ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - **Tel:** 0191 387 4700 **Fax:** 0191 387 4710
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - **Tel:** 01772 735 300 **Fax:** 01772 735 999

MOISTURE CONTENT CERTIFICATE

ISRM : 1981

Exploratory Hole No.	Sample Depth (m)	Sample ID	Moisture Content (%)	Date Tested	Remarks
S3_BHA03	10.50	C18	6.8	19/10/2021	
S3_BHA03	12.20	C20	7.6	22/10/2021	
S3_BHA03	13.20	C21	9.0	22/10/2021	
S3_BHA03	13.70	C21	8.6	22/10/2021	
S3_BHA03	14.30	C22	8.1	22/10/2021	
S3_BHA03	14.70	C22	6.6	19/10/2021	
S3_BHA04	8.40	C16	4.0	22/10/2021	
S3_BHA04	8.90	C17	4.5	22/10/2021	
S3_BHA04	9.90	C18	3.9	22/10/2021	
S3_BHA04	11.30	C19	3.2	22/10/2021	
S3_BHA04	11.80	C19	3.5	22/10/2021	
S3_BHA04	12.10	C19	3.3	22/10/2021	

For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- **Prairie Phase 4**

Client :- **Tees Valley Combined Authority**

Signed :- mseq

Name :- M. SELKIRK

Date of issue :- 16/11/2021

Certificate No :- RMC/4355/1

AEG Contract No. :- **4355**

UKAS TESTING 1367

LABORATORY TESTING ENCLOSURE 12

Determination of Point Load Index

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - **Tel:** 0191 387 4700 **Fax:** 0191 387 4710
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - **Tel:** 01772 735 300 **Fax:** 01772 735 999

POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/ Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De^2 (mm^2)	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
S3_BHA03	10.50	Diametral	174.0	102.5	0.8	10498.1	0.07	1.38	0.099	Sandstone	19/10/2021
S3_BHA03	10.50	Axial	104.0	72.6	1.8	9616.9	0.18	1.35	0.249	Sandstone	19/10/2021
S3_BHA03	12.20	Axial	101.5	43.8	2.2	5661.4	0.39	1.2	0.47	Siltstone	22/10/2021
S3_BHA03	12.30	Axial	103.5	48.3	2.1	6367.4	0.33	1.23	0.44	Siltstone	22/10/2021
S3_BHA03	13.16	Irregular Lump	87.6	32.1	1.2	3576.4	0.34	1.08	0.369	Siltstone	22/10/2021
S3_BHA03	13.20	Irregular Lump	90.7	30.0	1.1	3458.7	0.32	1.08	0.339	Siltstone	22/10/2021
S3_BHA03	13.70	Diametral	217.1	104.4	3.1	10893.1	0.29	1.39	0.398	Sandstone	22/10/2021
S3_BHA03	13.70	Axial	105.9	55.3	3.8	7465.2	0.5	1.28	0.644	Sandstone	22/10/2021
S3_BHA03	14.30	Axial	105.2	29.0	2.2	3886.0	0.57	1.1	0.628	Siltstone	22/10/2021
S3_BHA03	14.34	Axial	104.8	24.8	3.2	3315.8	0.95	1.07	1.012	Siltstone	22/10/2021
S3_BHA03	14.70	Axial	104.6	49.8	2.6	6631.1	0.39	1.25	0.481	Siltstone	19/10/2021
S3_BHA03	14.85	Axial	104.1	44.6	2.8	5908.4	0.48	1.21	0.578	Siltstone	22/10/2021
S3_BHA04	8.40	Irregular Lump	101.9	61.8	0.9	8017.6	0.11	1.3	0.141	Mudstone	22/10/2021
S3_BHA04	8.40	Irregular Lump	64.5	41.6	2.2	3420.2	0.65	1.07	0.698	Mudstone	22/10/2021

NOTES - +Tested specimen measured using calibrated vernier calipers #-Invalid Failure (Did not pass through both points) !-Too soft to register a reading

Date of issue :- 16/11/2021	Certificate No :- PL/4355/1	Signed :- MSelk	Name :- M. SELKIRK	Page 1 of 2
Client :- Tees Valley Combined Authority	Contract Title :- Prairie Phase 4			AEG Contract No :- 4355

UKAS TESTING 1367

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - **Tel:** 0191 387 4700 **Fax:** 0191 387 4710
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - **Tel:** 01772 735 300 **Fax:** 01772 735 999

POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/ Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De^2 (mm^2)	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
S3_BHA04	8.90	Irregular Lump	102.6	51.1	1.4	6675.4	0.21	1.25	0.263	Mudstone	22/10/2021
S3_BHA04	8.90	Irregular Lump	75.0	56.4	4.7	5384.1	0.88	1.19	1.042	Mudstone	22/10/2021
S3_BHA04	9.90	Irregular Lump	104.0	64.7	6.3	8565.4	0.74	1.32	0.978	Sandstone	22/10/2021
S3_BHA04	9.90	Irregular Lump	83.7	92.1	6.9	9818.7	0.7	1.36	0.958	Sandstone	22/10/2021
S3_BHA04	11.30	Irregular Lump	64.3	33.7	10.5	2760.7	3.79	1.02	3.874	Sandstone	22/10/2021
S3_BHA04	11.30	Irregular Lump	43.1	66.1	7.6	3620.6	2.1	1.09	2.277	Sandstone	22/10/2021
S3_BHA04	11.80	Irregular Lump	104.7	63.0	1.5	8392.0	0.18	1.31	0.235	Sandstone	22/10/2021
S3_BHA04	11.80	Irregular Lump	72.3	56.3	5.0	5180.9	0.96	1.18	1.126	Sandstone	22/10/2021
S3_BHA04	12.10	Irregular Lump	105.4	78.1	2.4	10483.0	0.23	1.38	0.315	Sandstone	22/10/2021
S3_BHA04	12.10	Irregular Lump	83.8	53.8	2.7	5741.8	0.46	1.21	0.559	Sandstone	22/10/2021

NOTES - +Tested specimen measured using calibrated vernier calipers #-Invalid Failure (Did not pass through both points) !-Too soft to register a reading

Date of issue :- 16/11/2021	Certificate No :- PL/4355/2	Signed :-	Name :- M. SELKIRK	Page 2 of 2
Client :- Tees Valley Combined Authority	Contract Title :- Prairie Phase 4			AEG Contract No :- 4355

UKAS TESTING 1367

APPENDIX I

Specialist Chemical Testing

(Tested Externally)

Certificate of Analysis

Certificate Number	21-24022	*Issued:*	18-Nov-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference	21-24022
Client Reference	4355
Order No	(not supplied)
Contract Title	Prairie Phase 4 Ground Investigation and SLEMS
Description	One Soil sample.
Date Received	10-Nov-21
Date Started	10-Nov-21
Date Completed	18-Nov-21
Test Procedures	Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

UKAS TESTING
2139

Summary of Chemical Analysis
Matrix Descriptions

Our Ref 21-24022
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
PRA-BK-34-S1	1	9.77	1932446	18/11/2021	Brown gravelly, sandy CLAY (Possible made ground - brick)

Summary of Chemical Analysis
Soil Samples

Our Ref 21-24022
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

Lab No	1932446
.Sample ID	PRA-BK-34-S1
Depth	9.77
Other ID	1
Sample Type	ES
Sampling Date	04/11/2021
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Aluminium	DETSC 2301*	1	mg/kg	8500
Antimony	DETSC 2301*	1	mg/kg	16
Arsenic	DETSC 2301#	0.2	mg/kg	30
Barium	DETSC 2301#	1.5	mg/kg	280
Beryllium	DETSC 2301#	0.2	mg/kg	0.7
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.7
Cadmium	DETSC 2301#	0.1	mg/kg	3.3
Chromium	DETSC 2301#	0.15	mg/kg	130
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	500
Iron	DETSC 2301	25	mg/kg	200000
Lead	DETSC 2301#	0.3	mg/kg	660
Magnesium	DETSC 2301*	1	mg/kg	4400
Manganese	DETSC 2301#	20	mg/kg	3300
Mercury	DETSC 2325#	0.05	mg/kg	0.87
Molybdenum	DETSC 2301#	0.4	mg/kg	16
Nickel	DETSC 2301#	1	mg/kg	82
Vanadium	DETSC 2301#	0.8	mg/kg	54
Zinc	DETSC 2301#	1	mg/kg	2000
Inorganics				
pH	DETSC 2008#		pH	8.2
Calorific Value	DETSC 5008	1	MJ/kg	8.8
Cyanide, Total	DETSC 2130#	0.1	mg/kg	20
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.7
Thiocyanate	DETSC 2130#	0.6	mg/kg	5.8
Organic matter	DETSC 2002#	0.1	%	9.4
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	800
Sulphur (free)	DETSC 3049#	0.75	mg/kg	< 0.75

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 21-24022
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

Lab No	1932446
.Sample ID	PRA-BK-34-S1
Depth	9.77
Other ID	1
Sample Type	ES
Sampling Date	04/11/2021
Sampling Time	n/s

Test	Method	LOD	Units	
Petroleum Hydrocarbons				
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	13
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	1300
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	29000
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	32000
Aromatic C5-C35	DETSC 3072*	10	mg/kg	62000
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	62000
PAHs				
Naphthalene	DETSC 3303#	0.03	mg/kg	0.11
Acenaphthylene	DETSC 3303#	0.03	mg/kg	0.22
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.06
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	2.1
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	1.1
Pyrene	DETSC 3303#	0.03	mg/kg	0.41
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.24
Chrysene	DETSC 3303	0.03	mg/kg	0.91
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.60
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.19
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.11
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.16
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.04
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.15
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	6.5

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 21-24022
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

Lab No	1932446
.Sample ID	PRA-BK-34-S1
Depth	9.77
Other ID	1
Sample Type	ES
Sampling Date	04/11/2021
Sampling Time	n/s

Test	Method	LOD	Units	
PCBs				
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg	< 0.01
PCB 52	DETSC 3401#	0.01	mg/kg	< 0.01
PCB 101	DETSC 3401#	0.01	mg/kg	< 0.01
PCB 118	DETSC 3401#	0.01	mg/kg	< 0.01
PCB 153	DETSC 3401#	0.01	mg/kg	< 0.01
PCB 138	DETSC 3401#	0.01	mg/kg	< 0.01
PCB 180	DETSC 3401#	0.01	mg/kg	< 0.01
PCB 7 Total	DETSC 3401#	0.01	mg/kg	< 0.01
VOCs				
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 21-24022
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1932446
			.Sample ID	PRA-BK-34-S1
			Depth	9.77
			Other ID	1
			Sample Type	ES
			Sampling Date	04/11/2021
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01
SVOCs				
Phenol	DETSC 3433	0.1	mg/kg	< 1.0
Aniline	DETSC 3433*	0.1	mg/kg	< 1.0
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 1.0
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 1.0
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 1.0
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 1.0
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 1.0
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 1.0
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 1.0
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 1.0
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 1.0
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 1.0
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	< 1.0
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 1.0
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 1.0
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 1.0
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 1.0
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 1.0
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 1.0

Summary of Chemical Analysis
Soil Samples

Our Ref 21-24022
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

Lab No	1932446
.Sample ID	PRA-BK-34-S1
Depth	9.77
Other ID	1
Sample Type	ES
Sampling Date	04/11/2021
Sampling Time	n/s

Test	Method	LOD	Units	
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 1.0
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 1.0
Dibenzofuran	DETSC 3433	0.1	mg/kg	< 1.0
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 1.0
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 1.0
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 1.0
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 1.0
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 1.0
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 1.0
Diphenylamine	DETSC 3433	0.1	mg/kg	< 1.0
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 1.0
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 1.0
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 1.0
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 1.0
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 1.0
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 1.0
Di-n-octylphthalate	DETSC 3433*	0.1	mg/kg	< 1.0
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 1.0
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 1.0
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 1.0
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 1.0
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 1.0
Azobenzene	DETSC 3433	0.1	mg/kg	< 1.0
Carbazole	DETSC 3433*	0.1	mg/kg	< 1.0

Summary of Asbestos Analysis
Soil Samples

Our Ref 21-24022
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1932446	PRA-BK-34-S1 1 9.77	SOIL	NAD	none	Keith Wilson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-24022
Client Ref 4355
Contract Prairie Phase 4 Ground Investigation and SLEMS

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1932446	PRA-BK-34-S1 9.77 SOIL	04/11/21	GJ 250ml, GJ 60ml x2, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report

Certificate of Analysis

Certificate Number 21-23510 *Issued:* 12-Nov-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-23510

Client Reference 4355

Order No (not supplied)

Contract Title Prairie Phase 4 Ground Investigation and SLEMS

Description 3 Water samples.

Date Received 03-Nov-21

Date Started 03-Nov-21

Date Completed 12-Nov-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis

Water Samples

Our Ref 21-23510
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1929351	1929352	1929353
			.Sample ID	S3_BHA04	S3_BHA04	S3_BHA03
			Depth	0.76-12.30	0.75-4.00	6.34-15.00
			Other ID	100	100	100
			Sample Type	EW	EW	EW
			Sampling Date	02/11/2021	02/11/2021	02/11/2021
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Metals						
Aluminium, Dissolved	DETSC 2306	10	ug/l	19	< 10	100
Antimony, Dissolved	DETSC 2306	0.17	ug/l	1.2	0.56	0.60
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	5.6	3.6	5.6
Barium, Dissolved	DETSC 2306	0.26	ug/l	110	100	62
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1	< 0.1	< 0.1
Boron, Dissolved	DETSC 2306*	12	ug/l	99	86	1400
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03	0.04
Chromium, Total	DETSC 2306*	0.25	ug/l	9.6	7.1	9.3
Chromium, Hexavalent	DETSC 2203	7	ug/l	< 7.0	< 7.0	< 7.0
Copper, Dissolved	DETSC 2306	0.4	ug/l	2.3	0.8	1.7
Iron, Dissolved	DETSC 2306	5.5	ug/l	52	58	240
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.15	0.43	5.0
Magnesium, Dissolved	DETSC 2306	0.02	mg/l	9.5	11	67
Manganese, Dissolved	DETSC 2306	0.22	ug/l	130	580	550
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.10	0.08	0.07
Molybdenum, Dissolved	DETSC 2306	1.1	ug/l	29	29	14
Nickel, Dissolved	DETSC 2306	0.5	ug/l	3.7	5.1	1.8
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	16	< 0.6	3.1
Zinc, Dissolved	DETSC 2306	1.3	ug/l	2.9	3.4	14
Inorganics						
pH	DETSC 2008		pH	8.4	7.5	7.2
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40
Cyanide, Free	DETSC 2130	20	ug/l	< 20	< 20	< 20
Thiocyanate	DETSC 2130	20	ug/l	88	77	25
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	0.74	0.85	0.80
Chloride	DETSC 2055	0.1	mg/l	82	64	260
Salinity (Calculated)	DETSC 2017*	0.01	%	0.7	0.6	1.7
Silicate as SiO2	DETSC 2211*	0.1	mg/l	4.8	3.5	5.8
Sulphate as SO4	DETSC 2076*	0.01	mg/l	480	410	1200
Sulphur (free)	DETSC 3049	84	ug/l	< 84	< 84	< 84

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis

Water Samples

Our Ref 21-23510
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1929351	1929352	1929353
			.Sample ID	S3_BHA04	S3_BHA04	S3_BHA03
			Depth	0.76-12.30	0.75-4.00	6.34-15.00
			Other ID	100	100	100
			Sample Type	EW	EW	EW
			Sampling Date	02/11/2021	02/11/2021	02/11/2021
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10
PAHs						
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05	1.1
Acenaphthylene	DETSC 3304	0.01	ug/l	0.14	0.04	0.02
Acenaphthene	DETSC 3304	0.01	ug/l	3.1	1.4	0.26
Fluorene	DETSC 3304	0.01	ug/l	0.60	0.35	0.07
Phenanthrene	DETSC 3304	0.01	ug/l	0.18	0.10	0.03
Anthracene	DETSC 3304	0.01	ug/l	0.05	0.05	0.02
Fluoranthene	DETSC 3304	0.01	ug/l	0.04	0.03	0.02
Pyrene	DETSC 3304	0.01	ug/l	0.03	0.02	0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	0.01	0.01	0.01
Chrysene	DETSC 3304	0.01	ug/l	0.02	0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	0.02	0.02	0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	0.01	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	4.2	2.0	1.6
Phenols						
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100	< 100	< 100

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis

Water Samples

Our Ref 21-23510
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1929351	1929352	1929353
			.Sample ID	S3_BHA04	S3_BHA04	S3_BHA03
			Depth	0.76-12.30	0.75-4.00	6.34-15.00
			Other ID	100	100	100
			Sample Type	EW	EW	EW
			Sampling Date	02/11/2021	02/11/2021	02/11/2021
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
VOCs						
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1
2,2-dichloropropane	DETSC 3432	2	ug/l	< 2	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	1	2	1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1	< 1
Benzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1
Toluene	DETSC 3432	1	ug/l	< 1	< 1	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2	< 2	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1	< 1
Styrene	DETSC 3432	1	ug/l	< 1	< 1	< 1
Bromoform	DETSC 3432	1	ug/l	< 1	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis

Water Samples

Our Ref 21-23510
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1929351	1929352	1929353
			.Sample ID	S3_BHA04	S3_BHA04	S3_BHA03
			Depth	0.76-12.30	0.75-4.00	6.34-15.00
			Other ID	100	100	100
			Sample Type	EW	EW	EW
			Sampling Date	02/11/2021	02/11/2021	02/11/2021
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	< 1	< 1	< 1
SVOCs						
Phenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
Aniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis

Water Samples

Our Ref 21-23510
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1929351	1929352	1929353
			.Sample ID	S3_BHA04	S3_BHA04	S3_BHA03
			Depth	0.76-12.30	0.75-4.00	6.34-15.00
			Other ID	100	100	100
			Sample Type	EW	EW	EW
			Sampling Date	02/11/2021	02/11/2021	02/11/2021
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
3-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
Dibenzofuran	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
Diphenylamine	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
Azobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
Carbazole	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0

Key: * -not accredited. n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 21-23510
Client Ref 4355
Contract Prairie Phase 4 Ground Investigation and SLEMS

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1929351	S3_BHA04 0.76-12.30 WATER	02/11/21	GB 1L x3, GV x2, PB 1L, PDO B		
1929352	S3_BHA04 0.75-4.00 WATER	02/11/21	GB 1L x3, GV x2, PB 1L, PDO B		
1929353	S3_BHA03 6.34-15.00 WATER	02/11/21	GB 1L x3, GV x2, PB 1L, PDO B		

Key: G-Glass P-Plastic B-Bottle V-Vial

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Certificate of Analysis

Certificate Number	21-21167	*Issued:*	05-Nov-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference	21-21167
Client Reference	4355
Order No	(not supplied)
Contract Title	Prairie Phase 4 Ground Investigation and SLEMS
Description	5 Soil samples.
Date Received	05-Oct-21
Date Started	05-Oct-21
Date Completed	05-Nov-21
Test Procedures	Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

UKAS TESTING
2139

Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-21167
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
S3_TPA_TP110	7	1.6	1914426	13/10/2021	Brown sandy CLAY
S3_TPA_TP102A	3	0.6	1914427	13/10/2021	Brown gravelly, very sandy CLAY
S3_TPA_TP104	3	0.4	1914428	13/10/2021	Brown gravelly, very sandy CLAY
S3_TPA_TP110	4	0.3	1914429	13/10/2021	Brown gravelly, sandy CLAY
S3_TPA_TP104	6	1.7	1914430	13/10/2021	Brown sandy CLAY

Summary of Chemical Analysis
Soil Samples

Our Ref 21-21167
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

	Lab No	1914426	1914427	1914428	1914429	1914430
	.Sample ID	S3_TPA_TP110	S3_TPA_TP102A	S3_TPA_TP104	S3_TPA_TP110	S3_TPA_TP104
	Depth	1.60	0.60	0.40	0.30	1.70
	Other ID	7	3	3	4	6
	Sample Type	ES	ES	ES	ES	ES
	Sampling Date	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
	Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Metals						
Aluminium	DETSC 2301*	1	mg/kg	8200	8300	36000	58000	15000
Antimony	DETSC 2301*	1	mg/kg	< 1.0	6.2	3.0	2.5	1.3
Arsenic	DETSC 2301#	0.2	mg/kg	7.4	25	16	16	8.1
Barium	DETSC 2301#	1.5	mg/kg	220	440	430	410	180
Beryllium	DETSC 2301#	0.2	mg/kg	0.7	1.1	3.3	5.3	1.2
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.8	1.6	1.5	1.9	0.6
Cadmium	DETSC 2301#	0.1	mg/kg	1.3	1.8	2.6	3.1	0.3
Chromium	DETSC 2301#	0.15	mg/kg	17	150	60	74	30
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	23	120	100	82	32
Iron	DETSC 2301	25	mg/kg	23000	74000	44000	16000	39000
Lead	DETSC 2301#	0.3	mg/kg	80	270	210	220	32
Magnesium	DETSC 2301*	1	mg/kg	4800	8200	20000	37000	11000
Manganese	DETSC 2301#	20	mg/kg	400	3900	3400	4000	550
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.50	0.43	0.50	< 0.05
Molybdenum	DETSC 2301#	0.4	mg/kg	1.5	3.6	2.2	0.9	0.9
Nickel	DETSC 2301#	1	mg/kg	24	33	23	15	40
Vanadium	DETSC 2301#	0.8	mg/kg	20	480	130	160	38
Zinc	DETSC 2301#	1	mg/kg	240	570	670	1400	89
Inorganics								
pH	DETSC 2008#		pH	8.5	10.3	10.7	10.6	8.5
Calorific Value	DETSC 5008	1	MJ/kg		6.6	< 1.0	< 1.0	
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.3	1.2	3.3	3.5	0.2
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	0.1	< 0.1	< 0.1
Thiocyanate	DETSC 2130#	0.6	mg/kg	< 0.6	< 0.6	0.7	< 0.6	< 0.6
Organic matter	DETSC 2002#	0.1	%	2.1	0.5	2.7	1.0	1.6
Ammoniacal Nitrogen as N	DETSC 2119#	0.5	mg/kg		< 0.50	< 0.50	< 0.50	
Chloride	DETSC 2055	1	mg/kg		47.2	25.0	16.4	
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	180	680	560	900	44
Sulphur (free)	DETSC 3049#	0.75	mg/kg	< 0.75	< 0.75	< 0.75	14	< 0.75

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 21-21167
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

	Lab No	1914426	1914427	1914428	1914429	1914430
	.Sample ID	S3_TPA_TP110	S3_TPA_TP102A	S3_TPA_TP104	S3_TPA_TP110	S3_TPA_TP104
	Depth	1.60	0.60	0.40	0.30	1.70
	Other ID	7	3	3	4	6
	Sample Type	ES	ES	ES	ES	ES
	Sampling Date	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
	Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**					
Petroleum Hydrocarbons								
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	0.56
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	0.24
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	3.7	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	92	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	150	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	250	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	250	< 10	< 10	< 10
PAHs								
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	0.76	0.04	< 0.03	0.07
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	1.4	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.25	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	2.3	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.03	8.4	0.21	0.26	0.07
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	6.7	0.04	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	110	0.74	0.40	0.08
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	90	0.65	0.33	0.07
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.04	46	0.39	0.14	0.04
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	28	0.32	0.17	0.04
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	42	0.68	0.18	0.07
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	22	0.31	0.09	0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	29	0.37	0.10	0.04
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	12	0.21	0.07	0.04
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	3.2	0.05	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	11	0.26	0.09	0.06
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	410	4.3	1.8	0.58

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis

Soil Samples

Our Ref 21-21167
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1914426	1914427	1914428	1914429	1914430
			.Sample ID	S3_TPA_TP110	S3_TPA_TP102A	S3_TPA_TP104	S3_TPA_TP110	S3_TPA_TP104
			Depth	1.60	0.60	0.40	0.30	1.70
			Other ID	7	3	3	4	6
			Sample Type	ES	ES	ES	ES	ES
			Sampling Date	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
			Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**					
PCBs								
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg		< 0.01	< 0.01		
PCB 52	DETSC 3401#	0.01	mg/kg		< 0.01	< 0.01		
PCB 101	DETSC 3401#	0.01	mg/kg		< 0.01	< 0.01		
PCB 118	DETSC 3401#	0.01	mg/kg		< 0.01	< 0.01		
PCB 153	DETSC 3401#	0.01	mg/kg		< 0.01	< 0.01		
PCB 138	DETSC 3401#	0.01	mg/kg		< 0.01	< 0.01		
PCB 180	DETSC 3401#	0.01	mg/kg		< 0.01	< 0.01		
PCB 7 Total	DETSC 3401#	0.01	mg/kg		< 0.01	< 0.01		
Phenols								
Phenol	DETSC 3451*	0.01	mg/kg		0.16	< 0.01	< 0.01	
4-Chloro-3-methylphenol	DETSC 3451*	0.01	mg/kg		< 0.01	< 0.01	< 0.01	
2,4-Dichlorophenol	DETSC 3451*	0.01	mg/kg		< 0.01	< 0.01	< 0.01	
2,4-Dimethylphenol	DETSC 3451*	0.01	mg/kg		0.06	< 0.01	< 0.01	
p-cresol	DETSC 3451*	0.01	mg/kg		0.16	< 0.01	< 0.01	
2,6-Dimethylphenol	DETSC 3451*	0.01	mg/kg		< 0.01	< 0.01	< 0.01	
2,6-Dichlorophenol	DETSC 3451*	0.01	mg/kg		< 0.01	< 0.01	< 0.01	
2,4,6-Trichlorophenol	DETSC 3451*	0.01	mg/kg		< 0.01	< 0.01	< 0.01	

Summary of Chemical Analysis
Soil VOC/SVOC Samples

Our Ref 21-21167
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1914427	1914428	1914429
			.Sample ID	S3_TPA_TP102A	S3_TPA_TP104	S3_TPA_TP110
			Depth	0.60	0.40	0.30
			Other ID	3	3	4
			Sample Type	ES	ES	ES
			Sampling Date	27/09/2021	27/09/2021	27/09/2021
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
VOCs						
Vinyl Chloride	DETSC 3431	0.01	mg/kg			< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg			< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg			< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg			< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg			< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg			< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg			< 0.01
Chloroform	DETSC 3431	0.01	mg/kg			< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg			< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg			< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg			< 0.01
Benzene	DETSC 3431	0.01	mg/kg			< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg			< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg			< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg			< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg			< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg			< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg			< 0.01
Toluene	DETSC 3431	0.01	mg/kg			< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg			< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg			< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg			< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg			< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg			< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg			< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg			< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg			< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg			< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg			< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg			< 0.01
Styrene	DETSC 3431*	0.01	mg/kg			< 0.01
Bromoform	DETSC 3431	0.01	mg/kg			< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg			< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg			< 0.01

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Soil VOC/SVOC Samples

Our Ref 21-21167
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1914427	1914428	1914429
			.Sample ID	S3_TPA_TP102A	S3_TPA_TP104	S3_TPA_TP110
			Depth	0.60	0.40	0.30
			Other ID	3	3	4
			Sample Type	ES	ES	ES
			Sampling Date	27/09/2021	27/09/2021	27/09/2021
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg			< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg			< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg			< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg			< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg			< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg			< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg			< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg			< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg			< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg			< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg			< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg			< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg			< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg			< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg			< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg			< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg			< 0.01
MTBE	DETSC 3431*	0.01	mg/kg			< 0.01
SVOCs						
Aniline	DETSC 3433*	0.1	mg/kg	< 1.0	< 0.1	
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 1.0	< 0.1	
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 1.0	< 0.1	
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 1.0	< 0.1	
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 1.0	< 0.1	
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 1.0	< 0.1	
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 1.0	< 0.1	
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 1.0	< 0.1	
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	< 1.0	< 0.1	
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 1.0	< 0.1	
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 1.0	< 0.1	
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 1.0	< 0.1	
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 1.0	< 0.1	
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 1.0	< 0.1	
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 1.0	< 0.1	
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 1.0	< 0.1	
Dibenzofuran	DETSC 3433	0.1	mg/kg	2.9	< 0.1	
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 1.0	< 0.1	
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 1.0	< 0.1	
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 1.0	< 0.1	

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Soil VOC/SVOC Samples

Our Ref 21-21167
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1914427	1914428	1914429
			.Sample ID	S3_TPA_TP102A	S3_TPA_TP104	S3_TPA_TP110
			Depth	0.60	0.40	0.30
			Other ID	3	3	4
			Sample Type	ES	ES	ES
			Sampling Date	27/09/2021	27/09/2021	27/09/2021
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 1.0	< 0.1	
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 1.0	< 0.1	
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 1.0	< 0.1	
Diphenylamine	DETSC 3433	0.1	mg/kg	< 1.0	< 0.1	
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 1.0	< 0.1	
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 1.0	< 0.1	
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 1.0	< 0.1	
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 1.0	< 0.1	
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 1.0	< 0.1	
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 1.0	< 0.1	
Di-n-octylphthalate	DETSC 3433*	0.1	mg/kg	< 1.0	< 0.1	
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 1.0	< 0.1	
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 1.0	< 0.1	
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	1.2	< 0.1	
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 1.0	< 0.1	
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 1.0	< 0.1	
Azobenzene	DETSC 3433	0.1	mg/kg	< 1.0	< 0.1	
Carbazole	DETSC 3433*	0.1	mg/kg	3.9	< 0.1	

Key: * -not accredited. n/s -not supplied.

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-21167
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1914426	S3_TPA_TP110 7 1.60	SOIL	NAD	none	Colin Patrick
1914427	S3_TPA_TP102A 3 0.60	SOIL	NAD	none	Colin Patrick
1914428	S3_TPA_TP104 3 0.40	SOIL	Chrysotile	small bundle of Chrysotile fibres	Colin Patrick
1914429	S3_TPA_TP110 4 0.30	SOIL	NAD	none	Colin Patrick
1914430	S3_TPA_TP104 6 1.70	SOIL	NAD	none	Colin Patrick

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-21167
Client Ref 4355
Contract Prairie Phase 4 Ground Investigation and SLEMS

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1914426	S3_TPA_TP110 1.60 SOIL	27/09/21	GJ 250ml x2, GJ 60ml x2, PT 500ml x2	Sulphur (free) (7 days), pH + Conductivity (7 days)	
1914427	S3_TPA_TP102A 0.60 SOIL	27/09/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Ammonia (3 days), Sulphur (free) (7 days), pH + Conductivity (7 days)	
1914428	S3_TPA_TP104 0.40 SOIL	27/09/21	GJ 250ml x2, GJ 60ml x2, PT 500ml x2	Ammonia (3 days), Sulphur (free) (7 days), pH + Conductivity (7 days)	
1914429	S3_TPA_TP110 0.30 SOIL	27/09/21	GJ 250ml x2, GJ 60ml x2, PT 500ml x2	Ammonia (3 days), Sulphur (free) (7 days), pH + Conductivity (7 days), VOC (7 days)	
1914430	S3_TPA_TP104 1.70 SOIL	27/09/21	GJ 250ml x2, GJ 60ml, PT 500ml x2	Sulphur (free) (7 days), pH + Conductivity (7 days)	

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report

Certificate of Analysis

Certificate Number	21-21165	*Issued:*	05-Nov-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference	21-21165
Client Reference	4355
Order No	(not supplied)
Contract Title	Prairie Phase 4 Ground Investigation and SLEMS
Description	10 Soil samples.
Date Received	05-Oct-21
Date Started	05-Oct-21
Date Completed	05-Nov-21
Test Procedures	Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

UKAS TESTING
2139

Summary of Chemical Analysis
Matrix Descriptions

Our Ref 21-21165
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
S3_TPA_TP108	3	0.6	1914415	13/10/2021	Brown gravelly, sandy CLAY
S3_TPA_TP107	6	0.9	1914416	13/10/2021	Brown sandy CLAY
S3_TPA_TP107	3	0.4	1914417	13/10/2021	Brown gravelly, sandy CLAY
S3_TPA_TP109	3	0.3	1914418	13/10/2021	Brown very gravelly SAND
S3_TPA_TP103	3	0.4	1914419	13/10/2021	Brown very gravelly SAND
S3_TPA_TP105	3	0.3	1914420	13/10/2021	Brown very gravelly, sandy CLAY
S3_TPA_TP105	6	1.2	1914421	13/10/2021	Brown sandy CLAY
S3_TPA_TP106	3	0.4	1914422	13/10/2021	Brown gravelly, very sandy CLAY
S3_TPA_TP101	3	0.2	1914423	13/10/2021	Brown very gravelly, very sandy CLAY
S3_TPA_TP101	6	1.1	1914424	13/10/2021	Brown sandy CLAY

Summary of Chemical Analysis
Soil Samples

Our Ref 21-21165
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

	Lab No	1914415	1914416	1914417	1914418	1914419
	.Sample ID	S3_TPA_TP108	S3_TPA_TP107	S3_TPA_TP107	S3_TPA_TP109	S3_TPA_TP103
	Depth	0.60	0.90	0.40	0.30	0.40
	Other ID	3	6	3	3	3
	Sample Type	ES	ES	ES	ES	ES
	Sampling Date	24/09/2021	24/09/2021	24/09/2021	24/09/2021	24/09/2021
	Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Metals						
Aluminium	DETSC 2301*	1	mg/kg	18000	15000	9600	29000	18000
Antimony	DETSC 2301*	1	mg/kg	3.9	1.2	1.2	3.8	4.8
Arsenic	DETSC 2301#	0.2	mg/kg	23	15	17	67	180
Barium	DETSC 2301#	1.5	mg/kg	520	120	240	510	330
Beryllium	DETSC 2301#	0.2	mg/kg	1.9	0.9	1.7	2.5	1.6
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.8	2.0	1.6	3.3	4.8
Cadmium	DETSC 2301#	0.1	mg/kg	2.6	0.2	0.4	1.3	0.3
Chromium	DETSC 2301#	0.15	mg/kg	97	28	23	180	58
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	77	29	100	31	120
Iron	DETSC 2301	25	mg/kg	50000	37000	34000	36000	54000
Lead	DETSC 2301#	0.3	mg/kg	270	61	74	380	50
Magnesium	DETSC 2301*	1	mg/kg	9700	2400	2900	19000	7700
Manganese	DETSC 2301#	20	mg/kg	4200	320	640	8100	98000
Mercury	DETSC 2325#	0.05	mg/kg	0.22	0.12	0.06	< 0.05	0.06
Molybdenum	DETSC 2301#	0.4	mg/kg	2.3	0.8	2.0	1.2	19
Nickel	DETSC 2301#	1	mg/kg	30	17	38	13	120
Vanadium	DETSC 2301#	0.8	mg/kg	200	45	110	390	190
Zinc	DETSC 2301#	1	mg/kg	840	140	200	370	100
Inorganics								
pH	DETSC 2008#		pH	10.1	7.2	8.2	10.8	9.1
Calorific Value	DETSC 5008	1	MJ/kg	3.0		6.3	< 1.0	< 1.0
Cyanide, Total	DETSC 2130#	0.1	mg/kg	7.7	0.4	0.4	0.2	0.8
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	0.4	< 0.1	< 0.1	< 0.1
Thiocyanate	DETSC 2130#	0.6	mg/kg	< 0.6	0.9	< 0.6	< 0.6	0.9
Organic matter	DETSC 2002#	0.1	%	3.3	3.4	2.1	0.6	1.9
Ammoniacal Nitrogen as N	DETSC 2119#	0.5	mg/kg	3.7		3.7	< 0.50	< 0.50
Chloride	DETSC 2055	1	mg/kg	18.7		20.7	26.6	91.2
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	270	140	360	1500	850
Sulphur (free)	DETSC 3049#	0.75	mg/kg	5.5	9.9	< 0.75	29	< 0.75

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 21-21165
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

	Lab No	1914415	1914416	1914417	1914418	1914419
	.Sample ID	S3_TPA_TP108	S3_TPA_TP107	S3_TPA_TP107	S3_TPA_TP109	S3_TPA_TP103
	Depth	0.60	0.90	0.40	0.30	0.40
	Other ID	3	6	3	3	3
	Sample Type	ES	ES	ES	ES	ES
	Sampling Date	24/09/2021	24/09/2021	24/09/2021	24/09/2021	24/09/2021
	Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	3.7	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	22	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	54	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	23	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	100	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	100	< 10	< 10	< 10	< 10
PAHs								
Naphthalene	DETSC 3303#	0.03	mg/kg	0.09	0.04	0.08	0.05	0.04
Acenaphthylene	DETSC 3303#	0.03	mg/kg	0.06	< 0.03	< 0.03	0.05	0.05
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.07	0.05
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.54	0.05	0.31	0.47	0.60
Anthracene	DETSC 3303	0.03	mg/kg	0.07	< 0.03	0.06	0.14	0.14
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.74	0.07	0.39	0.93	1.6
Pyrene	DETSC 3303#	0.03	mg/kg	0.76	0.06	0.31	0.71	1.3
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.56	0.04	0.12	0.38	0.79
Chrysene	DETSC 3303	0.03	mg/kg	0.68	< 0.03	0.11	0.30	0.64
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	1.7	0.04	0.12	0.35	1.1
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.84	< 0.03	0.05	0.15	0.44
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.91	< 0.03	0.08	0.25	0.68
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.76	< 0.03	0.04	0.10	0.33
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.23	< 0.03	< 0.03	0.03	0.09
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	1.0	< 0.03	0.05	0.12	0.37
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	9.0	0.26	1.7	4.1	8.1

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Summary of Chemical Analysis

Soil Samples

Our Ref 21-21165
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1914415	1914416	1914417	1914418	1914419
			.Sample ID	S3_TPA_TP108	S3_TPA_TP107	S3_TPA_TP107	S3_TPA_TP109	S3_TPA_TP103
			Depth	0.60	0.90	0.40	0.30	0.40
			Other ID	3	6	3	3	3
			Sample Type	ES	ES	ES	ES	ES
			Sampling Date	24/09/2021	24/09/2021	24/09/2021	24/09/2021	24/09/2021
			Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**					
PCBs								
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg				< 0.01	
PCB 52	DETSC 3401#	0.01	mg/kg				< 0.01	
PCB 101	DETSC 3401#	0.01	mg/kg				< 0.01	
PCB 118	DETSC 3401#	0.01	mg/kg				< 0.01	
PCB 153	DETSC 3401#	0.01	mg/kg				< 0.01	
PCB 138	DETSC 3401#	0.01	mg/kg				< 0.01	
PCB 180	DETSC 3401#	0.01	mg/kg				< 0.01	
PCB 7 Total	DETSC 3401#	0.01	mg/kg				< 0.01	
Phenols								
Phenol	DETSC 3451*	0.01	mg/kg	0.02		< 0.01	0.01	< 0.01
4-Chloro-3-methylphenol	DETSC 3451*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	DETSC 3451*	0.01	mg/kg	0.02		< 0.01	< 0.01	< 0.01
2,4-Dimethylphenol	DETSC 3451*	0.01	mg/kg	0.01		< 0.01	< 0.01	< 0.01
p-cresol	DETSC 3451*	0.01	mg/kg	0.02		< 0.01	< 0.01	< 0.01
2,6-Dimethylphenol	DETSC 3451*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01
2,6-Dichlorophenol	DETSC 3451*	0.01	mg/kg	0.02		< 0.01	< 0.01	< 0.01
2,4,6-Trichlorophenol	DETSC 3451*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01

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Summary of Chemical Analysis

Soil Samples

Our Ref 21-21165
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

	Lab No	1914420	1914421	1914422	1914423	1914424
	.Sample ID	S3_TPA_TP105	S3_TPA_TP105	S3_TPA_TP106	S3_TPA_TP101	S3_TPA_TP101
	Depth	0.30	1.20	0.40	0.20	1.10
	Other ID	3	6	3	3	6
	Sample Type	ES	ES	ES	ES	ES
	Sampling Date	24/09/2021	24/09/2021	24/09/2021	24/09/2021	24/09/2021
	Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Metals						
Aluminium	DETSC 2301*	1	mg/kg	15000	18000	44000	44000	17000
Antimony	DETSC 2301*	1	mg/kg	4.6	2.6	< 1.0	9.2	1.3
Arsenic	DETSC 2301#	0.2	mg/kg	21	30	9.2	6.6	8.7
Barium	DETSC 2301#	1.5	mg/kg	150	170	320	450	170
Beryllium	DETSC 2301#	0.2	mg/kg	0.7	1.5	5.1	4.1	1.4
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.2	1.9	3.3	3.8	1.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.7	0.1	0.3	0.1
Chromium	DETSC 2301#	0.15	mg/kg	320	46	36	46	24
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	49	56	24	31	31
Iron	DETSC 2301	25	mg/kg	74000	63000	14000	19000	47000
Lead	DETSC 2301#	0.3	mg/kg	56	130	19	56	33
Magnesium	DETSC 2301*	1	mg/kg	22000	3700	30000	37000	3500
Manganese	DETSC 2301#	20	mg/kg	14000	1700	4300	8600	750
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.18	< 0.05	< 0.05	< 0.05
Molybdenum	DETSC 2301#	0.4	mg/kg	1.2	1.6	0.9	1.0	< 0.4
Nickel	DETSC 2301#	1	mg/kg	20	33	7.0	7.6	28
Vanadium	DETSC 2301#	0.8	mg/kg	1700	120	150	180	30
Zinc	DETSC 2301#	1	mg/kg	110	360	57	120	92
Inorganics								
pH	DETSC 2008#		pH	11.0	7.7	10.4	11.0	8.0
Calorific Value	DETSC 5008	1	MJ/kg	< 1.0		< 1.0	< 1.0	
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.3	0.5	0.2	3.7	0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	0.5	0.2	0.3	< 0.1
Thiocyanate	DETSC 2130#	0.6	mg/kg	< 0.6	1.4	< 0.6	0.7	< 0.6
Organic matter	DETSC 2002#	0.1	%	2.2	4.7	0.6	1.0	1.8
Ammoniacal Nitrogen as N	DETSC 2119#	0.5	mg/kg	4.8		0.96	0.68	
Chloride	DETSC 2055	1	mg/kg	50.2		10.8	17.5	
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	320	190	1600	310	150
Sulphur (free)	DETSC 3049#	0.75	mg/kg	< 0.75	7.5	< 0.75	< 0.75	< 0.75

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Summary of Chemical Analysis
Soil Samples

Our Ref 21-21165
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1914420	1914421	1914422	1914423	1914424
			.Sample ID	S3_TPA_TP105	S3_TPA_TP105	S3_TPA_TP106	S3_TPA_TP101	S3_TPA_TP101
			Depth	0.30	1.20	0.40	0.20	1.10
			Other ID	3	6	3	3	6
			Sample Type	ES	ES	ES	ES	ES
			Sampling Date	24/09/2021	24/09/2021	24/09/2021	24/09/2021	24/09/2021
			Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**					
Petroleum Hydrocarbons								
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
PAHs								
Naphthalene	DETSC 3303#	0.03	mg/kg	0.10	0.06	0.04	0.04	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.04	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.04	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	1.2	0.22	0.33	0.46	0.06
Anthracene	DETSC 3303	0.03	mg/kg	0.11	0.03	0.04	0.11	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	2.8	0.48	0.69	0.89	0.07
Pyrene	DETSC 3303#	0.03	mg/kg	1.8	0.41	0.78	0.77	0.06
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.60	0.20	0.33	0.38	0.04
Chrysene	DETSC 3303	0.03	mg/kg	0.72	0.24	0.37	0.33	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.64	0.25	0.52	0.42	0.04
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.28	0.11	0.23	0.16	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.21	0.16	0.22	0.29	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.13	0.08	0.17	0.14	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	0.05	0.04	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.16	0.09	0.21	0.17	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	8.8	2.3	4.0	4.3	0.23

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Summary of Chemical Analysis

Soil Samples

Our Ref 21-21165
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

				Lab No	1914420	1914421	1914422	1914423	1914424
				.Sample ID	S3_TPA_TP105	S3_TPA_TP105	S3_TPA_TP106	S3_TPA_TP101	S3_TPA_TP101
				Depth	0.30	1.20	0.40	0.20	1.10
				Other ID	3	6	3	3	6
				Sample Type	ES	ES	ES	ES	ES
				Sampling Date	24/09/2021	24/09/2021	24/09/2021	24/09/2021	24/09/2021
				Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
PCBs									
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg				< 0.01	
PCB 52	DETSC 3401#	0.01	mg/kg				< 0.01	
PCB 101	DETSC 3401#	0.01	mg/kg				< 0.01	
PCB 118	DETSC 3401#	0.01	mg/kg				< 0.01	
PCB 153	DETSC 3401#	0.01	mg/kg				< 0.01	
PCB 138	DETSC 3401#	0.01	mg/kg				< 0.01	
PCB 180	DETSC 3401#	0.01	mg/kg				< 0.01	
PCB 7 Total	DETSC 3401#	0.01	mg/kg				< 0.01	
Phenols									
Phenol	DETSC 3451*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	0.02	
4-Chloro-3-methylphenol	DETSC 3451*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	
2,4-Dichlorophenol	DETSC 3451*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	
2,4-Dimethylphenol	DETSC 3451*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	
p-cresol	DETSC 3451*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	
2,6-Dimethylphenol	DETSC 3451*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	
2,6-Dichlorophenol	DETSC 3451*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	
2,4,6-Trichlorophenol	DETSC 3451*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	

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Summary of Chemical Analysis
Soil VOC/SVOC Samples

Our Ref 21-21165
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1914415	1914417	1914418	1914419
			.Sample ID	S3_TPA_TP108	S3_TPA_TP107	S3_TPA_TP109	S3_TPA_TP103
			Depth	0.60	0.40	0.30	0.40
			Other ID	3	3	3	3
			Sample Type	ES	ES	ES	ES
			Sampling Date	24/09/2021	24/09/2021	24/09/2021	24/09/2021
			Sampling Time	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
VOCs							
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
Benzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
Toluene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Soil VOC/SVOC Samples

Our Ref 21-21165
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1914415	1914417	1914418	1914419
			.Sample ID	S3_TPA_TP108	S3_TPA_TP107	S3_TPA_TP109	S3_TPA_TP103
			Depth	0.60	0.40	0.30	0.40
			Other ID	3	3	3	3
			Sample Type	ES	ES	ES	ES
			Sampling Date	24/09/2021	24/09/2021	24/09/2021	24/09/2021
			Sampling Time	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01		< 0.01	
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01	
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01		< 0.01	
SVOCs							
Aniline	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Soil VOC/SVOC Samples

Our Ref 21-21165
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1914415	1914417	1914418	1914419
			.Sample ID	S3_TPA_TP108	S3_TPA_TP107	S3_TPA_TP109	S3_TPA_TP103
			Depth	0.60	0.40	0.30	0.40
			Other ID	3	3	3	3
			Sample Type	ES	ES	ES	ES
			Sampling Date	24/09/2021	24/09/2021	24/09/2021	24/09/2021
			Sampling Time	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Dibenzofuran	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1
4-Nitroaniline	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
Hexachlorobenzene	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
Di-n-octylphthalate	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg		< 0.1		< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg		< 0.1		< 0.1

Key: * -not accredited. n/s -not supplied.

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-21165
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1914415	S3_TPA_TP108 3 0.60	SOIL	NAD	none	Colin Patrick
1914416	S3_TPA_TP107 6 0.90	SOIL	NAD	none	Colin Patrick
1914417	S3_TPA_TP107 3 0.40	SOIL	NAD	none	Colin Patrick
1914418	S3_TPA_TP109 3 0.30	SOIL	NAD	none	Colin Patrick
1914419	S3_TPA_TP103 3 0.40	SOIL	Chrysotile	small bundle of Chrysotile fibres	Colin Patrick
1914420	S3_TPA_TP105 3 0.30	SOIL	NAD	none	Colin Patrick
1914421	S3_TPA_TP105 6 1.20	SOIL	NAD	none	Colin Patrick
1914422	S3_TPA_TP106 3 0.40	SOIL	NAD	none	Colin Patrick
1914423	S3_TPA_TP101 3 0.20	SOIL	NAD	none	Colin Patrick
1914424	S3_TPA_TP101 6 1.10	SOIL	NAD	none	Colin Patrick

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-21165
Client Ref 4355
Contract Prairie Phase 4 Ground Investigation and SLEMS

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1914415	S3_TPA_TP108 0.60 SOIL	24/09/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Ammonia (3 days), Sulphur (free) (7 days), pH + Conductivity (7 days), VOC (7 days)	
1914416	S3_TPA_TP107 0.90 SOIL	24/09/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Sulphur (free) (7 days), pH + Conductivity (7 days)	
1914417	S3_TPA_TP107 0.40 SOIL	24/09/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Ammonia (3 days), Sulphur (free) (7 days), pH + Conductivity (7 days)	
1914418	S3_TPA_TP109 0.30 SOIL	24/09/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Ammonia (3 days), Sulphur (free) (7 days), pH + Conductivity (7 days), VOC (7 days)	
1914419	S3_TPA_TP103 0.40 SOIL	24/09/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Ammonia (3 days), Sulphur (free) (7 days), pH + Conductivity (7 days)	
1914420	S3_TPA_TP105 0.30 SOIL	24/09/21	GJ 250ml x2, GJ 60ml x2, PT 500ml x2	Ammonia (3 days), Sulphur (free) (7 days), pH + Conductivity (7 days)	
1914421	S3_TPA_TP105 1.20 SOIL	24/09/21	GJ 250ml x2, GJ 60ml x2, PT 500ml x2	Sulphur (free) (7 days), pH + Conductivity (7 days)	
1914422	S3_TPA_TP106 0.40 SOIL	24/09/21	GJ 250ml x2, GJ 60ml x2, PT 500ml x2	Ammonia (3 days), Sulphur (free) (7 days), pH + Conductivity (7 days)	
1914423	S3_TPA_TP101 0.20 SOIL	24/09/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Ammonia (3 days), Sulphur (free) (7 days), pH + Conductivity (7 days)	
1914424	S3_TPA_TP101 1.10 SOIL	24/09/21	GJ 250ml x2, GJ 60ml x2, PT 500ml x2	Sulphur (free) (7 days), pH + Conductivity (7 days)	

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report

Certificate of Analysis

Certificate Number	21-20633	*Issued:*	05-Nov-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference	21-20633
Client Reference	4355
Order No	(not supplied)
Contract Title	Prairie Phase 4 Ground Investigation and SLEMS
Description	6 Soil samples.
Date Received	28-Sep-21
Date Started	28-Sep-21
Date Completed	05-Nov-21
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

UKAS TESTING
2139

Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-20633
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
S3_BHA04	3	0.4	1911128	18/10/2021	Brown gravelly, very sandy CLAY
S3_BHA04	6	1.4	1911129	18/10/2021	Brown sandy CLAY
S3_TPA_TP111	3	0.3	1911130	18/10/2021	Brown gravelly, very sandy CLAY
S3_BHA03	3	0.3	1911131	18/10/2021	Brown gravelly, very sandy CLAY
S3_TPA_TP102	3	0.4	1911132	18/10/2021	Brown gravelly SAND
S3_BHA03	13	4.8	1911133	18/10/2021	Brown sandy CLAY

Summary of Chemical Analysis
Soil Samples

Our Ref 21-20633
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1911128	1911129	1911130
			.Sample ID	S3_BHA04	S3_BHA04	S3_TPA_TP111
			Depth	0.40	1.40	0.30
			Other ID	3	6	3
			Sample Type	ES	ES	ES
			Sampling Date	22/09/2021	22/09/2021	22/09/2021
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Metals						
Aluminium	DETSC 2301*	1	mg/kg	18000		31000
Antimony	DETSC 2301*	1	mg/kg	6.9	1.9	3.8
Arsenic	DETSC 2301#	0.2	mg/kg	20	9.7	10
Barium	DETSC 2301#	1.5	mg/kg	230	270	340
Beryllium	DETSC 2301#	0.2	mg/kg	1.4	1.3	2.0
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.0	0.8	3.6
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.2	0.4
Chromium	DETSC 2301#	0.15	mg/kg	290	36	62
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0		< 1.0
Copper	DETSC 2301#	0.2	mg/kg	140	32	40
Iron	DETSC 2301	25	mg/kg	120000		100000
Lead	DETSC 2301#	0.3	mg/kg	35	32	180
Magnesium	DETSC 2301*	1	mg/kg	18000	4300	25000
Manganese	DETSC 2301#	20	mg/kg	4600	490	8200
Mercury	DETSC 2325#	0.05	mg/kg	0.08	< 0.05	< 0.05
Molybdenum	DETSC 2301#	0.4	mg/kg	4.5	0.7	2.4
Nickel	DETSC 2301#	1	mg/kg	48	41	17
Selenium	DETSC 2301#	0.5	mg/kg	1.4	< 0.5	1.3
Vanadium	DETSC 2301#	0.8	mg/kg	310	51	190
Zinc	DETSC 2301#	1	mg/kg	95	77	120
Inorganics						
pH	DETSC 2008#		pH	11.4	8.1	10.4
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.4	0.1	6.8
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	0.2
Thiocyanate	DETSC 2130#	0.6	mg/kg	< 0.6	< 0.6	1.5
Organic matter	DETSC 2002#	0.1	%	1.8		2.1
Ammoniacal Nitrogen as N	DETSC 2119#	0.5	mg/kg			
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	460		1300
Sulphur (free)	DETSC 3049#	0.75	mg/kg	1.8		14

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis

Soil Samples

Our Ref 21-20633
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1911128	1911129	1911130
			.Sample ID	S3_BHA04	S3_BHA04	S3_TPA_TP111
			Depth	0.40	1.40	0.30
			Other ID	3	6	3
			Sample Type	ES	ES	ES
			Sampling Date	22/09/2021	22/09/2021	22/09/2021
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	580
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	2300
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	1300
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	4200
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	150
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	580
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	410
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	1100
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	5300
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 21-20633
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

	Lab No	1911128	1911129	1911130
	.Sample ID	S3_BHA04	S3_BHA04	S3_TPA_TP111
	Depth	0.40	1.40	0.30
	Other ID	3	6	3
	Sample Type	ES	ES	ES
	Sampling Date	22/09/2021	22/09/2021	22/09/2021
	Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
PAHs						
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.12	< 0.03	0.22
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.18	< 0.03	0.49
Pyrene	DETSC 3303#	0.03	mg/kg	0.15	< 0.03	0.42
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.06	< 0.03	0.21
Chrysene	DETSC 3303	0.03	mg/kg	0.09	< 0.03	0.32
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.09	< 0.03	0.41
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	0.20
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.05	< 0.03	0.17
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	0.16
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.04
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	0.19
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	0.86	< 0.10	2.8
PCBs						
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg		< 0.01	
PCB 52	DETSC 3401#	0.01	mg/kg		< 0.01	
PCB 101	DETSC 3401#	0.01	mg/kg		< 0.01	
PCB 118	DETSC 3401#	0.01	mg/kg		< 0.01	
PCB 153	DETSC 3401#	0.01	mg/kg		< 0.01	
PCB 138	DETSC 3401#	0.01	mg/kg		< 0.01	
PCB 180	DETSC 3401#	0.01	mg/kg		< 0.01	
PCB 7 Total	DETSC 3401#	0.01	mg/kg		< 0.01	
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3
Phenol	DETSC 3451*	0.01	mg/kg	< 0.01		
4-Chloro-3-methylphenol	DETSC 3451*	0.01	mg/kg	< 0.01		
2,4-Dichlorophenol	DETSC 3451*	0.01	mg/kg	< 0.01		
2,4-Dimethylphenol	DETSC 3451*	0.01	mg/kg	< 0.01		
p-cresol	DETSC 3451*	0.01	mg/kg	< 0.01		
2,6-Dimethylphenol	DETSC 3451*	0.01	mg/kg	< 0.01		
2,6-Dichlorophenol	DETSC 3451*	0.01	mg/kg	< 0.01		
2,4,6-Trichlorophenol	DETSC 3451*	0.01	mg/kg	< 0.01		

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Summary of Chemical Analysis
Soil Samples

Our Ref 21-20633
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1911131	1911132	1911133
			.Sample ID	S3_BHA03	S3_TPA_TP102	S3_BHA03
			Depth	0.30	0.40	4.80
			Other ID	3	3	13
			Sample Type	ES	ES	ES
			Sampling Date	23/09/2021	23/09/2021	23/09/2021
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Metals						
Aluminium	DETSC 2301*	1	mg/kg	50000	6900	16000
Antimony	DETSC 2301*	1	mg/kg	2.1	3.0	1.6
Arsenic	DETSC 2301#	0.2	mg/kg	11	14	7.4
Barium	DETSC 2301#	1.5	mg/kg	240	180	220
Beryllium	DETSC 2301#	0.2	mg/kg	3.7	0.9	0.9
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	4.3	1.6	0.8
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.6	0.2
Chromium	DETSC 2301#	0.15	mg/kg	110	43	24
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	20	88	26
Iron	DETSC 2301	25	mg/kg	19000	64000	45000
Lead	DETSC 2301#	0.3	mg/kg	94	120	22
Magnesium	DETSC 2301*	1	mg/kg	28000	4200	9700
Manganese	DETSC 2301#	20	mg/kg	14000	3000	640
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Molybdenum	DETSC 2301#	0.4	mg/kg	1.1	2.5	0.5
Nickel	DETSC 2301#	1	mg/kg	6.7	24	31
Selenium	DETSC 2301#	0.5	mg/kg	4.5	0.7	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	210	86	30
Zinc	DETSC 2301#	1	mg/kg	88	230	72
Inorganics						
pH	DETSC 2008#		pH	9.0	10.5	8.1
Cyanide, Total	DETSC 2130#	0.1	mg/kg	1.9	1.1	0.2
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.1	< 0.1	< 0.1
Thiocyanate	DETSC 2130#	0.6	mg/kg	< 0.6	< 0.6	< 0.6
Organic matter	DETSC 2002#	0.1	%	4.7	1.1	2.8
Ammoniacal Nitrogen as N	DETSC 2119#	0.5	mg/kg	0.53		
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	1300	810	190
Sulphur (free)	DETSC 3049#	0.75	mg/kg	43	< 0.75	< 0.75

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Summary of Chemical Analysis

Soil Samples

Our Ref 21-20633
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1911131	1911132	1911133
			.Sample ID	S3_BHA03	S3_TPA_TP102	S3_BHA03
			Depth	0.30	0.40	4.80
			Other ID	3	3	13
			Sample Type	ES	ES	ES
			Sampling Date	23/09/2021	23/09/2021	23/09/2021
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	13	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	150	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	410	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	4000	26	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	4500	28	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	8.2	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	89	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	290	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	1600	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	2000	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	6500	28	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01

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Summary of Chemical Analysis
Soil Samples

Our Ref 21-20633
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1911131	1911132	1911133
			.Sample ID	S3_BHA03	S3_TPA_TP102	S3_BHA03
			Depth	0.30	0.40	4.80
			Other ID	3	3	13
			Sample Type	ES	ES	ES
			Sampling Date	23/09/2021	23/09/2021	23/09/2021
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
PAHs						
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.06	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	0.05	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.11	1.2	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	0.04	0.15	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.30	2.4	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	0.57	1.8	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.18	0.87	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	0.14	0.77	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.40	0.86	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.12	0.34	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.18	0.57	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.17	0.22	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.03	0.07	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.23	0.24	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	2.4	9.6	< 0.10
PCBs						
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg		< 0.01	
PCB 52	DETSC 3401#	0.01	mg/kg		< 0.01	
PCB 101	DETSC 3401#	0.01	mg/kg		< 0.01	
PCB 118	DETSC 3401#	0.01	mg/kg		< 0.01	
PCB 153	DETSC 3401#	0.01	mg/kg		< 0.01	
PCB 138	DETSC 3401#	0.01	mg/kg		< 0.01	
PCB 180	DETSC 3401#	0.01	mg/kg		< 0.01	
PCB 7 Total	DETSC 3401#	0.01	mg/kg		< 0.01	
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3
Phenol	DETSC 3451*	0.01	mg/kg	< 0.01		< 0.01
4-Chloro-3-methylphenol	DETSC 3451*	0.01	mg/kg	< 0.01		< 0.01
2,4-Dichlorophenol	DETSC 3451*	0.01	mg/kg	< 0.01		< 0.01
2,4-Dimethylphenol	DETSC 3451*	0.01	mg/kg	< 0.01		< 0.01
p-cresol	DETSC 3451*	0.01	mg/kg	0.02		< 0.01
2,6-Dimethylphenol	DETSC 3451*	0.01	mg/kg	< 0.01		< 0.01
2,6-Dichlorophenol	DETSC 3451*	0.01	mg/kg	< 0.01		< 0.01
2,4,6-Trichlorophenol	DETSC 3451*	0.01	mg/kg	< 0.01		< 0.01

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Summary of Chemical Analysis
Soil VOC/SVOC Samples

Our Ref 21-20633
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1911128	1911131	1911133
			.Sample ID	S3_BHA04	S3_BHA03	S3_BHA03
			Depth	0.40	0.30	4.80
			Other ID	3	3	13
			Sample Type	ES	ES	ES
			Sampling Date	22/09/2021	23/09/2021	23/09/2021
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
VOCs						
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01		< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Soil VOC/SVOC Samples

Our Ref 21-20633
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1911128	1911131	1911133
			.Sample ID	S3_BHA04	S3_BHA03	S3_BHA03
			Depth	0.40	0.30	4.80
			Other ID	3	3	13
			Sample Type	ES	ES	ES
			Sampling Date	22/09/2021	23/09/2021	23/09/2021
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01		< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01		< 0.01
SVOCs						
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Soil VOC/SVOC Samples

Our Ref 21-20633
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

			Lab No	1911128	1911131	1911133
			.Sample ID	S3_BHA04	S3_BHA03	S3_BHA03
			Depth	0.40	0.30	4.80
			Other ID	3	3	13
			Sample Type	ES	ES	ES
			Sampling Date	22/09/2021	23/09/2021	23/09/2021
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Di-n-octylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1

Key: * -not accredited. n/s -not supplied.

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-20633
Client Ref 4355
Contract Title Prairie Phase 4 Ground Investigation and SLEMS

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1911128	S3_BHA04 3 0.40	SOIL	NAD	none	Colin Patrick
1911130	S3_TPA_TP111 3 0.30	SOIL	NAD	none	Colin Patrick
1911131	S3_BHA03 3 0.30	SOIL	NAD	none	Colin Patrick
1911132	S3_TPA_TP102 3 0.40	SOIL	NAD	none	Colin Patrick
1911133	S3_BHA03 13 4.80	SOIL	NAD	none	Colin Patrick

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-20633
Client Ref 4355
Contract Prairie Phase 4 Ground Investigation and SLEMS

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1911128	S3_BHA04 0.40 SOIL	22/09/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1911129	S3_BHA04 1.40 SOIL	22/09/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1911130	S3_TPA_TP111 0.30 SOIL	22/09/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1911131	S3_BHA03 0.30 SOIL	23/09/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Ammonia (3 days)	
1911132	S3_TPA_TP102 0.40 SOIL	23/09/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1911133	S3_BHA03 4.80 SOIL	23/09/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report

Quality Control

Quality Systems

Derwentside Environmental Testing Services (DETS) employs numerous measures to ensure high levels of confidence in the results produced. Our laboratory has been accredited by the United Kingdom Accreditation Service (UKAS) since its inception and operates in full compliance with the internationally recognised standard ISO 17025:2017 and the Environment Agency's MCERTS (Monitoring & Certification Scheme) standard for soils and waters, which provides greater assurance to all parties of the reliability of data from chemical analysis.

2139

To obtain a copy of our full UKAS schedule visit the UKAS website at www.ukas.com/search-accredited-organisations/ and search for our laboratory number 2139, or scan the QR code.

Proficiency Testing Schemes

DETS participates in six external proficiency testing schemes in order to monitor and ensure the continuing quality of analysis. These schemes cover soil, water and fuel analysis and the schemes are:

Internal Quality Control

DETS runs a strict internal quality control system. A minimum of 5% of all samples that undergo analysis in our laboratories are quality control samples. This way we can ensure a high level of confidence in all of the analytical data produced. In addition, MCERTS accredited tests must meet strict, ongoing limits for precision and bias, to maintain their accreditation status.

The types of internal Analytical Quality Control (AQC) samples undertaken by DETS include Blanks, Internal QC, Calibration Checks, Surrogates and Internal Standards.

In addition to internal AQC, DETS also checks aspects of instrument performance. These checks are in general method specific. Examples are, but not limited to, retention time, peak area, signal to noise, SPE column, peak shape and peak tailing check standards.

Quality Control

Methods

DETS currently have over 140 documented methods for analytical analysis. The analytical methods are always available to employees for reference purposes. All the methods follow a documented procedure for content and headings, including health and safety, interferences, reagents and standards preparation, quality control, method procedure, analysis of results, acceptability criteria and disposal of waste.

Procedures

DETS currently have over 170 documented Standard Operating Procedures (SOPs), covering every section of the business.

The Key Quality procedures include:

DETSC.SOP 1002 - Contract Review
DETSC.SOP 1003 - Deviating Samples
DETSC.SOP 1010 - Checking a Report
DETSC.SOP 1206 - Supplier/Subcontractor Approval and Review
DETSC.SOP 1401 - FERA Plant Health License
DETSC.SOP 3001 - Analysis of AQC Samples
DETSC.SOP 3004 - QC Chart Review
DETSC.SOP 3005 - AQC Failure Reporting
DETSC.SOP 3010 - Control of Nonconforming Testing
DETSC.SOP 3102 - Complaint Handling
DETSC.SOP 3103 - Corrective & Preventive Action
DETSC.SOP 3201 - Uncertainty of Measurement
DETSC.SOP 3204 - Validation, Evaluation and Revalidation of Methods
DETSC.SOP 3401 - Documentation of Methods
DETSC.SOP 3402 - Document Control - Issuing and Removal of Controlled Documents
DETSC.SOP 3404 - Internal Audit Procedure
DETSC.SOP 3407 - Training
DETSC.SOP 3408 - Control of Records & Data
DETSC.SOP 3411 - Archiving of Documents and Records
DETSC.SOP 3412 - Competency
DETSC.SOP 3501 - Handling PT Schemes
DETSC.SOP 4203 - Handling Scheduled Samples
DETSC.SOP 4204 - Handling Unscheduled Samples
DETSC.SOP 4205 - Sending Subcontracted Samples

DETS also have documented procedures for equipment calibration and scheduled checks, including procedures for balances, hotblock digesters, furnaces, shakers, ovens, fridges, incubators, sonic baths, thermometers, timers, auto-dispensers and syringes.

Quality Control

Training

All new employees at DETS undergo a formal induction on the first day, covering an introduction to the Company, followed by an overview of the Quality Systems, the Environmental Systems and the Health and Safety Systems, Human Resources Systems, Information Technology Systems and finally an overview of the Laboratory Operations.

All new employees at DETS also undertake a Week 1 Induction schedule covering AQC Analysis and Failure Reporting and Basic Laboratory Skills.

All training on analytical methods follows a documented process requiring the employee to read and observe the method being conducted. The employee must then conduct the method under supervision on at least three occasions to the required standard before both the trainer, trainee and section manager sign the training record. Before the trainee can perform the method unsupervised, a method training verification (MTV) audit must be undertaken by a senior member of staff to verify the trainee is undertaking analysis to the required standard.

Competency

All employees will have their competency to undertake analytical methods assessed every year. Competency is usually assessed by PT Scheme Testing Results, Method Audits, MTV Audits or UKAS Audits.

If no record of competency is present within a 12-month period, the employee will have to undergo a MTV audit before undertaking any further analytical method analysis.

DETS INFO 008 – Sample Holding Time Information

Soil

Analyte	Container type	Minimum sample required	Reference	Maximum holding time from sampling	
				pre drying/extraction[1]	post drying/extraction[2]
Acid Herbicides	Glass	20g	EPA SW-846 Chapter 4	14 days	40 days
Aliphatic/Aromatic	Glass	20g	EPA Victoria	14 days	-
Ammonium	Glass or plastic	20g	E DIN 19746	3 days	30 days
Anions	Glass or plastic	20g	BS ISO18512:2007	1 month	3 years
Boron	Glass or plastic	50g	BS ISO18512:2007	6 months	30 years
BTEX	60ml glass jar	Full container	EPA SW-846 Chapter 4	14 days	-
Carbonate	Glass or plastic	20g	Lab Validation	4 weeks	1 year
Chloride	Glass or plastic	20g	BS ISO18512:2007	1 month	3 years
Conductivity	Glass or plastic	20g	BS ISO18512:2007	1 week	3 years
Cyanide	Glass or plastic	20g	EPA SW-846 Chapter 3	14 days	-
Heavy metals	Glass or plastic	10g	BS ISO18512:2007	6 months	30 years
Hexavalent chromium	Glass or plastic	20g	BS ISO18512:2007	30 days	-
Loss on ignition	Glass or plastic	10g	EPA SW-846 Chapter 3	28 days	-
Mercury	Glass or plastic	10g	EPA SW-846 Chapter 3	28 days	-
OCP	Glass	20g	BS ISO18512:2007	1 month	-
Oil & grease	Glass	20g	EPA SW-846 Chapter 3	28 days	-
Organic matter/TOC	Glass or plastic	20g	EPA SW-846 Chapter 3	28 days	-
PAH	Glass	20g	EPA Victoria	14 days	-
PCB	Glass	20g	BS ISO18512:2007	1 month	-
pH	Glass or plastic	20g	BS ISO18512:2007	1 week	3 years
Phenols	Glass	20g	EPA Victoria	14 days	-
PRO	60ml glass jar	Full container	EPA SW-846 Chapter 4	14 days	-
Sulphate	Glass or plastic	50g	BS ISO18512:2007	1 month	3 years
Sulphide	Glass or plastic	20g	EPA SW-846 Chapter 3	7 days	-
SVOC	Glass	20g	EPA SW-846 Chapter 4	14 days	40 days
TEM/CEM	Glass	20g	EPA Victoria	14 days	-
Total sulphur	Glass or plastic	20g	EPA Victoria	7 days	-
TPH (C10-C40)	Glass	20g	EPA Victoria	14 days	-
VOC	60ml glass jar	Full container	EPA SW-846 Chapter 4	7 days	-
Whole Oil Interpretation	60ml glass jar	Full container	-	-	-

[1] From sampling to extraction

[2] Once extracted

DETS INFO 008 – Sample Holding Time Information

Water

Analyte	Container type	Minimum sample required	Reference	Maximum holding time from sampling	
				Preservative required	Holding Time
Acid Herbicides	Glass	500	EPA SW-846 Chapter 4	none	7 days
Alkalinity	Glass or plastic	100	ISO 5667 3:2018	none	2 weeks
Aluminium (Reactive)	Glass or plastic	50	DETS Stability Study	none	2 days
Ammonium	Glass or plastic	20	ISO 5667 3:2018	Sulphuric acid	3 weeks
BOD	Glass or plastic	500	DETS Stability Study	none	2 days
Boron	Plastic	20	ISO 5667 3:2018	HNO3	6 months
Bromide	Glass or plastic	20	ISO 5667 3:2018	none	1 month
BTEX	Glass vial	Full container	EPA SW-846 Chapter 4	none	7 days
Chloride / Fluoride	Glass or plastic	20	ISO 5667 3:2018	none	1 month
COD	Glass or plastic	20	ISO 5667 3:2018	Sulphuric acid	6 months
Conductivity	Glass or plastic	100	ISO 5667 3:2018	none	1 day
Cyanide	Glass or Plastic	50	EPA SW-846 Chapter 3	NaOH	14 days
Hexavalent chromium	Glass or plastic	20	ISO 5667 3:2018	none	4 days
Metals (including Hardness)	Glass or plastic	20	EPA SW-846 Chapter 3	HNO3	6 months
Mercury	Glass or plastic	20	ISO 5667 3:2018	HNO3	6 months
Nitrate	Glass or plastic	20	EPA SW-846 Chapter 3	none	28 days
Nitrite	Glass or plastic	20	DETS Stability Study	none	5 days
OCP	Glass	500	ISO 5667 3:2018	Dark Glass	7 days
Oil & grease	Glass	500 (Separate bottle)	ISO 5667 3:2018	HCl / HNO3 / H2SO4	1 month
PAH	Glass	500	ISO 5667 3:2018	none	4 days
pH	Glass or plastic	50	ISO 5667 3:2018	none	1 day
PCB	Glass	500	EPA Victoria	none	7 days
Phenols	Glass	500	ISO 5667 3:2018	H3PO4 / H2SO4	21 days
Phosphate	Glass or plastic	20	DETS Stability Study	none	5 days
Phosphorus	Glass or plastic	20	EPA Victoria	HNO3	28 days
PRO	Glass vial	Full container	ISO 5667 3:2018	HCl / HNO3 / H2SO4	7 days
Sulphate	Glass or plastic	20	ISO 5667 3:2018	none	1 month
Sulphide	Plastic	50	ISO 5667 3:2018	Zinc acetate / Na2CO3	7 days
Suspended solids	Glass or plastic	100	ISO 5667 3:2018	none	2 days
SVOC	Glass	500	EPA SW-846 Chapter 4	none	7 days
TDS / Total Solids	Glass or plastic	500	ISO 5667 3:2018	none	7 days
Thiocyanate	Glass or plastic	50	DETS Stability Study	none	3 days
TOC/DOC	Glass or plastic	20	EPA SW-846 Chapter 3	H2SO4	28 days
TON	Glass or plastic	20	DETS Stability Study	none	5 days
TPH/EPH	Glass	500 (Separate bottle)	ISO 5667 3:2018	none (HCl / HNO3)	4 days (1 Month)
VOC	Glass vial	Full container	ISO 5667 3:2018	HCl / HNO3 / H2SO4	7 days
Whole Oil Interpretation	60ml glass jar	Full container	-	-	-

DETS INFO 008 – Sample Holding Time Information

Fuel

Due to the nature of fuel samples, no sample holding time is appropriate.

Asbestos

Due to the nature of asbestos samples, no sample holding time is appropriate.

Whole Oil Interpretation

Due to the nature of whole oil interpretation, no sample holding time is appropriate.

Unaccredited Methods

As unaccredited methods may not have undertaken a full validation programme, no sample holding time study has been undertaken. A study will be conducted (if required) during the process of accreditation of the method.

Sample Transport Environment

5 ± 3°C

Sample Storage environment

3 ± 2°C

DETS INFO 001 - Analytical Method Summary

Method Number	Title	Description	Reference	LOD	Accreditation Status
DETSC 1001	**Sample Pre-Treatment and Preparation of Solids**	Solid samples are classified and identified. Samples requiring analysis for unstable or volatile determinands are analysed as received. Samples requiring analysis for stable and non-volatile determinands are dried at <30◦C or 50◦C, depending on requirements, for a minimum of 16hrs (overnight). Dried samples are crushed in a jaw crusher, if necessary, and then ground using a mechanical mixer mill and sieved through a 250µm sieve to ensure they are homogenous.	BS1377:1990 – Soils for Civil Engineering Purposes The preparation and pre-treatment of potentially contaminated soils prior to chemical analysis – MEWAM – 2006 – Environment Agency	n/a	Not Accredited
DETSC 1002	**Description of Soil Sample Type**	This method outlines the procedure used to describe soil samples with respect to basic type, predominant colour and inclusions. The procedure is carried out during the sample preparation stage.	BS 5930:Section 6:1999	n/a	Not Accredited
DETSC 1003	**Stone and Glass / Metal / Plastic Content of Soil**	This method outlines the procedure used to determine the Stone and Glass/Metal/Plastic content of soil samples. The procedure is carried out during the sample preparation stage.	BS 3882:2007 BS 1377:1990	0.10%	Not Accredited
DETSC 1004	**Natural Moisture Content / Loss on Drying of Soil**	Loss on drying is determined by loss of mass on drying in an oven set at 28ºC. Moisture content is determined by loss of mass on drying in an oven set at 105ºC. The procedure is carried out during the sample preparation stage.	Practical Environmental Analysis. Radojevic & Bashkin. RSC 1999 BS 1377: Part 2:1990 DETS drying time study	0.10%	Not Accredited
DETSC 1005	**Soil Crushing**	Dried samples are crushed in a jaw crusher, if necessary, and then ground using a mechanical mixer mill to ≤250µm to ensure they are homogenous.	In-house Method	n/a	Not Accredited
DETSC 1006	**Soil Weighing**	Soil samples are weighed to predefined tolerances into batches in preparation for extraction and analysis by documented methods.	In-house Method	n/a	Not Accredited
DETSC 1007	**Batch Scanning**	Batches of soil prepared as per DETSC 1006 – Soil Weighing are scanned to create LIMS worksheets for individual method extraction and analysis. Addition of extraction reagents followed by shaking or standing overnight of certain methods is also conducted.	In-house Method	n/a	Not Accredited
DETSC 1008	**Handling Liquid Samples**	Liquid samples are filtered and/or fixed before analysis by documented methods.	In-house Method	n/a	Not Accredited
DETSC 1009	**Leachate Preparation (NRA Method and BS EN 12457 Parts 1-3)**	Leachates are prepared as per the NRA (1994) method and as per BS EN 12457 Parts 1 - 3 one and two stage leachate preparation.	Leaching Test Method for the Assessment of Contaminated Land, Interim Guidance, NRA(1994) BS EN 12457 Part 1,2 & 3	n/a	Not Accredited
DETSC 1010	**Leaching Characteristics of Moulded and Monolithic Building or Waste Materials**	A block of the material to be analysed is placed into an appropriate container ensuring that there is a gap of at least 2cm around the test piece on all sides (including the base). The container is then filled with deionised water and covered. At set time periods, the water is drained from the container which is then re-filled. The water drained out of the container is retained and analysed for the components of interest.	EA NEN 7375:2004 – Leaching Characteristics of Moulded or Monolithic Building and Waste Materials	n/a	Not Accredited
DETSC 1101	**Asbestos - Bulk Analysis**	Samples are examined visually for the presence of asbestos containing materials or asbestos fibres. Suspect fibres are removed from the sample and examined using polarised light microscopy to determine whether they are asbestos fibres. If no asbestos fibres are identified by the method after an adequate length of examination time, and after at least two small pinch samples have been examined, then the sample may be reported as 'NAD' (no asbestos detected).	HSG 248 Asbestos: The Analysis Guide for Sampling, Analysis and Clearance Procedures. 2005 McCrone W.C., Asbestos Identification (Second Edition), The McCrone Research Institute, 1987 LAB 30, Application of ISO/IEC17025 for Asbestos Sampling and Testing, UKAS, Edition 3, January 2015	n/a	UKAS

DETSC 1102	**Quantification of asbestos in soils, loose aggregates and ballast**	The method of quantification is divided into three procedures: Gravimetric analysis, detailed gravimetric analysis and PCOM analysis. The analysis may be affected by the client's requirements as determined by contract review, and by the nature of the asbestos found in the sample, e.g. whether ACMs are present, and whether fibre bundles large enough to pick out using tweezers are have been found in the sample.	HSG 248 Asbestos: The Analysis Guide for Sampling, Analysis and Clearance Procedures. 2005 McCrone W.C., Asbestos Identification (Second Edition), The McCrone Rese HSG264 Asbestos: The survey guide. HSE Books, 2010 Davies, L. S.T., Wetherill, G. Z., McIntosh, C., McGonagle, C., Addison, J. 1996. Development and validation of an analytical method to determine the amount of asbestos in soils and loose aggregates. HSE Contract Research Report N0. 83/1996. HSE Books	Gravimetric Analysis: 0.01% for 1kg sample Detailed Gravimetric Analysis: 0.001% for 50g sample PCOM Analysis: 0.001%	UKAS
DETSC 1103	**Asbestos Water Absorption Test**	This test involves a sample of the asbestos product being dried and weighed before being immersed in water for a period of time. The sample is then removed from the water and re-weighed. If the amount of water absorbed is <30% by weight, then the sample should be reported as 'Not Licensed'. If ≥30% water is absorbed then the sample should be reported as being 'Licensed', i.e. an asbestos material for which a licence is required to work on.	Work with Materials Containing Asbestos: Approved Code of Practice and Guidance. HSE Books, 2006.	n/a	UKAS
DETSC 1104 (DRAFT)	**Respirable Fibres in Soil and Dust**	The analysis can follow-on from a quantitative analysis, or be scheduled as a test on its own, according to client requirements. A known mass of between 8g and 12g is removed and mixed with 1000ml of water. The mixture is stirred for 1 hour using a magnetic stirrer. A portion of the mixture is filtered through a 10 micron pore size filter, to collect a filtrate containing a sample of the respirable dust. The mass of respirable (PM10) dust per ml of the filtrate is calculated, and this value is used to decide how much of the filtrate is to be used for the rest of the analysis. Then, a known quantity of the filtrate is filtered through a cellulose-ester filter papers with a pore size of 0.8-1.2 microns. The filter is then placed onto a microscope slide, allowed to air dry, and then cleared and fixed using the acetone/triacetin method described in HSG 248. The filter is then evaluated using PCOM. From the number of respirable fibres observed on the slide the number of respirable fibres per mg of dust is calculated.	Asbestos: The analyst's guide for sampling, analysis and clearance procedures. HSG248, HSE Books, 2005 Asbestos: The survey guide. HSG264, HSE Books, 2012.	n/a	Not Accredited
DETSC 2002	**Organic matter content of soil**	The procedure is based upon Walkley and Black's method. Organic matter in soil is oxidised with potassium dichromate in the presence of concentrated sulphuric acid. The excess dichromate is titrated with ferrous sulphate using diphenylamine as an external indicator. The organic matter content is calculated from the amount of dichromate used during the oxidation process based on an empirical relationship.	BS1377 : Part 3 : 1990 Method 3 BS1377 : Part 1 : 1990 BS 3882:2007	0.10%	MCERTS(Soils)
DETSC 2003	**Loss On Ignition**	Soil is ignited at 440C and the amount of sample lost on ignition is determined gravimetrically. Other specified temperatures may be used but are not accredited.	BS1377 : Part 3 : 1990 Method 4 BS1377 : Part 1 : 1990	0.01%	MCERTS(Soils)
DETSC 2004	**Sulphate and Total Sulphur Content of Soil, Aggregate and Water**	The sulphate in the soil is dissolved in dilute hydrochloric acid, or in an aqueous extract having a water:soil ratio of 2:1 and the insoluble residue is removed by filtration. Waters are also filtered prior to analysis. The sulphate in the filtrate is precipitated as barium sulphate which is then filtered, ignited and weighed. Aggregate analysis is not comparable to BS EN 1744.	BS1377 : Part 3 : 1990 Method 5 BS1377 : Part 1 : 1990 BRE SD1: 2005 Concrete in Aggressive Ground	**Acid Soluble:** 0.01% **Water Soluble:** 100mg/l **Waters:** 10mg/l	MCERTS(Soils) Not Accredited (Aggregates)
DETSC 2005	**Carbonate content of soil by Rapid Titration**	The carbonate present in the soil reacts with a known excess of hydrochloric acid liberating carbon dioxide. The acid remaining after the reaction is determined by titration against sodium hydroxide. The result is calculated in terms of the equivalent proportion of carbon dioxide.	BS 1377: Part 1: 1990 BS 1377: Part 3: 1990: Method 5	1%	UKAS
DETSC 2006	**Water Soluble Chloride Content of Soil & Chloride Content of Water**	Chloride in the soil is extracted in deionised water and the insoluble material is removed by filtration. Water samples are filtered prior to analysis. The chloride in solution is analysed by titration using Mohr's method titration with standard silver nitrate solution using potassium chromate as an indicator.	BS1377 : Part 3 : 1990 Method 7.2 BS1377: Part 1: 1990	**Soil:** 0.01% **Water:** 10mg/l	UKAS
DETSC 2007	**Acid Soluble Chloride Content of Soil and Concrete**	The chloride in the sample is dissolved in nitric acid and the insoluble material is removed by filtration. The dissolved chloride is analysed by Volhard's method. The chloride in solution is precipitated with a known excess of standard silver nitrate. The excess silver nitrate is titrated against standard ammonium thiocyanate using ferric alum as an indicator. The colour change is white to red.	BS1377 : Part 3 : 1990 Method 7.3 BS1377: Part 1: 1990 BS 1881-124:1988	0.01%	UKAS

DETSC 2008	**pH Value of Soil and Water**	The pH value of a soil suspension in water or a groundwater sample is determined electrometrically using a glass electrode.	BS1377: Part 3: 1990 – Soils for Civil Engineering Purposes – Chemical and Electrochemical Methods	n/a	MCERTS (Soils) UKAS (Waters)
DETSC 2009	**Electrical Conductivity of Soil & Water**	The electrical conductance of a soil suspension in water or of a water sample is determined by voltammetry using a conductivity meter. In some cases, the soil may need to be extracted with an aqueous solution of an inorganic salt e.g. the conductivity of topsoil is determined by preparing a suspension of the soil in saturated calcium sulphate.	Standard Methods for the Examination of water and Wastewater Part 2510B 21st Edition 2005 APHA, AWWA, WEF BS3882:2007 Specification for Topsoil	1uS/cm	UKAS
DETSC 2010	**Chloramine in Water Samples**	Free available residual chlorine reacts with diethyl-p-phenylenediamine (DPD) to produce a pink/red coloured complex. The addition of a small amount of potassium iodide causes mono-chloramine to produce the same pink/red colour with the same reagent. Further addition of an excess of iodide causes di-chloramine and any nitrogen tri-chloride to react and produce a colour. The pink/red coloured complex is titrated with ferrous ammonium sulphate to a clear endpoint.	In-house Method	100µg/l	Not Accredited
DETSC 2011	**Acid Alkali Reserve**	An initial pH value is obtained for the sample. The sample is then titrated with either hydrochloric acid or sodium hydroxide to a pH of 7.00. From this result, the acid/alkali reserve value can be calculated.	In-house Method	TBC	Not Accredited
DETSC 2012	**Biofilm Potential of Sewage and Sludges**	Sodium hypochlorite solution is added to the sample in small increments. The sample temperature is monitored during the additions until no further changes in temperature occur due to all of the bacteria in the sample having been effectively neutralised.	In-house Method	TBC	Not Accredited
DETSC 2013	**Gravimetric Carbonate Content of Soils**	A dried and finely crushed portion of the sample is ashed in a muffle furnace at 440ºC for 4 hours to burn off any organic materials in the sample. The crucible containing the sample is then allowed to cool and is re-weighed and then returned to the furnace at a temperature of 950ºC which will break down any carbonates present and release them as carbon dioxide gas. The carbonate content of the sample is then determined by calculation.	The British Calcium Carbonates Federation–Calcium Carbonate – Occurrence and uses	0.10%	Not Accredited
DETSC 2014	**Total and Available Lime Content**	Samples for Total Lime are extracted with hot hydrochloric acid and analysed for calcium by ICP-OES. Samples for available lime content are extracted with hot water using granulated sugar as a catalyst and analysed by titration with standardised hydrochloric acid.	BS 4551: Part 2: 1998– Methods of testing mortars, screed and plasters. Chemical analysis and aggregate grading	TBC	Not Accredited
DETSC 2015	**Initial Consumption of Lime**	The pH of a saturated calcium hydroxide solution is measured at ambient temperature. Several portions of the sample to be analysed are weighed out and differing amounts of lime are added to each one. The samples are mixed with water and then shaken. After shaking the pH of each portion is determined and a graph plotted of pH against percentage of lime. From this graph, the initial consumption of lime is determined (this is the lime percentage at which the sample pH is the same as that of the saturated calcium hydroxide solution).	BS 1924: Part 2: 1990 – Stabilized materials for civil engineering purposes. Methods of test for cement-stabilized and lime-stabilized materials	TBC	Not Accredited
DETSC 2016	**Redox Potential of Soil and Water**	Redox potential is measured using a probe with two electrodes, one of platinum and the other of silver chloride between which the potential of the solution being tested is measured in millivolts. The probe is placed into the sample and a direct reading in millivolts is given on the meter attached to the redox probe. Soils are analysed by preparation of a 2:1 water to soil sludge.	Encyclopaedia of Soils in the Environment 2005 – Redox Potential	n/a	Not Accredited
DETSC 2017	**Salinity of Soils and Waters by Calculation**	The conductivity of the sample is measured in µS/cm and from this result the salinity is calculated.	Method 2520B - Standard Methods for the Examination of Water and Wastewater - 21st Edition – 2005	n/a	Not Accredited
DETSC 2018	**Specific Gravity of Sludge**	The 'as received' sample is transferred to a dry, tared measuring cylinder and the volume recorded. The cylinder and its contents are then weighed, and the specific gravity of the sample is calculated.	In-house Method	n/a	Not Accredited

DETSC 2019	**Loose Packed Dry Soil Density**	Dried, ground soil is transferred to a dry, tared measuring cylinder and the volume recorded. The cylinder and its contents are then weighed and the density of the soil calculated.	BS3882:2007 Specification for Topsoil	n/a	Not Accredited
DETSC 2024	**Sulphide in Soil and Water by Iodometry**	Hydrogen sulphide is liberated by acidification of the sample with hydrochloric acid in a steam distillation unit. The hydrogen sulphide produced is carried over with the steam and is absorbed in alkaline zinc acetate. The zinc sulphide produced reacts with iodine formed when iodate-iodide is acidified and the excess iodine titrated with standard thiosulphate.	In House Method based on: Environment Agency - The determination of easily liberated sulphide in soils and similar matrices (2010) - Blue Book 228 Method D - The determination of easily liberated sulphide in as received or air-dried samples following acid steam distillation with iodometric titration The determination of sulphide in waters and associated materials (2007) Draft Method D - The determination of easily liberated sulphide in as received or air-dried samples following phosphoric acid steam distillation with iodometric titration.	**Soils:** 10mg/kg **Waters:** 250ug/l	Not Accredited
DETSC 2025	**Volatile Fatty Acids in Waters and Sludges**	Volatile fatty acids are esterified with acidic ethylene glycol. The resultant esters are reacted with hydroxylamine to form hydroxamic acids. Addition of iron (II) chloride causes formation of purple coloured ferric hydroxamates which are determined spectrophotometrically at 500nm.	Determination of Volatile Fatty Acids in Environmental Aqueous Samples - Polish Journal of Environmental Studies Volume 17, No. 3 (2008), 351-356. Volatile Fatty Acids Production By Anaerobic Fermentation Of Urban Organic Wastes – C. Sans, J. Mata-Alvarez, Department of Chemical Engineering, University of Barcelona Determination of Volatile Fatty Acids in Sewage Sludge – Methods for the Examination of Waters and Associated Materials Book 21 ISBN 011-751462-4	20mg/l	Not Accredited
DETSC 2026	**AOC, pH and Alkalinity of Solid Soaps and Detergents**	A representative portion of the sample is weighed out and dissolved in water. The pH is measured on the liquid produced using a calibrated pH meter. The same solution is then titrated with standard sulphuric acid using methyl orange as an indicator and from this result the alkalinity is calculated. The active oxygen content is measured by digesting the sample with sulphuric acid and then titrating with potassium permanganate solution.	ISO 4321:1977 – Washing Powders - Determination of AOC – Titrimetric Method	TBC	Not Accredited
DETSC 2030	**Alkalinity in Water**	The alkalinity of a sample of water or leachate is determined by potentiometric or indicator end point titration with a strong acid from sample pH to pH 8.3 (where applicable) and then to pH 4.5. From the titres obtained the total alkalinity and concentrations and types of alkalinity present can be calculated.	SCA Method ISBN 0 11 751601 5 The Determination of Alkalinity and Acidity in Water 1981 Instruction Manual for Skalar SP50 Robotic Analyser	20mg/l as CaCO3	UKAS
DETSC 2031	**5 Day Biochemical Oxygen Demand**	The sample, either diluted or undiluted, is placed in a BOD bottle and the initial dissolved oxygen content of the sample is measured using a dissolved oxygen meter. The bottle is placed in an incubator at 20ºC in the dark for 5 days. After this time the bottle is removed and the residual dissolved oxygen content of the sample is measured. The BOD of the sample is calculated from the reduction in the concentration of dissolved oxygen over 5 days.	SCA Method ISBN 0 117522120 5 Day Biochemical Oxygen Demand (BOD5) Second Edition 1988	1 mg/l	UKAS
DETSC 2032	**Chemical Oxygen Demand**	Oxidisable substances react with sulphuric acid – potassium dichromate solution in the presence of silver sulphate as a catalyst. Chloride is masked by mercury sulphate. The reduction in the yellow colouration of Cr6+ is evaluated using a spectrophotometer for the low range tubes (LCK 314) whilst the green colouration of Cr3+ is evaluated for the medium and high range tubes (LCK 014 and LCK 114).	Environment Agency The determination of chemical oxygen demand in waters and effluents (2007) Methods for the Examination of Waters and Associated Materials	10 mg/l	UKAS MCERTS - Trade Effluent ONLY
DETSC 2033	**Total and Dissolved Organic Carbon in Water**	The term TOC (Total Organic Carbon) is used to describe the total content of organically bound carbon in dissolved and undissolved compounds. The TOC content is expressed in mg/l. If DOC (Dissolved Organic Carbon) is required, samples are filtered through a 0.45µm filter paper prior to analysis. Inorganic carbon is expelled by acidification of the sample. TOC is then determined by digestion of the sample with sulphuric acid and peroxodisulphate. Carbon containing compounds are transformed into carbon dioxide. The carbon dioxide evolves and reacts with an indicator solution. The colour change is measured using a spectrophotometer.	Hach-Lange Technical Instructions: LCK 385, LCK 386	2 mg/l	UKAS
DETSC 2034	**Suspended and Settleable Solids in Water**	Suspended matter is removed from a measured volume of sample by filtration under reduced pressure through a pre-treated, pre-weighed glass fibre filter paper. The paper is washed with deionised water to remove dissolved salts and the total suspended matter is determined gravimetrically after drying at 105 ±5°C. Settleable solids are determined by subtracting the solids left in suspension after settlement for 1 hour (or other agreed time) from the total suspended matter in the sample.	SCA Method ISBN 011 751957 X Suspended, Settleable and Total Dissolved Solids in Waters and Effluents 1980	5 mg/l	**Suspended Solids:** UKAS **Settleable Solids:** Not Accredited

DETSC 2035	**Total Solids, Total Dissolved Solids and Total Volatile Solids in Water**	For total dissolved solids determination: Water samples are pre-filtered to remove any suspended solids and evaporated in an oven at 180°C. The amount of residual dissolved solids is determined gravimetrically. An estimate of the total dissolved solids can be obtained by measuring the conductivity of the sample and performing an empirical calculation from the conductivity obtained. For total solids and total volatile solids: The sample is shaken to ensure homogeneity of any suspended matter. The sample is then evaporated and the result is determined gravimetrically as for total dissolved solids. If total volatile solids is required on the sample, the container used for the total solids determination is retained and heated in a muffle furnace to 440ºC and a further gravimetric determination is made.	SCA Method ISBN 011 751957 X Suspended, Settleable and Total Dissolved Solids in Waters and Effluents 1980. BS1377: Part 3 : 1990 Section 8	5 mg/l	**Total Dissolved Solids:** UKAS **Total Solids & Total Volatile Solids:** Not Accredited
DETSC 2036	**Combustibility of Solids**	A representative sample of 10 to 20g of the material to be tested is placed on a gauze mat and heated using a blowtorch. The sample is observed during and after heating and a determination of the behaviour of the sample during the test is made using a standard set of definitions.	EN ISO 1182:2010 Reaction to Fire Tests for Products – Non-Combustibility Test	n/a	Not Accredited
DETSC 2037	**Turbidity in Waters**	Samples are measured on a turbidity meter. The instrument measures turbidity in the sample by passing light at a wavelength of 860nm through a glass vial containing the liquid to be analysed. Light scattered by the sample is detected at an angle of 90º by a photo-diode and a result is displayed on the instrument screen, with results being based on a set of calibration standards for which the instrument stores a calibration graph.	Standard Methods for the Examination of Water and Wastewater 21st Edition	1.00 NTU	Not Accredited
DETSC 2038	**Total and Free Chlorine in Water**	The sample is reacted with diethyl-p-phenylenediamine (DPD) in an ethylene diamine tetra-acetic acid (EDTA) buffer for free chlorine. For total chlorine analysis, potassium iodide is added as well to break down any chloramine compounds in the sample so that the chlorine is released to react with the DPD. Samples for both tests are then analysed colourimetrically at a wavelength of 510nm using a small bench top photometer.	Methods for the Examination of Waters and Associated Materials - Chemical disinfecting agents in waters and effluents (2008)	0.1mg/l	Not Accredited
DETSC 2039	**Cation Exchange Capacity of Soil**	The sample is saturated with Ba2+ ions by mixing with in a barium chloride solution. The barium is then exchanged with Mg2+ by reaction with magnesium sulphate forming a precipitate of barium sulphate. The quantity of Mg2+ ions adsorbed (i.e. the CEC value) is determined by loss from magnesium sulphate solution added. This is determined by titration with an ethylene diamine tetra-acetic acid solution using eriochrome black as an indicator.	CEC & Kd Determination in Landfill Performance Evaluation - A review of methodologies and preparation of standard materials for laboratory analysis. BaCl2/triethanolamine method. PR: P1/254/01	1 meq/100g	Not Accredited
DETSC 2040	**Sediment Oxygen Demand**	The sample to be analysed is placed into a BOD bottle and covered with water saturated with oxygen, which also contains nutrients to promote bacterial growth. The oxygen level in the supernatant liquid is monitored for up to three hours. From the decrease in oxygen content of the supernatant liquid, the SOD rate can be determined.	Nutrient Release and Sediment Oxygen Demand in a Eutrophic Land-Locked Embayment in Hong Kong – Environment International Journal Volume 26 (2001) Sediment Oxygen Demand and Biochemical Oxygen Demand: Patterns of Oxygen Depletion in Tidal Creek Sites - Program in Marine Science, University of North Carolina at Wilmington (2003)	n/a	Not Accredited
DETSC 2047	**Formaldehyde in Water**	Formaldehyde in soil is extracted in water, with a water to soil ratio of 10:1. The insoluble residue is removed by filtration prior to analysis. Waters are filtered prior to analysis to remove any particulates in suspension. Formaldehyde in the extract or water sample reacts with chromatropic acid-sulphuric acid solution to form a purple coloured complex. The absorbance of the coloured solution is read at 580nm using a suitable visible spectrophotometer.	Formaldehyde by visible absorption spectrophotometry – Method 3500, Issue 2 – NIOSH Manual of Analytical Methods, Fourth edition, August 1994	**Soil:** 0.2mg/kg **Water:** 20µg/l	Not Accredited
DETSC 2048	**Dissolved Oxygen Content of Water**	The dissolved oxygen content of the sample is measured using a dissolved oxygen meter either electrochemically or by fluorescence, or by the titrimetric method developed by Winkler.	SCA Method ISBN 0.11 751442X. Dissolved Oxygen in Natural and Waste Waters 1979	0.1 mg/l	Not Accredited
DETSC 2055	**Anions in Water and Aqueous Soil Extracts by Ion Chromatography**	Liquid samples and aqueous soil extracts are filtered through a 0.22µm syringe filter prior to analysis. The filtered samples are injected into an Ion Chromatograph. The anions of interest are separated on the basis of their affinity for the active sites of the column packing material. The separated anions are converted into their highly conductive acid forms and measured by conductivity. The anions are identified on the basis of retention time as compared to standards and quantisation is by measurement of peak area.	Standard Methods for the Examination of Water and Wastewater Section 4110 21st Edition 2005 APHA, AWWA, WEF	**Soil:** 1.0 mg/kg **Water:** 0.1 mg/L	UKAS (except Br)
DETSC 2065	**Cement Content of Concrete and Mortor**	The concrete or mortar sample is dried and finely crushed, then digested with hydrochloric acid and filtered to remove the remaining solids, collecting the filtrate for further analysis. The remaining solids are then re-digested using an alkaline solution of sodium carbonate and ammonium chloride and re-filtered. The resulting filtrate is combined with that produced during the first stage of the extraction which is then analysed for calcium and silicon contents by ICP-OES. The remaining solids are ashed at 800ºC to determine the insoluble residue content of the sample. A loss on ignition of the original sample is also performed. From these results a series of calculations can be made to determine the soluble silica, calcium oxide and cement content of the sample.	BS1881:Part124:1988 Methods for analysis of hardened concrete	n/a	Not Accredited
DETSC 2066	**Gypsum Content of Soil by Acetone Precipitation**	The sample is mixed with water and filtered. The filtrate is then mixed with acetone to precipitate out the gypsum. The precipitate is separated out using a centrifuge then re-dissolved in water. The conductivity of the resulting solution is measured from which the gypsum content is calculated.	ASTM C 471M-01 Standard Test Methods for Chemical Analysis of Gypsum and Gypsum Products	TBC	Not Accredited
DETSC 2067	**Rapid Chemical Test for Detecting High Alumina Cement Concrete**	This is an empirical test to determine the presence or absence of high alumina cement in the sample, it does not provide a quantitative result. The sample is reacted with Oxine reagent in acidic solution. If high alumina cement is present, a yellow precipitate is formed.	BRE Centre for Concrete Construction Special Digest 3 – HAC Concrete in the UK: Assessment, Durability Management, Maintenance and Refurbishment	n/a	Not Accredited

DETSC 2073	**Acid Neutralisation Capacity of Soils and Other Solids**	ANC is a measure of the buffering capacity of soils and other waste materials. The analysis measures the amount of acid required to bring the sample to a fixed pH. The initial pH of the sample extract must be measured before analysis begins. Analysis is performed by the addition of acid in conjunction with pH measurement by pH meter until the specified pH has been reached as indicated by the meter. The result is expressed in mol/kg (dry wt).	Annex B (Preliminary determination of the acid/base consumption) – CEN/TC 292 – WI 292046 – Characterization of waste – Leaching behaviour tests – Acid and Base neutralization capacity test	1.0 mol/kg	Not Accredited
DETSC 2076	**Sulphate and Magnesium Content of 2:1 Aqueous Extract of Soil by ICP-OES**	The sulphate and magnesium in the soil are extracted in an aqueous extract having water: soil ratio of 2:1 and the insoluble material is removed by filtration. The concentrations of sulphate and magnesium in the filtrate are determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). The wavelengths used for identification and quantification are 181.972nm for sulphate and 285.213nm for magnesium.	BS1377 : Part 3: 1990 Method 5 BS1377 : Part 1: 1990 TRL 447 Sulphate Specification for Structural Backfills 2005. BRE SD1:2005 Concrete in Aggressive Ground 2005	10mg/L	**Sulphate:** MCERTS(Soils) **Magnesium:** Not Accredited
DETSC 2084	**Total Organic Carbon by PrimacATC Analyser**	Soil samples are treated with phosphoric acid to expel any inorganic carbonates. The samples are then heated at high temperature in a continuous flow of air so that any organic carbon is oxidised to carbon dioxide. The gas is then allowed to cool and analysed by an infra-red detector.	PrimacsATC Analyser – User Manual, Skalar	0.47%	MCERTS(Soils)
DETSC 2085	**Total and Dissolved Organic Carbon in Water**	**Direct TOC Analysis** - The sample is acidified, stirred and purged to remove the IC before the sample is injected and handled as in the TC Analysis. The sample is filtered before acidification for DOC. **TC Analysis** - The sample is injected by an automated septum less rotary port into a high temperature reactor. In the reactor, at a temperature of 750 - 950°C all organic and inorganic carbon is oxidized to the gaseous carbon dioxide (CO_2). The catalyst that is present in the reactor catalysis the oxidation to completion. A flow of air transports these oxidation products to the detectors. The oxygen required for reaction is taken from the airflow. The products are led into the non-dispersive infrared detector where the carbon dioxide is determined. The carbon dioxide is measured at a wavelength of 4.2 µm by NDIR detection.	Standard Methods for the Examination of Water and Wastewater Section 5310 B 21st Edition 2005 APHA, AWWA, WEF. HMSO Methods for the Examination of Waters and Associated Materials – The Instrumental Determination of Total Organic Carbon and Related Determinands 1995	lmg/l as C	UKAS
DETSC 2119	**Exchangeable Ammonia in Soil**	An intense blue-green complex, related to indophenol blue, is formed by the reaction of ammonia with hypochlorite and sodium salicylate, with sodium nitroprusside acting as a catalyst. The complex is measured at 655nm and is related to the ammonia concentration by means of a calibration curve. Sodium citrate is added to overcome interfering ions.	MAFF/ADAS Reference Book 427 – the Analysis of Agricultural Materials – Method 53, Ammonium, Nitrate and Nitrite-Nitrogen, Potassium Chloride Extractable	0.5mg/kg	MCERTS(Soils)
DETSC 2120	**Ammonia in Water by Spectrophotometry**	An intense blue-green complex, related to indophenol blue, is formed by the reaction of ammonia with hypochlorite and sodium salicylate, with sodium nitroprusside acting as a catalyst. The complex is measured at 655nm and is related to the ammonia concentration by means of a calibration curve. Sodium citrate is added to overcome interfering ions.	Environment Agency Ammonia in Waters 1981 ISBN 0117516139. Methods for the Examination of Waters and Associated Materials	20µg/l	UKAS
DETSC 2121	**Total Kjeldahl Nitrogen Content of Soils and Waters**	The sample is digested with sulphuric acid and a mixture of catalysts to convert organic nitrogen to ammonia. The sample is then distilled under alkaline conditions, and the distilled ammonia is absorbed in sulphuric acid. The ammonia content of the distillate is then determined colorimetrically either using the UV/vis spectrophotometer or the Konelab 60i. Ammonia reacts with hypochlorite ions generated by the alkaline hydrolysis of sodium dichloroisocyanurate to form monochloramine. Monochloramine reacts with salicylate ions in the presence of sodium nitroprusside at around pH 12.6 to form a blue compound. The absorbance of this compound is measured spectrophotometrically at wavelength 660nm	The Analysis of Agricultural Materials – MAFF/ADAS Reference Book 427 – HMSO. BS 3882: 2007 Specification for topsoil. Standard Methods for the Examination of Water and Wastewater Part 4500-N. 21st Edition 2005 APHA, WWA, WEF	**Soil:** 0.01% **Water:** 2mg/l	Not Accredited
DETSC 2122	**UV Light Transmittance in Waters**	The absorbance of a water sample is measured at a wavelength of 254nm in a 10mm glass or quartz cell using deionised water as a blank. The percentage UV transmission of the sample is then calculated from the absorbance result.	Ultraviolet Light Factsheet - Treatment of Residential Drinking Water Using UV – Water Quality Association	n/a	Not Accredited
DETSC 2123	**Water Soluble Boron in Soil & Boron in Water**	Boron in soil is extracted in boiling saline water. Waters are filtered prior to analysis to remove any particulates in suspension. The water soluble boron in the extract or filtrate reacts with azomethine–H to produce a yellow coloured complex. The resulting colour absorbance is measured at 420nm using a suitable visible spectrophotometer.	SecondSite Property (now National Grid Property Holdings) - Guidance for assessing and managing potential contamination on former gasworks and associated sites (Part I) (Version 3) Method 17.12 The analysis of Agricultural materials MAFF/ADAS – reference book 427 HMSO	**Soil:** 0.2mg/kg **Water:** 100ug/L	MCERTS(Soils)
DETSC 2124	**Reactive Aluminium in Waters and Leachates**	Aluminium reacts with Catechol violet in a suitably buffered solution (pH 6.1) to form an aluminium–catechol violet complex which can be measured photometrically at 575nm.	KonelabAquachemLabmedics Method No. ALU001. Standard Methods for the Examination of Water and Wastewater. Part 3111 B – 21stEdition, 2005 APHA, AWWA, WEFT	3µg/l	Not Accredited

DETSC 2125	**Colour in Water**	A filtered (true colour) or unfiltered (apparent colour) sample is analysed on a UV / Visible Spectrometer at 455nm and the result compared against a PtCo Calibration.	HACH - Water Analysis Handbook – Method 8025 Color, True and Apparent. APHA – Standard Methods for the Examination of Water & Wastewater 2005 - 2120 COLOR	1mg/l	Not Accredited
DETSC 2126	**Methylene Blue Active Substances**	Methylene Blue is much more readily soluble in water than in chloroform, however in the presence of anionic surfactants an ion-pair is formed which is readily extracted into chloroform. The sample is mixed with chloroform and methylene blue solution in a separating funnel. The resultant colour change in the chloroform layer is measured on a spectrophotometer at a wavelength of 654nm.	Koga, Yamamichi, Nomoto et al. Analytical Sciences 15, 563-568 (1999)	0.01mg/l	Not Accredited
DETSC 2127	**Acidity, Dissolved CO2 and Aggressive CO2 in Water**	Samples requiring acidity or aggressive CO2 are first digested by heating the sample with sulphuric acid and hydrogen peroxide. Samples for acidity analysis are then titrated with sodium hydroxide to pH 8.3 for total acidity or to pH 3.7 for mineral acidity. For aggressive and dissolved CO2 samples are titrated with sodium hydroxide to pH 8.3. The aggressive or dissolved CO2 in the sample is then calculated from the titration result.	USEPA – Method 305.1 Acidity HMSO – The Determination of Alkalinity and Acidity in Water 1981	10mg/l	Not Accredited
DETSC 2130	**Cyanides & Monohydric Phenols by Skalar**	Water samples are filtered through a 0.45µm syringe filter and solid samples are extracted with 1M caustic soda prior to analysis on the automated flow analyser. The method determines total cyanide, easily liberated cyanide, complex cyanide, thiocyanate and monohydric phenols.	Skalar methods: I295-001 w/r+P7, I295-002 w/r+P7, 293-902 w/r+P7, 497-001	**Soils mg/kg:** Total & Free CN=0.1, Thio=0.6, Phenol=0.3 **Waters ug/L:** Total CN=40, Free CN=20, Thio=20, Phenol=100	**Soils:** MCERTS **Waters:** UKAS
DETSC 2131	**Low Level Cyanides & Monohydric Phenols by SKALAR**	Water samples are filtered through a 0.45µm syringe filter prior to analysis on the automated flow analyser. The method determines total cyanide, easily liberated cyanide, complex cyanide, thiocyanate and monohydric phenols.	Skalar methods: I295-003w/r - Free Cyanide, I295-004w/r - Total Cyanide, 497-001 - Phenol	Total CN=0.1µg/l Free CN=0.1µg/l Phenol=1.5ug/l	UKAS
DETSC 2140	**Sugar in Mixing Water for Cement**	Waters are filtered prior to analysis to remove any particulates in suspension. The sugar in the filtrate reacts with phenol and sulphuric acid to produce a yellow-orange coloured complex. The resulting colour absorbance is measured at 490nm using a suitable visible spectrophotometer.	Colorimetric Method for Determination of Sugars and Related Substances. MICHEL DUBOIS, K. A. GILLES, J. K. HAMILTON, P. A. REBERS, and FRED SMITH - Division of Biochemistry, University of Minnesota, St. Paul, Minnesota.	10mg/l	Not Accredited
DETSC 2141	**Acid Base Accounting & Neutralisation Potential of Soils**	Carbonate content and Sulphur content are first determined on the sample using the current DETS methods (DETSC 2005 and DETSC 5017 respectively). Hydrochloric acid is then added to the sample, the amount being based on the initial carbonate content of the sample. After 22 hours the pH of the sample is checked. If pH is above 2.5 a further addition of acid is made to bring the pH down to around 2.0. Sample is then left to stand for a further 2 hours. Excess acid is then titrated with sodium hydroxide solution, and from this result the neutralisation potential of the sample is calculated. The acid potential of the sample is calculated from the sulphur content of the sample. Further calculations can then be performed using these results to give the neutralisation potential ratio and net neutralisation potential.	BSiPD CEN/TR 16363:2012 Characterisation of Waste – Kinetic testing for assessing acid generation potential of sulphidic waste from extractive industries. BS EN 15875:2011 Characterisation of Waste – Static test for determination of acid potential and neutralisation potential of sulphidic waste.	None available	Not Accredited
DETSC 2142	**Acid Soluble Fluoride in Soils and Sludges**	Samples are tested on an 'as received' basis, without drying and crushing, as fluoride is very volatile and may be lost during normal sample preparation procedures. Samples are treated with sulphuric acid and a mixture of sodium citrate and potassium chloride buffer solutions. The fluoride ions released are then measured potentiometrically using a fluoride ion selective electrode.	Fluoride in Waters, Effluents, Sludges, Plants and Soils 1982 (HMSO Publication ISBN 0117516627	1mg/kg	Not Accredited
DETSC 2143	**Partition Coefficient of Soil (Kd Value)**	The sample to be tested is first equilibrated with water (or any other solvent of interest) by mixing for a set time period (usually 72 hours). A spiking solution containing the compound or element of interest is then added to give a known concentration in the sample and then mixed for a further 48 hours. Analysis is then performed on the spiked samples by a standard method for the compound of interest. An un-spiked portion of the sample is extracted and analysed at the same time and the Kd value is calculated from the results obtained.	Environment Agency Science Report SC020039/4 – Development of the partition coefficient (Kd) test method for use in environmental risk assessments	TBC	Not Accredited
DETSC 2144	**Baumann-Gully Acidity in Soils**	The dried and crushed sample is treated with sodium acetate to produce acetic acid. The acid produced is titrated with standard sodium hydroxide solution to give an indication of the acidity potential of the sample.	BS EN 16502: 2014 – Test method for the determination of the degree of soil acidity according to Baumann-Gully	TBC	Not Accredited

DETSC 2201	**Nitrite in Waters and Leachates by Colourimetric Analysis**	Nitrite is determined colorimetrically using the Konelab60i autoanalyser. The nitrite colour reaction occurs at pH 2.0 to 2.5 by coupling diazotized Sulphanilamide with N-1-naphthyl-ethylenediamine. The absorbance of this compound is measured spectrophotometrically at 540nm.	Standard Methods for the Examination of Water and Wastewater Part 4500-NO2 B – 21st Edition 2005 APHA, AWWA, WEF. Aquakem Method Nitrite in Waters Iss No 2. Methods for the Examination of Water and Associated Materials Oxidised Nitrogen in Waters 1981. EPA Method 354.1 Nitrite, spectrophotometric (Approved at 40 CFR Part 136, not approved at Part 141)	0.04mg/l (as N)	UKAS
DETSC 2202	**Total Oxidised Nitrogen in Waters and Leachates by Colourimetric Analysis**	Nitrate is reduced to nitrite by hydrazine under alkaline conditions. The total nitrite ions are then reacted with sulphanilamide and N-1-naphthylethylenediamine dihydrochloride under acidic conditions to form a reddish purple azo-dye. The absorbance of this compound is measured spectrophotometrically at 540 nm using the Konelab 60i autoanalyser.	Standard Methods for the Examination of Water and Wastewater Part 4500-NO2 B and Part 4500-NO3 H – 21st Edition 2005 APHA, AWWA, WEF. Aquakem Method Total Oxidised Nitrogen. Methods for the Examination of Water and Associated Materials Oxidised Nitrogen in Waters 1981. EPA Method 353.1 Nitrate, Nitrite Colorimetric Automated Hydrazine Reduction (Approved at 40 CFR Part 136, Not approved at Part 141)	0.7mg/l (as N)	UKAS
DETSC 2203	**Hexavalent Chromium in Waters and Leachates by Colourimetric Analysis**	Hexavalent Chromium is determined colorimetrically using the Konelab 60i autoanalyser. Hexavalent chromium reacts with diphenylcarbizide in acid solution and produces a red-violet colour. The absorbance of this compound is measured spectrophotometrically at 540nm.	Standard Methods for the Examination of Water and Wastewater Part 3500-Cr – 21st Edition 2005 APHA, AWWA, WEF. USEPA 7196-A. Aquakem Method. Hexavalent Chromium	10µg/l	UKAS
DETSC 2204	**Hexavalent Chromium in Soil by Colourimetric Analysis**	Hexavalent Chromium is determined colourimetrically using the Konelab 60i or Smartchem 600 autoanalyser. Hexavalent chromium reacts with diphenylcarbazide in acid solution producing a red-violet colour. The absorbance of this compound is measured spectrophotometrically at 540nm	Aquakem Method. Hexavalent Chromium	1mg/kg	Not Accredited
DETSC 2205	**Reactive & Total Phosphorus in Waters and Leachates by Colourimetric Analysis**	Phosphate is determined colorimetrically using the Konelab 60i or Smartchem 600 autoanalyser. The orthophosphate ion reacts with ammonium molybdate and antimony potassium tartrate under acidic conditions to form a 12-molybdophosphoric acid complex. The complex is then reduced with ascorbic acid to form a blue heteropoly compound. The absorbance of this compound is measured spectrophotometrically at wavelength 880nm. The Konelab 60i analyses a series of manually prepared standards. An intermediate calibrator is diluted by the Smartchem 600 autoanalyser, to produce a series of standards. These standards are used to produce a calibration graph. Filtered samples are analysed and the phosphate content determined by comparison of the sample absorbance with the calibration graph. Samples for total phosphate analysis are digested by boiling with sulphuric acid and ammonium peroxodisulphate, then analysed as above.	Standard Methods for the Examination of Water and Wastewater Part 4500-P E– 21st Edition 2005 APHA, AWWA, WEF. Aquakem Method. Phosphate in Waters Issue 2	0.01mg/l	**Reactive Phosphorus:** UKAS **Total Phosphorus:** Not Accredited
DETSC 2207	**Ammonia in Waters and Leachates by Colourimetric Analysis**	NOTE THAT AMMONIA ANALYSIS IS PERFORMED IN TWO STAGES USING A HIGH-RANGE METHOD AND A LOW-RANGE METHOD. ALL SAMPLES ARE ANALYSED BY THE HIGH-LEVEL AMMONIA METHOD FIRST. SAMPLES THAT GIVE AN AMMONIA RESULT BELOW 2.5mg/l WILL AUTOMATICALLY BE ANALYSED BY THE INSTRUMENT USING THE LOW-LEVEL AMMONIA METHOD. Ammonia reacts with hypochlorite ions generated by the alkaline hydrolysis of sodium dichloroisocyanurate to form monochloramine. Monochloramine reacts with salicylate ions in the presence of sodium nitroprusside at around pH 12.6 to form a blue compound. The absorbance of this compound is measured spectrophotometrically at wavelength 660nm and is related to the ammonia concentration by means of a calibration curve. The Konelab 60i analyses a series of manually prepared standards for low-range ammonia analysis and prepares a series of calibration standards from a single stock solution for high-range analysis. The Smartchem 600 single stock solutions to prepare standards for both analysis ranges. These standards are used to produce a calibration graph. The ammonia content in the analysed samples is determined by comparison of the sample absorbance with the calibration graph.	Methods for the Examination of Waters and Associated Materials Ammonia in Waters 1981 ISBN 0117516139. Aquakem Method. Ammonia in Waters Issue 2	0.015mg/l	UKAS
DETSC 2208	**Sulphide in Waters and Leachates by Colourimetric Analysis**	Sulphide is determined colorimetrically using the Konelab60i autoanalyser. Potassium Dichromate converts N-N-Diethyl-p-phenylenediamine to the free radical which reacts rapidly with sulphide to produce the coloured 'DPD Blue' or 'Ethylene Blue'. The absorbance can then be measured at wavelength 660nm.	The determination of sulphide in waters and associated materials (2007) - SCA - Draft (March 2007). Aquakem Method. Sulphide SP001 Issue 2. Standard Methods for the Examination of Water and Wastewater, 21st Edition 2005, Part 4500. ISBN0-87553-223-3	10µg/l	UKAS

DETSC 2210	**Ferrous Iron in Waters and Leachates by Colourimetric Analysis**	Three molecules of phenanthroline chelate with each atom of ferrous iron to form an orange/red complex. The intensity of the coloured solution is stable between pH3 to pH9. Rapid colour development occurs between pH2.9 and pH3.5 in the presence of excess phenanthroline. The resulting colour absorbance is measured at 510nm	Aquakem Method Ferrous Iron FIR001 Issue 2	0.1mg/l	Not Accredited
DETSC 2211	**Silicate in Waters and Leachates by Colourimetric Analysis**	Reactive forms of silicon in acid solution, below pH2, react with ammonium molybdate ions to form a yellow silicomolybdate. Ascorbic acid reduces the yellow silicomolybdate to produce a blue silicomolybdate complex. Oxalic acid is added to destroy any molybdophosphoric acid formed.	ASTM D7126 - 10 Standard Test Method for On-Line Colorimetric Measurement of Silica. Aquakem Method Silica SIL Issue 2	0.25mg/l	Not Accredited
DETSC 2212	**Chloride Content of Waters and Leachates by Colourimetric Analysis**	Chloride reacts with mercury (II) thiocyanate to form a soluble non-ionic compound. The thiocyanate ions released react in acid solution with iron (III) nitrate to form a red/brown iron (III) thiocyanate complex. The resulting intensity of the stable colour produced is measured spectrophotometrically at a wavelength of 480nm and is related to the chloride concentration by means of a calibration curve.	EPA Method 325.1 Chloride Colorimetric, Automated Ferricyanide, Automated Analyzer I	10mg/l	Not Accredited
DETSC 2301	**Metals in Soil by ICP-OES** As, Ba, Be, Cd, Cr, Co, Cu, Fe, Mn, Mo, Ni, Pb, Se, V, Zn	Metals in soils and associated materials are extracted by boiling in a mixture of hydrochloric and nitric acids. The metal concentrations in the sample extract are determined by inductively coupled plasma optical emission spectroscopy (ICP-OES).	Standard Methods for the Examination of Water and Wastewater Part 3120 B – 21st Edition 2005, AWWA, WEF	**mg/kg:** As, Be Cu =0.2, Ba=1.5, Cd=0.1, Cr=0.15, Co=0.7, Mn=20, Mo=0.4, Pb=0.3, Fe=12, Se=0.5, V=0.8, Ni, Zn=1.0	UKAS (all listed) MCERTS (All soils listed except Fe)
DETSC 2303	**Total Hardness (By Calculation)**	The concentrations of calcium and magnesium are determined by following the procedures given in DETSC 2306 - Metals in Waters By ICP-MS. The hardness is calculated from the results obtained.	Standard Methods for the Examination of Water and Wastewater Part 3120 B – 21st Edition 2005 APHA, AWWA, WEF	n/a	UKAS
DETSC 2304	**Zinc Equivalent in Soil (By Calculation)**	The concentrations of copper, nickel and zinc concentrations are determined using the appropriate methodologies. The zinc equivalent is a measure of the combined toxicity of the three metals, relative to the toxicity of zinc.	In-house Method	n/a	Not Accredited
DETSC 2306	**Metals in Waters by ICP-MS** Ag, Al, As, Ba, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Sn, V, Zn	Concentrations of metals in water are determined by Inductively Coupled Plasma Mass Spectroscopy (ICP-MS). Any metals not listed can be determined but are not accredited under UKAS.	Standard Methods for the Examination of Water and Wastewater Part 3125 B – 21st Edition 2005 APHA, AWWA, WEF	**High Level µg/l:** Ag=0.13, Al=10.0, As=0.16, Ba=0.26, Ca=90, Cd=0.03, Co=0.16, Cr=0.25, Cu=0.40, Fe=5.50, Hg=0.01, K=80, Mg=20, Mn=0.22, Mo=1.1, Na=70, Ni=0.50, P=18.0, Pb=0.09, Sb=0.17, Se=0.25, Sn=0.40, V=0.60, Zn=1.3 **Low Level µg/l** Al=10.0, Cd=0.02, Cr=0.25, Cu=0.21, Fe=6.50, Ni=0.31, P=3.0, Pb=0.09, Zn=0.50	**High Level Dissolved:** UKAS (all listed except Mo, Sn) **High Level Total:** Not Accredited **Low Level Dissolved:** UKAS (Al, Cd, Cr, Cu, Fe, Ni, Pb, Zn) **Low Level Total:** UKAS (Al, Cd, Cr, Cu, Fe, Ni, P, Pb, Zn)
DETSC 2307	**Boron, Sulphur and Tin Content of Waters and Leachates by ICP-OES**	Filtered water and leachate samples are analysed for boron, sulphur and tin content by ICP-OES. The wavelengths used for the determination are 249.772nm for boron, 181.972nm for sulphur and 189.925nm for tin.	Standard Methods for the Examination of Water and Wastewater Part 3125 B – 21st Edition 2005 APHA, AWWA, WEFT	Boron: 5µg/l Tin: 17µg/l Sulphur: 0.65mg/l	Not Accredited
DETSC 2308	**Copper, Nickel and Zinc Content of Topsoil**	Dried and crushed soil samples are digested on a temperature controlled hotblock with hydrogen peroxide and nitric acid. The digested sample is then filtered and made up to a set volume before analysis for copper, nickel and zinc by ICP-OES.	BS 3882 – Specification for Topsoil	Copper: 0.40mg/kg Nickel: 0.65mg/kg Zinc: 0.65mg/kg	Not Accredited
DETSC 2309	**Extractable Magnesium and Potassium in Soil by ICP-OES**	Extractable metals in soil are extracted by shaking the soil in 1M Ammonium Nitrate for 30 minutes. The concentration of each metal extracted is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES)	BS 3882:2015 - Specification for topsoil. The Analysis of Agricultural Materials – MAFF/ADAS Reference Book 427	n/a	Not Accredited
DETSC 2310	**Extractable Phosphorus in Soil by ICP-MS**	Extractable phosphorus in soil is extracted by shaking the soil in 0.5M Sodium Hydrogen Carbonate for 30 minutes. The concentration of phosphorus extracted is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES).	BS 3882:2015 - Specification for topsoil. The Analysis of Agricultural Materials – MAFF/ADAS Reference Book 427	n/a	Not Accredited

DETSC 2311	**Water Soluble Boron in Soil by ICP-OES**	The sample is mixed with boiling water and then heated on a hotblock for 20 minutes. The sample is then filtered to remove the solid materials and then analysed for boron by ICP-OES at a wavelength of 249.772nm.	The analysis of Agricultural materials MAFF/ADAS – reference book 427 HMSO	0.20mg/kg	Not Accredited
DETSC 2312	**Metals in Oils by ICP-OES**	The sample is first oxidised using potassium permanganate and sulphuric acid. The oxidised sample is then digested in aqua regia on a hotplate, followed by analysis of the extract by ICP-OES.	US EPA Method 3031 – Acid Digest of Oils for Metals Analysis	**mg/kg:** As, Be Cu =0.2, Ba=1.5, Cd=0.1, Cr=0.15, Co=0.7, Mn=20, Mo=0.4, Pb=0.3, Fe=12, Se=0.5, V=0.8, Ni, Zn=1.0	Not Accredited
DETSC 2320	**Total Sulphur in Soil and Aggregate by ICP-OES**	Sulphur compounds in soil are extracted using aqua regia and the insoluble residue is removed by filtration. The concentration of sulphur in the filtrate is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). Loss of sulphur as H2S is prevented by oxidation of the sulphur compounds to sulphate by the aqua regia. Aggregate analysis is not comparable to BS EN 1744.	TRL 447 Sulphate Specification for Structural Backfills 2005. BRE SD1 Concrete in Aggressive Ground 2005	0.01%	UKAS (Soils) Not Accredited (Aggregates)
DETSC 2321	**Total Sulphate Content of Soil and Aggregate by ICP-OES**	The sulphate in the soil is extracted in dilute hydrochloric acid and the insoluble residue is removed by filtration. The filtrate is made up to volume and the concentration of sulphate in the filtrate is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). Aggregate analysis is not comparable to BS EN 1744.	BS1377 : Part 3: 1990 Method 5. BRE SD1 Concrete in Aggressive Ground 2005	0.01%	MCERTS(Soils) Not Accredited (Aggregates)
DETSC 2322	**Total Potential Sulfate and Total Oxidisable Sulphur (By Calculation)**	Sulphur compounds in soil are extracted using aqua regia and the insoluble residue is removed by filtration. The concentration of sulphur in the filtrate is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). Loss of sulphur as H2S is prevented by oxidation of the sulphur compounds to sulphate by the aqua regia. The wavelength used for identification and quantification of sulphate is 181.972nm. The sulphate in the soil is extracted in dilute hydrochloric acid and the insoluble residue is removed by filtration. The filtrate is made up to volume and the concentration of sulphate in the filtrate is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). The wavelength used for identification and quantification of sulphate is 181.972nm. The two results obtained from the above tests may then be combined to calculate the Total Potential Sulphate and Total Oxidisable Sulphur content	BS1377 : Part 3: 1990 Method 5. BS1377 : Part 1 : 1990	0.01%	Not Accredited
DETSC 2324	**Mercury in Waters by Atomic Fluorescence Spectroscopy**	Waters and aqueous samples are preserved by fixing with concentrated nitric acid. Treatment with tin (II) chloride reduces mercury (II) to mercury (0) vapour which is detected using atomic fluorescence spectrometry. For low level analysis, samples are filtered for dissolved mercury, but left un-filtered for total mercury. Samples are then digested with hydrochloric acid and bromide solution before analysing as above.	Standard Methods for the Examination of Water and Wastewater Part 3112 B – 21st Edition 2005 APHA, AWWA, WEF. PSA Method – Millennium Merlin Method for Total Mercury in Drinking, Surface, Ground, Industrial and Domestic Wastewaters and Saline Waters. USEPA Method 1631 – Determination of Low Level Mercury in Water	0.05µg/l 1.00ng/l (low level)	UKAS (Low level ONLY)
DETSC 2325	**Mercury in Soil Atomic Fluorescence Spectroscopy**	The mercury is extracted from soil in aqua regia with gentle refluxing. The extract is filtered to remove particulates and diluted to volume. Treatment with tin (II) chloride reduces mercury (II) to mercury (0) vapour which is detected using atomic fluorescence spectrometry.	PSA Method – Millennium Merlin Method for Mercury in Sludge, Soils and Sediments	0.05 mg/kg	MCERTS(Soils)
DETSC 2332 (DRAFT)	**Inorganic and Methyl Mercury Speciation**	Soils are air-dried and crushed before being subjected to hotblock extraction. Waters and aqueous samples are filtered to remove particulates. An aliquot is treated with bromate-bromide and tin (II) chloride to generate mercury and the mercury is determined by atomic fluorescence spectroscopy.	In-house Method	**Soil:** 100µg/kg **Water:** 1µg/l	Not Accredited
DETSC 2333	**Elemental Mercury Speciation**	Soils, waters and aqueous samples are tested on an as-received bases. A known quantity of sample is extracted using argon and the released elemental mercury is trapped. The trapped mercury is released upon heating in a scarifier module and determined by atomic fluorescence spectroscopy.	In-house Method	**Soil:** 0.6µg/kg **Water:** 1µg/l	Not Accredited
DETSC 2400	**Unified Barge Bioaccessible Metals in Soils**	The Unified BARGE Method (UBM) is a an in vitro method for simulating the human digestive system. Synthetic digestive fluids are used to simulate the fluids present in the body. Both inorganic solutions (Containing inorganic salts such as KCl, NaCletc), and organic solutions (Containing organic compounds such as Urea, Glucose etc) are mixed with enzymes to produce 4 Synthetic digestive fluids saliva (S), Gastric fluid (G), duodenal fluid (D) and bile (B). These solutions are then used to mimic the effect of a sample passing through a human gastro intestinal tract by shaking portions of the sample at 370C., human body temperature (17.4).	EPA 9200.2-86 April 2012- Standard Operating Procedure for an In Vitro Bioaccessibility Assay for Lead in Soil. BGS Chemical& Biological Hazards Programme Open Report OR/07/027 - Inter-laboratory Trial of a Unified Bioaccessibility Procedure	V = 1.0mg/kg, Cr = 5.0mg/kg, Co = 1.0mg/kg, Ni = 5.0mg/kg, As = 0.5mg/kg, Se = 0.5mg/kg, Cd = 0.5mg/kg, Pb = 1.0mg/kg	Not Accredited

DETSC 2501	**Leachate Preparation by Up-Flow Percolation**	The sample to be tested is compacted into a 5cm diameter column. A continuous vertical up-flow of water is then pumped through the sample and the resulting leachate is collected, changing the collection vessel every 24 hours. The leachates are then analysed using existing test methods for the components requested by the client.	Draft British Standard BS EN 14405 – Characterisation of Waste – Leaching Behaviour Test- Up- Flow Percolation Test	n/a	Not Accredited
DETSC 2502	**Particle Size Distribution of Topsoils**	Samples to be analysed are first air dried at 28±2°C. The dried sample is passed through sieves of 50, 20 and 2mm pore sizes. The portion of the sample passing the 2mm sieve is mixed with a dispersant solution to assist in breaking down any soil aggregates into the component sand/clay/silt particles. The sample is then wet-sieved through a 63µm sieve. The portion of sample passing this final sieve is allowed to settle out and separate into clay and silt fractions. From the weights of sample retained on each sieve and from the settled fractions, the proportions of cobbles, gravel, sand, silt and clay can be determined.	BS 7755 – Soil Quality; Section 5.4: Determination of particle size distribution in mineral soil material – Method by sieving and sedimentation BS 1377 – Soils for civil engineering purposes; Part 2: Classification tests Simplified Method for Soil Particle-Size determination to Accompany Soil-Quality Analyses – Kettler, Doran & Gilbert, American Journal of Soil Science May/June 2001	n/a	Not Accredited
DETSC 3001	**Solvent Extractable Matter in Soil**	Soil samples are extracted with a water-immiscible solvent and filtered to remove the water. The solvent is evaporated and the amount of extractable matter in the sample is determined gravimetrically.	In-house method based on:- Problems Arising from the Redevelopment of Gas Works and Similar Sites - AERE Harwell Laboratory 1981. Environmental Agency - The Determination of Material Extractable by Carbon Tetrachloride and of Certain Hydrocarbon Oil and Grease Components in sewage Sludge – 1978	40mg/kg	Not Accredited
DETSC 3002	**Oil & Grease/Solvent Extractable Matter in Waters**	A known volume of sample is acidified to pH<2 and extracted three times with an organic solvent, such as n-Hexane, in a separating funnel. The solvent is removed by evaporation and the amount of extractable matter in the sample is determined gravimetrically.	APHA 21st Edition, 2005 – Method 5520 B. Oil & Grease - Partition Gravimetric Method. USEPA Method 1664, Revision A: n-Hexane Extractable Material (HEM: Oil & Grease) and Silica Treated N-Hexane Extractable Material (SGT-HEM; Non Polar Material) by Extraction and Gravimetry.	1mg/l for 500ml sample	UKAS
DETSC 3049	**Elemental Sulphur in Soils and Waters by HPLC**	Soils are extracted in dichloromethane (DCM) by sonication. The elemental sulphur concentration is determined by high performance liquid chromatography (HPLC) with UV detection using a C_{18} (e.g. 250mm x 4.6mm) column and a mobile phase composed of 95% methanol and 5% water. Waters and aqueous extracts of soils are extracted using DCM in a separating funnel, filtered, and the concentration determined using HPLC.	National Grid Property Holdings Limited, Methods for the Collection and Analysis of Samples from National Grid Sites, Version 1, September 2006. Section 3.12 Soil Analysis: Elemental Sulphur.	**Soil:** 0.75mg/kg **Waters:** 90ug/l	**Soil:** MCERTS **Water:** UKAS
DETSC 3072	**Aliphatic / Aromatic TPH by GC-FID**	Aliphatic and aromatic petroleum hydrocarbons (C_{10}-C_{35}) are extracted from soil and water using n-Hexane. The fractions are separated by solid phase extraction using silica columns, whereby the aliphatic fraction is eluted first with n-Hexane and the aromatic portion is eluted second with dichloromethane. The total, aliphatic, and aromatic concentrations are determined by gas chromatography flame ionisation detection (GC-FID) using a capillary column and hydrogen as the carrier gas. The chromatographic data is further characterized by subdivision into approximate boiling point/carbon number ranges with respect to n-alkane retention time markers.	National Grid Property Holdings Limited, Methods for the Collection and Analysis of Samples from National Grid Sites, Version 1, September 2006. Section 3.12 Soil Analysis:Draft TNRCC Method 1006	**Soil mg/kg:** AL10-12 =1.5, AL12-16 =1.2, AL16-21 =1.5, AL21-35 =3.4, AR10-12 =0.9, AR12-16 =0.5, AR16-21 =0.6, AR21-35 =1.4 **Water:** 1ug/l	**Soil:** MCERTS(C10-C35 only) **Water:** Not Accredited
DETSC 3301	**PAH in Soil by GC-FID**	Soils and associated materials are extracted in dichloromethane (DCM) using sonication. The PAH concentration is recorded both as "Total PAH" and as "Speciated PAH", specified in terms of the 16 US EPA "Priority Pollutant" Polycyclic Aromatic Hydrocarbons. Concentrations are determined by gas chromatography using a BPX 50 (30m; 0.25µm ID; 0.25µm film) capillary column (or equivalent).	In-house method based on US EPA Method 8100, Polynuclear Aromatic Hydrocarbons	0.5 mg/kg each 1.6 mg/kg Total PAH	UKAS (16 PAH's only)
DETSC 3302	**Hexane / Acetone Extracted PAH in Soil by GC-FID**	Soils are extracted into hexane: acetone by shaking. The PAH concentration is recorded both as "Total PAH" and as "Speciated PAH", specified in terms of the 16 US EPA "Priority Pollutant" Polycyclic Aromatic Hydrocarbons. Concentrations are determined by gas chromatography using a BPX 50 (30m; 0.25µm ID; 0.25µm film) capillary column (or equivalent).	In-house method based on US EPA Method 8100, Polynuclear Aromatic Hydrocarbons	0.1 mg/kg each 1.6 mg/kg Total PAH	Not Accredited
DETSC 3303	**Polyaromatic Hydrocarbons in Soils by GC-MS**	The PAHs in the soil sample are extracted into hexane: acetone by shaking. The PAHs in the extract are separated by gas chromatography and identified by the mass selective detector. The concentration of each PAH is determined by referencing individual mass peak areas to the appropriate internal standard mass peak area. Quantification is carried out within the instrument software.	In-house method based on EPA Method 8270- US EPA Method 8270, Revision C, Semivolatile Organic Compounds by Gas Chromatography – Mass Spectrometry (GC/MS)	0.03 mg/kg each 0.10 mg/kg Total PAH	UKAS (All 16 PAH's) MCERTS (not Fluorene, Anthracene, Chrysene or Total)
DETSC 3304	**Polyaromatic Hydrocarbons in Waters by GC-MS**	The PAHs in the water sample are extracted into dichloromethane by shaking. The PAHs in the extract are separated by gas chromatography and identified by the mass selective detector. The concentration of each PAH is determined by referencing individual mass peak areas to the appropriate internal standard mass peak area. Quantification is carried out within the Instrument software.	In-house method based on EPA Method 8270- US EPA Method 8270, Revision 3, Semivolatile Organic Compounds by Gas Chromatography – Mass Spectrometry (GC/MS). In-house method based on EPA Method 3510C- EPA Method 3510C, Revision 3, Separatory Funnel Liquid-Liquid Extraction	10 ng/l each	UKAS (16 PAH's only)

DETSC 3311	**Extractable Petroleum Hydrocarbons (EPH) in Soil, Ballast and Water**	This method is designed to determine total concentrations of extractable petroleum hydrocarbons (EPH) in solid and aqueous matrices. This method uses a dichloromethane (DCM) extraction followed by quantification using gas chromatography/flame ionisation detection (GC-FID) analysis using a 1:1 mixture of diesel and mineral oil as calibration standards and n-alkane markers to establish the boiling point ranges. This method is used for the quantitative analysis of "Total EPH" (C10-C40) and as "Speciated EPH", specified in terms of the "diesel range" (C10-C24), and "mineral oil range" (C24-C40).	USEPA Method 3550C – Ultrasonic Extraction. USEPA Method 8015B – Non-Halogenated Organics Using GC/FID	**Soil:** 10 mg/kg **Ballast:** 10mg/kg **Water:**10µg/l	**Soil:** MCERTS **Water:** UKAS
DETSC 3312	**Hexane Extractable Petroleum Hydrocarbons (HPH)**	This method is designed to determine total concentrations of extractable petroleum hydrocarbons (EPH) in solid matrices. This method uses a hexane: acetone (9.4) extraction followed by quantification using gas chromatography/flame ionisation detection (GC-FID) analysis using a 1:1 mixture of diesel and mineral oil as calibration standards and n-alkane markers to establish the boiling point ranges. This method is used for the quantitative analysis of "Total EPH" (C10-C40) and as "Speciated EPH", specified in terms of the "diesel range" (C10- C24) and "mineral oil range" (C24-C40).	USEPA Method 8015B – Non-Halogenated Organics Using GC/FID	**Soil:** 5 mg/kg	Not Accredited
DETSC 3321	**BTEX, MTBE & PRO in Soils by Headspace GC-FID**	BTEX, MTBE and PRO in soils are determined via Headspace GC-FID. Individual aromatic compounds are quantified by external calibration against known standards. PRO range is banded using alkane markers to define retention time windows.	EPA Methods 5021 and 8015D	0.01 mg/kg	MCERTS(Soils) Not accredited for PRO range (C5-10)
DETSC 3322	**BTEX, MTBE & PRO in Waters & Leachates by Headspace GC-FID**	BTEX, MTBE and PRO in soils are determined via Headspace GC-FID. Individual aromatic compounds are quantified by external calibration against known standards. PRO range is banded using alkane markers to define retention time windows.	EPA Methods 5021 and 8015D	1 µg/l	UKAS
DETSC 3401	**PCBs in Soils by GC-MS**	An as-received soil sample is extracted in Hexane:Acetone (1:2) using sonication methodology. The sample is separated by gas chromatography and identified by mass selective detector. Quantification is carried out within the instrument software.	EPA Method 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography.	**µg/kg** PCB 28=1.25 PCB 52=1.12 PCB 101=1.32 PCB 118=1.43 PCB 153=2.08 PCB 138=1.35 PCB 180=1.42	MCERTS(Soils)
DETSC 3402	**Polychlorinated Biphenols in Waters by GC/MS**	The water sample is extracted in DCM on a reciprocal shaker. The sample is separated by gas chromatography and identified by mass selective detector. Quantification is carried out within the GC-MS software using an internal standard.	EPA Method 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography.	**ng/l** PCB 28=208, PCB 52=161, PCB 101=211, PCB 118+123=513, PCB 153=163, PCB 138=107, PCB 180=132, PCB 105=133, PCB 114=253, PCB 126=399, PCB 156=253, PCB 157=119, PCB 167=248, PCB 169=181, PCB 189=271, PCB 77=202, PCB 81=186.	UKAS
DETSC 3421	**Organotin Compounds in Soils and Waters by GCMS**	Organotin compounds are extracted from soil and liquid samples by shaking with hexane. The extract is derivatised with tetraethyl borate before being analysed by GC MS with selected ion monitoring (SIM).	TBC	**Soil: 0.2**mg/kg **Water:** 1µg/l	Not Accredited
DETSC 3431	**Volatile Organic Compounds in Soils by Headspace GC-MS**	The method covers the range of volatile organic compounds with boiling points up to 220°C. Soil samples in salty water are heated and agitated in a crimp cap vial. This drives the volatile components in to the headspace. An aliquot of the headspace is taken and injected in to a gas chromatograph with mass selective detection (GC-MS).The detector operates in full scan mode and is calibrated with standards containing known concentrations of the compounds of interest.	USEPA Method 8260B, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), Revision 2, December 1996	0.01mg/kg except: Chloroethane - 0.019mg/Kg Styrene - 0.025mg/Kg	UKAS
DETSC 3432	**Volatile Organic Compounds in Waters by Headspace GC-MS**	The method covers the range of volatile organic compounds with boiling points up to 220°C. Water samples are heated and agitated in a crimp cap vial. This drives the volatile components in to the headspace. An aliquot of the headspace is taken and injected in to a gas chromatograph with mass selective detection (GC-MS).The detector operates in full scan mode and is calibrated with standards containing known concentrations of the compounds of interest.	USEPA Method 8260B Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), Revision 2, December 1996	1 ug/l except: DCM (27), 2,2-Dichloropropane (2), Bromochloromethane (4), Bromodichloromethane (4), m+p-Xylene (2), 1,3-Dichlorobenzene (2)	UKAS except: Trichlorofluoromethane, Methylene Chloride, 1,1,1-Trichloroethane,
DETSC 3433	**Semi-Volatile Organic Compounds in Soils by GCMS**	The SVOCs in the soil sample are extracted into DCM: Acetone by shaking. The SVOCs in the extract are separated by gas chromatography and identified by the mass selective detector. The concentration of each SVOC is determined by referencing individual mass peak areas to the appropriate internal standard mass peak area. Quantification is carried out within the instrument software.	In-house method based on EPA Method 8270- US EPA Method 8270, Revision 3, Semi volatile Organic Compounds by Gas Chromatography – Mass Spectrometry (GC/MS)	Individual SVOCs: 0.1 mg/kg	UKAS

DETSC 3434	**Semi-Volatile Organic Compounds and Pesticides in Waters by GCMS**	The SVOCs in the water sample are extracted into DCM using a liquid liquid extraction. The SVOCs in the extract are separated by gas chromatography and identified by the mass selective detector. The concentration of each SVOC is determined by referencing individual mass peak areas to the appropriate internal standard mass peak area. Quantification is carried out within the instrument software.	In-house method based on EPA Method 8270- US EPA Method 8270, Revision 3, Semi volatile Organic Compounds by Gas Chromatography – Mass Spectrometry (GC/MS)	Individual SVOCs: 1mg/l	Not Accredited
DETSC 3447	**Acid Herbicides in Soils by LCMSMS**	Acid herbicides in the sample are extracted with formic acid fortified acetonitrile by shaking. Samples are centrifuged, extracts diluted with mobile phase and directly injected into an LCMSMS. The sample is separated by LC and identified by MSMS detector. Quantification is carried out within the LCMSMS software using an internal standard.	EPA Method 536 EPA Method 615 EPA Method 8151A	35ug/kg	UKAS
DETSC 3448	**Acid Herbicides in Liquids by LCMSMS**	Samples are filtered and directly injected into an LCMSMS. The sample is separated by LC and identified by MSMS detector. Quantification is carried out within the LCMSMS software using an internal standard	EPA Method 536 EPA Method 615 EPA Method 8151A	20ng/l	UKAS
DETSC 3451	**Phenol and British Gas Phenols in Soils and Waters by GCMS**	The phenols in the water sample are extracted by solid phase extraction. Phenol is eluted from the SPE column with DCM evaporated to dryness under nitrogen and re-dissolved in DCM. Soils and associated materials are extracted in dichloromethane: acetone using sonication.	TBC	Phenol Liquids0.1ug/l Phenol Soils0.01mg/kg British Gas Phenol Liquids0.1ug/l British Gas Phenol Soils0.5mg/kg	Not Accredited
DETSC 3501	**Target Based Screening of Water Samples by GCMS**	This method uses a target MS library that contains over 1000 compounds, including both volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) allowing rapid identification and reporting of organic pollutants in an extracted water sample. This is a semi-quant method. Some of the VVOCs elute either before, or underneath, the DCM solvent peak so can therefore not be identified.	Agilent note 5991-4127EN	0.1ug/l	Not Accredited
DETSC 3511	**Whole Oil Interpretation**	This method is designed to give an interpretation of the type of oil or the type of contamination of oil in solid and aqueous matrices. Neat oil samples, oil samples diluted in dichloromethane (DCM), DCM extract from soil samples, supernatant oil from liquid samples can be tested with method. A product or a solvent extract is directly injected onto a gas chromatograph and is analysed by temperature programmed capillary chromatography and flame ionisation detection (FID). The chromatogram obtained serves as a "fingerprint" of the sample components and allows the determination of the bulk characteristic of the sample. A sample of crude oil and a window definer standard are analysed daily to check the retention times of the n-alkanes and compare to those within the sample. The pattern produced in the sample chromatogram is best matched to a series of 'in-house' reference materials which have been analysed previously under the same GC-FID conditions.	TBC	n/a	Not Accredited
DETSC 5002	**Ash & LOI Content of Solid Biomass & Solid Recovered Fuels**	The ash and LOI content of the sample is determined gravimetrically. A known weight of the sample is placed in a prepared ash crucible and placed in a furnace. The furnace is heated to 550ºC ±10ºC where the temperature is maintained. Following combustion the crucible and sample are removed, cooled and reweighed.	BS EN 14775:2009. BS EN 15403:2011	0.10%	UKAS
DETSC 5003	**Volatile Matter Content of Solid Biomass, Solid Recovered Fuels and Coal**	A known weight of the sample produced for volatile matter determination is placed in a suitable crucible fitted with a lid. The crucible and sample is weighed and heated in a furnace with a limited air through put at a temperature of 900ºC ±10ºC for 7 minutes. The sample and crucible are re-weighed and the volatile matter content determined by difference.	BSEN15148:2009 – Solid Biofuels Determination of the Content of Volatile Matter. BS EN 15402:2011 - Solid Recovered Fuels - Determination of the Content of Volatile Matter	0.10%	UKAS (except Coal)
DETSC 5004	**Total Moisture / Dry Solids Content of Solid Biomass & Solid Recovered Fuels & Coal**	The sample produced for general analysis is placed into a suitable prepared and weighed tray and reweighed. The sample is dried at 105ºC to constant weight and the total moisture / dry solids content is calculated from the reduction in weight.	BSEN 14774 Parts 1 & 2 2009. DD CEN/TS 15414 Parts 1 & 2: 2010	0.10%	UKAS (except Coal)
DETSC 5005	**Analysis Moisture Content of Solid Biomass, Solid Recovered Fuels & Coal**	The sample produced for total moisture determination in accordance with DETSC 5009 or DETSC 5010 is placed in a suitable pre-weighed tray and reweighed. The sample is then dried at 105°C ±2°C to constant weight and then weighed again. The analysis moisture content is calculated from the reduction in weight.	BS EN 14774-3 2009. BS EN 15414-3 2011. BS 1016-104.1 -1999. ISO 11722 – 1999	n/a	UKAS (except Coal)

DETSC 5007	**Calorific Value of Solid Biomass, Solid Recovered Fuels & Coal**	Calorific value of a material is determined in an Isoperbol calorimeter by burning it in pure oxygen in a combustion bomb. A known amount of sample is placed in a combustion bomb which is then pressurised to 30bar with oxygen. A calorimeter bucket is filled with a known amount of deionised water which is placed in the calorimeter and the bomb placed in the bucket. The system is allowed to equilibrate and the bomb fired by electrical connection. The difference in temperature of the water in the calorimeter bucket caused by the ignition of the material in the bomb is measured and the calorific value calculated	BS EN 14918: Solid biofuels – Determination of calorific value. BS EN 15400: Solid recovered fuels - Determination of calorific value	1MJ/kg	UKAS (except Coal)
DETSC 5008	**Calorific Value of Soil**	A known amount of sample material is burnt in a combustion bomb that is immersed in water in a calorimeter and the difference in the water temperature before and after ignition measured. The calorific value of the sample material is calculated making any necessary corrections for heat generation not associated with the combusting sample. A gelatine capsule will be required to assist combustion which is also corrected for in the final calculations.	BS 1016-105 1992. ISO 19208. ASTM 5865	1MJ/kg	UKAS
DETSC 5009	**Sample Preparation of Solid Biomass & Solid Recovered Fuels**	If analysis is required on the original material (i.e. Bulk Density) a sub-sample will be taken after initial mixing after which the sample is then reduced by cutting/chopping oversized pieces of material. The material is then mixed and subdivided by manual means during which process representative samples are taken for analysis i.e. total moisture. The remainder of the sample is dried and then reduced to <1mm and again mixed and subdivided to produce the sample for laboratory analysis.	BS EN 14780:2011. BS EN 15413:2011	n/a	Not Accredited
DETSC 5011	**Calculation of Fixed Carbon Content of Coal, SRF and Solid Biomass Fuels**	The total moisture, analysis moisture, ash and volatile matter content are determined by approved methods. The values obtained are deducted from 100 and this gives the fixed carbon value of the fuel.	DD CENT/S 15296:2006. BS 1016.100:1994. BS ISO 17246:2005	0.10%	Not Accredited
DETSC 5012	**Determination of Biomass Content of SRF**	A portion of the sample is mixed with sulphuric acid and allowed to stand for at least 16 hours. Hydrogen peroxide is then added, and the sample is left for an additional 5 hours. At the end of this period the unreacted acid and peroxide are diluted down with deionised water. The residue is filtered off using a glass fibre filter and washed with deionised water to remove any remaining acid or peroxide. The filter and residue are placed in a pre-weighed crucible and dried at 1050C. The filter is re-weighed after drying and the non-biomass residue determined. A correction for carbonate content is made by determining the ash content of the original sample. By performing a calorific value on the solid captured on the filter paper, the result can also be expressed as a percentage.	BS EN 15440 Solid recovered fuels - Methods for the determination of biomass content	n/a	UKAS
DETSC 5013	**Determination Of Carbon, Hydrogen, Nitrogen & Oxygen In Solid Biomass, Solid Recovered Fuels & Coal**	A known mass of sample is introduced into a high temperature combustion reactor and burnt in a stream of pure oxygen. The sample is broken down into its elemental components N2, CO2, and H2O. High performance copper wires absorb the excess oxygen not used for sample combustion. The gases are separated and analysed by infra-red or thermal conductivity detectors, dependent on the instrument used. The oxygen content of the sample is determined by calculation from the results obtained for carbon, hydrogen and nitrogen.	BS EN 15104:2011 Solid biofuels - Determination of total content of carbon, hydrogen and nitrogen - Instrumental methods. BS EN 15407:2011 Solid recovered fuels - Methods for the determination of carbon (C), hydrogen (H) and nitrogen(N) content. BS EN 15296:2011 Solid biofuels - Conversion of analytical results from one basis to another	Carbon 0.10%, Nitrogen 0.30%, Hydrogen 0.30%, Oxygen 3.55%	UKAS (except Coal)
DETSC 5014	**Metals in Coal, SRF and Biomass by ICP**	Metals in coal, solid recovered fuel (SRF) and biomass samples are extracted by microwave using Hydrogen Peroxide (to oxidise and break down organic matter) and Aqua Regia (to dissolve the matrix and hold the metals in solution). Their concentrations are determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES).	BS EN 15410 - Solid recovered fuels - Methods for the determination of the content of major elements (Al, Ca, Fe, K, Mg, Na, P, Si, Ti). BS EN 15411 - Solid recovered fuels - Methods for the determination of the content of trace elements (As, Ba, Be, Cd, Co, Cr, Cu, Hg, Mo, Mn, Ni, Pb, Sb, Se, Tl, V and Zn). BS EN 15290 - Solid biofuels - Determination of major elements - Al, Ca, Fe, Mg, P, K, Si, Na and Ti. BS EN 15297 - Solid biofuels - Determination of minor elements - As, Cd, Co, Cr, Cu, Hg, Mn, Mo, Ni, Pb, Sb, V and Zn	**0.1 mg/kg:** As, Be, Cd, Co, Mn, Ni, P, Pb, Sb, Se, Sn, Ti, V, Zn **0.2mg/kg:** Cr, Cu, Tl **0.5mg/kg:** Mo **1mg/kg:** Al, Fe, K, Mg **5mg/kg:** Ca **10mg/kg:** Ag, Ba, Rh, Sr, Te	UKAS (except Coal): Al, As (SRF only), Ca, Cd, Co, Cr, Cu, K, Mg, Mn, Na (SRF only), Ni, P, Pb, Se, Sn, Tl, V, Zn All other metals not accredited
DETSC 5015	**Mercury in Coal, SRF and Biomass by Atomic Fluorescence Spectroscopy**	The mercury is extracted from coal, SRF and biomass in aqua regia with gentle refluxing. The extract is filtered to remove particulates and diluted to volume. Treatment of the resulting solution with tin (II) chloride reduces mercury (II) to mercury (0) vapour which is then quantitatively detected using atomic fluorescence spectrometry.	PSA Method – Millennium Merlin Method for Mercury in Sludge, Soils and Sediments.	0.055mg/kg	UKAS (except Coal)
DETSC 5016	**Total Sulphur Content Of Coal, SRF And Biomass**	Sulphur compounds in SRF and biomass are extracted using aqua regia / hydrogen peroxide and the insoluble residue is removed by filtration. The concentration of sulphur in the filtrate is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). Loss of sulphur as H2S is prevented by oxidation of the sulphur compounds to sulphate by the aqua regia. The use of hydrogen peroxide enhances the oxidation properties of nitric acid especially in the digestion of organics. Sulphur compounds in coal are determined by ICP-OES from the aqueous washings of the combustion products after firing in a bomb calorimeter.	TRL Report TRL447 (Updated) - Sulphate specification for structural backfills 2005	0.001mg/kg	UKAS (Except Coal)

DETSC 5017	**Sulphur, Chlorine, Fluorine & Bromine Content of Solid Biomass, Solid Recovered Fuels and Coal by IC**	A known weight of fuel is burnt in a pressurised bomb in pure oxygen. After firing of the bomb, it is stood for a minimum of five minutes to allow the combustion products to settle then the oxygen is slowly released over a period of at least three minutes. The bomb is then taken apart and the bomb electrodes rinsed with deionised water into the inside of the bomb. These washings are then decanted into a 50ml volumetric flask. The inside of the bomb is rinsed with deionised water and the washings added to those in the volumetric flask. The contents of the volumetric flask are made up to volume with deionised water and stored for the analysis of sulphur, chloride, fluoride and bromide by ion chromatography.	Operating Instruction Manual No. 442M 6200 Parr Oxygen Bomb Calorimeter. Operating Instruction Manual No. 205M 1108 Oxygen Combustion Bomb. Operating Instruction Manual No. 454M 6510 Water Handling System	0.01% Chlorine, 0.01% Fluorine, 0.01% Bromine, 0.04% Sulphur (Coal only)	UKAS (Except Coal and Br)
DETSC 5018	**XRF Analysis of Coal, Biomass, SRF and Cement**	When X-rays are targeted at a material they will cause electrons to be ejected from the component atoms (Ionisation). The ejection of electrons will cause the electronic structure of the component atoms to become unstable resulting in electrons from the higher energy outer orbitals "falling" into the inner orbitals to compensate. This causes a release of energy in the form of a photon equal to the energy difference between the two orbitals involved. Thus the material emits radiation which has energy characteristics of the atoms present. In energy dispersive X-ray fluorescence the fluorescent X-rays emitted are directed to a detector from which the data is processed by a multichannel analyser, producing a digital spectrum which is processed to obtain analytical data. The instrument analytical parameters are set up for the matrix type. A sample cell is prepared by placing a piece of prolene film over the outer cell and then inserting the inner cell. This gives a complete cell with a clear prolene base. A portion of the sample is placed into the cell and then analysed.	Rigaku NEX CG EDXRF instruction manual	**Cement:** 0.01% BaO, Cr_2O_3, CuO, PbO, Rb_2O, SrO, ZnO 0.02% Cl, V_2O_5 0.05% TiO_2 0.1% Mn_2O_3, P_2O_5, SO_3 0.5% K_2O 1% Al_2O_3, CaO, CdO, Co_2O_3, Fe_2O_3, MgO, Na_2O, NiO, SiO_2, Y_2O_3 **Fuel:** 0.01% Co, Cr, Cu, I, Li, Mn, Ni, P, Pb, Sn, Ti, V, Zn 0.02% Al, Ba, S, Si 0.1% Mg 0.2% Ca 0.5% As, Cd, Hg, Mo, Na, Sb, Se, Th, Tl 1% Ag	Not Accredited
DETSC 5019	**Determination of Biodegradable Municipal Waste Content (Compositional Analysis)**	The method is based on handpicking the BMW fraction from the municipal waste sample, and then weighing the amount of BMW sorted and expressing this as a percentage on a wet weight basis of the weight of the whole municipal waste sample.	ENVIRONMENT AGENCY: Guidance on monitoring of MBT and other treatment processes for the landfill allowances schemes (LATS and LAS) for England and Wales	n/a	Not Accredited
DETSC 5020	**Determination of Bulk Density in Solid Biomass and Solid Recovered Fuels**	The test portion is filled into a standard container of a given size and shape and weighed afterwards. Bulk density is calculated from the net weight per standard volume and reported for the moisture content.	BS EN 15103:2009 Solid Biofuels- Determination of bulk density DD CEN/TS 15401:2010 Solid Recovered Fuels- Determination of bulk density	0.5kg/m^3	Not Accredited
DETSC 5021	**Auto Ignition Temperature**	A quantity of the sample is placed into a metal tray or crucible and placed into an oven or furnace. The temperature of the oven / furnace is increased in predefined increments and the temperature in which the sample ignites is noted.	None	25°C	Not Accredited
DETSC 5022	**LOI Content of Fines**	The sample is dried to constant weight and its particle size reduced to <2mm. The LOI content of the sample is then determined gravimetrically. A known weight of the prepared sample is placed in a crucible and placed in a furnace. The furnace is heated to set temperature and following combustion the crucible and sample are removed, cooled and reweighed.	The Landfill Tax (Qualifying Material) Order 2011	0.10%	Not Accredited
DETSC 5023	**Crude Fibre**	The sample after defatting is sequentially treated with boiling dilute sulphuric acid, and with boiling potassium hydroxide solution. The loss in mass resulting from incineration corresponds to the mass of crude fibre.	FAO - Quality Assurance for Animal Feed Analysis Laboratories – Part II Analysis Section	1%	Not Accredited
DETSC 5024	**Void Space**	Water is added to a known volume of biofilter media until it fills all the void spaces and percentage voids is calculated.	https://www.sdstate.edu/abe/faculty/upload/Determining-Pressure-Drop-through-Compost-No-014080.pdf	0.1%	Not Accredited
DETSC 5025	**Theoretical Biogas Potential**	The Baserga equation determines how much biogas a feedstock may theoretically produce based on nutrient content.	An Analysis of Available Mathematical Models for Anaerobic Digestion of Organic Substances for Production of Biogas. Mandy Gerber, Chair of Thermodynamics, Germany, International Gas Union Research Conference, 2008. Biogas: Calculation of Gas Yield of co-substrates	0.1% Total Methane 1m^3/tonne Yield	Not Accredited
DETSC 5026	**Determination of Particle Size Distribution**	A sample is subjected to sieving through horizontally oscillating sieves, sorting the particles in decreasing size classes either manually or by machine sieving. For particles less than 25mm, only machine sieving is used, for particles greater than 25mm, manual or machine sieving is applied.	BS EN 15415-1 – Solid recovered fuels - Determination of particle size distribution BS EN 15149-2 – Solid biofuels - Determination of particle size distribution	n/a	Not Accredited

DETSC 5027	**Flammability Potential Screening Analysis**	The method is split into three parts which can be ran independently of each other: • exposure to heat and flame • exposure to a spark source • exposure to heat and a spark source (flash point) Exposure to heat and flame: the as-received sample is exposed to heat and flame. Observations are used to report if the sample has a negative or positive flammability potential. Exposure to a spark source: the as-received sample is placed into a beaker with a watchglass placed on top. Sparks are introduced to the vapour space above the sample and observations made to report if the sample has a negative or positive flammability potential. Exposure to heat and a spark source (flash point): the as-received sample is placed into a beaker with a watchglass placed on top. Sparks are introduced to the vapour space above the sample and if the sample flashes, the temperature is reported. The analysis is repeated at 5°C intervals until the vapour flashes or the temperature of 100°C is reached.	ASTM D4982-12: Standard Test method for Flammability Potential Screening Analysis of Waste	n/a	Not Accredited
DETSC 5028	**Determination of Length and Diameter of Pellets**	The length and diameter of fuel pellets of a representative sample of fuel pellets are measured by using a calliper. The length of a pellet is always measured along the axis of the cylinder. The diameter is measured perpendicular to the axis.	BS EN 16127 – Solid biofuels - Determination of length and diameter of pellets	n/a	Not Accredited

Certificate of Analysis

Certificate Number	21-02530	*Issued:*	15-Feb-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference	21-02530
Client Reference	4291/4280
Order No	(not supplied)
Contract Title	SLEMS, Redcar
Description	4 Water samples.
Date Received	08-Feb-21
Date Started	08-Feb-21
Date Completed	15-Feb-21
Test Procedures	Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis
Water Samples

Our Ref 21-02530
Client Ref 4291/4280
Contract Title SLEMS, Redcar

				[redacted]
			Lab No	1798160
			.Sample ID	SLEMS-SW01
			Depth	
			Other ID	400
			Sample Type	EW
			Sampling Date	04/02/2021
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
Metals				
Antimony, Dissolved	DETSC 2306	0.17	ug/l	1.7
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	5.2
Barium, Dissolved	DETSC 2306	0.26	ug/l	30
Boron, Dissolved	DETSC 2306*	12	ug/l	220
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.12
Calcium, Dissolved	DETSC 2306	0.09	mg/l	120
Chromium, Total	DETSC 2306*	0.25	ug/l	58
Chromium, Hexavalent	DETSC 2203	7	ug/l	< 7.0
Copper, Dissolved	DETSC 2306	0.4	ug/l	2.0
Iron, Dissolved	DETSC 2306	5.5	ug/l	470
Lead, Dissolved	DETSC 2306	0.09	ug/l	3.0
Manganese, Dissolved	DETSC 2306	0.22	ug/l	98
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.02
Molybdenum, Dissolved	DETSC 2306	1.1	ug/l	10
Nickel, Dissolved	DETSC 2306	0.5	ug/l	2.6
Sodium, Dissolved	DETSC 2306	0.07	mg/l	52
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	13
Zinc, Dissolved	DETSC 2306	1.3	ug/l	26
Inorganics				
pH	DETSC 2008		pH	8.5
Cyanide, Total	DETSC 2130	40	ug/l	< 40
Cyanide, Free	DETSC 2130	20	ug/l	< 20
Thiocyanate	DETSC 2130	20	ug/l	< 20
Dissolved Organic Carbon	DETSC 2085	2	mg/l	3.4
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	0.15
Chloride	DETSC 2055	0.1	mg/l	75
Salinity (Calculated)	DETSC 2017*	0.01	%	0.6
Sulphate as SO4	DETSC 2076*	0.01	mg/l	310
Sulphur (free)	DETSC 3049	84	ug/l	< 84
Petroleum Hydrocarbons				
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 21-02530
Client Ref 4291/4280
Contract Title SLEMS, Redcar

[redacted]

			Lab No	1798160
			.Sample ID	SLEMS-SW01
			Depth	
			Other ID	400
			Sample Type	EW
			Sampling Date	04/02/2021
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	< 10
PAHs				
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	0.02
Acenaphthene	DETSC 3304	0.01	ug/l	0.42
Fluorene	DETSC 3304	0.01	ug/l	0.05
Phenanthrene	DETSC 3304	0.01	ug/l	0.02
Anthracene	DETSC 3304	0.01	ug/l	0.01
Fluoranthene	DETSC 3304	0.01	ug/l	0.08
Pyrene	DETSC 3304	0.01	ug/l	0.08
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	0.03
Chrysene	DETSC 3304	0.01	ug/l	0.03
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	0.04
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	0.03
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	0.03
PAH Total	DETSC 3304	0.2	ug/l	0.91
Phenols				
Phenol	DETSC 3451*	0.1	ug/l	< 0.10
4-Chloro-3-methylphenol	DETSC 3451*	0.1	ug/l	< 0.10
2,4-Dichlorophenol	DETSC 3451*	0.1	ug/l	< 0.10
2,4-Dimethylphenol	DETSC 3451*	0.1	ug/l	< 0.10
p-cresol	DETSC 3451*	0.1	ug/l	< 0.10
2,6-Dimethylphenol	DETSC 3451*	0.1	ug/l	< 0.10
2,6-Dichlorophenol	DETSC 3451*	0.1	ug/l	< 0.10
2,4,6-Trichlorophenol	DETSC 3451*	0.1	ug/l	< 0.10

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 21-02530
Client Ref 4291/4280
Contract Title SLEMS, Redcar

			Lab No	1798160
			.Sample ID	SLEMS-SW01
			Depth	
			Other ID	400
			Sample Type	EW
			Sampling Date	04/02/2021
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
VOCs				
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1
2,2-dichloropropane	DETSC 3432	2	ug/l	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4
Chloroform	DETSC 3432	1	ug/l	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1
Benzene	DETSC 3432	1	ug/l	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1
Toluene	DETSC 3432	1	ug/l	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1
Styrene	DETSC 3432	1	ug/l	< 1
Bromoform	DETSC 3432	1	ug/l	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 21-02530
Client Ref 4291/4280
Contract Title SLEMS, Redcar

				[redacted]
			Lab No	1798160
			.Sample ID	SLEMS-SW01
			Depth	
			Other ID	400
			Sample Type	EW
			Sampling Date	04/02/2021
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
Bromobenzene	DETSC 3432	1	ug/l	< 1
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1
MTBE	DETSC 3432*	1	ug/l	< 1
SVOCs				
Aniline	DETSC 3434*	1	ug/l	< 1.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 1.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 1.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 1.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 1.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 1.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 1.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 1.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 1.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 1.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 1.0
Dibenzofuran	DETSC 3434*	1	ug/l	< 1.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 1.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 1.0

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 21-02530
Client Ref 4291/4280
Contract Title SLEMS, Redcar

			Lab No	1798160
			.Sample ID	SLEMS-SW01
			Depth	
			Other ID	400
			Sample Type	EW
			Sampling Date	04/02/2021
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
4-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0
Diphenylamine	DETSC 3434*	1	ug/l	< 1.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 1.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 1.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 1.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 1.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 1.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 1.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 1.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 1.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 1.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0
Azobenzene	DETSC 3434*	1	ug/l	< 1.0
Carbazole	DETSC 3434*	1	ug/l	< 1.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0

Key: * -not accredited. n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 21-02530
Client Ref 4291/4280
Contract SLEMS, Redcar

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1798157	SLEMS-SW03 WATER	04/02/21	GB 1L x2, GV, PB 1L, PU	pH/Cond/TDS (1 days)	
1798158	SLEMS-SW05 WATER	04/02/21	GB 1L x2, GV, PB 1L, PU	pH/Cond/TDS (1 days)	
1798159	SLEMS-SW02 WATER	04/02/21	GB 1L x2, GV, PB 1L, PU	pH/Cond/TDS (1 days)	
1798160	SLEMS-SW01 WATER	04/02/21	GB 1L x2, GV, PB 1L, PU	pH/Cond/TDS (1 days)	

Key: G-Glass P-Plastic B-Bottle V-Vial U-Tube

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Certificate of Analysis

Certificate Number	21-08112	*Issued:*	05-May-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference	21-08112
Client Reference	4280
Order No	(not supplied)
Contract Title	SLEMS, Former Redcar Steelworks
Description	6 Water samples.
Date Received	16-Apr-21
Date Started	19-Apr-21
Date Completed	05-May-21
Test Procedures	Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis

Water Samples

Our Ref 21-08112
Client Ref 4280
Contract Title SLEMS, Former Redcar Steelworks

Test	Method	LOD	Units	Lab No 1834080
				.Sample ID SLEMS_AUK_SW01
				Depth 0.00
				Other ID 200
				Sample Type EW
				Sampling Date 15/04/2021
				Sampling Time n/s
Metals				
Antimony, Dissolved	DETSC 2306	0.17	ug/l	1.0
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	3.5
Barium, Dissolved	DETSC 2306	0.26	ug/l	44
Boron, Dissolved	DETSC 2306*	12	ug/l	280
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.10
Calcium, Dissolved	DETSC 2306	0.09	mg/l	140
Chromium, Total	DETSC 2306*	0.25	ug/l	3.9
Chromium, Hexavalent	DETSC 2203	7	ug/l	< 7.0
Copper, Dissolved	DETSC 2306	0.4	ug/l	4.4
Iron, Dissolved	DETSC 2306	5.5	ug/l	97
Lead, Dissolved	DETSC 2306	0.09	ug/l	2.3
Manganese, Dissolved	DETSC 2306	0.22	ug/l	190
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.02
Molybdenum, Dissolved	DETSC 2306	1.1	ug/l	17
Nickel, Dissolved	DETSC 2306	0.5	ug/l	3.2
Sodium, Dissolved	DETSC 2306	0.07	mg/l	150
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	13
Zinc, Dissolved	DETSC 2306	1.3	ug/l	21
Inorganics				
pH	DETSC 2008		pH	8.3
Cyanide, Total	DETSC 2130	40	ug/l	75
Cyanide, Free	DETSC 2130	20	ug/l	65
Thiocyanate	DETSC 2130	20	ug/l	22
Dissolved Organic Carbon	DETSC 2085	2	mg/l	8.6
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	0.55
Chloride	DETSC 2055	0.1	mg/l	210
Salinity (Calculated)	DETSC 2017*	0.01	%	0.9
Sulphate as SO4	DETSC 2076*	0.01	mg/l	450
Sulphur (free)	DETSC 3049	84	ug/l	< 84

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis

Water Samples

Our Ref 21-08112
Client Ref 4280
Contract Title SLEMS, Former Redcar Steelworks

			Lab No	1834080
			.Sample ID	SLEMS_AUK_SW01
			Depth	0.00
			Other ID	200
			Sample Type	EW
			Sampling Date	15/04/2021
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
Petroleum Hydrocarbons				
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	5.4
Aliphatic C16-C21	DETSC 3072*	1	ug/l	24
Aliphatic C21-C35	DETSC 3072*	1	ug/l	91
Aliphatic C5-C35	DETSC 3072*	10	ug/l	120
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	120
PAHs				
Naphthalene	DETSC 3304	0.05	ug/l	0.30
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	0.05
Fluorene	DETSC 3304	0.01	ug/l	0.02
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	0.03
Pyrene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	0.44
Phenols				
Phenol	DETSC 3451*	0.1	ug/l	< 0.10
4-Chloro-3-methylphenol	DETSC 3451*	0.1	ug/l	< 0.10

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis

Water Samples

Our Ref 21-08112
Client Ref 4280
Contract Title SLEMS, Former Redcar Steelworks

				Lab No	1834080
				.Sample ID	SLEMS_AUK_SW01
				Depth	0.00
				Other ID	200
				Sample Type	EW
				Sampling Date	15/04/2021
				Sampling Time	n/s
Test	**Method**	**LOD**	**Units**		
2,4-Dichlorophenol	DETSC 3451*	0.1	ug/l	< 0.10	
2,4-Dimethylphenol	DETSC 3451*	0.1	ug/l	< 0.10	
p-cresol	DETSC 3451*	0.1	ug/l	< 0.10	
2,6-Dimethylphenol	DETSC 3451*	0.1	ug/l	< 0.10	
2,6-Dichlorophenol	DETSC 3451*	0.1	ug/l	< 0.10	
2,4,6-Trichlorophenol	DETSC 3451*	0.1	ug/l	< 0.10	

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis

Water Samples

Our Ref 21-08112
Client Ref 4280
Contract Title SLEMS, Former Redcar Steelworks

			Lab No	1834080
			.Sample ID	SLEMS_AUK_SW01
			Depth	0.00
			Other ID	200
			Sample Type	EW
			Sampling Date	15/04/2021
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
VOCs				
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1
2,2-dichloropropane	DETSC 3432	2	ug/l	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4
Chloroform	DETSC 3432	1	ug/l	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1
Benzene	DETSC 3432	1	ug/l	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1
Toluene	DETSC 3432	1	ug/l	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1
Styrene	DETSC 3432	1	ug/l	< 1
Bromoform	DETSC 3432	1	ug/l	< 1

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis

Water Samples

Our Ref 21-08112
Client Ref 4280
Contract Title SLEMS, Former Redcar Steelworks

			Lab No	1834080
			.Sample ID	SLEMS_AUK_SW01
			Depth	0.00
			Other ID	200
			Sample Type	EW
			Sampling Date	15/04/2021
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
Isopropylbenzene	DETSC 3432	1	ug/l	< 1
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1
MTBE	DETSC 3432*	1	ug/l	< 1
SVOCs				
Aniline	DETSC 3434*	1	ug/l	< 1.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 1.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 1.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 1.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 1.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 1.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 1.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 1.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 1.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 1.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 1.0
Dibenzofuran	DETSC 3434*	1	ug/l	< 1.0

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis

Water Samples

Our Ref 21-08112
Client Ref 4280
Contract Title SLEMS, Former Redcar Steelworks

			Lab No	1834080
			.Sample ID	SLEMS_AUK_SW01
			Depth	0.00
			Other ID	200
			Sample Type	EW
			Sampling Date	15/04/2021
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 1.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 1.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0
Diphenylamine	DETSC 3434*	1	ug/l	< 1.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 1.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 1.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 1.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 1.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 1.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 1.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 1.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 1.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 1.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0
Azobenzene	DETSC 3434*	1	ug/l	< 1.0
Carbazole	DETSC 3434*	1	ug/l	< 1.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0
VOC TICs				
Benzene, 1-bromo-2-fluoro- (TIC)	DETSC 3432*		ug/l	0.2735

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis

Water Samples

Our Ref 21-08112
Client Ref 4280
Contract Title SLEMS, Former Redcar Steelworks

Test	Method	LOD	Units	[redacted]
Lab No				
.Sample ID				
Depth				
Other ID				
Sample Type				
Sampling Date				
Sampling Time				
Metals				
Antimony, Dissolved	DETSC 2306	0.17	ug/l	
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	
Barium, Dissolved	DETSC 2306	0.26	ug/l	
Boron, Dissolved	DETSC 2306*	12	ug/l	
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	
Calcium, Dissolved	DETSC 2306	0.09	mg/l	
Chromium, Total	DETSC 2306*	0.25	ug/l	
Chromium, Hexavalent	DETSC 2203	7	ug/l	
Copper, Dissolved	DETSC 2306	0.4	ug/l	
Iron, Dissolved	DETSC 2306	5.5	ug/l	
Lead, Dissolved	DETSC 2306	0.09	ug/l	
Manganese, Dissolved	DETSC 2306	0.22	ug/l	
Mercury, Dissolved	DETSC 2306	0.01	ug/l	
Molybdenum, Dissolved	DETSC 2306	1.1	ug/l	
Nickel, Dissolved	DETSC 2306	0.5	ug/l	
Sodium, Dissolved	DETSC 2306	0.07	mg/l	
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	
Zinc, Dissolved	DETSC 2306	1.3	ug/l	
Inorganics				
pH	DETSC 2008		pH	
Cyanide, Total	DETSC 2130	40	ug/l	
Cyanide, Free	DETSC 2130	20	ug/l	
Thiocyanate	DETSC 2130	20	ug/l	
Dissolved Organic Carbon	DETSC 2085	2	mg/l	
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	
Chloride	DETSC 2055	0.1	mg/l	
Salinity (Calculated)	DETSC 2017*	0.01	%	
Sulphate as SO4	DETSC 2076*	0.01	mg/l	
Sulphur (free)	DETSC 3049	84	ug/l	

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis

Water Samples

Our Ref 21-08112
Client Ref 4280
Contract Title SLEMS, Former Redcar Steelworks

Test	Method	LOD	Units	Lab No	.Sample ID	Depth	Other ID	Sample Type	Sampling Date	Sampling Time
Petroleum Hydrocarbons										
Aliphatic C5-C6	DETSC 3322	0.1	ug/l							
Aliphatic C6-C8	DETSC 3322	0.1	ug/l							
Aliphatic C8-C10	DETSC 3322	0.1	ug/l							
Aliphatic C10-C12	DETSC 3072*	1	ug/l							
Aliphatic C12-C16	DETSC 3072*	1	ug/l							
Aliphatic C16-C21	DETSC 3072*	1	ug/l							
Aliphatic C21-C35	DETSC 3072*	1	ug/l							
Aliphatic C5-C35	DETSC 3072*	10	ug/l							
Aromatic C5-C7	DETSC 3322	0.1	ug/l							
Aromatic C7-C8	DETSC 3322	0.1	ug/l							
Aromatic C8-C10	DETSC 3322	0.1	ug/l							
Aromatic C10-C12	DETSC 3072*	1	ug/l							
Aromatic C12-C16	DETSC 3072*	1	ug/l							
Aromatic C16-C21	DETSC 3072*	1	ug/l							
Aromatic C21-C35	DETSC 3072*	1	ug/l							
Aromatic C5-C35	DETSC 3072*	10	ug/l							
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l							
PAHs										
Naphthalene	DETSC 3304	0.05	ug/l							
Acenaphthylene	DETSC 3304	0.01	ug/l							
Acenaphthene	DETSC 3304	0.01	ug/l							
Fluorene	DETSC 3304	0.01	ug/l							
Phenanthrene	DETSC 3304	0.01	ug/l							
Anthracene	DETSC 3304	0.01	ug/l							
Fluoranthene	DETSC 3304	0.01	ug/l							
Pyrene	DETSC 3304	0.01	ug/l							
Benzo(a)anthracene	DETSC 3304	0.01	ug/l							
Chrysene	DETSC 3304	0.01	ug/l							
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l							
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l							
Benzo(a)pyrene	DETSC 3304	0.01	ug/l							
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l							
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l							
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l							
PAH Total	DETSC 3304	0.2	ug/l							
Phenols										
Phenol	DETSC 3451*	0.1	ug/l							
4-Chloro-3-methylphenol	DETSC 3451*	0.1	ug/l							

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis

Water Samples

Our Ref 21-08112
Client Ref 4280
Contract Title SLEMS, Former Redcar Steelworks

	Test	Method	LOD	Units	[redacted]
Lab No					
.Sample ID					
Depth					
Other ID					
Sample Type					
Sampling Date					
Sampling Time					
	2,4-Dichlorophenol	DETSC 3451*	0.1	ug/l	
	2,4-Dimethylphenol	DETSC 3451*	0.1	ug/l	
	p-cresol	DETSC 3451*	0.1	ug/l	
	2,6-Dimethylphenol	DETSC 3451*	0.1	ug/l	
	2,6-Dichlorophenol	DETSC 3451*	0.1	ug/l	
	2,4,6-Trichlorophenol	DETSC 3451*	0.1	ug/l	

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis

Water Samples

Our Ref 21-08112
Client Ref 4280
Contract Title SLEMS, Former Redcar Steelworks

Test	Method	LOD	Units	[redacted]
Lab No				
.Sample ID				
Depth				
Other ID				
Sample Type				
Sampling Date				
Sampling Time				
VOCs				
Dichlorodifluoromethane	DETSC 3432	1	ug/l	
Chloromethane	DETSC 3432	1	ug/l	
Vinyl Chloride	DETSC 3432	1	ug/l	
Bromomethane	DETSC 3432	1	ug/l	
Chloroethane	DETSC 3432	1	ug/l	
Trichlorofluoromethane	DETSC 3432*	1	ug/l	
1,1-dichloroethylene	DETSC 3432	1	ug/l	
Methylene Chloride	DETSC 3432*	27	ug/l	
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	
1,1-dichloroethane	DETSC 3432	1	ug/l	
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	
2,2-dichloropropane	DETSC 3432	2	ug/l	
Bromochloromethane	DETSC 3432	4	ug/l	
Chloroform	DETSC 3432	1	ug/l	
1,1,1-trichloroethane	DETSC 3432	1	ug/l	
1,1-dichloropropene	DETSC 3432	1	ug/l	
Carbon tetrachloride	DETSC 3432	1	ug/l	
Benzene	DETSC 3432	1	ug/l	
1,2-dichloroethane	DETSC 3432	1	ug/l	
Trichloroethylene	DETSC 3432*	1	ug/l	
1,2-dichloropropane	DETSC 3432	1	ug/l	
Dibromomethane	DETSC 3432	1	ug/l	
Bromodichloromethane	DETSC 3432	4	ug/l	
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	
Toluene	DETSC 3432	1	ug/l	
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	
1,1,2-trichloroethane	DETSC 3432	1	ug/l	
Tetrachloroethylene	DETSC 3432	1	ug/l	
1,3-dichloropropane	DETSC 3432	1	ug/l	
Dibromochloromethane	DETSC 3432	1	ug/l	
1,2-dibromoethane	DETSC 3432	1	ug/l	
Chlorobenzene	DETSC 3432	1	ug/l	
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	
Ethylbenzene	DETSC 3432	1	ug/l	
m+p-Xylene	DETSC 3432	2	ug/l	
o-Xylene	DETSC 3432	1	ug/l	
Styrene	DETSC 3432	1	ug/l	
Bromoform	DETSC 3432	1	ug/l	

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis

Water Samples

Our Ref 21-08112
Client Ref 4280
Contract Title SLEMS, Former Redcar Steelworks

Test	Method	LOD	Units	[redacted]
Lab No				
.Sample ID				
Depth				
Other ID				
Sample Type				
Sampling Date				
Sampling Time				
Isopropylbenzene	DETSC 3432	1	ug/l	
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	
Bromobenzene	DETSC 3432	1	ug/l	
1,2,3-trichloropropane	DETSC 3432	1	ug/l	
n-propylbenzene	DETSC 3432	1	ug/l	
2-chlorotoluene	DETSC 3432	1	ug/l	
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	
4-chlorotoluene	DETSC 3432	1	ug/l	
Tert-butylbenzene	DETSC 3432	1	ug/l	
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	
sec-butylbenzene	DETSC 3432	1	ug/l	
p-isopropyltoluene	DETSC 3432	1	ug/l	
1,3-dichlorobenzene	DETSC 3432	2	ug/l	
1,4-dichlorobenzene	DETSC 3432	1	ug/l	
n-butylbenzene	DETSC 3432	1	ug/l	
1,2-dichlorobenzene	DETSC 3432	1	ug/l	
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	
Hexachlorobutadiene	DETSC 3432	1	ug/l	
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	
MTBE	DETSC 3432*	1	ug/l	
SVOCs				
Aniline	DETSC 3434*	1	ug/l	
2-Chlorophenol	DETSC 3434*	1	ug/l	
Benzyl Alcohol	DETSC 3434*	1	ug/l	
2-Methylphenol	DETSC 3434*	1	ug/l	
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	
3&4-Methylphenol	DETSC 3434*	1	ug/l	
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	
2-Methylnaphthalene	DETSC 3434*	1	ug/l	
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	
2-Chloronaphthalene	DETSC 3434*	1	ug/l	
2-Nitroaniline	DETSC 3434*	1	ug/l	
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	
3-Nitroaniline	DETSC 3434*	1	ug/l	
4-Nitrophenol	DETSC 3434*	1	ug/l	
Dibenzofuran	DETSC 3434*	1	ug/l	

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis

Water Samples

Our Ref 21-08112
Client Ref 4280
Contract Title SLEMS, Former Redcar Steelworks

				[redacted]
			Lab No	
			.Sample ID	
			Depth	
			Other ID	
			Sample Type	
			Sampling Date	
			Sampling Time	
Test	**Method**	**LOD**	**Units**	
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	
Diethylphthalate	DETSC 3434*	1	ug/l	
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	
4-Nitroaniline	DETSC 3434*	1	ug/l	
Diphenylamine	DETSC 3434*	1	ug/l	
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	
Hexachlorobenzene	DETSC 3434*	1	ug/l	
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	
Pentachlorophenol	DETSC 3434*	1	ug/l	
Di-n-butylphthalate	DETSC 3434*	1	ug/l	
Butylbenzylphthalate	DETSC 3434*	1	ug/l	
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	
Di-n-octylphthalate	DETSC 3434*	1	ug/l	
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	
Dimethylphthalate	DETSC 3434*	1	ug/l	
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	
Azobenzene	DETSC 3434*	1	ug/l	
Carbazole	DETSC 3434*	1	ug/l	
1-Methylnaphthalene	DETSC 3434*	1	ug/l	
VOC TICs				
Benzene, 1-bromo-2-fluoro- (TIC)	DETSC 3432*		ug/l	

Key: * -not accredited. n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 21-08112
Client Ref 4280
Contract SLEMS, Former Redcar Steelworks

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1834080	SLEMS_AUK_SW01 0.00 WATER	15/04/21	GB 1L x2, GV, PB 1L, P(other)		
1834081	SLEMS_AUK_SW02 0.00 WATER	15/04/21	GB 1L x2, GV, PB 1L, P(other)		
1834082	SLEMS_AUK_SW03 0.00 WATER	15/04/21	GB 1L x2, GV, PB 1L, P(other)		
1834083	SLEMS_AUK_SW04 0.00 WATER	15/04/21	GB 1L x2, GV, PB 1L, P(other)		
1834084	SLEMS_AUK_SW05 0.00 WATER	15/04/21	GB 1L x2, GV, PB 1L, P(other)		
1834085	SLEMS_AUK_SW06 0.00 WATER	15/04/21	GB 1L x2, GV, PB 1L, P(other)		

Key: G-Glass P-Plastic B-Bottle V-Vial

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Certificate of Analysis

Certificate Number	21-18738	*Issued:*	15-Sep-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference	21-18738
Client Reference	4280
Order No	(not supplied)
Contract Title	SLEMS, Former Redcar Steelworks
Description	6 Water samples.
Date Received	03-Sep-21
Date Started	03-Sep-21
Date Completed	15-Sep-21
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis

Water Samples

Our Ref 21-18738
Client Ref 4280
Contract Title SLEMS, Former Redcar Steelworks

			Lab No	1899263
			.Sample ID	SLEMS_AUK_SW01
			Depth	0.00
			Other ID	300
			Sample Type	EW
			Sampling Date	01/09/2021
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
Metals				
Antimony, Dissolved	DETSC 2306	0.17	ug/l	0.72
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	3.3
Barium, Dissolved	DETSC 2306	0.26	ug/l	23
Boron, Dissolved	DETSC 2306*	12	ug/l	250
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.07
Calcium, Dissolved	DETSC 2306	0.09	mg/l	140
Chromium, Total	DETSC 2306*	0.25	ug/l	0.58
Chromium, Hexavalent	DETSC 2203	7	ug/l	< 7.0
Copper, Dissolved	DETSC 2306	0.4	ug/l	1.3
Iron, Dissolved	DETSC 2306	5.5	ug/l	220
Lead, Dissolved	DETSC 2306	0.09	ug/l	2.4
Manganese, Dissolved	DETSC 2306	0.22	ug/l	35
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.01
Molybdenum, Dissolved	DETSC 2306	1.1	ug/l	15
Nickel, Dissolved	DETSC 2306	0.5	ug/l	2.3
Sodium, Dissolved	DETSC 2306	0.07	mg/l	150
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	4.0
Zinc, Dissolved	DETSC 2306	1.3	ug/l	11
Inorganics				
pH	DETSC 2008		pH	6.7
Cyanide, Total	DETSC 2130	40	ug/l	< 40
Cyanide, Free	DETSC 2130	20	ug/l	< 20
Thiocyanate	DETSC 2130	20	ug/l	< 20
Dissolved Organic Carbon	DETSC 2085	2	mg/l	4.6
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	0.76
Chloride	DETSC 2055	0.1	mg/l	210
Salinity (Calculated)	DETSC 2017*	0.01	%	0.9
Sulphate as SO4	DETSC 2076*	0.01	mg/l	450
Sulphur (free)	DETSC 3049	84	ug/l	< 84

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Summary of Chemical Analysis

Water Samples

Our Ref 21-18738
Client Ref 4280
Contract Title SLEMS, Former Redcar Steelworks

				Lab No	1899263
				.Sample ID	SLEMS_AUK_SW01
				Depth	0.00
				Other ID	300
				Sample Type	EW
				Sampling Date	01/09/2021
				Sampling Time	n/s
Test	**Method**	**LOD**	**Units**		
Petroleum Hydrocarbons					
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10	
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	< 10	

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Water Samples

Our Ref 21-18738
Client Ref 4280
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			Lab No	1899263	
			.Sample ID	SLEMS_AUK_SW01	
			Depth	0.00	
			Other ID	300	
			Sample Type	EW	
			Sampling Date	01/09/2021	
			Sampling Time	n/s	
Test	**Method**	**LOD**	**Units**		
PAHs					
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	
Anthracene	DETSC 3304	0.01	ug/l	0.01	
Fluoranthene	DETSC 3304	0.01	ug/l	0.03	
Pyrene	DETSC 3304	0.01	ug/l	0.04	
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	
Phenols					
Phenol	DETSC 3451*	0.1	ug/l	< 0.10	
4-Chloro-3-methylphenol	DETSC 3451*	0.1	ug/l	< 0.10	
2,4-Dichlorophenol	DETSC 3451*	0.1	ug/l	< 0.10	
2,4-Dimethylphenol	DETSC 3451*	0.1	ug/l	< 0.10	
p-cresol	DETSC 3451*	0.1	ug/l	< 0.10	
2,6-Dimethylphenol	DETSC 3451*	0.1	ug/l	< 0.10	
2,6-Dichlorophenol	DETSC 3451*	0.1	ug/l	< 0.10	
2,4,6-Trichlorophenol	DETSC 3451*	0.1	ug/l	< 0.10	

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Summary of Chemical Analysis

Water Samples

Our Ref 21-18738
Client Ref 4280
Contract Title SLEMS, Former Redcar Steelworks

			Lab No	1899263
			.Sample ID	SLEMS_AUK_SW01
			Depth	0.00
			Other ID	300
			Sample Type	EW
			Sampling Date	01/09/2021
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
VOCs				
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1
2,2-dichloropropane	DETSC 3432	2	ug/l	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4
Chloroform	DETSC 3432	1	ug/l	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1
Benzene	DETSC 3432	1	ug/l	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1
Toluene	DETSC 3432	1	ug/l	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1
Styrene	DETSC 3432	1	ug/l	< 1
Bromoform	DETSC 3432	1	ug/l	< 1

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