



Exova Jones Environmental

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4225

Attention :	Matt Askin
Date :	29th May, 2019
Your reference :	GG51920
Our reference :	Test Report 19/7034 Batch 1
Location :	Balcombe
Date samples received :	1st May, 2019
Status :	Final report
Issue :	2

Six samples were received for analysis on 1st May, 2019 of which six were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Phil Sommerton BSc

Senior Project Manager

Exova Jones Environmental

Client Name: Ground Gas Solutions
 Reference: GGS1920
 Location: Balcombe
 Contact: Matt Askin
 JE Job No.: 19/7034

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

J E Sample No.	1-6	7-12	13-18	19-24	25-32	33-40					Please see attached notes for all abbreviations and acronyms					
Sample ID	BALSW02	BALSW04	BALSW05	BALSW06	BALMW01 PRE PURGE	BALMW01 PORT PURGE										
Depth																
COC No / misc																
Containers	V H P G	V H H N P G	V H H N P G	V H H N P G	V H H N P B O D G	V H H N P B O D G										
Sample Date	30/04/2019	30/04/2019	30/04/2019	30/04/2019	30/04/2019	30/04/2019										
Sample Type	Surface Water	Surface Water	Surface Water	Surface Water	Ground Water	Ground Water										
Batch Number	1	1	1	1	1	1										
Date of Receipt	01/05/2019	01/05/2019	01/05/2019	01/05/2019	01/05/2019	01/05/2019										
												LOD/LOR	Units	Method No.		
Dissolved Aluminium #	<20	<20	<20	<20	<20	<20						<20	ug/l	TM30/PM14		
Dissolved Antimony #	<2	<2	<2	<2	<2	<2						<2	ug/l	TM30/PM14		
Dissolved Arsenic #	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5						<2.5	ug/l	TM30/PM14		
Dissolved Barium #	20	19	19	19	350	238						<3	ug/l	TM30/PM14		
Dissolved Beryllium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5						<0.5	ug/l	TM30/PM14		
Dissolved Boron	40	25	44	43	787	815						<12	ug/l	TM30/PM14		
Dissolved Cadmium #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5						<0.5	ug/l	TM30/PM14		
Dissolved Calcium #	39.5	43.4	34.7	37.4	1.4	1.1						<0.2	mg/l	TM30/PM14		
Total Dissolved Chromium #	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5						<1.5	ug/l	TM30/PM14		
Dissolved Cobalt #	<2	<2	<2	<2	<2	<2						<2	ug/l	TM30/PM14		
Dissolved Copper #	<7	<7	<7	<7	<7	<7						<7	ug/l	TM30/PM14		
Total Dissolved Iron #	97	59	131	88	<20	<20						<20	ug/l	TM30/PM14		
Dissolved Lead #	<5	<5	<5	<5	<5	<5						<5	ug/l	TM30/PM14		
Dissolved Lithium	-	-	-	-	<5	<5						<5	ug/l	TM30/PM14		
Dissolved Magnesium #	5.3	5.9	5.1	5.3	0.2	0.1						<0.1	mg/l	TM30/PM14		
Dissolved Manganese #	<2	140	78	52	7	5						<2	ug/l	TM30/PM14		
Dissolved Mercury #	<1	<1	<1	<1	<1	<1						<1	ug/l	TM30/PM14		
Dissolved Molybdenum #	<2	<2	<2	<2	<2	<2						<2	ug/l	TM30/PM14		
Dissolved Nickel #	<2	<2	<2	<2	<2	<2						<2	ug/l	TM30/PM14		
Dissolved Potassium #	2.7	3.1	2.6	2.5	0.6	0.7						<0.1	mg/l	TM30/PM14		
Dissolved Selenium #	<3	<3	<3	<3	<3	<3						<3	ug/l	TM30/PM14		
Dissolved Sodium #	18.4	15.7	18.6	19.0	187.7	188.4						<0.1	mg/l	TM30/PM14		
Dissolved Tin	-	-	-	-	<5	<5						<5	ug/l	TM30/PM14		
Dissolved Vanadium #	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5						<1.5	ug/l	TM30/PM14		
Dissolved Zinc #	<3	<3	<3	<3	<3	<3						<3	ug/l	TM30/PM14		

Client Name: Ground Gas Solutions
Reference: GGS1920
Location: Balcombe
Contact: Matt Askin
JE Job No.: 19/7034

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

J E Sample No.	1-6	7-12	13-18	19-24	25-32	33-40								
Sample ID	BALSW02	BALSW04	BALSW05	BALSW06	BALMW01 PRE PURGE	BALMW01 PORT PURGE								
Depth														
COC No / misc														
Containers	V H P G	V H H N P G	V H H N P G	V H H N P G	V H H N P B O D G	V H H N P B O D G								
Sample Date	30/04/2019	30/04/2019	30/04/2019	30/04/2019	30/04/2019	30/04/2019								
Sample Type	Surface Water	Surface Water	Surface Water	Surface Water	Ground Water	Ground Water								
Batch Number	1	1	1	1	1	1								
Date of Receipt	01/05/2019	01/05/2019	01/05/2019	01/05/2019	01/05/2019	01/05/2019								
TPH CWG														
Aromatics														
>C5-EC7 #	-	-	-	-	<10	<10						<10	ug/l	TM36/PM12
>EC7-EC8 #	-	-	-	-	<10	<10						<10	ug/l	TM36/PM12
>EC8-EC10 #	-	-	-	-	<10	<10						<10	ug/l	TM36/PM12
>EC10-EC12 #	-	-	-	-	<5	<5						<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	-	-	-	-	<10	<10						<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	-	-	-	-	<10	<10						<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	-	-	-	-	<10	<10						<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	-	-	-	-	<10	<10						<10	ug/l	TM5/PM16/PM30
Total aliphatics and aromatics(C5-35) #	-	-	-	-	<10	<10						<10	ug/l	TM5/PM16/PM30
Chloride #	26.6	28.6	25.6	26.3	-	-						<0.3	mg/l	TM38/PM0
Nitrate as NO3 #	-	-	-	-	2.0	3.1						<0.2	mg/l	TM38/PM0
Nitrite as NO2 #	-	-	-	-	<0.02	<0.02						<0.02	mg/l	TM38/PM0
Ammoniacal Nitrogen as N #	0.04	0.03	0.04	0.03	0.31	0.30						<0.03	mg/l	TM38/PM0
Dissolved Methane #	-	-	-	-	17566**	17495**						<1	ug/l	TM25/PM0
Dissolved Ethene #	-	-	-	-	<1	<1						<1	ug/l	TM25/PM0
Dissolved Ethane #	-	-	-	-	1563**	1697**						<1	ug/l	TM25/PM0
Dissolved Carbon Dioxide	-	-	-	-	23130	19669						<1	ug/l	TM25/PM0
Dissolved Butane	-	-	-	-	<2	<2						<2	ug/l	TM25/PM0
Total Alkalinity as CaCO3 #	130	118	116	128	-	-						<1	mg/l	TM75/PM0
BOD (Settled) #	-	-	-	-	6	3						<1	mg/l	TM58/PM0
COD (Settled) #	15	9	8	14	10	9						<7	mg/l	TM57/PM0
Electrical Conductivity @25C #	347	357	316	335	-	-						<2	uS/cm	TM76/PM0
pH #	7.22	7.81	7.05	7.56	8.83	8.88						<0.01	pH units	TM73/PM0
Salinity	-	-	-	-	<0.1	<0.1						<0.1	%	TM64/PM0
Total Dissolved Solids #	189	218	192	217	486	492						<35	mg/l	TM20/PM0
Total Suspended Solids #	61	71	<10	<10	<10	<10						<10	mg/l	TM37/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Gas Solutions
Reference: GGS1920
Location: Balcombe
Contact: Matt Askin

Matrix : Liquid

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
19/7034	1	BALMW01 PRE PURGE		25-32	BOD	Sample holding time exceeded

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 19/7034

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 19/7034

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM20	Modified BS 1377-3: 1990/USEPA 160.3 Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes			
TM25	Determinaion of Dissolved Methane, Ethane and Ethene by Headspace GC-FID	PM0	No preparation is required.				
TM25	Determinaion of Dissolved Methane, Ethane and Ethene by Headspace GC-FID	PM0	No preparation is required.	Yes			
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.				
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.	Yes			

JE Job No: 19/7034

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM31	Modified USEPA 8015B. Determination of Methylterbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM37	Modified methods USEPA 160.2, EN872:2005 and SMWW 2540D. Gravimetric determination of Total Suspended Solids. Sample is filtered through a 1.5um pore size glass fibre filter and the resulting residue is dried and weighed.	PM0	No preparation is required.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes			
TM57	Modified US EPA Method 410.4. Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometrically.	PM0	No preparation is required.	Yes			
TM58	APHA Standard methods for the examination of water and waste water (SMWW) 5210B. Comparable with ISO 5815:1989. Measurement of Biochemical Oxygen Demand. When cBOD (Carbonaceous BOD) is requested a nitrification inhibitor is added which prevents the oxidation of reduced forms of nitrogen, such as ammonia, nitrite and organic nitrogen which exert a nitrogenous demand. Determination of Dissolved Oxygen using the Hach HQ30D Oxygen Meter.	PM0	No preparation is required.	Yes			
TM64	Determination of the salinity of liquid samples using a salinity conductivity meter.	PM0	No preparation is required.				
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1. Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM76	Modified US EPA method 120.1. Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			