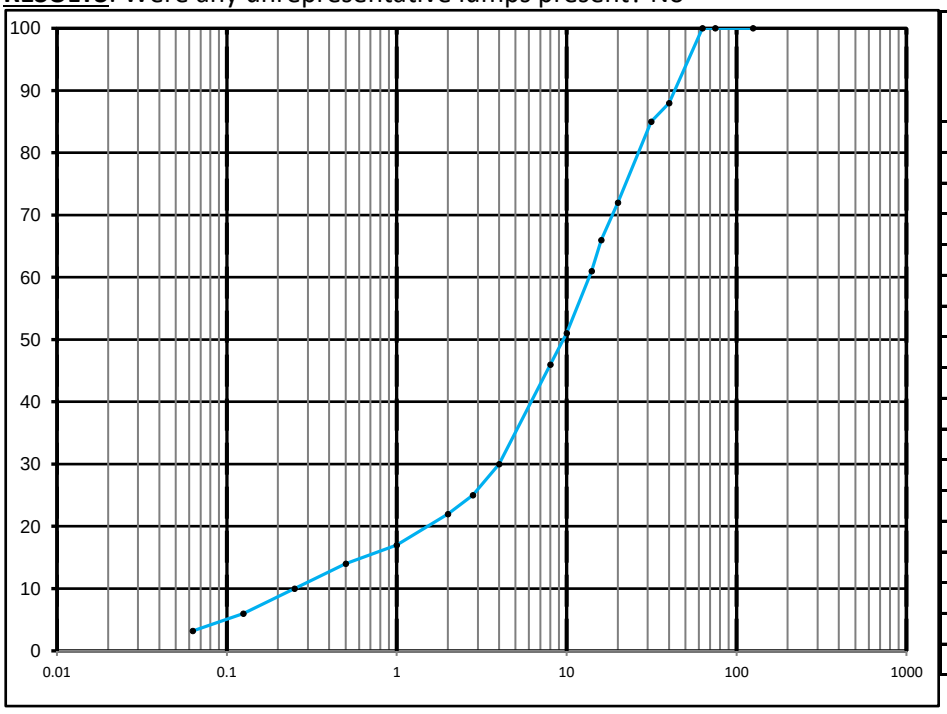
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G E3 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G E3 - 0.5m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	100	
40.0 mm	88	
31.5 mm	85	
20.0 mm	72	
16.0 mm	66	
14.0 mm	61	
10.0 mm	51	
8.0 mm	46	
4.0 mm	30	
2.8 mm	25	
2.0 mm	22	
1.0 mm	17	
0.500 mm	14	
0.250 mm	10	
0.125 mm	6	
0.063 mm	3.2	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640044

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G E3 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G E3 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) =	**13.5**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 15 January 2019
Test Report Ref: TR 640158

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G E3 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**14/01/2019**
Sampling Location:	**4G E3 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.89 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.89 Mg/m³**
Apparent Particle density =	**3.10 Mg/m³**
Water absorption (of dry mass) =	**3.6%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 18 February 2019
Test Report Ref: TR 640396

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

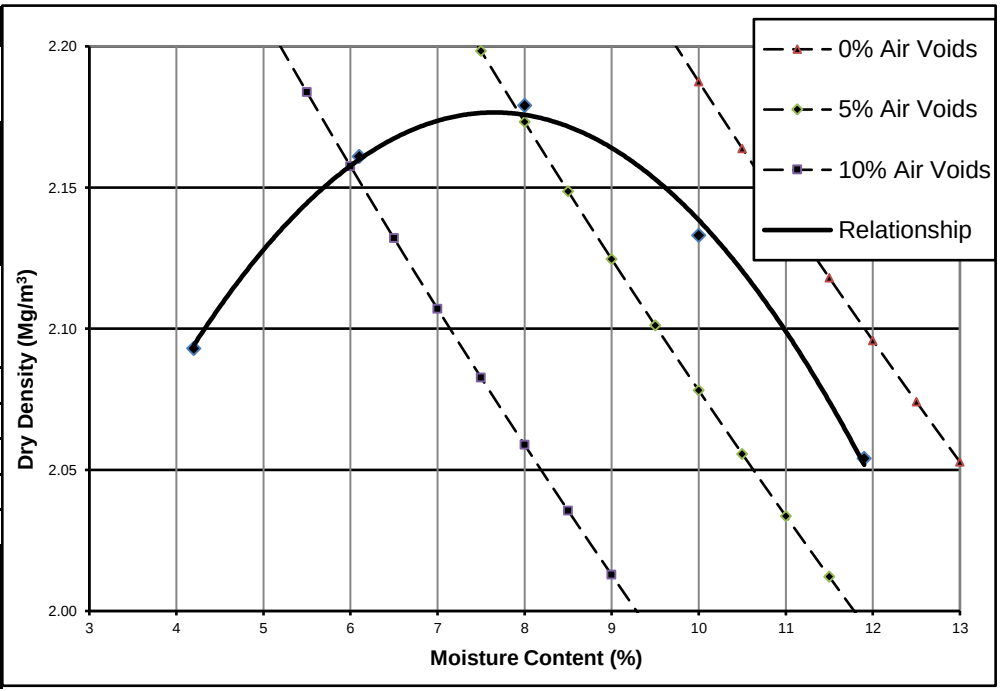
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G E3 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**13/02/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G E3 - 0.5m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 2.8Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	8 %
Retained on 20mm Sieve:	22 %

Moisture Content (%)	Dry Density Mg/m^3
4.2	2.09
6.1	2.16
8.0	2.18
10.0	2.13
11.9	2.05
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
7.7	**2.18**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

celtest
INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 18 January 2019
Test Report Ref: TR 640271

Order No: BACS-Former Llanwern Steelworks

LABORATORY TEST REPORT

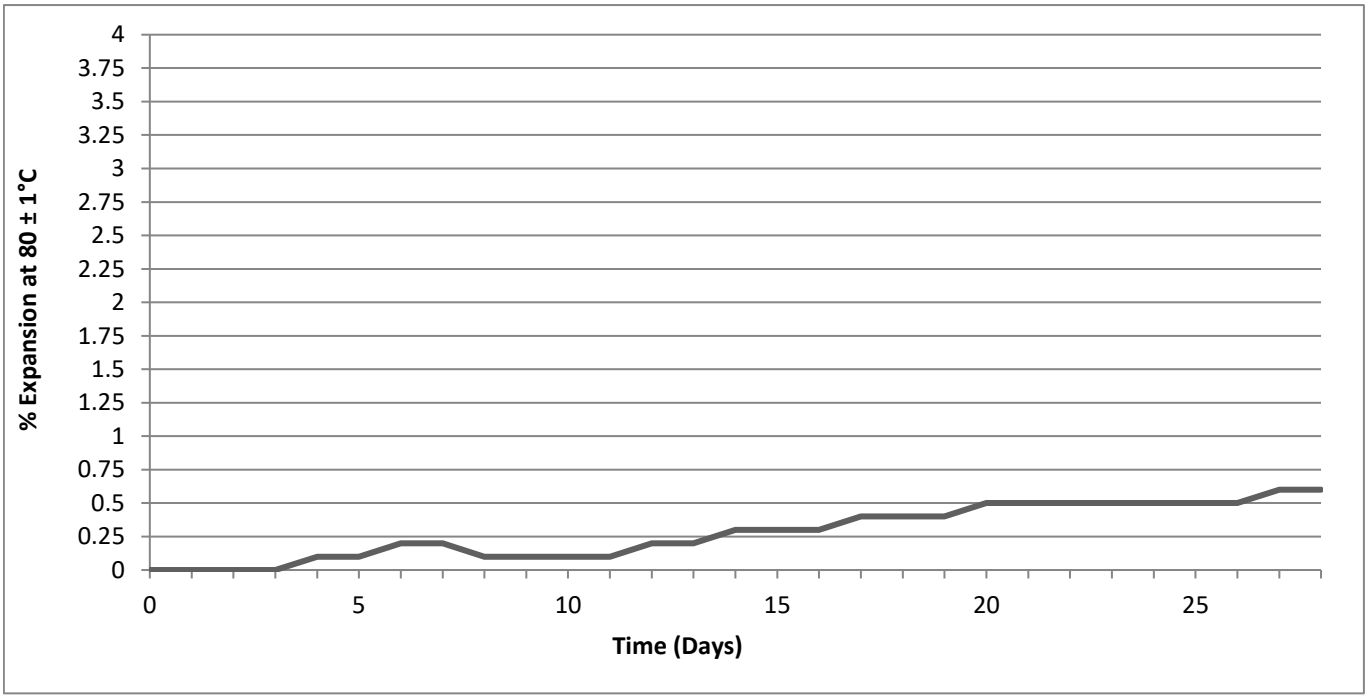
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G E3 0.5m**
Date and Time of Sampling:	**01/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**14/12/2018**
Sampling Location:	**Former Llanwern Steelworks**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = 0.6



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 16 January 2019
Test Report Ref: TR 639940

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

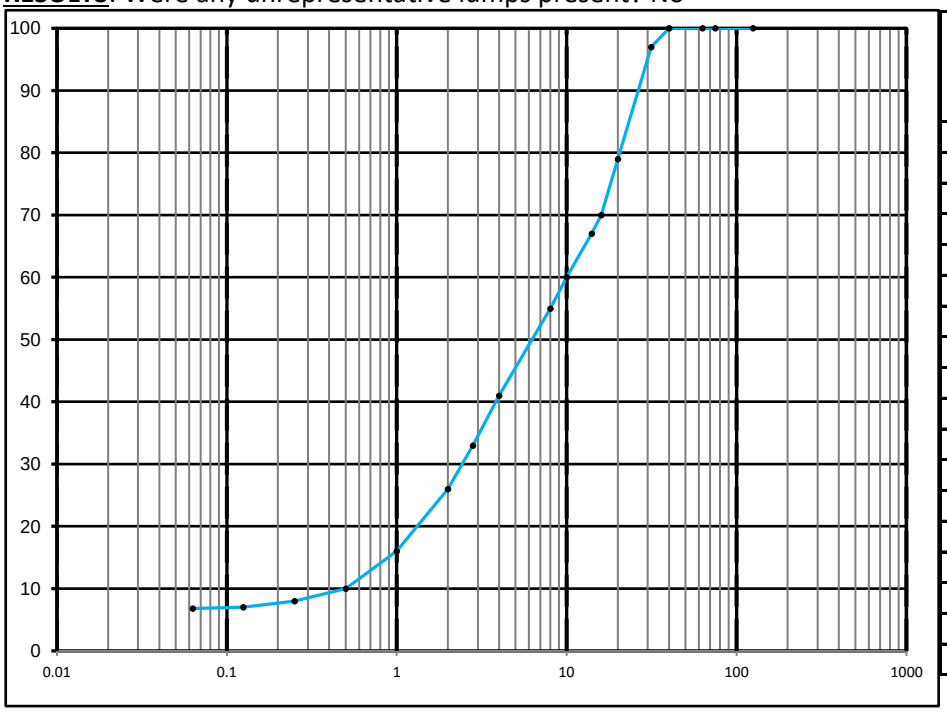
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G E5 - 0.4m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**08/01/2019**		
Sampling Location:	**4G E5 - 0.4m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	100	
40.0 mm	100	
31.5 mm	97	
20.0 mm	79	
16.0 mm	70	
14.0 mm	67	
10.0 mm	60	
8.0 mm	55	
4.0 mm	41	
2.8 mm	33	
2.0 mm	26	
1.0 mm	16	
0.500 mm	10	
0.250 mm	8	
0.125 mm	7	
0.063 mm	6.8	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 16 January 2019
Test Report Ref: TR 640049

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G E5 - 0.4m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**08/01/2019**
Sampling Location:	**4G E5 - 0.4m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) =	**7.6**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 18 January 2019
Test Report Ref: TR 640163

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G E5 - 0.4m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**18/01/2019**
Sampling Location:	**4G E5 - 0.4m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.54 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.62 Mg/m³**
Apparent Particle density =	**2.77 Mg/m³**
Water absorption (of dry mass) =	**3.3%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 06 February 2019
Test Report Ref: TR 640401

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

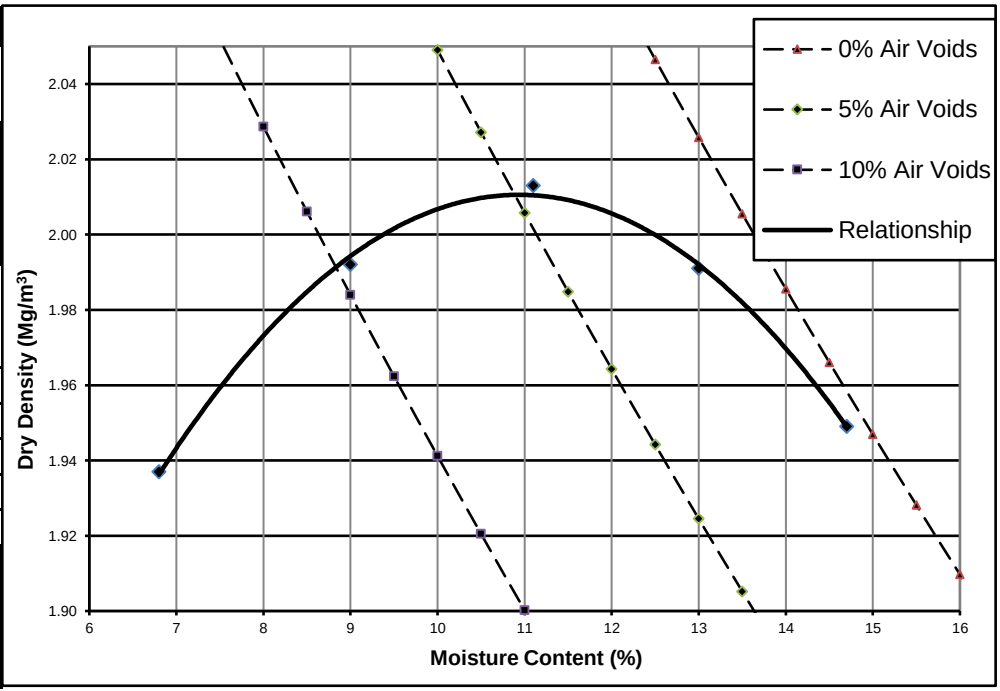
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G E5 - 0.4m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**29/01/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G E5 - 0.4m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 2.75Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	11 %
Retained on 20mm Sieve:	31 %

Moisture Content (%)	Dry Density Mg/m^3
6.8	1.94
9.0	1.99
11.1	2.01
13.0	1.99
14.7	1.95
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
12.0	**1.73**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 18 January 2019
Test Report Ref: TR 640276

Order No: BACS-Former Llanwern Steelworks

LABORATORY TEST REPORT

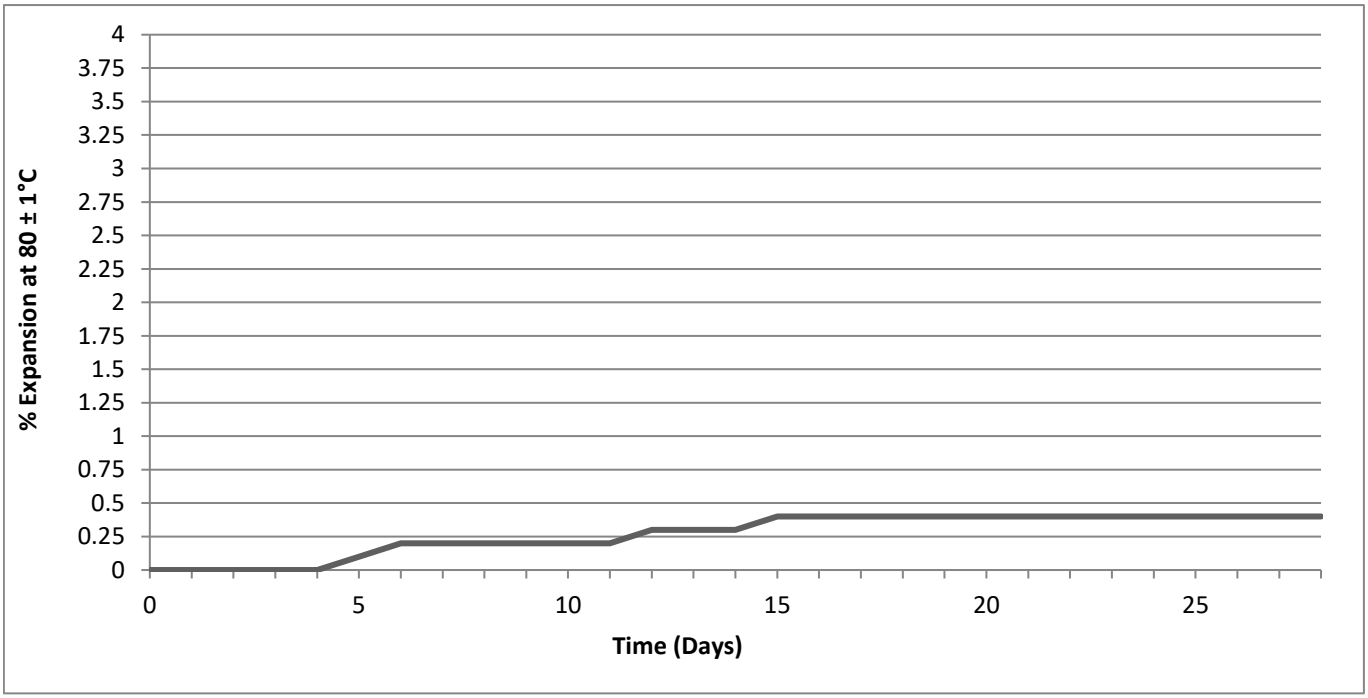
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G E5 0.4m**
Date and Time of Sampling:	**01/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**17/12/2018**
Sampling Location:	**Former Llanwern Steelworks**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) =



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

celtest
INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 04 January 2019
Test Report Ref: TR 639938

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

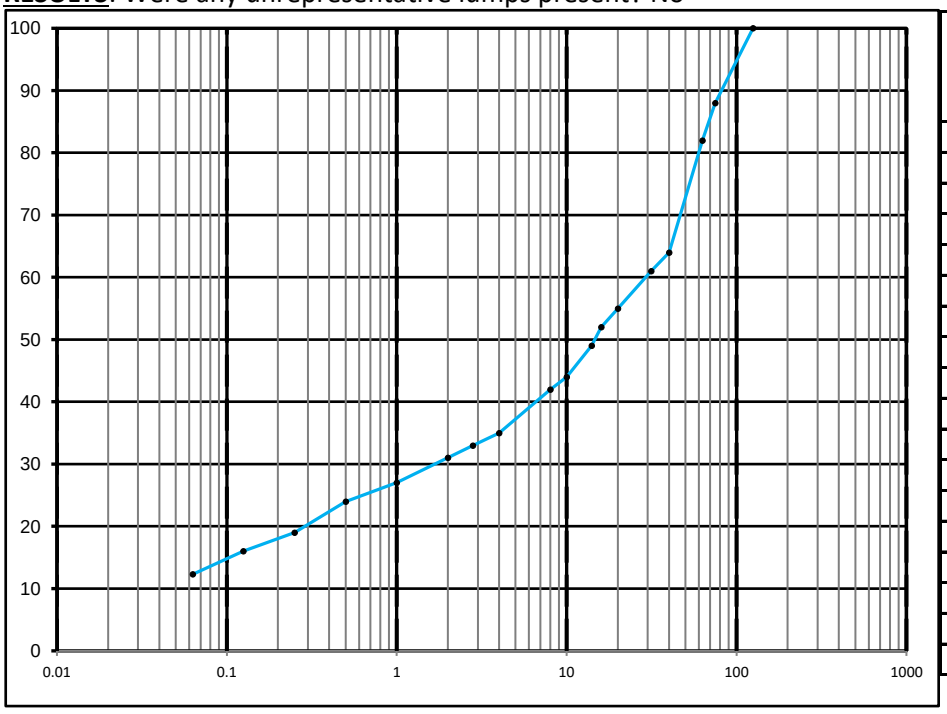
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G E6 - 0.3m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G E6 - 0.3m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	88	
63.0 mm	82	
40.0 mm	64	
31.5 mm	61	
20.0 mm	55	
16.0 mm	52	
14.0 mm	49	
10.0 mm	44	
8.0 mm	42	
4.0 mm	35	
2.8 mm	33	
2.0 mm	31	
1.0 mm	27	
0.500 mm	24	
0.250 mm	19	
0.125 mm	16	
0.063 mm	12.3	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640047

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G E6 - 0.3m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G E6 - 0.3m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) = 14.3

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

celtest
INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 15 January 2019
Test Report Ref: TR 640161

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G E6 - 0.3m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**14/01/2019**
Sampling Location:	**4G E6 - 0.3m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.41 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.49 Mg/m³**
Apparent Particle density =	**2.63 Mg/m³**
Water absorption (of dry mass) =	**3.3%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 24 January 2019
Test Report Ref: TR 640399

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

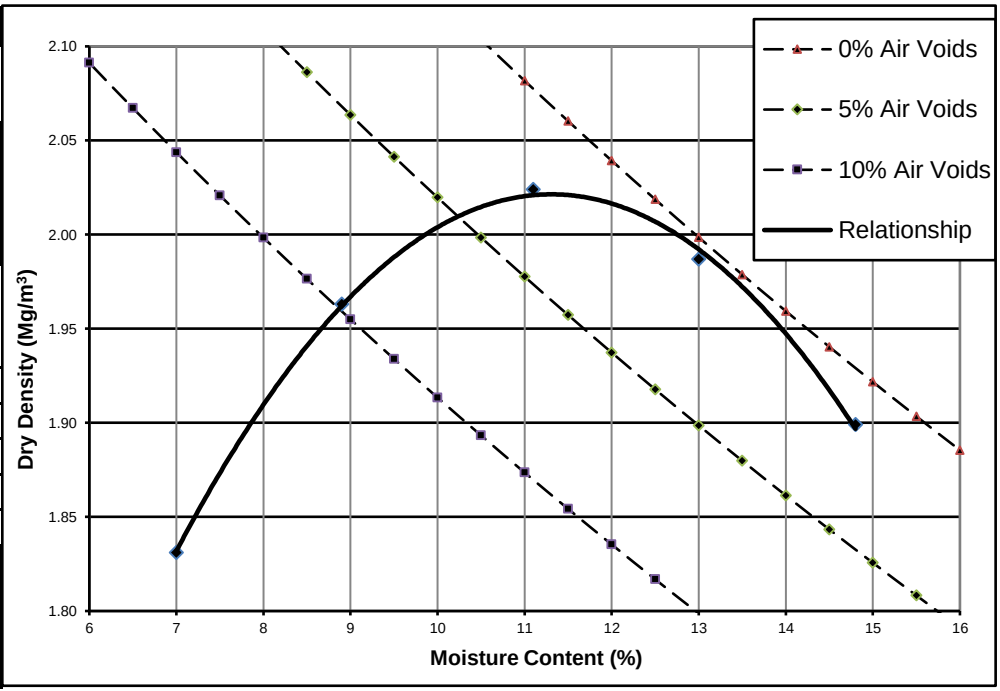
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G E6 - 0.3m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**23/01/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G E6 - 0.3m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 2.7Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	12 %
Retained on 20mm Sieve:	28 %

Moisture Content (%)	Dry Density Mg/m^3
7.0	1.83
8.9	1.96
11.1	2.02
13.0	1.99
14.8	1.90
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
11.0	**1.95**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 18 January 2019
Test Report Ref: TR 640274

Order No: BACS-Former Llanwern Steelworks

LABORATORY TEST REPORT

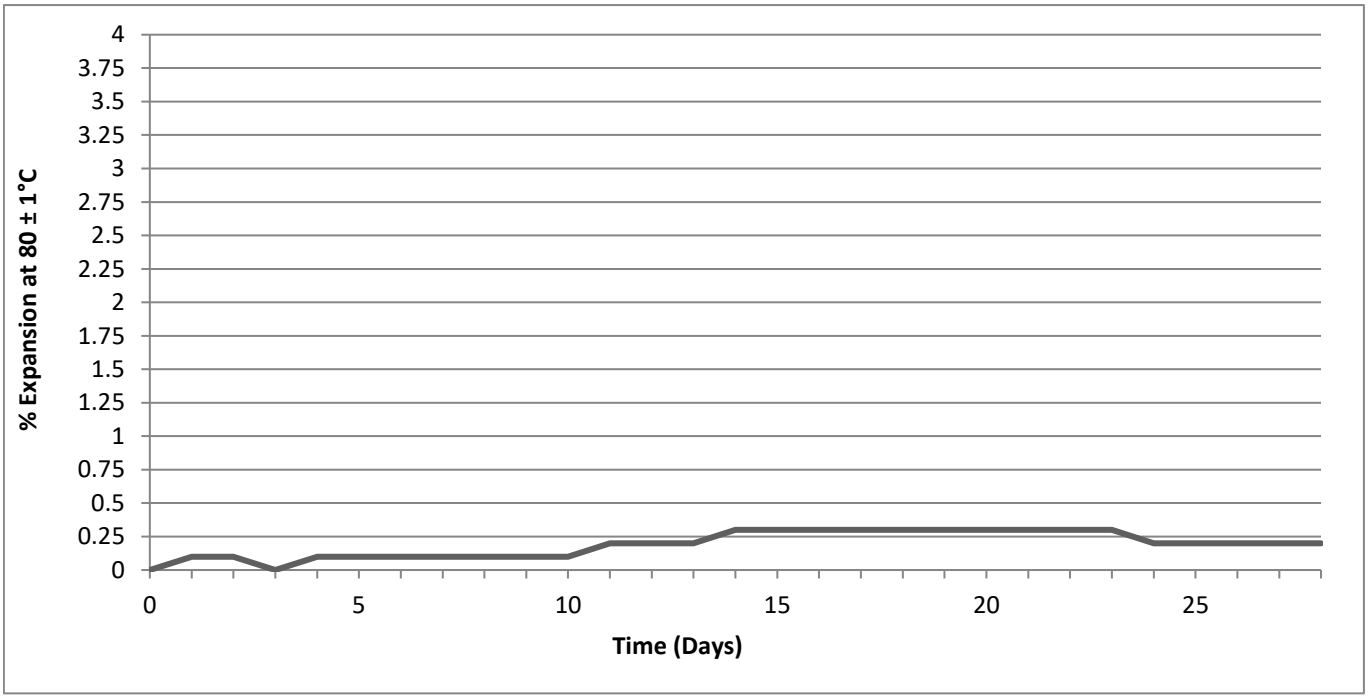
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G E6 0.3m**
Date and Time of Sampling:	**01/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**17/12/2018**
Sampling Location:	**Former Llanwern Steelworks**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = 0.2



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 04 January 2019
Test Report Ref: TR 639931

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

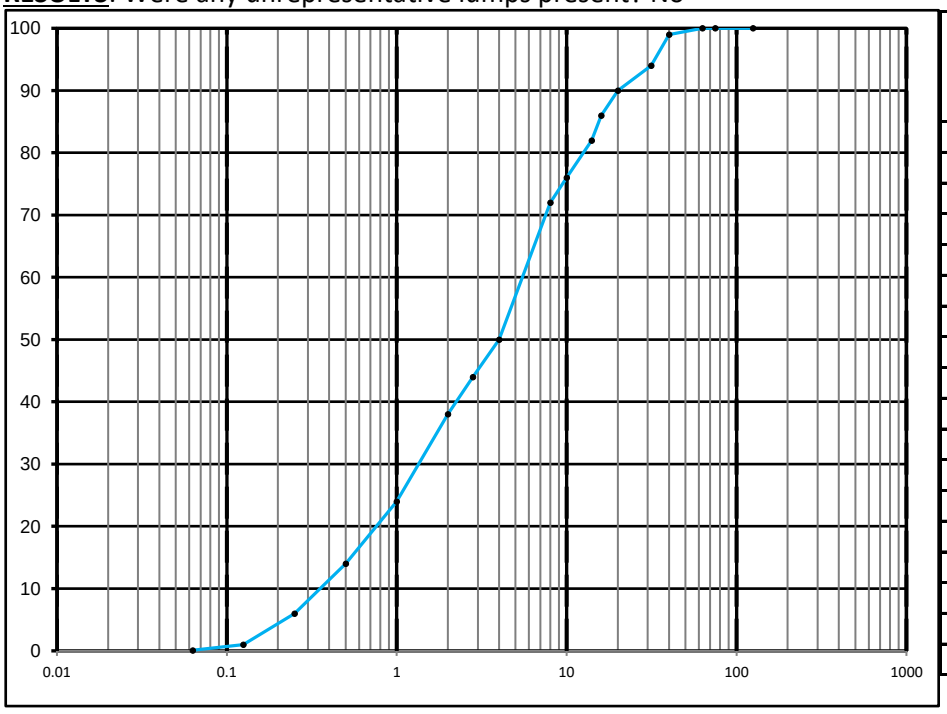
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G F1 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G F1 - 0.5m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	100	
40.0 mm	99	
31.5 mm	94	
20.0 mm	90	
16.0 mm	86	
14.0 mm	82	
10.0 mm	76	
8.0 mm	72	
4.0 mm	50	
2.8 mm	44	
2.0 mm	38	
1.0 mm	24	
0.500 mm	14	
0.250 mm	6	
0.125 mm	1	
0.063 mm	0.1	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640040

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G F1 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G F1 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) =	**16.5**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 15 January 2019
Test Report Ref: TR 640154

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G F1 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**14/01/2019**
Sampling Location:	**4G F1 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**3.29 Mg/m³**
Particle density on a saturated and surface-dried basis =	**3.30 Mg/m³**
Apparent Particle density =	**3.50 Mg/m³**
Water absorption (of dry mass) =	**2.3%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 18 February 2019
Test Report Ref: TR 640392

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

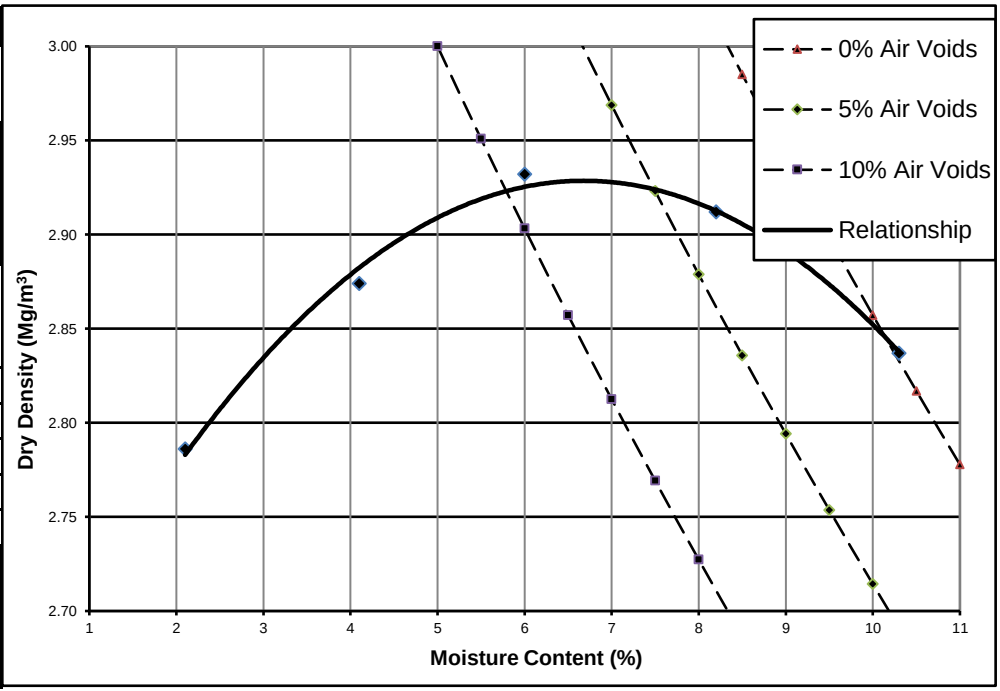
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G F1 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**13/02/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G F1 - 0.5m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 4Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	1 %
Retained on 20mm Sieve:	6 %

Moisture Content (%)	Dry Density Mg/m^3
2.1	2.79
4.1	2.87
6.0	2.93
8.2	2.91
10.3	2.84
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
6.7	**2.93**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 18 January 2019
Test Report Ref: TR 640267

Order No: BACS-Former Llanwern Steelworks

LABORATORY TEST REPORT

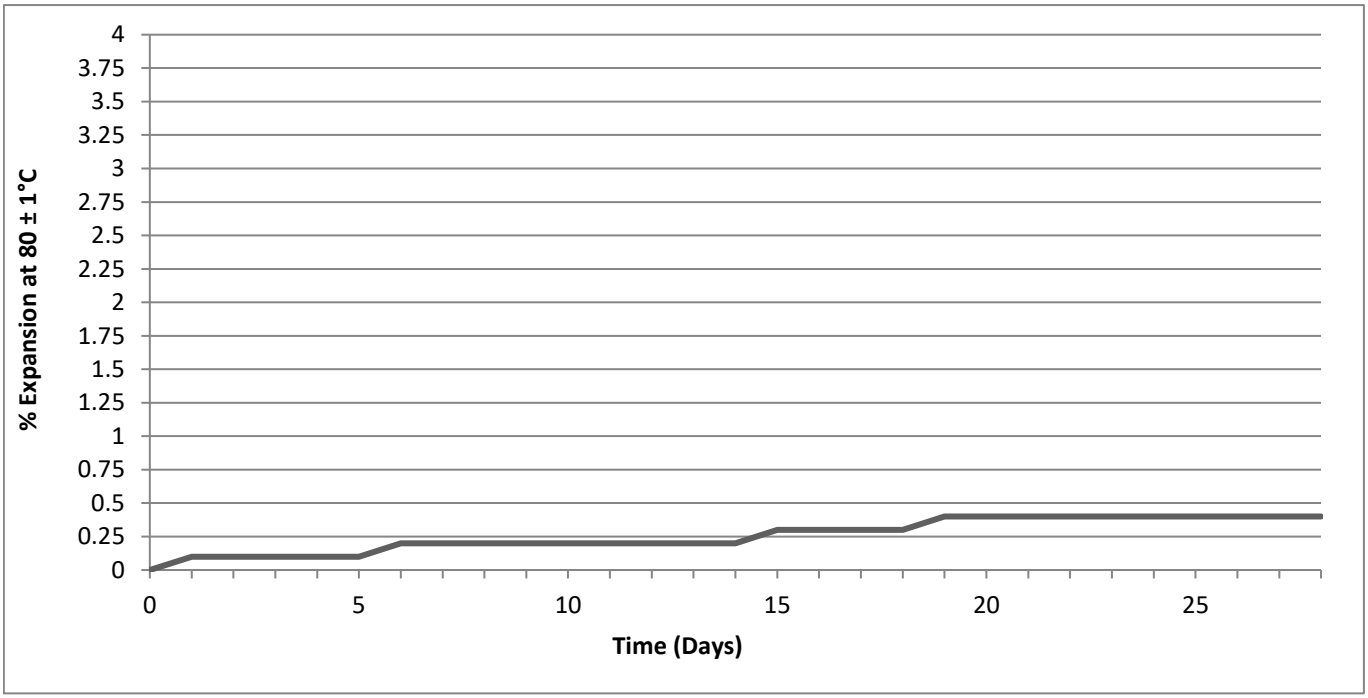
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G F1 0.5m**
Date and Time of Sampling:	**01/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**14/12/2018**
Sampling Location:	**Former Llanwern Steelworks**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = 0.4



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 04 January 2019
Test Report Ref: TR 639932

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

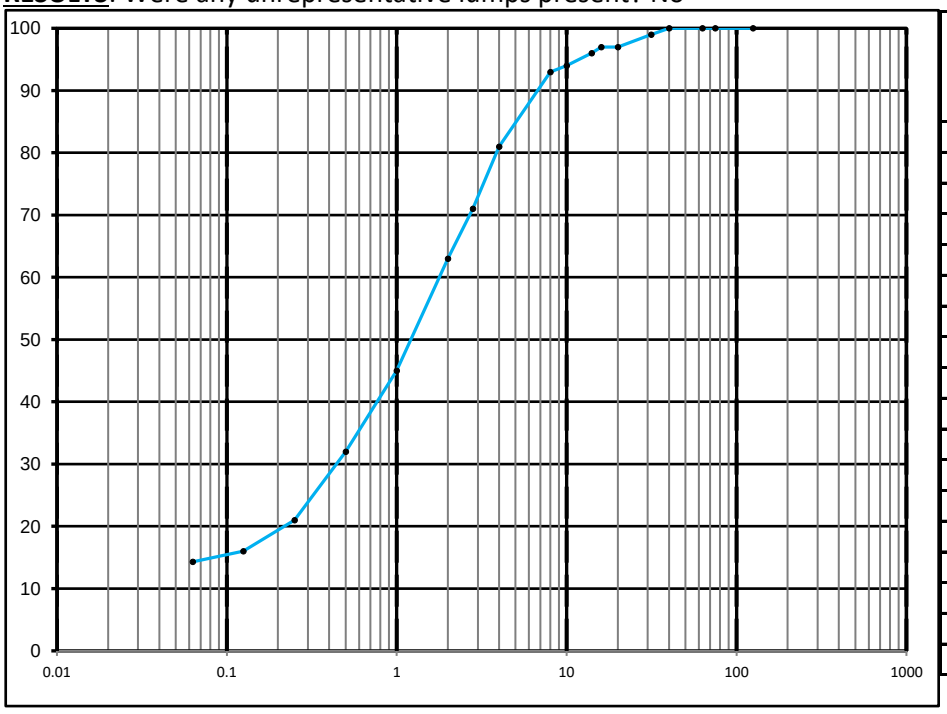
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G F2 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G F2 - 0.5m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	100	
40.0 mm	100	
31.5 mm	99	
20.0 mm	97	
16.0 mm	97	
14.0 mm	96	
10.0 mm	94	
8.0 mm	93	
4.0 mm	81	
2.8 mm	71	
2.0 mm	63	
1.0 mm	45	
0.500 mm	32	
0.250 mm	21	
0.125 mm	16	
0.063 mm	14.3	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640041

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G F2 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G F2 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) =	**8.9**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 15 January 2019
Test Report Ref: TR 640155

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G F2 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**14/01/2019**
Sampling Location:	**4G F2 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.36 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.44 Mg/m³**
Apparent Particle density =	**2.56 Mg/m³**
Water absorption (of dry mass) =	**3.2%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 24 January 2019
Test Report Ref: TR 640393

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

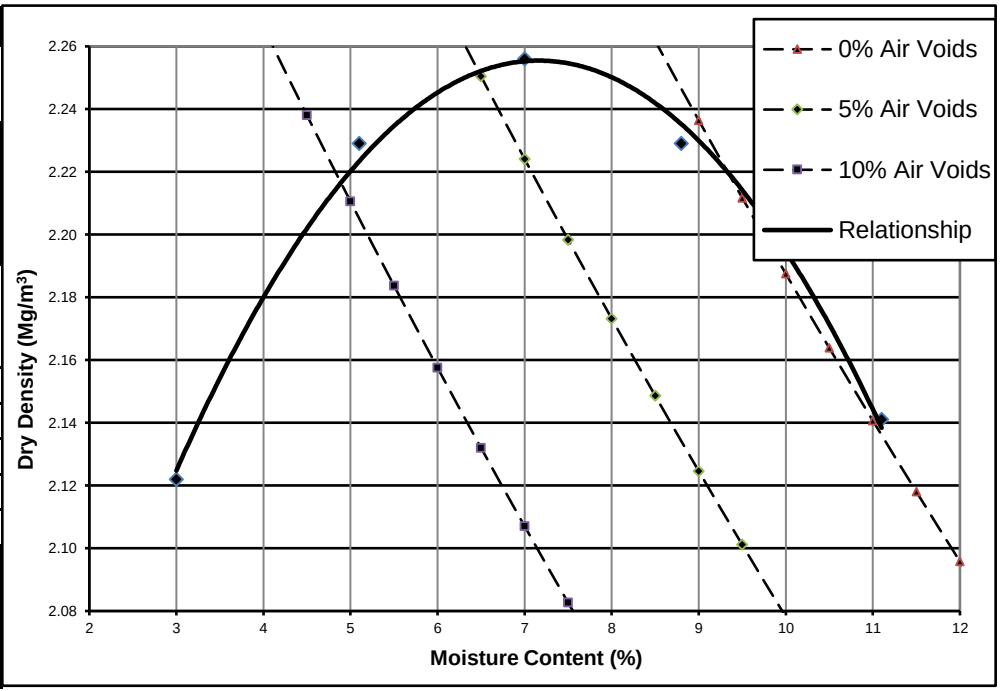
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G F2 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**22/01/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G F2 - 0.5m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 2.8Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	3 %
Retained on 20mm Sieve:	13 %

Moisture Content (%)	Dry Density Mg/m^3
3.0	2.12
5.1	2.23
7.0	2.26
8.8	2.23
11.1	2.14
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
7.0	**2.26**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 18 January 2019
Test Report Ref: TR 640268

Order No: BACS-Former Llanwern Steelworks

LABORATORY TEST REPORT

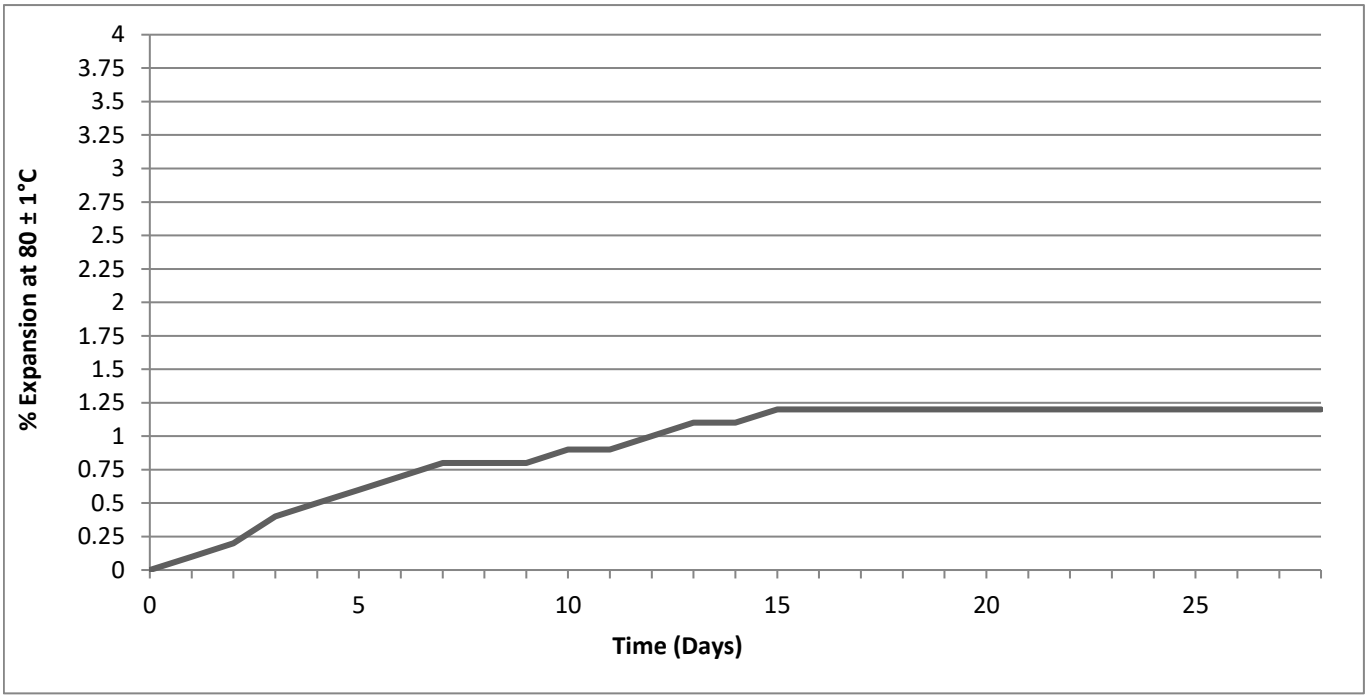
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G F2 0.5m**
Date and Time of Sampling:	**01/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**14/12/2018**
Sampling Location:	**Former Llanwern Steelworks**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = 1.2



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

celtest
INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 16 January 2019
Test Report Ref: TR 639936

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

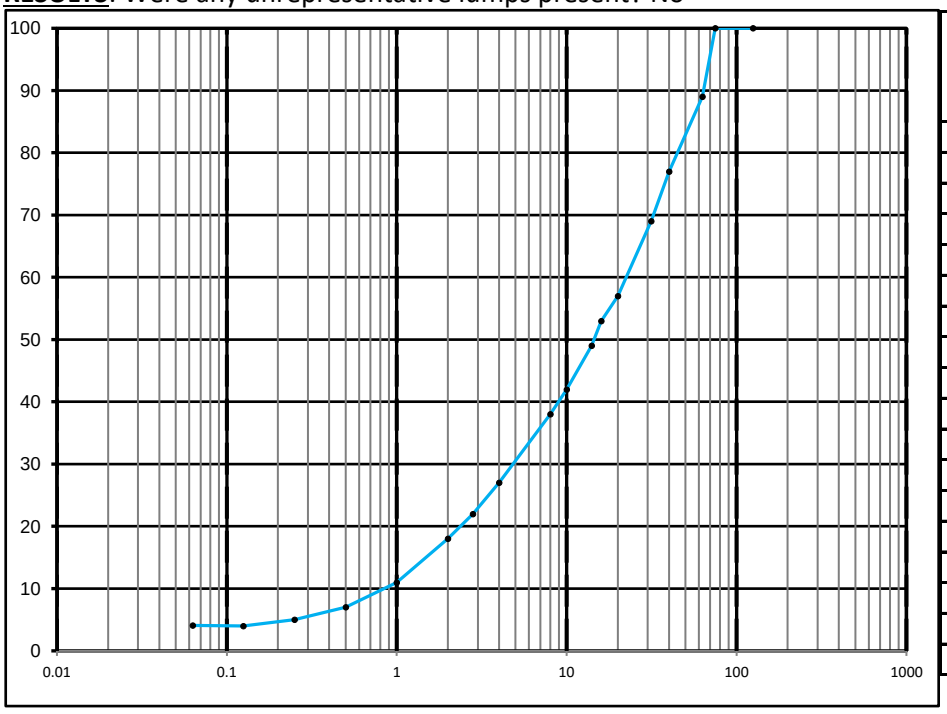
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G F3 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**08/01/2019**		
Sampling Location:	**4G F3 - 0.5m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	89	
40.0 mm	77	
31.5 mm	69	
20.0 mm	57	
16.0 mm	53	
14.0 mm	49	
10.0 mm	42	
8.0 mm	38	
4.0 mm	27	
2.8 mm	22	
2.0 mm	18	
1.0 mm	11	
0.500 mm	7	
0.250 mm	5	
0.125 mm	4	
0.063 mm	4.1	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 16 January 2019
Test Report Ref: TR 640045

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G F3 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**08/01/2019**
Sampling Location:	**4G F3 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) = 11.6

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 18 January 2019
Test Report Ref: TR 640159

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G F3 - 0.5m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**18/01/2019**
Sampling Location:	**4G F3 - 0.5m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.68 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.81 Mg/m³**
Apparent Particle density =	**3.10 Mg/m³**
Water absorption (of dry mass) =	**5.2%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 13 February 2019
Test Report Ref: TR 640397

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

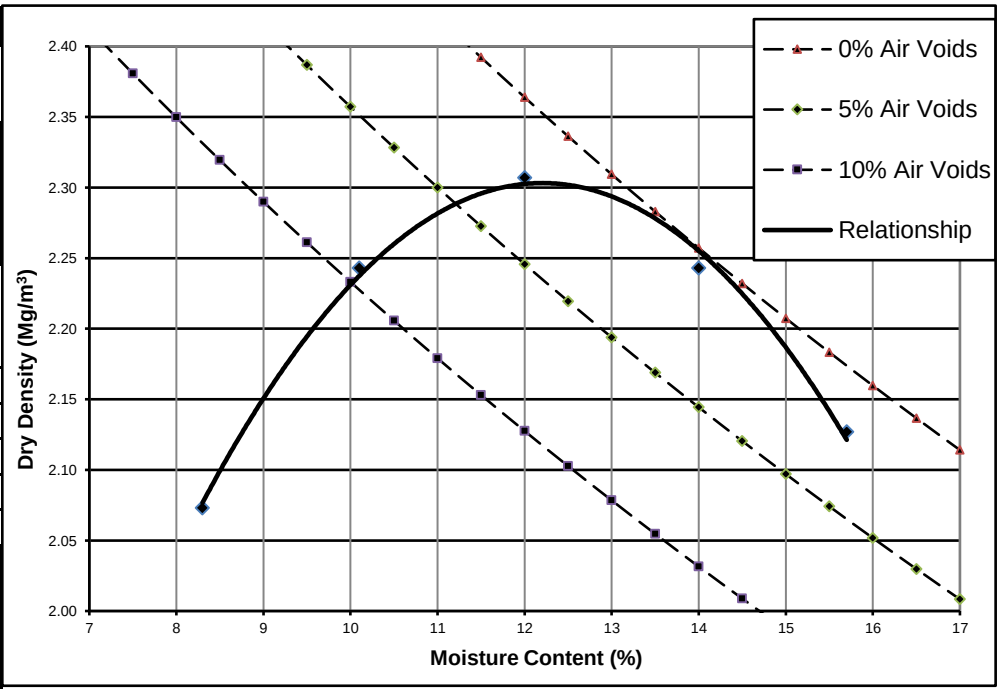
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G F3 - 0.5m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**31/01/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G F3 - 0.5m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 3.3Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	17 %
Retained on 20mm Sieve:	41 %

Moisture Content (%)	Dry Density Mg/m^3
8.3	2.07
10.1	2.24
12.0	2.31
14.0	2.24
15.7	2.13
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
12.0	**2.31**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 18 January 2019
Test Report Ref: TR 640272

Order No: BACS-Former Llanwern Steelworks

LABORATORY TEST REPORT

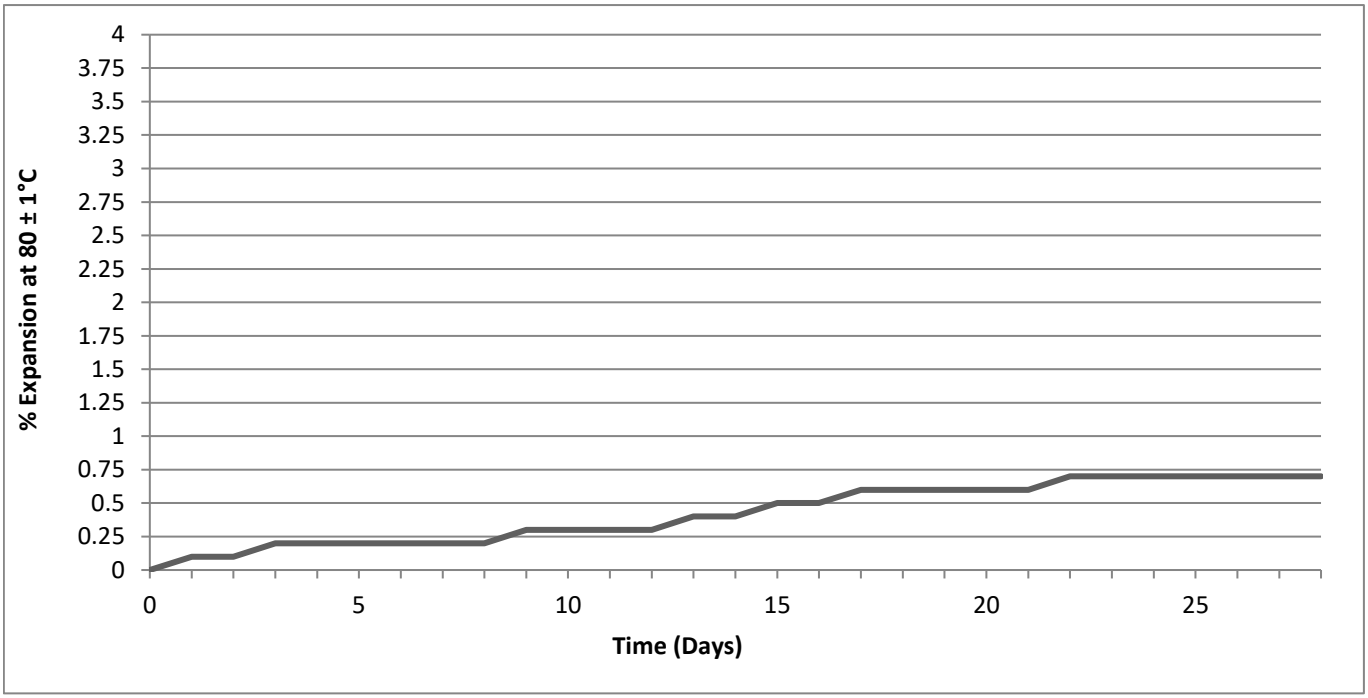
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G F3 0.5m**
Date and Time of Sampling:	**01/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**14/12/2018**
Sampling Location:	**Former Llanwern Steelworks**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = 0.7



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 03 January 2019
Test Report Ref: TR 639939

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

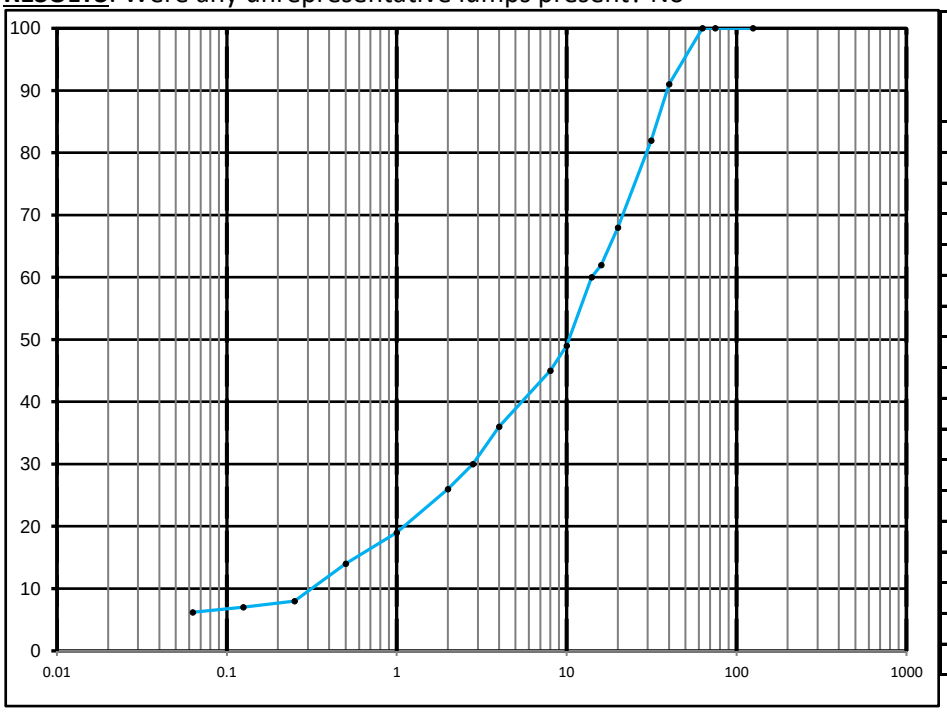
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G F6 - 0.7m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G F6 - 0.7m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	100	
40.0 mm	91	
31.5 mm	82	
20.0 mm	68	
16.0 mm	62	
14.0 mm	60	
10.0 mm	49	
8.0 mm	45	
4.0 mm	36	
2.8 mm	30	
2.0 mm	26	
1.0 mm	19	
0.500 mm	14	
0.250 mm	8	
0.125 mm	7	
0.063 mm	6.2	

Comments:
None

Report checked and approved by:
S Parry- Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640048

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G F6 - 0.7m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G F6 - 0.7m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) =	**9.7**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 15 January 2019
Test Report Ref: TR 640162

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G F6 - 0.7m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**14/01/2019**
Sampling Location:	**4G F6 - 0.7m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.64 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.70 Mg/m³**
Apparent Particle density =	**2.81 Mg/m³**
Water absorption (of dry mass) =	**2.3%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 25 February 2019
Test Report Ref: TR 640275

Order No: Bacs-Former Llanwern Steelworks

LABORATORY TEST REPORT

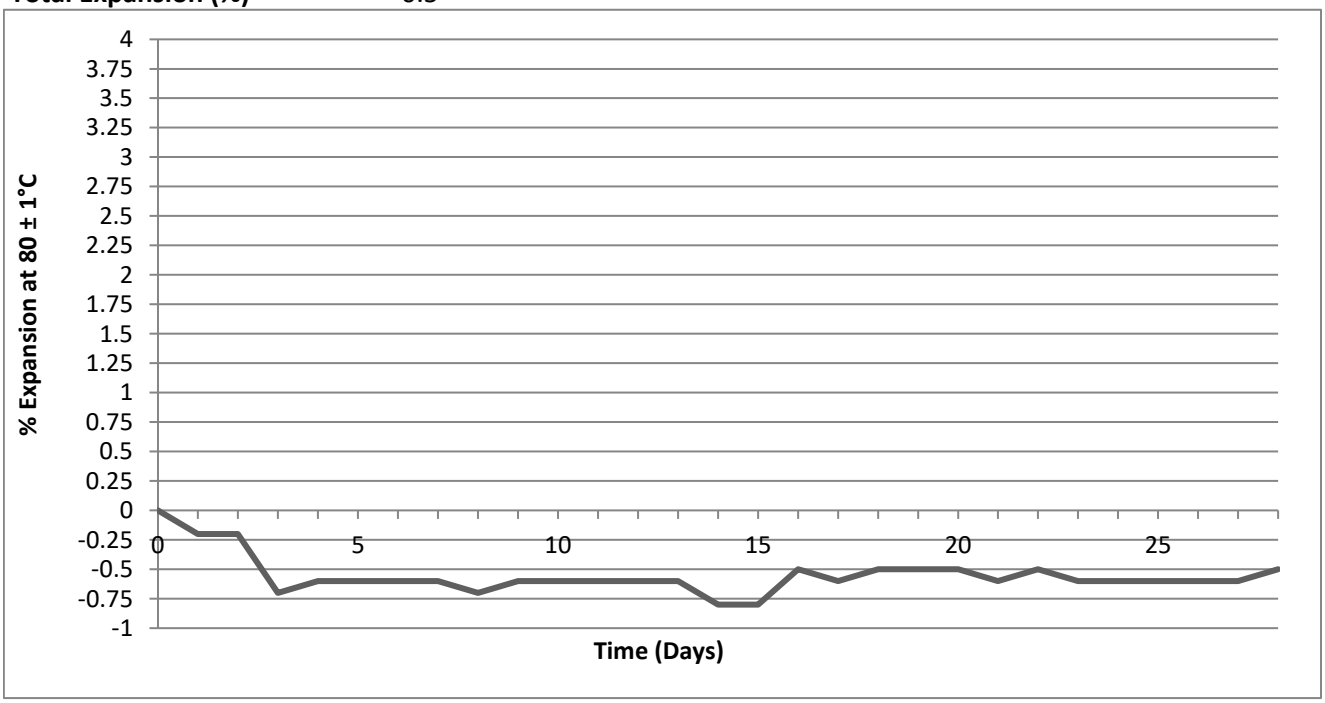
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G F6 - 0.7m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**28/01/2019**
Sampling Location:	**4G F6 - 0.7m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = -0.5



Comments:
Material crushed to pass 20mm

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

celtest
INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 25 March 2019
Test Report Ref: TR 640400

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

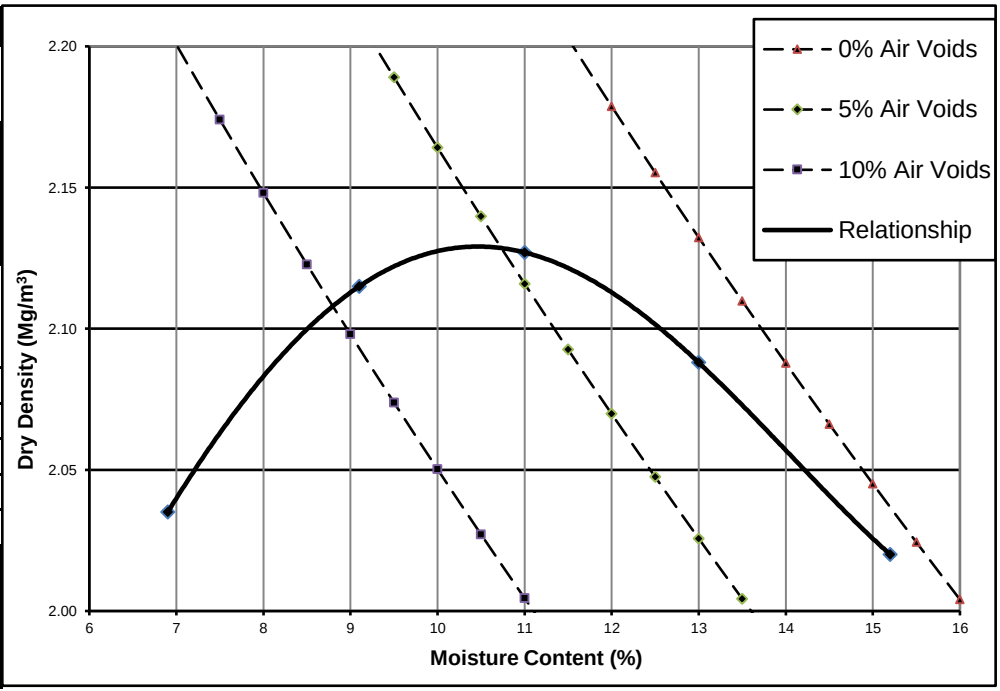
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G F6 - 0.7m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**21/03/2019**	Sample Preparation Procedure:	**3.2.4.1**
Sampling Location:	**4G F6 - 0.7m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 2.95Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	0 %
Retained on 20mm Sieve:	9 %

Moisture Content (%)	Dry Density Mg/m^3
6.9	2.04
9.1	2.12
11.0	2.13
13.0	2.09
15.2	2.02
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
11.0	**2.13**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

celtest
INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 07 January 2019
Test Report Ref: TR 639944

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

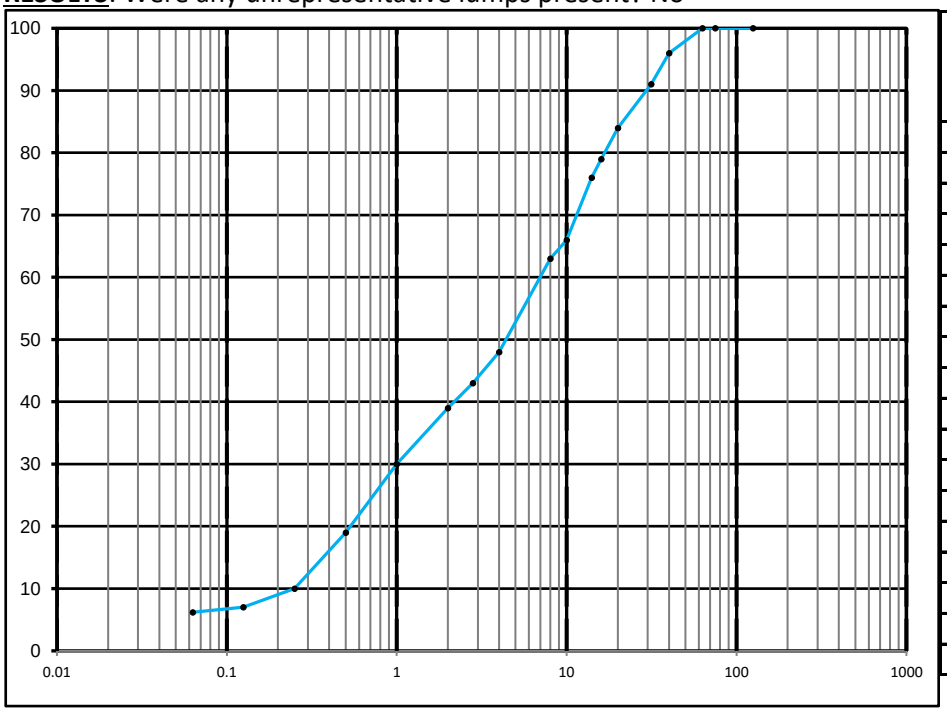
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. No:	**4G G6 - 0.3m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**		
Date of Start of Test:	**12/12/2018**		
Sampling Location:	**4G G6 - 0.3m**		
Material Description	**Granular**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	100	
40.0 mm	96	
31.5 mm	91	
20.0 mm	84	
16.0 mm	79	
14.0 mm	76	
10.0 mm	66	
8.0 mm	63	
4.0 mm	48	
2.8 mm	43	
2.0 mm	39	
1.0 mm	30	
0.500 mm	19	
0.250 mm	10	
0.125 mm	7	
0.063 mm	6.2	

Comments:
None

Report checked and approved by:
S Parry-Didcote

Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 11 January 2019
Test Report Ref: TR 640053

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G G6 - 0.3m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**12/12/2018**
Sampling Location:	**4G G6 - 0.3m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Water Content (%) =	**11.6**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 15 January 2019
Test Report Ref: TR 640167

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G G6 - 0.3m**
Date and Time of Sampling:	**25-26/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**14/01/2019**
Sampling Location:	**4G G6 - 0.3m**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.19 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.32 Mg/m³**
Apparent Particle density =	**2.49 Mg/m³**
Water absorption (of dry mass) =	**5.4%**

Comments:	Report checked and approved by:
None	S Parry-Didcote Sharon Parry-Didcote Aggregate Team Coordinator

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INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 18 February 2019
Test Report Ref: TR 640405

Order No: Bacs-Former Llanwern Steelworks

Contract: The Hawk Site

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

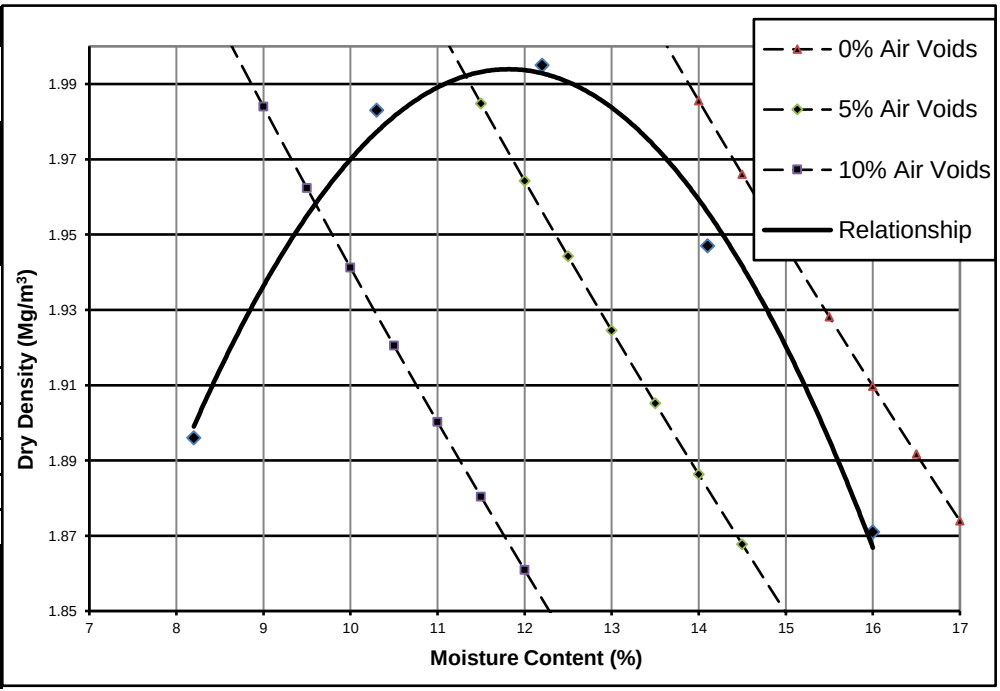
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S77023**	Method of Sampling:	**Unknown**
Client Ref. :	**4G G6 - 0.3m**	Sampled By:	**Client**
Date and Time of Sampling:	**25-26/11/2018**		
Date of Receipt at Lab:	**28/11/2018**	Unrepresentative lumps present?	
Date of Start of Test:	**05/02/2019**	Sample Preparation Procedure:	**Zone X**
Sampling Location:	**4G G6 - 0.3m**	Sample Preparation Method:	**Single**
Soil Description:	**Granular**		

RESULTS:

Particle Density: 2.75Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	21 %
Retained on 20mm Sieve:	28 %

Moisture Content (%)	Dry Density Mg/m^3
8.2	1.90
10.3	1.98
12.2	2.00
14.1	1.95
16.0	1.87
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
12.0	**2.00**



Comments:
None

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ
Contract: The Hawk Site

Date: 18 January 2019
Test Report Ref: TR 640280

Order No: BACS-Former Llanwern Steelworks

LABORATORY TEST REPORT

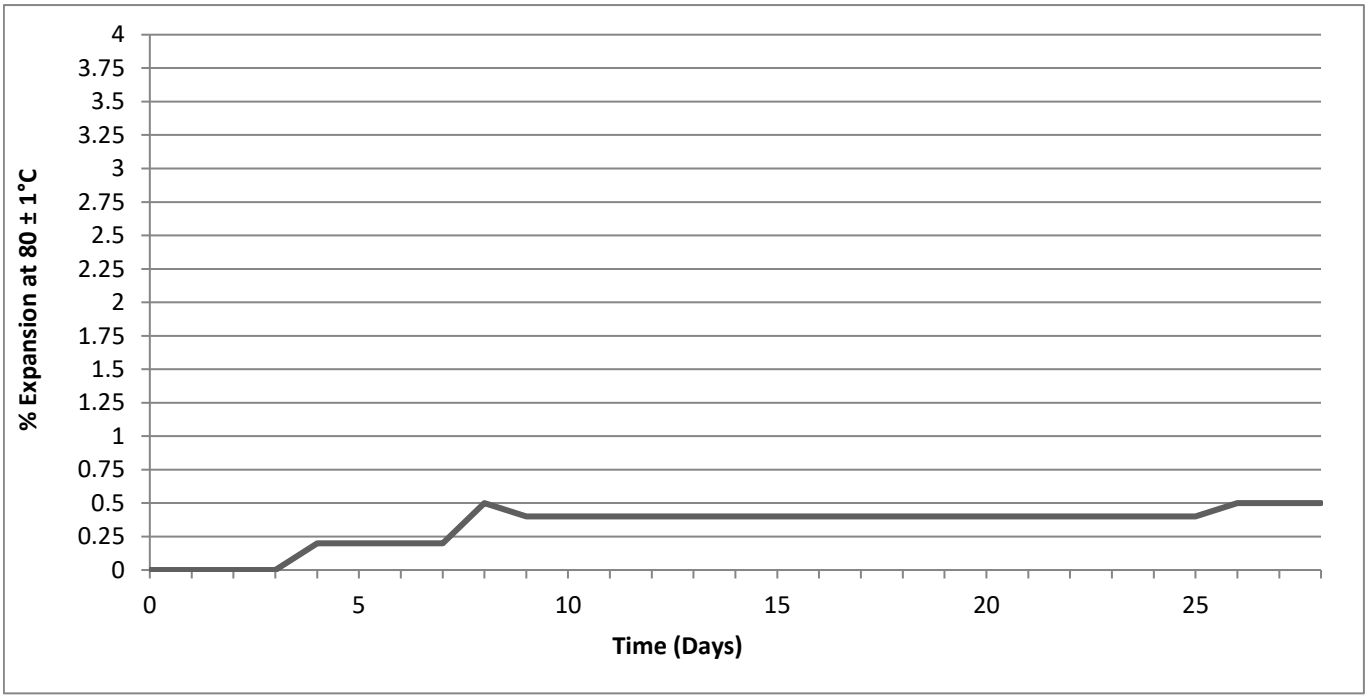
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S77023**
Client Ref. No:	**4G G6 0.3m**
Date and Time of Sampling:	**01/11/2018**
Date of Receipt at Lab:	**28/11/2018**
Date of Start of Test:	**17/12/2018**
Sampling Location:	**Former Llanwern Steelworks**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Material Description:	**Granular**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = 0.5



Comments:
Material crushed to pass 20mm sieve

Report checked and approved by:
S Parry-Didcote
Sharon Parry-Didcote
Aggregate Team Coordinator

celtest
CONSTRUCTION MATERIALS TESTING
A PHENNA GROUP COMPANY

St Modwen Developments (Llanwern) Limited
Two Devon Way
Longbridge
Birmingham
B31 2TS

Date: 05 September 2024
Test Report Ref: TR 1051708

LABORATORY TEST REPORT

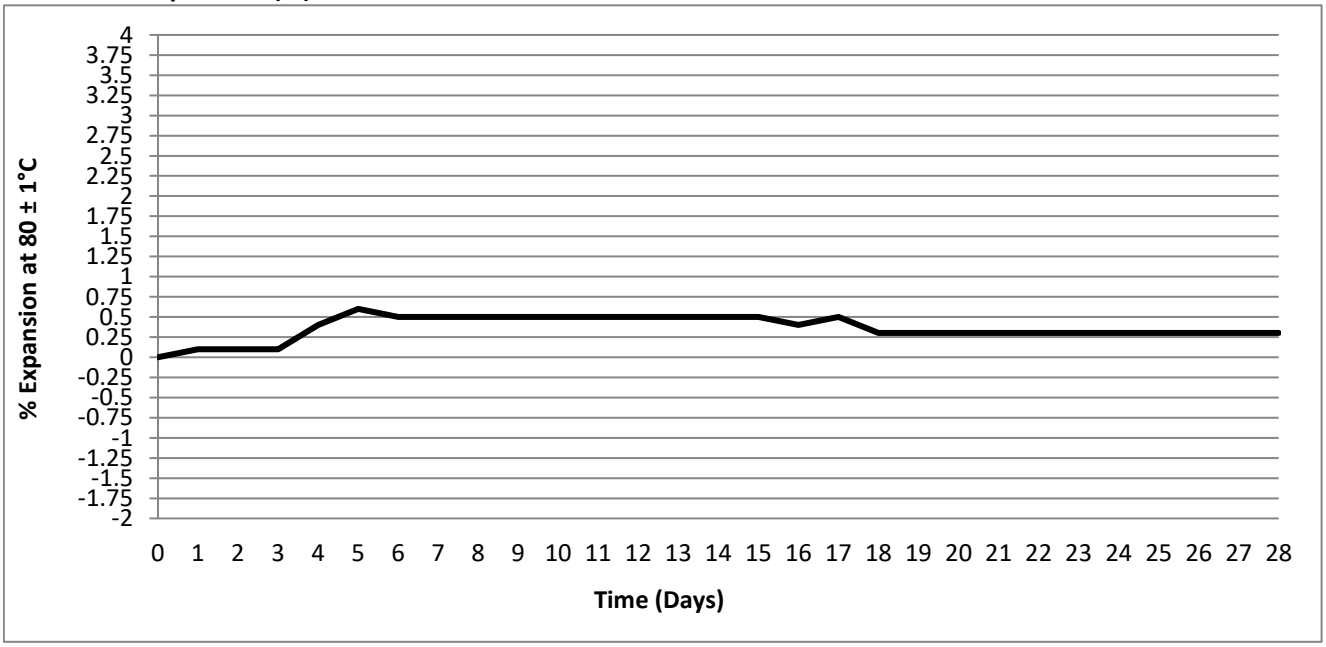
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S123473**
Client Ref. No:	**AF22-1 0.2m**
Date and Time of Sampling:	**15/07/2024**
Date of Receipt at Lab:	**23/07/2024**
Date of Start of Test:	**04/09/2024**
Sampling Location:	**0.2m**
Name of Source:	**Unknown**
Method of Sampling:	**Unknown**
Sampled By:	**Client (Test results apply to sample as received)**
Tested By:	**AW**
Material Description:	**Granular - 20mm Down**
Target Specification:	**N/A**

RESULTS:

Total Expansion at 28 days (%) = 0.28
Maximum Expansion (%) = 0.6



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These results relate only to the items tested.

Comments:

% of material retained on the 20mm sieve = 20

Report checked and approved by:

Izabella Kantor
CS Team

celtest
CONSTRUCTION MATERIALS TESTING
A PHENNA GROUP COMPANY

Rodgers Leask Limited
St James House
St Mary's Wharf
Manfield Road
Derby
DE1 3TQ

Date: 07 August 2024
Test Report Ref: TR 1051703

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a soil sample- washing and sieving method in accordance with **BS 1377-Part 2-1990 Clause 9.2**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S123473**
Client Ref. No:	**AF22-1 0.2m**
Date and Time of Sampling:	**15/07/2024**
Date of Receipt at Lab:	**23/07/2024**
Date of Start of Test:	**24/07/2024**
Sampling Location:	**0.2m**
Name of Source:	**Unknown**
Method of Sampling:	**Unknown**
Sampled By:	**Client (Test results apply to sample as received)**
Tested By:	**EK**
Material Description:	**Granular - 20mm Down**
Target Specification:	**N/A**

RESULTS:

SEE ATTACHED

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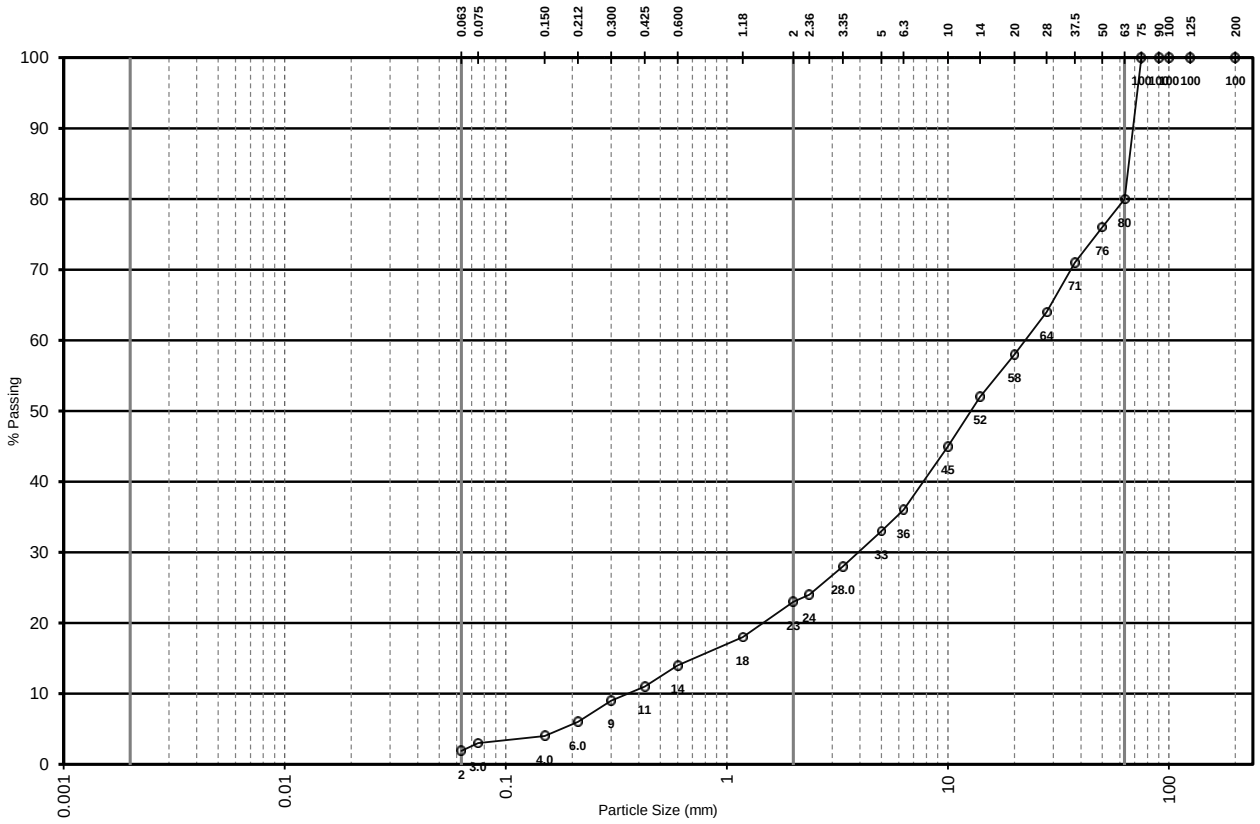
These results relate only to the items tested.

Comments:	Report checked and approved by:
None	Mathew Sayer Laboratory Operations Manager

MATERIAL DESCRIPTION
Granular - 20mm Down

Sieve Size mm	% Passing	Sieve Size mm	% Passing
200	100	3.35	28
125	100	2.36	24
100	100	2.0	23
90	100	1.18	18
75	100	0.600	14
63	80	0.425	11
50	76	0.300	9
37.5	71	0.212	6
28	64	0.150	4
20	58	0.075	3
14	52	0.063	2
10	45		
6.3	36		
5.0	33		

Cobbles	20.0
Gravel	57.0
Sand	21.1
Silt/Clay	1.9



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	0.002 0.006 0.02			0.063 0.2 0.63			2.0 6.3 20			63 200
	SILT			SAND			GRAVEL			

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CONSTRUCTION MATERIALS TESTING
A PHENNA GROUP COMPANY

Rodgers Leask Limited
St James House
St Mary's Wharf
Manfield Road
Derby
DE1 3TQ

Date: 07 August 2024
Test Report Ref: TR 1051704

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of a soil sample (definitive oven-drying method) in accordance with **BS EN ISO 17892-1: 2014 + A1: 2022**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S123473**
Client Ref. No:	**AF22-1 0.2m**
Date and Time of Sampling:	**15/07/2024**
Date of Receipt at Lab:	**23/07/2024**
Date of Start of Test:	**07/08/2024**
Sampling Location:	**0.2m**
Name of Source:	**Unknown**
Method of Sampling:	**Unknown**
Sampled By:	**Client (Test results apply to sample as received)**
Tested By:	**BR**
Material Description:	**Granular - 20mm Down**
Target Specification:	**N/A**

RESULTS:

Water Content (%) = **11.0**

This test report shall not be reproduced, except in full, without the written approval of Celtest Company Limited.

These results relate only to the items tested.

Comments:	Report checked and approved by:
None	Mathew Sayer Laboratory Operations Manager

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CONSTRUCTION MATERIALS TESTING
A PHENNA GROUP COMPANY

Rodgers Leask Limited
St James House
St Mary's Wharf
Manfield Road
Derby
DE1 3TQ

Date: 30 July 2024
Test Report Ref: TR 1051705

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density of Soil – Gas Jar method, in accordance with **BS1377-2: 2022: Cl 9.2**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S123473**
Client Ref. No:	**AF22-1 0.2m**
Date and Time of Sampling:	**15/07/2024**
Date of Receipt at Lab:	**23/07/2024**
Date of Start of Test:	**26/07/2024**
Sampling Location:	**0.2m**
Name of Source:	**Unknown**
Method of Sampling:	**Unknown**
Sampled By:	**Client (Test results apply to sample as received)**
Tested By:	**OHJ**
Material Description:	**Granular - 20mm Down**
Target Specification	**N/A**

RESULTS:

Particle Density = 2.80 Mg/m^3

This test report shall not be reproduced, except in full, without the written approval of Celtest Company Limited.

These results relate only to the items tested.

Comments:	Report checked and approved by:
None	N. Hughes Neil Hughes Assistant Technical Manager

CTS Limited
Warrington Laboratory
Ruby House
40A Hardwich Grange
Warrington
WA1 4RF

CONSTRUCTION TESTING SOLUTIONS
A PHENNA GROUP COMPANY

UKAS TESTING
4161

LABORATORY TEST REPORT

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP - BS 1377: Part 4: 1990

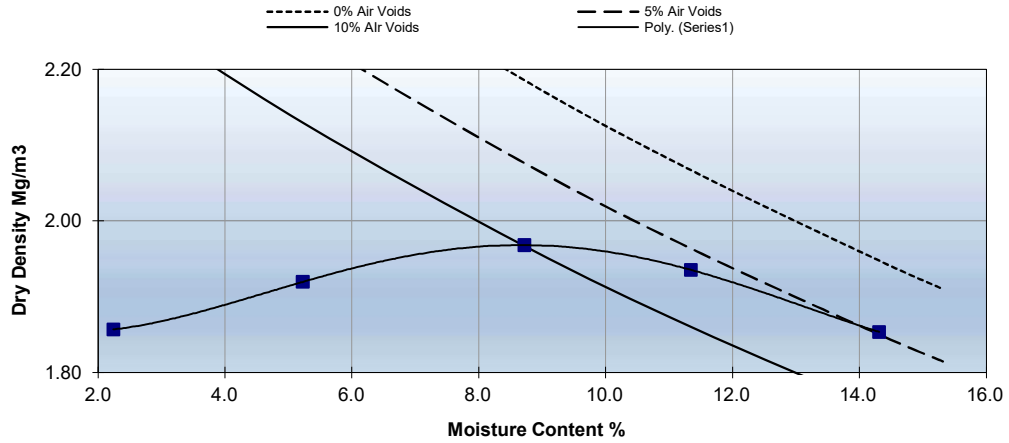
Project:	123473	**Lab Ref No.:**	S0147/6
Client:	Celtest	**Date Sampled:**	30/07/2024
	Trefelin, Llandegai	**Date Received:**	30/07/2024
	Bangor, Gwynedd	**Date Tested:**	02/08/2024
	LL57 4LH	**Date Reported:**	06/09/2024

Originator: **Joseph Roberts**

Client Sample Ref :	AF22-1 0.2m	**Supplier:**	Site Won
Sample Location:	AF22-1 0.2m	**Sample Type:**	Bulk
Material:	Stoney, Gravelly Soil	**Sampled By:**	Client
Specification:	SHW Series 600: Table 6/2	**Sampling Cert/Plan:**	Sampled by client
Visual Description:	Stoney, Gravelly Soil	**Preparation Method:**	BS 1377-1: 2016

Rammer used :	4.5kg	**No of layers:**	Multiple
No of sub samples :	3	**% retained on 37.5mm sieve**	6.1
Mould Size:	CBR	**% retained on 20mm sieve**	13.0

Bulk Density: Mg/m³	1.90	2.02	2.14	2.15	2.12
Moisture Content: %	2.2	5.2	8.7	11	14
Dry Density: Mg/m³	1.86	1.92	1.97	1.94	1.85



Maximum Dry Density (Mg/m³)	**1.97**
Optimum Moisture Content (%)	**8.7**

The stated result only relates to the item/location tested, this report shall not be reproduced except in full.
Where CMTL are not responsible for sampling, the sample is tested in an as received condition

Tested in accordance with BS 1377: Part 4:1990: Clause 3.6
Particle Density (Mg/m³) - 2.7 (Assumed)

CTS Limited Approved Signature
Gareth Venn - Laboratory Manager
GVenn

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 04 March 2021
Test Report Ref: TR 782346

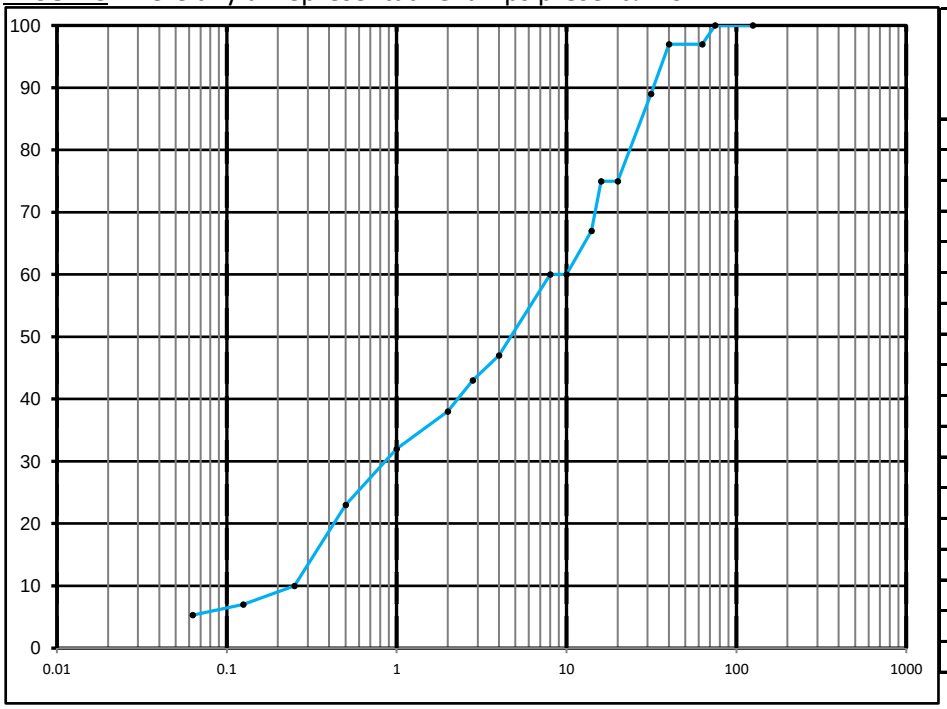
LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Size Distribution (PSD) of a aggregate sample-washing and sieving method in accordance with **BS EN 933-1: 2012.**

SAMPLE DETAILS:

Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S92900**	Method of Sampling:	**Unknown**
Client Ref. No:	**AJ21-1 - 0.3**	Sampled By:	**Client**
Date and Time of Sampling:	**29/01/2021**	Tested By:	**JP**
Date of Receipt at Lab:	**04/02/2021**		
Date of Start of Test:	**19/02/2021**		
Sampling Location:	**Unknown**		
Material Description	**Granular - 40mm Down**		

RESULTS: Were any unrepresentative lumps present? No



BS Test Sieve Size	Percentage By Mass Passing	Specification Limit
125.0 mm	100	
75.0 mm	100	
63.0 mm	97	
40.0 mm	97	
31.5 mm	89	
20.0 mm	75	
16.0 mm	75	
14.0 mm	67	
10.0 mm	60	
8.0 mm	60	
4.0 mm	47	
2.8 mm	43	
2.0 mm	38	
1.0 mm	32	
0.500 mm	23	
0.250 mm	10	
0.125 mm	7	
0.063 mm	5.3	

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These results relate only to the items tested.

Comments:

None

Report checked and approved by:

S Parry

Sharon Parry
Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 04 March 2021
Test Report Ref: TR 782347

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Water Content of aggregates by – drying in a ventilated oven according to **BS EN 1097-5: 2008**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S92900**
Client Ref. No:	**AJ21-1 - 0.3**
Date and Time of Sampling:	**29/01/2021**
Date of Receipt at Lab:	**04/02/2021**
Date of Start of Test:	**19/02/2021**
Sampling Location:	**Unknown**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client** **(Test result apply to sample as received)**
Tested By:	**JP**
Material Description:	**Granular - 40mm Down**
Target Specification:	**N/A**

RESULTS:

Water Content (%) =	**11.1**

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These results relate only to the items tested.

Comments:	Report checked and approved by:
None	S Parry Sharon Parry Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 24 March 2021
Test Report Ref: TR 782348

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Dry Density and Moisture Content Relationship of soil sieve 4.5kg Rammer Method in accordance with BS 1377: 4: 1990 Clause 3.6

SAMPLE DETAILS:

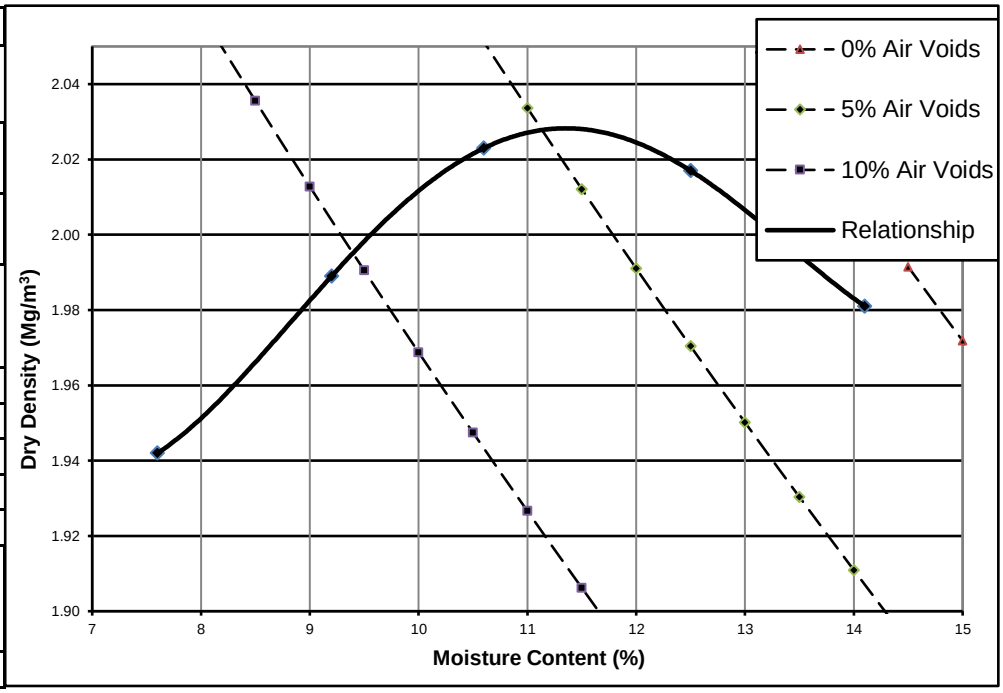
Certificate of sampling received:	**No**	Name of Source:	**Former Llanwern Steelworks**
Laboratory Ref. No:	**S92900**	Method of Sampling:	**Unknown**
Client Ref. :	**AJ21-1 - 0.3**	Sampled By:	**Client**
Date and Time of Sampling:	**29/01/2021**	Tested By:	**AO**
Date of Receipt at Lab:	**04/02/2021**	Sample Preparation Procedure:	**Clause X**
Date of Start of Test:	**23/03/2021**	Sample Preparation Method:	**Single**
Sampling Location:	**Unknown**		
Soil Description:	**Granular - 40mm Down**		

RESULTS:

Particle Density: 2.8Mg/m3 (Assumed)

Retained on 37.5mm Sieve:	18 %
Retained on 20mm Sieve:	26 %

Moisture Content (%)	Dry Density Mg/m^3
7.6	1.94
9.2	1.99
10.6	2.02
12.5	2.02
14.1	1.98
Optimum Moisture Content (%)	**Maximum Dry Density Mg/m^3**
11.0	**2.03**



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These results relate only to the items tested.

Comments:
None

Report checked and approved by:

S Parry

Sharon Parry
Aggregate Team Coordinator

celtest
INDEPENDENT MATERIALS TESTING I DIAMOND DRILLING & SAWING

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 10 March 2021
Test Report Ref: TR 782349

LABORATORY TEST REPORT

TEST REQUIREMENTS: To determine the Particle Density and water absorption for aggregate sample between 4 mm and 31.5mm, in accordance with **BS EN 1097-6: 2013 Clause 8**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S92900**
Client Ref. No:	**AJ21-1 - 0.3**
Date and Time of Sampling:	**29/01/2021**
Date of Receipt at Lab:	**04/02/2021**
Date of Start of Test:	**08/02/2021**
Sampling Location:	**Unknown**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Tested By:	**DW**
Material Description:	**Granular - 40mm Down**
Target Specification:	**N/A**

RESULTS:

Particle density on an oven-dried basis =	**2.32 Mg/m³**
Particle density on a saturated and surface-dried basis =	**2.40 Mg/m³**
Apparent Particle density =	**2.53 Mg/m³**
Water absorption (of dry mass) =	**3.6 %**

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These results relate only to the items tested.

Comments:	Report checked and approved by:
None	S Parry Sharon Parry Aggregate Team Coordinator

St Modwen Developments Limited
Park Point
17 High Street
Longbridge
Birmingham
B31 2UQ

Date: 14 June 2021
Test Report Ref: TR 782350

LABORATORY TEST REPORT

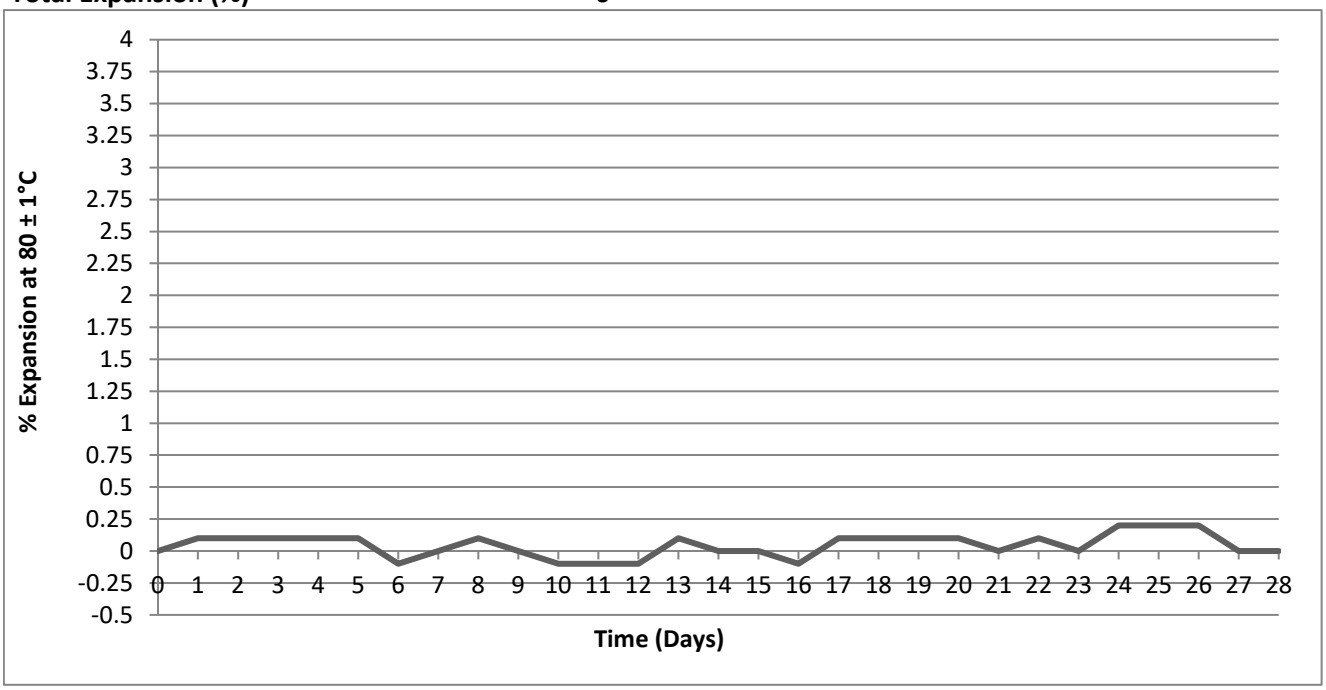
TEST REQUIREMENTS: To determine the Expansion of Steel Slag over 28 days at 80°C by **BRE in-house method (BR 481 Part B - Appendix B)**

SAMPLE DETAILS:

Certificate of sampling received:	**No**
Laboratory Ref. No:	**S92900**
Client Ref. No:	**AJ21-1 - 0.3**
Date and Time of Sampling:	**29/01/2021**
Date of Receipt at Lab:	**04/02/2021**
Date of Start of Test:	**13/04/2021**
Sampling Location:	**Unknown**
Name of Source:	**Former Llanwern Steelworks**
Method of Sampling:	**Unknown**
Sampled By:	**Client**
Tested By:	**IJ**
Material Description:	**Granular - 40mm Down**
Target Specification:	**N/A**

RESULTS:

Total Expansion (%) = 0



This test report shall not be reproduced, except in full, without the written approval of Celtest Company Limited.

These results relate only to the items tested.

Comments:

% of material retained on the 20mm sieve = 25

Report checked and approved by:

Mathew Sayer
Aggregate Team Manager

Rodgers Leask Limited & Rodgers Leask Environmental Limited
01332 285000 • rlderby@rodgersleask.co.uk • **rodgersleask.co.uk**
St James House, St Mary's Wharf, Mansfield Road, Derby DE1 3TQ
Seven House, 18 High Street, Longbridge, Birmingham B31 2UQ

Appendix E – H F Consulting Soil Validation Strategy

H Fraser Consulting
Contaminated Land and Hydrogeology

Glan Llyn: Soils validation strategy for protection of controlled waters

Prepared for: Rodgers Leask Ltd
Seven House, 18 High Street,
Longbridge,
Birmingham B31 2UG

Date: 17/12/2024
Status: FINAL
Reference: 30937 R2
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Prepared by: H Fraser Consulting Ltd

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H Fraser Consulting
Contaminated Land and Hydrogeology

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Version History

Version	Author	Approved by	Issue date	Comment
30937 R2D1	Xenia Boyes	Joe Gomme	05/11/2024	Draft report issued to client
30937 R2D2	Xenia Boyes	Joe Gomme	12/11/2024	Draft report issued to NRW and client
30937 R2	Xenia Boyes	Joe Gomme	17/12/2024	Final report issued to client

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APPENDICES

Appendix A RTM modelling spreadsheet outputs (electronic)

Appendix B Example RTM spreadsheets (electronic)

1. BACKGROUND

Glan Llyn is a major residential and commercial development in Llanwern, South Wales, on the site of a former steelworks. Planning permission for the development includes planning conditions PC27 and PC28, which relate to the remediation strategy for the on-site soils and the validation of the remediation once achieved.

The initial risk assessment and remediation strategy report was produced by Atkins (2017) and this was subsequently updated by Rodgers Leask (2019-22), as described in Section 2. These documents have been accepted as satisfying PC27 for a number of development phases that are already completed or are currently being developed. Recent efforts to satisfy the requirements of PC28, which relate to the validation of the soil quality following remediation, for the protection of controlled waters, have been subject to considerable discussion with the regulator, NRW, and the planning authority, Newport City Council.

Recent meetings and discussion involving H Fraser Consulting Ltd (HFCL) resulted in agreement in principle on a revised approach to validation reporting, with regard to protection of controlled waters.

1.1 Objective

The objective of this report is to present the revised approach referred to above. This will provide a standard methodology and reference for all future phase validations and thus enable validation to proceed efficiently for all parties.

1.2 Scope of report

The report summarises the remediation work and validation at Glan Llyn to date (Section 2) and presents the updated approach and methodology (Section 3). Section 4 contains reference tables for contaminants of concern, to be applied to validation of soil quality in future validation reporting.

Additional planning conditions related to surface water are not part of the scope of this validation strategy.

This report considers only the elements of the remediation that relate to protection of controlled waters; elements of the remediation strategy that protect human health receptors (for example, placement of vapour membranes) are outside the scope of this report.

2 REMEDIATION WORKS AND VALIDATION TO DATE

2.1 Remediation strategy

The agreed remediation strategy and risk assessment for controlled waters at the site is detailed in Rodgers Leask (2019-22). The remediation strategy is briefly summarised here.

The remediation comprises excavation of Made Ground materials, removal of materials unsuitable for re-use in the development platform, and re-compaction of suitable Made Ground materials as an engineered fill. A drainage layer, formed as part of the normal construction phase, will then be installed above the engineered fill layer, to reduce infiltration to the Made Ground.

The Site has been divided into two strategies broadly responding to the division of the site between residential use and commercial use, referred to as the 'Full Turnover Specification' and the 'One Metre Turnover Specification'. The Full Turnover Specification comprises the excavation of Made Ground to a depth where the natural underlying Tidal Flat Deposits are exposed before a minimum of 2 m of suitable material is placed and reengineered. The One Meter Turnover Specification requires a trim and chase process excavating material to a depth minimum of 5.3 m aOD before approximately 2 m of suitable material is placed and reengineered to a formation level of 7.25 m aOD. Practical measures to identify, remove and validate the absence of gross contamination and known and potential obstructions extending below 5.3 m aOD shall be undertaken.

Several phases of trial pitting have been undertaken across the Site to assess and characterise the Made Ground for suitability for reuse. Material present within the proposed residential area that exceeds residential soil re-use values shall be transferred and re-used in the commercial phase of the development. Where material is not suitable for either a residential or commercial end use, the material will either be treated to allow re-use on site (at the supervising engineers discretion), or arrangements made for off-site disposal.

The remediation work and development are proceeding in phases as shown in Figure 2.1 for the residential area, and Figure 2.2 for the commercial area.



Figure 2.1 Residential phases

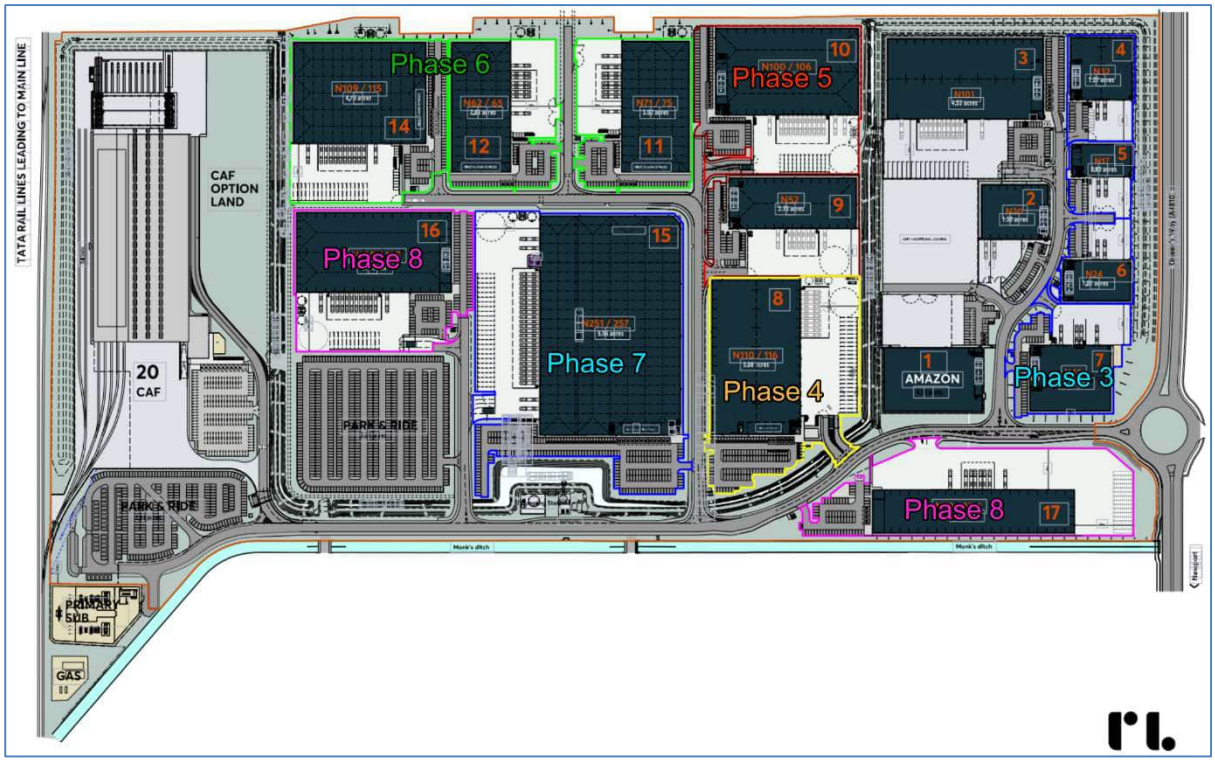


Figure 2.2 Commercial phases

Two planning conditions apply to the site remediation work.

- PC27 requires that, prior to commencement of each phase of development, a risk assessment, remediation strategy and verification plan are submitted to and approved in writing by the Local Authority.
- PC28 requires that prior to commencement of each phase of development (excluding works required for the remediation strategy) a verification report is submitted to and approved in writing by the Local Authority, to demonstrate completion of the remediation strategy and the effectiveness of the remediation.

The site is drained by a number of deep drainage ditches, referred to as reens. Soil re-use values (SRVs) for the protection of controlled waters were derived by Atkins and amended by Rodgers Leask, assuming the following conceptual model.

- 60% of the residential site surface and 95% of the commercial site surface is impermeable. 100% of incident rainfall on impermeable areas either evaporates or is routed via the drainage system directly to the reens.
- 40% of the residential site and 5% of the commercial site has soft landscaping. In these areas infiltration was calculated as 12.85 mm/a, by subtracting evapotranspiration and runoff from the total rainfall figure. Runoff from these areas also passes to the reens.
- 12.85 mm/a infiltrates the drainage layer overlying the engineered fill.
- In the soft landscaping areas, 60% of infiltration drains laterally through the drainage layer into a reen and does not enter the engineered fill.
- 40% of infiltration drains into the engineered fill and migrates through the fill to a reen, dissolving potential contaminants from the fill materials.
- The infiltration that travels through the fill is diluted on reaching the reens by runoff and infiltration through the drainage layer. The relative fluxes of water passing through the fill to clean runoff provides the dilution factor.
- SRVs are calculated by multiplying the Environmental Quality Standard (EQS) by the dilution factor and converting this water concentration into a soil concentration using a partition co-efficient.

This approach was set out originally by Atkins (2017), modified by Rogers Leask (2019-22) and approved by the Local Authority under discharge of PC27 for a number of development phases. The commercial area and the residential area have different remedial targets due to the different ratio of soft landscaping to hardstanding.

Soils re-use values (SRVs) were set out in Rogers Leask (2019-22). A minor update to correct an error in calculation for the residential area was provided by HFCL (2024). The SRVs are reproduced here in Table 2.1.

Table 2.1 Agreed soil re-use values (SRVs)

Determinand	Soil re-use values (mg/kg)	
	Commercial area	Residential area[1]
Inorganic Metals and Metalloids		
Arsenic	1.15E+4	2533
Cadmium	331	73.0
Chromium	4.27E+4	9431
Copper	2042	451
Iron	1.38E+6	3.05E+5
Lead	7.12E+4	1.57E+4
Manganese	1.51E+5	3.33E+4
Mercury	596	132
Nickel	5.21E+4	1.15E+4
Selenium	3178	702
Vanadium	7271	1606
Zinc	6.23E+5	1.38E+5
Other Inorganics		
Ammoniacal Nitrogen	699	154
Cyanide	9.14	2.02
Organics		
Benzene	17.2	3.80
Toluene	582	128
Ethylbenzene	364	80.0
Xylene	336	74.0
Phenol	13.8	3.05
TPH Criteria Working Group		
Aliphatics >C5-C6	331	73.0
Aliphatics >C6-C8	1626	359
Aliphatics >C8-C10	1.29E+4	2841
Aliphatics >C10-C12	1.02E+5	2.25E+4
Aliphatics >C12-C16	2.04E+6	4.50E+5
Aliphatics >C16-C21	2.56E+8	5.66E+7
Aliphatics >C21-C35	2.56E+8	5.66E+7
Aliphatics >C35-C44	2.56E+8	5.66E+7
Aromatics >EC5-EC7	38.5	8.51
Aromatics >EC7-EC8	802	177
Aromatics >EC8-EC10	650	144
Aromatics >EC10-EC12	1027	227
Aromatics >EC12-EC16	2043	451
Aromatics >EC16-EC21	6447	1424
Aromatics >EC21-EC35	5.12E+4	1.13E+4
Aromatics >EC35-EC44	5.12E+4	1.13E+4
Aromatics >EC40-EC44	5.12E+4	1.13E+4
Polyaromatic Hydrocarbons		
Acenaphthylene	75.7	16.7

[1] Updated per H Fraser Consulting 2024; *30937 TN1D1 Glan Llyn, Llanwern: Soil Quality Verification*

Determinand	Soil re-use values (mg/kg)	
	Commercial area	Residential area[1]
Acenaphthene	135	30.0
Anthracene	155	34.0
Benz(a)anthracene	2748	607
Benzo(a)pyrene	156	34.0
Benzo(b)fluoranthene	15.5	3.42
Benzo(k)fluoranthene	22.9	5.05
Benzo(g,h,i)perylene	60.2	13.0
Chrysene	2812	621
Dibenzo(a,h)anthracene	3793	838
Indeno(1,2,3-cd)pyrene	115	25.0
Fluoranthene	30.1	6.64
Fluorene	123	27.0
Naphthalene	124	27.0
Phenanthrene	123	27.0
Pyrene	346	76.0

2.2 Remediation

Remediation has taken place in phases as shown in Figure 2.1 (residential) and Figure 2.2 (commercial). As of October 2024, remediation has been completed across the majority of the site. Remediation has been validated and approved for Phases 1 to 3 of the residential development and Phases 1 to 3 of the commercial development. These phases were remediated and validated under the site model, risk assessment and remediation strategy developed by Atkins (2017), and therefore had different validation requirements to Phase 4 onwards.

The remediation and verification work on each of the phases includes the following:

- Complete excavation of Made Ground materials to the underlying Tidal Flat Deposits in the residential areas and to a depth minimum of 5.3 m aOD in the commercial area;
- Screening and stockpiling of the excavated material;
- Sampling of stockpile materials;
- Removal of material unsuitable for use;
- Subdivision of the site into backfill zones, generally in a 25x25 m grid;
- Placement of engineered fill in 300 mm layers, zone by zone;
- Sampling of surface materials, post-placement, to provide additional verification data.

As noted in Section 2.1, material originating from the site that was unsuitable for use in the residential area was to be re-used on the commercial area (where agreed SRVs are higher) or, if necessary, removed from site. In practice, all excavated material was stockpiled and tested, and the above criterion applied. That is, if testing of stockpiled material showed it to be unsuitable for residential area backfill, it was moved to the commercial area or removed from the site, in accordance with the stipulations of the remediation strategy (Rodgers Leask, 2019-22).

Table 2.2 shows a summary of where each phase is in the remediation and verification process. Table 2.2 also indicates whether the planning conditions for each phase have been discharged, and whether this was in accordance with the Atkins remediation strategy (RS) or the Rogers Leask RS. Note that part of the residential area that was formerly a coking works has been remediated by

Vertase FLI Ltd (Vertase); HFCL has not reviewed the remediation strategy or soil re-use values for this part of the site. The coking works area includes parts of Phases 4A, 4B, 5A and 5D, as well as the proposed school.

Table 2.2 Summary of phase progress

Phase	Remediation works complete	Discharge of planning conditions *	
		PC27	PC28
Residential			
Phase 1	Yes	Atkins RS	Atkins RS
Phase 2	Yes	Atkins RS	Atkins RS
Phase 3	Yes	Atkins RS	Atkins RS
Coking works	Yes	Vertase	Pending
Phase 4A (compound)	Yes	RL RS / Vertase	Pending
Phase 4B	Yes	Pending	Pending
Phase 4C	Yes	RL RS	Pending
Phase 4D	Yes	RL RS, parts 1 and 2	Pending
Phase 4E	Yes	Pending	Pending
Phase 4G	Yes	Pending	Pending
Phase 4H	Yes	RL RS	Pending
Phase 5A	Yes	Pending	Pending
Phase 5B	Yes	Pending	Pending
Phase 5G	Yes	Pending	Pending
Phase 5D	Yes	Pending	Pending
Phase 5E1	Yes	RL RS	Pending
Phase 5E2	Yes	Pending	Pending
Phase 5F	Ongoing	Pending	Pending
Commercial			
Phase 1 (Amazon)	Yes	Atkins RS	Atkins RS
Phase 2 (CAF)	Yes	Atkins RS	Atkins RS
Phase 3 (Units 4-7)	Yes	Atkins RS	Atkins RS
Phase 4 (Unit 8)	Yes	RL RS	Pending
Phase 5 (Units 9-10)	Yes	RL RS	Pending
Phase 6a (Units 11-14)	Yes	RL RS	Pending
Phase 6b (Units 15 and 16)	Yes	RL RS	Pending
Phase 7 (Park and Ride)	Yes	RL RS	Pending
Phase 8 (Unit 17)	Ongoing	Pending	Pending

* "Pending" indicates that the application has not yet been made.

2.3 Soil testing and validation

Soil samples are taken from each stockpile and sent to an accredited laboratory for analysis of the soil re-use determinands as listed in Table 2.1. An average soil concentration is then obtained for each stockpile. During the placement of the engineering fill each 300 mm layer is taken from a specific stockpile. Each stockpile may be used for multiple layers in one backfill zone, or across

multiple zones. Rogers Leask maintains a materials management database, so that there is a record of the soil analytical results for each stockpile and which stockpile was used for each layer in each backfill zone. A variable number of layers is laid down in each zone to achieve the desired ground surface level.

Surface verification samples may be taken upon completion of the engineered fill placement, principally for validation of human health criteria rather than controlled waters.

All samples are sent to an accredited laboratory for analysis of the determinands listed in Table 2.1. It is assumed the surface verification samples are representative of the top 100 mm of soil, since they are taken using a trowel.

Hundreds of soil samples are relevant to each backfill zone, and these can be taken as a group to represent the quality of soils used in the remediation.

A database of all the soil analytical results for each phase is developed. This includes all the surface verification samples taken across the phase, and all soil samples from any stockpiles used in the engineered fill. The 95%ile of all the analytical results is compared to the soil re-use values. Any determinands where the 95%ile exceeds the SRV is taken forward as a Contaminant of Concern (CoC) for that phase.

2.4 Issues arising

During the remediation verification for Phase 4H (residential) and Phases 4 and 5 (Units 8-10, commercial) exceedances of the SRVs were identified for certain parameters in specific areas of backfill during the verification process. It was therefore not possible to validate the remediation in those cases. An updated approach was consequently developed which combined a more detailed statistical analysis and enhanced data presentation, supplemented where needed by contaminant transport modelling. Where data presentation was unable to show that a contaminant presented no risk, modelling was applied to predict the concentration that would reach the surface water receptors. This updated approach allows for advection, dispersion, retardation and decay that act to reduce contaminant concentrations along a transport pathway.

The approach was agreed with NRW for Phase 4H and Units 8-10. This report sets out a streamlined approach to applying the same methodology, which involves the derivation of zoned reference values for all identified contaminants of concern across the site. This updated methodology, which will be applied to verification of future phases, is described in detail in Section 3.

As long as a sufficient number of robust sample analyses is available to represent the backfill material in each phase, the updated approach can be used to provide appropriate validation against the agreed soil criteria, without the need for additional consideration of subsurface water quality within the fill.

The updated SRVs derived by Rodgers Leask depend on the existence of a drainage layer above the fill. The drainage layer needs to be composed of appropriate granular material and evidence of its installation layer will form part of the requirement for the discharge of PC28.

3 UPDATED APPROACH AND METHODOLOGY

The following methodology is recommended for the future phases going forward. This methodology has been developed following discussion with NRW and agreement on the principles to be followed. An overview of the process is given here first, with further clarification of each stage in the following sub-sections.

Distance-specific reference values have been derived using Remedial Targets Methodology spreadsheets (RTM, see Environment Agency, 2006) to model the attenuation of contaminants during transport in the saturated zone. This allows for advection, dispersion, retardation and decay that act to reduce contaminant concentrations along a transport pathway. Reference values have been tabulated for three different travel distances to the compliance point. Comparison of reference values against measured soil concentrations can then determine whether contaminants are expected to reach the receptors at unacceptable concentrations. Full details of the derivation of the reference tables are provided in Sections 3.1 to 3.3.

For each development phase, a screening exercise will be carried out on all the contaminants of concern identified in the site-wide RL Remediation Strategy, as described in Section 3.4. Contaminants of Concern (CoCs) for that phase will be defined as determinands for which the 95%ile of the analytical results from the fill materials exceeded the SRV. (This maintains consistency with previous validation reporting.) The remaining CoCs will then be moved forward for further assessment.

In this further assessment a thorough statistical and spatial analysis will be carried out on the stockpile verification samples for these contaminants. This will include a calculation of the Upper Confidence Limit of the mean (UCLmean) for each backfill zone across the Phase (see Section 3.4). The UCLmean for each backfill area will then be compared to the tabulated reference values.

3.1 Development of reference tables

The agreed SRVs (Rodgers Leask, 2019-22) were calculated assuming that water infiltrates the engineered fill and travels to a reen, where it is then diluted in the volume of runoff across the site. The calculation only allows for dilution in the reen and does not allow for transport processes such as advection, dispersion, retardation and decay that act to reduce contaminant concentrations along a transport pathway. The site drainage strategy (Rodgers Leask, 2017) requires that a minimum depth of 300 mm of water always remains in the reens. This serves various purposes including dilution of groundwater from the Made Ground.

New reference values have now been derived using RTM spreadsheets to model the attenuation of contaminants during transport in the saturated zone. This allows for advection, dispersion, retardation and decay that act to reduce contaminant concentrations along a transport pathway.

Generic modelling reference tables are developed, so that modelling is not required for each individual phase. Instead, the concentration for each CoC in each backfill zone can be checked against the reference tables. Reference values in the tables are given for three specific distances (12.5 m, 37.5 m and 62.5 m)[2].

[2] 12.5 m was selected because it represents the half of the distance across a standard remediation grid square. Grid squares measure 25 m square and were used across most of the Glan Llyn site as backfill zones. 37.5 m represents the distance across one and a half grid squares, i.e. the travel distance from a backfill zone that is one removed from the

The RTM has been used to assess the attenuation of contaminant concentrations through the engineered fill. To do this a 'Level 3' groundwater assessment has been undertaken as follows.

- The target concentration at the compliance point is taken to be the pore water concentration in equilibrium with the previously calculated SRV (Table 2.1). This is representative of the groundwater concentration before dilution at the point of discharge into the reen.
- The source area has been taken as the area of a standard backfill zone (25 m by 25 m).
- A time period of 1,000 years has been used.[3]
- The reference value is calculated as the target soil concentration in equilibrium with the groundwater remedial target taken from the RTM Level 3 groundwater assessment.

Equivalent pore water concentrations for a given soil concentration, and vice versa, are calculated using the equation below.

$$C_p = \frac{C_s}{\left(K_d + \frac{\theta_w + \theta_a H}{\rho}\right)}$$

Where:

C_s = soil concentration (mg/kg)
C_p = pore water concentration (mg/l)
K_d = soil-water partition coefficient (l/kg)
θ_w = water-filled soil porosity (fraction)
θ_a = air-filled soil porosity (fraction)
ρ = bulk density (g/cm^3)
H = Henry's Law constant (dimensionless)

3.2 Input parameters

The model input parameters are shown in Table 3.1 (general parameters) and Table 3.2 (contaminant-specific input parameters). The models were run with no degradation in the sorbed phase (i.e. degradation was only allowed in the dissolved phase), which is a conservative approach.

When considering contaminant degradation, a range of values is usually provided by reference books, dependent on conditions such as the redox state of the environment. In these cases we conservatively assumed the longest given half-life, which usually corresponds to anaerobic conditions.

In general, model input parameters were based on those adopted by Atkins in the earliest derivation of soil re-use values, to provide consistency with previous approaches.

reen. 62.5 m represents the distance across 2 and a half grid squares, i.e. the travel distance from a backfill zone that is two removed from the reen.

[3] One thousand years is considered to represent a reasonably conservative time scale for any impacts to become apparent, and to allow a proportionate approach to contaminants that sorb to the extent that travel times are very long, in accordance with section 5.5 of the Remedial Targets Methodology (Environment Agency, 2006).

Table 3.1 General model parameters

Input parameters	symbol	value	Unit	Source
Plume thickness at source	Sy	1.98	m	Table 2-2 Atkins
Saturated aquifer thickness	da	2.1	m	Table 2-2 Atkins
Bulk density of aquifer materials	r	1.36	g/cm^3	Table 5-3 Atkins
Effective porosity of aquifer	n	0.08	fraction	Table 5.3.1 RL Remediation strategy
Water filled porosity	θ_w	0.5	fraction	Table 5-3 Atkins
Air filled porosity	θ_a	0.0037	fraction	Table 5-3 Atkins
Hydraulic gradient	i	0.0133	fraction	Table 5.3.1 RL Remediation strategy
Hydraulic conductivity of aquifer	K	1.00E-06	m/s	Hydraulic conductivity data given in RL, 2024[4]
Width of plume	S_z	25	m	Size of backfill zone
Distance to compliance point	x	12.5 37.5 62.5	m	
Time since pollutant entered groundwater	t	365,000	days	1,000 years

[4] Rodgers Leask, 2024, Phase 4H, Glan Llyn, Newport, Chemical Validation Report draft. Similar values have been reported from Phase 4A compound and Units 8-10 in the Commercial area.

Table 3.2 Contaminant-specific model parameters

Determinand	Commercial RL Soil re-use criteria[1]	Residential RL Soil re-use criteria[2]	Henry's Law Constant (H)[3]	Soil Organic Carbon-Water Partitioning Coefficient (koc)[3]	Solid/Liquid Partition Coefficient (Kd)[3]	Half life[4]	Commercial Compliance Target	Residential Compliance Target
Units	**mg/kg**	**mg/kg**	**(cm^3/cm^3)**	**(-)**	**l/kg**	**Days**	**mg/l**	**mg/l**
Inorganic Metals and Metalloids								
Arsenic	11,469	2,533	1	-	134	1.00E+99	85.352	18.851
Cadmium	331	73	1	-	776	1.00E+99	0.426	0.094
Chromium	42,699	9,431	1	-	5,336	1.00E+99	8.002	1.767
Copper	2,042	451	1	-	1,199	1.00E+99	1.703	0.376
Iron	1,379,516	304,690	1	-	810	1.00E+99	1,702.328	375.989
Lead	71,246	15,736	1	-	34,877	1.00E+99	2.043	0.451
Manganese	150,836	33,315	1	-	720	1.00E+99	209.386	46.247
Mercury	596	132	1	-	5,000	1.00E+99	0.119	0.026
Nickel	52,109	11,509	1	-	7,652	1.00E+99	6.810	1.504
Selenium	3,178	702	1	-	186	1.00E+99	17.051	3.767
Vanadium	7,271	1,606	1	-	213	1.00E+99	34.076	7.527
Zinc	622,690	137,532	1	-	33,558	1.00E+99	18.555	4.098
Other Inorganics								
Ammoniacal Nitrogen	699	154	1	-	1	1,095[5]	510.284	112.379
Cyanide	9	2	1	-	5	15[6]	1.702	0.372
Organics								
Benzene	17	4	0.182	27	1	720	17.081	3.769
Toluene	582	128	0.221	178	4	28	125.920	27.716
Ethylbenzene	364	80	0.300	432	10	228	34.051	7.492
Xylene	336	74	0.220	260	6	365	51.113	11.27

Determinand	Commercial RL Soil re-use criteria[1]	Residential RL Soil re-use criteria[2]	Henry's Law Constant (H)[3]	Soil Organic Carbon-Water Partitioning Coefficient (koc)[3]	Solid/Liquid Partition Coefficient (Kd)[3]	Half life[4]	Commercial Compliance Target	Residential Compliance Target
Units	**mg/kg**	**mg/kg**	**(cm^3/cm^3)**	**(-)**	**l/kg**	**Days**	**mg/l**	**mg/l**
Phenol	14	3	0.000068	29	1	28	13.063	2.836
TPH Criteria Working Group								
TPH Aliphatic C5-C6	331	73	33	794	19	8	16.989	3.752
TPH Aliphatic C6-C8	1,626	359	50	3,981	95	8	17.029	3.759
TPH Aliphatic C8-C10	12,861	2,841	80	31,623	755	8	17.021	3.760
TPH Aliphatic C10-C12	102,089	22,548	120	25,1189	5,996	365	17.024	3.760
TPH Aliphatic C12-C16	2,036,743	449,851	520	501,1872	119,643	730	17.023	3.760
TPH Aliphatic C16-C21	256,407,138	56,632,055	4,900	630,957,344	15,062,116	1.00E+99	17.023	3.760
TPH Aliphatic C21-C35	256,407,138	56,632,055	4,900	630,957,344	15,062,116	1.00E+99	17.023	3.760
TPH Aliphatic C35-C44	256,407,138	56,632,055	4,900	630,957,344	15,062,116	1.00E+99	17.023	3.760
TPH Aromatic C5-C7	39	9	0.230	79	2	730	16.269	3.589
TPH Aromatic C7-C8	802	177	0.270	251	6	28	125.878	27.79
TPH Aromatic C8-C10	650	144	0.480	1,585	38	365	16.949	3.753
TPH Aromatic C10-C12	1,027	227	0.140	2,512	60	258	17.013	3.760
TPH Aromatic C12-C16	2,043	451	0.0500	5,012	120	800	16.973	3.747
TPH Aromatic C16-C21	6,447	1,424	0.0100	15,849	378	120	17.039	3.764
TPH Aromatic C21-C35	51,166	11,301	0.000670	125,893	3,005	1,059	17.025	3.760
TPH Aromatic C35-C44	51,166	11,301	0.000670	125,893	3,005	1.00E+99	17.025	3.760
TPH Aromatic C40-C44	51,166	11,301	0.000670	125,893	3,005	1.00E+99	17.025	3.760
Polyaromatic Hydrocarbons								
Acenaphthene	76	17	0.00490	18,621	445	204	0.170	0.0375

Determinand	Commercial RL Soil re-use criteria[1]	Residential RL Soil re-use criteria[2]	Henry's Law Constant (H)[3]	Soil Organic Carbon-Water Partitioning Coefficient (koc)[3]	Solid/Liquid Partition Coefficient (Kd)[3]	Half life[4]	Commercial Compliance Target	Residential Compliance Target
Units	mg/kg	mg/kg	(cm^3/cm^3)	(-)	l/kg	Days	mg/l	mg/l
Acenaphthylene	135	30	0.00340	33,113	791	120	0.170	0.0379
Anthracene	155	34	0.00160	38,019	908	920	0.170	0.0374
Benzo(a)anthracene	2,748	607	0.000240	676,083	16,139	1,360	0.170	0.0376
Benzo(a)pyrene	156	34	0.0000190	426,580	10,183	2,120	0.0153	0.00334
Benzo(b)fluoranthene	15	3	0.000200	2,238,721	53,442	1,219	0.000289	0.0000636
Benzo(k)fluoranthene	23	5	0.0000340	3,311,311	79,047	4,280	0.000289	0.0000645
Benzo(g,h,i)perylene	60	13	0.0000300	8,709,636	207,915	1,300	0.000289	0.0000625
Chrysene	2,812	621	0.0000260	691,831	16,515	2,000	0.170	0.0376
Di-benz(a,h)anthracene	3,793	838	0.000000600	933,254	22,279	1,880	0.170	0.0376
Indeno(1,2,3-cd)pyrene	115	25	0.0000660	16,595,869	396,174	1,460	0.000289	0.0000631
Fluoranthene	30	7	0.000420	117,490	2,805	880	0.0107	0.00235
Fluorene	123	27	0.00320	30,200	721	120	0.170	0.0374
Naphthalene	124	27	0.0170	1,514	36	258	3.417	0.742
Phenanthrene	123	27	0.00130	30,200	721	402	0.170	0.0374
Pyrene	346	76	0.000370	85,114	2,032	3,796	0.170	0.0374

[1] Rodgers Leask (2019-22); [2] H Fraser Consulting (2024); [3] Rodgers Leask (2019-22), Appendix; [4] Howard et al. (1991); [5] Buss et al. (2004); [6] WFD UK Technical Advisory Group

3.3 Results

The RTM spreadsheet model can be applied to one contaminant and one transport distance at a time. With 59 contaminants and three distances, and different SRVs for the residential and commercial sites, the total number of models that were required for this report is therefore 354. The resulting reference values are given in Section 4. Appendix A provides the summarised outputs of the RTM assessments in more detail.

In both Section 4 and Appendix A, for each contaminant the remedial soil target is given at a distance of 12.5 m, 37.5 m, and 62.5 m from the compliance point. Two reference tables have been produced, one for the commercial site, and one for the residential site.

Some examples of the RTM spreadsheet calculations are provided electronically in Appendix B.

3.4 Statistical methodology

A summary of the general statistical methods referred to in the methodology is given here.

Box plots and histograms are used to present the range of data visually. Box plots show the minimum value of the data set, the range of data falling between the 25th and 75th percentile, the mean value and the maximum value. They are useful to visually assess whether the data points are evenly distributed throughout the range. Histograms show the data distributed by the number of data points within specific ranges and are useful for identifying the distribution of data across the range, and for identifying whether higher values are common or rare in the data set.

The 95th percentile of a dataset is the highest value in a set of data after removing the top 5% of values. Referred to in this report as the "95%ile".

For any data set, there is uncertainty associated with the estimate of the mean value; a conservative assessment of the mean value can be made by calculating a 95 % Upper Confidence Limit (UCL) in the mean. This will be done using Student's t-distribution method, which is appropriate for distributions with a small number of samples. The 95% upper confidence limit (UCL) is a probability statement that indicates a 95% confidence that the true population mean is less than or equal to the calculated UCL. This report refers to the 95% upper confidence limit in the mean value as "UCLmean".

For each 25x25 m backfill zone the UCLmean will be calculated by taking the average stockpile value for each 300 mm layer, and the average of any surface verification samples (taken from the top 100 mm) falling within that backfill zone. An overall weighted average and UCLmean will then be calculated for that whole soil profile in each backfill zone, with the layer and surface verification samples weighted by thickness (300 mm for each layer and 100 mm for the surface verification samples).

3.5 Summary of the approach

Generic modelling reference tables are developed in the next section, so that modelling is not required for each individual phase – rather the recorded values for each CoC can be checked against the reference tables.

Reference values in the tables are given for specific distances.

For each of the remaining site phases the following methodology will be implemented.

1. The 95%ile of all analytical results across the entire phase area (including stockpile and surface verification samples) will be calculated for all contaminants identified in the site-wide Remediation Strategy. These contaminants are as listed in Table 2.1.
2. The 95%ile value will be screened against the SRVs (Table 2.1). Any exceedances will be shortlisted as Contaminants of Concern (CoCs) for this phase and further assessment will be carried out.
3. Some CoCs are shown by the reference tables to have such slow travel times that they will not travel 12.5 m in the 1,000-year assessment period. These are marked "no impact" in the reference tables and they will be eliminated from the CoC shortlist.
4. For each remaining shortlisted CoC a thorough statistical and spatial analysis will be carried out. This will include the following:
    - Presentation of the entire data set as a box plot;
    - Presentation of the entire data set as a histogram; and
    - Spatial assessment of the data, with an average concentration and UCLmean concentration calculated for each 25x25 m backfill zone.
5. The UCLmean concentration for each 25x25 m backfill zone will be compared to the 12.5 m reference values. If any of the backfill zones exceed the reference values for 12.5 m, the UCLmean will be compared to the 37.5 m and the 62.5 m reference values tables as appropriate given the distance of the backfill zone from the nearest reen.

Table 4.1 and Table 4.2 in the following section set out the reference values for the residential and commercial parts of the site respectively. If any backfill zones are found to fail the relevant reference value checks, contingency actions will be required, as discussed in Section 3.6.

3.6 Contingency actions

Failure of backfilled soils to meet the appropriate reference values will require additional contingency action. Any such eventualities would need to be agreed on a case-by-case basis, since the appropriate actions may be different in each case.

The first contingency action would therefore be for the site owner to propose and for NRW to agree the appropriate work, given the specific circumstances of the failure. Appropriate works are likely to include one or more from the following list:

- further monitoring actions and additional soils testing to more closely define the soils in question;
- isolation of a volume of soils deemed to have failed the criteria;
- excavation and replacement of soils deemed to have failed the criteria; and
- installation of flow barriers (such as low permeability clays) to appropriately lengthen the flow pathway from such a source area to the reen system.

3.7 Validation of drainage layer

The Rogers Leask SRVs (and hence the new reference values in this report) were derived assuming that 60% of infiltration is intercepted by a drainage layer above the engineered fill. It is therefore important that the presence of a drainage layer comprising clean granular material (e.g. 6F5 or Type 1) is evidenced as follows:

- Materials import receipts including description of the materials
- Photographic evidence of the extent of the materials (e.g. aerial photographs)
- Photographic evidence of the type and depth of the materials on a 75 m x 75 m grid

The sequencing of site works is such that the drainage layer will be placed post-commencement of construction works, and will therefore need to be validated separately from the engineered fill materials.

3.8 Validation of hydraulic conductivity

The Rogers Leask SRVs assume that there is a sufficient contrast between the hydraulic conductivity of the drainage layer (high) and the engineered fill (low) that most of the infiltration travels laterally through the drainage layer. The calculations do not however specify a value for hydraulic conductivity. The reference values derived in this report assume a hydraulic conductivity of 1×10^{-6} m/d or less for the engineered fill.

It is proposed that the hydraulic conductivity of the fill is validated by taking at least three hydraulic conductivity measurements per phase, with a guide density of one test per 6.25 ha.

3.9 Groundwater sampling

Provided that there are sufficient soil samples available to have confidence in the quality of the soils materials, it is not considered necessary to provide groundwater sampling data to support discharge of PC28. [5]

[5] Note that groundwater monitoring may be required to support an application to discharge PC29, or to support an application for an environmental permit to discharge water from the reens to the wider environment. However, that is outside the scope of this report and will be dealt with separately.

4 REFERENCE TABLES FOR CONTAMINANTS OF CONCERN

In these tables the reference values shown are for comparison with UCLMean calculated soil concentrations in backfill zones at Glan Llyn.

Where a cell shows "No impact", the RTM spreadsheet predicts that the contaminant will not travel the indicated distance within the modelled time frame. (Where this occurs it results from a combination of the slow groundwater velocity, the degradation of the contaminant and its retardation (sorption) within the fill material.)

Other cell values show the remedial target for soil, calculated by the spreadsheet to meet the agreed soil reuse value at the reen margin. Where a cell shows ">1E+06" this means that the remedial target calculated is greater than 10^6 mg/kg, which cannot plausibly be reached.

4.1 Residential

Table 4.1 Residential phase reference tables, by distance from reen

	Remedial Target (Residential) mg/kg		
Contaminant	12.5 m	37.5 m	62.5 m
Metals and metalloids			
Arsenic	>1E+06	No impact	No impact
Cadmium	No impact	No impact	No impact
Chromium	No impact	No impact	No impact
Copper	No impact	No impact	No impact
Iron	No impact	No impact	No impact
Lead	No impact	No impact	No impact
Manganese	No impact	No impact	No impact
Mercury	No impact	No impact	No impact
Nickel	No impact	No impact	No impact
Selenium	>1E+06	No impact	No impact
Vanadium	No impact	No impact	No impact
Zinc	No impact	No impact	No impact
Other inorganics			
Ammoniacal Nitrogen	260.0	872.3	3,322
Cyanide	>1E+06	>1E+06	>1E+06
Organics			
Benzene	8.271	40.68	207.7
Ethylbenzene	703.5	20,947	466,939
Phenol	109,647	>1E+06	>1E+06
Toluene	>1E+06	>1E+06	>1E+06
Xylene	313.7	3,777	38,464
Petroleum hydrocarbons			
TPH Aliphatic C5-C6	>1E+06	>1E+06	>1E+06
TPH Aliphatic C6-C8	>1E+06	>1E+06	>1E+06
TPH Aliphatic C8-C10	No impact	No impact	No impact
TPH Aliphatic C10-C12	No impact	No impact	No impact
TPH Aliphatic C12-C16	No impact	No impact	No impact
TPH Aliphatic C16-C21	No impact	No impact	No impact
TPH Aliphatic C21-C35	No impact	No impact	No impact

Contaminant	Remedial Target (Residential) mg/kg		
	12.5 m	37.5 m	62.5 m
TPH Aliphatic C35-C44	No impact	No impact	No impact
TPH Aromatic C5-C7	18.32	88.80	448.6
TPH Aromatic C7-C8	>1E+06	>1E+06	>1E+06
TPH Aromatic C8-C10	1,558	>1E+06	>1E+06
TPH Aromatic C10-C12	17,730	>1E+06	No impact
TPH Aromatic C12-C16	>1E+06	No impact	No impact
TPH Aromatic C16-C21	No impact	No impact	No impact
TPH Aromatic C21-C35	No impact	No impact	No impact
TPH Aromatic C35-C44	No impact	No impact	No impact
TPH Aromatic C40-C44	No impact	No impact	No impact
Polyaromatic hydrocarbons			
Acenaphthene	No impact	No impact	No impact
Acenaphthylene	No impact	No impact	No impact
Anthracene	No impact	No impact	No impact
Benzo(a)anthracene	No impact	No impact	No impact
Benzo(a)pyrene	No impact	No impact	No impact
Benzo(b)fluoranthene	No impact	No impact	No impact
Benzo(g,h,i)perylene	No impact	No impact	No impact
Benzo(k)fluoranthene	No impact	No impact	No impact
Chrysene	No impact	No impact	No impact
Di-benz(a,h)anthracene	No impact	No impact	No impact
Fluoranthene	No impact	No impact	No impact
Fluorene	No impact	No impact	No impact
Indeno(1,2,3-cd)pyrene	No impact	No impact	No impact
Naphthalene	366.6	895,675	>1E+06
Phenanthrene	No impact	No impact	No impact
Pyrene	No impact	No impact	No impact

4.2 Commercial

Table 4.2 Commercial phase reference tables, by distance from reen

Contaminant	Remedial Target (Commercial) mg/kg		
	12.5 m	37.5 m	62.5 m
Metals and metalloids			
Arsenic	>1E+06	No impact	No impact
Cadmium	No impact	No impact	No impact
Chromium	No impact	No impact	No impact
Copper	No impact	No impact	No impact
Iron	No impact	No impact	No impact
Lead	No impact	No impact	No impact
Manganese	No impact	No impact	No impact
Mercury	No impact	No impact	No impact
Nickel	No impact	No impact	No impact
Selenium	>1E+06	No impact	No impact

Contaminant	Remedial Target (Commercial) mg/kg		
	12.5 m	37.5 m	62.5 m
Vanadium	No impact	No impact	No impact
Zinc	No impact	No impact	No impact
Other inorganics			
Ammoniacal Nitrogen	1,181	3,961	15,084
Cyanide	>1E+06	>1E+06	>1E+06
Organics			
Benzene	37.48	184.3	941.3
Toluene	>1E+06	>1E+06	>1E+06
Ethylbenzene	3,197	95,209	>1E+06
Xylene	1,423	17,137	174,505
Phenol	504,959	>1E+06	>1E+06
Petroleum hydrocarbons			
TPH Aliphatic C5-C6	>1E+06	>1E+06	>1E+06
TPH Aliphatic C6-C8	>1E+06	>1E+06	>1E+06
TPH Aliphatic C8-C10	No impact	No impact	No impact
TPH Aliphatic C10-C12	No impact	No impact	No impact
TPH Aliphatic C12-C16	No impact	No impact	No impact
TPH Aliphatic C16-C21	No impact	No impact	No impact
TPH Aliphatic C21-C35	No impact	No impact	No impact
TPH Aliphatic C35-C44	No impact	No impact	No impact
TPH Aromatic C5-C7	83.04	402.5	2,034
TPH Aromatic C7-C8	>1E+06	>1E+06	>1E+06
TPH Aromatic C8-C10	7,035	>1E+06	>1E+06
TPH Aromatic C10-C12	80,215	>1E+06	No impact
TPH Aromatic C12-C16	>1E+06	No impact	No impact
TPH Aromatic C16-C21	No impact	No impact	No impact
TPH Aromatic C21-C35	No impact	No impact	No impact
TPH Aromatic C35-C44	No impact	No impact	No impact
TPH Aromatic C40-C44	No impact	No impact	No impact
Polyaromatic hydrocarbons			
Acenaphthene	No impact	No impact	No impact
Acenaphthylene	No impact	No impact	No impact
Anthracene	No impact	No impact	No impact
Benzo(a)anthracene	No impact	No impact	No impact
Benzo(a)pyrene	No impact	No impact	No impact
Benzo(b)fluoranthene	No impact	No impact	No impact
Benzo(k)fluoranthene	No impact	No impact	No impact
Benzo(g,h,i)perylene	No impact	No impact	No impact
Chrysene	No impact	No impact	No impact
Di-benz(a,h)anthracene	No impact	No impact	No impact
Fluoranthene	No impact	No impact	No impact
Fluorene	No impact	No impact	No impact
Indeno(1,2,3-cd)pyrene	No impact	No impact	No impact
Naphthalene	1,687	>1E+06	>1E+06
Phenanthrene	No impact	No impact	No impact

Contaminant	Remedial Target (Commercial) mg/kg		
	12.5 m	37.5 m	62.5 m
Pyrene	No impact	No impact	No impact

5 VALIDATION REPORT AND DISCHARGE OF PLANNING CONDITION 28

It is proposed that, for each Phase, the discharge of PC28 is split into two parts as follows.

5.1 Discharge of PC28 Part 1

A validation report is to be submitted to demonstrate the quality of the engineered fill materials to include:

- Description of remediation activities
- Summary of soil movements (tickets for import and export of materials to be provided if relevant)
- Presentation of soils validation data (laboratory certificates and summary tables)
- Screening against RL SRVs to identify CoCs
- Statistical assessment and screening against reference values for CoCs
- Presentation of hydraulic conductivity data for the engineered fill

5.2 Discharge of PC28 Part 2

A validation report is to be submitted to demonstrate the presence, thickness and nature of the drainage layer, to include:

- A description of the works undertaken
- Materials import receipts including description of the materials (typically 6F2 or Type 1 materials)
- Photographic evidence of the extent of the materials (e.g. aerial photographs)
- Photographic evidence of the type and depth of the materials on a 75 m x 75 m grid (or finer grid as appropriate for the size of the plot)

6 REFERENCES

Atkins, 2017, Glan Llyn, Llanwern: Llanwern Controlled Waters Detailed Quantitative Risk Assessment.

Buss, SR, Herbert, AW, Morgan, P et al, 2004. A review of ammonium attenuation in soil and groundwater. *QJEG v 37.*

Environment Agency, 2006. Remedial Targets Methodology: hydrogeological risk assessment for land contamination.

HFCL, 2024. Glan Llyn, Llanwern: soil quality verification. Correction to calculated re-use criteria for soils at Glan Llyn (residential).

Howard, PH, Boethling, RS, Jarvis, WF, Meylan, WM and Michalenko, EM, 1991. Handbook of environmental degradation rates.

Rodgers Leask, 2019-2022: Glan Llyn Llanwern Sitewide: Controlled Waters DQRA 2019 Update.

Rodgers Leask, 2017: Glan Llyn surface water drainage strategy.

APPENDIX A

RTM modelling spreadsheet outputs (electronic)

APPENDIX B

Example RTM spreadsheets (electronic)

Appendix F – Glan Llyn Validation Plan

RLRE Consulting Engineers

Glan Llyn, Newport

Human Health and Controlled Waters Validation Plan

Glan Llyn, Newport

Human Health & Controlled Waters

Validation Plan

For

Brighton STM Developments Limited

DATE: May 2026

REV: P01

18669-RLL-26-XX-RP-O-0841

Document Reference & Control

Project Name:	**Glan Llyn, Newport**
Project Reference:	**P18-669**
Report Title:	**Human Health and Controlled Waters Validation Plan**
Client:	**Brighton STM Developments Limited**
Document Reference:	**18669-RLL-26-XX-RP-O-0841**
Report Status:	**Final**

Approval Status	Name & Position
Prepared by:	Aimee Meredith-Smith Geo-Environmental Consultant
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3rd party review by:	Joe Gomme Associate Director, H F Consulting
Approved by:	Howel Morris Director

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P01	May 2026	First Issue

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- **Appendix D**: RLL, CWDQRA Validation Plan.
- **Appendix E**: H Fraser Consulting, Glan Llyn: Soils Validation Strategy for Protection of Controlled Waters.
- **Appendix F**: RLL, Glan Llyn Remediation Strategy.
- **Appendix G**: RLL, Glan Llyn, Remediation Strategy Addendum Information.

1.0 Introduction

1.1. Terms of Reference

This note has been prepared by Rodgers Leask Limited (RLL) on behalf of and for the benefit of Brighton STM Developments Limited (BSTMDL) to provide information pertaining to human health and controlled waters validation on the Glan Llyn Development (herein referred to as the Site). The Site location plan is shown on RLL Drawing 18669-RLL-22-XX-DR-O-0262, included in **Appendix A**.

In July 2024 the Client, St Modwen Developments were rebranded to be called Revantage Real Estate, then Brighton STM Developments Limited. Any reference to the previous company names in this report should be referred to accordingly.

The site is large and has a complex history of investigation and assessment. This report acts as a signposting document for previous reports prepared to specify both the remediation and validation works required to facilitate the proposed development and mitigate identified potential risks to human health and controlled waters.

1.2. Purpose

This report has been prepared to support information presented pursuant to the discharge of Planning Condition 27 of the Outline Planning Permission Reference 06/0471 for the proposed development of residential development phases as part of a wider mixed-use development at Llanwern, Newport.

Planning Condition 27 states the following:

"(27) Prior to the commencement of each phase of development as defined by Condition 03 (or at such other date or stage in development or for such specified activities or works as may be agreed in writing with the Local Planning Authority), the following components of a scheme to deal with the risks associated with contamination relating to that phase or activity shall each be submitted to and approved, in writing, by the Local Planning Authority:

(1) A preliminary risk assessment which has identified:

(a) all previous uses;

(b) potential contaminants associated with those uses;

(c) a conceptual model of the site indicating sources, pathways and receptors;
(d) potentially unacceptable risks arising from contamination at the site.

(2) A site investigation scheme, based on (1) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site.

(3) The site investigation results and the detailed risk assessment (2) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken.

(4) A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in (3) are complete and identifying any requirements for longer term monitoring of pollutant linkages, maintenance and arrangements for contingency action. Any changes to these components require the express consent of the Local Planning Authority.

Reason: To ensure that the proposed development will not cause pollution of the environment or harm to human health."

The scope of this report is detailed in Section 1.3 below. It is considered that this report supports the reporting requirements for Condition 27 part 3 and part 4. Part 1 and part 2 will have been addressed in phase-specific Desk Study & Ground Investigation Reporting.

1.3. Objectives

The objective of this document is to outline the validation plan for residential phases within the Glan Llyn development. The validation works will aim to facilitate the proposed development and confirm that the identified potential risks to human health and controlled waters have been mitigated.

Information within this document has, on previous phases, been submitted within phase specific Remediation Strategies and phase specific Controlled Waters Detailed Quantitative Risk Assessments. Following recent PC27 submissions it was requested, by Natural Resources Wales (NRW), that details of the Validation Plan be summarised within one document and phase specific reporting to refer to one individual Validation Plan.

This report summarises the validation plan for both human health and controlled waters and appends the supporting documents, so that all relevant information is available in one place.

1.4. Reference Reports

Validation proposals have been based on the following sources of information, which should be referred to alongside the information in this report:

- RLL, Updated Controlled Waters Detailed Quantitative Risk Assessment, Glan Llyn, ref. 18669-RLE-19-RP-O-0006, dated August 2019 (**Appendix B**).
- Atkins, Glan Llyn, Newport - Engineering Measures to Reduce Permeability & Infiltration, ref. 5111373-LLA-OUT-0256, dated December 2016 (**Appendix C**).
- RLL, CWDQRA Validation Plan, ref. 18669-RLL-22-XX-RP-O-0260, dated June 2022 (**Appendix D**);
- H Fraser Consulting, Glan Llyn: Soils Validation Strategy for Protection of Controlled Waters, ref. 30937 R2, dated December 2024 (**Appendix E**).
- RLL, Glan Llyn Remediation Strategy, ref. 18669-RLL-21-XX-RP-O-0157, dated July 2022 (**Appendix F**); and
- RLL, Glan Llyn, Remediation Strategy Addendum Information, ref. 18669-RLL-22-XX-RP-O-0192, dated January 2022 (**Appendix G**).

1.5. Limitations and Confidentiality

All conclusions and recommendations made within this report are based on and limited to the factual information. No responsibility can be taken by RLL for information obtained by third parties and it has been assumed that all third-party information provided is true and correct.

No liability can be accepted for conditions not revealed within the exploratory holes or pits undertaken. The exploratory points cover only a small portion of the total Site area. RLL has, where necessary, undertaken extrapolation between locations and no responsibility can be taken for different conditions which may occur between locations.

RLL has undertaken the work in accordance with our understanding of current best practice at the time of undertaking the report. Further assessment and revision of the report may be required should new information come to light or legislation/ changes to best practice be introduced after the date of issue of the report. RLL has prepared the report for the sole use and reliance of the Client. The report may not be used or relied upon by any unauthorised third party without the explicit written agreement of RLL.

The work undertaken within this report remains the intellectual property of RLL and must not be divulged to any commercial third party without the prior written agreement of RLL.

2.0 Protection of Controlled Waters

The following reports should be referred to in relation to protection of controlled waters in the final development:

- RLL, Updated Controlled Waters Detailed Quantitative Risk Assessment, Glan Llyn, ref. 18669-RLE-19-RP-O-0006, dated August 2019 (**Appendix B**);
- Atkins, Glan Llyn, Newport - Engineering Measures to Reduce Permeability & Infiltration, ref. 5111373-LLA-OUT-0256, dated December 2016 (**Appendix C**);
- RLL, CWDQRA Validation Plan, ref. 18669-RLL-22-XX-RP-O-0260, dated June 2022 (**Appendix D**); and
- H Fraser Consulting, Glan Llyn: Soils Validation Strategy for Protection of Controlled Waters, ref. 30937 R2, dated December 2024 (**Appendix E**).

2.1. RLL CWDQRA Summary

In 2019, RLL prepared a Controlled Waters Detailed Quantitative Risk Assessment (CWDQRA) for the wider Glan Llyn development site (**Appendix B**). This assessment incorporated a comprehensive dataset of concentrations of contamination recorded in soils across the development, and included data taken from the 2018 investigations within the Site. Screening analysis of soil, soil leachate, groundwater and surface water data revealed potential moderate to low levels of inorganic and organic contamination present onsite in line with contaminants associated with former steelworks sites. Made Ground comprising clayey sandy gravels with local slag, burnt shale, tarmac, concrete, brick and mudstone was found to be a potential source of contamination. Calculation of representative re-use criteria for a commercial end use was undertaken using a dilution assessment methodology based on the site-wide water balance, incorporating site specific permeability and infiltration parameters. No allowance was made for dilution of discharged waters within Monks' Ditch itself as part of this calculation as, this being the receptor, it is proposed that the water quality in this Controlled Water be maintained (as far as possible) at EQS values.

Comparison of the re-use criteria against available soil chemical testing established that much of the Made Ground was likely to be suitable for re-use onsite, however, localised source materials existed containing higher concentrations of contamination (particularly elevated concentrations of iron, manganese and vanadium), and ammoniacal and cyanide components, may require remediation, or offsite disposal.

Further modelling of these contaminants was undertaken using Remedial Target Methodology (RTM) to assess the potential extent of attenuation of these specific determinands within the ground where these soils may be placed, with the receiving surface waters being assumed to be existing blueways (reens), which were considered as the Compliance Points. The compliance point for the Business Park is at the pumping station and will require an enacted permit for discharge to occur.

Initial modelling was carried out by Atkins (Glan Llyn, Llanwern Controlled Waters Detailed Quantitative Risk Assessment dated February 2017), with this approach being adopted within later revisions of this Report in the Rodgers Leask, Controlled Waters Detailed Quantitative Risk Assessment, Glan Llyn (sitewide) Update (2019). Modelling used the Equation presented in the EA Table 5.2 – soil-water partitioning of the EA Remedial Targets Methodology Guidance (2006) where a pore-water concentration (Cp) was determined from soil concentration analyses to derive soil reuse criteria at the site as a whole. Subsequently, to gauge the potential distance that re-engineered Made Ground could be placed from the respective Compliance Point(s), further modelling was carried out for specific determinands using the EA RT Excel Worksheets, based on maximum and average soils concentrations determined within samples of re-engineered Made Ground and available site derived data.

2.2. Atkins, Engineering Measures to Reduce Permeability & Infiltration

Atkins prepared the Engineering Measures to Reduce Permeability & Infiltration Technical Note (**Appendix C**) in 2016, the note presented the engineering capability of the Made Ground on the site.

The Technical Note discussed how the reduction in permeability and infiltration would be achieved by reducing the permeability of the shallow Made Ground soils by excavation and re-compaction, and providing a fall across its upper surface; as well as the placement of an overlying granular material to create a preferential pathway to minimise the potential for infiltration of precipitation into the underlying re-engineered Made Ground.

The reduction in the permeability of the re-engineered Made Ground was proposed reduce the flow of groundwater through the Made Ground. This was intended to have the benefit of increasing the proportion of intercepted rainwater against water infiltrating through the Made Ground within the surface water drainage system. Thus, the surface water quality within the reens at the perimeters of the development plots would be improved.

The report outlined that the re-engineering of the plots will form a stable platform with a fall from the centre to the periphery, and the materials used

will produce a preferential pathway. Based on soakaway tests carried out in the re-engineered Made Ground, and the results of Particle Size Distribution (PSD) laboratory tests carried out on the material, the site won re-engineered Made Ground within the plots is assessed as having a permeability of approximately 1 x 10^{-7} m/s (i.e. poor permeability).

The overlying gravel layer to be placed above the re-engineered Made Ground is expected to have a permeability of 1 x10^{-3} m/s (good) based on the values for a material on the boundary between a clean gravel and a clean sand.

The reduced permeability of the Made Ground dramatically increases the transport time of the rainwater through the material, in contrast, a large volume of intercepted rainwater can reach the surface water reen system rapidly via the storm water drainage system.

2.3. RLL, CWDQRA Validation Plan

Technical Note 260, ref. 18669-RLL-22-XX-RP-O-0260 (**Appendix D**) presents a validation plan to assess the hydraulic conductivity of the reengineered Made Ground, as assumed within the CWDQRA. The note presented the use of earthworks compaction information alongside formation falling head tests and falling and rising head tests in boreholes, to assess the hydraulic conductivity of the reengineered Made Ground.

The report also incorporates the requirement for construction materials/ a piling mat with the suitable permeability characteristics in accordance with the CWDQRA & Remediation Strategy.

Earthworks Testing

The earthworks validation reports, prepared on a phase-by-phase basis, present test results to characterise the Made Ground and standard results for compaction and air voids validating that the compaction requirements have been achieved. It is considered helpful, as a line of evidence to support the poor drainage characterisation of the reengineered material, to undertake falling head tests, and where possible rising head tests, upon and within the reengineered material.

Formation Falling Head Tests

The formation falling head tests were proposed to be undertaken using a cylinder to hold a head of water against the formation surface.

Whilst the dimensions of the falling head test are not compliant with BRE Soakaway test, the monitoring and assessment will be undertaken in accordance with the BRE. The standard dimensions of the BRE Soakaway test would damage the formation and potentially be influenced by the underlying clay.

Falling and Rising Head Tests

Falling and rising head tests will be undertaken on shallow monitoring wells installed, following the earthworks, in the reengineered Made Ground. Up to 8 shallow monitoring locations will be installed in each phase.

Drainage Layer Above Made Ground

The CWDQRA describes the permeability of piling mat post construction. This (or similar material) provides the required drainage layer. The validation report shall include, as part of the developer obligations, confirmation or verification of construction material/ piling mat with the suitable permeability characteristics in accordance with the CWDQRA & Remediation Strategy.

2.4. HFCL, Glan Llyn: Soils Validation Strategy for Protection of Controlled Waters

Following queries from Natural Resources Wales (NRW), H Fraser Consulting Limited (HFCL) were commissioned by RLL to assist with NRW liaison and reporting pursuant to the discharge of PC28. Following discussion with NRW, RLL and the developer, HFCL prepared a revised methodology for the validation of soils in relation to the protection of controlled waters.

The assessment included standardised presentation of statistical data for potential contaminants of concern; and distance-specific remedial targets that model the attenuation of contaminants in the saturated zone allowing for advection, dispersion, retardation and decay during transport. In addition to the inclusion of distance-specific remedial targets, further statistical and spatial analysis was carried out on contaminants of concern.

More detail is provided in the HFCL Glan Llyn: Soils Validation Strategy for the Protection of Controlled Waters (30937 R2) (**Appendix E**).

3.0 Protection of Human Health

3.1. General

The following reports should be referred to in relation to risk to Human Health in the final development:

- RLL, Glan Llyn Remediation Strategy, ref. 18669-RLL-21-XX-RP-O-0157, dated July 2022 (**Appendix F**);
- RLL, Glan Llyn, Remediation Strategy Addendum Information, ref. 18669-RLL-22-XX-RP-O-0192, January 2022 (**Appendix G**)

3.2. Remediation Strategy

Summary

Based on the results of the previous ground investigations and CWDQRA, the approved sitewide Remediation Strategy (**Appendix F**) highlighted the key requirements for the remediation of the Site. These include the removal of significant sources of contamination, below ground obstructions and re-engineering of near-surface Made Ground to reduce infiltration for the protection of surface waters; and installation of a clean cover system for the protection of human health.

Remediation shall be confirmed using the methodology presented in the Validation of Remediation of Land Contamination - Science Report SC030114/R1 (Environment Agency, 2010).

A Validation Report shall be prepared on completion of the works. The Validation Report will be submitted to the Local Planning Authority pursuant to the discharge of relevant planning conditions.

Post-remediation ground gas/ vapour monitoring will be required to further zone the Site with regard to the required gas/ vapour protection measures.

Remediation Specification

The sequence of deliverables listed below is proposed:

- Materials Management Plan to enable the movement and re-use of excavated and stockpiled materials in accordance with the limitations set out in this document.

- Removal of vegetation.
- Excavation and turnover of Made Ground to natural clay and removal of unsuitable material and buried obstructions.
- Treatment or offsite disposal of impacted soils (where required).
- Chemical and geotechnical validation of the placement of material following turnover.
- Post remediation ground gas and vapour assessment.
- Preparation of a Remediation Validation Report.
- Regulator liaison and submission pursuant to the discharge of relevant planning conditions.
- Onward housebuilder obligations to include:
    a. Placement and validation of a clean cover system (where required).
    b. Provision and validation of appropriate gas/ vapour membranes in buildings (where required).
    c. Designing of appropriate concrete for aggressive ground.
    d. Installation of appropriate chemical resistant water pipes.

Protection of Human Health

The remedial criteria adopted for the clean cover system at the Site are based on S4ULs (suitable for use levels) and C4SLs (category 4 screening levels) for a residential end use with plant uptake.

It is likely that human exposure to contaminants during the operational phase of the development will be restricted to inhalation of dust and dermal contact/ ingestion of contaminants within gardens, public open spaces and soil adhering to home grown produce. Risks to human health may be mitigated through either excavation of the contaminants, provision of clean cover, or construction of hardstanding (or a combination of these); this is intended to prevent exposure to these contaminants and thus break the pollutant linkages.

The overall philosophy for remediation of the Site with regards to protection of human health is therefore severance of linkage pathways, by means of the removal of significant sources of contamination from the sub-surface and installation of a clean cover system or hardstanding in order to provide a safe development platform. This includes a turnover strategy as part of the earthworks. Additional measures, such as the provision of clean cover, soil-gas protection, water pipe protection etc, are then to be provided by the future housebuilder.

3.3. Remediation Strategy Addendum Information (Technical Note 0192)

Technical Note 0192, ref. 18669-RLL-22-XX-RP-O-0192 (**Appendix G**), presents additional information relating to the Remediation Strategy and sets out the process adopted to collect additional validation information to assess the contamination status of the formation surface.

The following points were addressed within the Technical Note, raised by Newport City Council as comments on the Remediation Strategy:

1. Pictorial versions of the earthworks process intended to enhance the conceptual site model (CSM) for the residential part of the development were presented.
2. Explanation of the removal of unsuitable material from the residential phases and the turnover and placement of retained suitable Made Ground in 300mm layers in relation to gas and vapour.
3. Presentation of the proposal to undertake surface validation testing to comply with the recommended testing frequency but also provide information to assess the contamination status of the formation surface.
4. Discussion relating to the clean cover system in POS areas, also requiring 600mm clean cover.
5. Presentation of the developer & housebuilder actions

3.4. Onward Developer Actions

A Validation Report of the remediation shall be prepared and submitted to the regulatory authorities pursuant to the discharge of planning conditions with respect to contaminated land. The Validation Report shall provide information on the works undertaken together with the supporting information and required onward mitigation measures (i.e. clean cover and ground gas membranes).

The following actions are deferred to the developer:

- Undertaking required remediation excavation works including buried obstruction removal;
- Treatment or offsite disposal of impacted soils (where required);
- Chemical and geotechnical validation of the turnover;
- Non-targeted grid validation sampling at a frequency of 1 sample per 500m3 of placed material;
- Delineation and validation of the base and sides of hotspot excavations;
- Delineation and surveying of obstructions / deeper areas of Made Ground encountered;

- Post remediation ground gas and vapour assessment;
- Preparation of a Remediation Validation Report; and
- Regulator liaison and submission pursuant to the discharge of relevant planning conditions.

3.5. Onward Housebuilder Actions

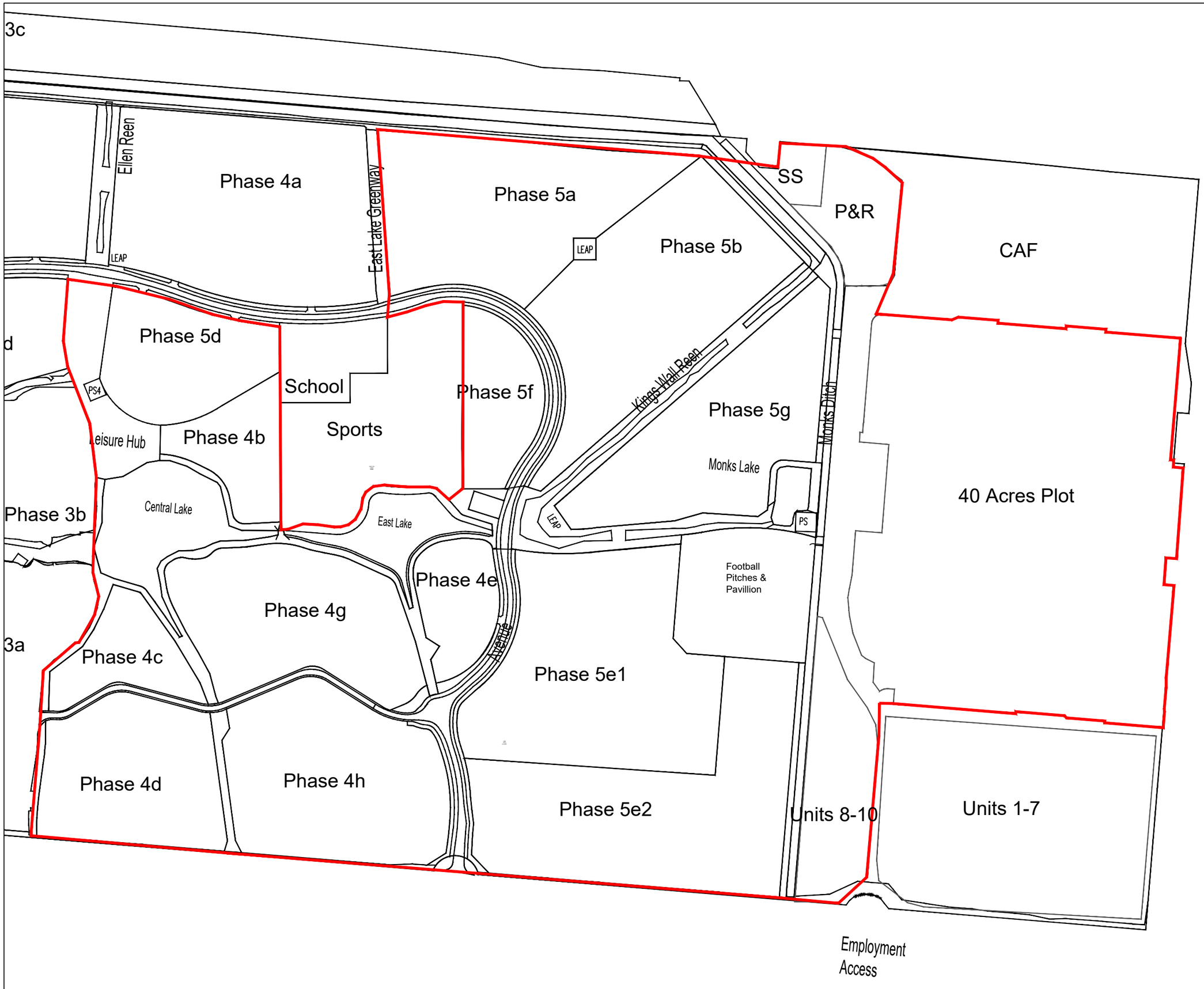
The following actions are deferred to the onward housebuilder:

- Placement of a clean cover system (600mm), construction materials (including piling mat), soils in residential gardens and areas of public open space as part of the overall development;
- Confirmation or verification of construction material/ piling mat with the suitable permeability characteristics in accordance with the CWDQRA & Remediation Strategy;
- Validation of the thickness and chemical composition of soils placed in gardens (as part of the clean cover system) in accordance with NHBC (or equivalent housing insurer) recommendations; and
- Provision of appropriate gas/ vapour membranes in buildings and validation in accordance with BS: 8485:2015+A1:2019 and CIRIA C735, if necessary.

Appendices

Appendix A

Drawings



GENERAL NOTES

NO DIMENSIONS TO BE SCALED OFF THIS DRAWING.

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S AND ENGINEER'S DRAWINGS.

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

ALL LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.

ANY DISCREPANCIES NOTED ON SITE ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY.

KEY:

- REMEDIATION STRATEGY BOUNDARY
- PHASE BOUNDARIES

Rev	Date	Amendments	By	Chk
A	03:05:22	Updated Boundary	SR	CW

Client

St Modwen Developments

Project

P18-669 Llanwern Reclamation

Drawing Title

Remediation Strategy Boundary Plan

INFORMATION

	Drawn	Checked	Date
NTS	SR	CW	27.04.22

Drawing No. — Rev.

18669-RLL-22-XX-DR-O-0262 A

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Appendix B:

RLL, Updated Controlled Waters Detailed Quantitative Risk Assessment

INCLUDED PRIOR

Appendix C:

Atkins, Glan Llyn, Newport - Engineering Measures to Reduce Permeability & Infiltration.

Technical Note

ATKINS

Subject:	Glan Llyn, Newport - Engineering Measures to Reduce Permeability & Infiltration		
Reference:	5111373-LLA-OUT-0256	**Revision:**	-
Author:	Howel Morris	**Checker:**	Chris Wilson
Issued to:	Craig Tidyman (Prosurv)	**Reviewer:**	Mark Williams
Date:	15th December 2016	**Authoriser:**	Howel Morris

Introduction

The Made Ground within the Glan Llyn site is generally compliant with residential, open space and commercial human health soil screening criteria. It is recognised that human health criteria is not intended to protect controlled waters but this note has been prepared to support the re-engineering of the onsite Made Ground material as a remediation measure in order to support parameters adopted within the Controlled Water Risk Assessment (Ref.1 5111373-OUT-RPT-0275). This is to be achieved by reducing the permeability of the shallow Made Ground soils by excavation and re-compaction, and providing a fall across its upper surface; as well as the placement of an overlying granular material to create a preferential pathway to minimise the potential for infiltration of precipitation into the underlying re-engineered Made Ground. The reduction in the permeability of the re-engineered Made Ground will attenuate the flow of precipitation through the Made Ground. This will have the intended benefit of increasing the volume intercepted rainwater against water infiltrating through the Made Ground within the surface water drainage system. Thus improving the surface water quality within the reens at the perimeters of the development plots.

It is worth noting that the re-use criteria developed within the CWRA report are protective of the surface water quality in the event that the full annual amount of water infiltrated and intercepted by the site be discharged to the reen system instantaneously. This technical note has been prepared to record the rationale of the chosen values for the permeability parameters used within the Controlled Waters Risk Assessment.

Site Permeability

The interception rates (where precipitation is intercepted by various development surfaces and flows into the surface water drainage system) and infiltration rates (where precipitation infiltrates through permeable gardens or landscaped areas into the underlying material) have been based on the figures provided in the drainage strategy prepared by Rodgers Leask (Rodgers Leask, 2016. Site Wide Surface Water Drainage Strategy Addendum for St Modwen Ltd. Rev 4 D12/084). The report provides figures for impermeable areas within the residential land and when this is compared with the total residential area a ratio of 60:40 is produced in favour of interception. The residential area includes all ancillary land including roads, landscaping features, drainage features, gardens and parks. The commercial area produces a ratio of 90:10 in favour of interception. The ratio provided within the drainage strategy does not account for the permeability of the percentage listed as permeable.

The respective adopted permeable values of 40% and 10% assume free draining material where the precipitation may freely percolate through the underlying materials. However, there are a number of factors resulting from the re-engineering of the development plots that significantly reduce the potential for infiltration of precipitation into the underlying Made Ground. The specification for the re-engineering of the Made Ground (Ref.2 5111373-LLA-OUT-225 Guidance for the Reuse of Made Ground Containing Slag, Dec 2016) requires compaction to a minimum 95% of maximum dry density and a minimum 5% CBR at finished levels to be achieved. The re-engineering of the plots into a stable platform with a fall from the centre to the periphery, and the materials used, will produce a preferential pathway. Based on soakaway tests carried out in the re-engineered Made Ground, and the results of Particle Size Distribution (PSD) laboratory tests carried out on the material, the site won re-engineered Made Ground within the plots is assessed as having a permeability of approximately 1 x 10^{-7} m/s (i.e. poor permeability). The properties of the re-engineered Made Ground are shown in Table 1 below.

Table 1: Properties of the Re-engineered Made Ground

Made Ground	PSD No./ Average	BRE Soakaway Test Result	Adopted Permeability(k)
Test 1	102 No./ 11% fines, 22% sand, 62% gravel, 5% cobbles	Fell 4mm in 3hrs	1 x 10^{-7} m/s
Test 2		Fell 20mm in 2hrs	1 x 10^{-7} m/s

* Unable to calculate an infiltration rate as the amount of infiltration was minimal during the test period indicating low permeability.

The PSD test samples were taken from existing stockpiles of site-won material. The soakaway tests were carried out on a re-engineered development plot within the site using typical stockpiled site-won Made Ground. The permeability of the re-engineered Made Ground was based on the values included within Soil Mechanics Principles & Practice, 3rd Edition, Table 3.3 (Ref.3) for a material with poor drainage characteristics.

The overlying gravel layer to be placed above the re-engineered Made Ground is expected to have a permeability of 1 x10^{-3} m/s (good) based on the values for a material on the boundary between a clean gravel and a clean sand provided in Soil Mechanics Principles & Practice, 3rd Edition, Table 3.3 (Ref.3).

The permeability will be validated on a plot by plot basis by undertaking soakaway tests. The designed fall at the top of the re-engineered Made Ground will promote flow within the more permeable granular layer and the infiltrated water will seek the course of least resistance, potentially flowing within the layer until it daylights at the reens at the periphery of the plot.

Landscaping/ Drainage & Public Open Space

The green areas of the site (including landscaped areas, parks & gardens) have been included within the permeable ratio for the residential areas. The green areas will have a minimum subsoil thickness of 450mm and in this region of south Wales red marl is a readily available subsoil which has already been used in some areas of the Glan Llyn development and which has a low permeability. The reduced permeability of areas assumed to allow free downward migration of rain water will further reduce the volume of rainwater able to infiltrate the re-engineered Made Ground. It is considered that a placed / un-compacted marl will have a permeability of 1 x 10^{-8} m/s, consistent with a stratified clay material (Ref.3). The reduced permeability of the green areas will also help improve the water quality within the drainage system.

Conclusion

The reduction in the permeability of the re-engineered Made Ground is intended to further improve surface water quality by attenuating the flow of infiltrated precipitation through the material. The reduced permeability of the Made Ground dramatically increases the transport time of the rainwater through the material, in contrast, a large volume of intercepted rainwater is able to reach the surface water reen system rapidly via the storm water drainage system. Therefore it is anticipated that the composition of surface waters will be dominated by intercepted clean rainwater. In reality, the large volume of intercepted precipitation and contrasting low volume of infiltrated seepage entering the reens annually will contribute to further improving water quality in a system already designed to maintain a compliant water quality within the surface water reens of the development.

References

1. 5111373-LLA-OUT- 0275, Glan Llyn, Site Wide Controlled Water Risk Assessment Atkins, December 2016.
2. 5111373-LLA-OUT-225 Guidance for the Reuse of Made Ground Containing Slag, Atkins, December 2016.
3. Soil Mechanics Principles & Practice, 3rd Edition, September 2010 (by G.E.Barnes).

Appendix D:

RLL, CWDQRA Validation Plan.

Technical Note

Project:	P18-669 Glan Llyn, Newport
Subject:	CWDQRA Validation Plan
Date:	June 2022
Document Reference:	18669-RLL-22-XX-RP-O-0260
Prepared by	Chris Wilson BSc (Hons) MCIWEM
Reviewed by	Howel Morris BSc (Hons) MSc CGeol FGS

A site wide Remediation Strategy was submitted by Rodgers Leask Limited (RLL) in November 2021 for the Glan Llyn development in Newport pursuant to the sitewide discharge of part of condition 27 of the outline planning approval 06/0471. Natural Resources Wales (NRW) reviewed the strategy and the appended updated controlled water detailed quantitative risk assessment (CWDQRA). A meeting was held with NRW on 20th April 2022 and following the meeting RLL has prepared this CWDQRA validation plan to verify that material with contaminants of concern exceeding the criteria are placed at the appropriate distance from a surface water, to assess whether the hydraulic conductivity and the pore water chemical concentrations within the reengineered material are as assumed in the CWDQRA. This note provides the method to collect and assess the CWDQRA validation information as an addendum to the remediation strategy and also presents a number of points as a continency plan.

Contaminants of Concern Validation

The updated CWDQRA identified some exceedances for concentrations of contaminants of concern (CoC) in relation to a 20m compliance distance. A further assessment has shown material recording concentrations exceeding the 20m compliance criteria for the CoC is suitable when placed at a distance of greater than 30m from the compliance point. The phase specific validation report will show that material with CoC exceeding the 20m compliance criteria has been placed at a suitable distance i.e. greater than 30m.

Hydraulic Conductivity Validation

The updated CWDQRA recognises the benefits of excavating and reengineering the made ground on the permeability of the material. The earthworks validation report presents test results characterising the made ground and standard results for compaction and air voids validating that the compaction requirements have been achieved. It is considered helpful, as a line of evidence to support the poor drainage characterisation of the reengineered material, to undertake falling head tests, and where possible rising head tests, upon and within the reengineered material.

The formation falling head tests are to be undertaken using a cylinder to hold a head of water against the formation surface. Approximately 10 falling head tests will be undertaken per phase or a minimum of 1 test per 100m^2. Whilst the dimensions of the falling head test are not

complaint with BRE Soakaway test, the monitoring and assessment will be undertaken in accordance with the BRE. The standard dimensions of the BRE Soakaway test would damage the formation and potentially be influenced by the underlying clay.

The falling and rising head tests will be undertaken on the shallow monitoring wells installed, following the earthworks, in the reengineered made ground. Up to 8 shallow monitoring locations will be installed in each phase.

The CWDQRA describes the permeability of piling mat post construction. The validation report shall include, as part of the developer obligations, confirmation or verification of construction material/ piling mat with the suitable permeability characteristics in accordance with the CWDQRA & Remediation Strategy.

Pore Water Concentration Assessment

The updated DQCWRA assumed pore water concentrations as shown in Table 1.

Table 1. Calculated Pore-water Concentrations for Contaminants of Concern (CoC) Modelled in P20 Remedial Target Worksheets

Determinands	**Calculated Porewater Concentrations (mg/l) based upon laboratory derived totals soil concentrations (mg/kg) and 1806 (No.) Soil Samples**		
	Average	Upper 95 % Percentile	Maximum
Iron	113.57	314.67	2949.27
Manganese	12.00	44.70	566.00
Vanadium	0.97	3.01	13.498
Benzo(a)pyrene	2.85E-4	0.00113	0.07
Benzo(b)fluoranthene	0.0767	0.28	20.77
Naphthalene	0.231	0.165	128.68

It is intended, as part of the validation, to then compare the field chemical concentrations with the pore water concentrations adopted within the CWDQRA. This will only be possible where perched water is encountered. Where water is present within the shallow monitoring wells the sample will be collected using a peristaltic (low flow) pump.

The monitoring locations, the positions of the formation surface tests falling head tests, the results and the assessment of the results will be presented in the validation report for each phase.

Following validation of the earthworks to achieve the formation surface, it is proposed that a limited number of monitoring wells are retained (approximately 30% or 3 per phase) or

installed in landscaping areas. The validation report for each phase will contain specific information on how this will be achieved. This will allow long-term monitoring of the perched water post construction and build on a sitewide dataset of perched water quality.

Contingency Plan

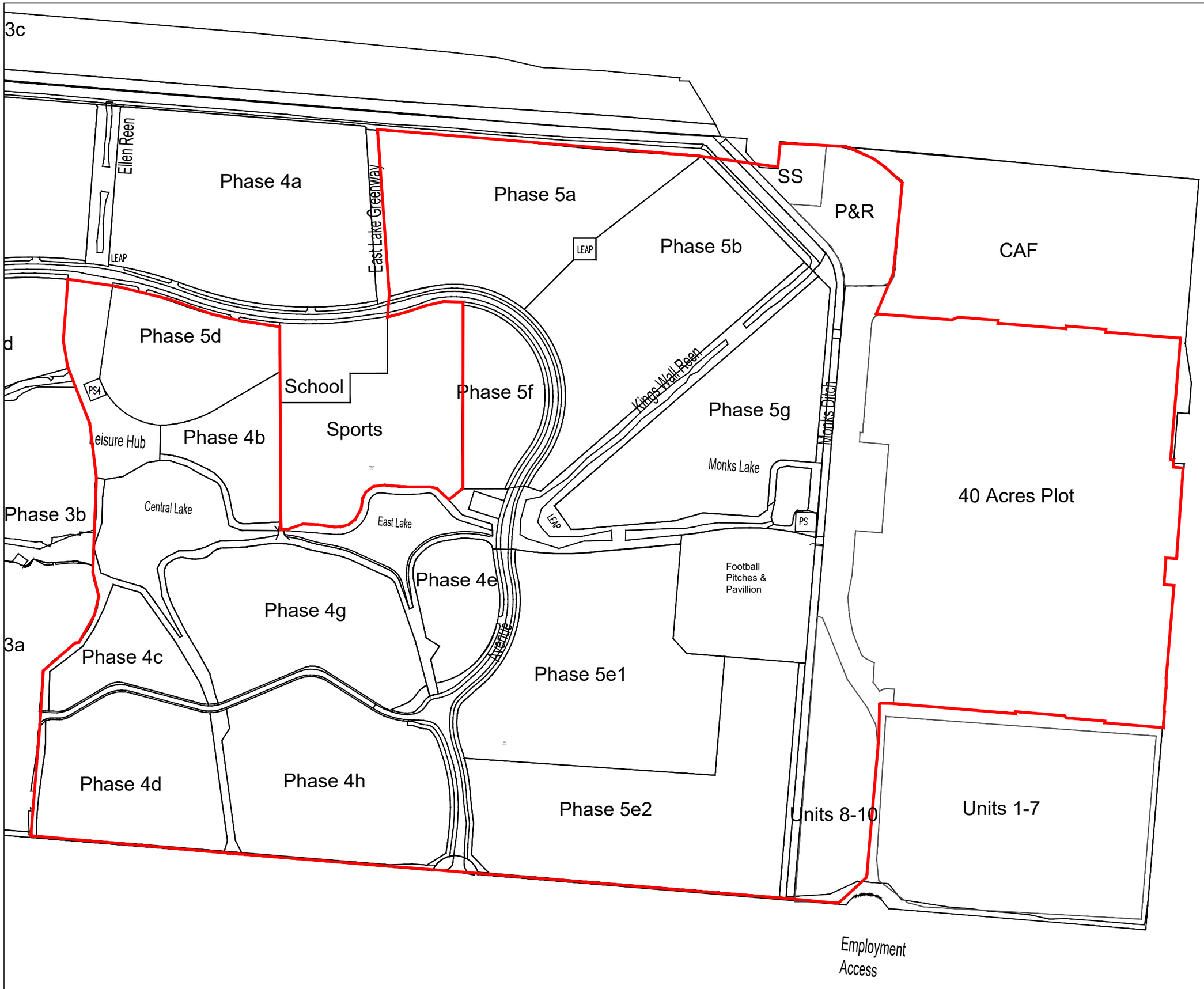
The validation assessment will also, where appropriate, compare results from adjacent phases and site wide monitoring results as part of the validation assessment. The creation of baseline set of data for the site, through the accumulation of results from individual phases, to support the maintenance of suitable site wide surface water quality. The comparison of phase specific information and sitewide information may also be used as contingency where soil concentrations exceed criteria or pore water concentrations exceed modelled parameters but monitoring indicates suitable sitewide conditions.

The CWDQRA also considers that there is a potential for natural attenuation benefits from further improving the existing surface water features on the site, which mainly comprise reens and ponds/small lakes. This is anticipated particularly through:

1. Further establishing the vegetation within the reens which will help reduce the concentrations of organic contaminants and particularly nutrients such as ammoniacal nitrogen. The reens are known to vegetate rapidly and require regular maintenance to remove surplus growth;

2. Undertaking organic matter enrichment of soils along margins of the reens and ponds/lakes into which water penetrating the Made Ground are likely to discharge. This could be undertaken by placement of locally excavated peat (obtained from Alluvial and underlying Tidal Flat Deposits) and other soils containing high concentrations of organic matter. This should enable a further stripping out of low concentrations of PAHs and TPH within these discharge waters. Amendment of these soils with other materials will also be considered, taking into consideration further knowledge of the residual contaminant profile, in order to provide a passive sustainable solution to the long-term remediation of this site.

The preliminary validation plan for Phase 4h is attached to this note as an example of the typical layout of post earthworks validation sampling and monitoring locations for a residential phase.



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KEY:

- REMEDIATION STRATEGY BOUNDARY
- PHASE BOUNDARIES

Rev	Date	Amendments	By	Chk
A	03:05:22	Updated Boundary	SR	CW

Client

St Modwen Developments

Project

P18-669 Llanwern Reclamation

Drawing Title

Remediation Strategy Boundary Plan

INFORMATION

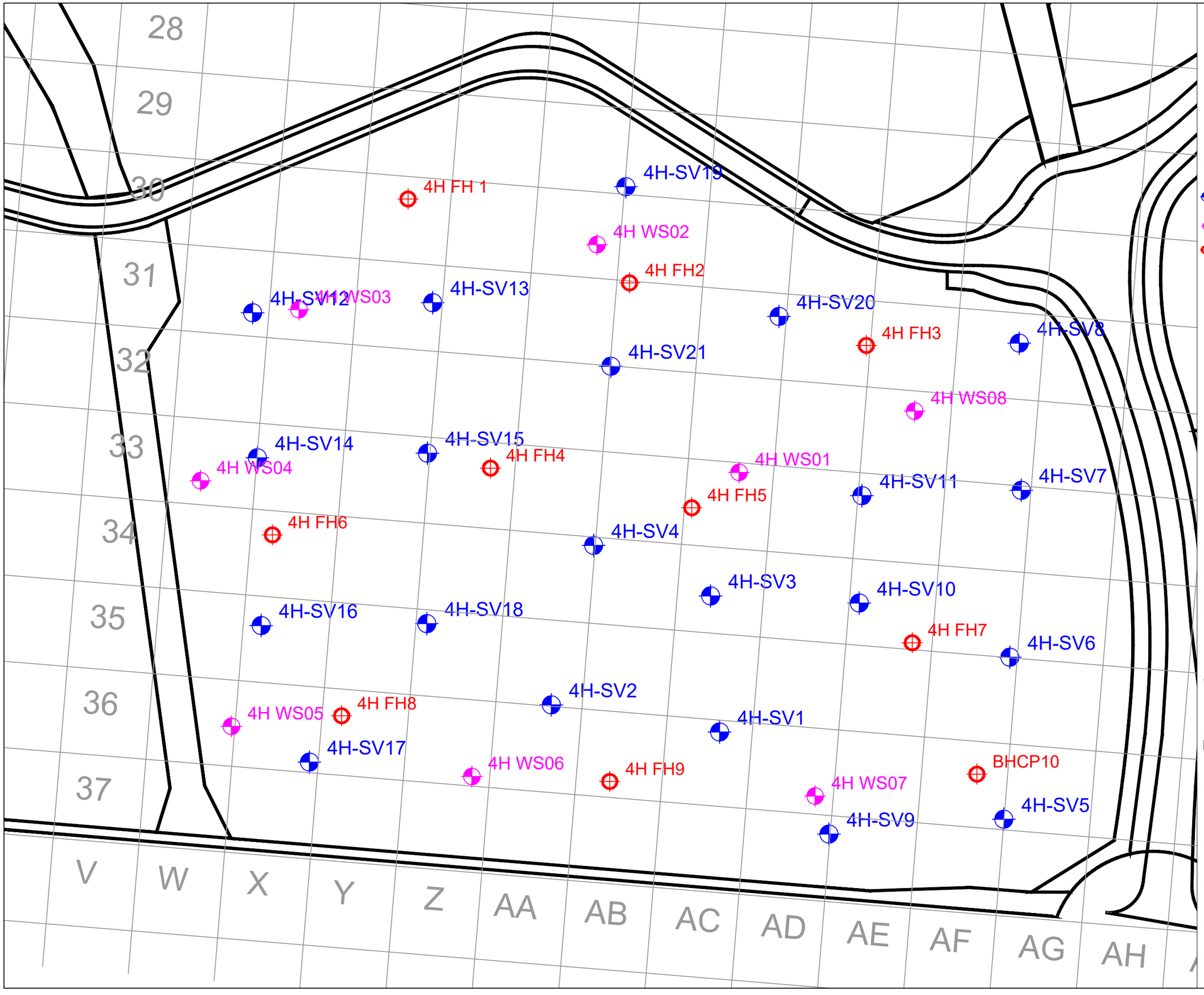
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KEY:

- 4H-SV — SURFACE VALIDATION CHEMICAL SAMPLE LOCATION
- 4H WS08 — WINDOW SAMPLE LOCATION FOR GAS AND PERCHED WATER MONITORING
- 4H FH3 — FALLING HEAD TEST LOCATION

Rev	Date	Amendments	By	Chk

Client

St Modwen Developments

Project

P18-669 Llanwern Reclamation

Drawing Title

Phase 4H Validation Plan

INFORMATION

	Drawn	Checked	Date
NTS	SR	CW	27.04.22

Drawing No. — Rev.

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Appendix E:

H Fraser Consulting, Glan Llyn: Soils Validation Strategy for Protection of Controlled Waters.

H Fraser Consulting
Contaminated Land and Hydrogeology

Glan Llyn: Soils validation strategy for protection of controlled waters

Prepared for: Rodgers Leask Ltd
Seven House, 18 High Street,
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Date: 17/12/2024
Status: FINAL
Reference: 30937 R2
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Version History

Version	Author	Approved by	Issue date	Comment
30937 R2D1	Xenia Boyes	Joe Gomme	05/11/2024	Draft report issued to client
30937 R2D2	Xenia Boyes	Joe Gomme	12/11/2024	Draft report issued to NRW and client
30937 R2	Xenia Boyes	Joe Gomme	17/12/2024	Final report issued to client

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APPENDICES

Appendix A RTM modelling spreadsheet outputs (electronic)

Appendix B Example RTM spreadsheets (electronic)

1. BACKGROUND

Glan Llyn is a major residential and commercial development in Llanwern, South Wales, on the site of a former steelworks. Planning permission for the development includes planning conditions PC27 and PC28, which relate to the remediation strategy for the on-site soils and the validation of the remediation once achieved.

The initial risk assessment and remediation strategy report was produced by Atkins (2017) and this was subsequently updated by Rodgers Leask (2019-22), as described in Section 2. These documents have been accepted as satisfying PC27 for a number of development phases that are already completed or are currently being developed. Recent efforts to satisfy the requirements of PC28, which relate to the validation of the soil quality following remediation, for the protection of controlled waters, have been subject to considerable discussion with the regulator, NRW, and the planning authority, Newport City Council.

Recent meetings and discussion involving H Fraser Consulting Ltd (HFCL) resulted in agreement in principle on a revised approach to validation reporting, with regard to protection of controlled waters.

1.1 Objective

The objective of this report is to present the revised approach referred to above. This will provide a standard methodology and reference for all future phase validations and thus enable validation to proceed efficiently for all parties.

1.2 Scope of report

The report summarises the remediation work and validation at Glan Llyn to date (Section 2) and presents the updated approach and methodology (Section 3). Section 4 contains reference tables for contaminants of concern, to be applied to validation of soil quality in future validation reporting.

Additional planning conditions related to surface water are not part of the scope of this validation strategy.

This report considers only the elements of the remediation that relate to protection of controlled waters; elements of the remediation strategy that protect human health receptors (for example, placement of vapour membranes) are outside the scope of this report.

2 REMEDIATION WORKS AND VALIDATION TO DATE

2.1 Remediation strategy

The agreed remediation strategy and risk assessment for controlled waters at the site is detailed in Rodgers Leask (2019-22). The remediation strategy is briefly summarised here.

The remediation comprises excavation of Made Ground materials, removal of materials unsuitable for re-use in the development platform, and re-compaction of suitable Made Ground materials as an engineered fill. A drainage layer, formed as part of the normal construction phase, will then be installed above the engineered fill layer, to reduce infiltration to the Made Ground.

The Site has been divided into two strategies broadly responding to the division of the site between residential use and commercial use, referred to as the 'Full Turnover Specification' and the 'One Metre Turnover Specification'. The Full Turnover Specification comprises the excavation of Made Ground to a depth where the natural underlying Tidal Flat Deposits are exposed before a minimum of 2 m of suitable material is placed and reengineered. The One Meter Turnover Specification requires a trim and chase process excavating material to a depth minimum of 5.3 m aOD before approximately 2 m of suitable material is placed and reengineered to a formation level of 7.25 m aOD. Practical measures to identify, remove and validate the absence of gross contamination and known and potential obstructions extending below 5.3 m aOD shall be undertaken.

Several phases of trial pitting have been undertaken across the Site to assess and characterise the Made Ground for suitability for reuse. Material present within the proposed residential area that exceeds residential soil re-use values shall be transferred and re-used in the commercial phase of the development. Where material is not suitable for either a residential or commercial end use, the material will either be treated to allow re-use on site (at the supervising engineers discretion), or arrangements made for off-site disposal.

The remediation work and development are proceeding in phases as shown in Figure 2.1 for the residential area, and Figure 2.2 for the commercial area.



Figure 2.1 Residential phases

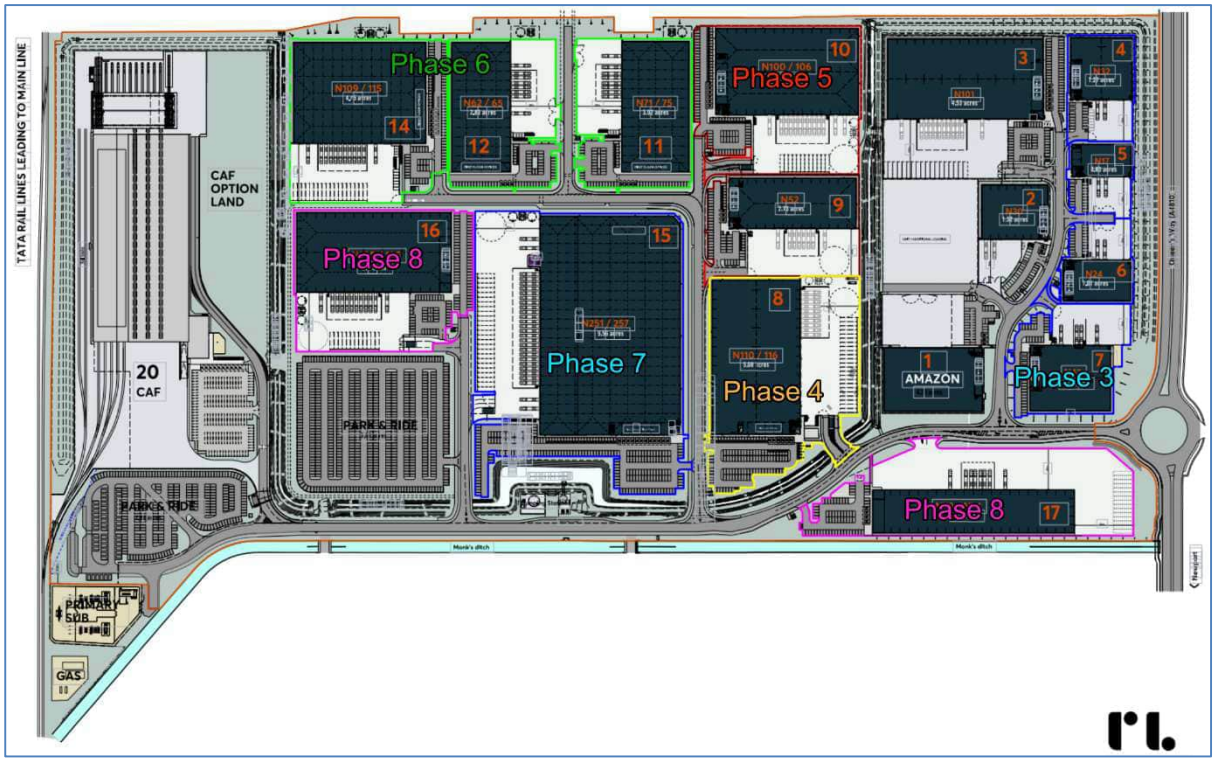


Figure 2.2 Commercial phases

Two planning conditions apply to the site remediation work.

- PC27 requires that, prior to commencement of each phase of development, a risk assessment, remediation strategy and verification plan are submitted to and approved in writing by the Local Authority.
- PC28 requires that prior to commencement of each phase of development (excluding works required for the remediation strategy) a verification report is submitted to and approved in writing by the Local Authority, to demonstrate completion of the remediation strategy and the effectiveness of the remediation.

The site is drained by a number of deep drainage ditches, referred to as reens. Soil re-use values (SRVs) for the protection of controlled waters were derived by Atkins and amended by Rodgers Leask, assuming the following conceptual model.

- 60% of the residential site surface and 95% of the commercial site surface is impermeable. 100% of incident rainfall on impermeable areas either evaporates or is routed via the drainage system directly to the reens.
- 40% of the residential site and 5% of the commercial site has soft landscaping. In these areas infiltration was calculated as 12.85 mm/a, by subtracting evapotranspiration and runoff from the total rainfall figure. Runoff from these areas also passes to the reens.
- 12.85 mm/a infiltrates the drainage layer overlying the engineered fill.
- In the soft landscaping areas, 60% of infiltration drains laterally through the drainage layer into a reen and does not enter the engineered fill.
- 40% of infiltration drains into the engineered fill and migrates through the fill to a reen, dissolving potential contaminants from the fill materials.
- The infiltration that travels through the fill is diluted on reaching the reens by runoff and infiltration through the drainage layer. The relative fluxes of water passing through the fill to clean runoff provides the dilution factor.
- SRVs are calculated by multiplying the Environmental Quality Standard (EQS) by the dilution factor and converting this water concentration into a soil concentration using a partition co-efficient.

This approach was set out originally by Atkins (2017), modified by Rogers Leask (2019-22) and approved by the Local Authority under discharge of PC27 for a number of development phases. The commercial area and the residential area have different remedial targets due to the different ratio of soft landscaping to hardstanding.

Soils re-use values (SRVs) were set out in Rogers Leask (2019-22). A minor update to correct an error in calculation for the residential area was provided by HFCL (2024). The SRVs are reproduced here in Table 2.1.

Table 2.1 Agreed soil re-use values (SRVs)

Determinand	Soil re-use values (mg/kg)	
	Commercial area	Residential area[1]
Inorganic Metals and Metalloids		
Arsenic	1.15E+4	2533
Cadmium	331	73.0
Chromium	4.27E+4	9431
Copper	2042	451
Iron	1.38E+6	3.05E+5
Lead	7.12E+4	1.57E+4
Manganese	1.51E+5	3.33E+4
Mercury	596	132
Nickel	5.21E+4	1.15E+4
Selenium	3178	702
Vanadium	7271	1606
Zinc	6.23E+5	1.38E+5
Other Inorganics		
Ammoniacal Nitrogen	699	154
Cyanide	9.14	2.02
Organics		
Benzene	17.2	3.80
Toluene	582	128
Ethylbenzene	364	80.0
Xylene	336	74.0
Phenol	13.8	3.05
TPH Criteria Working Group		
Aliphatics >C5-C6	331	73.0
Aliphatics >C6-C8	1626	359
Aliphatics >C8-C10	1.29E+4	2841
Aliphatics >C10-C12	1.02E+5	2.25E+4
Aliphatics >C12-C16	2.04E+6	4.50E+5
Aliphatics >C16-C21	2.56E+8	5.66E+7
Aliphatics >C21-C35	2.56E+8	5.66E+7
Aliphatics >C35-C44	2.56E+8	5.66E+7
Aromatics >EC5-EC7	38.5	8.51
Aromatics >EC7-EC8	802	177
Aromatics >EC8-EC10	650	144
Aromatics >EC10-EC12	1027	227
Aromatics >EC12-EC16	2043	451
Aromatics >EC16-EC21	6447	1424
Aromatics >EC21-EC35	5.12E+4	1.13E+4
Aromatics >EC35-EC44	5.12E+4	1.13E+4
Aromatics >EC40-EC44	5.12E+4	1.13E+4
Polyaromatic Hydrocarbons		
Acenaphthylene	75.7	16.7

[1] Updated per H Fraser Consulting 2024; *30937 TN1D1 Glan Llyn, Llanwern: Soil Quality Verification*

Determinand	Soil re-use values (mg/kg)	
	Commercial area	Residential area[1]
Acenaphthene	135	30.0
Anthracene	155	34.0
Benz(a)anthracene	2748	607
Benzo(a)pyrene	156	34.0
Benzo(b)fluoranthene	15.5	3.42
Benzo(k)fluoranthene	22.9	5.05
Benzo(g,h,i)perylene	60.2	13.0
Chrysene	2812	621
Dibenzo(a,h)anthracene	3793	838
Indeno(1,2,3-cd)pyrene	115	25.0
Fluoranthene	30.1	6.64
Fluorene	123	27.0
Naphthalene	124	27.0
Phenanthrene	123	27.0
Pyrene	346	76.0

2.2 Remediation

Remediation has taken place in phases as shown in Figure 2.1 (residential) and Figure 2.2 (commercial). As of October 2024, remediation has been completed across the majority of the site. Remediation has been validated and approved for Phases 1 to 3 of the residential development and Phases 1 to 3 of the commercial development. These phases were remediated and validated under the site model, risk assessment and remediation strategy developed by Atkins (2017), and therefore had different validation requirements to Phase 4 onwards.

The remediation and verification work on each of the phases includes the following:

- Complete excavation of Made Ground materials to the underlying Tidal Flat Deposits in the residential areas and to a depth minimum of 5.3 m aOD in the commercial area;
- Screening and stockpiling of the excavated material;
- Sampling of stockpile materials;
- Removal of material unsuitable for use;
- Subdivision of the site into backfill zones, generally in a 25x25 m grid;
- Placement of engineered fill in 300 mm layers, zone by zone;
- Sampling of surface materials, post-placement, to provide additional verification data.

As noted in Section 2.1, material originating from the site that was unsuitable for use in the residential area was to be re-used on the commercial area (where agreed SRVs are higher) or, if necessary, removed from site. In practice, all excavated material was stockpiled and tested, and the above criterion applied. That is, if testing of stockpiled material showed it to be unsuitable for residential area backfill, it was moved to the commercial area or removed from the site, in accordance with the stipulations of the remediation strategy (Rodgers Leask, 2019-22).

Table 2.2 shows a summary of where each phase is in the remediation and verification process. Table 2.2 also indicates whether the planning conditions for each phase have been discharged, and whether this was in accordance with the Atkins remediation strategy (RS) or the Rogers Leask RS. Note that part of the residential area that was formerly a coking works has been remediated by

Vertase FLI Ltd (Vertase); HFCL has not reviewed the remediation strategy or soil re-use values for this part of the site. The coking works area includes parts of Phases 4A, 4B, 5A and 5D, as well as the proposed school.

Table 2.2 Summary of phase progress

Phase	Remediation works complete	Discharge of planning conditions *	
		PC27	PC28
Residential			
Phase 1	Yes	Atkins RS	Atkins RS
Phase 2	Yes	Atkins RS	Atkins RS
Phase 3	Yes	Atkins RS	Atkins RS
Coking works	Yes	Vertase	Pending
Phase 4A (compound)	Yes	RL RS / Vertase	Pending
Phase 4B	Yes	Pending	Pending
Phase 4C	Yes	RL RS	Pending
Phase 4D	Yes	RL RS, parts 1 and 2	Pending
Phase 4E	Yes	Pending	Pending
Phase 4G	Yes	Pending	Pending
Phase 4H	Yes	RL RS	Pending
Phase 5A	Yes	Pending	Pending
Phase 5B	Yes	Pending	Pending
Phase 5G	Yes	Pending	Pending
Phase 5D	Yes	Pending	Pending
Phase 5E1	Yes	RL RS	Pending
Phase 5E2	Yes	Pending	Pending
Phase 5F	Ongoing	Pending	Pending
Commercial			
Phase 1 (Amazon)	Yes	Atkins RS	Atkins RS
Phase 2 (CAF)	Yes	Atkins RS	Atkins RS
Phase 3 (Units 4-7)	Yes	Atkins RS	Atkins RS
Phase 4 (Unit 8)	Yes	RL RS	Pending
Phase 5 (Units 9-10)	Yes	RL RS	Pending
Phase 6a (Units 11-14)	Yes	RL RS	Pending
Phase 6b (Units 15 and 16)	Yes	RL RS	Pending
Phase 7 (Park and Ride)	Yes	RL RS	Pending
Phase 8 (Unit 17)	Ongoing	Pending	Pending

* "Pending" indicates that the application has not yet been made.

2.3 Soil testing and validation

Soil samples are taken from each stockpile and sent to an accredited laboratory for analysis of the soil re-use determinands as listed in Table 2.1. An average soil concentration is then obtained for each stockpile. During the placement of the engineering fill each 300 mm layer is taken from a specific stockpile. Each stockpile may be used for multiple layers in one backfill zone, or across

multiple zones. Rogers Leask maintains a materials management database, so that there is a record of the soil analytical results for each stockpile and which stockpile was used for each layer in each backfill zone. A variable number of layers is laid down in each zone to achieve the desired ground surface level.

Surface verification samples may be taken upon completion of the engineered fill placement, principally for validation of human health criteria rather than controlled waters.

All samples are sent to an accredited laboratory for analysis of the determinands listed in Table 2.1. It is assumed the surface verification samples are representative of the top 100 mm of soil, since they are taken using a trowel.

Hundreds of soil samples are relevant to each backfill zone, and these can be taken as a group to represent the quality of soils used in the remediation.

A database of all the soil analytical results for each phase is developed. This includes all the surface verification samples taken across the phase, and all soil samples from any stockpiles used in the engineered fill. The 95%ile of all the analytical results is compared to the soil re-use values. Any determinands where the 95%ile exceeds the SRV is taken forward as a Contaminant of Concern (CoC) for that phase.

2.4 Issues arising

During the remediation verification for Phase 4H (residential) and Phases 4 and 5 (Units 8-10, commercial) exceedances of the SRVs were identified for certain parameters in specific areas of backfill during the verification process. It was therefore not possible to validate the remediation in those cases. An updated approach was consequently developed which combined a more detailed statistical analysis and enhanced data presentation, supplemented where needed by contaminant transport modelling. Where data presentation was unable to show that a contaminant presented no risk, modelling was applied to predict the concentration that would reach the surface water receptors. This updated approach allows for advection, dispersion, retardation and decay that act to reduce contaminant concentrations along a transport pathway.

The approach was agreed with NRW for Phase 4H and Units 8-10. This report sets out a streamlined approach to applying the same methodology, which involves the derivation of zoned reference values for all identified contaminants of concern across the site. This updated methodology, which will be applied to verification of future phases, is described in detail in Section 3.

As long as a sufficient number of robust sample analyses is available to represent the backfill material in each phase, the updated approach can be used to provide appropriate validation against the agreed soil criteria, without the need for additional consideration of subsurface water quality within the fill.

The updated SRVs derived by Rodgers Leask depend on the existence of a drainage layer above the fill. The drainage layer needs to be composed of appropriate granular material and evidence of its installation layer will form part of the requirement for the discharge of PC28.

3 UPDATED APPROACH AND METHODOLOGY

The following methodology is recommended for the future phases going forward. This methodology has been developed following discussion with NRW and agreement on the principles to be followed. An overview of the process is given here first, with further clarification of each stage in the following sub-sections.

Distance-specific reference values have been derived using Remedial Targets Methodology spreadsheets (RTM, see Environment Agency, 2006) to model the attenuation of contaminants during transport in the saturated zone. This allows for advection, dispersion, retardation and decay that act to reduce contaminant concentrations along a transport pathway. Reference values have been tabulated for three different travel distances to the compliance point. Comparison of reference values against measured soil concentrations can then determine whether contaminants are expected to reach the receptors at unacceptable concentrations. Full details of the derivation of the reference tables are provided in Sections 3.1 to 3.3.

For each development phase, a screening exercise will be carried out on all the contaminants of concern identified in the site-wide RL Remediation Strategy, as described in Section 3.4. Contaminants of Concern (CoCs) for that phase will be defined as determinands for which the 95%ile of the analytical results from the fill materials exceeded the SRV. (This maintains consistency with previous validation reporting.) The remaining CoCs will then be moved forward for further assessment.

In this further assessment a thorough statistical and spatial analysis will be carried out on the stockpile verification samples for these contaminants. This will include a calculation of the Upper Confidence Limit of the mean (UCLmean) for each backfill zone across the Phase (see Section 3.4). The UCLmean for each backfill area will then be compared to the tabulated reference values.

3.1 Development of reference tables

The agreed SRVs (Rodgers Leask, 2019-22) were calculated assuming that water infiltrates the engineered fill and travels to a reen, where it is then diluted in the volume of runoff across the site. The calculation only allows for dilution in the reen and does not allow for transport processes such as advection, dispersion, retardation and decay that act to reduce contaminant concentrations along a transport pathway. The site drainage strategy (Rodgers Leask, 2017) requires that a minimum depth of 300 mm of water always remains in the reens. This serves various purposes including dilution of groundwater from the Made Ground.

New reference values have now been derived using RTM spreadsheets to model the attenuation of contaminants during transport in the saturated zone. This allows for advection, dispersion, retardation and decay that act to reduce contaminant concentrations along a transport pathway.

Generic modelling reference tables are developed, so that modelling is not required for each individual phase. Instead, the concentration for each CoC in each backfill zone can be checked against the reference tables. Reference values in the tables are given for three specific distances (12.5 m, 37.5 m and 62.5 m)[2].

[2] 12.5 m was selected because it represents the half of the distance across a standard remediation grid square. Grid squares measure 25 m square and were used across most of the Glan Llyn site as backfill zones. 37.5 m represents the distance across one and a half grid squares, i.e. the travel distance from a backfill zone that is one removed from the

The RTM has been used to assess the attenuation of contaminant concentrations through the engineered fill. To do this a 'Level 3' groundwater assessment has been undertaken as follows.

- The target concentration at the compliance point is taken to be the pore water concentration in equilibrium with the previously calculated SRV (Table 2.1). This is representative of the groundwater concentration before dilution at the point of discharge into the reen.
- The source area has been taken as the area of a standard backfill zone (25 m by 25 m).
- A time period of 1,000 years has been used.[3]
- The reference value is calculated as the target soil concentration in equilibrium with the groundwater remedial target taken from the RTM Level 3 groundwater assessment.

Equivalent pore water concentrations for a given soil concentration, and vice versa, are calculated using the equation below.

$$C_p = \frac{C_s}{\left(K_d + \frac{\theta_w + \theta_a H}{\rho}\right)}$$

Where:

C_s = soil concentration (mg/kg)
C_p = pore water concentration (mg/l)
K_d = soil-water partition coefficient (l/kg)
θ_w = water-filled soil porosity (fraction)
θ_a = air-filled soil porosity (fraction)
ρ = bulk density (g/cm^3)
H = Henry's Law constant (dimensionless)

3.2 Input parameters

The model input parameters are shown in Table 3.1 (general parameters) and Table 3.2 (contaminant-specific input parameters). The models were run with no degradation in the sorbed phase (i.e. degradation was only allowed in the dissolved phase), which is a conservative approach.

When considering contaminant degradation, a range of values is usually provided by reference books, dependent on conditions such as the redox state of the environment. In these cases we conservatively assumed the longest given half-life, which usually corresponds to anaerobic conditions.

In general, model input parameters were based on those adopted by Atkins in the earliest derivation of soil re-use values, to provide consistency with previous approaches.

reen. 62.5 m represents the distance across 2 and a half grid squares, i.e. the travel distance from a backfill zone that is two removed from the reen.

[3] One thousand years is considered to represent a reasonably conservative time scale for any impacts to become apparent, and to allow a proportionate approach to contaminants that sorb to the extent that travel times are very long, in accordance with section 5.5 of the Remedial Targets Methodology (Environment Agency, 2006).

Table 3.1 General model parameters

Input parameters	symbol	value	Unit	Source
Plume thickness at source	Sy	1.98	m	Table 2-2 Atkins
Saturated aquifer thickness	da	2.1	m	Table 2-2 Atkins
Bulk density of aquifer materials	r	1.36	g/cm^3	Table 5-3 Atkins
Effective porosity of aquifer	n	0.08	fraction	Table 5.3.1 RL Remediation strategy
Water filled porosity	θ_w	0.5	fraction	Table 5-3 Atkins
Air filled porosity	θ_a	0.0037	fraction	Table 5-3 Atkins
Hydraulic gradient	i	0.0133	fraction	Table 5.3.1 RL Remediation strategy
Hydraulic conductivity of aquifer	K	1.00E-06	m/s	Hydraulic conductivity data given in RL, 2024[4]
Width of plume	S_z	25	m	Size of backfill zone
Distance to compliance point	x	12.5 37.5 62.5	m	
Time since pollutant entered groundwater	t	365,000	days	1,000 years

[4] Rodgers Leask, 2024, Phase 4H, Glan Llyn, Newport, Chemical Validation Report draft. Similar values have been reported from Phase 4A compound and Units 8-10 in the Commercial area.

Table 3.2 Contaminant-specific model parameters

Determinand	Commercial RL Soil re-use criteria[1]	Residential RL Soil re-use criteria[2]	Henry's Law Constant (H)[3]	Soil Organic Carbon-Water Partitioning Coefficient (koc)[3]	Solid/Liquid Partition Coefficient (Kd)[3]	Half life[4]	Commercial Compliance Target	Residential Compliance Target
Units	**mg/kg**	**mg/kg**	**(cm^3/cm^3)**	**(-)**	**l/kg**	**Days**	**mg/l**	**mg/l**
Inorganic Metals and Metalloids								
Arsenic	11,469	2,533	1	-	134	1.00E+99	85.352	18.851
Cadmium	331	73	1	-	776	1.00E+99	0.426	0.094
Chromium	42,699	9,431	1	-	5,336	1.00E+99	8.002	1.767
Copper	2,042	451	1	-	1,199	1.00E+99	1.703	0.376
Iron	1,379,516	304,690	1	-	810	1.00E+99	1,702.328	375.989
Lead	71,246	15,736	1	-	34,877	1.00E+99	2.043	0.451
Manganese	150,836	33,315	1	-	720	1.00E+99	209.386	46.247
Mercury	596	132	1	-	5,000	1.00E+99	0.119	0.026
Nickel	52,109	11,509	1	-	7,652	1.00E+99	6.810	1.504
Selenium	3,178	702	1	-	186	1.00E+99	17.051	3.767
Vanadium	7,271	1,606	1	-	213	1.00E+99	34.076	7.527
Zinc	622,690	137,532	1	-	33,558	1.00E+99	18.555	4.098
Other Inorganics								
Ammoniacal Nitrogen	699	154	1	-	1	1,095[5]	510.284	112.379
Cyanide	9	2	1	-	5	15[6]	1.702	0.372
Organics								
Benzene	17	4	0.182	27	1	720	17.081	3.769
Toluene	582	128	0.221	178	4	28	125.920	27.716
Ethylbenzene	364	80	0.300	432	10	228	34.051	7.492
Xylene	336	74	0.220	260	6	365	51.113	11.27

Determinand	Commercial RL Soil re-use criteria[1]	Residential RL Soil re-use criteria[2]	Henry's Law Constant (H)[3]	Soil Organic Carbon-Water Partitioning Coefficient (koc)[3]	Solid/Liquid Partition Coefficient (Kd)[3]	Half life[4]	Commercial Compliance Target	Residential Compliance Target
Units	**mg/kg**	**mg/kg**	**(cm^3/cm^3)**	**(-)**	**l/kg**	**Days**	**mg/l**	**mg/l**
Phenol	14	3	0.000068	29	1	28	13.063	2.836
TPH Criteria Working Group								
TPH Aliphatic C5-C6	331	73	33	794	19	8	16.989	3.752
TPH Aliphatic C6-C8	1,626	359	50	3,981	95	8	17.029	3.759
TPH Aliphatic C8-C10	12,861	2,841	80	31,623	755	8	17.021	3.760
TPH Aliphatic C10-C12	102,089	22,548	120	25,1189	5,996	365	17.024	3.760
TPH Aliphatic C12-C16	2,036,743	449,851	520	501,1872	119,643	730	17.023	3.760
TPH Aliphatic C16-C21	256,407,138	56,632,055	4,900	630,957,344	15,062,116	1.00E+99	17.023	3.760
TPH Aliphatic C21-C35	256,407,138	56,632,055	4,900	630,957,344	15,062,116	1.00E+99	17.023	3.760
TPH Aliphatic C35-C44	256,407,138	56,632,055	4,900	630,957,344	15,062,116	1.00E+99	17.023	3.760
TPH Aromatic C5-C7	39	9	0.230	79	2	730	16.269	3.589
TPH Aromatic C7-C8	802	177	0.270	251	6	28	125.878	27.79
TPH Aromatic C8-C10	650	144	0.480	1,585	38	365	16.949	3.753
TPH Aromatic C10-C12	1,027	227	0.140	2,512	60	258	17.013	3.760
TPH Aromatic C12-C16	2,043	451	0.0500	5,012	120	800	16.973	3.747
TPH Aromatic C16-C21	6,447	1,424	0.0100	15,849	378	120	17.039	3.764
TPH Aromatic C21-C35	51,166	11,301	0.000670	125,893	3,005	1,059	17.025	3.760
TPH Aromatic C35-C44	51,166	11,301	0.000670	125,893	3,005	1.00E+99	17.025	3.760
TPH Aromatic C40-C44	51,166	11,301	0.000670	125,893	3,005	1.00E+99	17.025	3.760
Polyaromatic Hydrocarbons								
Acenaphthene	76	17	0.00490	18,621	445	204	0.170	0.0375

Determinand	Commercial RL Soil re-use criteria[1]	Residential RL Soil re-use criteria[2]	Henry's Law Constant (H)[3]	Soil Organic Carbon-Water Partitioning Coefficient (koc)[3]	Solid/Liquid Partition Coefficient (Kd)[3]	Half life[4]	Commercial Compliance Target	Residential Compliance Target
Units	mg/kg	mg/kg	(cm^3/cm^3)	(-)	l/kg	Days	mg/l	mg/l
Acenaphthylene	135	30	0.00340	33,113	791	120	0.170	0.0379
Anthracene	155	34	0.00160	38,019	908	920	0.170	0.0374
Benzo(a)anthracene	2,748	607	0.000240	676,083	16,139	1,360	0.170	0.0376
Benzo(a)pyrene	156	34	0.0000190	426,580	10,183	2,120	0.0153	0.00334
Benzo(b)fluoranthene	15	3	0.000200	2,238,721	53,442	1,219	0.000289	0.0000636
Benzo(k)fluoranthene	23	5	0.0000340	3,311,311	79,047	4,280	0.000289	0.0000645
Benzo(g,h,i)perylene	60	13	0.0000300	8,709,636	207,915	1,300	0.000289	0.0000625
Chrysene	2,812	621	0.0000260	691,831	16,515	2,000	0.170	0.0376
Di-benz(a,h)anthracene	3,793	838	0.000000600	933,254	22,279	1,880	0.170	0.0376
Indeno(1,2,3-cd)pyrene	115	25	0.0000660	16,595,869	396,174	1,460	0.000289	0.0000631
Fluoranthene	30	7	0.000420	117,490	2,805	880	0.0107	0.00235
Fluorene	123	27	0.00320	30,200	721	120	0.170	0.0374
Naphthalene	124	27	0.0170	1,514	36	258	3.417	0.742
Phenanthrene	123	27	0.00130	30,200	721	402	0.170	0.0374
Pyrene	346	76	0.000370	85,114	2,032	3,796	0.170	0.0374

[1] Rodgers Leask (2019-22); [2] H Fraser Consulting (2024); [3] Rodgers Leask (2019-22), Appendix; [4] Howard et al. (1991); [5] Buss et al. (2004); [6] WFD UK Technical Advisory Group

3.3 Results

The RTM spreadsheet model can be applied to one contaminant and one transport distance at a time. With 59 contaminants and three distances, and different SRVs for the residential and commercial sites, the total number of models that were required for this report is therefore 354. The resulting reference values are given in Section 4. Appendix A provides the summarised outputs of the RTM assessments in more detail.

In both Section 4 and Appendix A, for each contaminant the remedial soil target is given at a distance of 12.5 m, 37.5 m, and 62.5 m from the compliance point. Two reference tables have been produced, one for the commercial site, and one for the residential site.

Some examples of the RTM spreadsheet calculations are provided electronically in Appendix B.

3.4 Statistical methodology

A summary of the general statistical methods referred to in the methodology is given here.

Box plots and histograms are used to present the range of data visually. Box plots show the minimum value of the data set, the range of data falling between the 25th and 75th percentile, the mean value and the maximum value. They are useful to visually assess whether the data points are evenly distributed throughout the range. Histograms show the data distributed by the number of data points within specific ranges and are useful for identifying the distribution of data across the range, and for identifying whether higher values are common or rare in the data set.

The 95th percentile of a dataset is the highest value in a set of data after removing the top 5% of values. Referred to in this report as the "95%ile".

For any data set, there is uncertainty associated with the estimate of the mean value; a conservative assessment of the mean value can be made by calculating a 95 % Upper Confidence Limit (UCL) in the mean. This will be done using Student's t-distribution method, which is appropriate for distributions with a small number of samples. The 95% upper confidence limit (UCL) is a probability statement that indicates a 95% confidence that the true population mean is less than or equal to the calculated UCL. This report refers to the 95% upper confidence limit in the mean value as "UCLmean".

For each 25x25 m backfill zone the UCLmean will be calculated by taking the average stockpile value for each 300 mm layer, and the average of any surface verification samples (taken from the top 100 mm) falling within that backfill zone. An overall weighted average and UCLmean will then be calculated for that whole soil profile in each backfill zone, with the layer and surface verification samples weighted by thickness (300 mm for each layer and 100 mm for the surface verification samples).

3.5 Summary of the approach

Generic modelling reference tables are developed in the next section, so that modelling is not required for each individual phase – rather the recorded values for each CoC can be checked against the reference tables.

Reference values in the tables are given for specific distances.

For each of the remaining site phases the following methodology will be implemented.

1. The 95%ile of all analytical results across the entire phase area (including stockpile and surface verification samples) will be calculated for all contaminants identified in the site-wide Remediation Strategy. These contaminants are as listed in Table 2.1.
2. The 95%ile value will be screened against the SRVs (Table 2.1). Any exceedances will be shortlisted as Contaminants of Concern (CoCs) for this phase and further assessment will be carried out.
3. Some CoCs are shown by the reference tables to have such slow travel times that they will not travel 12.5 m in the 1,000-year assessment period. These are marked "no impact" in the reference tables and they will be eliminated from the CoC shortlist.
4. For each remaining shortlisted CoC a thorough statistical and spatial analysis will be carried out. This will include the following:
    - Presentation of the entire data set as a box plot;
    - Presentation of the entire data set as a histogram; and
    - Spatial assessment of the data, with an average concentration and UCLmean concentration calculated for each 25x25 m backfill zone.
5. The UCLmean concentration for each 25x25 m backfill zone will be compared to the 12.5 m reference values. If any of the backfill zones exceed the reference values for 12.5 m, the UCLmean will be compared to the 37.5 m and the 62.5 m reference values tables as appropriate given the distance of the backfill zone from the nearest reen.

Table 4.1 and Table 4.2 in the following section set out the reference values for the residential and commercial parts of the site respectively. If any backfill zones are found to fail the relevant reference value checks, contingency actions will be required, as discussed in Section 3.6.

3.6 Contingency actions

Failure of backfilled soils to meet the appropriate reference values will require additional contingency action. Any such eventualities would need to be agreed on a case-by-case basis, since the appropriate actions may be different in each case.

The first contingency action would therefore be for the site owner to propose and for NRW to agree the appropriate work, given the specific circumstances of the failure. Appropriate works are likely to include one or more from the following list:

- further monitoring actions and additional soils testing to more closely define the soils in question;
- isolation of a volume of soils deemed to have failed the criteria;
- excavation and replacement of soils deemed to have failed the criteria; and
- installation of flow barriers (such as low permeability clays) to appropriately lengthen the flow pathway from such a source area to the reen system.

3.7 Validation of drainage layer

The Rogers Leask SRVs (and hence the new reference values in this report) were derived assuming that 60% of infiltration is intercepted by a drainage layer above the engineered fill. It is therefore important that the presence of a drainage layer comprising clean granular material (e.g. 6F5 or Type 1) is evidenced as follows:

- Materials import receipts including description of the materials
- Photographic evidence of the extent of the materials (e.g. aerial photographs)
- Photographic evidence of the type and depth of the materials on a 75 m x 75 m grid

The sequencing of site works is such that the drainage layer will be placed post-commencement of construction works, and will therefore need to be validated separately from the engineered fill materials.

3.8 Validation of hydraulic conductivity

The Rogers Leask SRVs assume that there is a sufficient contrast between the hydraulic conductivity of the drainage layer (high) and the engineered fill (low) that most of the infiltration travels laterally through the drainage layer. The calculations do not however specify a value for hydraulic conductivity. The reference values derived in this report assume a hydraulic conductivity of 1×10^{-6} m/d or less for the engineered fill.

It is proposed that the hydraulic conductivity of the fill is validated by taking at least three hydraulic conductivity measurements per phase, with a guide density of one test per 6.25 ha.

3.9 Groundwater sampling

Provided that there are sufficient soil samples available to have confidence in the quality of the soils materials, it is not considered necessary to provide groundwater sampling data to support discharge of PC28. [5]

[5] Note that groundwater monitoring may be required to support an application to discharge PC29, or to support an application for an environmental permit to discharge water from the reens to the wider environment. However, that is outside the scope of this report and will be dealt with separately.

4 REFERENCE TABLES FOR CONTAMINANTS OF CONCERN

In these tables the reference values shown are for comparison with UCLMean calculated soil concentrations in backfill zones at Glan Llyn.

Where a cell shows "No impact", the RTM spreadsheet predicts that the contaminant will not travel the indicated distance within the modelled time frame. (Where this occurs it results from a combination of the slow groundwater velocity, the degradation of the contaminant and its retardation (sorption) within the fill material.)

Other cell values show the remedial target for soil, calculated by the spreadsheet to meet the agreed soil reuse value at the reen margin. Where a cell shows ">1E+06" this means that the remedial target calculated is greater than 10^6 mg/kg, which cannot plausibly be reached.

4.1 Residential

Table 4.1 Residential phase reference tables, by distance from reen

	Remedial Target (Residential) mg/kg		
Contaminant	12.5 m	37.5 m	62.5 m
Metals and metalloids			
Arsenic	>1E+06	No impact	No impact
Cadmium	No impact	No impact	No impact
Chromium	No impact	No impact	No impact
Copper	No impact	No impact	No impact
Iron	No impact	No impact	No impact
Lead	No impact	No impact	No impact
Manganese	No impact	No impact	No impact
Mercury	No impact	No impact	No impact
Nickel	No impact	No impact	No impact
Selenium	>1E+06	No impact	No impact
Vanadium	No impact	No impact	No impact
Zinc	No impact	No impact	No impact
Other inorganics			
Ammoniacal Nitrogen	260.0	872.3	3,322
Cyanide	>1E+06	>1E+06	>1E+06
Organics			
Benzene	8.271	40.68	207.7
Ethylbenzene	703.5	20,947	466,939
Phenol	109,647	>1E+06	>1E+06
Toluene	>1E+06	>1E+06	>1E+06
Xylene	313.7	3,777	38,464
Petroleum hydrocarbons			
TPH Aliphatic C5-C6	>1E+06	>1E+06	>1E+06
TPH Aliphatic C6-C8	>1E+06	>1E+06	>1E+06
TPH Aliphatic C8-C10	No impact	No impact	No impact
TPH Aliphatic C10-C12	No impact	No impact	No impact
TPH Aliphatic C12-C16	No impact	No impact	No impact
TPH Aliphatic C16-C21	No impact	No impact	No impact
TPH Aliphatic C21-C35	No impact	No impact	No impact

Contaminant	Remedial Target (Residential) mg/kg		
	12.5 m	37.5 m	62.5 m
TPH Aliphatic C35-C44	No impact	No impact	No impact
TPH Aromatic C5-C7	18.32	88.80	448.6
TPH Aromatic C7-C8	>1E+06	>1E+06	>1E+06
TPH Aromatic C8-C10	1,558	>1E+06	>1E+06
TPH Aromatic C10-C12	17,730	>1E+06	No impact
TPH Aromatic C12-C16	>1E+06	No impact	No impact
TPH Aromatic C16-C21	No impact	No impact	No impact
TPH Aromatic C21-C35	No impact	No impact	No impact
TPH Aromatic C35-C44	No impact	No impact	No impact
TPH Aromatic C40-C44	No impact	No impact	No impact
Polyaromatic hydrocarbons			
Acenaphthene	No impact	No impact	No impact
Acenaphthylene	No impact	No impact	No impact
Anthracene	No impact	No impact	No impact
Benzo(a)anthracene	No impact	No impact	No impact
Benzo(a)pyrene	No impact	No impact	No impact
Benzo(b)fluoranthene	No impact	No impact	No impact
Benzo(g,h,i)perylene	No impact	No impact	No impact
Benzo(k)fluoranthene	No impact	No impact	No impact
Chrysene	No impact	No impact	No impact
Di-benz(a,h)anthracene	No impact	No impact	No impact
Fluoranthene	No impact	No impact	No impact
Fluorene	No impact	No impact	No impact
Indeno(1,2,3-cd)pyrene	No impact	No impact	No impact
Naphthalene	366.6	895,675	>1E+06
Phenanthrene	No impact	No impact	No impact
Pyrene	No impact	No impact	No impact

4.2 Commercial

Table 4.2 Commercial phase reference tables, by distance from reen

Contaminant	Remedial Target (Commercial) mg/kg		
	12.5 m	37.5 m	62.5 m
Metals and metalloids			
Arsenic	>1E+06	No impact	No impact
Cadmium	No impact	No impact	No impact
Chromium	No impact	No impact	No impact
Copper	No impact	No impact	No impact
Iron	No impact	No impact	No impact
Lead	No impact	No impact	No impact
Manganese	No impact	No impact	No impact
Mercury	No impact	No impact	No impact
Nickel	No impact	No impact	No impact
Selenium	>1E+06	No impact	No impact

Contaminant	Remedial Target (Commercial) mg/kg		
	12.5 m	37.5 m	62.5 m
Vanadium	No impact	No impact	No impact
Zinc	No impact	No impact	No impact
Other inorganics			
Ammoniacal Nitrogen	1,181	3,961	15,084
Cyanide	>1E+06	>1E+06	>1E+06
Organics			
Benzene	37.48	184.3	941.3
Toluene	>1E+06	>1E+06	>1E+06
Ethylbenzene	3,197	95,209	>1E+06
Xylene	1,423	17,137	174,505
Phenol	504,959	>1E+06	>1E+06
Petroleum hydrocarbons			
TPH Aliphatic C5-C6	>1E+06	>1E+06	>1E+06
TPH Aliphatic C6-C8	>1E+06	>1E+06	>1E+06
TPH Aliphatic C8-C10	No impact	No impact	No impact
TPH Aliphatic C10-C12	No impact	No impact	No impact
TPH Aliphatic C12-C16	No impact	No impact	No impact
TPH Aliphatic C16-C21	No impact	No impact	No impact
TPH Aliphatic C21-C35	No impact	No impact	No impact
TPH Aliphatic C35-C44	No impact	No impact	No impact
TPH Aromatic C5-C7	83.04	402.5	2,034
TPH Aromatic C7-C8	>1E+06	>1E+06	>1E+06
TPH Aromatic C8-C10	7,035	>1E+06	>1E+06
TPH Aromatic C10-C12	80,215	>1E+06	No impact
TPH Aromatic C12-C16	>1E+06	No impact	No impact
TPH Aromatic C16-C21	No impact	No impact	No impact
TPH Aromatic C21-C35	No impact	No impact	No impact
TPH Aromatic C35-C44	No impact	No impact	No impact
TPH Aromatic C40-C44	No impact	No impact	No impact
Polyaromatic hydrocarbons			
Acenaphthene	No impact	No impact	No impact
Acenaphthylene	No impact	No impact	No impact
Anthracene	No impact	No impact	No impact
Benzo(a)anthracene	No impact	No impact	No impact
Benzo(a)pyrene	No impact	No impact	No impact
Benzo(b)fluoranthene	No impact	No impact	No impact
Benzo(k)fluoranthene	No impact	No impact	No impact
Benzo(g,h,i)perylene	No impact	No impact	No impact
Chrysene	No impact	No impact	No impact
Di-benz(a,h)anthracene	No impact	No impact	No impact
Fluoranthene	No impact	No impact	No impact
Fluorene	No impact	No impact	No impact
Indeno(1,2,3-cd)pyrene	No impact	No impact	No impact
Naphthalene	1,687	>1E+06	>1E+06
Phenanthrene	No impact	No impact	No impact

Contaminant	Remedial Target (Commercial) mg/kg		
	12.5 m	37.5 m	62.5 m
Pyrene	No impact	No impact	No impact

5 VALIDATION REPORT AND DISCHARGE OF PLANNING CONDITION 28

It is proposed that, for each Phase, the discharge of PC28 is split into two parts as follows.

5.1 Discharge of PC28 Part 1

A validation report is to be submitted to demonstrate the quality of the engineered fill materials to include:

- Description of remediation activities
- Summary of soil movements (tickets for import and export of materials to be provided if relevant)
- Presentation of soils validation data (laboratory certificates and summary tables)
- Screening against RL SRVs to identify CoCs
- Statistical assessment and screening against reference values for CoCs
- Presentation of hydraulic conductivity data for the engineered fill

5.2 Discharge of PC28 Part 2

A validation report is to be submitted to demonstrate the presence, thickness and nature of the drainage layer, to include:

- A description of the works undertaken
- Materials import receipts including description of the materials (typically 6F2 or Type 1 materials)
- Photographic evidence of the extent of the materials (e.g. aerial photographs)
- Photographic evidence of the type and depth of the materials on a 75 m x 75 m grid (or finer grid as appropriate for the size of the plot)

6 REFERENCES

Atkins, 2017, Glan Llyn, Llanwern: Llanwern Controlled Waters Detailed Quantitative Risk Assessment.

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Howard, PH, Boethling, RS, Jarvis, WF, Meylan, WM and Michalenko, EM, 1991. Handbook of environmental degradation rates.

Rodgers Leask, 2019-2022: Glan Llyn Llanwern Sitewide: Controlled Waters DQRA 2019 Update.

Rodgers Leask, 2017: Glan Llyn surface water drainage strategy.

APPENDIX A

RTM modelling spreadsheet outputs (electronic)

APPENDIX B

Example RTM spreadsheets (electronic)

Appendix F:

RLL, Glan Llyn Remediation Strategy.

Glan Llyn, Llanwern

Remediation Strategy

Glan Llyn, Llanwern

Remediation Strategy

for

St. Modwen Developments Ltd.

DATE: July 2022

REV: FINAL

18669-RLL-21-XX-RP-O-0157

Document Reference & Control

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Revision Status	Date	Summary of Revision
Final	May 2022	Addendum Information & Drawing
Final	July 2022	Comments

Executive Summary

The following presents a summary of the remedial requirements for the development Site and should not be referred to in isolation.

Instruction	Rodgers Leask Limited (RLL) was commissioned by St. Modwen Developments Ltd. to prepare a Remediation Strategy for the proposed works for part of the Glan Llyn, Llanwern Site.
Site Location and Description	The Site is centred approximately 5.35km east-south-east of Newport city centre at National Grid Reference 336336E, 186851N and covers an area of approximately 136 hectares, comprising a former steel works which was demolished in 2004. Steelworks ancillaries located within the confines of the Site included mineral stockyards, coal stockyards, blast furnaces, offices, railway sidings and the 'Bitmac' Plant, a benzole refinery. The Site is bounded to the north by a railway line, to the west by previous residential phases of the Glan Llyn development, to the south by Queen's Way (A48110) and to the east by the operational Tata steelworks.
Proposed Development	The proposed development includes the construction of up to 4,500 dwellings comprising residential houses, apartment blocks alongside associated public open space and infrastructure. A 50ha commercial development is proposed within the east of Site.
Environmental Setting	**Site History**: Historically the Site exclusively comprised agricultural land. The wider Site was extensively developed as a steelworks in the 1960s. Prior to construction, marshland and arable farmland within the Site boundary was subject to approximately 2m of land raise and engineering to bring ground level to current levels. Steel making operations ceased in the western half of the wider site in 2001, with the majority of infrastructure demolished in 2004, following land transfer to St. Modwen Developments Ltd. **Geology**: Superficial Tidal Flat Deposits. Bedrock comprises the Mercia Mudstone Group, Penarth Group and St. Mary's Well Bay Member. **Hydrogeology**: The Mercia Mudstone Group is classified as a Secondary B Aquifer. The Penarth Group is classified as a Secondary (undifferentiated) Aquifer. The St. Mary's Well Bay Member is classified as a Secondary A Aquifer. The Tidal Flat Deposits are classified as unproductive strata. **Hydrology**: Several reens divide the Site north to south. Monks' Ditch (which is considered a 'main river') cross cuts the Site from north-south. Julian's Reen runs approximately parallel to the western boundary, 10m away at the nearest point. The reens are connected to

	east-west drains which run the length of the Site within 50m from the southern boundary and the north carrier drain within the Site adjacent to the northern boundary. The River Usk is located approximately 2.9km to the west and the Severn Estuary is located approximately 4.2km to the south.
Proven Ground Conditions	Numerous phases of ground investigation have been undertaken within the Glan Llyn site, Llanwern. Made Ground was encountered across the Site at thicknesses of between 0.2m to 2.6m. Superficial deposits were encountered in all exploratory holes that penetrated the Made Ground at thicknesses of between 7.0m and 10.0m. The Mercia Mudstone Formation was encountered during the intrusive investigations. The thickness was not proven.
Contamination Assessment	The sources of contamination within the Site are known to be the Made Ground, which was historically used to build up the level of the Site and known to include imported materials (slag, concrete, brick, burnt shale) from other steelworks in addition to natural deposits. Chemical compounds associated with metal production industry are: metals and metalloids, inorganic compounds, acids and alkalis. Contaminants, particularly related to coke-making include; PAHs, cyanides, ammoniacal liquors, sulphur and sulphates, BTEX VOCs and also include petroleum-based fuels and oils.
Controlled Waters Risk Assessment	The initial CWDQRA, prepared by Atkins in 2017, was issued with the intention that, as more extensive site specific information was collected, the assessment would be reviewed and updated. An updated CWDQRA was prepared by RLL in 2019 which concluded that the compaction and validation testing of the re-engineered Made Ground assists in verifying that the earthworks have a remediation/ stabilising benefit, by creating a low permeability material. The low permeability re-engineered material inhibits the downward migration of infiltrated rainwater. Lowering the permeability of this material also greatly increases time taken by the perched water to travel within the material. The Atkins CWDQRA assumed 100% of rainfall would infiltrate the Made Ground, allowing leachable contaminants to mobilise and impact surface wates therefore very conservative reuse criteria were proposed. Taking into account more realistic conditions, the RLE CWDQRA proposed a scenario based on 40% infiltration for a residential and commercial end use.

	It is proposed that 40% infiltration is assumed to derive the Site Acceptance Criteria for this Remediation Strategy.
Reclamation Strategy	Based on the results of the previous ground investigations and the updated CWDQRA, the key driver for the remediation of the Site is considered to be the removal of significant sources of contamination, below ground obstructions and re-engineering of near-surface Made Ground to reduce infiltration for the protection of surface waters and installation of a clean cover system for the protection of human health. For the purpose of the remediation, the Site has been divided into two strategies broadly responding to the division of the site between residential use and commercial use. Herein referred to as the 'Full Turnover Specification' and the 'One Meter Turnover Specification'. The Full Turnover Specification comprises the excavation of Made Ground to a depth where the natural underlying Tidal Flat Deposits are exposed before a minimum of 2m of suitable material is placed and reengineered. The One Meter Turnover Specification requires a trim and chase process excavating material to a depth minimum of 5.3mAOD before approximately 2m of suitable material is placed and reengineered to a formation level of 7.25mAOD. Practical measures to identify, remove and validate the absence of gross contamination and known and potential obstructions extending below 5.3mAOD shall be undertaken. Several phases of trial pitting have been undertaken across the Site to assess and characterise the Made Ground for suitability for reuse. Material present within the proposed residential area that exceeds residential SAC shall be transferred and re-used in the commercial phase of the development. Where material is not suitable for either a residential or commercial end use the contractor should inform the Client's Engineer on and propose a method for its treatment that will allow re-use (at the supervising engineers discretion) or, options for off-site disposal.
Validation and Reporting	The following validation testing will be required: ▪ Non-targeted grid validation sampling shall be undertaken at a frequency of 1 sample per 500m^3 of placed material. ▪ Delineation and validation of the base and sides of hotspot excavations. ▪ Delineation and surveying of obstructions / deeper areas of Made Ground encountered. A Validation Report of the remediation shall be prepared and submitted to the regulatory authorities pursuant to the discharge of planning conditions with respect to contaminated land. The Validation Report shall provide information on the works undertaken together

	with the supporting information and required onward mitigation measures (i.e. clean cover and ground gas membranes).
Anticipated Onward Developer Actions	The remedial works includes the following scope of works: ▪ Undertaking required remediation excavation works including buried obstruction removal. ▪ Treatment or offsite disposal of impacted soils (where required). ▪ Chemical and geotechnical validation of the turnover. ▪ Post remediation ground gas and vapour assessment. ▪ Preparation of a Remediation Validation Report; and. ▪ Regulator liaison and submission pursuant to the discharge of relevant planning conditions.
Anticipated House Builder Actions	Onward housebuilder actions to include. ▪ Placement and validation of a clean cover system. ▪ Provision and validation of appropriate gas / vapour membranes in buildings ▪ Designing of appropriate concrete for aggressive ground. ▪ Installation of appropriate chemical resistant water pipes.

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Appendices

Appendix A: Drawings and Plans
Appendix B: Rodgers Leask Controlled Waters DQRA
Appendix C: Conceptual Site Model
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1.0 Introduction

1.1. Terms of Reference

Rodgers Leask Ltd (RLL) was commissioned by St. Modwen Developments Ltd. (SMD) to prepare a sitewide Remediation Strategy for the proposed works for part of the Glan Llyn, Llanwern site (hereafter referred to as the 'Site'). This Remediation Strategy does not cover the 'Coking Works' or early residential phases in the west of the wider site which have already been developed. A site location plan with a red line boundary of the area covered by this report is shown on Drawing 18669-RLL-21-XX-RE-O-0164.

A contractor shall be employed by SMD to undertake the ground preparation and reclamation works, to include the requirements of this strategy. A monitoring engineer will oversee the works to monitor that the requirements of this strategy are achieved.

It is proposed that a phased approach will be adopted for the redevelopment. The majority of the west of Site is to be redeveloped for a residential end use. A school, shops, sports fields and other associated leisure facilities will also be constructed. The east of Site is to be redeveloped for a commercial end use. An illustrative masterplan (ref. 8111-08-A011, dated April 2019) is available in **Appendix A**.

1.2. Objectives

The objective of this document is to specify both the remediation and validation works required to facilitate the proposed development and mitigate identified potential risks to human health and controlled waters. The remediation works will also seek to mitigate previously unidentified risks to human health and controlled waters, should they be encountered.

The primary focus of this strategy is decreasing the infiltration through Made Ground by way of the re-engineering limiting mobilisation of leachable contaminants to the surface waters.

The remediation will comprise the excavation of hardstanding, buried obstructions and removal of contamination identified from previous phases of ground investigation and during the remedial turnover. Material is to be turned over and placed with an onward verification sampling programme to assess compliance with the remediation criteria established within this document for the Site.

Onward developer requirements are detailed in Section 6.

1.3. Planning Status

The Site currently subject to an outline planning application 06/0471 which is for the *'redevelopment of site to create a mixed use urban extension comprising: a range*

of new homes (apartments, houses and some sheltered accommodation for the elderly – use classes C2 & C3); new offices, workshops, factories, and warehouses (use classes B1, B2 & B8); community facilities including new schools and community centres (use classes D1 & D2); a local centre incorporating shops, offices and commercial leisure facilities including new bars, cafes and licenced premises (use classes A1, A2, A3 & D2); a network of open spaces including parkland, footpaths, sports pitches and areas for informal recreation; new roads, accesses and paths; healthcare and fitness facilities (use classes D1 & D2); provision for a new railway halt/ station; other ancillary uses and activities; and requiring: site clearance, treatment and preparation; the installation of new services and infrastructure; the creation of new water bodies and drainage channels; improvements/ works to the highways network and other ancillary works and activities.'

It is understood that this document will be submitted as part of a planning application for the Site towards the end of 2021.

1.4. Reference Reports

The following documents have been reviewed and should be read in conjunction with this report:

- Atkins: Glan Llyn Local Centre, Llanwern, Geo-Environmental Interpretive Report. Ref: 5111373-LLA-OUT-135.
- Atkins: Glan Llyn Primary School, Llanwern Geo-Environmental Interpretive Report. Reg: 511373-LLA-OUT-0183.
- Atkins: Glan Llyn Phases 2a & 2e, Llanwern, Geo-Environmental Interpretive Report. Ref: 511373/Geo-Environmental Interpretive Report.
- Atkins: Glan Llyn Development, Construction Management Plan, April 2014
- Atkins: Glan Llyn, Llanwern, Controlled Waters Detailed Quantitative Risk Assessment (Version: 3).
- Atkins: Glan Llyn, Llanwern, Controlled Waters Position Statement and Local Centre DQRA. Ref: Technical Note 197.
- Atkins: Glan Llyn, Newport – Engineering Measures to Reduce Permeability and Infiltration, 2016. Ref: Technical Note 256 5111373-LLA-OUT-0256.
- The Institute of Occupational Medicine: Llanwern, Assessment of Asbestos Contamination at Former Llanwern Steelworks Site, Newport, Wales, March 2014. Ref. 610-34464.
- Ian Farmer Associates: 2016. Llanwern Site Wide CWRA and Phase 2d Rotary Core Drilling Logs.
- Rodgers Leask Environmental: Glan Llyn, Phase 4D Desk Study and Phase 2 Geo-Environmental Report, August 2021, Ref: 18669-RLE-21-XX-RP-O-0146.

- Rodgers Leask Environmental: Glan Llyn, Phase 4H Desk Study and Phase 2 Geo-Environmental Report, October 2021, Ref: 18669-RLE-21-XX-RP-O-0146.
- Rodgers Leask Environmental: Glan Llyn, Llanwern (Sitewide) Controlled Waters Detailed Quantitative Risk Assessment, August 2019, Ref: 18669-RLE-19-RP-O-0006.

1.5. Limitations and Confidentiality

All conclusions and recommendations made within this report are based upon and limited to the factual information. No responsibility can be taken by RLL Ltd for information obtained by third parties and it has been assumed that all third party information provided is true and correct.

No liability can be accepted for conditions not revealed within the exploratory holes or pits undertaken. The exploratory points cover only a small portion of the total Site area. RLL Ltd has, where necessary, undertaken extrapolation between locations and no responsibility can be taken for different conditions which may occur between locations.

RLL Ltd has undertaken the work in accordance with our understanding of current best practice at the time of undertaking the report. Further assessment and revision of the report may be required should new information come to light or legislation/changes to best practice be introduced after the date of issue of the report. RLL Ltd has prepared the report for the sole use and reliance of the Client. The report may not be used or relied upon by any unauthorised third party without the explicit written agreement of RLL Ltd.

The work undertaken within this report remains the intellectual property of RLL Ltd and must not be divulged to any commercial third party without the prior written agreement of RLL Ltd.

2.0 Background Information

2.1. Proposed Development

The proposed development includes the construction of up to 4,500 dwellings comprising terraced, semi-detached and detached residential houses, apartment blocks alongside associated public open space and infrastructure. Additionally, the proposed development includes the construction of schools, sports fields, shops and other associated leisure facilities. A 50ha commercial development is proposed within the east of Site which presently comprises an Amazon distribution centre, a CAF rolling stock (train) factory and two recently completed commercial buildings (Units 2 & 3).

The Site is cross-cut and bounded by a series of north to south orientated reens (surface water ditches) which historically were box culverts beneath the Site and were cut into the natural clay. The drainage system for the proposed development comprises a number of reens cut into the clay set at similar invert levels to the former culverts.

2.2. Site Setting

The Site is centred approximately 5.35km east-south-east of Newport city centre at National Grid Reference 336336E, 186851N and covers an area of approximately 136ha. A site location plan showing the location approximate Site boundary is included in **Appendix A**.

The Site is bounded to the north by a railway line, to the west by previous residential phases of the Glan Llyn development, to the south by Queen's Way (A48110) and to the east by the operational Tata steelworks. The former Coking Works is located within the north of the Site however is subject to a separate Remediation Strategy.

2.3. Site History

Details of the documented Site history are provided in the reference reports (Section 1.4). In summary, historically the Site exclusively comprised agricultural land segregated into fields by hedgerows and drains. The wider Site was extensively developed as a steelworks by Richard Thomas and Baldwins Ltd in the 1960s. Prior to construction, marshland and arable farmland within the Site boundary was subject to approximately 2m of land raise and engineering to bring ground level to current levels. Within the confines of the development Site, steelworks ancillaries included but were not limited to; mineral stockyards, coal stockyards, blast furnaces, offices, railway sidings and the 'Bitmac' Plant, a benzole refinery.

Steel making operations ceased in the western half of the wider site in 2001, with the majority of infrastructure demolished in 2004, following land transfer to St. Modwen Developments Ltd.

It is much of the materials used as part of this pre-development land raise, together with demolished former steelworks buildings and structures that comprise the existing Made

Ground across the Site, which will be subject to the proposed reengineering and compaction works associated with this redevelopment.

2.4. Geology and Hydrogeology

Information presented on the British Geological Survey website, GeoIndex[1] indicates that the Site is underlain by superficial geology of Tidal Flat Deposits comprising clays and silts.

The superficial deposits are described on the BGS Lexicon as '*tidal flat deposits, including mud flat and sand flat deposits, deposited on extensive nearly horizontal marshy land in the intertidal zone that is alternately covered and uncovered by the rise and fall of the tide. They consist of unconsolidated sediment, mainly mud and/or sand. They may form the top surface of deltaic deposit. Normally a consolidated soft silty clay, with layers of sand, gravel and peat. Characteristically low relief*'.

The superficial deposits are shown to be underlain by bedrock strata of the Mercia Mudstone Group across the majority of the Site apart from a strip along the northern boundary and the north-east corner of Site which is shown to be underlain by bedrock strata of the Penarth Group and St Mary's Well Bay Member.

The Mercia Mudstone Group is described on the BGS Lexicon as comprising '*Dominantly red, less commonly green-grey, mudstones and subordinate siltstones with thick halite-bearing units in some basinal areas. Thin beds of gypsum/anhydrite widespread; sandstones are also present*'.

The Penarth Group is described on the BGS Lexicon as comprising '*Grey to black mudstones with subordinate limestones and sandstones; predominantly marine in origin'.*

The St Mary's Well Bay Member is described on the BGS Lexicon as comprising '*Limestone and mudstone, interbedded'*.

The Tidal Flat Deposits are classified as unproductive strata.

The Mercia Mudstone Group is classified as a Secondary B Aquifer. Secondary B aquifers are defined by the Environment Agency (EA) as: '*predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers'*.

The Penarth Group is classified as a Secondary (undifferentiated) Aquifer; this classification is defined by the EA as being: *'predominantly lower permeability layers which may*

The St Mary's Well Bay Member is classified as a Secondary A Aquifer; this classification is defined by the EA as: *'permeable layers capable of supporting water supplies at a local*

[1] http://mapapps2.bgs.ac.uk/geoindex/home.html

rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.'

Information presented in the Landmark Envirocheck Report (2021) indicated that there are no recorded groundwater abstractions licences or potable water abstraction licenses within 500m of the Site and it is not within a groundwater source protection zone.

2.5. Hydrology

The surface water drainage onsite comprises several man-made surface water drainage ditches (reens) cut into the natural clay which divide the Site north to south, receiving water from the land to the north in addition to onsite drainage baseflow. Monks' Ditch (which is considered a 'main river') cross cuts the Site from north-south and Julian's Reen runs approximately parallel to the western boundary, 10m away at the nearest point. The reens are connected to east-west drains which run the length of the Site along A4810 (Queen's Way Road) within 50m from the southern boundary and the north carrier drain within the Site adjacent to the northern boundary; ultimately discharging to the water treatment works at the operational Tata steelworks to the east of the Site.

The River Usk is located approximately 2.9km to the west and the Severn Estuary is located approximately 4.2km to the south.

Information presented on the Natural Resources Wales (NRW) Flood Map for Planning website[2] indicates that the Site lies in Flood Zone C, land served by significant infrastructure, including flood defences. Several small areas, notably in the centre of Site, to the west of Monks' Ditch, are indicated to lie in Flood Zone B, areas known to have flooded in the past.

2.6. Radon

Information presented on the UK Health Security Agency 'UK Maps of Radon' website[3] indicate that the majority of the Site is not within a Radon Affected Area, as less that 1% of properties are above Action Level. The north and eastern part of the Site lies within an area of elevated radon potential, with a maximum radon potential of 5-10%. Further assessment is required on a phase by phase basis to ascertain if radon protection measures are needed.

[2] https://naturalresources.wales/flooding/flood-map-for-planning-development-advice-map
[3] https://www.ukradon.org/information/ukmaps

3.0 Pre-Remediation Ground Investigations

Numerous phases of ground investigation have been undertaken within the Glan Llyn site, Llanwern. Historically ground investigations were undertaken on a phase by phase basis and local conditions are presented in respective factual and geo-environmental reports.

A sitewide ground investigation was undertaken in 2016, the CWRA Ground Investigation (IFA, 2016) which provides a sitewide coverage, information on the regional groundwater and deeper geology.

Information relevant to pre-remediation ground conditions are presented within the RLE Controlled Waters Detailed Quantitative Risk Assessment 2019 (**Appendix B**)

3.1. Geological Summary

The geology on site is well assessed with intrusive investigations recording the Site to be underlain by Made Ground overlying Tidal Flat Deposits. Bedrock strata of the Mercia Mudstone Group underlies the Tidal Flat deposits.

Topsoil

Topsoil was found only locally within some exploratory holes and was often of nominal thickness. Where present the topsoil was described as soft brown slightly sandy clay.

Made Ground

Made Ground was present in all exploratory hole locations. Thickness varied between 0.2m to 2.6m and was present at ground level within the majority of exploratory holes. The DQCWRA described three distinct types of Made Ground:

- Grey occasionally clayey sandy gravel of angular to subangular fine to coarse slag with occasional tarmac, concrete, brick, limestone and ceramic/fused slag.
- Red brown/ brown clayey sandy gravel (locally gravelly sand) with cobbles and boulders
- Red brown/ brown soft to firm sandy gravelly clay with cobbles and boulders. Gravel includes subrounded to angular fine to coarse burnt shale, brick, slag, sandstone, mudstone, shale and occasional coal.

Tidal Flat Deposits

Tidal Flat deposits were encountered in all locations where the Made Ground was penetrated. Thickness of the tidal flats varied from 7 – 10m. Descriptions of the deposits were variable, typically comprising interbedded clays, peat and sands.

Within the Tidal Flat deposits, distinct horizons are described as followed in the sequence order below;

- Upper Clay – Generally very soft to firm blue grey slightly gravelly silty clay with rare localised pockets of peat.
- Upper Peat – Generally spongey dark brown occasionally clayey fibrous peat
- Lower peat - Generally spongy to plastic dark brown occasionally clayey occasionally sandy pseudo fibrous to amorphous peat.

- Lower Clay – generally soft to firm bluish grey slightly sandy slightly gravelly clay. Gravel is angular to subangular fine to medium sandstone.
- Red Clay – generally firm to stiff red brown mottled grey slight gravelly clay, gravel is angular to subangular fine to medium mudstone.
- Basal sand – Generally medium dense light brown slightly silty slightly gravelly fine grained sand the gravel is of subrounded to subangular fine siltstone and quartzite.

Not all horizons were identified in all holes and it is understood that horizons are variable across the site.

Solid Geology

The solid geology of the Mercia Mudstone Group was encountered during the intrusive investigations. The thickness was not proven. The Mercia Mudstone was described as stiff to very stiff reddish brown slightly gravelly clay and extremely weak to very weak occasionally laminated red brown mudstone.

Groundwater

A summary of groundwater levels recorded in deep and shallow wells were presented in Appendix C of the RLE 2021 CWDQRA Report.

It was considered that groundwater levels recorded during the CWRA GI and subsequent monitoring suggested that the groundwater is present beneath the proposed development as follows:

- Shallow / perched groundwater within the Made Ground (shallow boreholes); and
- Groundwater within the Tidal Flat Deposits (confined to the basal sand layers) and Mercia Mudstone (deep boreholes).

Groundwater monitored within the deep boreholes was considered to be primarily derived from the bedrock geology, and hydraulic continuity between the upper perched shallow groundwater and 'regional' groundwater was considered likely to be limited. Post-development, the excavation and re-compaction of the Made Ground was recognised as likely to reduce its permeability, lowering still further, the hydraulic continuity.

3.2. Contamination Assessment

The sources of contamination within the site are known to be the Made Ground, which was historically used to build up the level of the site and known to include imported materials (slag, concrete, brick, burnt shale) from other steelworks in addition to natural deposits.

Chemical compounds which have the potential to contaminate the ground outlined by the Department of Environment (DoE, 1995) as being associated with metal production industry are: metals and metalloids, inorganic compounds, acids and alkalis. Contaminants, particularly related to coke-making include; PAHs, cyanides, ammoniacal liquors, sulphur and sulphates, BTEX VOCs and also include petroleum-based fuels and oils.

4.0 Controlled Waters Risk Assessments

4.1.1. Atkins 2017, Controlled Waters Detailed Quantitative Risk Assessment

The initial Controlled Waters Detailed Quantitative Risk Assessment (CWDQRA) prepared by Atkins (Version: 3 and dated February 2017), was issued with the intention that, as more extensive site specific information was collected, the assessment would be reviewed and updated. It was described as the starting point and that the proposed criteria were understood to be conservative. The CWDQRA modelled two site conditions for the mixed use development; comprising residential and commercial end usage. More details are included in the following reports:

- Atkins: Glan Llyn, Llanwern, Controlled Waters Detailed Quantitative Risk Assessment (Version: 3).
- Atkins: Glan Llyn, Llanwern, Controlled Waters Position Statement and Local Centre DQRA. Ref: Technical Note 197.

The CWDQRA included the following:

Sources

With respect to controlled waters, the following potential sources of contamination were identified:

- Made Ground – Historically used to build up the level of the site, is known to include imported waste products (slag, concrete, brick, burnt shale) from other steelworks in addition to natural deposits.
- Chemical compounds which have the potential to contaminate the ground associated with metal production industry:
    - Metalloids, inorganic compounds, acids and alkalis.
- Chemical compounds which have the potential to contaminate the ground associated with the coke production industry:
    - PAH, fuels and oils.
- Groundwater within the bedrock noted to have contaminants associated with the former steel producing industry.

Pathways

With respect to controlled waters, the following potential pathways were identified:

- Leaching of soil-borne contamination in Made ground and subsequent lateral migration through permeable pathways in Made Ground to Monks' Ditch via onsite reens.

No effective pathway was identified between the shallow perched water in the Made Ground and the deep groundwater within the Mercia Mudstone Secondary B Aquifer due to the low permeability of the clay-rich Tidal Flat Deposits.

Receptors

With respect to controlled waters, the following potential pathways were identified:

- Monks' Ditch (into which surface water from the development site is to be pumped).
- Mercia Mudstone Secondary B Aquifer.

Monks' Ditch, as a Main River, was considered to the principal receptor for any Controlled Waters impact at the site.

Remediation Target Values

The Atkins CWDQRA modelling generated material re-use criteria for the soils which is shown in the following table:

Atkins 2017 Material Re-use Criteria				
Determinand (PCOD)	**EQS (mg/l)**	**EQS Reference**	**Commercial Area**	**Residential Area**
Inorganic Metals and Metalloids				
Arsenic	0.05	1	4,328.7	1,093.5
Cadmium	0.00025	1	124.8	31.5
Chromium	0.0047	1	1,611.6	4,071.1
Copper	0.001	1 (d)	770.8	194.7
Iron	1	1	520,673.3	13,152.73
Lead	0.0012	1 (d)	26,890.6	6,792.8
Manganese	0.123	1 (d)	56,930.2	14,381.1
Mercury	0.00007	1	224.9	56.8
Nickel	0.004	1 (d)	19,667.7	4,968.3
Selenium	0.01	8	1,199.4	303
Vanadium	0.02	3	2,744.2	693.2
Zinc	0.0109	1 (d)	235.023.1	59,369.2
Other Inorganics				
Ammoniacal Nitrogen	0.3	1	263.9	66.7
Cyanide	0.001	1	3.5	0.87
Organics				
Benzene	0.01	1	6.5	1.6
Toluene	0.074	1	219.5	55.4
Ethylbenzene	0.02	4	137.2	34.7
Xylene	0.03	3	126.7	32.0
Phenol	0.0077	1	5.2	1.3
TPH Criteria Working Group31.5				
TPH Aliphatic >C_5-C_6	0.01	6	124.8	31.5
TPH Aliphatic >C_6-C_8	0.01	6	613.8	155.1
TPH Aliphatic >C_8-C_{10}	0.01	6	4,854	1,226.2
TPH Aliphatic >C_{10}-C_{12}	0.01	6	38,531.7	9,733.5
TPH Aliphatic >C_{12}-C_{16}	0.01	6	768,731.7	194,189.4
TPH Aliphatic >C_{16}-C_{21}	0.01	6	96,776,235.1	24,446.657.1
TPH Aliphatic >C_{21}-C_{35}	0.01	6	96,776,235.1	24,446.657.1
TPH Aliphatic >C_{35}-C_{44}	0.01	6	96,776,235.1	24,446.657.1
TPH Aromatic >C_5-C_7	0.01	1, 2 (benzene)	14.5	3.7
TPH Aromatic >C_7-C_8	0.074	1 (toluene)	302.6	76.4
TPH Aromatic >C_8-C_{10}	0.01	6	245.4	62

Atkins 2017 Material Re-use Criteria				
Determinand (PCOD)	**EQS (mg/l)**	**EQS Reference**	**Commercial Area**	**Residential Area**
TPH Aromatic >C_{10}-C_{12}	0.01	6	387.6	97.9
TPH Aromatic >C_{12}-C_{16}	0.01	6	771.1	194.8
TPH Aromatic >C_{16}-C_{21}	0.01	6	2,433.3	614.7
TPH Aromatic >C_{21}-C_{35}	0.01	6	19,311.7	4,878.3
TPH Aromatic >C_{35}-C_{44}	0.01	6	19,311.7	4,878.3
TPH Aromatic >C_{40}-C_{44}	0.01	6	19,311.7	4,878.3
Polycyclic Aromatic Hydrocarbons				
Acenapthene	0.0001	5	28.6	7.2
Acenapthylene	0.0001	5	50.8	12.8
Anthracene	0.0001	1	58.3	14.7
Benzo(a) anthracene	0.001	5	1,037	262
Benzo(a)pyrene	0.00000017	1	11	0.28
Benzo(b)fluoranthene	0.00000017	1	5.8	1.5
Benzo(k)fluoranthene	0.00000017	1	8.6	2.2
Benzo(g,h,i)perylene	0.00000017	1	22.7	5.7
Chrysene	0.0001	5	1,0611	268.1
Di-benz(a,h)anthracene	0.0001	5	1,431.4	361.6
Indeno(1,2,3-cd)pyrene	0.00000017	1	43.3	10.9
Fluoranthene	0.0000063	1	11.3	2.9
Fluorene	0.0001	5	46.3	11.7
Napthalene	0.002	1	46.9	11.8
Phenanthrene	0.0001	5	46.3	11.7
Pyrene	0.0001	5	130.6	32

The residential end use was assumed to have a rainwater interception/ infiltration ratio of 60:40. The commercial end use was assumed to have a rainwater interception/ infiltration ratio of 95:5. The interception is where roofs, roads and hard paving take the rainwater and transfer it directly into the surface water reens. The infiltration is where rainwater lands on grassed of landscaped areas and is able to percolate into the construction material (soils, piling mat, sub-base etc.) and underlying post-development Made Ground. The current evapotranspiration rate for grassed areas is estimated as 600mm/a against an annual rainfall rate of 953mm/a. The earlier Atkins value utilised, (applicable to permeable areas) was 416mm/a.

The Atkins CWDQRA, which generated the initial criteria, assumed that 100% of the infiltrated rainwater (12.85mm per year or 1.3% of total rainfall) percolated through the construction material and in to the Made Ground.

On derivation of their soil re-use criteria (calculated to be expressed as mg/kg for direct comparison against actual soils analytical data obtained), it was previously noted by Atkins in their 2017 CWDQDRA Report and demonstrated in their associated Table 5.5 that the maximum and average soil sample concentrations resulted in some exceedances for inorganic compounds, copper and vanadium. It was also noted that there were exceedances in surface water analyses for iron, manganese, cyanide and ammoniacal nitrogen. Although these had not been previously analysed by Atkins in soil samples, subsequent analyses has included these determinands.

Exceedances were also noted in soil samples analysed for organic compounds, especially C_{12}-C_{35} species aromatic TPH (total petroleum hydrocarbons), and a number of PAH (polycyclic aromatic hydrocarbons) species as compared to the

derived soil re-use criteria. Concentrations of PAHs present in actual soil analytical data obtained were, in some cases, over on order of magnitude in excess of the calculated re-use criteria, suggesting that attenuation, particularly of heavy fraction TPH and PAHs is likely to be an issue on this site requiring further consideration as part of the proposed remedial and redevelopment works. Although previous analysis of soils samples undertaken by Atkins did not include phenols, recent analyses has included this determinand.

4.1.2. Rodgers Leask Environmental 2019, Controlled Waters Detailed Quantitative Risk Assessment

The 2019 CWDQRA (**Appendix B**) was prepared by RLE to update and further develop the earlier Atkins CWDQRA. The principal rationales for reviewing the model that generated the initial criteria were:

- The amount of additional field, site specific data collected since preparation of the earlier Atkins CWDQRA.
- The remedial benefit of the currently proposed turnover and re-engineering process were not included in the earlier Atkins CWDQRA.

More detail is included in the following report:

- Rodgers Leask Environmental: Glan Llyn, Llanwern (Sitewide) Controlled Waters Detailed Quantitative Risk Assessment, August 2019, Ref: 18669-RLE-19-RP-O-0006 (**Appendix B**).

The CWDQRA was undertaken based on sampling data obtained prior to the completion of remedial works within the Site, hence it is anticipated to be in its worst condition. The undeveloped Site is considered a worst case scenario where rainfall is free to percolate through material that has not been compacted to reduce permeability. Removal of unsuitable material and increased compaction through re-engineering and the subsequent redevelopment of the Site will reduce infiltration and mobilisation serving to improve the currently monitored conditions. The reclamation, in terms of surface water quality, will be at its most effective when the Site is fully built out.

The updated CWDQRA identified the following:

<u>Sources</u>

With respect to controlled waters, the following potential sources of contamination were identified:

- Made Ground - Historically used to build up the level of the site was known to include imported waste products (slag, concrete, brick, burnt shale) from other steelworks in addition to natural deposits.
- Chemical compounds which have the potential to contaminate the ground associated with metal production industry:

    - Metals and metalloids, inorganic compounds, acids and alkalis.
- Chemical compounds which have the potential to contaminate the ground associated with the coke production industry:
    - PAHs, cyanides, ammoniacal liquors, sulphur and sulphates, BTEX VOCs and petroleum-based fuels and oils

Pathway

With respect to controlled waters, the following potential pathways were identified:

- Leaching of soil-borne contamination in Made Ground and subsequent lateral migration through permeable pathways in Made Ground to Monks' Ditch via on-site reens.

No effective pathway was identified between the shallow groundwater in the Made Ground and the deep groundwater within the Mercia Mudstone Secondary B Aquifer, due to the low permeability of the clay-rich Tidal Flat Deposits and the aquifer being under sub-artesian pressure.

Receptors

With respect to controlled waters, the following potential receptors were identified:

- Monks' Ditch (into which surface water from the development site is to be pumped).
- Mercia Mudstone Secondary B Aquifer.

Monks' Ditch, as a Main River, was considered to the principal receptor for any Controlled Waters impact at the site.

Re-Engineering

In 2016, geotechnical information relating to the permeability of the Made Ground was assessed (Atkins Ltd Permeability Infiltration Technical Note Ref: 5111373-LLA-OUT-0256, dated 15th December 2016), but this was not used in the model for the Atkins 2017 CWDQRA. The Atkins Ltd Technical Note presented information on the characteristics of the reengineered ground. Previous phase specific Earthworks Specifications for the placement of material (following the turnover to natural clay), requires particle size distribution (PSD) tests, density tests, compaction tests and air void tests on each layer to validate the material has been compacted sufficiently.

The particle size distribution within the Made Ground is known to be well graded and when compacted, the permeability is assessed as having a low permeability/ poor drainage potential. A number of falling head tests were undertaken within a re-engineered plot, which returned failed test results. The reengineering therefore has a remediation/ stabilising benefit, by creating a low permeability material and this can be assessed by the geotechnical validation information collected for each

phase. The compacted material would be considered difficult to dig by normal mechanical means.

In contrast to the re-engineered ground, the construction materials (6F2 piling mat & clean soils) placed above the Made Ground are likely to be of good drainage potential (if they are not, then they will only serve to further limit the downward migration of rainwater).

The low permeability re-engineered material inhibits the downward migration of infiltrated rainwater as the pore water in the construction material does not readily flow into the material with much reduced pore spaces (air voids <10%). Lowering the permeability of this material also greatly increases time taken by the perched water to travel within the material.

The engineered characteristics have two distinct remedial benefits as follows:

- The volume of infiltrated water entering the body of re-engineered Made Ground is reduced, therefore the volume of water exposed to mobile contaminants is also reduced;
- The time taken for migration of the perched water within the re-engineered ground is greatly increased and therefore, the volume of perched water reaching the surface water via this route is reduced, increasing the ratio of clean rainwater in the surface water reens. Where this passage is also through areas of cleaner reengineered Made Ground, there are likely to be benefits associated with increased contamination attenuation prior to reen discharge. These are the areas of the site where some retardation (degradation and/ or sorption) of contaminants within the Made Ground is considered possible. On this basis it is proposed to place ‘cleaner’ Made Ground closer to the reens which are known to be the surface water receptors for the perched waters.

The Atkins CWDQRA, that generated the initial criteria, assumed that in areas of soft landscaping, 100% of the infiltrated rainwater (12.85mm per year or 1.3% of total rainfall) percolated through the construction material (imported top soils) and in to the Made Ground. This value takes account of estimated surface-water run-off (55% of total rainfall) and evapotranspiration (43.7% of total rainfall). It is considered likely that the lowest achievable, permeability of the post-development Made Ground is like to be in the region of (1x10-7 m/s).

It was also apparent in the Atkins CWDQRA and Conceptual Site Model that although lateral drainage within the capping layer was anticipated, this wasn’t accounted for in the calculations, where it assumed that essentially all (1.3% of the total rainwater) passed into the underlying post-development Made Ground. It is therefore reasonable to assume that a reduction in infiltration into post-development Made Ground will be enabled by the placement of higher permeability ground surface construction materials (imported piling mat & soils) and any possible introduced gradient within this layer which will encourage an element of lateral flow.

In order to gauge potential impacts on the existing calculated soil reuse criteria, a process of sensitivity analyses was therefore proposed using a scenario where 40% of the 12.85mm per year (5.14mm/year) penetrates into the underlying post-development Made Ground. It is recognised that this modelling is of a further potential reduction in what is already, apparently, a low rate of rainwater infiltration (1.3% of total rainfall). Reuse criteria would then be derived for the range of determinands previously selected by Atkins, and it was proposed that these criteria now also include iron, manganese, cyanide, ammoniacal nitrogen and phenol, which would be modelled in current revision to the report.

Remedial Target Values

The 2019 CWDQRA has derived Site specific reuse criteria for 40% infiltration. The tables below present the proposed reuse criteria, pink highlighted cells represent where the maximum recorded concentration exceeds the CWDQRA criteria:

Determinand	Commercial Area				Residential Area			
	Re-use Criteria C_{mq} (mg/kg)	Maximum Soil Sample Value* (mg/kg)	Average Soil Sample Value* (mg/kg)	95th Percentile	Re-use Criteria (mg/kg)	Maximum Soil Sample Value (mg/kg)	Average Soil Sample Value* (mg/kg)	95th Percentile
Inorganic Metals and Metalloids								
Arsenic	11468.786	397.00	12.12	22.00	2902.688	397.00	12.12	22.00
Cadmium	330.551	31.30	0.66	2.22	83.661	31.30	0.66	2.22
Chromium	42699.080	3090.00	123.26	533.00	10806.907	3090.00	123.26	533.00
Copper	2042.252	1970.00	25.60	53.84	516.883	1970.00	25.60	53.84
Iron	1379515.806	*2390000.00*	92413.21	255000.00	349148.010	*2390000.00*	92413.21	255000.00
Lead	71246.366	4220.00	81.71	211.60	18032.071	4220.00	81.71	211.60
Manganese	150835.652	*408000.00*	8689.62	32270.00	38175.690	*408000.00*	8689.62	32270.00
Mercury	595.859	*14.00*	0.61	1.40	150.809	*14.00*	0.61	1.40
Nickel	52109.372	313.00	25.04	43.86	13188.601	313.00	25.04	43.86
Selenium	3177.881	51.70	5.62	15.60	804.305	51.70	5.62	15.60
Vanadium	7270.791	2880.00	186.56	645.25	1840.198	2880.00	186.56	645.25
Zinc	622690.141	13300.00	281.36	771.40	157599.516	13300.00	281.36	771.40
Other Inorganics								
Ammoniacal Nitrogen	699.276	*1590.00*	62.39	269.00	176.983	*1590.00*	62.39	269.00
Cyanide	9.140	*272.00*	2.53	4.58	2.313	*272.00*	2.53	4.58
Organics								
Benzene	17.220	7.03	0.15	0.20	4.358	7.03	0.15	0.20
Toluene	581.530	28.30	0.13	0.14	147.182	28.30	0.13	0.14
Ethylbenzene	363.617	1.15	0.06	0.08	92.030	1.15	0.06	0.08
Xylene	335.724	61.50	0.20	0.20	84.970	61.50	0.20	0.20
Phenol	13.816	1.51	0.02	0.03	3.497	1.51	0.02	0.03
TPH Criteria Working Group								
Aliphatics >C5-C6	330.563	0.92	0.03	0.04	83.664	0.92	0.03	0.04
Aliphatics >C6-C8	1626.370	3.90	0.04	0.08	411.626	3.90	0.04	0.08
Aliphatics >C8-C10	12860.726	74.20	0.20	0.16	3254.980	74.20	0.20	0.16
Aliphatics >C10-C12	102089.217	987.00	2.06	0.48	25838.230	987.00	2.06	0.48
Aliphatics >C12-C16	2036742.733	1330.00	7.41	19.40	515488.601	1330.00	7.41	19.40
Aliphatics >C16-C21	256407138.283	3530.00	26.15	74.28	64895263.78	3530.00	26.15	74.28
Aliphatics >C21-C35	256407138.283	3580.00	73.42	212.40	64895263.78	3580.00	73.42	212.40
Aliphatics >C35-C44	256407138.283	1380.00	23.71	81.28	64895263.78	1380.00	23.71	81.28
Aromatics >EC5-EC7	38.530	5.26	0.04	0.04	9.752	5.26	0.04	0.04
Aromatics >EC7-EC8	801.639	20.30	0.05	0.04	202.890	20.30	0.05	0.04
Aromatics >EC8-EC10	650.327	49.50	0.15	0.14	164.594	49.50	0.15	0.14
Aromatics >EC10-EC12	1027.020	658.00	1.38	0.32	259.933	658.00	1.38	0.32
Aromatics >EC12-EC16	2042.955	5280.00	11.68	20.96	517.061	5280.00	11.68	20.96
Aromatics >EC16-EC21	6446.891	9800.00	46.85	127.80	1631.673	9800.00	46.85	127.80
Aromatics >EC21-EC35	51166.143	9010.00	113.20	400.80	12949.875	9010.00	113.20	400.80

Determinand	Commercial Area				Residential Area			
	Re-use Criteria C_{mg} (mg/kg)	Maximum Soil Sample Value* (mg/kg)	Average Soil Sample Value* (mg/kg)	95th Percentile	Re-use Criteria (mg/kg)	Maximum Soil Sample Value (mg/kg)	Average Soil Sample Value* (mg/kg)	95th Percentile
Aromatics >EC35-EC44	51166.143	1580.00	39.47	145.40	12949.875	1580.00	39.47	145.40
Aromatics >EC40-EC44	51166.143	724.00	14.62	51.92	12949.875	724.00	14.62	51.92
Polyaromatic Hydrocarbons								
Acenaphthylene	75.733	2100.00	2.35	1.96	19.168	2100.00	2.35	1.96
Acenaphthene	134.627	193.00	0.37	0.31	34.073	193.00	0.37	0.31
Anthracene	154.563	1860.00	2.78	4.00	39.119	1860.00	2.78	4.00
Benz(a)anthracene	2747.512	1150.00	3.62	8.63	695.380	1150.00	3.62	8.63
Benzo(a)pyrene	156.023	714.00	2.92	7.93	39.489	714.00	2.92	7.93
Benzo(b)fluoranthene	15.466	1110.00	4.15	11.18	3.914	1110.00	4.15	11.18
Benzo(k)fluoranthene	22.876	373.00	1.63	4.18	5.790	373.00	1.63	4.18
Benzo(g,h,i)perylene	60.170	333.00	1.98	5.62	15.229	333.00	1.98	5.62
Chrysene	2811.508	1090.00	3.31	8.46	711.578	1090.00	3.31	8.46
Dibenzo(a,h)anthracene	3792.598	177.00	0.58	1.40	959.886	177.00	0.58	1.40
Indeno(1,2,3-cd)pyrene	114.651	374.00	2.04	5.46	29.018	374.00	2.04	5.46
Fluoranthene	30.083	2940.00	8.97	20.50	7.614	2940.00	8.97	20.50
Fluorene	122.786	1890.00	2.17	1.75	31.077	1890.00	2.17	1.75
Naphthalene	124.264	4680.00	8.42	4.14	31.450	4680.00	8.42	4.14
Phenanthrene	122.786	3810.00	7.57	11.48	31.077	3810.00	7.57	11.48
Pyrene	345.946	1.95	0.01	0.02	87.557	1.95	0.01	0.02

Recommendations

The updated CWDQRA concluded that the compaction and validation testing of the re-engineered Made Ground assists in verifying that the earthworks have a remediation/ stabilising benefit, by creating a low permeability material. The low permeability re-engineered material inhibits the downward migration of infiltrated rainwater. Lowering the permeability of this material also greatly increases time taken by the perched water to travel within the material. The falling head tests undertaken, that failed, provide another line of site based testing indicating the material has a low permeability.

The Atkins CWDQRA assumed 100% of rainfall would infiltrate the Made Ground, allowing leachable contaminants to mobilise and impact surface wates therefore very conservative reuse criteria were proposed. Taking into account more realistic conditions, the RLE CWDQRA proposed a scenario based on 40% infiltration for a residential and commercial end use.

It is proposed that a conservative 40% infiltration is assumed to derive the Site Acceptance Criteria for this Remediation Strategy.

Total Cyanide

Exceedances for total cyanide in soils were noted in the calculated re-use criteria for both residential and commercial re-use scenarios. However, the results of Level 3 Groundwater P20 modelling using the porewater leachate equivalent of the 95th percentile cyanide concentration in site soils has indicated the relatively rapid attenuation of cyanide concentrations within the re-engineered Made Ground, with these results suggesting that placement of such material within a 20m distance of the receiving water reens is unlikely to cause discernible impact. This finding is

generally consistent with the site sampling findings, where approximately 3.4% of on-site surface waters were found to contain cyanide concentrations in excess of the proposed WQS. However, it has been noted that there appears to a slight increase in cyanide concentrations within the reen system, possibly as leached contributions are made from deposited materials associated with the former coking works located within the northern central section of the site.

Ammoniacal Nitrogen

Exceedances for ammoniacal nitrogen in soils were noted in the calculated re-use criteria for both residential and commercial re-use scenarios. The results of Level 3 Groundwater P20 modelling using the porewater leachate equivalent of the 95th percentile ammoniacal nitrogen concentration in site soils has indicated a slight exceedance of the EQS at a distance of 20m from the receiving water reens. However, if this material is placed at a minimum distance of approximately 30m from receiving water reens, then these soils are unlikely to cause discernible impact.

The remedial works in the area of the site previously occupied by the coking works should have a positive impact on the reduction of ammoniacal and cyanide leachates, which appear to be currently entering the surface water reen drainage system from this source area.

5.0 Conceptual Site Model

5.1. Potential Pollutant Linkages

This section provides a qualitative assessment of the risk posed from potential on-Site contamination sources identified from the information presented in the previous sections. The CSM considers the findings of the ground investigations that have been undertaken at the Site and the Site's history.

The CSM below has been developed based on the commonly adopted source-pathway-receptor model as recommended within the Land Contamination Risk Management (LCRM) guidance from the Environment Agency[4].

A visual interpretation of the CSM is included in **Appendix C**.

5.2. Sources

The Site has comprised a steelworks from the 1960s through to 2004 when the majority of the infrastructure was demolished. Historically, ancillaries within the confines of the Site included, but were not limited to, mineral stockyards, blast furnaces, offices, railway sidings and a 'Bitmac' plant, a benzole refinery.

Additionally, Made Ground, including slag, concrete, brick and burnt shale, was imported from sources around south Wales, including other steelworks, to raise levels across the Site.

Following a review of the Site history and ground investigation information, the following sources have been identified:

- Made Ground known to include imported waste products (slag, concrete, brick, burnt shale) from sources around south Wales, including other steelworks in addition to natural deposits.
- Chemical compounds which have the potential to contaminate the ground associated with metal production industry:
    - Metals and metalloids, inorganic compounds, acids and alkalis.
- Chemical compounds which have the potential to contaminate the ground associated with the coke and 'benzole' production industry:
    - PAHs, cyanides, ammoniacal liquors, sulphur and sulphates, BTEX VOCs and petroleum-based fuels and oils

5.3. Potential Receptors

The following receptors (current and proposed) have been identified at the Site:

<u>Humans:</u>

- Construction workers and maintenance workers;

[4] https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm

- Commercial unit employees and visitors on and off-Site (current and proposed); and
- Residents on and off-Site (current and proposed).

Controlled Waters:

- Monks' Ditch (into which surface water from the development site is to be pumped); and
- Mercia Mudstone Secondary B Aquifer.

Property:

- Existing and proposed buildings and services on and immediately surrounding the Site; and
- Proposed infrastructure on the Site.

5.4. Potential Pathways

Human Health

There is potential for exposure of Site users (future and proposed) to contaminants in soils via the following pathways, for a residential end use.

- Direct soil and dust ingestion;
- Consumption of home grown produce;
- Consumption of soil adhering to home grown produce;
- Dermal contact with soil and indoor dust; and
- Inhalation of indoor and outdoor dust, gases and vapours.

The potential presence of contamination within the Site presents a potential risk to construction workers within the Site boundary, as such appropriate risk assessments and safety measures (use of PPE / hygiene rules) will need to be enforced in order to provide adequate protection.

Given the potential for vapours from hydrocarbons in soils, possible hydrocarbon contamination in groundwater and radon associated with the regional geology in some areas of the Site, subject to further risk assessment on a phase by phase basis, appropriate protective membranes may be required.

Controlled Waters

The main controlled water receptors at the Site are Monk's Ditch, a main river channel, and the Secondary B Aquifer associated with the underlying Mercia Mudstone Group.

With regard to controlled waters, the following pathways are considered applicable:

- Lateral migration through soils and bedrock towards the nearest surface water feature.
- Lateral migration through existing infrastructure e.g. drainage, reens.

5.5. Conceptual Site Model and Risk Assessment

Based on the information currently available, plausible pollutant linkages have been identified and a risk assessment has been undertaken for the Site. The estimation of the potential significance of each linkage is based on the proposed Site redevelopment, the mobility and the predicted magnitude of potential contaminants, and the nature of the identified migration/exposure pathways.

Summary of Pre-Remediation and Post Remediation Conceptual Site Model (CSM)										
Sources	**Key Contaminants**	**Receptor**	**Pathway**	**Pre-Remediation**			**Post-Remediation**			
				Probability	**Consequence**	**Risk Level**	**Mitigation**	**Probability**	**Consequence**	**Risk Level**
Made Ground Contaminants within soil and generation of gases.	Inorganic substances (heavy metals/ asbestos) Organic substances (ammoniacal nitrogen, petroleum hydrocarbons, PAHs, VOCs, SVOCs)	Human Health: Construction Workers End Users (on and off site)	Direct Contact – dermal contact, absorption through skin, ingestion. Inhalation of vapours (VOCs) from soil derived gas via Made Ground. Inhalation of contaminants in soils/dust/fibres.	Moderate likelihood	Medium	Moderate	During construction, appropriate PPE should be worn when coming into contact with arisings. With the installation of a clean cover system the pathway of contaminants within the underlying soil to reach human health receptors is essentially severed. Additional post-remedial ground gas / vapour assessment is required.	Low likelihood	Medium	Low
		Property: Future on Site Buildings Future on Site Infrastructure	Direct contact – contaminants in soils, soil derived dust, perched water and groundwater. Concrete in contact with aggressive ground.	Moderate likelihood	Medium	Moderate	Additional post-remedial ground gas / vapour assessment is required. Design of concrete in accordance with BRE Special Digest 1. Dependent upon finished levels, its likely that chemical resistant barrier pipes will be required.	Low likelihood	Medium	Low
			Potential migration and build-up of methane from soil derived gas via Made Ground (risk of explosion). Potential migration and build-up of carbon dioxide from soils derived gas via Made Ground (risk of asphyxiation).	Moderate likelihood	Medium	Moderate	Additional post-remedial ground gas / vapour assessment is required to further assess the Site.	Low likelihood	Medium	Moderate
		Controlled Waters: Secondary B Aquifer Monk's Ditch	Potential migration of leachable contaminants through shallow groundwater.	Moderate likelihood	Medium	Moderate	Analysis of the groundwater data and the production of a Controlled Waters Risk Assessment has shown the leachable effect of the Made Ground on the controlled waters receptors is acceptable. The proposed remediation and onward redevelopment will reduce infiltration in an overall betterment of the Site.	Low likelihood	Medium	Moderate
		Flora and Fauna	Uptake through roots of contaminants in soils.	Unlikely	Medium	Low	Importation of suitable topsoil material for use within garden areas and landscaped areas.	Unlikely	Medium	Low
Residual contaminants in groundwater	Inorganic substances (heavy metals) Organic substances (ammoniacal nitrogen, petroleum hydrocarbons, PAHs, VOCs, SVOCs)	Human health: Construction Workers End Users	Direct contact – dermal contact, absorption through skin, ingestion. Inhalation of vapours (VOCs) from soil derived gas via Made Ground.	Moderate Likelihood	Medium	Moderate	Appropriate PPE should be worn when coming into contact with perched water. Should potentially contaminated perched water be encountered during site works, it should be contained and disposed of off-site at a suitably permitted facility. Due to the depth of the groundwater and with the installation of clean cover, it is unlikely that residential end users will come into contact with it, therefore no viable pathway is present.	Low likelihood	Medium	Moderate / Low

Summary of Pre-Remediation and Post Remediation Conceptual Site Model (CSM)										
Sources	Key Contaminants	Receptor	Pathway	Pre-Remediation			Post-Remediation			
				Probability	Consequence	Risk Level	Mitigation	Probability	Consequence	Risk Level
							Vapour resistant membranes may be required following a detailed site investigation and risk assessment.			
		Property: Future on Site Buildings Future on Site Infrastructure	Potential migration and build-up of soil/water-derived vapours via Made Ground.	Low Likelihood	Medium	Moderate	Additional post-remedial ground gas / vapour assessment is required to further assess and zone the Site.	Unlikely	Medium	Low
		Controlled Waters: Secondary B Aquifer Spital Brook	Potential migration of contaminants through shallow groundwater.	Low Likelihood	Severe	Moderate	Remedial works to remove free product / grossly contaminated soils and treatment of soils / dissolved phase will significantly reduce the sources onsite reducing the risk to receptors. Low permiability of Tidal Flat Deposits means a viable pathway for downward migration is unlikely.	Low Likelihood	Medium	Moderate

6.0 Remediation Strategy

6.1. Remediation Approach

Based on the results of the previous ground investigations and CWDQRA (**Appendix B**), the key driver for the remediation of the Site is considered to be the removal of significant sources of contamination, below ground obstructions and re-engineering of near-surface Made Ground to reduce infiltration for the protection of surface waters and installation of a clean cover system for the protection of human health.

The risks to controlled waters have been assessed in an updated CWDQRA report included as **Appendix B**.

For the purpose of the remediation, the Site has been divided into two strategies, herein referred to as the 'Full Turnover Specification' and the 'Commercial Specification'. It is proposed that some areas which are to be redeveloped for a commercial end use will be subject to the Residential Strategy. Plans showing the proposed remedial areas (Drawing 18669-RLL-21-XX-DR-O-0165), the remediation strategy boundary (Drawing 18669-RLL-22-XX-DR-O-0262), the steelworks layout with remediation strategy boundary (Drawing 18669-RLL-22-XX-DR-O-0266) and the site aerial view with remediation strategy boundary (Drawing 18669-RLL-22-XX-DR-O-0265) are presented in **Appendix A**.

6.2. Full Turnover Specification

<u>Proposed Sequence of Deliverables</u>

The sequence of deliverables listed below is proposed:

- Materials Management Plan to enable the movement and re-use of excavated and stockpiled materials in accordance with the limitations set out in this document.
- Removal of vegetation.
- Undertaking turnover of Made Ground to natural clay and removal of unsuitable material and buried obstructions.
- Treatment or offsite disposal of impacted soils (where required).
- Chemical and geotechnical validation of the placement of material following turnover.
- Post remediation ground gas and vapour assessment.
- Preparation of a Remediation Validation Report.
- Regulator liaison and submission pursuant to the discharge of relevant planning conditions; and
- Onward housebuilder obligations to include.
    a. Placement and validation of a clean cover system (where required).

b. Provision and validation of appropriate gas / vapour membranes in buildings (where required).
c. Designing of appropriate concrete for aggressive ground.
d. Installation of appropriate chemical resistant water pipes.

Removal of Obstructions

A Materials Management Plan (MMP) will be prepared to allow the on-site reuse of materials in accordance with the CL:AIRE Definition of Waste, Development Industry Code of Practice. The recommended approach involves excavation of Made Ground to a depth where the natural underlying Tidal Flat Deposits are exposed. Obstructions, where they are unsuitable for retention, shall be removed leaving only the supporting piles. Supporting piles shall be cropped at the level of the underlying natural geology.

The recyclable materials generated (i.e. concrete removed from floor slabs, foundations and buried structures) are to be moved to a material processing area where they will be screened, crushed and validated for re-use within the onward development, in accordance with the MMP. Appropriate revisions will be made to the approved MMP as required.

Asbestos has previously been encountered as free fibres in the Made Ground. Concrete shall therefore be assessed prior to crushing in order to limit the risk of asbestos contamination of crushed concrete stockpiles and care shall be taken to ensure it is not cross-contaminated with Made Ground.

Protection of Human Health

The remedial criteria adopted for the clean cover system at the Site are based on S4ULs (suitable for use levels) and C4SLs (category 4 screening levels) for a residential end use with plant uptake.

It is likely that human exposure to contaminants during the operational phase of the development will be restricted to inhalation of dust and dermal contact/ ingestion of contaminants within gardens, public open spaces and soil adhering to home grown produce. Risks to human health may be mitigated through either excavation of the contaminants, provision of clean cover, or construction of hardstanding (or a combination of these); this is intended to prevent exposure to these contaminants and thus break the pollutant linkages.

The overall philosophy for remediation of the Site with regards to protection of human health is therefore severance of linkage pathways, by means of the removal of significant sources of contamination from the sub-surface and installation of a clean cover system or hardstanding in order to provide a safe development platform. This includes a turnover strategy as part of the earthworks. Additional measures, such as the provision of clean cover, soil-gas protection, water pipe protection etc, are then to be provided by the future housebuilder.

Protection of Controlled Waters

Following completion of the CWDQRA, it has been concluded that the Site in its present state is at the highest risk to controlled waters whereby potentially 100% of rainfall infiltrates through the Made Ground before entering reens leading to Monk's Ditch. Therefore, remediation is required to mitigate the risks. The CWDQRA has set remediation criteria for soils which are included within **Appendix B** and in **Tables 4** and **5** at the rear of this document.

The CWDQRA has assessed that once remediation has been undertaken and the removal of any free product and highly contaminated soils has been completed in accordance with the remedial targets set out in the CWDQRA and summarised in **Tables 4** and **5**, the Site is unlikely to pose a risk to controlled waters.

6.3. One Meter Turnover Specification

Proposed Sequence of Deliverables

The sequence of deliverables listed below is proposed:

- Materials Management Plan to enable the movement and re-use of excavated and stockpiled materials in accordance with the limitations set out in this document.
- Removal of vegetation.
- Excavation to 5.3mAOD in areas where the existing ground level is greater than 5.3mAOD.
- Removal of obstructions not suitable for retention
- Validation pits to assess depth to underlying clay and verify absence of gross contamination or underlying obstructions.
- Upfilling of site to 5.3mAOD where existing ground levels are below 5.3mAOD
- Placement of approximately 2m of suitable site won reengineered material to achieve the proposed formation 7.25mAOD.
- Treatment or offsite disposal of impacted soils (where required).
- Chemical and geotechnical validation of the excavation and filling works.
- Post remediation ground gas and vapour assessment.
- Preparation of a Remediation Validation Report.
- Regulator liaison and submission pursuant to the discharge of relevant planning conditions; and
- Onward developer actions to include.
    a. Placement and validation of a clean cover system (where required).
    b. Provision and validation of appropriate gas / vapour membranes in buildings (where required).
    c. Designing of appropriate concrete for aggressive ground.
    d. Installation of appropriate chemical resistant water pipes.

Removal of Obstructions

A Materials Management Plan (MMP) will be prepared to allow the on-site reuse of materials in accordance with the CL:AIRE Definition of Waste, Development Industry Code of Practice.

The areas of Site proposed for the One Meter Turnover Specification currently sit topographically lower than the areas proposed for the Full Turnover Specification. Surplus material from the residential areas is to be used to raise levels within the commercial areas.

The recommended approach involves a trim and chase process excavating material to a depth minimum of 5.3mAOD. Practical measures to identify, remove and validate the absence of gross contamination and known and potential obstructions extending below 5.3mAOD shall be undertaken.

The recyclable materials generated (i.e. concrete removed from floor slabs, foundations and buried structures) are to be moved to a material processing area where they will be screened, crushed and validated for re-use within the onward development, in accordance with the MMP. Appropriate revisions will be made to the approved MMP as required.

Asbestos has previously been encountered as free fibres in the Made Ground. Concrete shall therefore be assessed prior to crushing in order to limit the risk of asbestos contamination of crushed concrete stockpiles and care shall be taken to ensure it is not cross-contaminated with Made Ground.

Protection of Human Health

The remedial criteria adopted for the clean cover system at the Site are based on S4ULs (suitable for use levels) and C4SLs (category 4 screening levels) for a commercial end use.

It is likely that human exposure to contaminants during the operational phase of the development will be restricted to inhalation of dust and dermal contact/ ingestion of contaminants within gardens, public open spaces and soil adhering to home grown produce. Risks to human health may be mitigated through either excavation of the contaminants, provision of clean cover, or construction of hardstanding (or a combination of these); this is intended to prevent exposure to these contaminants and thus break the pollutant linkages.

The overall philosophy for remediation of the Site with regards to protection of human health is therefore severance of linkage pathways, by means of the removal of significant sources of contamination from the sub-surface and installation of a clean cover system or hardstanding in order to provide a safe development platform. This includes an excavation strategy as part of the earthworks. Additional measures, such as the provision of clean cover, soil-gas protection, water pipe protection etc, are then to be provided by the future developer.

Protection of Controlled Waters

Following completion of the CWDQRA, it has been concluded that the Site in its present state is at the highest risk to controlled waters whereby 100% of rainfall infiltrates through the Made Ground before entering reens leading to Monk's Ditch. Therefore, remediation is required to mitigate the risks. The CWDQRA has set remediation criteria for soils which are included within **Appendix B** and in **Tables 4 and 5** at the rear of this document.

The CWRA has demonstrated that once remediation has been undertaken, in accordance with the remedial targets set out in the CWDQRA and summarised in **Table 4 and 5**, and redeveloped with 95% impermeable surfaces the Site is unlikely to pose a risk to controlled waters.

6.4. Re-Use of Arisings

Several phases of trial pitting have been undertaken across the Site to assess and characterise the Made Ground for suitability for reuse. Trial pitting in the area proposed for a commercial end use was undertaken between May and July 2018 and trial pitting in the areas proposed for a residential end use was undertaken between December 2020 and February 2021.

Commercial Material Characterisation

A total of 415 samples were collected from 139 trial pits which were excavated within the commercial phase of the development. The results were compared to the proposed commercial Site acceptance criteria (SAC) detailed in **Tables 4** and **5**. The following table presents the exceedances, full screening against residential and commercial criteria is presented in **Appendix D**.

Summary of Exceedances of Commercial SACs.			
Determinant	**Commercial Criteria (mg/kg)**	**Locations Exceeding (depth in m)**	**Max Concentration (mg/kg)**
Benzo(b)fluoranthene	15	40ATP09	27

Residential Material Characterisation

Trial pitting was undertaken on a 25m X 25m grid with samples taken at every location across the residential phase of the development. The results were compared to the proposed Residential SAC detailed in **Tables 4** and **5**. The following table below presents the exceedances, full screening against residential and commercial criteria is presented in **Appendix D**.

Summary of Exceedances of Residential SACs.			
Determinant	**Residential Criteria (mg/kg)**	**Locations Exceeding Residential Criteria**	**Max Concentration (mg/kg)**
Cyanide, Total	2.313	2BSE-1, 2BSE-5, 2BSE-17, 2BSE-38, AT6-1, AU7-1, AV7-1, AW7-1, AW7-2, SPFO-4, SPFO-6, SPFO-7, SPFO-10, SPFO-12, Q37-2, R36-3, M37-1, AR2-1, AR4-1, AS3-1, AS7-2, AT4-1, AT4-2, AS11-1, AS11-2, AT11-1,	273

Summary of Exceedances of Residential SACs.			
Determinant	**Residential Criteria (mg/kg)**	**Locations Exceeding Residential Criteria**	**Max Concentration (mg/kg)**
		AT11-2, AU10-1, AV10-1, AV10-2, AW10-1, AW10-2, AN12-2, AV11-1, AV11-2, AW11-1, AW11-2, AN13-2, AM15-2, AO20-1, AO20-2, AO15-2, AP21-2, AQ21-1, AR21-2, AS20-1, AT22-2, AW20-1, AW21-1, AW21-2, AG10-2, AG11-1, AG11-2, AG11-3, AG11-4, AG12-2, AG13-2, AH14-3, W166-1, W166-2, W166-5, W166-6, AG15-2, AG19-1, AG19-2, AI14-1, AI15-2, AG15-2, AG19-1, AG19-2, AI14-1, AI15-2, AG8-2, AH6-1, AH6-2, AI8-2, AJ10-1, AF2-2, AF5-2, AG2-1, AG6-2, AH2-1, AM5-2, P17-1, Q17-1, V4-1, V5-2, V1-1, V2-1, Z2-2, P14-2, Q14-1, AK21-2, AK22-1, L21-1, V12-2, AS5-2, AT5-2, AU5-2A, U5-3, AU6-2, AV6-1, AV6-2, AV6-3, SPIA-1, SPIA-2, U16-1, SPJB-3, W127-1, W127-2, W127-3, W127-4, W127-5, W127-6, W204-3, W204-4, W204-17, AI-I-2, SPHR-1, SPHR-2, SPHU-1, SPHU-2, T9-2, V6-1, V7-1, V8-1, V10-2, AG15-2, AG19-1, AG19-2, AI14-1, AI15-2, SPDL-1, SPDL-2, SPDL-3, SPDL-4, W156-2, W156-5, W156-7, W156-9, W209-1, W209-2, W209-3, W209-4, W209-5, W209-6, W209B-2, W209B-3,W209B-4, W209C-2, W214-1, W-199-2, W-199-2, R117-1, R193-1, SPIS-1, R102-3, R102-4, R102-6, R102-7, T9-2, V6-1, V7-1, V8-1, V10-2, R105-1, R105-2, R105-3, R105-4, R105-5, R105-6, R105-7, R105-8, R123-5, R123-6, R104-1, R104-2, R104-3, R107-1-2, R107-2-1, AC31-2, AD31-1, AD34-1, AD31-2, AD36-2	
Exchangeable Ammonia as N	176.983	AS10-2, AO20-2	1,260
Copper	516.883	AK17-1, W35-4	560
Iron	349,148.010	N33-2, P37-2, AP21-2, AT20-1, AO27-2, AQ24-2, W166-2, AH30-2, Q32-2, AV6-2, AV6-3, W127-2, W156-2, R105-2, R105-4, R104-2	170,000
Manganese	38,175.690	M33-2, AT6-2, O34-2, AS6-2, AT4-3, AT9-2, AT9-3, AU9-2, AV10-2, AV10-3, AO15-1, AT22-2, AM33-1, AQ25-2, P16-1, T5-2, AH29-2, AL28-1, AL28-2, AL29-1, R32-1, SPJB-1, TP9-1, TP9-2, W156-1, W156-6, 3C-6, R102-6, R138-3, T9-1, T9-2	27,700
Vanadium	1,840.198	AS6-2, AQ25-2	2,050
Aromatics > EC10-EC12	259.933	AH14-3, AG15-2, AG19-2, AH15-3, AG15-2, AG19-2, AH15-3, AG15-2, AG19-2, AH15-3, W172B-2	6,920
Aromatics > EC12-EC16	517.061	AH14-3, AG15-2, AH15-3, AI11-3, AG15-2, AH15-3, AI11-3, AG15-2, AH15-3, AI11-3	5,300
Aromatics > EC16-EC21	1,631.673	SPFO-4, SPFO-7, AH14-3, AG15-2, AH15-3, AG15-2, AH15-3, AG15-2, AH15-3	13,600
Naphthalene	31.450	AH14-3, AG15-2, AG19-2, AH15-3, AG15-2, AG19-2, AH15-3, AH7-2, AG15-2, AG19-2, AH15-3	4,480
Acenaphthylene	19.168	AH14-3, AG15-2, AH15-3, AG15-2, AH15-3, AG15-2, AH15-3, W172B-1	616
Acenaphthene	34.073	AH14-3, AG15-2, AH15-3, AG15-2, AH15-3, AG15-2, AH15-3, W172B-2	1,130
Fluorene	31.077	2BN2-7, SPFO-9, AH14-3, AG15-2, AH15-3, AG15-2, AH15-3, AH7-2, W204-18, AG15-2, AH15-3, W172B-1, W172B-2	751
Phenanthrene	31.077	2BSE-13, 2BSE-35, 2BN2-7, 2BN2-19, SPFO-1, SPFO-2, SPFO-3, SPFO-4, SPFO-7, SPFO-8, SPFO-9, SPFO-10, 4A Comp -28, AM15-1, AM15-2, AG11-2, AH14-3, AG15-2, AH15-3, AG15-2, AH15-3, AH7-2, AG2-1, Q17-2, V1-1, Y1-1, T4-1, T4-2, S19-2, W204-17, W204-18, SPHR-1, SPHR-2, T10-1, AG15-2, AH15-3, W156-5, W209-4, W209B-3, W172B-1, W172B-2, R117-1, T10-1	3,100

Summary of Exceedances of Residential SACs.			
Determinant	**Residential Criteria (mg/kg)**	**Locations Exceeding Residential Criteria**	**Max Concentration (mg/kg)**
Anthracene	39.119	2BN2-7, SPFO-8, SPFO-9, AH14-3, AG15-2, AH15-3, AG15-2, AH15-3, W204-17, W204-18, SPHR-1, SPHR-2, AG15-2, AH15-3, W156-5, W172B-1, W172B-2	577
Fluoranthene	7.614	2BSE-1, 2BSE-5, 2BSE-7, 2BSE-8, 2BSE-9, 2BSE-10, 2BSE-12, 2BSE-13, 2BSE-22, 2BSE-25, 2BSE-26, 2BSE-28, 2BSE-30, 2BSE-31, 2BSE-32, 2BSE-35, 2BN-1, 2BN-4, 2BN-7, 2BN-9, 2BN2-1, 2BN2-2, 2BN2-4, 2BN2-5, 2BN2-6, 2BN2-7, 2BN2-12, 2BN2-15, 2BN2-16, 2BN2-19, 2BN2-20, 2BN2-21, 2BN2-22, 2BN2-23, 2BN2-24, 2BN2-25, 2BN2-26, 2BN2-21, 2BN2-22, 2BN2-23, 2BN2-24, 2BN2-25, 2BN2-26, 2BN2-28, 2BSE-15, 2BSE-16, 2BSE-18, 2BSE-37, 2BSE-38, 2BSE-39, SPFO-1, SPFO-2, SPFO-3, SPFO-4, SPFO-7, SPFO-8, SPFO-9, SPFO-10, P37-1, AP1-2, 4A Comp -1, 4A Comp -5, 4A Comp -11, 4A Comp -13, 4A Comp -15, 4A Comp -16, 4A Comp -17, 4A Comp -21, 4A Comp -24, 4A Comp -26, 4A Comp -28, 4A Comp -30, 4A Comp -31, 4A Comp -33, 4A Comp -35, 4A Comp -36, 4A Comp -37, 2BN2-8, 2BN2-10, 2BN2-29, 2BN2-29, 2BN2-31, 2BN2-33, 2BN2-34, AN12-3, AN14-1, AN14-2, AN16-1, AN17-2, AO18-2, AL12-2, AL12-3, AM15-1, AM15-2, A012-1, AM11-2, AO15-1, AO15-2, AO16-1, AP15-1, AR19-2, AQ25-1, AQ25-2, AQ26-1, W168-1, W168-2, W168-3, W168-4, W168-5, W168-6, W168-7, W168-8, W168-9, W168-10, W168-11, AG11-1, AG11-1, AG11-2, AG11-3, AG11-4, AH14-1, AH14-3, AG15-2, AH15-3, AI14-1, AI14-2, AI14-3, AI19-2, AG15-2, AH15-3, AI14-1, AI14-2, AI14-3, AI19-2, AH7-2, AH8-2, AH8-3, AH8-4, AJ18-1, AG2-1, AL15-2, P17-1, Q17-2, Q18-2, AQ7-1, V1-1, V1-2, Y1-1, Z1-1, P15-2, Q14-1, R15-2, T4-1, T4-2, AK31-1, AK32-1, P21-1, S19-1, S19-2, S21-1, SPLP-2, W213-2, W213-3, SPJB-3, W177-1, W177-2, SPLF-2, W204-1, W204-2, W204-6, W204-7, W204-8, W204-10, W204-11, W204-14, W204-17, W204-18, SPHR-1, SPHR-2, T8-1, T10-1, T10-3, V9-2, V10-1, AG15-2, AH15-3, AI14-1, AI14-2, AI14-3, AI19-2, W156-4, W156-5, W156-10, W209-1, W209-4, W209B-3, W209C-1, W202-2, W205-2, W205-6, W214-5, W172B-1, W172B-2, 3C-1, 3C-4, 3C-6, R117-1, R-135-2, R106-1, W-208-4-3, W-89-1, W-186-1, W-186-2, W-186-3, R139-1, W182-1, T8-1, T10-1, T10-3, V9-2, V10-1, R123-5, R123-6	2,360
Pyrene	87.557	2BN2-7, SPFO-4, SPFO-8, SPFO-9, AH14-3, AG15-2, AH15-3, AI14-1, AG15-2, AH15-3, AI14-1, AH7-2, W204-18, SPHR-1, SPHR-2, AG15-2, AH15-3, AI14-1, W156-5, W172B-1, W172B-2	1,540
Benzo(b)-fluoranthene	3.914	2BSE-1, 2BSE-5, 2BSE-7, 2BSE-8, 2BSE-9, 2BSE-10, 2BSE-12, 2BSE-13, 2BSE-14, 2BSE-22, 2BSE-25, 2BSE-26, 2BSE-28, 2BSE-30, 2BSE-31, 2BSE-32, 2BSE-33, 2BSE-35, 2BN-1, 2BN-2, 2BN-4, 2BN-6, 2BN-7, 2BN-9, 2BN2-1, 2BN2-2, 2BN2-4, 2BN2-5, 2BN2-6, 2BN2-7, 2BN2-12, 2BN2-13, 2BN2-15, 2BN2-19, 2BN2-20, 2BN2-21, 2BN2-22, 2BN2-23, 2BN2-24, 2BN2-25, 2BN2-26, 2BN2-21, 2BN2-22, 2BN2-23, 2BN2-24, 2BN2-25, 2BN2-26, 2BN2-27, 2BN2-28, 2BSE-15, 2BSE-16, 2BSE-17, 2BSE-18, 2BSE-21, 2BSE-36, 2BSE-37, 2BSE-38, 2BSE-39, SPFO-1, SPFO-2, SPFO-3, SPFO-4, SPFO-7, SPFO-8, SPFO-9, SPFO-10, P37-1, M36-2, AP1-2, 4A Comp -5, 4A Comp -11, 4A Comp -13, 4A Comp -15, 4A Comp -16, 4A Comp -17, 4A Comp -21, 4A Comp -26, 4A Comp -28, 4A Comp -30, 4A Comp -31, 4A Comp -33, 4A Comp -35, 4A Comp -36, 4A Comp -37, 2BN2-8, 2BN2-10, 2BN2-29, 2BN2-29, 2BN2-31, 2BN2-33, 2BN2-34, 2BN2-35, AN12-2, AN12-3, AN14-1, AN14-2, AN16-1, AN17-2, AO18-2, AL12-2, AL12-3, AM15-1, AM15-2, A012-1, AM11-2, AO15-1, AO15-2, AO16-1, AP15-1, AR19-2, AW21-2, AO27-1, AQ25-1, AQ25-2, AQ26-1, W168-1, W168-2, W168-3, W168-4, W168-5, W168-6, W168-7, W168-8, W168-9, W168-10, W168-11, AG10-2, AG11-1, AG11-2, AG11-3, AG11-4, AG12-2, AH14-1, AH14-3, AG15-2, AH15-3, AH19-1, AI14-1, AI14-2, AI14-3, AI18-1, AI19-1, AI19-2, AG15-2, AH15-3, AH19-1, AI14-1, AI14-2, AI14-3, AI18-1, AI19-1, AI19-2, AH7-2, AH8-1, AH8-2, AH8-3, AH8-4, AJ18-1, AF5-1, AG2-1, P17-1, Q17-2, Q18-2, AQ7-1, V1-1, X2-1, Y1-1, Y2-2, Z1-1, Z2-2, P15-2, Q14-1, R15-2, T4-1, T4-2, AK32-1, P21-1, S19-1, S19-2, SPLP-2, W213-2, W213-3, W213-3, SPDL-1, SPDL-2, SPJB-1, SPJB-3, W177-1, W177-2, SPLF-2, W125-2, W204-1, W204-2, W204-7, W204-8, W204-10, W204-11, W204-14, W204-17, W204-18, SPHR-1, SPHR-2, T8-1, T9-1, T10-1, T10-2, V9-2, V10-1, AG15-2, AH15-3, AH19-1, AI14-1, AI14-2, AI14-3, AI18-1, AI19-1, AI19-2, SPDL-2, SPDL-3, SPDL-4, W35-4, W156-4, W156-5, W156-10, W209-1, W209-4, W209B-3, W209C-1, W202-2, W203-4, W207515-6, W214-5, W172B-1, W172B-2, 3C-1, 3C-31004, 3C-6, R117-1, SPIS-1, R-135-2, R106-1, W577-208-4-3, W-89-1, W-186-2, W-186-3, R139-12360, W182-1, T8-1, T9-1, T10-1, T10-2, V9-2, 1540V10-1, R123-5, R123-6772	772

Summary of Exceedances of Residential SACs.			
Determinant	**Residential Criteria (mg/kg)**	**Locations Exceeding Residential Criteria**	**Max Concentration (mg/kg)**
Benzo(k)-fluoranthene	5.790	2BSE-13, 2BSE-35, 2BN2-5, 2BN2-7, 2BN2-19, 2BN2-20, SPFO-1, SPFO-2, SPFO-4, SPFO-7, SPFO-8, SPFO-9, SPFO-10, AP1-2, 4A Comp -28, AM15-1, AM15-2, AH14-3, AG15-2, AH15-3, AI14-1, AG15-2, AH15-3, AI14-1, AG8-1, AH7-2, AG2-1, Q17-2, V1-1, Y1-1, Q14-1, T4-2, W204-17, W204-18, SPHR-1, SPHR-2, AG15-2, AH15-3, AI14-1, W156-5, W209B-3, W172B-1, W172B-2, 3C-1, R117-1, W-89-1, W-186-1, W182-1, R123-6	265
Benzo(a)pyrene	39.489	2BN2-7, SPFO-4, SPFO-9, AM15-1, AH14-3, AG15-2, AH15-3, AH15-3, AI14-1, AG15-2, AH15-3, AI14-1, AH7-2, W204-18, SPHR-1, SPHR-2, AG15-2, AH15-3, AI14-1, W209B-3	555
Indeno(1,2,3-cd)pyrene	29.018	2BN2-7, SPFO-4, SPFO-9, AM15-1, AH14-3, AG15-2, AH15-3, AI14-1, AG15-2, AH15-3, AI14-1, AH7-2, W204-18, SPHR-1, SPHR-2, AG15-2, AI14-1, W156-5, W209B-3	429
Benzo(g,h,i)-perylene	15.229	2BN2-5, 2BN2-7, SPFO-1, SPFO-2, SPFO-4, SPFO-8, SPFO-9, AP1-2, AM15-1, AM15-2, AH14-3, AG15-2, AH15-3, AI14-1, AG15-2, AH15-3, AI14-1, AH7-2, V1-1, Y1-1, T4-2, W204-18, SPHR-1, SPHR-2, AG15-2, AH15-3, AI14-1, W156-5, W209B-3, W172B-1, W172B-2, R117-1, R123-6	370.000
Benzene	4.358	AH14-3, SPHR-2	6.060

Material present within the proposed residential area that exceeds residential SAC shall be transferred and re-used in the commercial phase of the development, in accordance with an approved Materials Management Plan prepared in accordance with the CL:AIRE Definition of Waste, Development Industry Code of Practice.

Where material is not suitable for either a residential or commercial end use, or during remediation, if any material exhibits previously unencountered significant evidence of contamination (i.e. free product or grossly impacted soils) the contractor should inform the Client's Engineer on and propose a method for its treatment that will allow re-use (at the supervising engineers discretion) or, options for off-site disposal.

The re-use of treated materials will be subject to regulatory approval and an approved Materials Management Plan prepared in accordance with the CL:AIRE Definition of Waste, Development Industry Code of Practice. On-site treatment and processing will be undertaken where possible to reduce contaminant concentrations so the arisings will be either:

- Suitable for shallow residential garden use (part of the clean cover layer);
- Suitable for re-use at depth (e.g. below the clean cover or within POS landscaped areas).

If treatment is required, then testing shall be undertaken at a frequency of 1 sample per 100m^3 and compared against the re-use screening criteria for the various potential end-uses detailed in **Table 1**, **Table 2, Table 3**, **Table 4** and **Table 5** included to the rear of this report.

6.5. Clean Cover System

To reasonably prevent contact between Site end users and contaminants within the Made Ground, a clean cover system shall be placed in gardens and areas of public open space. Following completion of the reclamation works, the Site shall be left 750mm below from Finished Floor Levels (FFL). This is to incorporate drainage arisings (150mm) and facilitate the installation of the clean cover system for residential gardens, which will comprise a minimum of 600mm of suitable material (or 300mm in areas of public open space). Material is considered suitable after being assessed against the criteria detailed in **Table 1, 2 and 3**. Material proposed for reuse within residential gardens is to be assessed in accordance with **Table 1**. Material to be reused within public open space within a residential area is to be assessed in accordance with **Table 2**. Material to be reused within public open space in a commercial area is to be assessed in accordance with **Table 3**.

The cover system will comprise suitable subsoil and topsoil and is to be placed by the onward developer. A Validation Report is required for the cover system and this shall be submitted to the regulators to satisfy planning conditions. It is advised that the onward developer also share details of the clean cover system with their chosen housing insurer (NHBC, LABC or equivalent) for approval in accordance with their guidance. The clean cover requirements for areas of public open space are anticipated to be 300mm of suitable material in accordance with **Tables 2** and **3**.

6.6. Ground Gas Protection Measures

The assessment of ground gas protection measures is to be updated following the remedial works. The classification of the Site will depend on the competency of the upper clay of the Tidal Flat Deposits. A site-specific ground gas assessment is recommended following the earthworks. In accordance with BS8485:2015+A1:2019.

A gas assessment was undertaken on a nearby phase in accordance with BS8485:2015+A1:2019. Based on the continuous gas monitoring undertaken in borehole 3CWS109, the nearby site was classified with a Characteristic Situation of CS1. The gas monitoring dataset obtained from the installation within the Made Ground suggests that the methane monitored within the deeper Tidal Flat Deposits was not migrating into the overlying Made Ground.

Risks from vapours has not been assessed as part of the 2020 site investigation and will be assessed as part of the post remediation ground gas and vapour assessment detailed within this Remediation Strategy.

6.7. Risks to Construction Workers

Site workers are advised to follow normal health and safety procedures, including the use of suitable PPE (e.g. gloves and overalls) and following hygiene rules, particularly when handling the Made Ground. Contamination is present within the Made Ground (including asbestos), therefore specific contractor RAMS (with

reference to guidelines presented in Control of Asbestos Regulations 2012) may need to be produced to mitigate the risks.

A watching brief should be maintained during excavation works as part of the development to check for the presence of previously unexpected contamination.

6.8. Onward Developer Actions

The following actions are deferred to the onward developer:

- Placement of a clean cover system in residential gardens and areas of public open space as part of the overall development;
- Validation of the thickness and chemical composition of soils placed in gardens (as part of the clean cover system) in accordance with NHBC (or equivalent housing insurer) recommendations;
- Provision of appropriate gas / vapour membranes in buildings and validation in accordance with BS: 8485:2015+A1:2019 and CIRIA C735, if necessary;
- Designing concrete in accordance with BRE Special Digest 1 will prevent significant risks from concrete degrading if in contact with aggressive ground; and
- Installation of appropriate chemical resistant water pipes (if required).

6.9. Environmental Monitoring

The Construction Management Plan (Atkins, April 2014) should be read in conjunction with this section for the environmental monitoring requirements.

6.9.1. Surface Water Monitoring

During the remediation works, surface water monitoring shall be undertaken from the on site reen system and from Monks Ditch at numerous appropriate locations across the site, shown on Drawing 18669-RLL-21-DR-O-O-18669-RLL-21-XX-DR-O-0167 (**Appendix A**). Visual monitoring of the watercourse will be undertaken on a daily basis and chemical samples will be taken on a fortnightly basis.

The results of chemical analysis shall be compared against the EQS determinands detailed in **Table 4**. If exceedances are identified, then additional monitoring and assessment will be required and liaison with the appropriate regulators.

6.9.2. Dust and Air Quality

Dust monitoring is required throughout the works as residential and commercial receptors are located near to the Site boundary on all sides. Monitoring locations are detailed in the Construction Environmental Management Plan (CEMP); however the locations shall be reviewed and adapted based on working areas and actual conditions encountered on Site.

6.9.3. Noise and Vibration

The Contractor will ensure that operations are undertaken in a manner considerate to sensitive receptors, including adjacent residential properties. This includes limiting noise and vibration as far as is reasonably practicable. Details of required monitoring are included in the CEMP.

7.0 Contingency for Unexpected Contaminated Soil

Should the Contractor or Employer's Environmental Engineer identify suspected areas of gross contamination, the suspected contaminated soils shall be excavated and stockpiled separately on polythene sheeting with appropriate bunding and suitably identified.

Contaminated soils shall be defined as soils exhibiting visual evidence of contamination (e.g. soils with hydrocarbon content above the saturation limit) or olfactory indications of contamination (e.g. organic odour indicative of hydrocarbons). Initial vapour screening of the impacted Made Ground / natural deposits may be undertaken using a photoionization detector (PID), where visual or olfactory evidence of organic contamination is recorded.

Representative samples of affected soils shall be tested for the suspected contaminants of concern. The minimum number of samples will be five i.e. one from each side and one from the base. As a minimum, and dependent on contamination type, one sample shall be taken for every 10m along the side per contaminated horizon and one sample per 100m^2 base area. If the thickness of the contaminated zone is greater than 1.0m, one sample shall be taken per 1.5m of vertical face. Results shall be compared against the criteria detailed in the tables at the rear if this document, which will determine a suitable end-use and the material will be re-used accordingly (in accordance with the MMP). Should samples exceed the criteria, soils will be deemed unsuitable for re-use without liaison with the regulator and further risk assessment and/or treatment. Any material deemed unsuitable following further risk assessment shall require treatment or disposal from the Site.

Should soils require disposal from the Site, the soil's chemical results shall be used to begin the assessment of the material as non-hazardous or hazardous waste. Waste Acceptance Criteria (WAC) testing may be required prior to off-site disposal. Material sent to landfill must be hauled by a registered waste carrier in accordance with the Waste Duty of Care: Code of Practice. The Contractor shall be responsible for keeping all records including waste transfer notes.

Validation testing of the sides and base of the resultant excavation shall be carried out by the appropriate monitoring Engineer, in accordance with Section 9 this document. The contaminated soils will be deemed to have been successfully removed once the validation samples of the sides and base meet the respective criteria for re-use.

The extent and location of contaminated soils removed shall be surveyed and recorded by the Contractor.

8.0 Re-use of Site Won Material

8.1. Re-use of Site Generated Materials

In the interest of sustainability and in order to avoid the unnecessary transport of material from the Site to landfill, it is proposed to re-use the Made Ground and any recycled aggregates generated as part of the works. Re-use of material will be in accordance with the CL:AIRE Definition of Waste, Development Industry Code of Practice. A compliant Materials Management Plan has previously been prepared for the site.

Material movements shall be tracked by the Contractor on daily or weekly material tracking sheets, to include:

- Survey plans of material sources and destinations.
- Summaries of volumes and composition of materials moved.
- Associated chemical testing to demonstrate suitability.
- Locations and ongoing volumes of temporary stockpiles.

Material movement records shall be maintained by the Contractor on Site for inclusion in the Validation Report.

8.2. Soil for Formation of Clean Cover

The placement of clean cover will be the responsibility of the onward developer.

Subsoil and topsoil proposed for formation of capping layers shall be tested prior to import and/ or placement and compared to screening criteria in **Tables 1, 2** and **3** included at the rear of this document. Soils shall be tested at a frequency of one sample per 250m^3 and a minimum of three samples per source.

8.3. General Site Fill Beneath Clean Cover

Site won materials and existing stockpiles may be used as general fill below formation level (i.e. below the clean cover), providing they are chemically suitable when compared with the criteria in **Tables 4 and 5**. Soils that are impacted with free product or grossly contaminated will not be acceptable for re-use without further treatment/assessment. Screened materials will be tested at a frequency of 1 sample per 500m^3 and compared against the screening criteria detailed at the rear of this document.

If asbestos is identified, dependent upon the concentration, it shall be re-used in accordance with the depths detailed in the Institute of Occupational Medicine (**Appendix E**): Llanwern, Assessment of Asbestos Contamination at Former Llanwern Steelworks Site. The report concludes that a minimum of 600mm of clean soil (the clean cover system) will be placed across the Site. Beneath the clean soils, Made ground may be used in residential areas if asbestos contamination is less

than 0.02% (200ppm) and used in commercial areas if asbestos contamination is less than 0.03% (300ppm).

Should material be found to contain contaminants above the re-use criteria, then the upper 95th percentile value (US^{95}) may be used to assess the material for suitability for re-use subject to agreement with the Local Authority.

8.4. Offsite Disposal

Material sent to landfill must be hauled by a registered waster carrier in accordance with the Waste Duty of Care: Code of Practice. The Contractor shall be responsible for surveying the source areas of all off site material, recording volumes, relevant compliance and classification testing results and the keeping of records including waste transfer notes, consignment notes and material tracking sheets for inclusion in the Validation Report.

9.0 Validation

9.1. General

The remediation and/ or earthworks activities described in this strategy will be supervised full-time by the suitably qualified Monitoring Engineer. As an addendum to the remediation strategy, following consultation with Newport City Council and Natural Resources Wales, technical notes have been prepared to capture additional relevant phase specific information as part of the validation exercise. The technical notes prepared as an addendum to the remediation strategy are presented in Appendix F. Technical Note 192 (Appendix F) presents additional information relating to the remediation strategy and the setting out the process to collect additional validation information to assess the contamination status of the formation surface. Technical Note 260 (Appendix F) presents a validation plan to assess the hydraulic conductivity of the reengineered made ground and to assess the sampled perched water samples against the pore water concentrations assumed within the CWDQRA.

Remediation shall be confirmed using the methodology presented in the Validation of Remediation of Land Contamination - Science Report SC030114/R1 (Environment Agency, 2010).

A Validation Report shall be prepared on completion of the works. The Validation Report will be submitted to the Local Planning Authority pursuant to the discharge of relevant planning conditions.

Post-remediation ground gas/ vapour monitoring will be required to further zone the Site with regard to the required gas/ vapour protection measures.

9.2. Validation of Turnover

Turnover works will be undertaken under a full-time watching brief by the Monitoring Engineer. Material exhibiting visual or olfactory evidence of contamination will be segregated and further assessed. Records of wider material movements will also be kept and detailed within the MMP.

Non-targeted grid validation sampling shall be undertaken at a frequency of 1 sample per 500m^3 of placed material. Formation level is to be left up to 600mm below final floor level (FFL) to account for the placement of clean cover (300mm in areas of POS). Soil samples shall be compared to the following criteria.

- Made Ground used within residential gardens as part of the clean cover system (i.e. above formation level) shall be compared with the criteria detailed in **Table 1**.
- Made Ground used within public open space as part of the clean cover system (i.e. above formation level) within a residential area shall be compared with the criteria detailed in **Table 2**

- Made Ground used within public open space as part of the clean cover system (i.e. above formation level) within a commercial area shall be compared with the criteria detailed in **Table 3**
- Made Ground used as general fill beneath the formation level (i.e. below clean cover) within a residential area shall be compared with the criteria in **Table 4** and will be visually validated at the Client's Environmental Engineers discretion based on definitions of free product impacted and grossly impacted soils used in the previous sections.
- Made Ground used as general fill beneath the formation level (i.e. below clean cover) within a residential area shall be compared with the criteria in **Table 5** and will be visually validated at the Client's Environmental Engineers discretion based on definitions of free product impacted and grossly impacted soils used in the previous sections.
- A 600mm clean cover system will be placed across the Site. Beneath the clean soils, Made Ground may be used in residential areas if asbestos contamination is less than 0.02% (200ppm) and used in commercial areas if asbestos contamination is less than 0.03% (300ppm).

Validation will generally comprise the following procedure:

I. Delineation of Unexpected Contamination (if encountered)

Material exhibiting evidence of visual or olfactory gross contamination will be removed. A photo ionization detector (PID) should be used on-site to determine the extent of the contamination. Soil sampling and testing shall be undertaken until the results meet the respective re-use criteria detailed in **Tables 4** and **5** and the material is not grossly impacted or impacted with free product, at which point the extent of the potential hot-spot will be regarded as having been delineated.

II. Excavation of Contaminated Material

Material which does not meet the re-use criteria detailed in the tables at the rear of this document or is visually impacted with free product/ grossly impacted will be removed by the Contractor and stockpiled on-site for further assessment/treatment; if necessary the material will be removed from Site. The extent of the excavation may be increased should it be deemed necessary, for example, if further visual or olfactory evidence of significant contamination is present.

III. Hot-Spot Validation Sampling

Soil samples will be obtained for validation testing on the sides and base of the hot-spot excavation following soil removal. Samples will be tested for the contaminants that did not meet the respective criteria at that particular hot-spot location.

The minimum number of samples will be five i.e. one from each side and one from the base. As a minimum, and dependent on contamination type, one sample shall be taken for every 10m along the side per contaminated horizon and one sample per 100m^2 base area. If the thickness of the contaminated zone is greater than 1m, one sample shall be taken per 1.5m of vertical face.

If validation samples do not meet the criteria, further soil will be excavated horizontally and vertically and additional validation samples taken. The procedure will be repeated until samples meet the remedial targets. Any deviation from the above methods will require liaison and approval from the regulator.

IV. Survey

The extent of the excavation will be surveyed to Ordnance Datum (co-ordinates and levels) and a plan produced showing the location of relevant samples taken. Obstructions left in-situ will also be recorded on the survey.

An as dug survey will also be completed for the whole area of the earthworks across the Site showing depth of excavation / turnover per 5m grid and increased survey points array for any deeper excavations.

V. Sampling, Sample Transfer and Analytical Laboratories

Soils for chemical testing shall be sampled in accordance with the following British and Eurocode Standards, BS 10175:2011+A2 2017 – 'Investigation of potentially contaminated Sites – Code of practice', Eurocode 7, and the BS 5930:2015 – 'Code of Practice for Site investigations – Incorporating Amendment No.2' for contamination testing and for geotechnical testing.

Sample containers required for soils shall include vials for volatile organic compound (VOC) testing, amber jars for hydrocarbon testing and a 1kg sized plastic containers for testing of metals and asbestos screening.

Soil, groundwater and surface water samples are to be stored in a cool box, maintained at a temperature between 2°C and 4°C in darkness and shall be transported under these conditions to the accredited laboratory.

Internal and external laboratories shall be UKAS/MCERTS (or equivalent) accredited or it shall be demonstrated that appropriate quality systems have been implemented in lieu of accreditation for non-accredited tests.

9.3. Validation of Free Product Removal

Validation of the free product removal shall be undertaken by the Monitoring Engineer. Soil material exhibiting visual or olfactory evidence of contamination will be segregated and further assessed. Groundwater monitoring shall be undertaken

to confirm removal of free product from the boreholes or open excavations. Free product shall be removed as much as reasonably practical to a maximum residual thickness of 2mm. Upon completion, details of the product removal and monitoring will be included within the overall Validation Report.

9.4. Validation of Clean Cover

It is proposed that clean cover in residential areas shall be placed as part of the construction of each plot. The clean cover shall be 600mm thickness and comprise suitable construction materials, subsoil and topsoil. Clean cover will also be required in areas of public open space within the residential and commercial development of 300mm thickness.

Placement and validation of the clean cover layer, either construction materials or soils in residential gardens, shall be undertaken by the housebuilder in accordance with requirements of the regulators and NHBC.

9.5. Geotechnical Validation

Excavated material will be placed, compacted and tested for compliance with a phase specific Earthworks Specifications. Areas of deeper Made Ground, fill and remnant structures will be surveyed and recorded on a drawing.

10.0 Supervision and Reporting

The post-demolition and remediation works described in this report shall be supervised by the suitably qualified Monitoring Engineer.

Survey plans and test results shall be presented within the Validation Report.

The Contractor shall be responsible for obtaining the necessary licences, permits and consents for the works (correspondence shall be forwarded to the Employer' Environmental Engineer) with the exception of the Materials Management Plan and associated Declaration to CL:AIRE, which shall be updated by the Employer's Environmental Engineer upon regulatory approval of this Remediation Strategy.

The Contractor shall maintain records of:

- Survey plans and material tracking of the movements of material from source to final destination.
- Base of excavation and obstruction survey.
- Type and volumes of any materials removed from the Site for disposal, together with the Duty of Care documentation / waste transfer notes.
- Geochemical and geotechnical sampling locations,
- Records of the works including Daily Records Sheets.
- Health and Safety documentation.
- Noise and dust monitoring carried out.
- Records of the complaints received regarding noise and dust.

The Contractor's Environmental Engineer will prepare a Validation Report for the remedial works undertaken under their supervision. The Validation Report shall be compliant with the Environment Agency's Land Contamination Risk Management (LCRM) guidance and 'Verification of remediation of land contamination (SC030114/R1)', providing the following:

- Details of the earthworks and material movements completed.
- Details of hot-spots/ contaminated material removal (if required),
- Details of the free product plume removal/remediation,
- Details of the validation and verification analytical testing.

The Validation Report shall be submitted to the regulatory authorities to satisfy the requirements of the planning permission with respect to contamination issues. The report will also contain all earthworks testing data, proof of compliance with the targets and all survey data.

Tables

Table 1: Assessment Criteria for Clean Cover in Residential Gardens (600mm): Residential End Use with Homegrown Produce

Category	Determinand	Criteria mg/kg			Source
	Arsenic	37			a
	Boron	290			b
	Cadmium	26			a
	Chromium VI	6			b
	Chromium III	910			b
	Lead	200			a
	Elemental Mercury	1.2			b
	Inorganic Mercury	40			b
	Methyl Mercury	11			b
	Nickel	130			b
	Selenium	250			b
	Beryllium	1.7			b
	Copper	2400			b
	Vanadium	410			b
	Zinc	3700			b
Soil Organic Matter Content (SOM) dependent		**SOM 1%**	**SOM 2.5%**	**SOM 6%**	
Phenols	Phenol	120	200	380	b
Petroleum Hydrocarbons	Aliphatic EC 5-6	42	78	160	b
	Aliphatic EC>6-8	100	230	530	b
	Aliphatic EC>8-10	27	65	150	b
	Aliphatic EC>10-12	130 (48)[vap]	330 (118)[vap]	760 (283)[vap]	b
	Aliphatic EC>12-16	1100 (24)[sol]	2400 (59)[sol]	4300 (142)[sol]	b
	Aliphatic EC>16-35	65000 (8.48)[sol]	92000 (21)[sol]	110000	b
	Aliphatic EC>35-44	65000 (8.48) [sol]	92000 (21) [sol]	110000	b
	Aromatic EC 5-7 (Benzene)	70	140	300	b
	Aromatic EC>7-8 (Toluene)	130	290	660	b
	Aromatic EC>8-10	34	83	190	b
	Aromatic EC>10-12	74	180	380	b
	Aromatic EC>12-16	140	330	660	b
	Aromatic EC>16-21	260	540	930	b
	Aromatic EC>21-35	1100	1500	1700	b
	Aromatic EC>35-44	1100	1500	1700	b
	Aliphatic + Aromatic EC>44-70	1600	1800	1900	b
Polycyclic Aromatic Hydrocarbons	Acenaphthene	210	510	1100	b
	Acenaphthylene	170	420	920	b
	Anthracene	2400	5400	11000	b
	Benz(a)anthracene	7.2	11	13	b
	Benzo(a)pyrene	2.2	2.7	3.0	b
	Benzo(b)fluoranthene	2.6	3.3	3.7	b
	Benzo(ghi)perylene	320	340	350	b
	Benzo(k)fluoranthene	77	93	100	b
	Chrysene	15	22	27	b

Category	Determinand	Criteria mg/kg			Source
	Dibenzo(a,h) anthracene	0.24	0.28	0.3	b
	Fluoranthene	280	560	890	b
	Fluorene	170	400	860	b
	Indeno(1,2,3cd) pyrene	27	36	41	b
	Naphthalene	2.3	5.6	13	b
	Phenanthrene	95	220	440	b
	Pyrene	620	1200	2000	b
Chloroalkanes & alkenes	1,2-Dichloroethane	0.0071	0.011	0.019	b
	1,1,1-trichloroethane	8.8	18	39	b
	1,1,2,2 Tetrachloroethanes (PCA)	1.6	3.4	7.5	b
	1,1,1,2 Tetrachloroethanes (PCA)	1.2	2.8	6.4	b
	Tetrachloroethene (PCE)	0.18	0.39	0.90	b
	Tetrachloromethane (Carbon Tetrachloride)	0.026	0.056	0.13	b
	Trichloroethene (TCE)	0.016	0.034	0.075	b
	Vinyl Chloride (chloroethene)	0.00064	0.00087	0.0014	b
BTEX	o-xylene	60	140	330	b
	m-xylene	59	140	320	b
	p-xylene	56	130	310	b
	Toluene	130	290	660	b
	Ethylbenzene	47	110	260	b
	Benzene	0.087	0.17	0.37	b
	Asbestos	Zero fibres			

Source of Criteria

Category 4 Screening Level (C4SL)
LQM/CIEH Suitable for Use Level (S4UL)

Notes

Organic matter content does not affect assessment criteria for metals
Arsenic S4UL is based on a comparison of oral and dermal soil exposure with oral Index Dose.
Cadmium C4SL is based on lifetime exposure
Beryllium S4UL is based on comparison of inhalation exposure with inhalation TDI
Chromium VI S4UL are based on localised effects comparing inhalation exposure with inhalation ID only
Values for total xylene should be compared with the most protective S4UL for xylene
Methyl mercury is not a routine contaminant but a S4UL has been generated for Sites where this may be present due to past industrial use. Unless methyl and elemental mercury is suspected to be present, a total mercury concentration can be compared with the GAC for inorganic mercury.
^{vap} S4UL presented exceeds the vapour saturation limit, which is presented in brackets.
^{sol} S4UL presented exceeds the solubility limit, which is presented in brackets.
All assessment criteria assume no free phase contamination is present.

Table 2: Assessment Criteria for Clean Cover in POS Near Residential Houses (300mm): Residential End Use without Homegrown Produce

Category	Determinand	Criteria mg/kg			Source
Metals*	Arsenic	79			a
	Boron	21000			b
	Cadmium	220			a
	Chromium VI	7.7			b
	Chromium III	1500			b
	Lead	630			a
	Inorganic Mercury	120			b
	Nickel	230			b
	Selenium	1100			b
	Beryllium	2.2			b
	Copper	12000			b
	Vanadium	2000			b
	Zinc	81000			b
Soil Organic Matter Content (SOM) dependent		**SOM 1%**	**SOM 2.5%**	**SOM 6%**	
Phenols	Phenol	440dir (10000)	690dir (10000)	1300dir (10000)	b
Petroleum Hydrocarbons	Aliphatic EC 5-6	570000 (304) sol	590000	600000	b
	Aliphatic EC>6-8	600000	610000	620000	b
	Aliphatic EC>8-10	13000	13000	13000	b
	Aliphatic EC>10-12	13000	13000	13000	b
	Aliphatic EC>12-16	13000	13000	13000	b
	Aliphatic EC>16-35	250000	250000	250000	b
	Aliphatic EC>35-44	250000	250000	250000	b
	Aromatic EC 5-7 (Benzene)	56000	56000	56000	b
	Aromatic EC>7-8 (Toluene)	56000	56000	56000	b
	Aromatic EC>8-10	5000	5000	5000	b
	Aromatic EC>10-12	5000	5000	5000	b
	Aromatic EC>12-16	5100	5100	5000	b
	Aromatic EC>16-21	3800	3800	3800	b
	Aromatic EC>21-35	3800	3800	3800	b
	Aromatic EC>35-44	3800	3800	3800	b
	Aliphatic + Aromatic EC>44-70	3800	3800	3800	b
Polycyclic Aromatic Hydrocarbons	Acenaphthene	15000	15000	15000	b
	Acenaphthylene	15000	15000	15000	b
	Anthracene	74000	74000	74000	b
	Benz(a)anthracene	29	29	29	b
	Benzo(a)pyrene	5.7	5.7	5.7	b
	Benzo(b)fluoranthene	7.1	7.2	7.2	b
	Benzo(ghi)perylene	640	640	640	b
Polycyclic Aromatic Hydrocarbons	Benzo(k)fluoranthene	190	190	190	b
	Chrysene	57	57	57	b
	Dibenzo(a,h) anthracene	0.57	0.57	0.58	b
	Fluoranthene	3100	3100	3100	b

Category	Determinand	Criteria mg/kg			Source
	Fluorene	9900	9900	9900	b
	Indeno(1,2,3cd)pyrene	82	82	82	b
	Naphthalene	4900	4900	4900	b
	Phenanthrene	3100	3100	3100	b
	Pyrene	7400	7400	7400	b
Chloroalkanes & alkenes	1,2-Dichloroethane	29	29	29	b
	Trichloroethene (TCE)	120	120	120	b
	Vinyl Chloride (chloroethene)	3.5	3.5	3.5	b
BTEX	o-xylene	41000	42000	43000	b
	m-xylene	41000	42000	43000	b
	p-xylene	41000	42000	43000	b
	Toluene	56000	56000	56000	b
	Ethylbenzene	24000	24000	25000	b
	Benzene	72	72	73	b

Source of Criteria

a Category 4 Screening Level (C4SL)

b LQM/CIEH Suitable for Use Level (S4UL)

Notes

- Organic matter content does not affect assessment criteria for metals
- Arsenic S4UL is based on a comparison of oral and dermal soil exposure with oral Index Dose.
- Cadmium C4SL is based on lifetime exposure
- Beryllium S4UL is based on comparison of inhalation exposure with inhalation TDI
- Chromium VI S4UL are based on localised effects comparing inhalation exposure with inhalation ID only
- Values for total xylene should be compared with the most protective S4UL for xylene
- Methyl mercury is not a routine contaminant but a S4UL has been generated for Sites where this may be present due to past industrial use. Unless methyl and elemental mercury is suspected to be present, a total mercury concentration can be compared with the GAC for inorganic mercury.
- ^{vap} S4UL presented exceeds the vapour saturation limit, which is presented in brackets.
- ^{sol} S4UL presented exceeds the solubility limit, which is presented in brackets.
- All assessment criteria assume no free phase contamination is present.

Table 3: Assessment Criteria for Clean Cover in POS Near Commercial Properties (300mm): Commercial End Use

Category	Determinand	Criteria mg/kg			Source
Metals*	Arsenic	640			a
	Boron	240000			b
	Cadmium	410			a
	Chromium VI	33			b
	Chromium III	8600			b
	Lead	2330			a
	Inorganic Mercury	1100			b
	Nickel	980			b
	Selenium	12000			b
	Beryllium	12			b
	Copper	68000			b
	Vanadium	9000			b
	Zinc	730000			b
Soil Organic Matter Content (SOM) dependent		**SOM 1%**	**SOM 2.5%**	**SOM 6%**	
Phenols	Phenol	31000	35000	37000	b
Petroleum Hydrocarbons	Aliphatic EC 5-6	3200	5900	12000	b
	Aliphatic EC>6-8	7800	17000	40000	b
	Aliphatic EC>8-10	2000	4800	11000	b
	Aliphatic EC>10-12	9700	23000	47000	b
	Aliphatic EC>12-16	59000	82000	90000	b
	Aliphatic EC>16-35	1600000	1700000	1800000	b
	Aliphatic EC>35-44	1600000	1700000	1800000	b
	Aromatic EC 5-7 (Benzene)	26000	46000	86000	b
	Aromatic EC>7-8 (Toluene)	56000	110000	180000	b
	Aromatic EC>8-10	3500	8100	17000	b
	Aromatic EC>10-12	16000	28000	34000	b
	Aromatic EC>12-16	36000	37000	38000	b
	Aromatic EC>16-21	28000	28000	28000	b
	Aromatic EC>21-35	28000	28000	28000	b
	Aromatic EC>35-44	28000	28000	28000	b
	Aliphatic + Aromatic EC>44-70	28000	28000	28000	b
Polycyclic Aromatic Hydrocarbons	Acenaphthene	84000	97000	100000	b
	Acenaphthylene	83000	97000	100000	b
	Anthracene	520000	540000	540000	b
	Benz(a)anthracene	170	170	180	b
	Benzo(a)pyrene	35	35	36	b
	Benzo(b)fluoranthene	44	44	45	b
	Benzo(ghi)perylene	3900	4000	4000	b
Polycyclic Aromatic Hydrocarbons	Benzo(k)fluoranthene	1200	1200	1200	b
	Chrysene	350	350	350	b
	Dibenzo(a,h) anthracene	3.5	3.6	3.6	b
	Fluoranthene	23000	23000	23000	b
	Fluorene	63000	68000	71000	b
	Indeno(1,2,3cd)pyrene	500	510	510	b

Category	Determinand	Criteria mg/kg			Source
	Naphthalene	190	460	1100	b
	Phenanthrene	22000	22000	23000	b
	Pyrene	54000	54000	54000	b
Chloroalkanes & alkenes	1,2-Dichloroethane	0.67	0.97	1.7	b
	Trichloroethene (TCE)	1.2	2.6	5.7	b
	Vinyl Chloride (chloroethene)	0.059	0.077	0.12	b
BTEX	o-xylene	6600sol (478)	15000sol (1120)	33000sol (2620)	b
	m-xylene	6200vap (625)	1400vap (1470)	31000vap (3460)	b
	p-xylene	5900sol (576)	1400sol (1350)	30000sol (3170)	b
	Toluene	56000vap (869)	110000vap (1920)	180000vap (4360)	b
	Ethylbenzene	5700vap (518)	13000vap (1220)	27000vap (2840)	b
	Benzene	27	47	90	b

Source of Criteria

a Category 4 Screening Level (C4SL)

b LQM/CIEH Suitable for Use Level (S4UL)

Notes

- Organic matter content does not affect assessment criteria for metals
- Arsenic S4UL is based on a comparison of oral and dermal soil exposure with oral Index Dose.
- Cadmium C4SL is based on lifetime exposure
- Beryllium S4UL is based on comparison of inhalation exposure with inhalation TDI
- Chromium VI S4UL are based on localised effects comparing inhalation exposure with inhalation ID only
- Values for total xylene should be compared with the most protective S4UL for xylene
- Methyl mercury is not a routine contaminant but a S4UL has been generated for Sites where this may be present due to past industrial use. Unless methyl and elemental mercury is suspected to be present, a total mercury concentration can be compared with the GAC for inorganic mercury.
- ^{vap} S4UL presented exceeds the vapour saturation limit, which is presented in brackets.
- ^{sol} S4UL presented exceeds the solubility limit, which is presented in brackets.
- All assessment criteria assume no free phase contamination is present.

Appendices

Appendix A – Drawings