

CROMWELL WOOD ESTATE COMPANY LIMITED

Report on Bradshaw Quarry

Conceptual Model and Sampling Report

J.Carlon

[30/05 2011]

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Bradshaw Quarry – Site Investigation Details - January 2011.

Licence Holder - J.G.Pears Limited, Bella Vista Farm, Hartcliffe , Penistone

Introduction

Discussions have been held with the Environment Agency in November 2010 as to how the site known as Bradshaw Quarry at Fullshaw can be restored to a satisfactory standard since the waste management licence has been closed and the site requires capping with material and some drainage medium.

A site visit was undertaken on the 8th November 2010 to inspect the site and then to agree a monitoring scheme for the life of the site and assess the waste that has been deposited in the area that is now restored to the west of the unrestored site and is nearer to the residential dwellings.

It was agreed between Mr Haystead and Mr Wrathmell of the Environment Agency and John Carlon and Jeff Pears acting for the Licence Holder that the site would be assessed and monitored on a quarterly basis.

Mr Wrathmell confirmed in an email, dated the 12th November 2010 the requirements that needed to be addressed and his understanding of the water flows and the mine openings and sinks on site. He provided a conceptual model of the site based on his understanding of the geology and the site visit and asked for two boreholes to be drilled to assess the risk of landfill gas to the nearby dwellings.

J.G.Pears Limited commissioned the drilling to be undertaken on the two areas of restored land to the north and south of the access road and the sampling of the water on site from all boreholes and the five surface water bodies on site. The new boreholes were numbered 8 and 9. Due to the cold weather and snow from November to February the drilling team could not attend until the 25th January 2011.

Samples of water have been taken from each borehole on the 25th January 2011 and from the new boreholes in February 2011. On the same date the drilling took place the water was collected from the other monitoring points and the samples sent to I2 Analytical for analyses. Gas readings have also been undertaken on that date and compared with the previous readings taken from the boreholes.

It is proposed to continue monitoring on a quarterly basis for the next two years as the site is closed and the monitoring will progress the surrender of the licence whilst the site is being capped with clay, subsoil and topsoil.

It is proposed to import material to be used for capping the site after it has been screened to remove the coarse material which will be used for drainage mediums to control the surface water runoff and also to maintain the site roads to the various parts of the site and beyond to farmland owned by the licence holder to the east.

This report discusses the site investigation and sampling results from the first 9 samples taken on the 25th January 2011 and the previous samples taken in June 2006 and September 2010.

Site Location.

Bradshaw Quarry is situated on Fullshaw Lane west of the Flouch Inn on the Manchester Road and to the north of Langsett Dam. The NGR is SE21250118. The access road is to the east of the lane through a double steel gate. The site falls gently from the road to the eastern boundary of the site and there is a farm track from the access road running north of the tip to grazing land beyond the site boundary to the fields to the east.

The site is bounded by a stream to the north, known as Ochre Dike and a stream to the south that seeps out of the tipped valley side from Hewitt's tip and runs in to a pond system and then runs across the site to the large pond on the north side and a drain to the north east corner. Refer to plan numbers DESID 2 and JGP/BQ/2010-07.

The Conceptual Model.

The quarry was a ganister pit and the geology consists of mudstone, coal seams and sandstone which has been altered to a paleosol. This is a sandy soil that has had coal forest growing on it during the late Carboniferous Period which has reduced the compounds and nutrient elements in the soil leaving mainly quartz behind. The quarry was last worked in the 1930's and forties to provide coal from the Halifax Hard Bed and ganister from the beds below for foundry sand and kiln lining bricks for the steel industry in Sheffield.

The ganister beds were associated with the Halifax Hard Bed and the Middle Band coal beneath and also with the Huddersfield White Rock which is in the Millstone Grit Series.

The quarry was surveyed in 1990 prior to the infilling of the site and the levels show the site was between 8 and 10 metres deep. The site has been filled with inert waste from the west to the east since planning permission was granted by Barnsley Council, reference number B90/1708 and the plan reference is SW/BQ02.

The site has a geological barrier in the base consisting of mudstone and seat earth associated with the Halifax Hard Bed horizon. The coal measures mudstones usually attain a permeability coefficient of 1×10 to the minus 9 metres per second or lower which is acceptable for a site that did accept inert waste which could now be classed as non-hazardous due to foundry sand and ash. The site has not been lined due to there being no requirement for engineered liners for that type of waste in the past when the waste management licence was issued.

The general geological section is;

Made ground consisting of brick rubble, soil, ash, foundry sand, concrete, stone, steel slag and ceramics and a base on the quarry floor of grey to dark grey mudstone.

Considering the section from the drilling records of borehole 2006-001 drilled on the 25th July 2006 which is now monitoring borehole number 2 shown on plan number JGP/BQ/BHLP/01 the strata was as follows;

Dark grey shale 0.3m

Black Mudstone 3.2m

Old Coal Mine Workings (Halifax Hard Bed) seam thickness 0.6m to 0.9 m @ 4.1m depth

Seatearth, Brown Sandstone (Ganister) 3.3 m thick

Light Grey Mudstone 6.5 m

Black Mudstone 8.2 m

The dip of the strata is to the east and the general angle is 6 degrees east. There is a fault recorded across the site in a central location and running in a north east direction. The downthrow side of the fault is to the south east which has thrown the Halifax Hard Bed down by approximately 4 metres. It should be noted that the seat earths and the mudstone was used in the Halifax area and the Loxley area to manufacture ceramic pots, pipes and bricks. There is likely to have been a similar operation here as the 1932 map shows a ganister works. The plan was included in the report dated November 2010 and is plan number DESID 9.

A full description of the conceptual model is discussed in the report prepared by FGB in November 2010 entitled "Conceptual Model and Capping Scheme".

The conceptual model has been reviewed in the light of the information gathered since October 2009 and it is clear that the surface water falling on the site is collected by drains which are open channels that run across the site and provide flow to the adit at SW3, Pond SW4 and Pond SW5 where there are sink holes and has percolated into the waste mass area coloured yellow buff on the plan number JGP/BQ/BHLP-01 which has not been capped yet.

Surface water also flows over the pasture that has been created on the western side of the site in the part that has been restored up to the original pond from the old ganister workings which is still evident on site. The north bank of the pond has crown holes in the face and sinks to the coal level. This has allowed an inspection of the geology which is mudstone and black shale from the surface which is original north of the pond down to the water level at 285 m aod.

The conceptual model for the groundwater is that the water is perched and is likely to be contained within the old quarry workings shown on the plan attached to the licence, reference number WD20 B813 included in appendix A. The plan shows the extent of the old mine workings and the surface mining for the ganister. The outline of the faces is shown as brown dashed line on plan number JGP/BQ/2010-07. The surrounding faces are in mudstone and black shale and there is mudstone below the ganister, refer to photograph number 20 in appendix C. The site is surrounded by impermeable material so the water within the waste mass is contained and seeps into the drains and ponds downstream which drain to Pond SW 5 and the sink. The water can also flow through the

ganister bed below the coal horizon. The ganister is a finely grained stone which has few interstitial voids within the stone so flow will be in the fractures in the bedding of the ganister. The water will flow to borehole 2006-001 and 2006-002 which are now BH2 and BH3 respectively. These were drilled to a depth of 24 metres and 12.2 metres respectively as shown on the drillers log and the borehole sections in appendix B.

The material that has been deposited in the site is mainly construction and demolition waste and the organic fraction is low. There has been a loss on ignition of the 3% and 6% on the samples taken from borehole 8 and borehole 9 and there is no source for landfill gas to the properties on Fullshaw Lane as the site is separated from the dwellings by mudstone and black shale which is impermeable. The site has not been capped in this area so any emissions if under pressure would be emitted in the side of the north west pond and the surface.

Site Investigation 25th January 2011

The site has been drilled and boreholes equipped with installations to allow gas monitoring and water sampling and dip measures. 3 boreholes were drilled on the perimeter of the site to ascertain the geology boreholes 1 to 3, 4 boreholes within the waste mass to ascertain the waste character and risk, boreholes 4 to 7, and 2 boreholes in the restored part of the site to the west in the waste mass to assess the waste types tipped in the early period of tipping from the sampled drill returns and the gas risk to the nearby houses, boreholes 8 and 9. The site plan is included in appendix A and the borehole logs in appendix B.

Water samples have also been taken from 5 surface locations at the site to assess the water quality and to assess the impact from the neighbouring tip to the south and the coal mining. These are denoted at SW1 to SW5. Photographs have been taken of each location where surface water is taken and the photographs are included in appendix C.

The surface water points are all related to either sinks where the pond water drains to the old underground workings or in the case of SW2 on the south side where Ochre water issues from a spring in the valley side. The water from this issues runs along the valley bottom to the ponds to the east and then the water from the ponds flows in a channel to the pond in the north side where it then flows into a sink on the west side corner.

SW1 is located on the north side of the western most pond, north of borehole 8 and is located in the central part of the face from the opencast ganister and coal extraction.

SW2 is located on the issue from the valley and flows to the ponds to the east of borehole 7.

SW3 is located in the old mine workings on the north side beyond the tipping area just east of borehole number 2.

SW4 is located in the north east corner of the site in a sink hole that would appear to be an old shaft, just east of borehole 3.

SW5 is located in the north east corner pond where the water flows down a sink into the old workings.

SW5 is connected to the water system from SW2 via the two ponds in line with the valley and the drain open channel to the pond with SW5.

It is proposed to fill in pond SW5 and then provide a channel around the pond to the sink SW5 and allow the water to flow down a pipe to the sink. The pond has steep sides and is a risk to children and livestock due to the steep sides and the depth of water.

Note that no water sample is taken from the ponds in the restored part near to borehole 1 located in the south west corner of the site which are shown on the drawing number JGP/BQ/BHLP 01 due to the ponds being at the surface and catching surface water runoff from the restored pasture which sheep graze.

The boreholes have been sampled in the past to characterise the waste and boreholes 4 to 6 were in the waste mass. Borehole 7 was in the colliery spoil which is mudstone with black shale and coal fragments and borehole 1 was in shallow made ground and then natural strata which was a shale trending to mudstone.

Boreholes 8 and 9 were sampled this time when they had been drilled on the 25th January 2011.

The boreholes have all been dipped to assess the water table in the site and the waste mass and the levels of the boreholes and the water table is shown in the table in appendix D.

Sample Analyses

The boreholes drilled in the waste mass were boreholes 4 to 6, with number 7 being drilled in the quarry spoil to assess any contamination from the waste activities, were sampled at each drill rod change which is 3 metres of hole. The boreholes were drilled on June 2009 and materials were sampled to assess the character of the waste and to leach samples for the supplementary closure report submitted to the Environment Agency in October 2009.

Two boreholes were drilled on the 25th January 2011 in the restored part of the site to allow the assessment of risk from landfill gas to the nearby houses on Fullshaw Lane. The waste returns were sampled for each borehole as the depth of waste was 8 metres.

Please note that the boreholes are numbered 1 to 9 for sampling which when cross referenced with the drillers records and FGB's annotation for the first boreholes drilled on the perimeter of the landfill in July 2006 are as follows;

BH 2006-001 is now number 2 on the north side in the natural geology

BH 2006-002 which is now number 3, located in the north east corner, drilled in the natural geology.

BH 2006-003 which is now number 1, in the south west corner, located upstream side of the landfill in strata.

BH 2006-004 was drilled to check the depth of the mudstone beneath the ganister bed and was backfilled with spoil and sealed with bentonite.

BH 4 drilled in July 2009 for the supplementary closure report in the waste mass.

BH 5 drilled in July 2009 for the supplementary closure report in the waste mass.

BH 6 drilled in July 2009 for the supplementary closure report in the waste mass.

BH7 drilled in July 2009 for the supplementary closure report in the quarry material mass.

BH8 drilled on the 25th January 2011 in the waste mass for the closure report in the restored area.

BH9 drilled on the 25th January 2011 in the waste mass for the closure report in the restored area.

The boreholes logs are shown in Appendix B and the summary analyses of the general inorganics and heavy metals are shown in appendix E. The analyses sheets for the site from the laboratories are shown in appendix F.

Discussion of the sample analyses from the boreholes.

The sample analyses taken in September 2006 showed elevated levels of ammoniacal nitrogen, molybdenum and Dimethyl benzene in BH 2006-002 located by the shaft in the north east corner in the water retrieved from the bores.

The sample analyses taken in November 2006 showed elevated levels of ammoniacal nitrogen, molybdenum in the three boreholes and in borehole 2006-002 (No3) in the north east corner, downstream, dichloromethane and dimethylbenzene (m&p xylene) in the water retrieved from the bores.

The boreholes drilled in the waste mass and spoil, reference numbers 2009-004 to 007 were sampled every three metres for the solid drill returns and the samples were also leach tested to provide information on the risk to groundwater as the site is not capped and surface water can still percolate into the waste mass. The results of the sample analyses were included in the supplementary closure report dated October 2009. The sample sheets have been included in this report in appendix F for easy reference.

The boreholes drilled in January 2011, number 2011-008 and 2011-009 were sampled for the whole section and the samples leached to assess the risk to groundwater and the surface water points on site.

The sample from borehole 8 was all within the inert classification and borehole 9 leachate sample showed elevated levels of molybdenum at 3.3 mg/kg when the limit is 0.5 for compliance. Sulphate was also found to be above the waste acceptance criteria for inert materials at 1600mg/kg compared to a compliance level of 1000mg/kg. Fluoride levels are just below the limits.

Surface water ponds were sampled also to assess the impact from the waste mass on the surface water that is collected on site which flows to the old mine workings. There is also interaction with

the neighbouring tip to the south of the site, known as Hewitt's tip which was filled in with water treatment materials from Langsett. The samples were taken on the 25th January 2011

Water from the boreholes 1 to 7 were also sampled on the 25th January 2011 at the following times and depths.

Surface Pond Sample 1 at the sink hole to old mine workings. Time 08:38

Surface water sample 2, south side in valley at the issue of the brown ochre water. Time 09:02

Surface water sampled at old mine working, north side. Time 09:30

Sample number 4 at the pond in the drain to the old shaft site in the north east corner. Time 09:37

Sample number 5 in the pond near the tip at the sink hole near the willow tree. Time 10:30

The boreholes were measured to the water levels prior to being bailed out to purge the borehole to obtain a sample.

Borehole 1 (BH2006-003) purged by removing 4 bailers of water and sampling the fifth and filling 2x 50 mm vials and 1x250mm brown bottle. Depth to the water sample 3.1 metres at 15:15.

Borehole 2 (BH2006-001) sampled by removing 4 bailers of water and then sampling the fifth bailer full into 2x50 mm vials and 1x250 mm bottle. Depth to the water is 7 metres. Time 14:00.

Borehole 3 sampled (BH2006-002) sampled by removing 4 bailers of water and then sampling the fifth bailer full into 2x50 mm vials and 1x250 mm bottle. Depth to the water is 9.1 metres. Time 14:38.

Borehole 4 (7/2009) sampled by removing 4 bailers of water and then sampling the fifth bailer full into 2x50 mm vials and 1x250 mm bottle. Depth to the water is 4.8 metres. Time 15:05.

Borehole 5 sampled by removing 4 bailers of water and then sampling the fifth bailer full into 2x50 mm vials and 1x250 mm bottle. Depth to the water is 5.5 metres. Time 14:57.

Borehole 6 sampled with the water at the surface of the borehole, sampled by removing 4 bailers of water and then sampling the fifth bailer full into 2x50 mm vials and 1x250 mm bottle. Depth to the water is 0.2 metres. After the borehole was bailed out the depth to the water was 1.5 metres. Time 14:45.

Borehole 7 sampled by removing 4 bailers of water and then sampling the fifth bailer full into 2x50 mm vials and 1x250 mm bottle. Depth to the water is 4.5 metres. Time 14:50.

Boreholes 8 and 9 were not sampled on the same day due to the drilling. The samples were obtained on the 16th February 2011 after the holes had settled down and the suspended solids would be representative. Water sampled by removing 4 bailers of water and then sampling the fifth bailer full into 2x50 mm vials and 1x250 mm bottle.

Borehole number 8 sampled by removing 4 bailers of water and then sampling the fifth bailer full into 2x50 mm vials and 1x250 mm bottle. Depth to the water is 6.3 metres prior to bailing out the boreholes to purge the water. Time 09:35.

Borehole number 9 sampled by removing 4 bailers of water and then sampling the fifth bailer full into 2x50 mm vials and 1x250 mm bottle. Depth to the water is 2.5 metres prior to bailing. Time 10:00.

The samples of water were placed in a cool box and then logged in the office and despatched by courier to the laboratory. Emails were exchanged with the laboratory, I2 Analytical so the samples could be collected and booked into the laboratory as soon as possible.

The water samples taken on the 25th January and the 16th February 2011 show elevated levels of molybdenum in borehole 5 and 6 and it is clear that there is a high iron content due to the ochre water in sample 2 in the valley. Borehole 9 showed elevated levels of molybdenum in the leachate sample prepared from the solid returns.

Overall there is a presence of metals which is likely to be from the foundry sand and the steel slag which is the source for the metals being leached to the waste mass water but apart from these elements the water is acceptable to the EQS standard for other compounds apart from sulphate.

The upstream side of the tip Borehole 1 (2006-003) is within natural strata but the borehole log still shows 2.4 metres of made ground but the water table is below this in the borehole ranging from 3.12 metres to 2.34 metres below the surface. The water samples are compared to this borehole for the waste mass and the downstream side.

Dichloromethane was found in borehole 2006-002 (November 2006) at 18.2 ug/l which is the downstream borehole near the sink in the north east corner and is now denoted now as borehole 3 downstream. This is the only time this compound has been found and a note is attached to the report number ID 214530. The compound is used in a wide range of products such as agricultural products, insect control, plastic modelling as a glue and as an aerosol propellant and a solvent. The compound evaporates to air and is slightly soluble in water. More details are provided on the Environment Agency's web site, Environmental Topics, Pollution Inventory Compounds.

Gas Monitoring

The boreholes have been monitored for landfill gas from boreholes 1 to 7 and the results are enclosed in appendix G. No landfill gas emissions are being given off above the trigger levels for Methane of 1.5% v/v and 5% CO₂ v/v except in borehole 5 which will continue to be monitored in accordance with the Environmental permit.

Future Monitoring.

It is proposed to continue monitoring the site from the 5 water points and the 9 boreholes for a period of two years every quarter, to progress the site to a position where the licence can be surrendered. The monitoring will provide information on the water quality in relation to ammoniacal

nitrogen and molybdenum and the other metal elements found in the water analyses. The licence has been modified and issued as an environmental permit to reflect what has been agreed with the Environment Agency. The reference number is EPR/YP3490ZE/V006 and the monitoring frequencies are included in Table S3.3. Samples have been obtained on the 7th May 2011 and the analyses are awaited from the laboratory. The water levels and gas readings have been updated on the summary sheet.

The water samples will be sampled for inorganics and heavy metals as there is no evidence of any TPH, VOC or SVOC. These are to be sampled once a year or as the permit requires. The area to be closed and monitored is shown on the plan that accompanied the issue of the licence reference WD20 B.813 and plan number JGP/BQ/BHLP/01 dated 21/12/2009 included in appendix A.

The surface water course known as Ochre Dyke is not connected to the site run off so the compliance point will be the old mine shaft and water sampling point in the north east corner of the site, this is the downstream point of the water runoff. Water flows to the old mine workings from the ponds on the site and surface water point 2 near the old workings on the north side which is annotated as a badger set but is an old adit for the Halifax Hard Bed coal mine.

Future Activity to Restore the Site and Surrender the Licence.

The site is being capped with imported material that has been screened to provide a capping layer of 0.5 metres thick with a permeability of 1×10^{-7} metres per second or less and then 300 mm of subsoil and 100mm of topsoil. It is intended to import 12000 cubic metres of soil and this may entail importing slightly more than that as the material is to be screened to remove the coarse material and use that for road maintenance.

The total amount to be imported will be 35000 tonnes of which 25000 tonnes will be used for capping material and 10000 tonnes for road maintenance, making the old mine workings safe and drainage medium for the surface water runoff. The soils will be retrieved from the stockpiles on the north side of the site near Ochre Dike.

Pond Number 5 will be filled in as required after discussion by Ed Wrathmell and Jeff Pears to alleviate the risk of livestock or children being drowned in the pond. The water from the drainage channel will be directed to the sink via a channel and a pipe. The pond will be re-profiled after filling in to a shallow depression to collect water from the pasture after the site has been capped. A plan of the scheme is enclosed in appendix A, reference number JGP/BQ/2010-10.

Summary

The site is located within an old ganister pit which has exploited the band of ganister beneath the Halifax Hard Bed and above the Middle Band Coals. The deep boreholes drilled in July 2006, BH(2006-001) and BH(2006-002) found that the Halifax Hard bed in this location was directly on the ganister and the middle band was absent replaced by a dark to black mudstone.

The site has been filled in with construction, demolition and excavation waste with some streams of steel slag, ceramics, ash and foundry sand. The foundry sand contains metals from the steel industry and these are mainly nickel and molybdenum but there are also traces of boron and vanadium.

The waste is encapsulated on all sides by mudstone, shale and seat earth and these materials are impermeable to migration of water and gas. The site is underlain in on the periphery by old mine workings worked for the Halifax Hard Bed coal but in the waste area this has been removed by surface means as has the ganister. The ganister is a fine grained quartz rock >95% quartz with no interstitial pores to store water and any pathway for water transport would be through joints and layers in the bedding plane. The stone is a paleosol so it has been altered by Coal Measures Forests to produce a quartz rich stone that contains few joints or bedding planes which when present are widely spaced.

The area where waste has been tipped has no ganister and the floor of the tip is mudstone. Leachate from the tipped material could flow east and north east through the joints where ganister was exposed in the face and will be monitored in the boreholes to the north and north east corner, now denoted as BH2 and BH3.

The conceptual model considers that the surface water seeps into the waste mass and in places is confined by the old quarry sides and the water table rises and then seeps out of the waste mass and runs to the ponds and the levels of ponds is controlled by the level of the mine sinks and shafts where the surface water runs into. The basic conceptual model was defined from the boreholes and show on plan number HRA 1 and the sections on plan HRA 2. The conceptual model has been refined and is shown on plan number JGP/BQ/2010-09 dated November 2010. The geology is the same as the HRA plans and the surface water flow and percolation into the waste mass has been refined based on the outline of the quarry and the sections.

The site is being monitored and the new boreholes are providing information on the previously tipped area and the restored pasture. The closure area is shown on plan number DESID Site Plan and DESID 2.

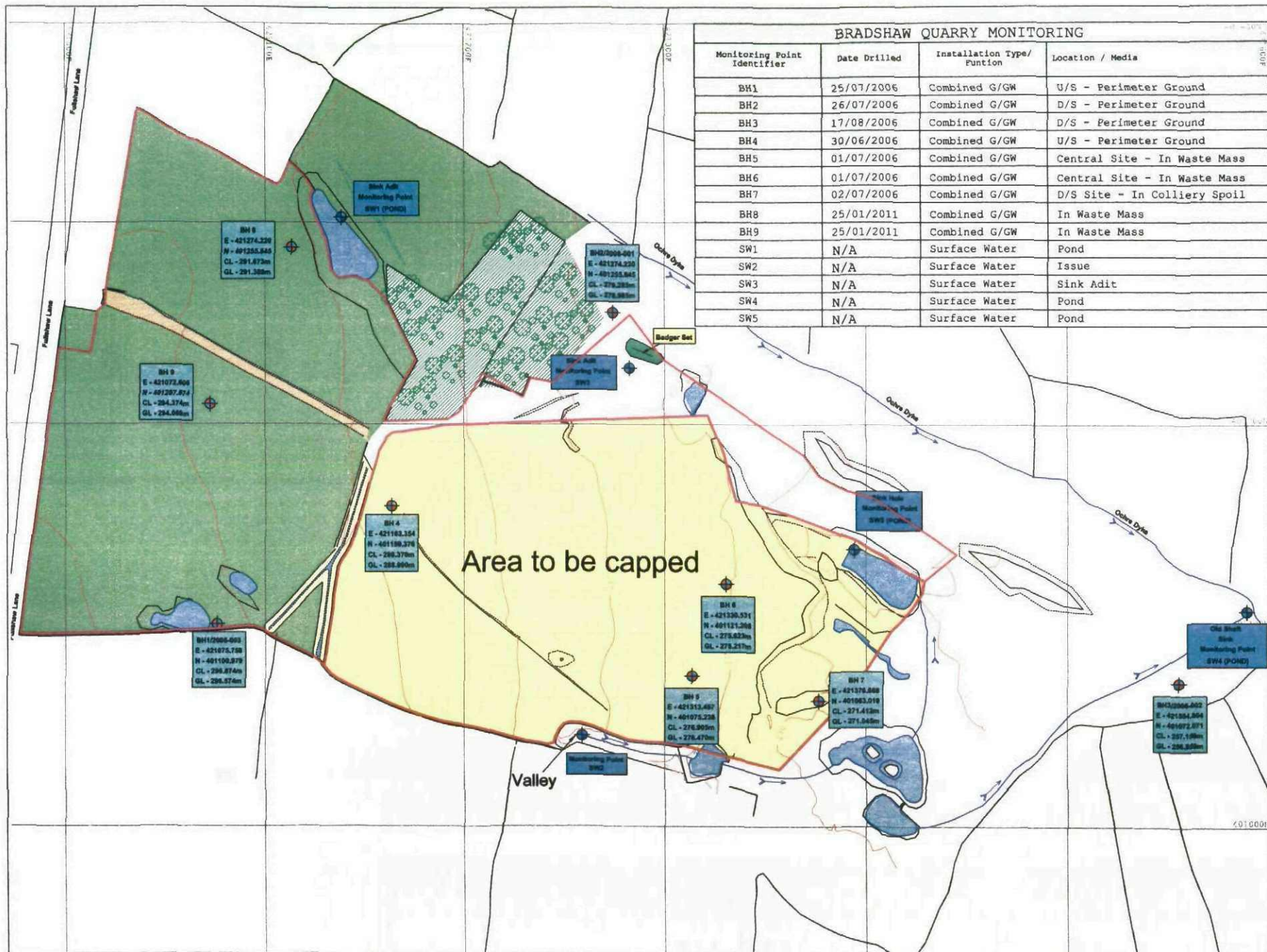
In conclusion the site should be capped to cover the waste and prevent further percolation of surface water into the waste mass which can leach heavy metals into the water environment.

Signed

Eur Ing John Carlon B.Eng (Hons) C.Eng MIMM MRICS MCIWM MIQ.

May 2011.

Bradshaw Quarry
Appendix A
Plans



Date	Description	By

Closure Area

Combined Gas/Water Monitoring Point

Surface Water Monitoring Point

LINEAR SURVEYS LIMITED

LINEAR SURVEYS LIMITED
10 Rediff Gardens
Leamington
West Yorkshire
CV32 5AT

Tel: 01774 876236
Mob: 0798454482
e-mail: linear@linear.co.uk

Client

J.G.Pears

Job Title

Bradshaw Quarry

Project Title

Closure Report

Scale

1:1250

Date

23.05.11

Drawn By

PR

Checked By

JC

Drawn By

Gas & Water Monitoring Plan
May 2011

Drawn By

JGP/BQ/BHLP_01_00

Appendix B

Bradshaw Quarry

Borehole Logs

Logged By
SS/AC

Continued next sheet

AGS

Project Name
Bradshaw Quarry

Project No.
09/06/1322W

Co-ords: 421163E - 401159N
Level: 288.99 m AOD

Date
30/06/2009

Location: Thurstone

Dimensions:

Depth
8.40m

Scale
1:25

Client: J. G Pears

Logged By
SS/AC

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
6.00-8.40	B		6.00	282.99		MADE GROUND - Coarse gritty clayey sand with an abundance of pebbles and some red brick and concrete fragments. (MADE GROUND)
						MUDSTONE - Dark grey silty weathered clay / mudstone. Sample wet and containing small red brick fragments at the top of the horizon. (CLAY)
						
						
						
						
						
						
						
						
			8.40	280.59	Trialpit Complete at 8.40 m	

Remarks: Samples were taken at 3.0 metre intervals and the waste composition recorded in the Stratum Description. Reference has also been made to the drillers logs for drilled depths, changes in horizon and well installation details.

Groundwater:



Project Name
Bradshaw Quarry

Project No.
09/06/1322W

Co-ords: 421313E - 401075N
Level: 276.47 m AOD

Date
01/07/2009

Location: Thurstone

Dimensions:

Scale
1:25

Client: J. G Pears

Depth
8.40m

Logged By
SS/AC

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.00-3.00	B					MADE GROUND - Brown medium sandy gritty clay with large sandstone fragments. Very small red brick, concrete, coal and clinker. (MADE GROUND)
			3.00	273.47		MADE GROUND - Brown medium sandy clay with larger sandstone fragments than the above horizon. Occasional small black shale and red brick fragments. (MADE GROUND)
3.00-6.30	B					

Continued next sheet

Remarks:	Samples were taken at 3.0 metre intervals and the waste composition recorded in the Stratum Description. Reference has also been made to the drillers logs for drilled depths, changes in horizon and well installation details.
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Groundwater:



Project Name
Bradshaw Quarry

Project No.
09/06/1322W

Co-ords: 421313E - 401075N
Level: 276.47 m AOD

Date
01/07/2009

Location: Thurstone

Dimensions:

Scale
1:25

Client: J. G Pears

Depth
8.40m

Logged By
SS/AC

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						MADE GROUND - Brown medium sandy clay with larger sandstone fragments than the above horizon. Occasional small black shale and red brick fragments. (MADE GROUND)
6.30			6.30	270.17		
						SANDSTONE - Grey brown and buff sandy clay with some black shale and sandstone fragments above grey brown weathered sandstone. (SANDS & GRAVELS)
6.30-8.40	B					Water level 7.1 metres bgl.
			8.40	268.07		Trialpit Complete at 8.40 m

Remarks: Samples were taken at 3.0 metre intervals and the waste composition recorded in the Stratum Description. Reference has also been made to the drillers logs for drilled depths, changes in horizon and well installation details.

Groundwater:



Date
01/07/2009

Client: J. G Pears

Depth
11.50m

Logged By
SS/AC

Continued next sheet

Remarks:	Samples were taken at 3.0 metre intervals and the waste composition recorded in the Stratum Description. Reference has also been made to the drillers logs for drilled depths, changes in horizon and well installation details.								

Groundwater:



F C B

Fennell, Green & Bates

V.M.P.H. - M.C.A. - M.S. S.T.H.W. D.P.A. - W. S.T.H.P. - M.S. L.C.M.J. A.B.H.S.

Trialpit No

6

Sheet 2 of 3

Project Name Bradshaw Quarry	Project No. 09/06/1322W	Co-ords: 421331E - 401121N Level: 275.22 m AOD	Date 01/07/2009
Location: Thurlstone		Dimensions: -	Scale 1:25
Client: J. G Pears		Depth 11.50m	Logged By SS/AC

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			6.00	269.22		MADE GROUND - Medium brown sandy gritty clay with red brick, concrete and some pebbles and coal fragments. (MADE GROUND)	
6.00-9.00	B					MADE GROUND - Medium brown fine sandy clay with red brick, concrete and coal fragments. (MADE GROUND)	6
			9.00	266.22		MADE GROUND - Medium brown fine sandy clay with some red brick, concrete and coal. Sandstone fragments present towards the base of the horizon. (MADE GROUND) Water level 9.2 metres bgl.	9
							10

Continued next sheet

Remarks: Samples were taken at 3.0 metre intervals and the waste composition recorded in the Stratum Description. Reference has also been made to the drillers logs for drilled depths, changes in horizon and well installation details.

Groundwater:



FGB

Fennell, Green & Bates

V. 1000 - NOV 01 - MS 5000-0000 - W. 0000 - MS 10000 - 0000

Trialpit No

6

Sheet 3 of 3

Project Name

Bradshaw Quarry

Project No.

09/06/1322W

Co-ords: 421331E - 401121N

Level: 275.22 m AOD

Date

01/07/2009

Location: Thurstone

Dimensions:

Depth

11.50m

Scale

1:25

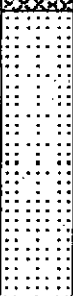
Client:

J. G Pears

Logged By

SS/AC

Samples & In Situ Testing

Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
			10.50	284.72		MADE GROUND - Medium brown fine sandy clay with some red brick, concrete and coal. Sandstone fragments present towards the base of the horizon. (MADE GROUND)
			11.50	283.72		SANDSTONE - Grey brown sandstone. (SANDS & GRAVELS)
Trialpit Complete at 11.50 m						

11

12

13

14

15

Remarks:

Samples were taken at 3.0 metre intervals and the waste composition recorded in the Stratum Description. Reference has also been made to the drillers logs for drilled depths, changes in horizon and well installation details.

Groundwater:



AGS 1000 Standard Trialpit Log 12' dated 12th Nov 08

Project Name
Bradshaw Quarry

Project No.
09/06/1322W

Co-ords: 421377E - 401063N
Level: 271.05 m AOD

Date
02/07/2009

Location: Thurstone

Dimensions:

Depth
7.50m

Scale
1:25

Client: J. G Pears

Logged By
SS/AC

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
0.00-3.00	B					MADE GROUND - Very dark, almost black medium sandy shaley clay / mudstone with rootlets and sandstone fragments. Colliery spoil from opencast workings. Colliery spoil from opencast workings. (MADE GROUND)	1
							2
			3.00	268.05		MADE GROUND - Very dark almost black sandy shaley clay / mudstone with occasional clumps of orange sandy clay. (MADE GROUND)	3
							4
3.00-6.30	B						5

Continued next sheet

Remarks: Samples were taken at 3.0 metre intervals and the waste composition recorded in the Stratum Description. Reference has also been made to the drillers logs for drilled depths, changes in horizon and well installation details.

Groundwater:



F C B

Fennell, Green & Bates

V.M.B. - N.S. - K.S. - S.H. - P.T. - C.F.A. - W. - B.M. - N.S. - L.C. - N.J. - R.N.S.

Trialpit No

7

Sheet 2 of 2

Project Name

Bradshaw Quarry

Project No.

09/06/1322W

Co-ords: 421377E - 401063N

Level: 271.05 m AOD

Date

02/07/2009

Location: Thurstone

Dimensions:

-

Scale

1:25

Client:

J. G Pears

Depth

7.50m

Logged By

SS/AC

Samples & In Situ Testing

Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
			6.00	285.05		MADE GROUND - Very dark almost black sandy shaley clay / mudstone with occasional clumps of orange sandy clay. (MADE GROUND)
			6.30	284.75		MADE GROUND - Very dark almost black sandy shaley clay / mudstone with sandstone fragments towards base of the horizon. (MADE GROUND)
6.30-7.50	B					SANDSTONE - Grey brown sandstone. (SANDS & GRAVELS)
			7.50	283.55		Water level 7.25 metres bgl.
						Trialpit Complete at 7.50 m

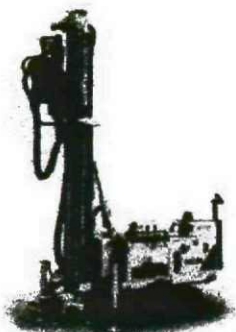
Remarks:

Samples were taken at 3.0 metre intervals and the waste composition recorded in the Stratum Description. Reference has also been made to the drillers logs for drilled depths, changes in horizon and well installation details.

Groundwater:



DYNAMIC SAMPLING UK LTD

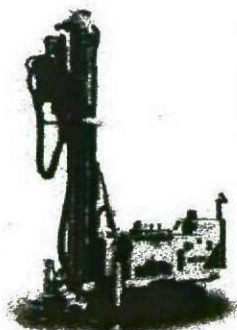


Web: www.dynamicsampling.co.uk

Date
25.01.2011

[illegible]

DYNAMIC SAMPLING UK LTD



Web: www.dynamicsampling.co.uk

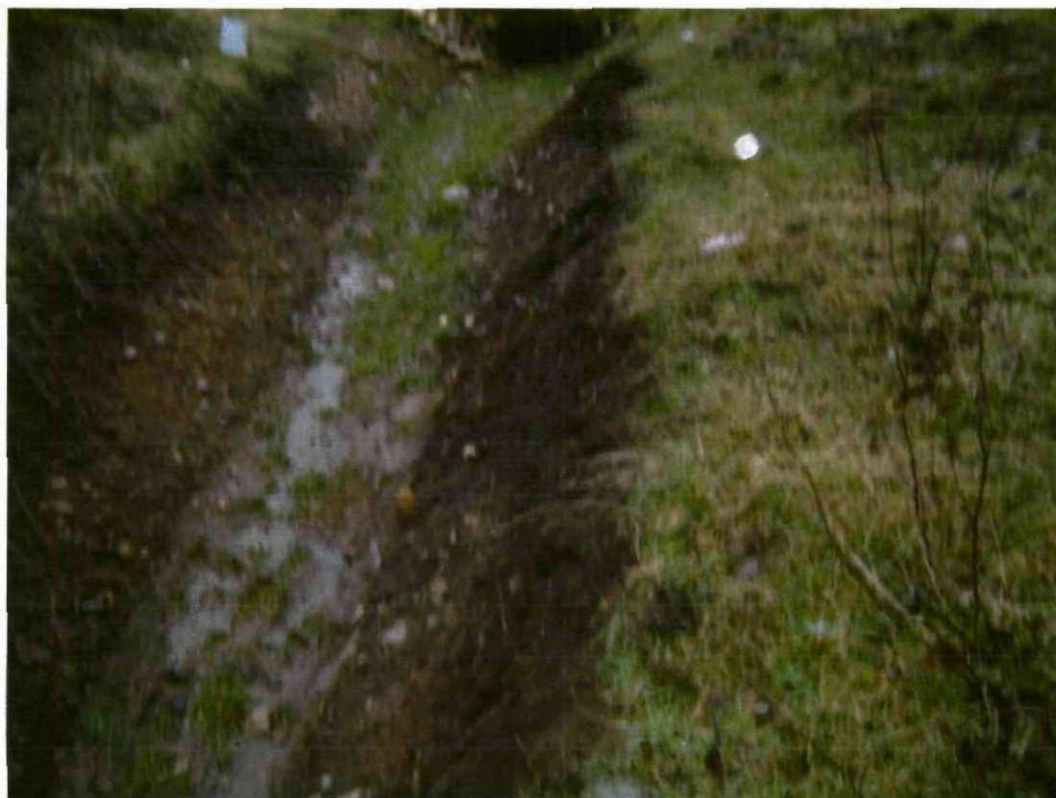
Date
25.01.2011

[illegible]

Appendix C



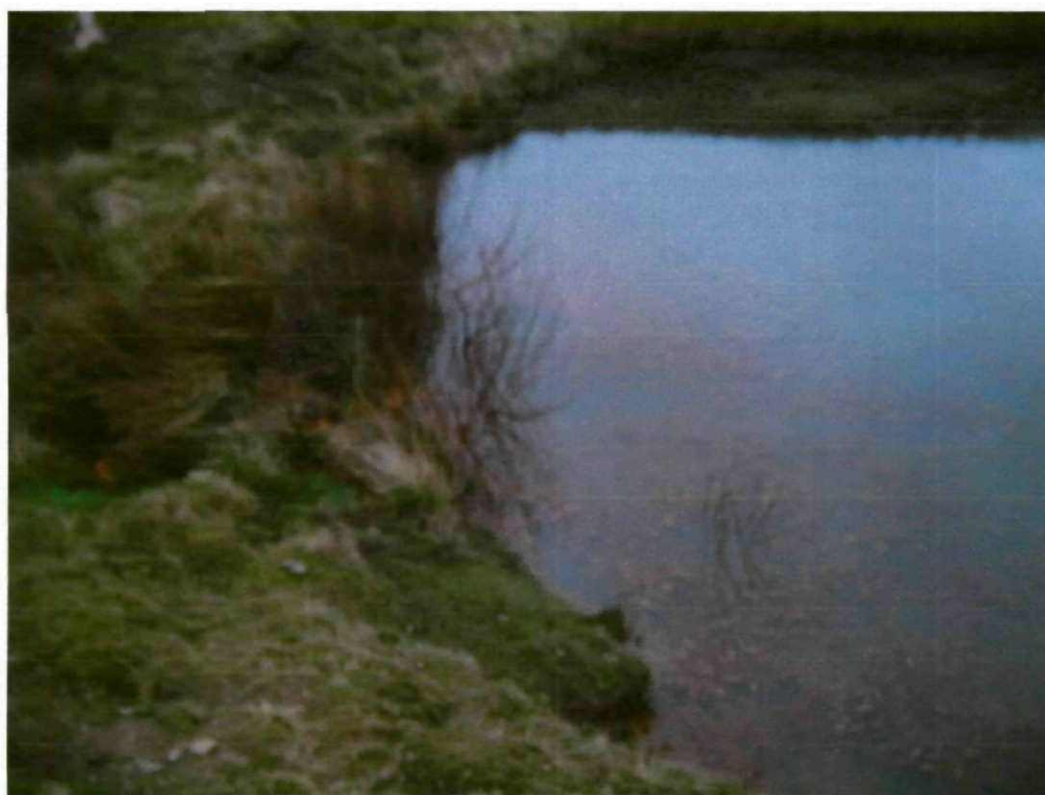
Photograph Number 1 showing the sink hole (old shaft) in the north east corner of the site. SW4.



Photograph Number 2 showing the channel to the sink from the ponds on the south east corner. Monitoring point for surface water, SW4.



Photograph Number 3 showing Pond 5 and the tip in the background. This pond is to be filled and reformed to provide run off storage.



Photograph Number 4 showing pond 5 and the ochre on the weed near the east bank.



Photograph Number 5 showing pond 5 and the sink in the left hand side foreground. This pond is to be filled in and re-profiled at a higher level.



Photograph number 6 showing the old adit and mine tunnel for the Halifax Hard Bed. The tunnel is open and the ground is collapsing around the entrance. Surface Water Point SW3.



Photograph Number 7 showing the drain to the adit running across the site, monitoring point SW3.



Photograph Number 8 showing the old tunnel collapsed and the coal mine.



Photograph Number 9 showing the collapsed ground around the old roadway and adit being eroded by the surface water run off over the site.



Photograph Number 10 showing the ponds at the eastern end of the site and the valley to the ponds from Hewitt's Tip and the Ochre Spring. Sample Point SW2.



Photograph Number 11 showing monitoring point SW2 where Ochre water seeps from the adjoining tip to the valley and then to the ponds on the east side.



Photograph Number 12 showing the ochre water running down the valley to the ponds.



Photograph Number 13 showing borehole 9 drilled 25th January 2011 for water and gas monitoring.



Photograph Number 14 showing borehole number 8 in the north west corner field on the site.



Photograph Number 15 showing the strata drilled through, left side, inert rubble, then coal, light grey fireclay, ganister stone.



Photograph number 16 showing the fireclay seatearth that the inert waste has been tipped on above the ganister horizon.



Photograph Number 17 showing the Halifax Hard Bed coal and the fireclay bed above the ganister.



Photograph Number 18 showing the coal and the waste which is brick, and excavation waste.



Photograph Number 19 showing the waste drilled through which is stone, brick, earth and concrete.



Photograph Number 20 showing the pond in the north west side of the site, Pond 1. Note the old mine workings and crown holes o the bank on the far side which is the face of the old quarry.



Photograph Number 21 showing the monitoring point BH8 and the bungalow on Fullshaw Lane.

Appendix D

Bradshaw Quarry Water Levels of the Site

Appendix D.

Site:	Bradshaw Quarry, Hartcliffe			
Client:	JG Pears Ltd			
Date:	30/09/2009	03/09/2010	25/01/2011	22/02/2011
Weather Conditions:	Overcast/Windy	Warm/Light wind	Cold and Wet	Warm/Light Wind & Sunny
Ground Conditions:	Dry	Dry	Wet	Wet
Atmospheric Pressure (mbars):	982	989	979	982
Air Temperature (°C):	13	15	2	11
Monitoring Borehole 1				
CH ₄ Methane (%)		0.4	0	0
CO ₂ Carbon Dioxide (%)		2.1	0.2	0.6
O ₂ Oxygen (%)		15.9	20.7	19.4
Balance (%)		81.6	79	79.9
Relative Pressure (mbars)		0.32	0.21	1.91
Water Level (m AOD)		3.12	Not taken	2.34
Monitoring Borehole 2				
CH ₄ Methane (%)		0.4	0	0
CO ₂ Carbon Dioxide (%)		0.3	0.1	0.1
O ₂ Oxygen (%)		18.6	20.5	19.6
Balance (%)		80.6	79.4	80.3
Relative Pressure (mbars)		4.71	-2.18	2.31
Water Level (m AOD)		6.24	Not taken	6.01
Monitoring Borehole 3				
CH ₄ Methane (%)		0.3	0	0.1
CO ₂ Carbon Dioxide (%)		1.5	0.1	0.2
O ₂ Oxygen (%)		17.0	20.7	18.7
Balance (%)		81.1	79.1	81
Relative Pressure (mbars)		-0.1	6.1	7.1
Water Level (m AOD)		8.6	Not taken	8.12
Monitoring Borehole 4				
CH ₄ Methane (%)	0.2	0.3	0	0
CO ₂ Carbon Dioxide (%)	3.9	4.2	2.3	1.8
O ₂ Oxygen (%)	6.4	7.3	11.6	8.6
Balance (%)	89.5	88.1	86	89.5
Relative Pressure (mbars)	0.1	0.87	-0.11	2.72
Water Level (m AOD)	4.09	4.42	Not taken	4.43
Monitoring Borehole 5				
CH ₄ Methane (%)	25.4	0.3	17.1	0
CO ₂ Carbon Dioxide (%)	15.9	0.4	20.2	0.1
O ₂ Oxygen (%)	1.5	18.4	0.4	19.7
Balance (%)	57.3	80.8	62.2	80.2
Relative Pressure (mbars)	0.14	0.24	0.04	-0.55
Water Level (m AOD)	4.99	5.06	Not taken	4.92
Monitoring Borehole 6				
CH ₄ Methane (%)	11.1	6.7	No reading	Borehole 6 was water logged, no readings gathered
CO ₂ Carbon Dioxide (%)	0.2	0.3		
O ₂ Oxygen (%)	16.8	17.2		
Balance (%)	78.1	75.8		
Relative Pressure (mbars)	-0.29	0.01	0.12	0.12
Water Level (m AOD)	0.96	0.98		
Monitoring Borehole 7				
CH ₄ Methane (%)	0.2	0.3	0	0
CO ₂ Carbon Dioxide (%)	4	2.9	1.7	4.6
O ₂ Oxygen (%)	14.7	16.4	18.2	12.1
Balance (%)	80	80.4	79.8	83.2
Relative Pressure (mbars)	-0.1	0.13	0.1	0.35
Water Level (m AOD)	5.31	5.89	Not taken	3.98
Monitoring Borehole 8				
CH ₄ Methane (%)			0.1	0
CO ₂ Carbon Dioxide (%)			3.7	7
O ₂ Oxygen (%)			18.4	1.5
Balance (%)			77.7	91.6
Relative Pressure (mbars)			0.1	5.45
Water Level (m AOD)			Not taken	5.98
Monitoring Borehole 9				
CH ₄ Methane (%)			0	0.2
CO ₂ Carbon Dioxide (%)			0.7	0.9
O ₂ Oxygen (%)			20.2	7
Balance (%)			79	92
Relative Pressure (mbars)			0.16	-0.11
Water Level (m AOD)			not taken	2.22

Notes :-
Boreholes 8 & 9 drilled January 2011

Appendix E

Bradshaw Quarry
Summary of Samples

Site: BRADSHAW QUARRY

Client: J. G. Pears

Job: Closure Report In-Waste Boreholes

Analysis Summary Sheet: SOIL TOTALS (Page 1 of 2)

Contaminant	Units	CLEA - SGVs / GACs (mg/kg ⁻¹)			BH4 0m-9m	BH5 0m-9m	BH6 0m-9m	BH7 0m-7.5m
		Res - With Plants Residential	Res - No Plants Allotments	Industrial Commercial				
pH					9.6	9	7.8	4.4
OMC	%				3.4	3.4	4.1	16
Sulphate (Water Sol.)	g/l	400 EQS / 250 DWS (mg/l)			0.28	0.21	0.35	0.08
METALS								
Arsenic	mg/kg	32	43	640	10	16	14	15
Cadmium	mg/kg	10	1.8	230	1.7	0.92	0.63	0.28
Chromium	mg/kg	130*	200*	5000*	32	66	45	25
Copper	mg/kg	2330	524	71700	65	55	60	55
Lead	mg/kg	450	450	750	71	75	100	71
Mercury	mg/kg	1/170/11	26 ³ /80/8	26 ³ /3600/410	1.1	0.3	0.31	0.2
Nickel	mg/kg	130	230	1800	45	44	47	18
Selenium	mg/kg	350	120	13000	0.69	0.26	0.28	6.8
Zinc	mg/kg	3750	618	665000	210	100	130	32
Cobalt	mg/kg				18	11	14	3.1
Manganese	mg/kg				790	640	760	110
Molybdenum	mg/kg				550	450	140	60
Antimony	mg/kg				<2	<2	<2	<2
Tin	mg/kg				<5	7.7	<5	<5
Titanium	mg/kg				100	150	130	46
Vanadium	mg/kg	75	18	3160	24	32	32	55
Cyanide (Total)	mg/kg				<0.5	1.1	1.2	<0.5
Cyanide (Free)	mg/kg				<0.5	<0.5	<0.5	<0.5

*Previous SGV for Chromium used as analysis not speciated into Chromium (III) and Chromium (VI).

Site: BRADSHAW QUARRY

Client: J. G. Pears

Job: Closure Report In-Waste Boreholes

Analysis Summary Sheet: SOIL TOTALS - Additional results for parameters with SGVS / GACs reproduced from Inert WAC analysis
(Page 2 of 2)

Contaminant	Units	CLEA - SGVs / GACs (mg/kg ⁻¹)			BH 4 0m-9m	BH5 0m-9m	BH6 0m-9m	BH7 0m-7.5m
		Res - With Plants Residential	Res - No Plants Allotments	Industrial Commercial				
ORGANICS								
TPH	mg/kg				88	95	100	280
BTEX (Total)	mg/kg				<0.005	<0.005	<0.005	<0.005
Benzene	mg/kg	0.33	0.07	95	<0.001	<0.001	<0.001	<0.001
Toluene	mg/kg	610	120	4.4x10 ³	<0.001	<0.001	<0.001	<0.001
Ethylbenzene	mg/kg	350	90	2.8x10 ³	<0.001	<0.001	<0.001	<0.001
m & p Xylene	mg/kg	240/230	180/160	3.5x10 ³ /3.2x10 ³	<0.001	<0.001	<0.001	<0.001
o Xylene	mg/kg	250	160	2.6x10 ³	<0.001	<0.001	<0.001	<0.001
PAHs-USEPA 16 (Total)	mg/kg				17	22	21	10
Napthalene	mg/kg	3.7 (8.7)	9.9 (23)	480 (183) / 1100 (432)	0.26	0.13	0.13	0.82
Acenaphthylene	mg/kg	400 (850)	69 (160)	97000(212) / 100000	0.45	0.21	0.44	0.68
Acenaphthene	mg/kg	480 (1000)	85 (200)	98000 (141) / 100000	0.14	0.17	<0.1	<0.1
Fluorene	mg/kg	380 (780)	67(160)	69000 (71000)	0.28	0.32	0.35	0.93
Phenanthrene	mg/kg	200 (380)	38 (90)	22000 (23000)	2.1	2.1	2.5	1.5
Anthracene	mg/kg	4900 (9200)	950 (2200)	540000 (540000)	0.54	0.58	0.58	<0.1
Fluoranthene	mg/kg	460 (670)	130 (290)	23000 (23000)	2.5	3.6	3.6	0.64
Pyrene	mg/kg	1000 (1600)	270 (620)	54000 (54000)	3.3	3.4	3.4	4.9
Benzo[a]anthracene	mg/kg	4.7 (5.9)	5.5 (10)	95 (97)	1.2	1.7	1.5	<0.1
Chrysene	mg/kg	8.0 (9.3)	5.8 (12)	140 (140)	1.4	1.8	1.6	0.49
Benzo[b]fluoranthene	mg/kg	6.5 (7.0)	7.4 (13)	100 (100)	1.2	1.9	1.4	0.31
Benzo[k]fluoranthene	mg/kg	9.6 (10)	14 (23)	140 (140)	1	1	1.1	<0.1
Benzo[a]pyrene	mg/kg	0.94 (1.0)	1.2 (2.1)	14 (14)	1.5	2.7	2.3	0.12
Indeno[1,2,3-cd]pyrene	mg/kg	3.9 (4.2)	3.8 (7.1)	61 (62)	0.61	1.1	0.72	<0.1
Dibenzo[a,h]anthracene	mg/kg	0.86 (0.90)	1.5 (2.3)	13 (13)	<0.1	0.37	0.15	<0.1
Benzo[a,h,i]perylene	mg/kg	46 (47)	120 (160)	660 (660)	0.51	1	0.94	<0.1

* SOM = 2.5% (& 6%)

Site: BRADSHAW QUARRY

Client: J. G. Pears

Job: Closure Report In-Waste Boreholes

Analysis Summary Sheet: WAC INERT SUITE - SOILS (Page 1 of 3)

Contaminant	Units	Inert Waste Landfill WAC limit values for granular wastes (mg/kg ⁻¹)	BH4 0m-9m	BH5 0m-9m	BH6 0m-9m	BH7 0m-7.5m
Soil pH			9.8	8.2	7.9	4.3
Acid Neutralisation Capac.	mol kg		0.038	0.027	0.018	<0.002
Loss on Ignition	%		5.56	6.17	5.88	18.1
TOC / FOC w/w	%	3%	1.6	2.1	2.8	8.5
ORGANICS						
BTEX (Total)	mg/kg	6000	<0.005	<0.005	<0.005	<0.005
Benzene	µg/kg		<1	<1	<1	<1
Toluene	µg/kg		<1	<1	<1	<1
Ethylbenzene	µg/kg		<1	<1	<1	<1
m- & p- Xylenes	µg/kg		<1	<1	<1	<1
o- Xylenes	µg/kg		<1	<1	<1	<1
PCBs 7 Cong (Total)	mg/kg	1000	<1	<1	<1	<1
PCB28	mg/kg		<0.1	<0.1	<0.1	<0.1
PCB52	mg/kg		<0.1	<0.1	<0.1	<0.1
PCB101	mg/kg		<0.1	<0.1	<0.1	<0.1
PCB118	mg/kg		<0.1	<0.1	<0.1	<0.1
PCB153	mg/kg		<0.1	<0.1	<0.1	<0.1
PCB138	mg/kg		<0.1	<0.1	<0.1	<0.1
PCB180	mg/kg		<0.1	<0.1	<0.1	<0.1
TPH C₁₀-C₄₀ (Total)	mg/kg	500000	120	100	100	200

Site: BRADSHAW QUARRY

Client: J. G. Pears

Job: Closure Report In-Waste Boreholes

Analysis Summary Sheet: WAC INERT SUITE - SOILS (Page 2 of 3)

Contaminant	Units	Inert Waste Landfill WAC limit values for granular wastes (mg/kg ⁻¹)	BH4 0m-9m	BH5 0m-9m	BH6 0m-9m	BH7 0m-7.5m
ORGANICS (Cont)						
PAHs-USEPA 17 (Total)	mg/kg	100 1000 000	15	18	18	11
Napthalene	mg/kg		0.4	0.1	0.2	0.9
Acenaphthylene	mg/kg		0.5	0.4	0.2	1.2
Acenaphthene	mg/kg		0.1	0.2	<0.1	0.7
Fluorene	mg/kg		0.3	0.3	0.2	1
Phenanthrene	mg/kg		2.1	2.1	1.9	1.3
Anthracene	mg/kg		0.5	0.5	0.4	0.2
Fluoranthene	mg/kg		2.1	3.2	2.8	0.5
Pyrene	mg/kg		2.7	2.9	2.6	3.5
Benzo[a]anthracene	mg/kg		1	1.4	1.4	0.3
Chrysene	mg/kg		1.1	1.5	1.5	0.6
Benzo[b]fluoranthene	mg/kg		0.9	1.3	1.4	0.2
Benzo[k]fluoranthene	mg/kg		0.7	1	1.1	<0.1
Benzo[a]pyrene	mg/kg		0.7	0.9	2	0.2
Indeno[1,2,3-cd]pyrene	mg/kg		0.3	0.3	0.2	<0.1
Dibenzo[a,h]anthracene	mg/kg		0.7	0.8	1.1	<0.1
Benzo[g,h,i]perylene	mg/kg		0.5	0.8	0.9	<0.1
Coronene	mg/kg		<0.1	<0.1	<0.1	<0.1

Site: BRADSHAW QUARRY

Client: J. G. Pears

Job: Closure Report In-Waste Boreholes

Analysis Summary Sheet: WAC INERT SUITE - TABLE 3 BSEN 12457/3@L/S10 LITRE kg⁻¹ Calculated Results
(Page 3 of 3)

Contaminant	Units	Inert Waste Landfill WAC limit values for granular wastes (mg/kg ⁻¹)	BH 4 0m-9m	BH5 0m-9m	BH6 0m-9m	BH7 0m-7.5m
Total Dissolved Solids	TDS	4000 ug	1980	1810	2440	461
DOC at own pH	mg/kg ⁻¹	500	321	305	308	253
METALS						
Antimony	mg/kg ⁻¹	0.06 60	0.03	0.02	0.02	<0.01
Arsenic	mg/kg ⁻¹	0.5 500	0.06	<0.05	<0.05	<0.05
Cadmium	mg/kg ⁻¹	0.04 40	0.02	<0.01	<0.01	<0.01
Chromium	mg/kg ⁻¹	0.5 500	<0.05	<0.05	<0.05	<0.05
Copper	mg/kg ⁻¹	2 2000	0.14	<0.05	0.05	<0.05
Lead	mg/kg ⁻¹	0.5 500	<0.05	<0.05	<0.05	<0.05
Mercury	mg/kg ⁻¹	0.01 10	<0.005	<0.005	<0.005	<0.005
Molybdenum	mg/kg ⁻¹	0.5 500	30.5	22.5	13.5	0.15
Nickel	mg/kg ⁻¹	0.4 400	0.06	<0.05	<0.05	0.11
Selenium	mg/kg ⁻¹	0.1 100	0.13	0.03	0.01	0.02
Zinc	mg/kg ⁻¹	4 4000	<0.5	<0.5	<0.5	0.77
Barium	mg/kg ⁻¹	20 20000	<0.5	<0.5	<0.5	<0.5
Chloride	mg/kg ⁻¹	800 800000	67.9	39.4	67.5	7.84
Fluoride	mg/kg ⁻¹	10 10000	7.41	14.5	13.8	1.01
Sulphate	mg/kg ⁻¹	1000 1000.000	756	702	1000	209
ORGANICS						
Phenol Index	mg/kg ⁻¹	1000	<0.5	<0.5	<0.5	<0.5

Site: BRADSHAW QUARRY

Client: J. G. Pears

Job: Closure Report In-Waste Boreholes

Analysis Summary Sheet: LIST II / LIST I LEACHATES (Page 1 of 5)

Contaminant	Units	EQS Freshwater	UK Drinking Water Standards		Units	BH4 0m-9m	BH5 0m-9m	BH6 0m-9m	BH7 0m-7.5m
METALS - Category 1 (List I)									
Antimony	µg/l		5		µg/l	1.5	6.2	2.8	2.2
Arsenic	µg/l	50	10		µg/l	4.3	2.7	2.7	<1
Chromium	µg/l	5 - 250	50		µg/l	<1	1.8	3.1	5.7
Cobalt					µg/l	1.7	<1	1.1	2.9
Copper	µg/l	1 - 28	2000		µg/l	8.1	5.5	9.8	4.6
Lead (inorg. - dissolved)	µg/l	4 - 250	25 (reducing to 10)		µg/l	1.9	3.1	16	4.2
Molybdenum	µg/l				µg/l	1900	1500	850	21
Nickel	µg/l	50 - 200	20		µg/l	4.4	1.4	3.4	10
Selenium	µg/l		10		µg/l	46	<1	<1	2.4
Thallium					µg/l	<1	<1	<1	<1
Tin (inorganic)	µg/l	25			µg/l	<1	<1	<1	<1
Uranium					µg/l	<1	<1	<1	<1
Vanadium	µg/l	20 - 60			µg/l	14	5.5	7.4	1.8
Zinc	µg/l	8 - 500	5000		µg/l	20	3.8	16	50
Silver	µg/l	0.05 (0.1)	10		µg/l	<1	<1	<1	<1
Barium	mg/l		1		µg/l	16	19	47	8.8
Boron	mg/l	2	1		µg/l	44	57	85	<20
Beryllium					µg/l	<1	<1	<1	<1
Titanium					µg/l	170	92	160	28

Site: BRADSHAW QUARRY

Client: J. G. Pears

Job: Closure Report In-Waste Boreholes

Analysis Summary Sheet: LIST II / LIST I LEACHATES (Page 2 of 5)

Contaminant	Units	EQS Freshwater	UK Drinking Water Standards	MRVs for List I Substances to G/w (µg/l)	Units	BH4 0m-9m	BH5 0m-9m	BH6 0m-9m	BH7 0m-7.5m
Category 5 (List II)									
Phosphorous	µg/l		2200		mg/l	0.21	<0.20	<0.20	<0.20
Category 6 (List II)									
Fluoride*	µg/l		1500		mg/l	7.41	14.5	13.8	1.01
Category 7 (List II)									
Nitrate (as NO ₃)	mg/l		50		mg/l	6.6	3.7	2.6	<0.5
Nitrite (as NO ₂)	µg/l		100						
Ammonia (NH ₃ as N)	mg/l	0.015							
Ammonium (as NH ₄ ⁺)	mg/l		0.5		mg/l	0.09	0.07	0.09	0.19
Category 1 (List I)									
Dichlorodifluoromethane					µg/l	<1	<1	<1	<1
Chloromethane					µg/l	<1	<1	<1	<1
Vinyl Chloride					µg/l	<1	<1	<1	<1
Bromomethane					µg/l	<20	<20	<20	<20
Chloroethane					µg/l	<2	<2	<2	<2
Trichlorofluoromethane					µg/l	<1	<1	<1	<1
1,1-Dichloroethene (1,1-DCE)					µg/l	<1	<1	<1	<1
1,2-Dichloroethene (1,2-DCE)	µg/l			1	µg/l	<1	<1	<1	<1
1,1-Dichloroethane					µg/l	<1	<1	<1	<1
cis 1,2-Dichloroethene					µg/l	<1	<1	<1	<1
Bromochloromethane					µg/l	<1	<1	<1	<1
Trichloromethane/Chloroform	µg/l	12		0.1	µg/l	<1	<1	<1	<1
1,1,1-Trichloroethane (1,1,1-TCA)	µg/l	100 (1000)		0.1	µg/l	<1	<1	<1	<1

*Figures used are the maximum value obtained from Inert WAC first and second stage leachate analysis results.

Site: BRADSHAW QUARRY

Client: J. G. Pears

Job: Closure Report In-Waste Boreholes

Analysis Summary Sheet: LIST II / LIST I LEACHATES (Page 3 of 5)

Contaminant	Units	EQS Freshwater	UK Drinking Water Standards	MRVs for List I Substances to G/w (µg/l)	Units	BH1 0m-9m	BH1 0m-9m	BH2 0m-9m	BH2 0m-7.5m
Category I (List I) continued									
Carbon Tetrachloride	µg/l	12	3	0.1	µg/l	<1	<1	<1	<1
1,1-Dichloropropene					µg/l	<1	<1	<1	<1
Benzene	µg/l	30 (300)	1	1	µg/l	<1	<1	<1	<1
1,2-Dichloroethane (1,2-DCA)	ug/l	10	3		µg/l	<2	<2	<2	<2
Trichloroethene (TCE)	ug/l	10	10 (with PCE)		µg/l	<1	<1	<1	<1
1,2-Dichloropropane	ug/l		0.1		µg/l	<1	<1	<1	<1
Dibromomethane					µg/l	<10	<10	<10	<10
Bromodichloromethane					µg/l	<5	<5	<5	<5
cis 1,3-Dichloropropene	µg/l		0.1		µg/l	<10	<10	<10	<10
Toluene	µg/l	50 (500)		4	µg/l	<1	<1	<1	<1
trans 1,3-Dichloropropene	µg/l		0.1		µg/l	<10	<10	<10	<10
1,1,2-Trichloroethane	µg/l	400 (4000)		0.1	µg/l	<10	<10	<10	<10
Trichloroethene (TCE)	µg/l	10	10 (with PCE)		µg/l	<1	<1	<1	<1
1,3-Dichloropropane					µg/l	<2	<2	<2	<2
Dibromochloromethane					µg/l	<10	<10	<10	<10
1,2-Dibromoethane					µg/l	<5	<5	<5	<5
Chlorobenzene					µg/l	<1	<1	<1	<1
Ethylbenzene					µg/l	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane (PCE)	µg/l	10	10 (with TCE)		µg/l	<2	<2	<2	<2
m and p Xylene	µg/l	30			µg/l	<1	<1	<1	<1
o-Xylene	µg/l	30		3	µg/l	<1	<1	<1	<1
Styrene	µg/l	50 (500)			µg/l	<1	<1	<1	<1
Bromoform/Tribromomethane					µg/l	<10	<10	<10	<10
Iso-Propylbenzene					µg/l	<1	<1	<1	<1

Site: BRADSHAW QUARRY

Client: J. G. Pears

Job: Closure Report In-Waste Boreholes

Analysis Summary Sheet: LIST II / LIST I LEACHATES (Page 4 of 5)

Contaminant	Units	EQS Freshwater	UK Drinking Water Standards	MRVs for List I Substances to G/w (µg/l)	Units	BH4 0m-9m	BH5 0m-9m	BH6 0m-9m	BH7 0m-7.5m
Category 1 (List I) Continued									
1,1,2,2-Tetrachloroethane	µg/l	10	10 (with TCE)		µg/l	<10	<10	<10	<10
n-Propylbenzene					µg/l	<1	<1	<1	<1
Bromobenzene					µg/l	<1	>1	<1	<1
1,2,3-Trichloropropane					µg/l	<50	<50	<50	<50
2-Chlorotoluene	µg/l			1	µg/l	<1	<1	<1	<1
1,3,5-Trimethylbenzene					µg/l	<1	<1	<1	<1
4-Chlorotoluene	µg/l			1	µg/l	<1	<1	<1	<1
tert-Butylbenzene					µg/l	<1	<1	<1	<1
1,2,4-Trimethylbenzene					µg/l	<1	<1	<1	<1
sec-Butylbenzene					µg/l	<1	<1	<1	<1
p-Isopropyltoluene					µg/l	<1	<1	<1	<1
1,3-Dichlorobenzene					µg/l	<1	<1	<1	<1
1,4-Dichlorobenzene					µg/l	<1	<1	<1	<1
n-Butylbenzene					µg/l	<1	<1	<1	<1
1,2-Dichlorobenzene					µg/l	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/l		0.1		µg/l	<50	<50	<50	<50
1,2,4-Trichlorobenzene	µg/l	0.4		0.01	µg/l	<1	<1	<1	<1
Hexachlorobutadiene	µg/l	0.1		0.005	µg/l	<1	<1	<1	<1
1,2,3-Trichlorobenzene	µg/l	0.4			µg/l	<2	<2	<2	<2

Site: BRADSHAW QUARRY

Client: J. G. Pears

Job: Closure Report In-Waste Boreholes

Analysis Summary Sheet: LIST II / LIST I LEACHATES (Page 5 of 5)

Contaminant	Units	EQS Freshwater	UK Drinking Water Standards	MRVs for List I Substances to G/w (µg/l)	Units	BH4 0m-9m	BH5 0m-9m	BH6 0m-9m	BH7 0m-7.5m
Category 5 (List I)									
Mercury*	µg/l	1	1	0.01	mg/l	<0.005	<0.005	<0.005	<0.005
Category 6 (List I)									
Cadmium*	µg/l	5	5	0.1	mg/l	0.03	<0.01	<0.01	<0.01
Category 7 (List I)									
TPH / Mineral Oils	µg/l		10		µg/l	<10	<10	<10	<10
Category 8 (List I)									
Cyanide	µg/l		50		mg/l	<0.05	<0.05	<0.05	<0.05

*Figures used are the maximum value obtained from Inert WAC first and second stage leachate analysis results.

Appendix F

Bradshaw Quarry

Analyses Sheets.

ENVIRONMENTAL MONITORING REPORT

**Bradshaw Quarry
Penistone**

**September 2006
FENNELL, GREEN AND BATES
25 Smyth Street
Wakefield
WF1 1ED**

Landfill Gas Monitoring- Bradshaw Quarry, Penistone- 21 September 2006

Monitoring of this site was carried out on 21 September 2006 by Fennell Green and Bates.

Landfill gas monitoring

Monitoring was undertaken using a GA2000 which reads to 0.01 % methane.

The trigger values recommended in Waste Management paper No 27 are:

- a) methane 20% LEL or the equivalent of 1%GIA by volume
- b) carbon dioxide 1.5% by volume

The recommended trigger levels of carbon dioxide and methane are not exceeded.

Results of the water sampling are attached to this report

We would advise you to forward a copy of all results to the Environment Agency.

Yours faithfully

A handwritten signature in black ink, appearing to read 'S.L. Hunter', written in a cursive style.

S.L.Hunter

Landfill Gas Monitoring

SITE NAME: Bradshaw Quarry,
WEATHER CONDITIONS: Dry, cool

DATE: 21 September 2006
GROUND CONDITIONS: damp

ATMOSPHERIC PRESSURE: 991mbars

MONITORING POINT	METANE		CARBON DIOXIDE	OXYGEN	DEPTH TO WATER
	GIA %	LEL %	%	%	M
Borehole 1		0	0.1	20.0	24.3
Borehole 2		0	0	20.4	19.9
Borehole 3		0	0	19.2	23.4



ALcontrol Laboratories

01 NOV 2006

Templeborough House, Mill Close,
Rotherham, S60 1BZ
Tel : 01709 841096
Fax : 01709 841079
customer.services@alcontrol.co.uk

Mr J Carlon
Fennell Green & Bates
25 Smyth Street
Wakefield
WF1 1ED

30/10/2006

Dear Mr J Carlon

Your Ref and Description :

Site Name : Bradshaw Quarry

SDG Number : SDG06026345

Please find enclosed the test reports for the samples received on 21 Sep 2006.

The samples were given Lab numbers 060093894 - 060093896. Please quote these numbers should you have any queries about the enclosed test reports. This report should contain an Accredited Test Procedure List. If this document is absent please contact the customer services department as the report may be incomplete.

Where appropriate, all liquid and solid samples are retained for 10 working days from the report date: After that date the samples will be discarded.

If you wish to extend the period for which a sample is to be retained, please call 01709 841096. A cost of 20p per sample per container per day will apply for this extended storage service.

Should you have any queries about the enclosed report or if you have any comments to make about the service you have received, please contact the Customer Services Team at the address, telephone number or email address given above.

Yours sincerely

Lee Martin
Service Delivery Manager - Waters



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2300



Accredited Test Procedures

<u>Method Ref.</u>	<u>Technique</u>
R2.21	Colorimetric
R2.3.2/S2.3	Colorimetric
R2.4.2/S2.4	Colorimetric
R2.5	Colorimetric
R2.6.1/S2.6	Colorimetric
R2.7.3/S2.7	Colorimetric
R2.8.2/S2.8	Colorimetric
R3.2/S3.2	Titrimetric
R3.3/S3.3	Electrochemical
R3.4.1	Ion Selective Electrode
R3.5.1	Ion Selective Electrode
R3.6/S3.6.2	Ion Selective Electrode
R3.7.1/S3.7.1	Gravimetric
R3.8/S3.8	Gravimetric
R4.2/S4.1	Titrimetric
R5.1/S5.1	Electrochemical (dissolved oxygen probe)
R5.2/S5.2	Dichromate oxidation / colorimetric
R5.5	Ion Chromatography
R6.13	Colorimetric
R7.2	Infra-red spectrometry
R7.22	Gas chromatography - flame ionisation detector
R7.25	Gas chromatography - flame ionisation detector
R7.31	Gas chromatography - mass spectrometry
R7.41	Gas chromatography - mass spectrometry
R7.4.1	Gravimetric
R7.6	HPLC
R7.7	Gas chromatography - mass spectrometry
R7.9	Gas chromatography - mass spectrometry
R7.10	Thermal desorption / GC FID (MEG)
R8B	Inductively coupled plasma
R9A	Atomic fluorescence spectrometry
R9B	Atomic fluorescence spectrometry
R11.1/S11.1	Gravimetric
R11.2/S11.2	Gravimetric
R12.1	Respiration inhibition
R12.2.1a	Nitrification inhibition
R12.3	Microtox

Issue Date: 22/08/06
Issued By: N.Bingham
Page 1 of 1
Version 1.8





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Rotherham Laboratory : Templeborough House, Mill Close, Rotherham. S60 1BZ.
 Bellshill Laboratory : 2 Mallard Way, Strathclyde Business Park, Bellshill. ML4 3BF.
 Bradford Laboratory : George Street, Bradford. BD1 5AU.
 Telephone: 01709 841096 Fax: 01709 841079 E-mail: customer.services@alcontrol.co.uk

(UKAS Lab No. 0995/2300)
 (UKAS Lab No. 0995)
 (UKAS Lab No. 0996)

Certificate of Analysis

Sample Received : 21/09/2006
 Analysis Completed : 30/10/2006
 Site Name : Bradshaw Quarry

Fennell Green & Bates
 25 Smyth Street
 Wakefield
 WF1 1ED

Your PO No : None Supplied

Our Ref		060093894		060093895		060093896	
Your Ref		BH1 8m		BH2 8m		BH3 3m	
Sampled On		21/09/2006		21/09/2006		21/09/2006	
	Method						
Ammoniacal nitrogen	R2.3.2	0.647	mg/l N	0.814	mg/l N	1.21	mg/l N
Fluoride	R*5.5	0.214	mg/l	0.556	mg/l	0.34	mg/l
Nitrate	R2.7.3	< 0.4	mg/l N	< 0.4	mg/l N	< 0.4	mg/l N
Nitrite	R2.6.1	<0.08	mg/l N	<0.08	mg/l N	<0.08	mg/l N
Total oxidised nitrogen (TON)	R2.7.3	<0.5	mg/l N	<0.5	mg/l N	<0.5	mg/l N
Dissolved Oxygen	R3.2	8.08	mg/l	1.39	mg/l	3.81	mg/l
Silver (dissolved)	R*8B	0.47	ug/l	<0.3	ug/l	<0.3	ug/l
Arsenic (dissolved)	R9B	<0.75	ug/l	1.47	ug/l	<0.75	ug/l
Boron (dissolved)	R8B	132	ug/l	63.0	ug/l	<50	ug/l
Barium (dissolved)	R*8B	27.0	ug/l	38.3	ug/l	45.1	ug/l
Beryllium (dissolved)	R*8B	<0.3	ug/l	2.60	ug/l	<0.3	ug/l
Cadmium (total)	R8B	<0.005	mg/l	0.0173	mg/l	0.0073	mg/l
Cobalt (dissolved)	R*8B	<5	ug/l	34.4	ug/l	5.75	ug/l
Chromium (dissolved)	R8B	<4	ug/l	9.00	ug/l	<4	ug/l
Copper (dissolved)	R8B	<2	ug/l	211	ug/l	8.17	ug/l
Mercury (total)	R9A	<0.05	ug/l	<0.05	ug/l	<0.05	ug/l
Molybdenum (dissolved)	R8B	2.10	ug/l	<1.5	ug/l	17.0	ug/l
Nickel (dissolved)	R8B	<5	ug/l	164	ug/l	9.13	ug/l
Phosphorus (dissolved)	R8B.4	<0.1	mg/l	<0.1	mg/l	<0.1	mg/l
Lead (dissolved)	R8B	<6	ug/l	15.3	ug/l	<6	ug/l
Antimony (dissolved)	*9B	<0.75	ug/l	<0.75	ug/l	<0.75	ug/l
Selenium (dissolved)	R*9B	<0.75	ug/l	0.91	ug/l	<0.75	ug/l
Tin (dissolved)	R8B	<10	ug/l	<10	ug/l	<10	ug/l
Tellurium (dissolved)	R*8B	<0.5	ug/l	<0.5	ug/l	<0.5	ug/l
Titanium (dissolved)	R*8B	1.02	ug/l	<0.5	ug/l	5.14	ug/l
Thallium (dissolved)	R*8B	<0.2	ug/l	1.01	ug/l	0.502	ug/l
Uranium (dissolved)	R*8B	0.498	ug/l	27.2	ug/l	0.277	ug/l
Vanadium (dissolved)	R8B	<5	ug/l	<5	ug/l	<5	ug/l
Zinc (dissolved)	R8B	<10	ug/l	256	ug/l	11.3	ug/l
1,1,1,2-Tetrachloroethane	R7.9	<2	ug/l	<2	ug/l	<2	ug/l

Approved by: Hans van der Wart Business Director - Waters
 Reported : 30/10/2006 16:36

SDG Number : SDG06026345
 Certificate ID : 208333
 Page 1 of 8



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 2300



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 Telephone: 01709 841096 Fax: 01709 841079 E-mail: customer.services@alcontrol.co.uk

(UKAS Lab No. 0995/2300)
 (UKAS Lab No. 0995)
 (UKAS Lab No. 0996)

Certificate of Analysis

Sample Received : 21/09/2006
 Analysis Completed : 30/10/2006
 Site Name : Bradshaw Quarry

Fennell Green & Bates
 25 Smyth Street
 Wakefield
 WF1 1ED

Your PO No : None Supplied

Our Ref	060093894	060093895	060093896
Your Ref	BH1 8m	BH2 8m	BH3 3m
Sampled On	21/09/2006	21/09/2006	21/09/2006
Method			
1,1,1-Trichloroethane	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,1,2,2-Tetrachloroethane	R7.9 <10 ug/l	<10 ug/l	<10 ug/l
1,1,2-Trichloroethane	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,1-Dichloroethane	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,1-Dichloroethene	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,1-Dichloropropene	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,2,3-Trichlorobenzene	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,2,3-Trichloropropane	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,2,4-Trichlorobenzene	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,2,4-Trimethylbenzene	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,2-Dibromo-3-Chloropropane	R7.9 <10 ug/l	<10 ug/l	<10 ug/l
1,2-Dibromoethane	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,2-Dichlorobenzene	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,2-Dichloroethane	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,2-Dichloropropane	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,2-Dimethylbenzene (o-Xylene)	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,3 & 1,4-Dimethylbenzene (m & p-Xylene)	R7.9 <2 ug/l	4.20 ug/l	<2 ug/l
1,3,5-Trichlorobenzene	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,3,5-Trimethylbenzene	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,3-Dichlorobenzene	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,3-Dichloropropane	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,4-Dichlorobenzene	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
2,2-Dichloropropane	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
2-Chlorotoluene	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
4-Chlorotoluene	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
4-Isopropyltoluene	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1,1-Dimethylethylbenzene	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1-Methylethylbenzene	R7.9 <2 ug/l	<2 ug/l	<2 ug/l
1-Methylpropylbenzene	R7.9 <2 ug/l	<2 ug/l	<2 ug/l

Approved by: Hans van der Wart Business Director - Waters
 Reported : 30/10/2006 16:36

SDG Number : SDG06026345

Certificate ID : 208333

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(UKAS Lab No. 0995/2300)
 (UKAS Lab No. 0995)
 (UKAS Lab No. 0996)

Certificate of Analysis

Sample Received : 21/09/2006
 Analysis Completed : 30/10/2006
 Site Name : Bradshaw Quarry

Fennell Green & Bates
 25 Smyth Street
 Wakefield
 WF1 1ED

Your PO No : None Supplied

Our Ref		060093894	060093895	060093896
Your Ref		BH1 8m	BH2 8m	BH3 3m
Sampled On		21/09/2006	21/09/2006	21/09/2006
	Method			
Benzene	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
Bromobenzene	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
Bromochloromethane	R7.9	<10 ug/l	<10 ug/l	<10 ug/l
Bromodichloromethane	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
Chlorobenzene	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
cis-1,2-Dichloroethene	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
cis-1,3-Dichloropropene	R7.9	<10 ug/l	<10 ug/l	<10 ug/l
Dibromochloromethane	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
Dibromomethane	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
Dichloromethane	R7.9	<10 ug/l	<10 ug/l	<10 ug/l
Ethylbenzene	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
Hexachloro-1,3-Butadiene	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
Naphthalene	R7.9	<10 ug/l	<10 ug/l	<10 ug/l
n-Butylbenzene	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
n-Propylbenzene	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
Styrene	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
Tetrachloroethene	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
Tetrachloromethane	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
(carbon tetrachloride)				
Toluene	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
trans-1,2-Dichloroethene	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
trans-1,3-Dichloropropene	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
Tribromomethane	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
(bromoform)				
Trichloroethene	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
Trichloromethane	R7.9	<2 ug/l	<2 ug/l	<2 ug/l
(chloroform)				
VOC/HS1 Liq Scan	R*	(1) See report	(1) See report	(1) See report
SVOC BNA	R*7.50.X	(3) See report	(3) See report	(5) See report
SVOC DERIV	R*7.50.X	(2) See report	(4) See report	(2) See report
Tributyltin	R*7.23.X	<0.025 ug/l	<0.05 ug/l	<0.025 ug/l
Triphenyltin	R*7.23.X	<0.025 ug/l	<0.05 ug/l	<0.025 ug/l

Approved by: Hans van der Wart Business Director - Waters
 Reported : 30/10/2006 16:36

SDG Number : SDG06026345

Certificate ID : 208333

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Bellshill Laboratory : 2 Mallard Way, Strathclyde Business Park, Bellshill. ML4 3BF.
Bradford Laboratory : George Street, Bradford. BD1 5AU.
Telephone: 01709 841096 Fax: 01709 841079 E-mail: customer.services@alcontrol.co.uk

(UKAS Lab No. 0995/2300)
(UKAS Lab No. 0995)
(UKAS Lab No. 0996)

Certificate of Analysis

Sample Received : 21/09/2006
Analysis Completed : 30/10/2006
Site Name : Bradshaw Quarry
Your PO No : None Supplied

Fennell Green & Bates
25 Smyth Street
Wakefield
WF1 1ED



Approved by: Hans van der Wart Business Director - Waters
Reported : 30/10/2006 16:36

SDG Number : SDG06026345
Certificate ID : 208333
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(UKAS Lab No. 0995/2300)
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(UKAS Lab No. 0996)

Certificate of Analysis

Sample Received : 21/09/2006
Analysis Completed : 30/10/2006
Site Name : Bradshaw Quarry

Fennell Green & Bates
25 Smyth Street
Wakefield
WF1 1ED

Your PO No : None Supplied

Result Notes

(1) Report for VOC Scan:

The anticipated detection limit for this analysis is approximately 100ug/l quantified ONLY by comparison with an internal standard.

A tentative identification of a compound is only reported if the PBM (Probability Based Matching) algorithm produces a match quality of greater than 75%

Tentatively identified compounds: -

No additional VOC compounds were detected.

This means that no reportable compounds were found under the analytical conditions employed in this method, at concentrations greater than 100ug/l
Report for Derivatised SVOC from EC groundwater directive 80/68:-

(2)

Core determinands as specified in the above

2-chlorophenol: - <50ug/l
Dichlorprop: - <50ug/l
Pentachlorophenol: - <50ug/l
Bromoxynil: - <50ug/l
2,4,6 Trichlorophenol: - <50ug/l

The internal standards Trichloropropane, Chloroxynil and Dibromo octafluorobiphenyl were recovered and derivatised satisfactorily.

The anticipated detection limit for this analysis is approximately 50ug/l quantified ONLY by comparison with the closest internal standard.

A tentative identification of a compound is only reported if the PBM (Probability Based Matching) algorithm produces a match quality of greater than 75%

Tentatively identified compounds: -

A GC/MS scan was conducted on a derivatised dichloromethane extract from this sample but no reportable peaks were found on the resulting chromatogram.

This means that no reportable compounds were found under the analytical conditions employed in this method, at concentrations greater than 50ug/l.

Approved by: Hans van der Wart Business Director - Waters
Reported : 30/10/2006 16:36

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Sample Received : 21/09/2006
Analysis Completed : 30/10/2006
Site Name : Bradshaw Quarry
Your PO No : None Supplied

Fennell Green & Bates
25 Smyth Street
Wakefield
WF1 1ED

(3) Report for BNA extraction for SVOC from EC groundwater directive 80/68: -

Core determinands as specified in the above

Aldrin: - <10ug/l
Pentachlorobenzene: - <10ug/l
Malathion: - <10ug/l
Trifluralin: - <10ug/l
Simazine: - <10ug/l

The internal standards Fluoroaniline, Dibromobiphenyl and Acenaphthene D10 were recovered satisfactorily.

The anticipated detection limit for this analysis is approximately 10ug/l quantified ONLY by comparison with the closest internal standard.

A tentative identification of a compound is only reported if the PBM (Probability Based Matching) algorithm produces a match quality of greater than 75%

Tentatively identified compounds: -

A GC/MS scan was conducted on a dichloromethane extract from this sample but no reportable peaks were found on the resulting chromatogram.

This means that no reportable compounds were found under the analytical conditions employed in this method, at concentrations greater than 10ug/l.

Approved by: Hans van der Wart Business Director - Waters
Reported : 30/10/2006 16:36

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Certificate ID : 208333
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Certificate of Analysis

Sample Received : 21/09/2006
Analysis Completed : 30/10/2006
Site Name : Bradshaw Quarry
Your PO No : None Supplied

Fennell Green & Bates
25 Smyth Street
Wakefield
WF1 1ED

(4) Report for Derivatised SVOC from EC groundwater directive 80/68:-

Core determinands as specified in the above

2-chlorophenol: - <20ug/l
Dichlorprop: - <20ug/l
Pentachlorophenol: - <20ug/l
Bromoxynil: - <20ug/l
2,4,6 Trichlorophenol: - <20ug/l

The internal standards Trichloropropane, Chloroxynil and Dibromo octafluorobiphenyl were recovered and derivatised satisfactorily.

The anticipated detection limit for this analysis is approximately 20ug/l quantified ONLY by comparison with the closest internal standard.

A tentative identification of a compound is only reported if the PBM (Probability Based Matching) algorithm produces a match quality of greater than 75%

Tentatively identified compounds: -

A GC/MS scan was conducted on a derivatised dichloromethane extract from this sample but no reportable peaks were found on the resulting chromatogram.

This means that no reportable compounds were found under the analytical conditions employed in this method, at concentrations greater than 20ug/l.

Approved by: Hans van der Wart Business Director - Waters
Reported : 30/10/2006 16:36

SDG Number : SDG06026345
Certificate ID : 208333
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ENVIRONMENTAL MONITORING REPORT

**BRADSHAW QUARRY
Millhouse Green**

November 2006
FENNELL, GREEN AND BATES
25 Smyth Street
Wakefield
WF1 1ED

Landfill Gas Monitoring

SITE NAME: Bradshaw Quarry,
WEATHER CONDITIONS: Dry, cool

DATE: 09 November 2006
GROUND CONDITIONS: damp

ATMOSPHERIC PRESSURE: 991mbars

MONITORING POINT	METANE		CARBON DIOXIDE	OXYGEN	DEPTH TO WATER
	GIA %	LEL %	%	%	M
Borehole 1		0	0.1	20.0	6.85
Borehole 2		0	0	20.4	8.52
Borehole 3		0	0	19.2	2.77



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(UKAS Lab No. 0995/2300)
(UKAS Lab No. 0995)
(UKAS Lab No. 0996)

Certificate of Analysis

Sample Received : 21/09/2006
Analysis Completed : 30/10/2006
Site Name : Bradshaw Quarry

Fennell Green & Bates
25 Smyth Street
Wakefield
WF1 1ED

Your PO No : None Supplied

(5) Report for BNA extraction for SVOC from EC groundwater directive 80/68: -

Core determinands as specified in the above

Aldrin: - <20ug/l
Pentachlorobenzene: - <20ug/l
Malathion: - <20ug/l
Trifluralin: - <20ug/l
Simazine: - <20ug/l

The internal standards Fluoroaniline, Dibromobiphenyl and Acenaphthene D10 were recovered satisfactorily.

The anticipated detection limit for this analysis is approximately 20ug/l quantified ONLY by comparison with the closest internal standard.

A tentative identification of a compound is only reported if the PBM (Probability Based Matching) algorithm produces a match quality of greater than 75%

Tentatively identified compounds: -

A GC/MS scan was conducted on a dichloromethane extract from this sample but no reportable peaks were found on the resulting chromatogram.

This means that no reportable compounds were found under the analytical conditions employed in this method, at concentrations greater than 20ug/l.

Approved by: Hans van der Wart Business Director - Waters
Reported : 30/10/2006 16:36

SDG Number : SDG06026345

Certificate ID : 208333

Page 8 of 8



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 (UKAS Lab No. 0995)
 (UKAS Lab No. 0996)

Certificate of Analysis

Sample Received : 09/11/2006
 Analysis Completed : 30/11/2006
 Site Name : Bradshaw Quarry
 Your PO No : None Supplied

Fennell Green & Bates
 25 Smyth Street
 Wakefield
 WF1 1ED

(4) Report for BNA extraction for SVOC from EC groundwater directive 80/68:-

Core determinands as specified in the above

Aldrin: - <200ug/l
 Pentachlorobenzene: - <200ug/l
 Malathion: - <200ug/l
 Trifluralin: - <200ug/l
 Simazine: - <200ug/l

The internal standards Fluoroaniline, Dibromobiphenyl and Acenaphthene D10 were recovered satisfactorily.

The main compounds tentatively identified by library matching and quantified ONLY by comparison with the closest internal standard are listed below.

Reporting criteria :-

The anticipated detection limit for this analysis is approximately 200ug/l
 That means that under the analytical conditions employed, only compounds at concentrations greater than 200ug/l are reported.
 A tentative identification of a compound is only reported if the PBM (Probability Based Matching) algorithm produces a match quality of greater than 75%

Tentatively identified compounds: -

(5) Bis(2-ethylhexyl)phthalate :- 3900 ug/l
 Report for VOC Scan:

The anticipated detection limit for this analysis is approximately 100ug/l quantified ONLY by comparison with an internal standard.

A tentative identification of a compound is only reported if the PBM (Probability Based Matching) algorithm produces a match quality of greater than 75%

Tentatively identified compounds: -

No additional VOC compounds were detected.

This means that no reportable compounds were found under the analytical conditions employed in this method, at concentrations greater than 100ug/l

Approved by: Andrew Timms Environmental Laboratory Manager
 Reported : 30/11/2006 10:37

SDG Number : SDG06030864

Certificate ID : 214530

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(UKAS Lab No. 0995/2300)
 (UKAS Lab No. 0996)
 (UKAS Lab No. 0996)

Certificate of Analysis

Sample Received : 09/11/2006
 Analysis Completed : 30/11/2006
 Site Name : Bradshaw Quarry
 Your PO No : None Supplied

Fennell Green & Bates
 25 Smyth Street
 Wakefield
 WF1 1ED

(2) Report for Derivatised SVOC from EC groundwater directive 80/68:-

Core determinands as specified in the above

2-chlorophenol: - <200ug/l
 Dichlorprop: - <200ug/l
 Pentachlorophenol: - <200ug/l
 Bromoxynil: - <200ug/l
 2,4,6 Trichlorophenol: - <200ug/l

The internal standards Trichloropropane, Chloroxynil and Dibromo octafluorobiphenyl were recovered and derivatised satisfactorily.

The anticipated detection limit for this analysis is approximately 200ug/l quantified ONLY by comparison with the closest internal standard.

A tentative identification of a compound is only reported if the PBM (Probability Based Matching) algorithm produces a match quality of greater than 75%

Tentatively identified compounds: -

A GC/MS scan was conducted on a derivatised dichloromethane extract from this sample but no reportable peaks were found on the resulting chromatogram.

This means that no reportable compounds were found under the analytical conditions employed in this method, at concentrations greater than 200ug/l.
 Report for VOC Scan:

(3)

The anticipated detection limit for this analysis is approximately 100ug/l quantified ONLY by comparison with an internal standard.

A tentative identification of a compound is only reported if the PBM (Probability Based Matching) algorithm produces a match quality of greater than 75%

Tentatively identified compounds: -

No additional VOC compounds were detected.

This means that no reportable compounds were found under the analytical conditions employed in this method, at concentrations greater than 500ug/l

Approved by: Andrew Timms Environmental Laboratory Manager
 Reported : 30/11/2006 10:37

SDG Number : SDG06030864

Certificate ID : 214530

Page 6 of 8



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Certificate of Analysis

Sample Received : 09/11/2006
Analysis Completed : 30/11/2006
Site Name : Bradshaw Quarry

Fennell Green & Bates
25 Smyth Street
Wakefield
WF1 1ED

Your PO No : None Supplied

Result Notes

(1) Report for BNA extraction for SVOC from EC groundwater directive 80/68: -

Core determinands as specified in the above

Aldrin: - <200ug/l
Pentachlorobenzene: - <200ug/l
Malathion: - <200ug/l
Trifluralin: - <200ug/l
Simazine: - <200ug/l

The internal standards Fluoroaniline, Dibromobiphenyl and Acenaphthene D10 were recovered satisfactorily.

The anticipated detection limit for this analysis is approximately 200ug/l quantified ONLY by comparison with the closest internal standard.

A tentative identification of a compound is only reported if the PBM (Probability Based Matching) algorithm produces a match quality of greater than 75%

Tentatively identified compounds: -

A GC/MS scan was conducted on a dichloromethane extract from this sample but no reportable peaks were found on the resulting chromatogram.

This means that no reportable compounds were found under the analytical conditions employed in this method, at concentrations greater than 200ug/l.

Approved by: Andrew Timms Environmental Laboratory Manager
Reported : 30/11/2006 10:37

SDG Number : SDG06030864
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Sample Received : 09/11/2006
Analysis Completed : 30/11/2006
Site Name : Bradshaw Quarry

Fennell Green & Bates
25 Smyth Street
Wakefield
WF1 1ED

Your PO No : None Supplied

Our Ref	060108846	060108847	060108848
Your Ref	BH3	BH2	BH1
Sampled On	09/11/2006	09/11/2006	09/11/2006
Method			
Triphenyltin	R*7.23.X		
	<0.13 ug/l	<0.13 ug/l	<0.13 ug/l

Approved by: Andrew Timms Environmental Laboratory Manager
Reported : 30/11/2006 10:37

SDG Number : SDG06030864
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 Analysis Completed : 30/11/2006
 Site Name : Bradshaw Quarry

Fennell Green & Bates
 25 Smyth Street
 Wakefield
 WF1 1ED

Your PO No : None Supplied

Our Ref		060108846		060108847		060108848	
Your Ref		BH3		BH2		BH1	
Sampled On		09/11/2006		09/11/2006		09/11/2006	
	Method						
1-Methylpropylbenzene	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
Benzene	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
Bromobenzene	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
Bromochloromethane	R7.9	<50	ug/l	<10	ug/l	<10	ug/l
Bromodichloromethane	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
Chlorobenzene	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
cis-1,2-Dichloroethene	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
cis-1,3-Dichloropropene	R7.9	<50	ug/l	<10	ug/l	<10	ug/l
Dibromochloromethane	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
Dibromomethane	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
Dichloromethane	R7.9	<50	ug/l	18.2	ug/l	<10	ug/l
Ethylbenzene	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
Hexachloro-1,3-Butadiene	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
Naphthalene	R7.9	<50	ug/l	<10	ug/l	<10	ug/l
n-Butylbenzene	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
n-Propylbenzene	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
Styrene	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
Tetrachloroethene	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
Tetrachloromethane (carbon tetrachloride)	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
Toluene	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
trans-1,2-Dichloroethene	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
trans-1,3-Dichloropropene	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
Tribromomethane (bromoform)	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
Trichloroethene	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
Trichloromethane (chloroform)	R7.9	<10	ug/l	<2	ug/l	<2	ug/l
VOC/HS1 Liq Scan	R*	(3) See report		(5) See report		(5) See report	
SVOC BNA	R*7.50.X	(1) See report		(4) See report		(6) See report	
SVOC DERIV	R*7.50.X	(2) See report		(2) See report		(2) See report	
Tributyltin	R*7.23.X	<0.13	ug/l	<0.13	ug/l	<0.13	ug/l

Approved by: Andrew Timms Environmental Laboratory Manager
 Reported : 30/11/2006 10:37

SDG Number : SDG06030864
 Certificate ID : 214530
 Page 3 of 8



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0995
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 2300



ALcontrol Laboratories

Rotherham Laboratory : Templeborough House, Mill Close, Rotherham. S60 1BZ.
 Bellshill Laboratory : 2 Mallard Way, Strathclyde Business Park, Bellshill. ML4 3BF.
 Bradford Laboratory : George Street, Bradford. BD1 5AU.
 Telephone: 01709 841096 Fax: 01709 841079 E-mail: customer.services@alcontrol.co.uk

(UKAS Lab No. 0995/2300)
 (UKAS Lab No. 0995)
 (UKAS Lab No. 0996)

Certificate of Analysis

Sample Received : 09/11/2006
 Analysis Completed : 30/11/2006
 Site Name : Bradshaw Quarry
 Your PO No : None Supplied

Fennell Green & Bates
 25 Smyth Street
 Wakefield
 WF1 1ED

Our Ref	060108846	060108847	060108848
Your Ref	BH3	BH2	BH1
Sampled On	09/11/2006	09/11/2006	09/11/2006
Method			
1,1,1,2-Tetrachloroethane	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,1,1-Trichloroethane	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,1,2,2-Tetrachloroethane	R7.9 <50 ug/l	<10 ug/l	<10 ug/l
1,1,2-Trichloroethane	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,1-Dichloroethane	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,1-Dichloroethene	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,1-Dichloropropane	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,2,3-Trichlorobenzene	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,2,3-Trichloropropane	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,2,4-Trichlorobenzene	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,2,4-Trimethylbenzene	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,2-Dibromo-3-Chloropropane	R7.9 <50 ug/l	<10 ug/l	<10 ug/l
1,2-Dibromoethane	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,2-Dichlorobenzene	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,2-Dichloroethane	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,2-Dichloropropane	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,2-Dimethylbenzene (o-Xylene)	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,3 & 1,4 Dimethylbenzene (m & p-Xylene)	R7.9 <10 ug/l	2.80 ug/l	<2 ug/l
1,3,5-Trichlorobenzene	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,3,5-Trimethylbenzene	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,3-Dichlorobenzene	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,3-Dichloropropane	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,4-Dichlorobenzene	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
2,2-Dichloropropane	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
2-Chlorotoluene	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
4-Chlorotoluene	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
4-Isopropyltoluene	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1,1-Dimethylethylbenzene	R7.9 <10 ug/l	<2 ug/l	<2 ug/l
1-Methylethylbenzene	R7.9 <10 ug/l	<2 ug/l	<2 ug/l

Approved by: Andrew Timms Environmental Laboratory Manager
 Reported : 30/11/2006 10:37

SDG Number : SDG06030864
 Certificate ID : 214530
 Page 2 of 8



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 Telephone: 01709 841096 Fax: 01709 841079 E-mail: customer.services@alcontrol.co.uk

(UKAS Lab No. 0995/2300)
 (UKAS Lab No. 0995)
 (UKAS Lab No. 0996)

Certificate of Analysis

Sample Received : 09/11/2006
 Analysis Completed : 30/11/2006
 Site Name : Bradshaw Quarry

Fennell Green & Bates
 25 Smyth Street
 Wakefield
 WF1 1ED

Your PO No : None Supplied

Our Ref		060108846		060108847		060108848	
Your Ref		BH3		BH2		BH1	
Sampled On		09/11/2006		09/11/2006		09/11/2006	
	Method						
Ammoniacal nitrogen	R2.3.2	1.61	mg/l N	1.03	mg/l N		
Ammoniacal nitrogen	R2.3.2					0.267	mg/l N
Fluoride	R*5.5	0.151	mg/l	0.559	mg/l	0.187	mg/l
Nitrate	R2.7.3	< 0.4	mg/l N	< 0.4	mg/l N	3.42	mg/l N
Nitrite	R2.6.1	0.102	mg/l N	<0.08	mg/l N	<0.08	mg/l N
Total oxidised nitrogen (TON)	R2.7.3	<0.5	mg/l N	<0.5	mg/l N	3.42	mg/l N
Dissolved Oxygen	R3.2	12.1	mg/l	14.5	mg/l	14.3	mg/l
Silver (dissolved)	R*8B	0.589	ug/l	0.706	ug/l	0.453	ug/l
Arsenic (dissolved)	R9B	2.14	ug/l	1.17	ug/l	<0.75	ug/l
Boron (dissolved)	R8B	607	ug/l	283	ug/l	210	ug/l
Barium (dissolved)	R*8B	32.8	ug/l	25.1	ug/l	11.5	ug/l
Beryllium (dissolved)	R*8B	<0.3	ug/l	1.61	ug/l	<0.3	ug/l
Cadmium (total)	R8B	0.0094	mg/l	0.0103	mg/l	<0.005	mg/l
Cobalt (dissolved)	R*8B	<5	ug/l	23.3	ug/l	<5	ug/l
Chromium (dissolved)	R8B	<4	ug/l	10.2	ug/l	<4	ug/l
Copper (dissolved)	R8B	8.64	ug/l	122	ug/l	3.11	ug/l
Mercury (total)	R9A	<0.05	ug/l	<0.05	ug/l	<0.05	ug/l
Molybdenum (dissolved)	R8B	10.5	ug/l	1.80	ug/l	4.79	ug/l
Nickel (dissolved)	R8B	8.47	ug/l	146	ug/l	5.32	ug/l
Phosphorus (dissolved)	R8B.4	<0.1	mg/l	<0.1	mg/l	<0.1	mg/l
Lead (dissolved)	R8B	<6	ug/l	12.0	ug/l	<6	ug/l
Antimony (dissolved)	*9B	<0.75	ug/l	<0.75	ug/l	<0.75	ug/l
Selenium (dissolved)	R*9B	<0.75	ug/l	<0.75	ug/l	<0.75	ug/l
Tin (dissolved)	R8B	<10	ug/l	<10	ug/l	<10	ug/l
Tellurium (dissolved)	R*8B	<0.5	ug/l	<0.5	ug/l	<0.5	ug/l
Titanium (dissolved)	R*8B	4.24	ug/l	<0.5	ug/l	1.21	ug/l
Thallium (dissolved)	R*8B	0.432	ug/l	0.813	ug/l	<0.2	ug/l
Uranium (dissolved)	R*8B	0.801	ug/l	16.8	ug/l	0.483	ug/l
Vanadium (dissolved)	R8B	<5	ug/l	<5	ug/l	<5	ug/l
Zinc (dissolved)	R8B	27.8	ug/l	196	ug/l	12.3	ug/l

Approved by: Andrew Timms Environmental Laboratory Manager
 Reported : 30/11/2006 10:37

SDG Number : SDG06030864
 Certificate ID : 214530
 Page 1 of 8



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Accredited Test Procedures

<u>Method Ref.</u>	<u>Technique</u>
R2.21	Colorimetric
R2.3.2/S2.3	Colorimetric
R2.4.2/S2.4	Colorimetric
R2.5	Colorimetric
R2.6.1/S2.6	Colorimetric
R2.7.3/S2.7	Colorimetric
R2.8.2/S2.8	Colorimetric
R3.2/S3.2	Titrimetric
R3.3/S3.3	Electrochemical
R3.4.1	Ion Selective Electrode
R3.5.1	Ion Selective Electrode
R3.6/S3.6.2	Ion Selective Electrode
R3.7.1/S3.7.1	Gravimetric
R3.8/S3.8	Gravimetric
R4.2/S4.1	Titrimetric
R5.1/S5.1	Electrochemical (dissolved oxygen probe)
R5.2/S5.2	Dichromate oxidation / colorimetric
R5.5	Ion Chromatography
R6.13	Colorimetric
R7.2	Infra-red spectrometry
R7.22	Gas chromatography - flame ionisation detector
R7.25	Gas chromatography - flame ionisation detector
R7.31	Gas chromatography - mass spectrometry
R7.41	Gas chromatography - mass spectrometry
R7.4.1	Gravimetric
R7.6	HPLC
R7.7	Gas chromatography - mass spectrometry
R7.9	Gas chromatography - mass spectrometry
R7.10	Thermal desorption / GC FID (MEG)
R8B	Inductively coupled plasma
R9A	Atomic fluorescence spectrometry
R9B	Atomic fluorescence spectrometry
R11.1/S11.1	Gravimetric
R11.2/S11.2	Gravimetric
R12.1	Respiration inhibition
R12.2.1a	Nitrification inhibition
R12.3	Microtox

Issue Date: 22/08/06
Issued By: N.Bingham
Page: 1 of 1
Version: 1.8



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ALcontrol Laboratories

01 DEC 2006

Templeborough House, Mill Close,
Rotherham, S60 1BZ
Tel : 01709 841096
Fax : 01709 841079
customer.services@alcontrol.co.uk

Mr J Carlon
Fennell Green & Bates
25 Smyth Street
Wakefield
WF1 1ED

30/11/2006

Dear Mr J Carlon

Your Ref and Description : None Supplied

Site Name : Bradshaw Quarry

SDG Number : SDG06030864

Please find enclosed the test reports for the samples received on 09 Nov 2006.

The samples were given Lab numbers 060108846 - 060108848. Please quote these numbers should you have any queries about the enclosed test reports. This report should contain an Accredited Test Procedure List. If this document is absent please contact the customer services department as the report may be incomplete.

Where appropriate, all liquid and solid samples are retained for 10 working days from the report date. After that date the samples will be discarded.

If you wish to extend the period for which a sample is to be retained, please call 01709 841096. A cost of 20p per sample per container per day will apply for this extended storage service.

Should you have any queries about the enclosed report or if you have any comments to make about the service you have received, please contact the Customer Services Team at the address, telephone number or email address given above.

Yours sincerely

Lee Martin
Service Delivery Manager - Waters



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2300



Attention: Paul Redman

CERTIFICATE OF ANALYSIS

Date: 12 September 2010
Customer: H_FGBSURV_WAK-7
Sample Delivery Group (SDG): 100906-62 **Report No.:** 96530
Your Reference:
Location: Bradshaw Quarry

We received 8 samples on Monday September 06, 2010 and 8 of these samples were scheduled for analysis which was completed on Sunday September 12, 2010. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

J. Sinton

Operations Director - Land UK & Ireland

Trading division of ALcontrol UK Limited

2 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No: 4057291



Validated

ALcontrol Laboratories Analytical Services

SDG:	100906-62	Customer:	Fennel, Green & Bates Surveyors
Job:	H_FGBSURV_WAK-7	Attention:	Paul Redman
Client Reference:		Order No.:	
Location:	Bradshaw Quarry	Report No:	96530

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
2051530	BH1		3.12	03/09/2010
2051539	BH2		6.24	03/09/2010
2051550	BH3		8.60	03/09/2010
2051561	BH4		4.42	03/09/2010
2051579	BH5		5.06	03/09/2010
2051593	BH6		0.98	03/09/2010
2051606	BH7		5.89	03/09/2010
2051621	SW3 / POND			03/09/2010

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

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

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

Asbestos Type

Common Name

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

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKE	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM	LIQUID/LIQUID SHAKE	GC MS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GC FID

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOX THERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOX THERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOX THERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOX THERM	HPLC
Phenols by GCMS	WET	DCM	SOX THERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOX THERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOX THERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH_4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. Results relate only to the items tested
13. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported.
For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 – 130 %.
14. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
18. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
19. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as $\mu\text{g/kg}$ or $\mu\text{g/l}$. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

APPENDIX

Table of Results - Appendix

Sample Number : 100906-62

Client : H_FGBSURV_WAK

Client Ref :

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10⁻⁷

NDP	No Determination Possible	ISO	ISO 17025 Accredited ¹	Sub	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	RP	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample	Surrogate Corrected
TM045	MEWAM BOD5 2nd Ed.HMSO 1988 / Method 5210B, AWWA/APHA, 20th Ed., 1999; SCA Blue Book 130	Determination of BOD (ATU) Filtered by Oxygen Meter on liquids		
TM062	MEWAM BOOK 124 1988.HMSO/ Method 17.7, Second Site property, March 2003	Determination of Phenolic compounds by HPLC with electro-chemical detection		
TM087	Modified: US EPA Method 8440	Measurement of Total Petroleum Hydrocarbons in soil or water samples by infra-red spectrophotometry		
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water		
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter		
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water		
TM133	BS 1377: Part 3 1990/BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM187	Winkler, L.W, Ber Deutsch. Chem. Ges, 21,2843,1888.*	Dissolved Oxygen in Natural and Waste Waters HMSO 1979 ISBN 011 751442		
TM235	The Determination of Hydrocarbon Oils in Waters by Solvent Extraction, Infra red Absorption and Gravimetry 1983, HMSO, London	Determination of Total Petroleum Hydrocarbons (TPH) in Waters By Infra-Red Spectroscopy		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM259				

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

APPENDIX

SDG: 100906-62
 Job: H_FGBSURV_WAK-7
 Client Reference:
 Location: Bradshaw Quarry

Customer: Fennel, Green & Bates Surveyors
 Attention: Paul Redman
 Order No.:
 Report No: 96530

Results Legend		Customer Sample Ref.	BH7	SW3 / POND	
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	5.89		
M	ANCERTS accredited.		Water(GW/SW)	Water(GW/SW)	
AQ	Aqueous / settled sample.		03/09/2010	03/09/2010	
Diss.filt	Dissolved / filtered sample.		08/09/2010	06/09/2010	
Total.filt	Total / unfiltered sample.		100906-62	100906-62	
-	subcontracted test.		2051806	2051821	
* % recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.					
Component	LOD/Units	Method			
BOD, unfiltered	<1 mg/l	TM045	5.4	1.54	
Organic Carbon, Total	<3 mg/l	TM090	18.5	10.7	
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	0.798	<0.2	
Fluoride	<0.5 mg/l	TM104	<0.5	<0.5	
Conductivity @ 20 deg.C	<0.014 mS/cm	TM120	0.316	0.326	
Dissolved solids, Total (meter)	<5 mg/l	TM123	237	256	
Arsenic (diss.filt)	<0.12 µg/l	TM152	1.77	0.583	
Boron (diss.filt)	<9.4 µg/l	TM152	50.1	55.5	
Cadmium (diss.filt)	<0.1 µg/l	TM152	0.441	<0.1	
Chromium (diss.filt)	<0.22 µg/l	TM152		3.86	
Copper (diss.filt)	<0.85 µg/l	TM152	10.3	<0.85	
Lead (diss.filt)	<0.02 µg/l	TM152	14.2	0.027	
Molybdenum (diss.filt)	<0.24 µg/l	TM152	217	28.8	
Nickel (diss.filt)	<0.15 µg/l	TM152	12.2	2.57	
Selenium (diss.filt)	<0.39 µg/l	TM152	4.38	0.812	
Uranium (diss.filt)	<1.5 µg/l	TM152	<1.5	<1.5	
Vanadium (diss.filt)	<0.24 µg/l	TM152	1.28	1.13	
Zinc (diss.filt)	<0.41 µg/l	TM152	10.5	2.75	
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	
Sulphate	<3 mg/l	TM184	57	41.8	
Chloride	<2 mg/l	TM184	20.3	28	
Oxygen, dissolved	<1 mg/l	TM187	4.94	7.4	
TPH / Oil & Greases	<1 mg/l	TM235	<1	<1	
pH	<1 pH Units	TM256	6.11	7.82	
Phenols, Total monohydric	<0.015 mg/l	TM259	<0.015	<0.015	

SDG: 100906-62
 Job: H_FGBSURV_WAK-7
 Client Reference:
 Location: Bradshaw Quarry

Customer: Fennel, Green & Bates Surveyors
 Attention: Paul Redman
 Order No.:
 Report No: 96530

Results Legend			Customer Sample Ref.		BH1	BH2	BH3	BH4	BH5	BH6
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference		3.12	6.24	8.60	4.42	5.06	0.96
M	mCERTS accredited.				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
aq	Aqueous / settled sample.				03/09/2010	03/09/2010	03/09/2010	03/09/2010	03/09/2010	03/09/2010
diss.filt	Dissolved / filtered sample.				06/09/2010	06/09/2010	06/09/2010	06/09/2010	06/09/2010	06/09/2010
tot.unfilt	Total / unfiltered sample.				100906-62	100906-62	100906-62	100906-62	100906-62	100906-62
*	subcontracted test.				2051530	2051539	2051550	2051561	2051579	2051593
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.									
Component	LOD/Units	Method								
BOD, unfiltered	<1 mg/l	TM045	<1	#	<1	#	1.05	#	<1	#
Organic Carbon, Total	<3 mg/l	TM090	18.1	#	<3	#	<3	#	15.1	#
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	1.47	#	0.374	#	0.423	#	1.36	#
Fluoride	<0.5 mg/l	TM104	1.78	#	<0.5	#	0.92	#	5.3	#
Conductivity @ 20 deg.C	<0.014 mS/cm	TM120	0.214	#	0.301	#	0.195	#	0.522	#
Dissolved solids, Total (meter)	<5 mg/l	TM123	171	#	245	#	159	#	412	#
Arsenic (diss.filt)	<0.12 µg/l	TM152	2.05	#	0.397	#	1.08	#	8.92	#
Boron (diss.filt)	<9.4 µg/l	TM152	20.7	#	110	#	68.1	#	44.4	#
Cadmium (diss.filt)	<0.1 µg/l	TM152	1.23	#	<0.1	#	0.303	#	0.232	#
Chromium (diss.filt)	<0.22 µg/l	TM152	6.78	#	7.37	#	4.71	#	4.08	#
Copper (diss.filt)	<0.85 µg/l	TM152	1.56	#	<0.85	#	1.08	#	1.05	#
Lead (diss.filt)	<0.02 µg/l	TM152	1.77	#	<0.02	#	<0.02	#	0.075	#
Molybdenum (diss.filt)	<0.24 µg/l	TM152	7.18	#	0.386	#	<0.24	#	0.766	#
Nickel (diss.filt)	<0.15 µg/l	TM152	4.42	#	0.87	#	11.2	#	3.47	#
Selenium (diss.filt)	<0.39 µg/l	TM152	1.73	#	0.996	#	0.735	#	0.916	#
Uranium (diss.filt)	<1.5 µg/l	TM152	<1.5	#	<1.5	#	<1.5	#	<1.5	#
Vanadium (diss.filt)	<0.24 µg/l	TM152	2.63	#	1.97	#	1.25	#	1.14	#
Zinc (diss.filt)	<0.41 µg/l	TM152	9.89	#	1.4	#	12.1	#	9.89	#
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	#	<0.01	#	<0.01	#	<0.01	#
Sulphate	<3 mg/l	TM184	13.2	#	<3	#	54.7	#	24.7	#
Chloride	<2 mg/l	TM184	34.7	#	12.6	#	20.1	#	35.2	#
Oxygen, dissolved	<1 mg/l	TM187	1.35	#	2.58	#	1.9	#	<1	#
TPH / Oil & Greases	<1 mg/l	TM235	1.07	#	<1	#	<1	#	<1	#
pH	<1 pH Units	TM256	6.31	#	7.51	#	5.23	#	5.74	#
Phenols, Total monohydric	<0.015 mg/l	TM259	<0.015	#	<0.015	#	<0.015	#	<0.015	#

SDG: 100906-62
Job: H_FGBSURV_WAK-7
Client Reference:
Location: Bradshaw Quarry

Customer: Fennel, Green & Bates Surveyors
Attention: Paul Redman
Order No.:
Report No: 96530

Test Completion Dates

[illegible]

SDG: 100906-62
Job: H_FGBSURV_WAK-7
Client Reference:
Location: Bradshaw Quarry

Customer: Fennel, Green & Bates Surveyors
Attention: Paul Redman
Order No.:
Report No: 96530

LIQUID

Results Legend

☒

Test

N

No Determination
Possible

[illegible]



environmentalscience

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Analytical Report Number : 11-26191

Project / Site name: Bradshaw

Samples received on: 08/02/2011

Your job number:

Samples instructed on: 08/02/2011

Your order number:

Analysis completed by: 04/03/2011

Report Issue Number: 1

Report issued on: 19/04/2011

Samples Analysed: 12 water samples

Signed:

Dr Claire Stone
Quality Manager
For & on behalf of I2 Analytical Ltd.

Signed:

Thurstan Plummer
Organics Technical Manager
For & on behalf of I2 Analytical Ltd.

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

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

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting



Analytical Report Number: 11-26191

Project / Site name: Bradshaw

Lab Sample Number				166839	166840	166841	166842	166843
Sample Reference				BH1	BH2	BH3	BH4	BH5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH	✓	pH units	N/A	ISO 17025	5.7	6.5	5.4	5.5	6.1
Electrical Conductivity	✓	µS/cm	10	NONE	190	310	210	180	1000
Sulphate as SO ₄	✓	µg/l	100	NONE	19000	4700	64000	24000	170000
Chloride	✓	mg/l	4	ISO 17025	88	19	21	34	58
Fluoride		µg/l	50	ISO 17025	100	180	150	210	160
Ammoniacal Nitrogen as N	✓	µg/l	15	ISO 17025	1300	230	280	350	1900
BOD (Biological Oxygen Demand)		mg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Total Dissolved Solids		mg/l	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Dissolved Oxygen		mg/l	1	NONE	6.5	6.7	6.7	5.4	5.4

Heavy Metals / Metalloids

Arsenic (dissolved)		µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Boron (dissolved)		µg/l	10	NONE	< 10	80	25	13	38
Cadmium (dissolved)		µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium (dissolved)		µg/l	1	ISO 17025	5.7	< 1.0	< 1.0	< 1.0	< 1.0
Copper (dissolved)		µg/l	1	ISO 17025	15	4.0	< 1.0	1.8	< 1.0
Lead (dissolved)		µg/l	5	ISO 17025	< 5.0	5.1	< 5.0	5.1	< 5.0
Mercury (dissolved)		µg/l	1.5	NONE	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Molybdenum (dissolved)		µg/l	3	ISO 17025	14	< 3.0	< 3.0	< 3.0	17.90
Nickel (dissolved)		µg/l	1	ISO 17025	4.0	< 1.0	8.5	1.8	< 1.0
Selenium (dissolved)		µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Vanadium (dissolved)		µg/l	5	ISO 17025	< 5.0	6.4	< 5.0	< 5.0	< 5.0
Zinc (dissolved)		µg/l	1	ISO 17025	36	12	19	21	18
Uranium (dissolved)		µg/l	100	NONE	< 100	< 100	< 100	< 100	< 100

Petroleum Hydrocarbons

TPH Texas (C6 - C8)		µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH Texas (C8 - C10)		µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH Texas (C10 - C12)		µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH Texas (C12 - C16)		µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH Texas (C16 - C21)		µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH Texas (C21 - C40)		µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH Texas (C6 - C40)		µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10



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Analytical Report Number: 11-26191

Project / Site name: Bradshaw

Lab Sample Number	166839	166840	166841	166842	166843
Sample Reference	BH1	BH2	BH3	BH4	BH5
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		

VOCs									
Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl Chloride	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



Analytical Report Number: 11-26191

Project / Site name: Bradshaw

Lab Sample Number	166839	166840	166841	166842	166843
Sample Reference	BH1	BH2	BH3	BH4	BH5
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		

SVOCs								
Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

U/S = Unsuitable Sample I/S = Insufficient Sample

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Iss No 11-26191-1



Analytical Report Number: 11-26191

Project / Site name: Bradshaw

Lab Sample Number	166844	166845	166846	166847	166848
Sample Reference	BH6	BH7	Surface 2	Surface 3	Pond Surface 1
Sample Number	None Supplied	Sample13	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH units	N/A	ISO 17025	7.4	6.2	6.8	7.3	7.1
Electrical Conductivity	µS/cm	10	NONE	1700	410	580	1200	720
Phosphate as SO ₄	µg/l	100	NONE	91000	90000	44000	< 100	140000
Chloride	mg/l	4	ISO 17025	51	22	29	39	29
Fluoride	µg/l	50	ISO 17025	1600	71	370	1400	650
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	5900	65	22	1000	210
BOD (Biological Oxygen Demand)	mg/l	3	NONE	< 3.0	< 3.0	< 3.0	1/5	< 3.0
Total Dissolved Solids	mg/l	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Dissolved Oxygen	mg/l	1	NONE	5.4	5.5	5.2	5.2	5.4

Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Boron (dissolved)	µg/l	10	NONE	470	20	< 10	< 10	100
Cadmium (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium (dissolved)	µg/l	1	ISO 17025	< 1.0	6.6	1.0	< 1.0	2.2
Copper (dissolved)	µg/l	1	ISO 17025	13	12	10	< 1.0	8.9
Lead (dissolved)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Mercury (dissolved)	µg/l	1.5	NONE	< 1.5	< 1.5	< 1.5	7.9	< 1.5
Molybdenum (dissolved)	µg/l	3	ISO 17025	24500	24500	24500	< 3.0	24500
Nickel (dissolved)	µg/l	1	ISO 17025	4.3	4.7	2.1	< 1.0	15
Selenium (dissolved)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Vanadium (dissolved)	µg/l	5	ISO 17025	< 5.0	13	< 5.0	< 5.0	< 5.0
Zinc (dissolved)	µg/l	1	ISO 17025	13	20	10	< 1.0	32
Uranium (dissolved)	µg/l	100	NONE	< 100	< 100	< 100	< 100	< 100

Petroleum Hydrocarbons

TPH Texas (C6 - C8)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH Texas (C8 - C10)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH Texas (C10 - C12)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH Texas (C12 - C16)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH Texas (C16 - C21)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH Texas (C21 - C40)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH Texas (C6 - C40)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10



Analytical Report Number: 11-26191

Project / Site name: Bradshaw

Lab Sample Number	166844	166845	166846	166847	166848
Sample Reference	BH6	BH7	Surface 2	Surface 3	Pond Surface 1
Sample Number	None Supplied	Sample13	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		

VOCs								
Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
P-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



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Analytical Report Number: 11-26191

Project / Site name: Bradshaw

Lab Sample Number				166844	166845	166846	166847	166848
Sample Reference				BH6	BH7	Surface 2	Surface 3	Pond Surface 1
Sample Number				None Supplied	Sample13	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status		

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

U/S = Unsuitable Sample I/S = Insufficient Sample

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Iss No 11-26191-1



Analytical Report Number: 11-26191

Project / Site name: Bradshaw

Lab Sample Number		166849	166850				
Sample Reference		Pond Surface 4	Pond Surface 5				
Sample Number		None Supplied	None Supplied				
Depth (m)		None Supplied	None Supplied				
Date Sampled		None Supplied	None Supplied				
Time Taken		None Supplied	None Supplied				
Analytical Parameter Water Analysis)	Units	Limit of detection	Accreditation Status				

General Inorganics

pH	pH units	N/A	ISO 17025	7.2	7.0		
Electrical Conductivity	$\mu\text{S/cm}$	10	NONE	950	480		
Sulphate as SO_4	$\mu\text{g/l}$	100	NONE	3500000	1200000		
Chloride	mg/l	4	ISO 17025	27	32		
Fluoride	$\mu\text{g/l}$	50	ISO 17025	280	260		
Ammoniacal Nitrogen as N	$\mu\text{g/l}$	15	ISO 17025	130	180		
BOD (Biological Oxygen Demand)	mg/l	3	NONE	< 3.0	< 3.0		
Total Dissolved Solids	mg/l	4	NONE	< 4.0	< 4.0		
Dissolved Oxygen	mg/l	1	NONE	5.3	5.2		

Heavy Metals / Metalloids

Arsenic (dissolved)	$\mu\text{g/l}$	10	ISO 17025	< 10	< 10		
Boron (dissolved)	$\mu\text{g/l}$	10	NONE	100	49		
Cadmium (dissolved)	$\mu\text{g/l}$	0.5	ISO 17025	< 0.5	< 0.5		
Chromium (dissolved)	$\mu\text{g/l}$	1	ISO 17025	2.8	1.4		
Copper (dissolved)	$\mu\text{g/l}$	1	ISO 17025	10	7.8		
Lead (dissolved)	$\mu\text{g/l}$	5	ISO 17025	< 5.0	< 5.0		
Mercury (dissolved)	$\mu\text{g/l}$	1.5	NONE	< 1.5	< 1.5		
Molybdenum (dissolved)	$\mu\text{g/l}$	3	ISO 17025	3.0	1.5		
Nickel (dissolved)	$\mu\text{g/l}$	1	ISO 17025	3.0	16		
Selenium (dissolved)	$\mu\text{g/l}$	10	ISO 17025	< 10	< 10		
Vanadium (dissolved)	$\mu\text{g/l}$	5	ISO 17025	< 5.0	< 5.0		
Zinc (dissolved)	$\mu\text{g/l}$	1	ISO 17025	16	37		
Uranium (dissolved)	$\mu\text{g/l}$	100	NONE	< 100	< 100		

Petroleum Hydrocarbons

TPH Texas (C6 - C8)	$\mu\text{g/l}$	10	NONE	< 10	< 10		
TPH Texas (C8 - C10)	$\mu\text{g/l}$	10	NONE	< 10	< 10		
TPH Texas (C10 - C12)	$\mu\text{g/l}$	10	NONE	< 10	< 10		
TPH Texas (C12 - C16)	$\mu\text{g/l}$	10	NONE	< 10	< 10		
TPH Texas (C16 - C21)	$\mu\text{g/l}$	10	NONE	< 10	< 10		
TPH Texas (C21 - C40)	$\mu\text{g/l}$	10	NONE	< 10	< 10		
TPH Texas (C6 - C40)	$\mu\text{g/l}$	10	NONE	< 10	< 10		



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Analytical Report Number: 11-26191

Project / Site name: Bradshaw

Lab Sample Number					166849	166850			
Sample Reference					Pond Surface 4	Pond Surface 5			
Sample Number					None Supplied	None Supplied			
Depth (m)					None Supplied	None Supplied			
Date Sampled					None Supplied	None Supplied			
Time Taken					None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	units	Limit of detection	Accreditation Status						

VOCs									
Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0				
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0				
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0				
Methyl Chloride	µg/l	1	ISO 17025	< 1.0	< 1.0				
Trichlorofluoromethane	µg/l	1	ISO 17025	< 1.0	< 1.0				
1,1-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0				
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0				
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0				
1,1-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0				
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0				
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0				
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0				
1,2-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0				
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0				
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0				
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0				
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0				
1,2-dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0				
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0				
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0				
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0				
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0				
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0				
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0				
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0				
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0				
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0				
1,1-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0				
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0				
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0				
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0				
Tribromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0				
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0				
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0				
N-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0				
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0				
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0				
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0				
Tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0				
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0				
Sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0				
1,3-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0				
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0				
1,2-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0				
1,4-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0				
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0				
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0				
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0				
Hexachlorobutadiene	µg/l	0.1	ISO 17025	< 0.1	< 0.1				
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0				



Analytical Report Number: 11-26191

Project / Site name: Bradshaw

Lab Sample Number				166849	166850			
Sample Reference				Pond Surface 4	Pond Surface 5			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				None Supplied	None Supplied			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05			
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05			
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05			
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05			
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05			
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05			
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05			
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05			
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05			
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05			
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05			
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05			
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05			
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05			
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05			
Hexachlorobenzene	µg/l	0.02	NONE	< 0.02	< 0.02			
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05			
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05			
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05			
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05			
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			

U/S = Unsuitable Sample I/S = Insufficient Sample

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Iss No 11-26191-1



Analytical Report Number : 11-26191

Project / Site name: Bradshaw

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in water	Determination of ammoniacal nitrogen in water by addition of buffer solution followed by ion selective electrode. Accredited matrices: SW PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L035-UK	W	ISO 17025
Biological oxygen demand of water	Determination of biochemical oxygen demand in water.	In-house method		W	NONE
Boron in water	Determination of boron by acidification followed by ICP-OES.	In-house method based on MEWAM	L039-UK	W	NONE
Chloride in water	Determination of chloride in water by titration against silver nitrate. Accredited matrices: SW PW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L024-UK	W	ISO 17025
Dissolved Oxygen in water	Determination of dissolved oxygen.	In-house method		W	NONE
Electrical conductivity of water	Determination of electrical conductivity in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031-PL	W	NONE
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW PW	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033-UK	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-UK	W	ISO 17025
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in water by extraction in hexane followed by GC-MS.	In-house method based on USEPA 8270	L070-UK	W	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-UK	W	NONE
Total dissolved solids in water	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-UK	W	NONE
TPH Texas (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-UK	W	NONE
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW	In-house method based on USEPA8260	L036-UK	W	ISO 17025

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

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

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



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Analytical Report Number : 11-26229

Project / Site name: Bradshaw

Samples received on: 08/02/2011

Your job number:

Samples instructed on: 08/02/2011

Your order number:

Analysis completed by: 21/02/2011

Report Issue Number: 1

Report issued on: 21/02/2011

Samples Analysed: 2 wac multi samples

Signed:

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Thurstan Plummer
Organics Technical Manager
For & on behalf of i2 Analytical Ltd.

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

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

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting

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Waste Acceptance Criteria Analytical Results							
Report No:	11-26229						
					Client: CROMWELLWOOD		
					Landfill Waste Acceptance Criteria		
Location	Bradshaw				Limits		
Lab Reference (Sample Number)	166987						
Sampling Date							
Sample ID	BH8						
Depth (m)					Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Solid Waste Analysis							
TOC (%)**	0.7				3%	5%	6%
Loss on Ignition (%)	3.6				—	—	10%
BTEX (µg/kg) **	< 10				6000	—	—
Sum of PCBs (mg/kg)	< 0.30				1	—	—
Mineral Oil (mg/kg)	< 10				500	—	—
Total PAH (mg/kg)	26				100	—	—
pH (units)**	7.9				—	>6	—
Acid Neutralisation Capacity (mol / kg)	0.011				—	To be evaluated	To be evaluated
Eluate Analysis	2:1	8:1		Cumulative 10:1	Limit values for compliance leaching test		
					using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
	mg/l	mg/l		mg/kg			
Arsenic	< 0.010	< 0.010		< 0.050	0.5	2	25
Barium	0.13	0.095		0.99	20	100	300
Cadmium	< 0.0005	< 0.0005		< 0.0020	0.04	1	5
Chromium	< 0.0010	0.0032		0.026	0.5	10	70
Copper	0.0070	0.0066		0.067	2	50	100
Mercury	< 0.0015	< 0.0015		< 0.010	0.01	0.2	2
Molybdenum	0.045	0.037		0.38	0.5	10	30
Nickel	0.0053	0.0043		0.044	0.4	10	40
Lead	< 0.0050	< 0.0050		0.021	0.5	10	50
Antimony	< 0.0050	< 0.0050		< 0.020	0.06	0.7	5
Selenium	0.026	< 0.010		0.096	0.1	0.5	7
Zinc	0.0017	0.0065		0.059	4	50	200
Chloride	< 4.0	< 4.0		< 15	800	4000	25000
Fluoride	0.80	0.62		6.5	10	150	500
Sulphate	290	48		790	1000	20000	50000
TDS	360	100		1300	4000	60000	100000
Phenol Index	< 0.13	< 0.13		< 0.50	1	-	-
DOC	3.0	3.5		34	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.6						
Dry Matter (%)	86						
Moisture (%)	14						
Stage 1							
Volume Eluate L2 (litres)	0.33						
Filtered Eluate VE1 (litres)	0.23						
Results are expressed on a dry weight basis, after correction for moisture content where applicable. Stated limits are for guidance only and IZ cannot be held responsible for any discrepancies with current legislation.							

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
Stated limits are for guidance only and I2 cannot be held responsible for any discrepancies with current legislation

* = UKAS accredited

** = MCERTS accredited

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Waste Acceptance Criteria Analytical Results							
Report No:	11-26229						
					Client: CROMWELLWOOD		
Location	Bradshaw						
Lab Reference (Sample Number)	166988				Landfill Waste Acceptance Criteria		
					Limits		
Sampling Date					Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	BH9						
Depth (m)							
Solid Waste Analysis							
TOC (%)**	0.1				3%	5%	6%
Loss on Ignition (%)	6.3				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg)	< 0.30				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (mg/kg)	17				100	--	--
pH (units)**	7.4				--	>6	--
Acid Neutralisation Capacity (mol / kg)	0.0075				--	To be evaluated	To be evaluated
Eluate Analysis	2:1	8:1		Cumulative 10:1	Limit values for compliance leaching test		
					using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
	mg/l	mg/l		mg/kg			
Arsenic	< 0.010	< 0.010		< 0.050	0.5	2	25
Barium	0.15	0.045		0.61	20	100	300
Cadmium	< 0.0005	< 0.0005		< 0.0020	0.04	1	5
Chromium	< 0.0010	0.0016		0.012	0.5	10	70
Copper	0.0095	0.0079		0.082	2	50	100
Mercury	< 0.0015	< 0.0015		< 0.010	0.01	0.2	2
Molybdenum	0.50	0.31		3.3	0.5	10	30
Nickel	0.0080	0.0048		0.052	0.4	10	40
Lead	< 0.0050	< 0.0050		< 0.020	0.5	10	50
Antimony	< 0.0050	< 0.0050		< 0.020	0.06	0.7	5
Selenium	0.023	< 0.010		0.084	0.1	0.5	7
Zinc	< 0.0010	0.0014		< 0.020	4	50	200
Chloride	14	< 4.0		32	800	4000	25000
Fluoride	0.95	0.89		9.0	10	150	500
Sulphate	690	76		1600	1000	20000	50000
TDS	670	140		2200	4000	60000	100000
Phenol Index	< 0.13	< 0.13		< 0.50	1	-	-
DOC	12	5.8		68	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.4						
Dry Matter (%)	87						
Moisture (%)	13						
Stage 1							
Volume Eluate L2 (litres)	0.33						
Filtered Eluate VE1 (litres)	0.25						

Results are expressed on a dry weight basis, after correction for moisture content where applicable

Results are expressed on a dry weight basis, after correction for moisture content where applicable
(Standard limits are for cadmium, lead, and 11 chromium, but should be held responsible for any discrepancy with current legislation)

* = UKAS accredited

** = MCERTS accredited



4041



MCERTS



environmentalscience

Analytical Report Number : 11-26229

Project / Site name: Bradshaw

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

Stone content

of a sample is calculated as the % weight of the stones not passing a 2 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
166987	BH8	None Supplied	None Supplied	Brown clay and sand.
166988	BH9	None Supplied	None Supplied	Brown gravelly clay with brick.

Analytical Report Number : 11-26229

Project / Site name: Bradshaw

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analyse	Accreditation Status
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance on Sampling and Testing of Wastes to Meet Landfill Waste Acceptance	L046	W	NONE
BTEX in soil	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073S	W	MCERTS
Chloride in WAC leachate	Determination of chloride in leachate by titration against silver nitrate.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L024	W	NONE
Fluoride in WAC leachate	Determination of fluoride in leachate by 1:1 ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L033	W	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	NONE
Metals in WAC leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L039	W	ISO 17025
Mineral Oil in Soil	Determination of dichloromethane/hexane extractable hydrocarbons in soil by GC-MS.	In-house method based on USEPA 8270	L064	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK	W	NONE
Monohydric phenols in WAC leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080	W	NONE
PCB's by GC-MS in soil	Determination of PCB by extraction with DCM and analysis by GC-MS.	In-house method based on USEPA 8270	L064	D	NONE
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-UK	W	MCERTS
Sedated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064	D	NONE
Stones content of soil	Stones not passing through a 2 mm sieve is determined gravimetrically and reported as a percentage of the dry weight. Sample results are not corrected for the stone content of the sample.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK	D	NONE
Sulphate in WAC leachate	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L039	W	NONE
Total dissolved solids in WAC leachate	Determination of total dissolved solids in leachate by electrometric measurement.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L004	W	NONE
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023	D	MCERTS
Total organic carbon in WAC leachate	Determination of total organic carbon in leachate by the measurement on a non-dispersive infrared analyser of carbon dioxide released by acidification.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L037	W	NONE



Analytical Report Number : 11-26229

Project / Site name: Bradshaw

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

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

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



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Analytical Report Number : 11-26447

Project / Site name: Bradshaw

Samples received on: 24/02/2011

Your job number:

Samples instructed on: 24/02/2011

Your order number:

Analysis completed by: 09/03/2011

Report Issue Number: 1

Report issued on: 19/04/2011

Samples Analysed: 2 water samples

Signed:

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Thurstan Plummer
Organics Technical Manager
For & on behalf of i2 Analytical Ltd.

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

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

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting



Analytical Report Number: 11-26447

Project / Site name: Bradshaw

Lab Sample Number	168369	168370					
Sample Reference	BH8	BH9					
Sample Number	None Supplied	None Supplied					
Depth (m)	None Supplied	None Supplied					
Date Sampled	16/02/2011	16/02/2011					
Time Taken	None Supplied	None Supplied					
Analytical Parameter (Water Analysis)	Units	Unit of detection	Accreditation Scheme				

General Inorganics

pH	pH units	N/A	ISO 17025	6.6	6.4		
Electrical Conductivity	µS/cm	10	NONE	1100	530		
Chloride	µg/l	50	ISO 17025	310	380		
Ammonia as NH ₃	µg/l	15	ISO 17025	320	850		
Ammonium as NH ₄	µg/l	15	ISO 17025	330	900		
Total Organic Carbon (TOC)	mg/l	0.1	NONE	11	8.1		
Total Inorganic Carbon (TIC)	mg/l	0.1	NONE	170	71		
Chemical Oxygen Demand (Total)	mg/l	3	ISO 17025	14	15		
BOD (Biological Oxygen Demand)	mg/l	3	NONE	< 3.0	< 3.0		
Total Dissolved Solids	mg/l	4	NONE	560	320		
Dissolved Oxygen	mg/l	1	NONE	5.5	5.8		

Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01		
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01		
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01		
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01		
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01		
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01		
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01		
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01		
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01		
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01		
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01		
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01		
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01		
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01		
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01		
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01		

Total PAH

Total EPA-16 PAHs	µg/l	0.2	ISO 17025	< 0.2	< 0.2		
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	10	ISO 17025	< 10	< 10		
Cadmium (dissolved)	µg/l	0.5	ISO 17025	0.8	0.7		
Chromium (dissolved)	µg/l	1	ISO 17025	< 1.0	5.1		
Copper (dissolved)	µg/l	1	ISO 17025	5.1	6.4		
Lead (dissolved)	µg/l	5	ISO 17025	< 5.0	< 5.0		
Mercury (dissolved)	µg/l	1.5	NONE	< 1.5	< 1.5		
Nickel (dissolved)	µg/l	1	ISO 17025	22	15		
Selenium (dissolved)	µg/l	10	ISO 17025	< 10	< 10		
Zinc (dissolved)	µg/l	1	ISO 17025	6.8	4.7		

Petroleum Hydrocarbons

Diesel Range Organics (C10 - C28)	µg/l	10	NONE	< 10	< 10		
Diesel Range Organics (C10 - C25)	µg/l	10	NONE	< 10	< 10		



Analytical Report Number: 11-26447

Project / Site name: Bradshaw

Lab Sample Number	168369	168370					
Sample Reference	BH8	BH9					
Sample Number	None Supplied	None Supplied					
Depth (m)	None Supplied	None Supplied					
Date Sampled	16/02/2011	16/02/2011					
Time Taken	None Supplied	None Supplied					
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status				

VOCs							
Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0		
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0		
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0		
Vinyl Chloride	µg/l	1	ISO 17025	< 1.0	< 1.0		
Trichlorofluoromethane	µg/l	1	ISO 17025	< 1.0	< 1.0		
1,1-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0		
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0		
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0		
1,1-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0		
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0		
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0		
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0		
1,2-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0		
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0		
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0		
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0		
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0		
1,2-dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0		
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0		
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0		
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0		
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0		
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0		
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0		
1,1,2-Trichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0		
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0		
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0		
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0		
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0		
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0		
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0		
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0		
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0		
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0		
Tribromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0		
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0		
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0		
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0		
N-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0		
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0		
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0		
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0		
Tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0		
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0		
Sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0		
1,3-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0		
P-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0		
1,2-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0		
1,4-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0		
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0		
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0		
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0		
Hexachlorobutadiene	µg/l	0.1	ISO 17025	< 0.1	< 0.1		
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0		

U/S = Unsuitable Sample I/S = Insufficient Sample

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Iss No 11-26447-1



Analytical Report Number : 11-26447

Project / Site name: Bradshaw

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonia as NH ₃ in water	Determination of ammonia in water by addition of buffer solution followed by ion selective electrode. Accredited matrices: SW PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L035-UK	W	ISO 17025
Ammonium as NH ₄ in water	Determination of ammonium in water by addition of buffer solution followed by ion selective electrode. Accredited matrices: SW PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L035-UK	W	ISO 17025
Biological oxygen demand of water	Determination of biochemical oxygen demand in water.	In-house method		W	NONE
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by oxidation with acidified potassium dichromate at 150°C. Reduced chromate ions assayed colorimetrically. Accredited matrices: SW PW	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-UK	W	ISO 17025
Dissolved Oxygen in water	Determination of dissolved oxygen.	In-house method		W	NONE
DRO (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-UK	W	NONE
Electrical conductivity of water	Determination of electrical conductivity in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031-PL	W	NONE
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW PW	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033-UK	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-UK	W	ISO 17025
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in hexane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L070-UK	W	ISO 17025
Total dissolved solids in water	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-UK	W	NONE
Total organic carbon in water	Determination of total organic carbon in water by the measurement on a non-dispersive infrared analyser of carbon dioxide released by acidification.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-UK	W	NONE
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW	In-house method based on USEPA 8260	L036-UK	W	ISO 17025

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

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

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



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Analytical Report Number : 11-27641

Project / Site name: Bradshaw

Samples received on: 11/05/2011

Your job number:

Samples instructed on: 13/05/2011

Your order number: 05-11-82

Analysis completed by: 26/05/2011

Report Issue Number: 1

Report issued on: 26/05/2011

Samples Analysed: 4 water samples

Signed:

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Thurstan Plummer
Organics Technical Manager
For & on behalf of i2 Analytical Ltd.

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

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

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting



Environmental Science

Analytical Report Number: 11-27641

Project / Site name: Bradshaw

Lab Sample Number	176471	176472	176473	176474	
Sample Reference	Pond 1	Pond 2	OCHRE	Pond 5	
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)	Surface	Surface	Surface	Surface	
Date Sampled	07/05/2011	07/05/2011	07/05/2011	07/05/2011	
Time Taken	1430	1440	1510	1530	
Analytical Parameter (Water Analysts)	Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH units	N/A	ISO 17025	7.3	7.4	6.5	6.7	
Electrical Conductivity	µS/cm	10	NONE	700	480	350	400	
Fluoride	µg/l	50	ISO 17025	820	360	220	320	
Ammonia as NH ₃	µg/l	15	ISO 17025	350	310	940	180	
Ammonium as NH ₄	µg/l	15	ISO 17025	370	320	1000	190	
Total Organic Carbon (TOC)	mg/l	0.1	NONE	22	21	14	16	
Total Inorganic Carbon (TIC)	mg/l	0.1	NONE	37	38	9.3	12	
Alkalinity	mgCaCO ₃ /l	10	NONE	190	190	54	72	
Chemical Oxygen Demand (Total)	mg/L	3	ISO 17025	100	87	55	34	
BOD (Biological Oxygen Demand)	mg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0	
Total Dissolved Solids	mg/l	4	NONE	640	470	350	410	
Dissolved Oxygen	mg/l	1	NONE	8.5	8.8	8.6	8.5	

Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Boron (dissolved)	µg/l	0.9	ISO 17025	120	38	32	50	
Cadmium (dissolved)	µg/l	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1	
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.0	1.3	0.8	1.3	
Copper (dissolved)	µg/l	0.7	ISO 17025	15	15	15	14	
Iron (dissolved)	mg/l	0.004	ISO 17025	0.20	0.10	6.0	0.078	
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Manganese (dissolved)	µg/l	0.06	ISO 17025	210	100	4500	31	
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	
Molybdenum (dissolved)	µg/l	3	ISO 17025	12	260	3.4	160	
Nickel (dissolved)	µg/l	0.3	ISO 17025	6.6	4.1	31	11	
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	
Zinc (dissolved)	µg/l	0.4	ISO 17025	< 0.4	< 0.4	23	0.5	
Calcium (dissolved)	mg/l	0.012	ISO 17025	91	76	31	54	
Magnesium (dissolved)	mg/l	0.005	ISO 17025	24	16	8.9	12	
Potassium (dissolved)	mg/l	0.025	ISO 17025	6.6	8.6	4.3	4.7	
Sodium (dissolved)	mg/l	0.01	ISO 17025	30	13	19	20	

Petroleum Hydrocarbons

TPH1 (C10 - C40)	µg/l	10	NONE	< 10	< 10	< 10	< 10	
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Environmental Science

Analytical Report Number: 11-27641

Project / Site name: Bradshaw

Lab Sample Number				176471	176472	176473	176474	
Sample Reference				Pond 1	Pond 2	OCHRE	Pond 5	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				Surface	Surface	Surface	Surface	
Date Sampled				07/05/2011	07/05/2011	07/05/2011	07/05/2011	
Time Taken				1430	1440	1510	1530	
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status		
VOCs								
Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Vinyl Chloride	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Trichlorofluoromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Tribromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
N-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,3-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
P-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,4-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Hexachlorobutadiene	µg/l	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1	
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Dichloromethane	µg/l	100	NONE	< 100	< 100	< 100	< 100	

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Environmental Science

Analytical Report Number: 11-27641

Project / Site name: Bradshaw

Lab Sample Number	176471	176472	176473	176474	
Sample Reference	Pond 1	Pond 2	OCHRE	Pond 5	
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)	Surface	Surface	Surface	Surface	
Date Sampled	07/05/2011	07/05/2011	07/05/2011	07/05/2011	
Time Taken	1430	1440	1510	1530	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Series		
SVOCs					
Aniline	µg/l	0.05	NONE	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	0.06	0.07
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	0.12	0.06
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.02	NONE	< 0.02	< 0.02
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01

U/S = Unsuitable Sample I/S = Insufficient Sample

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Environmental Science

Analytical Report Number : 11-27641

Project / Site name: Bradshaw

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Alkalinity in water	Determination of Alkalinity by titration using 0.1M HCl.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L025-UK	W	NONE
Ammonia as NH ₃ in water	Determination of ammonia in water by addition of buffer solution followed by ion selective electrode. Accredited matrices: SW PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L035-UK	W	ISO 17025
Ammonium as NH ₄ in water	Determination of ammonium in water by addition of buffer solution followed by ion selective electrode. Accredited matrices: SW PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L035-UK	W	ISO 17025
Biological oxygen demand of water	Determination of biochemical oxygen demand in water.	In-house method		W	NONE
Boron in water	Determination of boron by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by oxidation with acidified potassium dichromate at 150°C. Reduced chromate ions assayed colorimetrically. Accredited matrices: SW PW	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-UK	W	ISO 17025
Dissolved Oxygen in water	Determination of dissolved oxygen.	In-house method		W	NONE
Electrical conductivity of water	Determination of electrical conductivity in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031-PL	W	NONE
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW PW	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination*	L033-UK	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-UK	W	ISO 17025
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in water by extraction in hexane followed by GC-MS.	In-house method based on USEPA 8270	L070-UK	W	NONE
Total dissolved solids in water	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-UK	W	NONE
Total organic carbon in water	Determination of total organic carbon in water by the measurement on a non-dispersive infrared analyser of carbon dioxide released by acidification.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE

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Environmental Science

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Analytical Report Number : 11-27641

Project / Site name: Bradshaw

Samples received on: 11/05/2011

Your job number:

Samples instructed on: 13/05/2011

Your order number: 05-11-82

Analysis completed by: 26/05/2011

Report Issue Number: 1

Report issued on: 26/05/2011

Samples Analysed: 4 water samples

Signed:

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Thurstan Plummer
Organics Technical Manager
For & on behalf of i2 Analytical Ltd.

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

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

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting



Environmental Science

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Lab Sample Number	176471	176472	176473	176474	
Sample Reference	Pond 1	Pond 2	OCHRE	Pond 5	
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)	Surface	Surface	Surface	Surface	
Date Sampled	07/05/2011	07/05/2011	07/05/2011	07/05/2011	
Time Taken	1430	1440	1510	1530	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH units	N/A	ISO 17025	7.3	7.4	6.5	6.7
Electrical Conductivity	µS/cm	10	NONE	700	480	350	400
Fluoride	µg/l	50	ISO 17025	820	360	220	320
Ammonia as NH ₃	µg/l	15	ISO 17025	350	310	940	180
Ammonium as NH ₄	µg/l	15	ISO 17025	370	320	1000	190
Total Organic Carbon (TOC)	mg/l	0.1	NONE	22	21	14	16
Total Inorganic Carbon (TIC)	mg/l	0.1	NONE	37	38	9.3	12
Alkalinity	mgCaCO ₃ /l	10	NONE	190	190	54	72
Chemical Oxygen Demand (Total)	mg/l	3	ISO 17025	100	87	55	34
BOD (Biological Oxygen Demand)	mg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0
Total Dissolved Solids	mg/l	4	NONE	640	470	350	410
Dissolved Oxygen	mg/l	1	NONE	8.5	8.8	8.6	8.5

Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Boron (dissolved)	µg/l	0.9	ISO 17025	120	38	32	50
Cadmium (dissolved)	µg/l	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.0	1.3	0.8	1.3
Copper (dissolved)	µg/l	0.7	ISO 17025	15	15	15	14
Iron (dissolved)	mg/l	0.004	ISO 17025	0.20	0.10	6.0	0.078
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Manganese (dissolved)	µg/l	0.06	ISO 17025	210	100	4500	31
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5
Molybdenum (dissolved)	µg/l	3	ISO 17025	12	260	3.4	160
Nickel (dissolved)	µg/l	0.3	ISO 17025	6.6	4.1	31	11
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	< 0.4	< 0.4	23	0.5
Calcium (dissolved)	mg/l	0.012	ISO 17025	91	76	31	54
Magnesium (dissolved)	mg/l	0.005	ISO 17025	24	16	8.9	12
Potassium (dissolved)	mg/l	0.025	ISO 17025	6.6	8.6	4.3	4.7
Sodium (dissolved)	mg/l	0.01	ISO 17025	30	13	19	20

Petroleum Hydrocarbons

TPH1 (C10 - C40)	µg/l	10	NONE	< 10	< 10	< 10	< 10
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Depth (m)				Surface	Surface	Surface	Surface
Date Sampled				07/05/2011	07/05/2011	07/05/2011	07/05/2011
Time Taken				1430	1440	1510	1530
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accuracy Specification				
VOCs							
Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Trifluoromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,3-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,4-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Dichloromethane	µg/l	100	NONE	< 100	< 100	< 100	< 100

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The results included within the report are representative of the samples submitted for analysis.

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Environmental Science

Analytical Report Number: 11-27641

Project / Site name: Bradshaw

Lab Sample Number	176471	176472	176473	176474	
Sample Reference	Pond 1	Pond 2	OCHRE	Pond 5	
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)	Surface	Surface	Surface	Surface	
Date Sampled	07/05/2011	07/05/2011	07/05/2011	07/05/2011	
Time Taken	1430	1440	1510	1530	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	0.06	0.07	0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	0.12	< 0.05	0.06	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01

U/S = Unsuitable Sample I/S = Insufficient Sample

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The results included within the report are representative of the samples submitted for analysis.

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Environmental Science

Analytical Report Number : 11-27641

Project / Site name: Bradshaw

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Alkalinity in water	Determination of Alkalinity by titration using 0.1M HCl.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L025-UK	W	NONE
Ammonia as NH3 in water	Determination of ammonia in water by addition of buffer solution followed by ion selective electrode. Accredited matrices: SW PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L035-UK	W	ISO 17025
Ammonium as NH4 in water	Determination of ammonium in water by addition of buffer solution followed by ion selective electrode. Accredited matrices: SW PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L035-UK	W	ISO 17025
Biological oxygen demand of water	Determination of biochemical oxygen demand in water.	In-house method		W	NONE
Boron in water	Determination of boron by addition followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by oxidation with acidified potassium dichromate at 150°C. Reduced chromate ions assayed colorimetrically. Accredited matrices: SW PW	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-UK	W	ISO 17025
Dissolved Oxygen in water	Determination of dissolved oxygen.	In-house method		W	NONE
Electrical conductivity of water	Determination of electrical conductivity in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031-PL	W	NONE
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW PW	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033-UK	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by addition followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by addition followed by ICP-OES. Accredited matrices: SW PW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-UK	W	ISO 17025
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in water by extraction in hexane followed by GC-MS.	In-house method based on USEPA 8270	L070-UK	W	NONE
Total dissolved solids in water	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-UK	W	NONE
Total organic carbon in water	Determination of total organic carbon in water by the measurement on a non-dispersive infrared analyser of carbon dioxide released by acidification.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE



Environmental Science

Analytical Report Number : 11-27641

Project / Site name: Bradshaw

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-UK	W	NONE
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW	In-house method based on USEPA8260	L036-UK	W	ISO 17025
Volatile organic compounds in water extended	Determination of volatile organic compounds in water by headspace GC-MS.	In-house method based on USEPA8260	L036-UK	W	NONE

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

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

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



Environmental Science

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Analytical Report Number : 11-27700

Project / Site name: Bradshaw Tip

Samples received on: 18/05/2011

Your job number:

Samples instructed on: 18/05/2011

Your order number: 05-11-85

Analysis completed by: 01/06/2011

Report Issue Number: 1

Report issued on: 01/06/2011

Samples Analysed: 9 water samples

Signed:

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Thurstan Plummer
Organics Technical Manager
For & on behalf of i2 Analytical Ltd.

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

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

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting



Environmental Science

Analytical Report Number: 11-27700

Project / Site name: Bradshaw Tip

Lab Sample Number	176759	176760	176761	176762	176763
Sample Reference	BH8	BH9	BH1	BH4	BH5
Sample Number	1	2	3	4	5
Depth (m)	6.70	1.70	2.30	4.70	None Supplied
Date Sampled	14/05/2011	14/05/2011	14/05/2011	14/05/2011	14/05/2011
Time Taken	1018	1038	1050	1105	1115
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH units	N/A	ISO 17025	7.2	7.8	7.3	6.5	6.0
Electrical Conductivity	$\mu\text{S/cm}$	10	NONE	1000	280	200	180	520
Fluoride	$\mu\text{g/l}$	50	ISO 17025	210	150	110	220	< 50
Ammonia as NH_3	$\mu\text{g/l}$	15	ISO 17025	240	74	180	380	1800
Ammonium as NH_4	$\mu\text{g/l}$	15	ISO 17025	250	78	190	410	1900
Total Organic Carbon (TOC)	mg/l	0.1	NONE	2.7	0.6	5.2	< 0.1	3.5
Total Inorganic Carbon (TIC)	mg/l	0.1	NONE	65	6.7	8.0	4.3	28
Alkalinity	mgCaCO_3/l	10	NONE	260	24	16	12	20
Chemical Oxygen Demand (Total)	mg/L	3	ISO 17025	10	19	32	5.0	31
BOD (Biological Oxygen Demand)	mg/l	3	NONE	< 3.0	< 3.0	32	< 3.0	< 3.0
Total Dissolved Solids	mg/l	4	NONE	900	300	180	160	450
Dissolved Oxygen	mg/l	1	NONE	8.1	8.2	7.9	7.6	7.6

Heavy Metals / Metalloids

Arsenic (dissolved)	$\mu\text{g/l}$	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Boron (dissolved)	$\mu\text{g/l}$	0.9	ISO 17025	38	13	7.7	32	30
Cadmium (dissolved)	$\mu\text{g/l}$	0.1	ISO 17025	0.2	0.5	0.2	< 0.1	< 0.1
Chromium (dissolved)	$\mu\text{g/l}$	0.4	ISO 17025	2.5	2.5	2.3	1.3	1.0
Copper (dissolved)	$\mu\text{g/l}$	0.7	ISO 17025	17	17	16	11	9.1
Iron (dissolved)	mg/l	0.004	ISO 17025	0.37	0.13	0.66	0.26	19
Lead (dissolved)	$\mu\text{g/l}$	1	ISO 17025	2.0	1.3	< 1.0	1.6	< 1.0
Manganese (dissolved)	$\mu\text{g/l}$	0.06	ISO 17025	3000	690	200	1300	5400
Mercury (dissolved)	$\mu\text{g/l}$	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Molybdenum (dissolved)	$\mu\text{g/l}$	0.4	ISO 17025	4.7	1.6	2.1	0.6	5.2
Nickel (dissolved)	$\mu\text{g/l}$	0.3	ISO 17025	32	18	4.7	2.8	13
Selenium (dissolved)	$\mu\text{g/l}$	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Zinc (dissolved)	$\mu\text{g/l}$	0.4	ISO 17025	6.9	15	4.4	8.9	10
Calcium (dissolved)	mg/l	0.012	ISO 17025	150	23	14	7.7	29
Magnesium (dissolved)	mg/l	0.005	ISO 17025	23	3.8	4.9	7.5	21
Sodium (dissolved)	mg/l	0.01	ISO 17025	34	25	18	12	33

Petroleum Hydrocarbons

TPH1 (C10 - C40)	$\mu\text{g/l}$	10	NONE	< 10	< 10	< 10	< 10	< 10
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Environmental Science

Analytical Report Number: 11-27700

Project / Site name: Bradshaw Tip

Lab Sample Number	176759	176760	176761	176762	176763
Sample Reference	BH8	BH9	BH1	BH4	BH5
Sample Number	1	2	3	4	5
Depth (m)	6.70	1.70	2.30	4.70	None Supplied
Date Sampled	14/05/2011	14/05/2011	14/05/2011	14/05/2011	14/05/2011
Time Taken	1018	1038	1050	1105	1115
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		

VOCs

Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dichloromethane	µg/l	100	NONE	N/A	N/A	N/A	N/A	N/A



Environmental Science

Analytical Report Number: 11-27700

Project / Site name: Bradshaw Tip

Lab Sample Number	176759	176760	176761	176762	176763
Sample Reference	BH8	BH9	BH1	BH4	BH5
Sample Number	1	2	3	4	5
Depth (m)	6.70	1.70	2.30	4.70	None Supplied
Date Sampled	14/05/2011	14/05/2011	14/05/2011	14/05/2011	14/05/2011
Time Taken	1018	1038	1050	1105	1115
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

U/S = Unsuitable Sample I/S = Insufficient Sample

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The results included within the report are representative of the samples submitted for analysis.

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Environmental Science

Analytical Report Number: 11-27700

Project | Site name: Bradshaw Tip

Lab Sample Number	176764	176765	176766	176767	
Sample Reference	BH6	BH7	BH2	BH3	
Sample Number	6	7	8	9	
Depth (m)	1.60	4.70	6.50	None Supplied	
Date Sampled	14/05/2011	14/05/2011	14/05/2011	14/05/2011	
Time Taken	1130	1150	1215	1250	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH units	N/A	ISO 17025	7.3	6.5	6.4	3.7
Electrical Conductivity	µS/cm	10	NONE	1600	300	300	350
Fluoride	µg/l	50	ISO 17025	1500	55	180	310
Ammonia as NH ₃	µg/l	15	ISO 17025	8900	320	380	320
Ammonium as NH ₄	µg/l	15	ISO 17025	9400	340	400	340
Total Organic Carbon (TOC)	mg/l	0.1	NONE	33	16	< 0.1	< 0.1
Total Inorganic Carbon (TIC)	mg/l	0.1	NONE	180	16	31	2.4
Alkalinity	mgCaCO ₃ /l	10	NONE	670	92	110	< 10
Chemical Oxygen Demand (Total)	mg/L	3	ISO 17025	100	63	3.0	8.0
BOD (Biological Oxygen Demand)	mg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0
Total Dissolved Solids	mg/l	4	NONE	1500	250	260	320
Dissolved Oxygen	mg/l	1	NONE	7.7	7.8	7.6	7.6

Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	2.7	1.1	< 1.0	< 1.0
Boron (dissolved)	µg/l	0.9	ISO 17025	590	46	110	51
Cadmium (dissolved)	µg/l	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	1.2
Chromium (dissolved)	µg/l	0.4	ISO 17025	2.2	4.0	1.3	1.3
Copper (dissolved)	µg/l	0.7	ISO 17025	13	28	11	26
Iron (dissolved)	mg/l	0.004	ISO 17025	0.13	0.77	0.29	0.36
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	3.2	1.5
Manganese (dissolved)	µg/l	0.06	ISO 17025	1100	260	180	640
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5
Molybdenum (dissolved)	µg/l	0.4	ISO 17025	2400	470	1.6	< 0.4
Nickel (dissolved)	µg/l	0.3	ISO 17025	14	16	1.0	49
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	0.7	36	1.0	46

Calcium (dissolved)	mg/l	0.012	ISO 17025	120	29	29	18
Magnesium (dissolved)	mg/l	0.005	ISO 17025	99	12	15	8.5
Sodium (dissolved)	mg/l	0.01	ISO 17025	46	9.6	13	16

Petroleum Hydrocarbons

TPH1 (C10 - C40)	µg/l	10	NONE	< 10	< 10	< 10	< 10
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Environmental Science

Analytical Report Number: 11-27700

Project / Site name: Bradshaw Tip

Lab Sample Number	176764	176765	176766	176767	
Sample Reference	BH6	BH7	BH2	BH3	
Sample Number	6	7	8	9	
Depth (m)	1.60	4.70	6.50	None Supplied	
Date Sampled	14/05/2011	14/05/2011	14/05/2011	14/05/2011	
Time Taken	1130	1150	1215	1250	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		
VOCs					
Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	ISO 17025	< 1.0	< 1.0
Trichlorofluoromethane	µg/l	1	ISO 17025	< 1.0	< 1.0
1,1-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0
1,1-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0
1,2-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0
1,2-dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0
Tribromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
N-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
Tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
Sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,3-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
P-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,2-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,4-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	0.1	ISO 17025	< 0.1	< 0.1
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
Dichloromethane	µg/l	100	NONE	N/A	< 100



Environmental Science

Analytical Report Number: 11-27700

Project / Site name: Bradshaw Tip

Lab Sample Number					176764	176765	176766	176767	
Sample Reference					BH6	BH7	BH2	BH3	
Sample Number					6	7	8	9	
Depth (m)					1.60	4.70	6.50	None Supplied	
Date Sampled					14/05/2011	14/05/2011	14/05/2011	14/05/2011	
Time Taken					1130	1150	1215	1250	
Analytical Parameter (Water Analysis)									
	units	Limit of detection	Accreditation Status						
SVOCs									
Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Bis(2-chloroethyl) ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Bis(2-chloroisopropyl) ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Dimethylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Hexachlorobenzene	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	

U/S = Unsubstantiated Sample I/S = Insufficient Sample

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Environmental Science

Analytical Report Number : 11-27700

Project / Site name: Bradshaw Tip

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Alkalinity in water	Determination of Alkalinity by titration using 0.1M HCl.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L025-UK	W	NONE
Ammonia as NH3 in water	Determination of ammonia in water by addition of buffer solution followed by ion selective electrode. Accredited matrices: SW PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L035-UK	W	ISO 17025
Ammonium as NH4 in water	Determination of ammonium in water by addition of buffer solution followed by ion selective electrode. Accredited matrices: SW PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L035-UK	W	ISO 17025
Biological oxygen demand of water	Determination of biochemical oxygen demand in water.	In-house method		W	NONE
Boron in water	Determination of boron by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by oxidation with acidified potassium dichromate at 150°C. Reduced chromate ions assayed colorimetrically. Accredited matrices: SW PW	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-UK	W	ISO 17025
Dissolved Oxygen in water	Determination of dissolved oxygen.	In-house method		W	NONE
Electrical conductivity of water	Determination of electrical conductivity in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031-PL	W	NONE
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW PW	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033-UK	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in water by extraction in hexane followed by GC-MS.	In-house method based on USEPA 8270	L070-UK	W	NONE
Total dissolved solids in water	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-UK	W	NONE
Total organic carbon in water	Determination of total organic carbon in water by the measurement on a non-dispersive infrared analyser of carbon dioxide released by acidification.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-UK	W	NONE

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Environmental Science

Analytical Report Number : 11-27700

Project / Site name: Bradshaw Tip

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW	In-house method based on USEPA8260	L036-UK	W	ISO 17025
Volatile organic compounds in water extended	Determination of volatile organic compounds in water by headspace GC-MS.	In-house method based on USEPA8260	L036-UK	W	NONE

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

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

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