Facility Information Summary	
AER Reporting Year	2017
Licence Register Number	W0184-02
Name of site	Enva Ireland Limited
Site Location	Clonminan Industrial Estate, Portlaoise, Co. Loias
NACE Code	3832
Class/Classes of Activity	**Fourth Schedule** - Class 6, Class 7, Class 12, Class 13.
National Grid Reference (6E, 6 N)	2461 E, 1978 N

A description of the activities/processes at the site for the reporting year. This should include information such as production increases or decreases on site, any infrastructural changes, environmental	**Site Performance:** The processing activities onsite include waste oil re-processing, treatment of contaminated soil, repacking of oily contaminated wastes, and paint wastes. The site also stores wastes in packages (barrels, ASPs, IBCs, etc.) prior to transfer off site for recovery or disposal. The company continues to demonstrate its commitment towards HSE management standards - the site maintains ISO14001 and OHSAS 18001. This ensures a standard approach is taking to managing activities from an environmental and safety aspect. There were no issues raised during the reporting period regarding maintenance to the standard. **Infrastructure / EMP progress:** The site completed a licence review on 15.06.2017. Revised monitoring ELVs were introduced. As a result, these will be recorded seperately in this report to demonstrate compliance to

performance which was measured during the reporting year **and an overview of compliance with your licence** listing all exceedances of licence limits (where applicable) and what they relate to e.g. air, water, noise.	the limits of the new and old licence. Yard integrity is monitored regularly and repaired as required. The EMP has been updated to include programme of works devised for reduction of odour generation from the site. **Environmental Performance:** There were 11 complaints received by Enva during the reporting period. Compliance Investigation (CI001037) remains open. Control measures have been implemented as per correspondance uploaded to EDEN and as set out in the EMP attached. Fluctuations in waste quantities accepted onsite was subject to availability from customers rather than an intentional increase/decrease in waste volumes.

Declaration:

All the data and information presented in this report has been checked and certified as being accurate. The quality of the information is assured to meet licence requirements.

Donal Conroy	31.03.16
Signature	Date
Group/Facility manager (or nominated, suitably qualified and experienced deputy)	

AIR-summary template

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Answer all questions and complete all tables where relevant

			Additional information
1	Does your site have licensed air emissions? If yes please complete table A1 and A2 below for the current reporting year and answer further questions. If **you do not have** licenced emissions and **do not complete a solvent management plan** (table A4 and A5) you do not need to complete the tables	Yes	Dust monitoring results are detailed on the table below however they are not emission points. Carbon filter emission points have been added as they are part of the licence W0184-02 that was implemented on 15/06/2017

Periodic/Non-Continuous Monitoring

2	Are there any results in breach of licence requirements? If yes please provide brief details in the comment section of TableA1 below	No	
3	Was all monitoring carried out in accordance with EPA guidance note AG2 and using the basic air monitoring checklist? Basic air monitoring checklist AGN2	Yes	

Table A1: Licensed Mass Emissions/Ambient data-periodic monitoring (non-continuous)

Emission reference no:	Parameter/ Substance	Frequency of Monitoring	ELV in licence or any revision therof	Licence Compliance criteria	Measured value	Unit of measurement	Compliant with licence limit	Method of analysis	Annual mass load (kg)	Comments - reason for change in % mass load from previous year if applicable
A-01	Nitrogen oxides (NOx/NO2)	Annually	N/A	No 30min mean can exceed the ELV	129.5	mg/Nm3	SELECT	EN 14792:2005	526.77	N/A
A3-52	Total Organic Carbon (as C)	Monthly	20 mg/Nm³	Monitoring to occur monthly	0.1	kg/hour	yes	OTH	1431.384	Part of the licence W0184-02
A3-53	Total Organic Carbon (as C)	Monthly	20 mg/Nm³	Monitoring to occur monthly	0.011	kg/hour	yes	OTH	253.164	Part of the licence W0184-02
A3-55	Total Organic Carbon (as C)	Monthly	20 mg/Nm³	Monitoring to occur monthly	0.021	kg/hour	yes	OTH	431.868	Part of the licence W0184-02
A3-57	Total Organic Carbon (as C)	Monthly	20 mg/Nm³	Monitoring to occur monthly	0.001	kg/hour	yes	OTH	17.52	Part of the licence W0184-02
DP1	LICENCED	Quarter 1	Yes - 350 mg/m2	Monitoring to occur 4 times a year	30.05	mg/m2/day	yes	Standard Method	N/A	N/A
DP2	LICENCED	Quarter 1	Yes - 350 mg/m2	Monitoring to occur 4 times a year	24.04	mg/m2/day	yes	Standard Method	N/A	N/A
DP3	LICENCED	Quarter 1	Yes - 350 mg/m2	Monitoring to occur 4 times a year	42.08	mg/m2/day	yes	Standard Method	N/A	N/A
DP1	LICENCED	Quarter 2	Yes - 350 mg/m2	Monitoring to occur 4 times a year	71.12	mg/m2/day	yes	Standard Method	N/A	N/A
DP2	LICENCED	Quarter 2	Yes - 350 mg/m2	Monitoring to occur 4 times a year	24.43	mg/m2/day	yes	Standard Method	N/A	N/A
DP3	LICENCED	Quarter 2	Yes - 350 mg/m2	Monitoring to occur 4 times a year	51.03	mg/m2/day	yes	Standard Method	N/A	N/A
DP1	LICENCED	Quarter 3	Yes - 350 mg/m2	Monitoring to occur 4 times a year	28.81	mg/m2/day	yes	Standard Method	N/A	N/A
DP2	LICENCED	Quarter 3	Yes - 350 mg/m2	Monitoring to occur 4 times a year	147.13	mg/m2/day	yes	Standard Method	N/A	N/A
DP3	LICENCED	Quarter 3	Yes - 350 mg/m2	Monitoring to occur 4 times a year	41.26	mg/m2/day	yes	Standard Method	N/A	N/A

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DP1	LICENCED	Quarter 4	Yes - 350 mg/m2	Monitoring to occur 4 times a year	40.72	mg/m2/day	yes	Standard Method	N/A	N/A
DP2	LICENCED	Quareter 4	Yes - 350 mg/m2	Monitoring to occur 4 times a year	63.96	mg/m2/day	yes	Standard Method	N/A	N/A
DP3	LICENCED	Quareter 4	Yes - 350 mg/m2	Monitoring to occur 4 times a year	51.58	mg/m2/day	yes	Standard Method	N/A	N/A

Note 1: Volumetric flow shall be included as a reportable parameter

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Continuous Monitoring

4	Does your site carry out continuous air emissions monitoring?	No	

If yes please review your continuous monitoring data and report the required fields below in Table A2 and compare it to its relevant Emission Limit Value (ELV)

5	Did continuous monitoring equipment experience downtime? If yes please record downtime in table A2 below	No	
6	Do you have a proactive service agreement for each piece of continuous monitoring equipment?	No	
7	Did your site experience any abatement system bypasses? If yes please detail them in table A3 below	No	

Table A2: Summary of average emissions -continuous monitoring

Emission reference no:	Parameter/ Substance	ELV in licence or any revision therof	Averaging Period	Compliance Criteria	Units of measurement	Annual Emission	Annual maximum	Monitoring Equipment downtime (hours)	Number of ELV exceedences in current reporting year	Comments
	SELECT			SELECT	SELECT					
	SELECT				SELECT					
	SELECT				SELECT					
	SELECT				SELECT					
	SELECT				SELECT					

note 1: Volumetric flow shall be included as a reportable parameter.

Table A3: Abatement system bypass reporting table

Bypass protocol

Date*	Duration** (hours)	Location	Reason for bypass	Impact magnitude	Corrective action

* this should include all dates that an abatement system bypass occurred

** an accurate record of time bypass beginning and end should be logged on site and maintained for future Agency inspections please refer to bypass protocol link

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Solvent use and management on site

8 Do you have a total Emission Limit Value of direct and fugitive emissions on site? if yes please fill out tables A4 and A5

SELECT

Table A4: Solvent Management Plan Summary
Total VOC Emission limit value

Solvent regulations — Please refer to linked solvent regulations to complete table 5 and 6

Reporting year	Total solvent input on site (kg)	Total VOC emissions to Air from entire site (direct and fugitive)	Total VOC emissions as %of solvent input	Total Emission Limit Value (ELV) in licence or any revision therof	Compliance
					SELECT
					SELECT

Table A5: Solvent Mass Balance summary

	(I) Inputs (kg)	(O) Outputs (kg)						
Solvent	(I) Inputs (kg)	Organic solvent emission in waste	Solvents lost in water (kg)	Collected waste solvent (kg)	Fugitive Organic Solvent (kg)	Solvent released in other ways e.g. by-	Solvents destroyed onsite through	Total emission of Solvent to air (kg)
							Total	

AER Monitoring returns summary template-WATER/WASTEWATER(SEWER) Lic No: W0184-02 Year 2017

	Additional information
Does your site have licensed emissions direct to surface water or direct to sewer? If yes please complete table W2 and W3 below for the current reporting year and answer further questions. If **you do not have** licenced emissions you <u>only</u> need to complete table W1 and or W2 for storm water analysis and visual inspections	Yes	
Was it a requirement of your licence to carry out visual inspections on any surface water discharges or watercourses on or near your site? If yes please complete table W2 below summarising <u>only any evidence of contamination noted during visual inspections</u>	No	

Table W1 Storm water monitoring W0184-01

Location reference	Location relative to site activities	PRTR Parameter	Licenced Parameter	Monitoring date	ELV or trigger level in licence or any revision thereof*	Licence Compliance criteria	Measured value	Unit of measurement	Compliant with licence	Comments
SW01	onsite	not applicable	Fats, Oils and Greases	13/04/2017	15 mg/L	All values < ELV	0.01	mg/L	yes	The highest result for the reporting year is recorded in this table.
SW01	onsite	not applicable	pH	15/06/2017	N/A	All values < ELV	8.11	pH units	yes	The highest result for the reporting year is recorded in this table.
SW01	onsite	not applicable	COD	20/06/2017	250 mg/L	All values < ELV	220	mg/L	yes	The highest result for the reporting year is recorded in this table.
SW01	onsite	not applicable	Suspended Solids	02/03/2017	60 mg/L	All values < ELV	54	mg/L	yes	The highest result for the reporting year is recorded in this table.
SW01	onsite	not applicable	Mineral oils	17/05/2017 07/06/2017	5 mg/L	All values < ELV	0.01	mg/L	yes	The highest result for the reporting year is recorded in this table.
SW02	onsite	not applicable	Fats, Oils and Greases	N/A	N/A	All values < ELV	N/A	N/A	N/A	The highest result for the reporting year is recorded in this table.
SW02	onsite	not applicable	pH	08/03/2017	N/A	All values < ELV	8.1	pH units	yes	The highest result for the reporting year is recorded in this table.
SW02	onsite	not applicable	COD	24/02/2017	250 mg/L	All values < ELV	174	mg/L	yes	The highest result for the reporting year is recorded in this table.
SW02	onsite	not applicable	Suspended Solids	09/01/2017	60 mg/L	All values < ELV	72	mg/L	yes	The highest result for the reporting year is recorded in this table.
SW02	onsite	not applicable	Mineral oils	17/05/2017	5 mg/L	All values < ELV	0.1	mg/L	yes	The highest result for the reporting year is recorded in this table.

Table W1.1 Storm water monitoring W0184-02

Location reference	Location relative to site activities	PRTR Parameter	Licenced Parameter	Monitoring date	ELV or trigger level in licence or any revision thereof*	Licence Compliance criteria	Measured value	Unit of measurement	Compliant with licence	Comments
SW01	onsite	not applicable	Fats, Oils and Greases	N/A	N/A	All values < ELV	N/A	mg/L	yes	The highest result for the reporting year is recorded in this table.
SW01	onsite	not applicable	pH	06/11/2017	8.35	All values < ELV	8.22	pH units	yes	The highest result for the reporting year is recorded in this table.
SW01	onsite	not applicable	COD	06/11/2017	111 mg/L	All values < ELV	92	mg/L	yes	The highest result for the reporting year is recorded in this table.
SW01	onsite	not applicable	Suspended Solids	20/11/2017	34 mg/L	All values < ELV	37	mg/L	yes	The highest result for the reporting year is recorded in this table.
SW01	onsite	not applicable	Mineral oils	13/7/2017 10/08/2017 08/09/2017	0.2 mg/L	All values < ELV	0.01	mg/L	yes	The highest result for the reporting year is recorded in this table.
SW02	onsite	not applicable	Fats, Oils and Greases	N/A	N/A	All values < ELV	N/A	N/A	N/A	The highest result for the reporting year is recorded in this table.
SW02	onsite	not applicable	pH	08/09/2017	8.35	All values < ELV	8.32	pH units	yes	The highest result for the reporting year is recorded in this table.
SW02	onsite	not applicable	COD	20/11/2017	78 mg/L	All values < ELV	93	mg/L	yes	The highest result for the reporting year is recorded in this table.
SW02	onsite	not applicable	Suspended Solids	18/07/2017	34 mg/L	All values < ELV	90	mg/L	yes	The highest result for the reporting year is recorded in this table.
SW02	onsite	not applicable	Mineral oils	13/07/2017 10/08/2017 08/09/2017	0.2 mg/L	All values < ELV	0.01	mg/L	yes	The highest result for the reporting year is recorded in this table.

*trigger values may be agreed by the Agency outside of licence conditions

Table W2 Visual inspections-Please only enter details where contamination was observed.

Location Reference	Date of inspection	Description of contamination	Source of contamination	Corrective action	Comments
		not applicable	SELECT		
			SELECT		

Licensed Emissions to water and /or wastewater(sewer)-periodic monitoring (non-continuous)

Was there any result in breach of licence requirements? If yes please provide brief details in the comment section of Table W3 below	No	Table 3 illustrates the period January to June 14th (W0184-01). Table 3.1 illustrates the period June 15th to December (W0184-02)
Was all monitoring carried out in accordance with EPA guidance and checklists for Quality of Aqueous Monitoring Data Reported to the EPA? If no please detail what areas require improvement in additional information box (External /internal Lab Quality checklist; Assessment of results checklist)	Yes	

Table W3: Licensed Emissions to water and /or wastewater (sewer)-periodic monitoring (non-continuous) (W0184-01)

Emission reference no:	Emission released to	Parameter/ SubstanceNote 1	Type of sample	Frequency of monitoring	Averaging period	ELV or trigger values in licence or any revision thereof[Note 2]	Licence Compliance criteria	Measured value	Unit of measurement	Compliant with licence	Method of analysis	Procedural reference source	Procedural reference standard number	Annual mass load (kg)	Comments
FS1	Wastewater/Sewe	pH	composite	Daily	24 hour	6 - 8.5	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	9.26	pH units	no (if no please enter details in comments box)	pH Meter (Electrode)	As per manufacturers guide	SOP 1134		.
FS1	Wastewater/Sewe	Temperature	composite	Daily	24 hour	43	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	39.54	degrees C	yes	Temperature Probe	SCADA	SCADA		
FS1	Wastewater/Sewe	Suspended Solids	composite	Daily	24 hour	400 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	244	mg/L	yes	Gravimetric analysis	APHA / AWWA "Standard Methods"	SOP 1291	316.28	This was the maximum release. This release was compliant according to licence condition 6.10
FS1	Wastewater/Sewe	Ammonia (as N)	composite	Weekly	24 hour	80 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	135	mg/L	yes	Spectrophotometry (Colorimetry)	APHA / AWWA "Standard Methods"	SOP 1245	195.99	This was the maximum release. This release was compliant according to licence condition 6.10
FS1	Wastewater/Sewe	Chlorides (as Cl)	composite	Weekly	24 hour	6000 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	4030	mg/L	yes	Titration	APHA / AWWA "Standard Methods"	SOP 1028	9094.93	
FS1	Wastewater/Sewe	Copper and compounds (as Cu)	composite	Weekly	24 hour	1 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	0.04	mg/L	yes	ICP	TM30 - Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7	TM30/PM14	0.0670	
FS1	Wastewater/Sewe	Lead and compounds (as Pb)	composite	Weekly	24 hour	0.5 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	0.01	mg/L	yes	ICP	TM30 - Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.8	TM30/PM14	0.0190	
FS1	Wastewater/Sewe	Zinc and compounds (as Zn)	composite	Weekly	24 hour	1 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	0.45	mg/L	yes	ICP	TM30 - Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.9	TM30/PM14	0.30	
FS1	Wastewater/Sewe	Cadmium and compounds (as Cd)	composite	Weekly	24 hour	0.15 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	0	mg/L	yes	ICP	TM30 - Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.10	TM30/PM14	0.00	
FS1	Wastewater/Sewe	COD	composite	Daily	24 hour	280Kg/day	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	175.6	mg/L	yes	Spectrophotometry (Colorimetry)	APHA / AWWA "Standard Methods"	SOP 1241	8551.25	
FS1	Wastewater/Sewe	Phenols (as total C)	composite	Weekly	24 hour	50 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	31	mg/L	yes	Spectrophotometry (Colorimetry)	APHA / AWWA "Standard Methods"	SOP 1289	34.41	
FS1	Wastewater/Sewe	Sulphate	composite	Weekly	24 hour	1000 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	34	mg/L	yes	Spectrophotometry (Colorimetry)	APHA / AWWA "Standard Methods"	SOP 1032	20.96	
FS1	Wastewater/Sewe	Fats, Oils and Greases	composite	Weekly	24 hour	100 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	19.72	mg/L	yes	EPH with GC-FID	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	TMS/PM30	12.69	
FS1	Wastewater/Sewe	Total phosphorus	composite	Weekly	24 hour	150 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	132	mg/L	yes	Spectrophotometry (Colorimetry)	APHA / AWWA "Standard Methods"	SOP 1246	279.35	
FS1	Wastewater/Sewe	volumetric flow	composite	Daily	24 hour	50 m3/day	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	48.14	m3/day	yes	SCADA	SCADA	SCADA	3899220	

Table W3.1: Licensed Emissions to water and /or wastewater (sewer)-periodic monitoring (non-continuous) (W0184-02)

Emission reference no:	Emission released to	Parameter/ SubstanceNote 1	Type of sample	Frequency of monitoring	Averaging period	ELV or trigger values in licence or any revision thereof[Note 2]	Licence Compliance criteria	Measured value	Unit of measurement	Compliant with licence	Method of analysis	Procedural reference source	Procedural reference standard number	Annual mass load (kg)	Comments
FS1	Wastewater/Sewe	pH	composite	Daily	24 hour	6-9pH	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	8.29	pH units	no (if no please enter details in comments box)	pH Meter (Electrode)	As per manufacturers guide	SOP 1134		.
FS1	Wastewater/Sewe	Temperature	composite	Daily	24 hour	43	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	43.3	degrees C	yes	Temperature Probe	SCADA	SCADA		
FS1	Wastewater/Sewe	Suspended Solids	composite	Daily	24 hour	400 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	303	mg/L	yes	Gravimetric analysis	APHA / AWWA "Standard Methods"	SOP 1291	397.8	This was the maximum release. This release was compliant according to licence condition 6.10
FS1	Wastewater/Sewe	Ammonia (as N)	composite	Weekly	24 hour	80 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	96.8	mg/L	yes	Spectrophotometry (Colorimetry)	APHA / AWWA "Standard Methods"	SOP 1245	241.95	This was the maximum release. This release was compliant according to licence condition 6.10
FS1	Wastewater/Sewe	Chlorides (as Cl)	composite	Weekly	24 hour	6000 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	2310	mg/L	yes	Titration	APHA / AWWA "Standard Methods"	SOP 1028	215916.60	
FS1	Wastewater/Sewe	Copper and compounds (as Cu)	composite	Weekly	24 hour	0.5mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	0.01	mg/L	yes	ICP	TM30 - Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7	TM30/PM14	0.9700	
FS1	Wastewater/Sewe	Lead and compounds (as Pb)	composite	Weekly	24 hour	0.5 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	0.01	mg/L	yes	ICP	TM30 - Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.8	TM30/PM14	0.6917	
FS1	Wastewater/Sewe	Zinc and compounds (as Zn)	composite	Weekly	24 hour	0.5mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	0.5	mg/L	yes	ICP	TM30 - Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.9	TM30/PM14	9.30	
FS1	Wastewater/Sewe	Cadmium and compounds (as Cd)	composite	Weekly	24 hour	0.005mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	0	mg/L	yes	ICP	TM30 - Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.10	TM30/PM14	0.07	
FS1	Wastewater/Sewe	COD	composite	Daily	24 hour	6000mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	4190.0	mg/L	yes	Spectrophotometry (Colorimetry)	APHA / AWWA "Standard Methods"	SOP 1241	352809.00	
FS1	Wastewater/Sewe	Phenols (as total C)	composite	Weekly	24 hour	30 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	13.9	mg/L	yes	Spectrophotometry (Colorimetry)	APHA / AWWA "Standard Methods"	SOP 1289	1064.23	
FS1	Wastewater/Sewe	Sulphate	composite	Weekly	24 hour	800 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	9	mg/L	yes	Spectrophotometry (Colorimetry)	APHA / AWWA "Standard Methods"	SOP 1032	222.33	
FS1	Wastewater/Sewe	Fats, Oils and Greases	composite	Weekly	24 hour	100 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	25.13	mg/L	yes	EPH with GC-FID	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	TMS/PM30	344.69	
FS1	Wastewater/Sewe	Total phosphorus	composite	Weekly	24 hour	150 mg/L	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	116	mg/L	yes	Spectrophotometry (Colorimetry)	APHA / AWWA "Standard Methods"	SOP 1246	8964.93	
FS1	Wastewater/Sewe	volumetric flow	composite	Daily	24 hour	50 m3/day	All results < 1.2 times ELV, plus 8 from ten results must be < ELV	49.31	m3/day	yes	SCADA	SCADA	SCADA	5125610	

Note 1: Volumetric flow shall be included as a reportable parameter

Note 2: Where Emission Limit Values (ELV) do not apply to your licence please compare results against EQS for Surface water or relevant receptor quality standards

Continuous monitoring

	Additional Information
Does your site carry out continuous emissions to water/sewer monitoring?	No	
If yes please summarise your continuous monitoring data below in Table W4 and compare it to its relevant Emission Limit Value (ELV)		
Did continuous monitoring equipment experience downtime? **If yes please record downtime in table W4 below**	No	We do not have continuous monitoring equipment
Do you have a proactive service contract for each piece of continuous monitoring equipment on site?	No	We do not have continuous monitoring equipment
Did abatement system bypass occur during the reporting year? **If yes please complete table W5 below**	No	

Table W4: Summary of average emissions -continuous monitoring

Emission reference no:	Emission released to	Parameter/ Substance	ELV or trigger values in licence or any revision thereof	Averaging Period	Compliance Criteria	Units of measurement	Annual Emission for current reporting year (kg)	% change +/- from previous reporting year	Monitoring Equipment downtime (hours)	Number of ELV exceedences in reporting year	Comments
	SELECT	SELECT		SELECT	SELECT	SELECT					
	SELECT	SELECT		SELECT	SELECT	SELECT					

note 1: Volumetric flow shall be included as a reportable parameter.

Table W5: Abatement system bypass reporting table

Date	Duration (hours)	Location	Resultant emissions	Reason for bypass	Corrective action*	Was a report submitted to the EPA?	When was this report submitted?
						SELECT	

*Measures taken or proposed to reduce or limit bypass frequency

Bund/Pipeline testing template

Lic No: W0184-02 Year 2017

Bund testing

dropdown menu click to see options

			Additional information
1	Are you required by your licence to undertake integrity testing on bunds and containment structures ? if yes please fill out table B1 below listing all **new bunds and containment structures** on site, in addition to **all bunds which failed** the integrity test-**all bunding structures which failed including mobile bunds must be listed in the table below, please include all bunds outside the licenced testing period** (mobile bunds and chemstore included)	Yes	
2	Please provide integrity testing frequency period	3 years	
3	Does the site maintain a register of bunds, underground pipelines (including stormwater and foul), Tanks, sumps and containers? (containers refers to "Chemstore" type units and mobile bunds)	Yes	
4	How many bunds are on site?	10	
5	How many of these bunds have been tested within the required test schedule?	10	They are due in be tested in 2018
6	How many mobile bunds are on site?	18	
7	Are the mobile bunds included in the bund test schedule?	Yes	
8	How many of these mobile bunds have been tested within the required test schedule?	18	Two new added to list from 2015.
9	How many sumps on site are included in the integrity test schedule?	12	
10	How many of these sumps are integrity tested within the test schedule?	12	
	Please list any sump integrity failures in table B1		
11	Do all sumps and chambers have high level liquid alarms?	No	
12	If yes to Q11 are these failsafe systems included in a maintenance and testing programme?	SELECT	
13	Is the Fire Water Retention Pond included in your integrity test programme?	No	

Table B1: Summary details of bund /containment structure integrity test

Bund/Containment structure ID	Type	Specify Other type	Product containment	Actual capacity	Capacity required*	Type of integrity test	Other test type	Test date	Integrity reports maintained on site?	Results of test	Integrity test failure explanation <50 words	Corrective action taken	Scheduled date for retest	Results of retest(if in current reporting year)
	SELECT					SELECT			SELECT	SELECT		SELECT		

* Capacity required should comply with 25% or 110% containment rule as detailed in your licence

			Commentary
15	Has integrity testing been carried out in accordance with licence requirements and are all structures tested in line with BS8007/EPA Guidance?	Yes	
16	Are channels/transfer systems to remote containment systems tested?	No	N/A
17	Are channels/transfer systems compliant in both integrity and available volume?	SELECT	N/A

bunding and storage guidelines

Pipeline/underground structure testing

1	Are you required by your licence to undertake integrity testing* on underground structures e.g. pipelines or sumps etc ? if yes please fill out table 2 below listing all underground structures and pipelines on site **which failed the integrity test and all which have not been tested withing the integrity test period as specified**	Yes	Due in 2017
2	Please provide integrity testing frequency period	3 years	

*please note integrity testing means water tightness testing for process and foul pipelines (as required under your licence)

Table B2: Summary details of pipeline/underground structures integrity test

Structure ID	Type system	Material of construction:	Does this structure have Secondary containment?	Type of secondary containment	Type integrity testing	Integrity reports maintained on site?	Results of test	Integrity test failure explanation <50 words	Corrective action taken	Scheduled date for retest	Results of retest(if in current reporting year)
	SELECT	SELECT	SELECT	SELECT	SELECT	SELECT	SELECT				SELECT

Please use commentary for additional details not answered by tables/ questions above

Environmental Liabilities template	Lic No:	W0184-02	Year	2017

Click here to access EPA guidance on Environmental Liabilities and Financial provision

			Commentary
1	ELRA initial agreement status	Submitted and agreed by EPA	
2	ELRA review status	Review required and completed	
3	Amount of Financial Provision cover required as determined by the latest ELRA	4,133,343	
4	Financial Provision for ELRA status	Submitted and agreed by EPA	
5	Financial Provision for ELRA - amount of cover	4,133,343	
6	Financial Provision for ELRA - type	Other please specify	Insurance and Bond
7	Financial provision for ELRA expiry date	Insurance (11.10.17) & Bond (11.10.19)	
8	Closure plan initial agreement status	Closure plan submitted and agreed by EPA	
9	Closure plan review status	Review required and completed	
10	Financial Provision for Closure status	Submitted and agreed by EPA	
11	Financial Provision for Closure - amount of cover	2,255,641.34	
12	Financial Provision for Closure - type	bond	
13	Financial provision for Closure expiry date	01/05/2019	

Environmental Management Programme/Continuous Improvement Programme template

Lic No: W0184-02 Year 2017

Highlighted cells contain dropdown menu click to view

			Additional Information
1	Do you maintain an Environmental Mangement System (EMS) for the site. If yes, please detail in additional information	Yes	
2	Does the EMS reference the most significant environmental aspects and associated impacts on-site	Yes	
3	Does the EMS maintain an Environmental Management Programme (EMP) as required in accordance with the licence requirements	Yes	
4	Do you maintain an environmental documentation/communication system to inform the public on environmental performance of the facility, as required by the licence	Yes	EHS management system in place (ISO 14001 & OHSAS 18001)

Environmental Management Programme (EMP) report

Objective Category	Target	Status (% completed)	How target was progressed	Responsibility	Intermediate outcomes
Overspill protection	Reduction in risk of overspill from tanks	85%	All Enva tanks are fitted with high level controls linked back to the scada system which close off the valves and pumps on the activation of an alarm. Additional controls are being installed to protect against overfill due to gravity feed.	Facility and Production	Increase safety to prevent damage and loss of containment.
	Catchment of leaks	On-going	Leak inspections on flanges and valves are recorded on a weekly basis	Production	Increase safety to prevent damage and loss of containment.
	Maintain a register of bunds, sumps and trays	On-Going	Bund register is maintained onsite. All bunds, sumps and trays are inspectd weekly or more regularly during busy periods and emptied if required. No water to be discharged to storm unless tested	Facility and Production	Increase safety to prevent damage and loss of containment.
Improve tank, pipeline, bund integrity, yard and expansion gap assessments.	Replace damaged concrete to upgrade yard integrity and reseal expansion gaps joints as required.	On-going	All yard surface integrities, seals and expansion gaps will be monitored on a regular and prescheduled basis. A log is in place to document any repairs that have taken place. A site map will be updated to include all crack/expansion repairs. A monitoring programme is in place to ensure checks are undertaken in a prescheduled and routine manner where faults can be identified and repaired on an ongoing basis. This is a system that will be rolling each year. Minor repairs were done in 2017	HSE & Facilities	Remediation of contamination on site
	Review the site with regards to tanks and pipelines, in order to draft a register of current bunds, sumps, mobile bunds and pipelines, with their inclusion/exclusion (if required) in the three yearly bund integrity assessment.	95%	Tank and pipeline assesssment for the entire facility is 95 % completed. There is one remaining oil line and a programme is in place to replace the remaining line that requires testing.	Production	Remediation of contamination on site
	Label all pipe lines in process	100%	All oil lines, steam lines, condensate lines, water line have been labeled.	Production	Remediation of contamination on site
	labelling of bunds	100%	A register is in place for listing all bunds, mobile bunds, trays and storm water gullies. These are checked on a weekly to ensure they are empty of contaminents and are fit for purpose. All mobile bunds and trays have an identification label. All surface drains are identified with metal triangle.	Facility and Production	Remediation of contamination on site
	Review the assessment of bunds to meet standard reporting requirements.	50%	All sumps were tested in 2017	Facilities	Remediation of contamination on site
Energy Efficiency/Utility conservation	Review lighting onsite in order to determine where motion sensors can be installed in order to reduce energy consumption.	On-going	Bulbs which have come to their end of life have been replaced with Low wattage LED lights both inside and outside. Motion sensors have been installed in areas/rooms where deemed safe to do so. This is an ongoing project as there are numerous lights in the facility, replacements will occur as they come to end of life.	HSE & Facilities	Improved Environmental Management Practices
	Energy Audit	10%	Carry out energy audit. This will include assessment of use of raw materials and water consumption. Enva are currently reviewing proposal submitted from an external contractors with a view to implementing an energy management system.	Facility and Production	
Control of Fugitive emissions & Odour Reduction Programme	Reduce odour emissions from site	100%	Review and determine suitable odour abatement equipment for drying tanks and submit for approval to the Agency. Drying operations for oil processing have ceased pending installation of RTO	HSE & Operations	Increased compliance with licence conditions
		On-going	Increase odour assessments frequency. External contractors remain engaged by Enva to ensure regular independent monitoring of local area. Enva have also recruited a dedicated environmental supervisor to manage and help ensure environmental compliance as per the EPA Waste Licence	HSE	Increased compliance with licence conditions
		Complete	A carbon filter is in place within the oil filter and centrifuge rooms. The filter area has also been enclosed and sealed to further control fugitive emissions from this process.	Production	Increased compliance with licence conditions
		Complete	An odour abatement system to be installed in the paint processing machine. A carbon filter has been installed to mitigate and minimise odours deriving from the process of paint	Facilities	Increased compliance with licence conditions
		95%	Cladding of soil bay to reduce fugitive emissions from the site. The back (adjacent to CIE) and side (adjacent to Rockview) are closed off. The front of the soil bay will be enclosed with panels and cladding with two roller doors. This will also reduce noise and dust levels from the soil operation.	Facilities	Increased compliance with licence conditions
		Complete	Implementation of odour abatement mobile unit with odour abatement chemical during soil operations.	Facilities	Increased compliance with licence conditions
		Complete	Develop an odour management plan. Identify all odour sources, pathways and receptors. Implement interim controls to minimise odours	Facilities, HSE, Production	
		40%	Develop programme to monitor negative air pressure in certain waste processing areas. Additional sealing of process areas is underway.	Facilities	
		100%	Carry a programme of tank testing to demonstrate air tightness of process tanks. Complete.	Production	Increased compliance with licence conditions
Communication and Public Awareness Programme	Implement a public awareness programme	NEW	Ongoing regular communications to local businesses and residents regarding plant activities and ongoing development	Director	Increased compliance with licence conditions
RTO	Implement a by-pass system in the event of a failure	Pending RTO installation.	In the event that the RTO is not operational, the RTO will be by passed and emissons will be diverted to a carbon filter system	Operations	Increased compliance with licence conditions

Noise monitoring summary report	Lic No:	W0184-02	Year	2017

1	Was noise monitoring a licence requirement for the AER period? If yes please fill in table N1 noise summary below	Yes
2	Was noise monitoring carried out using the EPA Guidance note, including completion of the "Checklist for noise measurement report" included in the guidance note as table 6? (Noise Guidance note NG4)	Yes
3	Does your site have a noise reduction plan	No
4	When was the noise reduction plan last updated?	Enter date
5	Have there been changes relevant to site noise emissions (e.g. plant or operational changes) since the last noise survey?	No

Table N1: Noise monitoring summary

Date of monitoring	Time period	Noise location (on site)	Noise sensitive location -NSL (if applicable)	LA_{eq}	LA_{90}	LA_{10}	LA_{max}	Tonal or Impulsive noise* (Y/N)	If tonal /impulsive noise was identified was 5dB penalty applied?	Comments (ex. main noise sources on site, & extraneous noise ex. road traffic)	Is site compliant with noise limits (day/evening/night)?
14.12.17	17.25	N1	No	57	52	59	66	No		Enva activity included: vehicle movement. Offsite Noise: 2 trains and cars in/out of adjacent carpark, distant traffic noise	Yes
14.12.17	17.55	N1	No	54	50	56	62	No		Enva activity included: vehicle movement. Offsite Noise: 3 trains and cars in/out of adjacent carpark, distant traffic noise	Yes
14.12.17	18.25	N1	No	55	48	56	66	No		Enva activity: No audible noise from site. Offsite Noise: 2 trains, cars in/out of adjacent carpark, distant traffic noise	Yes
14.12.17	19.07	N1	No	50	47	52	56	No		Enva activity: no audible noise from site. Offsite Noise: 1 train passes, distant traffic noise, industrial noise.	Yes
14.12.17	0.02	N1	No	45	43	48	53	No		Enva activity: no audible noise from the site. Offsite Noise: distant traffic, local industrial noise.	Yes
14.12.17	0.17	N1	No	45	42	48	52	No		Enva activity: no audible noise from the site. Offsite Noise: distant traffic, local industrial noise.	Yes
14.12.17	13.40pm	N2	No	55	51	57	62	No		Dominant Noise: industrial noise, distant traffic. Onsite noise: boiler, filter room, motor at tank farm. Offsite noise: industrial noise, distant traffic, HGV movement in neighbouring facility. Onsite Noise: forklift, vehicle movement, boiler Offsite Noise: vehicle movement next door, distant traffic noise, construction noise from	Yes
14.12.17	14.13	N2	No	56	52	57	63	No		Dominant Noise: HGV on idle next door. Onsite noise: boiler, filter room, motor at tank farm. Offsite noise: Industrial noise, distant traffic, HGV on idle in neighbouring facility. Onsite Noise: forklift, vehicle movement, boiler Offsite Noise: vehicle movement next door, distant traffic noise,	Yes
14.12.17	14.45	N2	No	56	53	57	64	No		on idle next door. Onsite noise: boiler, filter room, motor at tank farm. Offsite noise: industrial noise, distant traffic, HGV on idle in neighbouring facility. Onsite Noise: No noise audible from Enva Offsite Noise: fan noise in neighbouring facility, distant traffic.	Yes
14.12.17	21.05	N2	No	53	50	54	56	No		Dominant Noise: industrial noise, distant traffic. Onsite noise: boiler on/off (just audible). Offsite noise: industrial noise, distant traffic. Onsite Noise: No noise audible from Enva Offsite Noise: fan noise in neighbouring facility, distant traffic, distant train	Yes
14.12.17	23.09	N2	No	49	47	50	52	No		Dominant Noise: industrial noise, distant traffic. Onsite noise: boiler on/off (just audible). Offsite noise: industrial noise, distant traffic. Onsite Noise: No noise audible from Enva Offsite Noise: fan noise in neighbouring facility, distant traffic, distant train	Yes
14.12.17	23.24	N2	No	48	47	50	52	No		Dominant Noise: industrial noise, distant traffic. Onsite noise: boiler on/off (just audible). Offsite noise: industrial noise, distant traffic. Onsite Noise: No noise	Yes
14.12.17	14.55	N3	No	51	47	52	58	No		Dominant noise: Construction work, industrial noise, distant traffic, soil shed. Onsite noise: soil shed excavator. Offsite Noise: Construction work, industrial noise,	Yes

14.12.17	15.25	N3	No	55	47	51	60	No		Dominant noise: Construction work, industrial noise, distant traffic, soil shed. Onsite noise: soil shed excavator. Offsite Noise: 2 trains, Construction work, industrial noise, distant traffic.	Yes
14.12.17	16.24	N3	No	53	47	53	62	No		Dominant noise: Construction work, industrial noise, distant traffic, soil shed. Onsite noise: soil shed excavator. Offsite Noise: 2 trains, Construction work, industrial noise, distant	Yes
14.12.17	21.15	N3	No	50	46	52	54	No		Dominat Noise: Distant traffic noise, train when passing. Onsite noise: no noise audible from Enva. Offsite noise: 1 train, distant traffic.	Yes
14.12.17	23.02	N3	No	47	43	50	54	No		Dominat Noise: Distant traffic noise, train when passing. Onsite noise: no noise audible from Enva. Offsite noise: 1 train, distant traffic.	Yes
14.12.17	23.19	N3	No	49	43	50	63	No		Dominat Noise: Distant traffic noise, train when passing. Onsite noise: no noise audible from Enva. Offsite noise: 1 train, distant traffic.	Yes
14.12.17	15.3	N4	No	56	46	60	66	No		Dominant noise: passing traffic, distant traffic. Onsite Noise: No noise audible from Enva. Offsite Noise: approximately 35 cars pass, distant traffic.	Yes
14.12.17	16.02	N4	No	56	47	58	65	No		Dominant noise: passing traffic, distant traffic. Onsite Noise: No noise audible from Enva. Offsite Noise: approximately 40 cars pass, distant traffic.	Yes
14.12.17	16.34	N4	No	56	48	60	65	No		Dominant noise: passing traffic, distant traffic. Onsite Noise: No noise audible from Enva. Offsite Noise: approximately 45 cars pass, distant traffic.	Yes
14.12.17	19.55	N4	No	51	45	53	62	No		Dominant Noise: Industrial noise, distant traffic. Onsite Noise: No noise audible from Enva. Offsite Noise: Approximately 20 cars pass, distant traffic.	Yes
14.12.17	0.46	N4	No	42	39	44	49	Yes		Dominant Noise: Industrial noise, distant traffic. Onsite Noise: No noise audible from Enva. Offsite Noise: Approximately 2 cars pass, distant traffic.	Yes
14.12.17	1.01	N4	No	41	39	43	49	No		Dominant Noise: Industrial noise, distant traffic. Onsite Noise: No noise audible from Enva. Offsite Noise: Approximately 1 car pass, distant traffic.	Yes
14.12.17	17.05	N5	No	54	47	56	60	No		Dominant Noise: distant traffic, vehicle movement onsite, train and cars leaving carpark. Onsite Noise: forklift, 1 HGV. Offsite Noise: 2 trains pass,	Yes
14.12.17	17.37	N5	No	54	46	56	63	No		Dominant Noise: distant traffic, vehicle movement onsite, train and cars leaving carpark. Onsite Noise: forklift, 1 HGV. Offsite Noise: 3 trains pass,	Yes
14.12.17	18.08	N5	No	53	44	54	62	No		Dominant Noise: distant traffic, train and cars leaving carpark. Onsite Noise: no noise audible from Enva. Offsite Noise: 2 trains pass, cars in/out of	Yes
14.12.17	19.1	N5	No	49	46	51	55	No		Dominant Noise: distant traffic, train. Onsite Noise: no noise audible from Enva. Offsite Noise: 1 train passes, distant traffic noise, industrial noise.	Yes
14.12.17	0.01	N5	No	46	43	49	53	No		Dominant Noise: distant traffic, local industrial noise. Onsite Noise: no noise audible from Enva. Offsite Noise: distant traffic noise, local industrial	Yes
14.12.17	0.17	N5	No	46	43	48	52	No		Dominant Noise: distant traffic, local industrial noise. Onsite Noise: no noise audible from Enva. Offsite Noise: distant traffic noise, local industrial	Yes

*Please ensure that a tonal analysis has been carried out as per guidance note NG4. These records must be maintained onsite for future inspection

If noise limits exceeded as a result of noise attributed to site activities, please choose the corrective action from the following options?

SELECT

** please explain the reason for not taking action/resolution of noise issues?
Any additional comments? (less than 200 words)

Resource Usage/Energy efficiency summary

Lic No: W0184-02 Year 2017

			Additional information
1	When did the site carry out the most recent energy efficiency audit? Please list the recommendations in table 3 below	Jan-07	
2	Is the site a member of any accredited programmes for reducing energy usage/water conservation such as the SEAI programme linked to the right? If yes please list them in additional information	No	SEAI - Large Industry Energy Network (LIEN)
3	Where Fuel Oil is used in boilers on site is the sulphur content compliant with licence conditions? Please state percentage in additional information	Yes	

Table R1 Energy usage on site

Energy Use	Previous year	Current year	Production +/- % compared to previous reporting year**	Energy Consumption +/- % vs overall site production*
Total Energy Used (MWHrs)	3903.408	4992.844	27.90986748	
Total Energy Generated (MWHrs)				
Total Renewable Energy Generated (MWHrs)				
Electricity Consumption (MWHrs)	368.569	377.81	2.507264583	
Fossil Fuels Consumption:				
Heavy Fuel Oil (m3)				
Light Fuel Oil (m3)		0		
Natural gas (m3)	334843.046	437443.98	30.64150062	
Coal/Solid fuel (metric tonnes)				
Peat (metric tonnes)				
Renewable Biomass				
Renewable energy generated on site				

* where consumption of energy can be compared to overall site production please enter this information as percentage increase or decrease compared to the previous reporting year.

** where site production information is available please enter percentage increase or decrease compared to previous year

Table R2 Water usage on site

					Water Emissions	Water Consumption	
Water use	Water extracted Previous year m3/yr.	Water extracted Current year m3/yr.	Production +/- % compared to previous reporting year**	Energy Consumption +/- % vs overall site production*	Volume Discharged back to environment(m^3yr):	Volume used i.e not discharged to environment e.g. released as steam m3/yr	Unaccounted for Water:
Groundwater							
Surface water							
Public supply	16185	19180	18.50478838				
Recycled water							
Total							

* where consumption of water can be compared to overall site production please enter this information as percentage increase or decrease compared to the previous reporting year.

** where site production information is available please enter percentage increase or decrease compared to previous year

Table R3 Waste Stream Summary

	Total	Landfill	Incineration	Recycled	Other
Hazardous (Tonnes)					
Non-Hazardous (Tonnes)					

Resource Usage/Energy efficiency summary

Lic No: W0184-02 Year 2017

Table R4: Energy Audit finding recommendations

Date of audit	Recommendations	Description of Measures proposed	Origin of measures	Predicted energy savings %	Implementation date	Responsibility	Completion date	Status and comments

Table R5: Power Generation: Where power is generated onsite (e.g. power generation facilities/food and drink industry)please complete the following information

	Unit ID	Unit ID	Unit ID	Unit ID	Station Total
Technology					
Primary Fuel					
Thermal Efficiency					
Unit Date of Commission					
Total Starts for year					
Total Running Time					
Total Electricity Generated (GWH)					
House Load (GWH)					
KWH per Litre of Process Water					
KWH per Litre of Total Water used on Site					

Complaints and Incidents summary template

Lic No: W0184-02 Year 2017

Complaints

Have you received any environmental complaints in the current reporting year? If yes please complete summary details of complaints received on site in table 1 below		Additional information
	Yes	

Table 1 Complaints summary

Date	Category	Other type (please specify)	Brief description of complaint (Free txt <20 words)	Corrective action< 20 words	Resolution status	Resolution date	Further information
23.01.17 to 05.12.17	Odour		Odour complaints received.	The Agency opened Compliance Investigation CI001037 in relation to odours emitting from Enva Ireland Portlaoise. Enva have indentified odour sources on site and have implemented controls to mitigate odour nuisances. Information in relation to corrective actions have been uploaded to EDEN under CI001037	Ongoing	Ongoing	
	SELECT				SELECT		
	SELECT				SELECT		
	SELECT				SELECT		
	SELECT				SELECT		

Total complaints open at start of reporting year	28
Total new complaints received during reporting year	11
Total complaints closed during reporting year	All complaints remain open as part of CI001037
Balance of complaints end of reporting year	All complaints remain open as part of CI001037

Incidents

Have any incidents occurred on site in the current reporting year? Please list all incidents for current reporting year in Table 2 below		Additional information
	Yes	For details on Non conformances please refer to Eden.

*For information on how to report and what constitutes an incident	What is an incident

Table 2 Incidents summary

Date of occurrence	Incident nature	Location of occurrence	Incident category*please refer to guidance	Receptor	Cause of incident	Other cause(please specify)	Activity in progress at time of incident	Communication	Occurrence	Corrective action<20 words	Preventative action <20 words	Resolution status	Resolution date	Likelihood of reoccurence

Complaints and Incidents summary template Lic No: W0184-02 Year 2017

	Breach of ELV	Licenced discharge point (typ	1. Minor	Water	Operational controls		Normal activities	EPA	New	New maintenance pro	New maintena	Complete	28.02.18	Low
	Other(please specify)	Licenced discharge point (typ	1. Minor	Water	Operational controls		Normal activities	EPA	New	Staf to ensure all requi	Staf to ensure	Complete		Low
	Other(oil stains on concrete)	Other location (please specif	1. Minor	Water	Operational controls		Normal activities	EPA	New	Concrete cleaned and	Concrete clean	Complete	02.07.17	Low
	Other(Waste not in bunded area)	Other location (please specif	1. Minor	Water	Operational controls		Normal activities	EPA	Recurring	Waste placed in bunde	Operatives inst	Complete	02.06.17	Low
	Odour	Other location (please specif	1. Minor	Air	Operational controls		Normal activities	EPA	Recurring	Odour abatement impl	Odour abatem	Complete	31.01.18	Low
	Other(Waste not stored in a bunde	Other location (please specif	1. Minor	Water	Operational controls		Normal activities	EPA	Recurring	Waste placed in bunde	Operatives inst	Complete	13.04.17	Low

Total number of incidents current year	6
Total number of incidents previous year	3
% reduction/ increase	100

WASTE SUMMARY	Lic No:	W0184-02	Year	2017
SECTION A-PRTR ON SITE WASTE TREATMENT AND WASTE TRANSFERS TAB- TO BE COMPLETED BY ALL IPPC AND WASTE FACILITIES		PRTR facility logon	dropdown list click to see options	

SECTION B- WASTE ACCEPTED ONTO SITE-TO BE COMPLETED BY ALL IPPC AND WASTE FACILITIES

			Additional Information
1	Were any wastes accepted onto your site for recovery or disposal or treatment prior to recovery or disposal within the boundaries of your facility ?; (waste generated within your boundaries is to be captured through PRTR reporting) If yes please enter details in table 1 below	Yes	
2	Did your site have any rejected consignments of waste in the current reporting year? If yes please give a brief explanation in the additional information	No	
3	Was waste accepted onto your site that was generated outside the Republic of Ireland? If yes please state the quantity in tonnes in additional information	Yes	

Table 1 Details of waste accepted onto your site for recovery, disposal or treatment (do not include wastes generated at your site, as these will have been reported in your PRTR workbook)

Licenced annual tonnage limit for your site (total tonnes/annum)	EWC code European Waste Catalogue EWC codes	Source of waste accepted	Description of waste accepted **Please enter an accurate and detailed description - which applies to relevant EWC code** European Waste Catalogue EWC codes	Quantity of waste accepted in current reporting year (tonnes)	Quantity of waste accepted in previous reporting year (tonnes)	Reduction/ Increase over previous year +/ - %	Reason for reduction/ increase from previous reporting year	Packaging Content (%)- only applies if the waste has a packaging component	Disposal/Recovery or treatment operation carried out at your site and the description of this operation	Quantity of waste remaining on site at the end of reporting year (tonnes)	Comments -
110,000 tons	*13 02 08*	*13- OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)*	*Waste oil*	9145.337	*14269.867*	-35.91154704	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R9-Oil re-refining or other reuses*	*30*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	13 07 01	*13- OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)*	*Diesel and Fuel oil*	399.57	214.11	86.6190276	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R9-Oil re-refining or other reuses of oil*		*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*

WASTE SUMMARY					Lic No:	W0184-02		Year	2017		
	13 05 03	13- OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)	Interceptor sludges	225.94	335.05	-32.56596963	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R9-Oil re-refining or other reuses of oil		Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	13 08 02	13- OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)	Other emulsions	668.78	434.70	53.84863124	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R9-Oil re-refining or other reuses	37	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	13 05 01	13- OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)	Solids from grit chambers and oil/water separators	51.96	258.98	-79.93667465	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R5-Recycling/reclamation or other inorganic materi		Enva Ireland does not currently record the packaging content of waste as it arrives on-site

WASTE SUMMARY					Lic No:	W0184-02		Year	2017	
	13 08 99	*13- OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)*	*Waste not oherwise specified*	22.01	13.27	65.86799277	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	13 01 13	*13- OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)*	*Other hydraulic oils*	0.00	0.00	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R9-Oil re-refining or other reuses of oil*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	13 05 08	*13- OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)*	*Mixtures of waste from grit chambers and oil / water separators*	210.80	279.03	-24.45310932	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R9-Oil re-refining or other reuses of oil*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*

WASTE SUMMARY					Lic No:	W0184-02		Year	2017	
	13 02 05	*13- OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)*	*Mineral based non-chlorinated engine, gear and lubricating oils*	*0*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R9-Oil re-refining or other reuses of oil*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	08 01 13	*08- WASTES FORM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS,) ADHESIVES, SEALANTS AND PRINTING INKS*	*Sludges from paint or varnish containing organic solvents or other dangerous substances*	*18.584*	*14.66*	26.76671214	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	08 04 13	*08- WASTES FORM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS,) ADHESIVES, SEALANTS AND PRINTING INKS*	*Aqueous sludges containing adhesive or sealants containing organic solvents or other dangerous substances*	*0*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*

WASTE SUMMARY					Lic No:	W0184-02		Year	2017		
	20 01 21	20- MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS	Fluorescent tubes	2.887	2.685	7.523277467	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending an	0.25	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	16 01 07	16- WASTES NOT OTHERWISE SPECIFIED IN THE LIST	Oil filters	708.2	697.631	1.514984283	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending an	14.5	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	17 05 03	17- CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)	Soil and stone containng dangerous substances	13,106.31	5745.003	128.1341542	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R5-Recycling/reclamation or othe	5804	Enva Ireland does not currently record the packaging content of waste as it arrives on-site

WASTE SUMMARY					Lic No:	W0184-02		Year	2017		
	16 06 01	16- WASTES NOT OTHERWISE SPECIFIED IN THE LIST	Lead batteries	572.43	726.41	-21.19671533	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending an	36.05	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	15 02 02	15- WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	467.574	437.618	6.845239455	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending an	55.3	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	16 07 08	16- WASTES NOT OTHERWISE SPECIFIED IN THE LIST	Waste containing oil	34.887	32.311	7.972517099	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending any of the operations		Enva Ireland does not currently record the packaging content of waste as it arrives on-site

WASTE SUMMARY					Lic No:	W0184-02		Year	2017		
	16 01 13	16- WASTES NOT OTHERWISE SPECIFIED IN THE LIST	Brake fluids	13.30	9.69	37.28970998	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending any of the operations		Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	13 07 03	13- OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)	Other fuels (including mixtures)	295.64	233.66	26.52714472	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending an	26.75	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	13 07 02	13- OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)	Petrol	8.88	10.22	-13.07752545	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending an	6	Enva Ireland does not currently record the packaging content of waste as it arrives on-site

WASTE SUMMARY					Lic No:	W0184-02		Year	2017		
	16 05 04	16- WASTES NOT OTHERWISE SPECIFIED IN THE LIST	Gases in pressure containers (including halons) containing dangerous substances	42.53	44.55	-4.531884806	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending an	2.8	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	08 01 11	08- WASTES FORM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS,) ADHESIVES, SEALANTS AND PRINTING INKS	Waste paint and varnish containing organic solvents or other dangerous substances	1,463.85	1,006.47	45.44413103	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R5-Recycling/reclamation or othe	150.7	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	09 01 02	09- WASTES FROM THE PHOTOGRAPHIC INDUSTRY	Water-based offset plate developer solutions	0.00	8.41	-100	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	D15-Storage pending any of the operations number		Enva Ireland does not currently record the packaging content of waste as it arrives on-site

WASTE SUMMARY					Lic No:	W0184-02		Year	2017		
	15 01 10	15- WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED	Packaging containing residues of or containing dangerous substances	164.95	182.67	-9.698363169	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending an	43	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	20 01 27	20- MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS	Paint, inks, adhesives and resins containing dangerous substances	1.53	18.42	-91.70646982	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending an	4	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	08 04 09	08- WASTES FORM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS,) ADHESIVES, SEALANTS AND PRINTING INKS	Waste adhesives and sealants containing organic solvents or other dangerous substances	0.4	0.21	90.47619048	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending any of the operations		Enva Ireland does not currently record the packaging content of waste as it arrives on-site

WASTE SUMMARY					Lic No:	W0184-02		Year	2017		
	16 05 06	*16- WASTES NOT OTHERWISE SPECIFIED IN THE LIST*	*Laboratory chemicals, consisting of or containing dangerous substances, including mixtures of dangerous chemicals*	24.32	21.96	10.75381462	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R13-Storage of waste pending an*	*6.5*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	16 05 08	*16- WASTES NOT OTHERWISE SPECIFIED IN THE LIST*	*Discarded organic chemicals consisting of or containing dangerous substances*	16.94	10.22	65.70450098	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R13-Storage of waste pending an*	*6*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	17 02 04	*17- CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)*	*Glass, plastic and wood containing or contaminated with dangerous substances*	*0.16*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R13-Storage of waste pending any of the operations*		*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*

WASTE SUMMARY					Lic No:	W0184-02		Year	2017	
	08 03 12	*08- WASTES FORM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS,) ADHESIVES, SEALANTS AND PRINTING INKS*	*Waste ink containing dangerous substances*	*21.485*	*16.595*	29.46670684	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	0	*06- WASTES FROM INORGANIC CHEMICAL PROCESSES*	*Sodium and potassium hydroxide*	*0*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*D15-Storage pending any of the operations number*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	20 01 19	*20- MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS*	*Pesticides*	*0*	*0.914*	-100	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*

WASTE SUMMARY					Lic No:	W0184-02		Year	2017		
	10 01 04	10- WASTES FROM THERMAL PROCESSES	Oil fly ash and boiler dust	0	0	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R5-Recycling/reclamation or other inorganic materi		Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	06 03 15	06- WASTES FROM INORGANIC CHEMICAL PROCESSES	Metal oxides containing heavy metal	0	0	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending any of the operations		Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	16 01 14	16- WASTES NOT OTHERWISE SPECIFIED IN THE LIST	Antifreeze fluids containing dangerous fluids	9.2	10.26	-10.33138402	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending an	20	Enva Ireland does not currently record the packaging content of waste as it arrives on-site

WASTE SUMMARY					Lic No:	W0184-02		Year	2017	
	20 01 14	*20- MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS*	*Acids*	*0*	*6.61*	-100	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	13 01 10	*13- OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)*	*Mineral based non-chlorinated hydraulic oils*	*2.04*	*9.2*	-77.82608696	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R9-Oil re-refining or other reuses of oil*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	19 11 05	*19- WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE*	*Sludges from onsite effluent treatment containing dangerous substances*	*3.32*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*

WASTE SUMMARY					Lic No:	W0184-02		Year	2017	
	08 03 13	*08- WASTES FORM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS,) ADHESIVES, SEALANTS AND PRINTING INKS*	*Waste ink other than those mentioned in 08.03.12*	22.91	19.36	18.35743802	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	08 03 08	*08- WASTES FORM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS,) ADHESIVES, SEALANTS AND PRINTING INKS*	*Aqueous liquid waste containing ink*	0.00	19.57	-100	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	16 01 12	*16- WASTES NOT OTHERWISE SPECIFIED IN THE LIST*	*Brake pads other than those mentioned in 16.01.11*	0	4.895	-100	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*

WASTE SUMMARY					Lic No:	W0184-02		Year	2017	
	20 01 25	20- MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS	edible oil and fat	0	13.795	-100	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending any of the operations	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	16 10 02	16- WASTES NOT OTHERWISE SPECIFIED IN THE LIST	aqueous liquid wastes other than those mentioned in 16 10 01	3.82	27.14	-85.92275943	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending any of the operations	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	08 01 12	08- WASTES FORM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS,) ADHESIVES, SEALANTS AND PRINTING INKS	waste paint and varnish other than those mentioned in 08 01 11	0.00	12.41	-100	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending any of the operations	Enva Ireland does not currently record the packaging content of waste as it arrives on-site

WASTE SUMMARY					Lic No:	W0184-02		Year	2017	
	16 01 15	16- WASTES NOT OTHERWISE SPECIFIED IN THE LIST	antifreeze fluids other than those mentioned in 16 01 14	138.88	185.68	-25.20250329	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending any of the operations	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	16 05 05	16- WASTES NOT OTHERWISE SPECIFIED IN THE LIST	gases in pressure containers other than those mentioned in 16 05 04	0	0	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending any of the operations	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	16 06 05	16- WASTES NOT OTHERWISE SPECIFIED IN THE LIST	other batteries and accumulators	0.43	1.2	-64.16666667	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending any of the operations	Enva Ireland does not currently record the packaging content of waste as it arrives on-site

WASTE SUMMARY					Lic No:	W0184-02		Year	2017		
	0	16- WASTES NOT OTHERWISE SPECIFIED IN THE LIST	discarded chemicals other than those mentioned in 16 05 06, 16 05 07 or 16 05 08	0	0	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending any of the operations		Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	20 01 40	20- MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS	Metals	160.5	157.622	1.825887249	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending an	321	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	17 05 04	17- CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)	soil and stones other than those mentioned in 17 05 03	28691.08	63.94	44771.87989	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R5-Recycling/reclamation or other inorganic materi		Enva Ireland does not currently record the packaging content of waste as it arrives on-site

WASTE SUMMARY					Lic No:	W0184-02		Year	2017	
	16 01 22	*16- WASTES NOT OTHERWISE SPECIFIED IN THE LIST*	*components not otherwise specified*	*0.276*	*0.285*	-3.157894737	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	19 09 04	*19- WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE*	*spent activated carbon*	*2.8*	*10.26*	-72.70955166	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	13 03 10	*13- OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)*	*other insulating and heat transmission oils*	*0*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R9-Oil re-refining or other reuses of oil*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*

WASTE SUMMARY					Lic No:	W0184-02		Year	2017	
	13 05 02	*13- OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)*	*sludges from oil/water separators*	*29.4*	*24.86*	18.2622687	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R5-Recycling/reclamation or other inorganic materi*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	13 05 07	*13- OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)*	*oily water from oil/water separators*	*1408.281*	*506.0733*	178.2760916	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R9-Oil re-refining or other reuses of oil*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	13 03 07	*13- OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)*	*mineral-based non-chlorinated insulating and heat transmission oil*	*185.3*	*49.414*	274.9949407	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R9-Oil re-refining or other reuses of oil*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*

WASTE SUMMARY					Lic No:	W0184-02		Year	2017	
	13 01 11	13- OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)	synthetic hydraulic oils	0	0.955	-100	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending any of the operations	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	0	08- WASTES FORM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS,) ADHESIVES, SEALANTS AND PRINTING INKS	waste from paint or varnish removal containing organic solvents or other dangerous substances	0	0	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending any of the operations	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	0	07- WASTES FROM ORGANIC CHEMICAL PROCESSES	sludges from onsite effluent treatment containing dangerous substances	0	0	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending any of the operations	Enva Ireland does not currently record the packaging content of waste as it arrives on-site

WASTE SUMMARY					Lic No:	W0184-02		Year	2017	
	16 06 04	16- WASTES NOT OTHERWISE SPECIFIED IN THE LIST	alkaline batteries (except 16 06 03)	0.217	0.294	-26.19047619	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending any of the operations	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	18 01 09	18- WASTES FROM HUMAN OR ANIMAL HEALTH CARE AND/OR RELATED RESEARCH (except kitchen and restaurant wastes not arising from immediate RESEARCH (except kitchen and restaurant wastes not arising from immediate health care)	medicines other than those mentioned in 18 01 08	0	0.342	-100	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending any of the operations	Enva Ireland does not currently record the packaging content of waste as it arrives on-site
	0	20- MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS	paint, inks, adhesives and resins other than those mentioned in 20 01 27	0	0	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	N/A	R13-Storage of waste pending any of the operations	Enva Ireland does not currently record the packaging content of waste as it arrives on-site

WASTE SUMMARY					Lic No:	W0184-02		Year	2017	
	0	*20- MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS*	*Streat cleaning residues*	*0*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were excepted onsite that were not accepted in previous years.	*N/A*	*R5-Recycling/reclamation or other inorganic materi*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	02 01 08	*02-WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARATION AND PROCESSING*	*Agrochemical containing dangerous substanvces*	*0*	*0.04*	-100	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	07 02 01	*07- WASTES FROM ORGANIC CHEMICAL PROCESSES*	*Aqueous washing liquids*	*2*	*0.8*	150	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	07 05 99	*07- WASTES FROM ORGANIC CHEMICAL PROCESSES*	*Waste not other wise specified*	*0.2*	*0.04*	400	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	10 01 26	*03- WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURNITURE, PULP, PAPER AND CARDBOARD*	*Waste from cooling water treatment*	*4.66*	*3*	55.33333333	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*

WASTE SUMMARY					Lic No:	W0184-02		Year	2017		
	13 04 03	*13- OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)*	*Bilge oil*	*7118.905*	*3858.531*	84.49780499	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some	*N/A*	*R9-Oil re-refining or other reuses of oil*		*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	15 01 06	*15- WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED*	*Mixed Packaging*	*1.293*	*0.935*	38.28877005	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some	*N/A*	*R13-Storage of waste pending any of the operations*		*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	19 08 05	*19- WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE*	*Sludges from treatmet of urban wastewater*	*37.64*	*6.2*	507.0967742	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some	*N/A*	*R13-Storage of waste pending an*	*5*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	19 09 02	*19- WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE*	*Sludges from treatmet of urban wastewater*	*1.34*	*16.08*	-91.66666667	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were	*N/A*	*R13-Storage of waste pending any of the operations*		*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	02 07 02	*02-WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARATION AND PROCESSING*	*Wastefrom spirits distillation*	*5.94*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were	*N/A*	*R13-Storage of waste pending any of the operations*		*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	06 01 01	*06- WASTES FROM INORGANIC CHEMICAL PROCESSES*	*Sulphuric acid*	*0.125*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were	*N/A*	*R13-Storage of waste pending any of the operations*		*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	06 01 06	*06- WASTES FROM INORGANIC CHEMICAL PROCESSES*	*Acids*	*0.065*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were	*N/A*	*R13-Storage of waste pending any of the operations*		*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*

WASTE SUMMARY					Lic No:	W0184-02		Year	2017	
	06 13 02	*06- WASTES FROM INORGANIC CHEMICAL PROCESSES*	*spent activated carbon*	*6.78*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	07 05 13	*07- WASTES FROM ORGANIC CHEMICAL PROCESSES*	*Solid contaminated waste*	*236.06*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	08 01 12	*08- WASTES FORM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS,) ADHESIVES, SEALANTS AND PRINTING INKS*	*Paint related waste*	*8.181*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	08 01 17	*08- WASTES FORM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS,) ADHESIVES, SEALANTS AND PRINTING INKS*	*Paint related waste*	*2.585*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	08 04 10	*08- WASTES FORM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS,) ADHESIVES, SEALANTS AND PRINTING INKS*	*Adhesive*	*16.829*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	16 05 09	*16- WASTES NOT OTHERWISE SPECIFIED IN THE LIST*	*Discarded chemicals*	*0.16*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*

WASTE SUMMARY					Lic No:	W0184-02		Year	2017	
	17 01 01	*17- CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)*	*Concrete*	*797.54*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were	*N/A*	*R5-Recycling/reclamation or other inorganic materi*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	16 06 05	*16- WASTES NOT OTHERWISE SPECIFIED IN THE LIST*	*Batteries*	*0.43*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	17 03 01	*17- CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)*	*Tar*	*97.86*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	17 03 02	*17- CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)*	*Tar*	*284.66*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	19 02 05	*19- WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE*	*Sludge*	*170.08*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*
	19 07 03	*19- WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE*	*Leachate*	*34.12*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*

WASTE SUMMARY Lic No: W0184-02 Year 2017

	20 03 06	*20- MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS*	*Sewage waste*	*14*	*0*	#DIV/0!	Increase/decrease in the tonnages of waste accepted in 2016 compared to 2017, was subject to the quantity of waste made available to Enva Ireland. In some instances some wastes were	*N/A*	*R13-Storage of waste pending any of the operations*	*Enva Ireland does not currently record the packaging content of waste as it arrives on-site*

SECTION C-TO BE COMPLETED BY ALL WASTE FACILITIES (waste transfer stations, Composters, Material recovery facilities etc) EXCEPT LANDFILL SITES

4 Is all waste processing infrastructure as required by your licence and approved by the Agency in place? If no please list waste processing infrastructure required onsite	Yes	
5 Is all waste storage infrastructure as required by your licence and approved by the Agency in place? If no please list waste storage infrastructure required on site	Yes	
6 Does your facility have relevant nuisance controls in place?	Yes	
7 Do you have an odour management system in place for your facility? If no why?	Yes	
8 Do you maintain a sludge register on site?	No	

SECTION D-TO BE COMPLETED BY LANDFILL SITES ONLY

Table 2 Waste type and tonnage-landfill only

Waste types permitted for disposal	Authorised/licenced annual intake for disposal (tpa)	Actual intake for disposal in reporting year (tpa)	Remaining licensed capacity at end of reporting year (m3)	Comments

Table 3 General information-Landfill only

Area ID	Date landfilling commenced	Date landfilling ceased	Currently landfilling	Private or Public Operated	Inert or non-hazardous	Predicted date to cease landfilling	Licence permits asbestos	Is there a separate cell for asbestos?	Accepted asbestos in reporting year	Total disposal area occupied by waste	Lined disposal area occupied by waste	Unlined area
										SELECT UNIT	SELECT UNIT	SELECT UNIT
Cell 8												

WASTE SUMMARY

Lic No: W0184-02 Year 2017

Table 4 Environmental monitoring-landfill only

Landfill Manual-Monitoring Standards

Was meterological monitoring in compliance with Landfill Directive (LD) standard in reporting year +	Was leachate monitored in compliance with LD standard in reporting year	Was Landfill Gas monitored in compliance with LD standard in reporting year	Was SW monitored in compliance with LD standard in reporting year	Have GW trigger levels been established	Were emission limit values agreed with the Agency (ELVs)	Was topography of the site surveyed in reporting year	Has the statement under S53(A)(5) of WMA been submitted in reporting year	Comments

.+ please refer to Landfill Manual linked above for relevant Landfill Directive monitoring standards

Table 5 Capping-Landfill only

Area uncapped*	Area with temporary cap	Area with final cap to LD Standard m2 ha, a	Area capped other	Area with waste that should be permanently capped to date under licence	What materials are used in the cap	Comments
SELECT UNIT	SELECT UNIT					

*please note this includes daily cover area

Table 6 Leachate-Landfill only

9	Is leachate from your site treated in a Waste Water Treatment Plant?	SELECT
10	Is leachate released to surface water? If yes please complete leachate mass load information below	SELECT

Volume of leachate in reporting year(m3)	Leachate (BOD) mass load (kg/annum)	Leachate (COD) mass load (kg/annum)	Leachate (NH4) mass load (kg/annum)	Leachate (Chloride) mass load kg/annum	Leachate treatment on-site	Specify type of leachate treatment	Comments

Please ensure that all information reported in the landfill gas section is consistent with the Landfill Gas Survey submitted in conjunction with PRTR returns

Table 7 Landfill Gas-Landfill only

Gas Captured&Treated by LFG System m3	Power generated (MW / KWh)	Used on-site or to national grid	Was surface emissions monitoring performed during the reporting year?	Comments
			SELECT	

Comments on liner type

Appendix 1

Environmental Protection Agency

Guidance to completing the PRTR workbook

PRTR Returns Workbook

Version 1.1.19

REFERENCE YEAR	2017

1. FACILITY IDENTIFICATION

Parent Company Name	Enva Ireland Limited
Facility Name	Enva Ireland Limited (Portlaoise)
PRTR Identification Number	W0184
Licence Number	W0184-02

Classes of Activity

No.	**class_name**
-	Refer to PRTR class activities below

Address 1	Clonminam Industrial Estate
Address 2	Portlaoise
Address 3	
Address 4	
	Laois
Country	Ireland
Coordinates of Location	-7.31391 53.0294
River Basin District	IESE
NACE Code	3832
Main Economic Activity	Recovery of sorted materials
AER Returns Contact Name	David McKelvey
AER Returns Contact Email Address	David.McKelvey@Enva.com
AER Returns Contact Position	Environmental Administrator
AER Returns Contact Telephone Number	0578678600
AER Returns Contact Mobile Phone Number	0578678600
AER Returns Contact Fax Number	
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	101
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

Activity Number	**Activity Name**
5(a)	Installations for the recovery or disposal of hazardous waste
5(c)	Installations for the disposal of non-hazardous waste
50.1	General

3. SOLVENTS REGULATIONS (S.I. No. 543 of 2002)

Is it applicable?	No
Have you been granted an exemption ?	
If applicable which activity class applies (as per Schedule 2 of the regulations) ?	
Is the reduction scheme compliance route being used ?	

4. WASTE IMPORTED/ACCEPTED ONTO SITE

Guidance on waste imported/accepted onto site

Do you import/accept waste onto your site for on-site treatment (either recovery or disposal activities) ?	Yes

This question is only applicable if you are an IPPC or Quarry site

4.1 RELEASES TO AIR

Link to previous years emissions data

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
08	Nitrogen oxides (NOx/NO2)	M	OTH		542.0	542.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION C : REMAINING POLLUTANT EMISSIONS (As required in your Licence)

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

Additional Data Requested from Landfill operators

For the purposes of the National Inventory on Greenhouse Gases, landfill operators are requested to provide summary data on landfill gas (Methane) flared or utilised on their facilities to accompany the figures for total methane generated. Operators should only report their Net methane (CH4) emission to the environment under T(total) KG/yr for Section A: Sector specific PRTR pollutants above. Please complete the table below:

Landfill: Enva Ireland Limited (Portlaoise)

Please enter summary data on the quantities of methane flared and / or utilised	T (Total) kg/Year	M/C/E	Method Used: Method Code	Method Used: Designation or Description	Facility Total Capacity m3 per hour	
Total estimated methane generation (as per site model)	0.0				N/A	
Methane flared	0.0				0.0	(Total Flaring Capacity)
Methane utilised in engine/s	0.0				0.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A above)	0.0				N/A	

SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
06	**Ammonia (NH3)**	C	OTH	APHA /AWWA Standard Me TM30 - Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method	416.87	416.87	0.0	0.0
18	Cadmium and compounds (as Cd)	C	OTH	200.10	0.00455	0.00455	0.0	0.0
79	Chlorides (as Cl)	C	OTH	APHA /AWWA Standard Me TM30 - Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method	17300.166	17300.166	0.0	0.0
20	Copper and compounds (as Cu)	C	OTH	200.7 TM30 - Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method	0.0835	0.0835	0.0	0.0
23	Lead and compounds (as Pb)	C	OTH	200.8 APHA /AWWA Standard	0.0451	0.0451	0.0	0.0
71	Phenols (as total C)	C	OTH	Methods TM30 - Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method	74.139	74.139	0.0	0.0
24	Zinc and compounds (as Zn)	c	OTH	200.9 APHA /AWWA Standard	0.653	0.653	0.0	0.0
13	Total phosphorus	C	OTH	Methods	613.052	613.052	0.0	0.0
12	Total nitrogen	M	EN 12260:2003		342.5	342.5	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
314	Fats, Oils and Greases	C	OTH	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	25.36	25.36	0.0	0.0
240	Suspended Solids	C	OTH	APHA /AWWA Standard Methods	714.075	714.075	0.0	0.0
343	Sulphate	C	OTH	APHA /AWWA Standard Methods	30.198	30.198	0.0	0.0
306	COD	C	OTH	APHA /AWWA Standard Methods	22033.794	22033.794	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

Please enter all quantities on this sheet in Tonnes 0

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used: M/C/E	Method Used: Method Used	Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility Non Haz Waste : Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility Non Haz Waste : Address of Recover/Disposer	Name and Licence / Permit No and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
Within the Country	16 05 06	Yes	7.8	laboratory chemicals, consisting of or containing dangerous substances, including mixtures of laboratory chemicals	R1	M	Weighed	Offsite in Ireland	Enva ,W041-1	Smithstown Industrial estate ,,,Shannon ,Co. Clare,Ireland	Lindenschmidt , 04 714 98089,Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany	Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany
Within the Country	08 01 11	Yes	9.16	waste paint and varnish containing organic solvents or other dangerous substances	R2	M	Weighed	Offsite in Ireland	Soltec Ltd,W0041-01	Mullingar business park,Mullingar,,,Westmeath,Ireland and Rue de Courriere 49 ,Zoning Industrial de Feluy	Soltec Ltd,W0041-01	Mullingar business park,Mullingar,,,Westmeath,Ireland and
To Other Countries	08 01 11	Yes	74.06	waste paint and varnish containing organic solvents or other dangerous substances	R1	M	Weighed	Abroad	Geocycle ,38.152/BP	, ,B 7181 Seneffe ,Belgium	Geocycle ,38.152/BP, Rue de Courriere 49 ,Zoning Industrial de Feluy ,,,,B 7181 Seneffe ,Belgium	Rue de Courriere 49 ,Zoning Industrial de Feluy ,,,,B 7181 Seneffe ,Belgium
Within the Country	19 11 06	No	56.48	sludges from on-site effluent treatment other than those mentioned in 19 11 05	D9	M	Weighed	Offsite in Ireland	Enva Dublin,W0196-01	JFK Road,Naas Road,Dublin,Dublin12,Ireland	Enva,W0196-01,,,JFK Road Naas Road,,,Dublin,Dublin 12,Ireland	JFK Road Naas Road,,,Dublin,Dublin 12,Ireland
To Other Countries	09 01 04	Yes	0.375	fixed solutions	D9	M	Weighed	Abroad	Enva ,W041-1	Smithstown Industrial estate ,,,Shannon ,Co. Clare,Ireland	Lindenschmidt , 04 714 98089,Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany	Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany
Within the Country	13 05 03	Yes	62.64	interceptor sludges	D9	M	Weighed	Offsite in Ireland	Enva,W0196-1	JFK Road Naas Road,,,Dublin,Dublin 12,Ireland	Enva,W0196-01,,,JFK Road Naas Road,,,Dublin,Dublin 12,Ireland	JFK Road Naas Road,,,Dublin,Dublin 12,Ireland
To Other Countries	13 07 03	Yes	129.68	other fuels (including mixtures)	R1	M	Weighed	Abroad	KS Recycling ,12 150 139840/1TMS	Raiffeisenstraße 38 ,,,, D-47665 Sonsbeck ,Germany	KS Recycling ,12 150 139840/1TMS Nettken GmbH & Co.kg, A-4187 HH,Louis-Krages-Strabe ,,Bremen, D-28237 ,Germany	Louis-Krages-Strabe ,,,Bremen, D-28237 ,Germany
To Other Countries	15 01 10	Yes	340.58	packaging containing residues of or contaminated by dangerous substances	R1	M	Weighed	Abroad	Recykel S.A.,3200/61080/RGPED/2008/2/AP-PU	Noning Industriel d'Ehein,B-4480 Engis,,,,Belgium		
To Other Countries	15 01 10	Yes	5.532	packaging containing residues of or contaminated by dangerous substances	R1	M	Weighed	Abroad	Enva ,W041-1	Smithstown Industrial estate ,,,Shannon ,Co. Clare,Ireland	Lindenschmidt , 04 714 98089,Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany	Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany
To Other Countries	16 01 07	Yes	687.29	oil filters	R1	M	Weighed	Abroad	RD Recycling ,Ovam approved KS Recycling ,12 150 139840/1TMS	Centrum Zuid 3017 ,,,,3530,Belgium. Raiffeisenstraße 38 ,,,, D-47665 Sonsbeck ,Germany	RD Recycling ,Ovam approved,Centrum Zuid 3017 ,,,,3530,Belgium.	Centrum Zuid 3017 ,,,,3530,Belgium.
To Other Countries	16 01 15	No	116.66	antifreeze fluids other than those mentioned in 16 01 14	R3	M	Weighed	Abroad				
To Other Countries	16 05 04	Yes	39.12	gases in pressure containers (including halons) containing dangerous substances	R4	M	Weighed	Abroad	SBH ,121296753	Austrabe 5 ,,,,D74238 Krautheim,Germany	SBH ,121296753,Austrabe 5 ,,,,D74238 Krautheim,Germany	Austrabe 5 ,,,,D74238 Krautheim,Germany
To Other Countries	16 05 08	Yes	20.225	discarded organic chemicals consisting of or containing dangerous substances	R13	M	Weighed	Abroad	Enva ,W041-1	Smithstown Industrial estate ,,,Shannon ,Co. Clare,Ireland	Lindenschmidt , 04 714 98089,Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany	Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany
To Other Countries	16 06 01	Yes	624.06	lead batteries	R4	M	Weighed	Abroad	Campine,Ovam Approved	Nijverheidsstraat 2 Belgium,,,,B- 2340 Beerse ,Belgium	Campine,Ovam Approved, Nijverheidsstraat 2 Belgium,,,,B- 2340 Beerse ,Belgium	Nijverheidsstraat 2 Belgium,,,,B- 2340 Beerse ,Belgium
Within the Country	16 06 04	No	1.06	alkaline batteries (except 16 06 03)	R13	M	Weighed	Offsite in Ireland	KNK Metals Recycling Limited,W0113-04	Cappincur Industrial Estate ,Daingean Road,Tullamore,Co. Offaly,Ireland		
To Other Countries	17 05 03	Yes	12495.84	soil and stones containing dangerous substances	R5	M	Weighed	Abroad	AVaistoffen Terminal Moerdijk BV,NB501809/XXHB	Vlasweg 12,4782 PW Moerdijk, , ,Netherlands	AVaistoffen Terminal Moerdijk,NB501809/XXHB,Vlasweg 12,4782 PW Moerdijk,Holland,Holland,Netherlands	Vlasweg 12,4782 PW Moerdijk,Holland,Netherlands
Within the Country	17 05 04	No	1070.9	soil and stones other than those mentioned in 17 05 03	R5	M	Weighed	Offsite in Ireland	Hinch Plant hire ,WFP-LS-09-0002-01	Strabore , , Portlaoise ,Co Laois ,Ireland	Hinch Plant hire ,WFP-LS-09-0002-01	Strabore , , Portlaoise ,Co Laois ,Ireland
Within the Country	18 02 02	Yes	1.16	wastes whose collection and disposal is subject to special requirements in order to prevent infection	D9	M	Weighed	Offsite in Ireland	SRCI Eco Safe Systems Limited,W054-02	Unit 1A ,Allied Industrial Estate Kylemore Road ,Ballyfermot,Dublin 10,Ireland	SRCI, Eco Safe Systems,W0154-02,Unit 1A,Allied Industrial Estate,Kylemore Road,Ballyfermot,Ireland	Unit 1A,Allied Industrial Estate,Kylemore Road,Ballyfermot,Ireland
To Other Countries	19 02 08	Yes	954.35	liquid combustible wastes containing dangerous substances	R1	M	Weighed	Abroad	Recykel S.A.,3200/61080/RGPED/2008/2/AP-PU	Noning Industriel d'Ehein,B-4480 Engis,,,,Belgium	Lindenschmidt , 04 714 98089,Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany	Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany
To Other Countries	19 02 09	Yes	79.84	solid combustible wastes containing dangerous substances	R1	M	Weighed	Abroad	Recykel S.A.,3200/61080/RGPED/2008/2/AP-PU	Noning Industriel d'Ehein,B-4480 Engis,,,,Belgium	Recykel S.A.,3200/61080/RGPED/2008/2/AP-PU	Noning Industriel d'Ehein,B-4480 Engis,,,,Belgium
To Other Countries	19 02 08	Yes	21.56	liquid combustible wastes containing dangerous substances	R1	M	Weighed	Abroad	Lindenschmidt , 04 714 98089	Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany	Lindenschmidt , 04 714 98089,Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany	Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany
To Other Countries	19 02 11	Yes	417.0	other wastes containing dangerous substances	D10	M	Weighed	Abroad	Mc Quillans,P018707A	Cauiside Drive,Greystone Road,Newpark Industrial Estate,Antrim,Ireland	Mc Quillans,P018707A/V1,Cauiside Drive,Greystone Road,Antrim,Antrim,United Kingdom	Cauiside Drive,Greystone Road,Antrim,Antrim,United Kingdom
To Other Countries	19 12 11	Yes	95.62	other wastes (including mixtures of materials) from mechanical treatment of waste containing dangerous substances	D10	M	Weighed	Abroad	KWA,E17012100	Grafstr. 25 ,,,,47475 Kamp-Lintfort ,Germany	KWA,E17012100	Grafstr. 25 ,,,,47475 Kamp-Lintfort ,Germany
To Other Countries	19 12 11	Yes	274.0	other wastes (including mixtures of materials) from mechanical treatment of waste containing dangerous substances	R1	M	Weighed	Abroad	Lindenschmidt , 04 714 98089	Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany	Lindenschmidt , 04 714 98089	Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany
Within the Country	20 01 21	Yes	0.58	fluorescent tubes and other mercury-containing waste	R4	M	Weighed	Offsite in Ireland	Irish Lamp Recycling ,WFP-KE-08-0348-01	Woodstock Industrial Estate ,,,Athy ,Co. Kildare, ,Ireland	Irish Lamp Recycling ,WFP-KE-08-0348-01	Woodstock Industrial Estate ,,,Athy ,Co. Kildare, ,Ireland
Within the Country	20 01 25	No	2.03	edible oil and fat	R3	M	Weighed	Offsite in Ireland	Frylite ,WFP-DS-10-0009-01	Ballymount Drive Ballymount Industrial Estate,Unit J1 ,Dublin,Dublin 12,Ireland		
Within the Country	20 01 40	No	377.88	metals	R4	M	Weighed	Offsite in Ireland	MSM Recycling,WFP-TN-11-0003-02	Arreagh,,,Birr,Co. Tipperary,Ireland		
Within the Country	19 02 05	Yes	120.52	sludges from physicol/chemical treatment containing dangerous substances	R12	M	Weighed	Offsite in Ireland	Veolia,W50-01	Johnstown Castle Estate,,,,County Wexford,Ireland	Veolia,W50-01	Johnstown Castle Estate,,,,County Wexford,Ireland
Within the Country	19 12 03	No	40.94	non-ferrous metal	R4	M	Weighed	Offsite in Ireland	United Metals Recycling,WFP/L/2016/147A/R2	Arreagh,,,Birr,Co. Tipperary,Ireland Eastway Business Park,Ballysimon,,,,Co. Limerick,Ireland		
Within the Country	20 01 40	No	67.14	metals	R4	M	Weighed	Offsite in Ireland	United Metals Recycling,WFP/L/2016/147A/R2	Eastway Business Park,Ballysimon,,,,Co. Limerick,Ireland		
Within the Country	19 12 03	No	138.98	non-ferrous metal	R4	M	Weighed	Offsite in Ireland				
Within the Country	16 02 14	No	0.94	discarded equipment other than those mentioned in 16 02 09 to 16 02 13	R13	M	Weighed	Offsite in Ireland	KMK Metals Recycling Limited,W0113-04	Cappincur Industrial Estate ,Daingean Road,Tullamore,Co. Offaly,Ireland		
Within the Country	19 12 04	No	13.65	plastic and rubber	R12	M	Weighed	Offsite in Ireland	Irish Polymer Extrusion Ltd,WFP-LS-13-0001-01	Unit 20,Bay Road Business Park,Mountmellick,Laois,Ireland		
Within the Country	16 05 09	No	0.505	discarded chemicals other than those mentioned in 16 05 06, 16 05 07 or 16 05 08	R1	M	Weighed	Offsite in Ireland	Enva ,W041-1	Smithstown Industrial estate ,,,Shannon ,Co. Clare,Ireland		
Within the Country	20 01 19	Yes	0.98	pesticides	R1	M	Weighed	Offsite in Ireland	Enva ,W041-1	Smithstown Industrial estate ,,,Shannon ,Co. Clare,Ireland	Lindenschmidt , 04 714 98089,Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany	Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany
Within the Country	06 01 01	Yes	0.1	sulphuric acid and sulphurous acid	R1	M	Weighed	Offsite in Ireland	Enva ,W041-1	Smithstown Industrial estate ,,,Shannon ,Co. Clare,Ireland	Lindenschmidt , 04 714 98089,Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany	Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany
Within the Country	06 01 02	Yes	0.2	hydrochloric acid	R1	M	Weighed	Offsite in Ireland	Enva ,W041-1	Smithstown Industrial estate ,,,Shannon ,Co. Clare,Ireland JFK Road,Naas Road,,,Dublin,Dublin 12,Ireland	Lindenschmidt , 04 714 98089,Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany Enva,W0196-01,,,JFK Road Naas Road,,,Dublin,Dublin 12,Ireland	Krombacher Strasse 42-46 ,,,Kreutzal,D57223 ,Germany JFK Road Naas Road,,,Dublin,Dublin 12,Ireland
Within the Country	13 08 02	Yes	9.08	other emulsions	D9	M	Weighed	Offsite in Ireland	Enva Dublin,W0196-01			
Within the Country	17 03 02	No	88.32	bituminous mixtures containing other than those mentioned in 17 03 01	R5	M	Weighed	Offsite in Ireland	Crystalhill Inns Ltd,WFP-KK-16-0001-01	Grannagh,Kilmacow,,,,Kilkenny,Ireland		
Within the Country	17 03 02	No	34.48	bituminous mixtures containing other than those mentioned in 17 03 01	R5	M	Weighed	Offsite in Ireland	Cullen Excavations Ltd,WFP-WW-17-0003-03	Ballygannon,Kilcoole,,,,Wicklow,Ireland		
Within the Country	17 05 04	No	6176.2	soil and stones other than those mentioned in 17 05 03	R5	M	Weighed	Offsite in Ireland	Dowling Quarries Ltd,COR-LS-13-0001-01	Granfallow,Abbeyleix,,,,Laois,Ireland		
Within the Country	17 05 04	No	20210.62	soil and stones other than those mentioned in 17 05 03	R5	M	Weighed	Offsite in Ireland	Cemex Ltd,W0254-01	Walshtown,Blackwall,Tipperkevin & Bawnogir,Nass Kildare,Ireland		
Within the Country	17 05 04	No	10604.98	soil and stones other than those mentioned in 17 05 03	R5	M	Weighed	Offsite in Ireland	Greenstar Holdings Ltd,W0178-02	Weast Galway Landfill,Killaghmore,Ballybaun Ballinrobe Ballinasloe,Galway,Ireland		

* Select a row by double-clicking the Description of Waste then click the delete button

Link to previous years waste data
Link to previous years waste summary data & percentage change
Link to Waste Guidance

Appendix 2

WRIGHT ENVIRONMENTAL SERVICES

CONFIDENTIAL REPORT

Client	**Title**
Enva Ireland Ltd	Annual Environmental
Clonminam Industrial Estate	Noise Survey - 2017
Portlaoise	Enva Ireland Ltd. – Portlaoise
Co. Laois	EPA Industrial Emissions Licence
	Reg. No. WO184-02

Attn. Mr. Kevin Coll

Report Ref:	1755	Survey and Report by:	Frances Wright *LFOH, BSc, PgDip Env, Dip SHWW*
Date recd:		Approved by:	Paddy Wright *BSc, PgDip ChemEng, CertOH*
Copies to:		Date:	28th February 2018

CONTENTS PAGE

1. INTRODUCTION:

Enva Ireland Ltd. (Enva) operate a waste recovery facility at Clonminam Industrial Estate, Portlaoise which is licensed under the EPA Industrial Emissions Licence Reg. No. WO184-02. Section 6.16 of this licence requires that the company carry out a noise survey of the site operations.

At the request of Mr. Kevin Coll of Enva Ireland Ltd., Wright Environmental Services carried out this Noise Survey on the 14th December 2017. The survey was undertaken in accordance with the methodology specified in the 'Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)' as published by the EPA.

This report presents and interprets the results of the survey with reference to the company's EPA Industrial Emissions Licence Reg. No. WO184-02 criteria. The methodology used for the survey is described in Appendix 1. Instrumentation and calibration is described in Appendix 2. Details of the inverse square law calculations are presented in Appendix 3. Monitoring locations are shown in the site map in Appendix 4.

2. SUMMARY

Enva are required by their EPA Industrial Emissions Licence Reg. No. WO184-02 to have an Environmental Noise Survey undertaken. Wright Environmental Services carried out this survey on the 14th December 2017. Table 1 outlines the monitoring plan. Table 2 summarises the noise levels measured at each location and exams the results in relation to the noise criteria set the company's Licence.

The results for each sampling location passed the licence criteria. It is therefore concluded that Enva Ireland Ltd. are in compliance with the noise criteria set out in their EPA Industrial Emissions Licence Reg. No. WO184-02.

Table 1

-	**N1** *boundary location*	**N2** *boundary location*	**N3** *boundary location*	**N4** *noise sensitive location*	**N5** *abandoned noise sensitive location*
Day Time 07:00 – 19:00	3 X 30 minutes sampling periods for each location				
Evening 19:00 - 23:00	1 X 30 minutes sampling periods for each location				
Night Time 23:00 – 07:00	2 X 15 minutes sampling periods for each location				

Table 2: Summary of noise monitoring results

Location	Leq Range Day	Leq Range Evening	Leq Range Night	Dominant Noise Sources	Pass/ Fail	Rational Licence criteria: 55dB(A) Daytime, 50dB(A) evening and 47dB(A) at Noise Sensitive Locations (NSL)
N1	54 - 57	50	45	Distant traffic, vehicle movement (day)	**Pass**	The effective noise levels to the nearest noise sensitive location were calculated using the inverse square law and found to be well below the limit values.
N2	55 - 56	53	48 - 49	Distant traffic and industrial noise, onsite boiler (day)	**Pass**	The effective noise levels to the nearest noise sensitive location were calculated using the inverse square law and found to be well below the limit values.
N3	51 - 55	50	47 - 49	distant construction work and traffic, onsite soil shed (day)	**Pass**	The effective noise levels to the nearest noise sensitive location were calculated using the inverse square law and found to be well below the limit values.
N4	56	51	41 - 42	Passing and distant traffic, industrial noise	**Pass**	Enva not audible at this location
N5	53 - 54	49	46	Distant traffic, vehicle movement onsite (day)	**Pass**	The effective noise levels to the nearest noise sensitive location were calculated using the inverse square law and found to be well below the limit values.

3. MONITORING RESULTS AND DISCUSSION:

Wright Environmental Services carried out the day, evening and night Environmental Noise Survey. The monitoring locations are described below and are shown in the site map in Appendix 4.

Location **N1**:Along the mid western site boundary.
Location **N2**: In the corner of the site, along the south eastern boundary
Location **N3**:In the corner of the site, along the north eastern boundary.
Location **N4**:Nearby residential area, east/south east of Enva, on the corner of Knockmay Road and Marian Avenue. The railway yard is the main land use between Enva in this monitoring location.
Location **N5**:North west of Enva site, on the corner with access road for Rowan halting site (currently deserted). Note access to this point is now restricted, therefore monitoring was carried out at the barrier, blocking access to this point (see map in Appendix III).

The following "A-Weighted" data was determined for each discrete sampling period.

L_{eq} : The equivalent continuous noise level for the measurement period.
(This is defined as the sound level of a steady sound having the same energy as a fluctuating sound over the specified measuring period).

L_{1} : The noise level exceeded for 1% of the measurement period.
(This parameter gives a good indication of typical maximum levels.)

L_{10} : The noise level exceeded for 10% of the measurement period.

L_{90} : The noise level exceeded for 90% of the measurement period.
(This is taken to represent the background noise level).

Detailed results are presented in the Tables below along with appropriate comments regarding noise in the monitoring environment.

Table 3

N1 - Monitoring Location

Start Time	L_{eq} dB(A)	L_1 dB(A)	L_{10} dB(A)	L_{90} dB(A)	Comments	-
17:25	**57**	66	59	52	Dominant Noise: distant traffic, vehicle movement onsite, train and cars leaving carpark (when passing) Onsite Noise: forklift, 1 HGV Offsite Noise: 2 trains pass, cars in/out of adjacent car park (local business and Enva employees), distant traffic noise	DAY
17:55	**54**	62	56	50	Dominant Noise: distant traffic, forklift movement onsite, train and cars leaving carpark (when passing) Onsite Noise: forklift Offsite Noise: 3 trains pass, cars in/out of adjacent car park (local business and Enva employees), distant traffic noise	
18:25	**55**	66	56	48	Dominant Noise: distant traffic, train and cars leaving carpark (when passing) Onsite Noise: no noise audible from site Offsite Noise: 2 trains pass, cars in/out of adjacent car park (local business and Enva employees), distant traffic noise	
19:07	**50**	56	52	47	Dominant Noise: distant traffic, train Onsite Noise: no noise audible from Enva Offsite Noise: 1 trains passes, distant traffic noise, industrial noise (S)	EVENING
00:02	**45**	53	48	43	Dominant Noise: distant traffic (particularly from the S/SW), local industrial noise (S) Onsite Noise: no noise audible from Enva Offsite Noise: distant traffic (particularly from the S/SW), local industrial noise (S)	NIGHT
00:17	**45**	52	48	42	Dominant Noise: distant traffic (particularly from the S/SW), local industrial noise (S) Onsite Noise: no noise audible from Enva Offsite Noise: distant traffic (particularly from the S/SW), local industrial noise (S)	

Table 4

N2 - Monitoring Location

Start Time	L_{eq} dB(A)	L_1 dB(A)	L_{10} dB(A)	L_{90} dB(A)	Comments	-
13:40	**55**	62	57	51	Dominant Noise: boiler, industrial noise (S), distant traffic Onsite Noise: boiler, filter room, motor at tank farm Offsite Noise: industrial noise (S), distant traffic, HGV movement in neighbouring facility	DAY
14:13	**56**	63	57	52	Dominant Noise: HGV on idle next door Onsite Noise: boiler, filter room, motor at tank farm Offsite Noise: industrial noise (S), distant traffic, HGV on idle in neighbouring facility	
14:45	**56**	64	57	53	Dominant Noise: HGV on idle next door Onsite Noise: boiler, filter room, motor at tank farm Offsite Noise: industrial noise (S), distant traffic, HGV on idle in neighbouring facility	
21:05	**53**	56	54	50	Dominant Noise: industrial noise (S), distant traffic Onsite Noise: boiler on/off (just audible) Offsite Noise: industrial noise (S), distant traffic	EVENING
23:09	**49**	52	50	47	Dominant Noise: industrial noise (S), distant traffic Onsite Noise: boiler on/off (just audible) Offsite Noise: industrial noise (S), distant traffic	NIGHT
23:24	**48**	52	50	47	Dominant Noise: industrial noise (S), distant traffic Onsite Noise: boiler on/off (just audible) Offsite Noise: industrial noise (S), distant traffic	

Table 5

N3 - Monitoring Location

Start Time	L_{eq} dB(A)	L_1 dB(A)	L_{10} dB(A)	L_{90} dB(A)	Comments	-
14:55	**51**	58	52	47	Dominant Noise: construction work, industrial noise, distant traffic, soil shed Onsite Noise: soil shed excavator Offsite Noise: construction work (S/E), industrial noise (S), distant traffic	DAY
15:25	**55**	60	51	47	Dominant Noise: construction work, industrial noise, distant traffic, soil shed Onsite Noise: soil shed excavator Offsite Noise: train 2, construction work (S/E), industrial noise (S), distant traffic	
16:24	**53**	62	53	47	Dominant Noise: construction work, industrial noise, distant traffic, soil shed Onsite Noise: soil shed excavator Offsite Noise: train 2, construction work (S/E), industrial noise (S), distant traffic	
21:15	**50**	54	52	46	Dominant noise: Distant traffic noise, train when passes Onsite Noise: no noise audible from Enva. Offsite Noise: Train 1, Distant traffic noise	EVENING
23:02	**47**	54	50	43	Dominant noise: Distant traffic noise, train when passes Onsite Noise: no noise audible from Enva. Offsite Noise: Train 1, Distant traffic noise	NIGHT
23:19	**49**	63	50	43	Dominant noise: Distant traffic noise, train when passes Onsite Noise: no noise audible from Enva. Offsite Noise: Train 1, Distant traffic noise	

Table 6

N4 - Monitoring Location

Start Time	L_{eq} dB(A)	L_1 dB(A)	L_{10} dB(A)	L_{90} dB(A)	Comments	-
15:30	**56**	66	60	46	Dominant Noise: passing traffic and distant traffic Onsite Noise: No noise audible from Enva Offsite Noise: approximately 35 cars pass, distant traffic	DAY
16:02	**56**	65	58	47	Dominant Noise: passing traffic and distant traffic Onsite Noise: No noise audible from Enva Offsite Noise: approximately 40 cars pass, distant traffic	
16:34	**56**	65	60	48	Dominant Noise: passing traffic and distant traffic Onsite Noise: No noise audible from Enva Offsite Noise: approximately 45 cars pass, distant traffic	
19:55	**51**	62	53	45	Dominant Noise: industrial noise to south and distant traffic Onsite Noise: No noise audible from Enva Offsite Noise: approximately 20 cars pass, distant traffic	EVENING
00:46	**42**	49	44	39	Dominant Noise: industrial noise to south and distant traffic Onsite Noise: No noise audible from Enva Offsite Noise: approximately 2 cars pass, distant traffic	NIGHT
01:01	**41**	49	43	39	Dominant Noise: industrial noise to south and distant traffic Onsite Noise: No noise audible from Enva Offsite Noise: approximately 1 cars pass, distant traffic	

Table 7

N5 - Monitoring Location

Start Time	L_{eq} dB(A)	L_1 dB(A)	L_{10} dB(A)	L_{90} dB(A)	Comments	
17:05	**54**	60	56	47	Dominant Noise: distant traffic, vehicle movement onsite, train and cars leaving carpark (when passing) Onsite Noise: forklift, 1 HGV Offsite Noise: 2 trains pass, cars in/out of adjacent car park (local business and Enva employees), distant traffic noise	DAY
17:37	**54**	63	56	46	Dominant Noise: distant traffic, vehicle movement onsite, train and cars leaving carpark (when passing) Onsite Noise: forklift, 1 HGV Offsite Noise: 3 trains pass, cars in/out of adjacent car park (local business and Enva employees), distant traffic noise	
18:08	**53**	62	54	44	Dominant Noise: distant traffic, train and cars leaving carpark (when passing) Onsite Noise: no noise audible from site Offsite Noise: 2 trains pass, cars in/out of adjacent car park (local business and Enva employees), distant traffic noise	
19:10	**49**	55	51	46	Dominant Noise: distant traffic, train Onsite Noise: no noise audible from Enva Offsite Noise: 1 trains passes, distant traffic noise, industrial noise (S)	EVENING
00:01	**46**	53	49	43	Dominant Noise: distant traffic (particularly from the S/SW), local industrial noise (S) Onsite Noise: no noise audible from Enva Offsite Noise: distant traffic (particularly from the S/SW), local industrial noise (S)	NIGHT
00:17	**46**	52	48	43	Dominant Noise: distant traffic (particularly from the S/SW), local industrial noise (S) Onsite Noise: no noise audible from Enva Offsite Noise: distant traffic (particularly from the S/SW), local industrial noise (S)	

In accordance with their EPA Industrial Emissions Licence Reg. No. WO184-02, Enva are required to comply with maximum noise limit values. Section 4.5 of their licence states that "Noise from the installation shall not give rise to sound pressure levels (L_{AeqT},) measured at noise sensitive locations which exceed the limit values." The limit levels for Noise Sensitive Locations are presented in Schedule B.4 of the licence as follows:

Day	*55*	*dB(A) $L_{Ar,\,T}$ (30 minutes)*
Evening	*50*	*dB(A) $L_{Ar,\,T}$ (30 minutes)*
Night	*45*	*dB(A) $L_{Ar,\,T}$ (15 to 30 minutes)*

Where tonal noise is objectively identified, a 5dB(A) should be applied to the measured noise level and compared to the limit. No tonal elements were identified from Enva and therefore no penalty applied.

Noise levels were measured at one Noise Sensitive Location N4. The noise levels were just above the limit values for day and evening at this location. However there is no noise audible from Enva at this location and the dominant noise source is traffic on the adjacent road, distant traffic noise and industrial noise to the south. Therefore the company are in compliance with their licence for this noise sensitive location.

The other monitoring locations were boundary locations. Using the noise results from the boundary locations, noise levels attributable to Enva at the nearest noise sensitive location were calculated. The Inverse Square Law is used to calculate the expected reduction in noise levels as one moves away from a given noise source, which is assumed to radiate uniformly in all directions. The Inverse Square Law states that as one doubles the distance from a source, a reduction of 6 dB is achieved as follows:

$$\mathbf{L_{p2} = L_{p1} - 20\ Log\ (^{R2}/_{R1})}$$

where:

- L_{p1} is the measured reference Sound Pressure Level (SPL) at a distance of R1 metres from the source.
- L_{p2} is the calculated SPL at a distance of R2 metres from the source.

Using the maximum noise level measured at each location and the estimated distance from the dominant onsite source and the nearest noise sensitive location, the expectant noise level at the nearest noise sensitive locations were calculation. These are presented in Table 8. The results are colour coded GREEN for below the limit value and RED for above the limit values. All of the expectant noise levels were well below the limit values and therefore in compliance with the licence. Details of these calculations are presented in Appendix 3.

Table 8

Noise Monitoring Location	Approximate Distance to nearest NSL(m)	Effective Noise Level		
		Leq dB(A)		
		Daytime	Evening	Night Time
N1	130	47	40	35
N2	200	43	40	36
N3	255	41	36	35
N4	n/a	Enva not audible	Enva not audible	Enva not audible
N5	115	46	41	38
Limit Values dB(A)		**55**	**50**	**45**

Appendix B.4 of their licence also states that there shall be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise-sensitive location during the night time survey. Enva was not audible at the noise sensitive location (N4) therefore are in compliance with this aspect of the licence.

It is therefore concluded that Enva Ireland Ltd. are in compliance with all the noise criteria set out in their EPA Industrial Emissions Licence Reg. No. WO184-02.

APPENDIX I

Methodology

METHODOLOGY

The methodology of the survey was based upon procedures set out in the International Standard, ISO 1996-2:2007 (Acoustics – description, measurement and assessment of environmental noise Part 2: Determination of Environmental Noise Levels.). The survey was carried out in accordance with EPA published document *(NG4) Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities.*

Environmental noise levels were determined by using a Pulsar Model 33 , Type 1 Real Time Sound Level Meter, with half inch condenser microphone and B&K Type 2250 Light, Type 1 Real Time Sound Level Meter, with half inch condenser microphone. The instrumentation was calibrated directly before and after the noise measurements. Details of the instrumentation and external calibration are presented in Appendix 2 of this report.

Results reported were determined using the fast response, A-Weighting (ref. 20 μPa) and are rounded off to the nearest whole decibel. Monitoring was conducted in relatively calm, dry weather conditions. Throughout the monitoring, the microphone was situated 1.5 m above ground level, away from any reflective surfaces. The monitoring equipment was manned throughout the sampling intervals and comments were recorded in order to aid the interpretation of the results. Details of the weather conditions are presented in the Table below.

Summary of Weather Conditions

Date/Time	Air Temperature ºC	Relative Humidity %	Wind Direction	Wind Speed m/s	General Conditions
14th December 2017 16:30	4	93	west	5.1	Dry – no precipitation.
14th December 2017 23:00	4	87	WSW	7.7	Dry – no precipitation.

APPENDIX 2

Instrumentation and External Calibration Details

Certificate of Calibration

pulsar Instruments Plc

Equipment Details

Instrument Manufacturer	Pulsar Instruments plc
Instrument Type	Model 33
Description	Sound Level Meter
Serial Number	T223417

Calibration Procedure

The instrument detailed above has been calibrated to the publish test and calibration data as detailed in the instrument hand book, using the techniques recommended in the latest revisions of the International Standards IEC 61672-1:2002, IEC 60651:1979, IEC 60804:2001,IEC 61260:1995, IEC 60942:1997, IEC 61252:1993, ANSI S1.4-1983, ANSI S1.11-1986 and ANSI S1.43-1997 where applicable.
Sound Level Meters: All Calibration procedures were carried out by subsitituting the microphone capsule with a suitable electrical signal, apart from the final acoustic calibration.

Calibration Traceability

The equipment detailed above was calibrated against the calibration laboratory standards held by Cirrus Research plc. These are traceable to International Standards {A.0.6}. The standards are:

Microphone Type	B&K 4192	Serial Number	1920791	Calibration Ref.	S6450
Pistonphone Type	B&K 4220	Serial Number	613843	Calibration Ref.	S6388

Calibrated by M. BERRY

Calibration Date 16 January 2017

Calibration Certificate Number 245308

This Calibration Certificate is valid for 12 months from the date above.

Pulsar Instruments plc, The Evron Centre, John Street, Filey, North Yorkshire, YO14 9DW
Telephone: +44 (0) 1723 518011 Fax: +44 (0) 1723 518043
Email: sales@pulsarinstruments.com

Certificate of Calibration

pulsar Instruments Plc

Equipment Details

Instrument Manufacturer	Pulsar Instruments plc
Instrument Type	Model 100B
Description	Acoustic Calibrator
Serial Number	42171

Calibration Procedure

The acoustic calibrator detailed above has been calibrated to the published data as described in the operating manual. The procedures and techniques used to follow the recommendations of the IEC standard Electroacoustics – Sound Calibrators IEC 60942:2003, IEC 60942:1997, BS EN 60942:1998 and BS EN 60942:2003 where applicable.. The calibrator's main output is 94.00 dB (1 Pa) and this was set within the 0.01 dB resolution of the test system, i.e. one hundredth of a decibel. Numbers in {parenthesis} refer to the paragraph in IEC 60942.

Calibration Traceability

The calibrator above was calibrated against the calibration laboratory standards held by Cirrus Research plc. These are traceable to International Standards {A.0.6}. The standards are:

Microphone Type	B&K 4192	Serial Number	1920791	Calibration Ref.	S6450
Pistonphone Type	B&K 4220	Serial Number	613843	Calibration Ref.	S6388

Calibration Climate Conditions

The climatic test conditions were all maintained within the permitted limits of IEC 60942:1997.

Temperature	{B.3.2}	Permitted band 15°C to 25°C
Humidity	{B.3.2}	Permitted band 30% to 90% RH
Static Pressure	{B.3.2}	Permitted band 85 kPa to 105 kPa
Ambient Noise Level	{B.3.3.6}	Max permitted level 64 dB(Z)

Measurement Results

The figures below are the Calibration Laboratory test limits for this model calibrator and have a smaller tolerance than those permitted in IEC 60942.

94 dB Output	93.99 dB	Permitted band	93.95 to 94.05dB
104 dB Output	103.98 dB	Permitted band	103.80 to 104.30dB
Frequency	995 Hz	Permitted band	990 to 1010Hz

Uncertainty

With an uncertainty coefficient of k=2, i.e. a 95% confidence level, the uncertainty of each measure is

94 dB Output	± 0.13 dB	104 dB Output	± 0.14 dB
Frequency	± 0.1 Hz	Level Stability	± 0.04 dB

Calibrated by M. BERRY

Calibration Date 16 January 2017

Calibration Certificate Number 245309

This Calibration Certificate is valid for 12 months from the date above.

Pulsar Instruments plc, The Evron Centre, John Street, Filey, North Yorkshire, YO14 9DW
Telephone: +44 (0) 1723 518011 Fax: +44 (0) 1723 518043

Brüel & Kjær

The Calibration Laboratory
Skodsborgvej 307, DK-2850 Nærum, Denmark

ilac-MRA DANAK CAL Reg.nr. 307

CERTIFICATE OF CALIBRATION

No: CDK1609408 Page 1 of 10

CALIBRATION OF

Sound Level Meter:	Brüel & Kjær Type 2250	No: 2654662	Id: - 2654662
Microphone:	Brüel & Kjær Type 4950	No: 2737145	
Preamplifier:	Brüel & Kjær Type ZC-0032	No: 6822	
Supplied Calibrator:	Brüel & Kjær Type 4231	No: 2460008	
Software version:	BZ7222 Version 2.1	Pattern Approval:	PTB1.63-4046158
Instruction manual:	BE1712-18		

CUSTOMER

Enfonic Ltd
Tecpro House
IDA Business & Technology Park
Dublin
D17 NX50
Ireland

CALIBRATION CONDITIONS

Preconditioning: 4 hours at 23°C ± 3°C

Environment conditions: *See actual values in **Environmental conditions** sections.*

SPECIFICATIONS

The Sound Level Meter Brüel & Kjær Type 2250 has been calibrated in accordance with the requirements as specified in IEC61672-1:2002 class 1. Procedures from IEC 61672-3:2006 were used to perform the periodic tests. The accreditation assures the traceability to the international units system SI.

PROCEDURE

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System 3630 with application software type 7763 (version 4.9 - DB: 4.90) by using procedure 2250-4189.

RESULTS

Calibration Mode: **Calibration as received.**

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k = 2$ providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

Date of calibration: 2017-02-13

Date of issue: 2017-02-13

M. Önder
Mikail Önder
Calibration Technician

Susanne Jørgensen
Susanne Jørgensen
Approved Signatory

APPENDIX 3

Inverse Square Law Calculations

Noise Monitoring Location	Noise Measured at Boundary Location (max)			main onsite noise source	distance - monitoring location to source (m)	Approximate Distance to nearest NSL(m)	Effective Noise level		
	Leq dB(A)						Leq dB(A)		
	Daytime	Evening	Night Time				Daytime	Evening	Night Time
N1	57	50	45	vehicle movement onsite	40	130	47	40	35
N2	56	53	49	boiler	45	200	43	40	36
N3	55	50	49	soil shed	50	255	41	36	35
N4	56	51	42	n/a	n/a	n/a	Enva not audible	Enva not audible	Enva not audible
N5	54	49	46	vehicle movement onsite	40	115	46	41	38
Limit Values dB(A)							**55**	50	**45**

The Inverse Square Law can be used to calculate the expected reduction in noise levels as one moves away from a given noise source, which is assumed to radiate uniformly in all directions. The Inverse Square Law states that as one doubles the distance from a source, a reduction of 6 dB is achieved as follows:

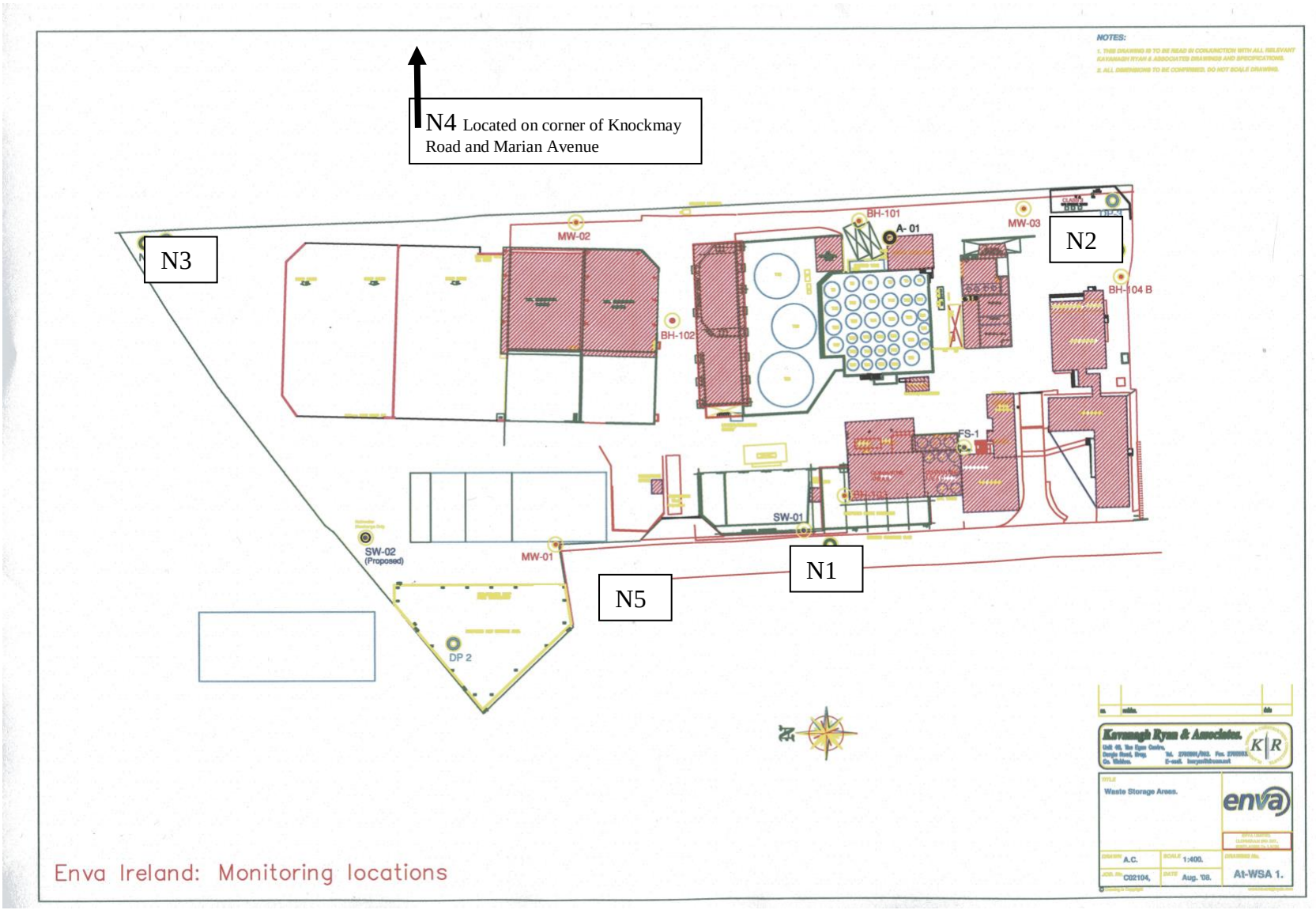
$$L_{p2} = L_{p1} - 20 \text{ Log } (R2/R1)$$

where:

- L_{p1} is the measured reference Sound Pressure Level (SPL) at a distance of R1 metres from the source.
- L_{p2} is the calculated SPL at a distance of R2 metres from the source.

APPENDIX III

Site Plan showing Noise Monitoring Positions


N4 Located on corner of Knockmay Road and Marian Avenue
N3
N2
N1
N5
MW-02
BH-101
A- 01
MW-03
BH-104 B
BH-102
FS-1
SW-01
SW-02
(Proposed)
MW-01
DP 2
Enva Ireland: Monitoring locations
Kavanagh Ryan & Associates.
Waste Storage Areas.
enva
A.C.
1:400.
C02104,
Aug. '08.
At-WSA 1.

Appendix 3

Report Title	Air Emissions Compliance Monitoring Emissions Report
Company address	Air Scientific Ltd., Unit 5, Caherdavin Business Centre, Caherdavin, Park, Ennis Road, Limerick V94 NT63.
Stack Emissions Testing Report Commissioned by	Enva Portlaoise
Facility Name	Enva Ireland Ltd
Contact Person	Donal Conroy
EPA Licence Number	W0184-02
Licence Holder	Enva Ireland Limited
Stack Reference Number	A1-1, A3-52, A3-53, A3-55 & A3-57
Dates of the Monitoring Campaign	13-12-2017
Job Reference Number	ENPOTL6131217
Report Written By	Mr. Daniel Mullins
Report Approved by	Mr. David Noonan
Stack Testing Team	Mr. Daniel Mullins & Mr. Jer Moore
Report Date	09-01-2018
Report Type	Test Report Compliance Monitoring
Version	1
Signature of Approver	

Opinions and interpretations expresses herein will be outside the scope of Air Scientific Limited INAB accreditation.
This test report shall not be reproduced, without the written approval of Air Scientific Limited.
All sampling and reporting is completed in accordance with Environmental Protection Agency Air Guidance Note 2 requirements.

Executive Summary

Monitoring Objectives

Overall Aim of the monitoring Campaign

The aim of the monitoring campaign was to demonstrate compliance with a set of emission limit values as specified in the site licence.

Special Requirements

There were no special requirements.

Target Parameters

Oxides of Nitrogen (NOx) as NO_2

Emission Limit Values

A1-1	$mg.m^{-3}$
Oxides of Nitrogen (NOx) as NO_2	200
Combustion Efficiency	-

Reference Conditions

Reference Conditions	Value
Oxygen Reference %	3
Temperature K	273.15
Total Pressure kPa	101.3
Moisture %	-

Executive Summary

Overall Results

Stack Name	Concentration				
Parameter	**Units**	**Result**	**MU +/-**	**Limit**	**Compliant**
Oxides of Nitrogen (NOx) as NO_2	$mg.m^{-3}$	129.5	7.8	200	Yes
Combustion Efficiency	%	92.6	-	-	n/a

Accreditation details

Air Scientific Limited	INAB Number: 319T

Executive Summary

Process details

Stack Name	A1-1
Process status	Boiler only runs for a few minutes at a time.
Capacity (per/hour) (if applicable)	Variable
Continuous or Batch Process	Batch
Feedstock	n/a
Abatement System	None
Abatement Systems Running Status	n/a
Fuel	Natural Gas
Plume Appearance	No
Other information	None

Executive Summary

Monitoring, Equipment & Analytical Methods

Parameter	Standard	Technical Procedure	Accredited Testing	Analytical Technique	Equipment / Media	Equipment ID Used on Site
Oxides of Nitrogen (NOx) as NO_2	EN14792:2006	2002	Yes	Chemiluminescence	Horiba	ASLLK15EQ510 ASLLK16EQ511 ASLLK16EQ512
Oxygen (%)	EN14789	2008	Yes	Paramagnetic/ Zirconia	Horiba	ASLLK17EQ539 ASLLK14EQ513 ASLLK14EQ509 ASLLK16EQ508

Sampling Deviations

A1-1	Deviation
EN14792	None
EN14789	None

Reference Documents

Risk Assessment (RA)	SOP 1011
Site Review (SR)	SOP 1015
Site Specific Protocol (SSP)	SOP 1015

Suitability of Sample Location

General Information	A1-1
Permanent/Temporary	Permanent
Inside/ Outside	Inside

Platform Details		
Irish EPA Technical Guidance Note AG1 / BS EN 15259 Platform Requirements	**Value**	**Comment**
Sufficient Working area to manipulate probe and measuring instruments	Yes	-
Platform has 2 handrails (approx. 0.5m & 1.0 m high)	n/a	-
Platform has vertical base boards (approx. 0.25 m high)	n/a	-
Platform has chains / self-closing gates at top of ladders	n/a	-
There are no obstructions present which hamper insertion of sampling equipment	Yes	-
Safe Access Available	Yes	-
Easy Access Available	Yes	-

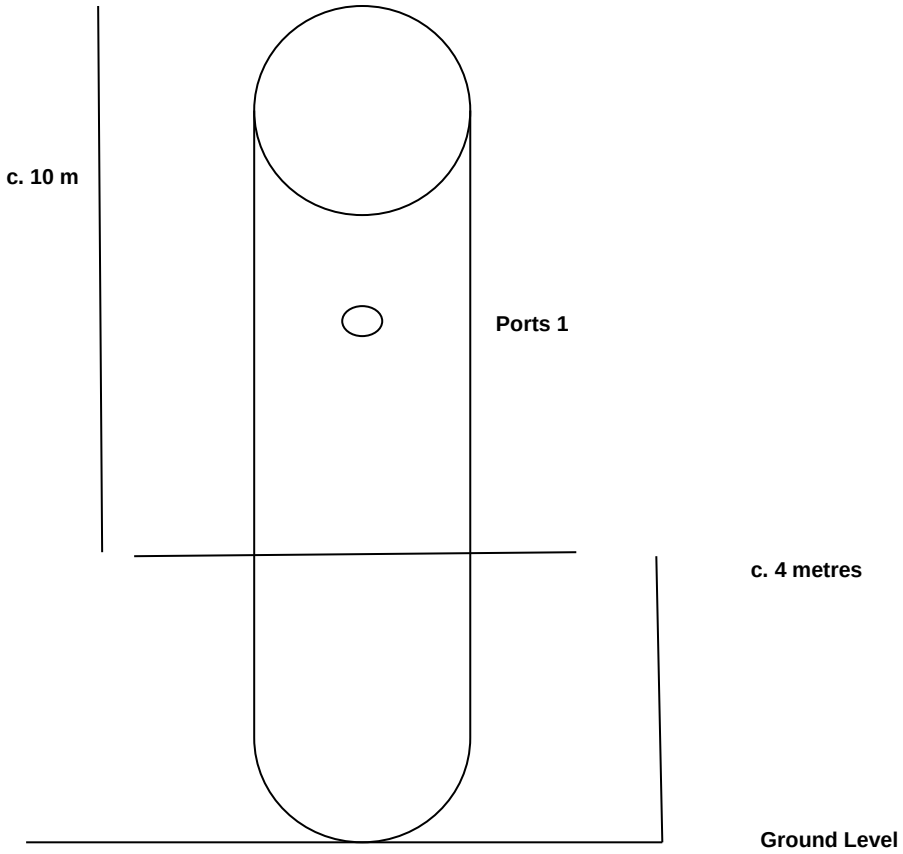
Sampling Location / Platform Improvement Recommendations
None

BSEN 15259 Homogeneity Test Requirements
1.

Select Option :

1: There is no requirement to perform a BSEN15259 Homogeneity Test on this stack
2: Test results were obtained from previous Homogeneity test carried out by ASL
3: Test results were obtained from previous Homogeneity test carried out by Alternative contractor
4: Homogeneity Test is required on this stack and the client has been informed of this requirement.

Stack Diagram



1. APPENDICES

Appendix I Monitoring Personnel & Equipment

Stack Emissions Monitoring Personnel

Team Leader	**Name**	Daniel Mullins
	System approval	ASL Team Leader Approved
Team Leader	**Name**	Jer Moore
	System approval	ASL Team Leader Approved

Appendix II Stack Raw Data

Title:	***Determination of Combustion Flue Gases***				
Method:	EN 14792 / EN 14789 / EN 15058 / TGN M21				
Test Date:	13/12/2017				
Stack Name	A1-1			**Quality Assurance**	
				Probe Material	Stainless Steel
Reference Conditions				Filtration Type/size	Stainless Steel
Measured Oxygen		6.5	%	Heated Filter used	Yes
Reference Oxygen		3	%	No. of sampling lines	1
				No. of Sampling points	1
				Sampling point I.D.s	1

Parameter		NO	O_2
Emission Limit Values	$mg.m^{-3}$ ref	200	n/a
Instrument Range	ppm	500	25
Span Gas Value	ppm	397	20.9
Acceptable Gas Range	-	Yes	Yes
Calibration Gas Reference No.	-	ASLLK17ING505	n/a
Calibration Gas Uncertainty	%	0.6	0.5
Calibration Gas Start Bar	Bar	Aug-18	n/a
Expiry Date	-	50	n/a
Quality Assurance	Units		
Conditioning Unit Temperature	C	2	2
Average Temperature	< C	2	2
Allowable Temperature	-	4	4
Temperature Acceptable	-	Yes	Yes
Pump flow rate	l/min.	0.5	0.5
Zero Drift	Units		
Zero (Ambient air or Nitrogen)		Ambient	Nitrogen
Zero (Pre)	ppm	0.1	0.04
Zero (Post)	ppm	0.3	0.12
Zero drift	ppm	0.2	0.08
Allowable Zero Drift (Less than)	ppm	7.94	0.418
Adjustable Zero Drift (Less than)	ppm	19.85	1.045
Zero Drift Failure (Greater than)	ppm	19.85	1.045
Zero Drift Acceptable	-	Yes	Yes
Span Drift	Units		
Span Down (Pre)	ppm	397.2	20.92
Span Down (Post)	ppm	396.7	20.89
Span Drift	ppm	-0.5	-0.03
Allowable Span Drift (less than)	ppm	7.94	0.418
Adjustable Span Drift (Less than)	ppm	19.85	1.045
Span Drift Failure (Greater than)	ppm	19.85	1.045
Span Drift Acceptable (Y/N)	-	Yes	Yes
Leak Check			
Span Gas Conc.	ppm	397	20.9
Recorded Conc. down Line	ppm	397.2	20.92
Leak Detected	ppm	0.2	0.02
Leak check acceptable (< 2%)	ppm	7.94	0.418
Pass	(Y/N)	Yes	Yes
Response Time (<200 seconds)		Yes	Yes
Test Conditions	Units		
Run Ambient Temperature Range	C	0	0

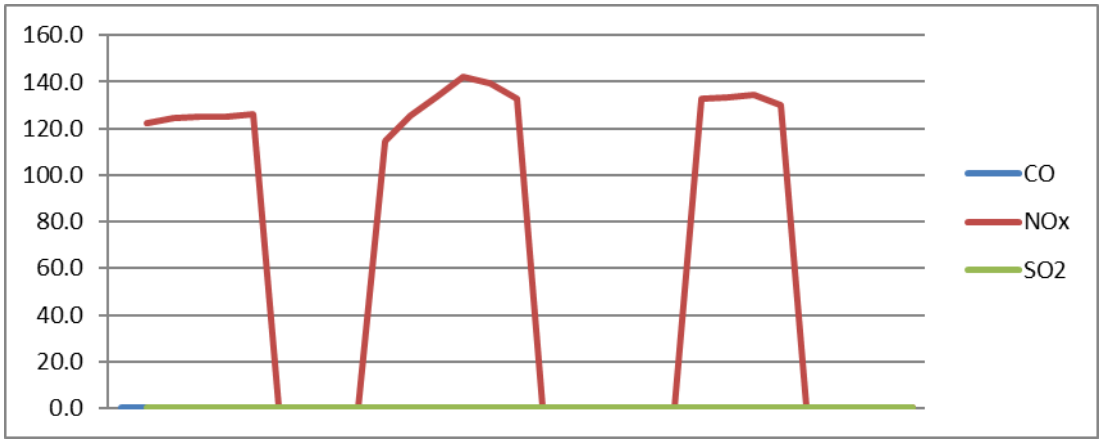
Raw Data

Date/Time	*Data source*	*NOx*	*O_2*
		ppm	*vol%*
13/12/2017 10:45		49.758	5.945
13/12/2017 10:46		50.617	5.949
13/12/2017 10:47		50.592	6.056
13/12/2017 10:48		50.525	6.060
13/12/2017 10:49		50.517	6.164
13/12/2017 10:54		49.250	5.124
13/12/2017 10:55		50.558	6.090
13/12/2017 10:56		50.750	6.947
13/12/2017 10:57		50.000	7.977
13/12/2017 10:58		51.225	7.417
13/12/2017 10:59		52.542	6.352
13/12/2017 11:06		50.408	6.949
13/12/2017 11:07		50.567	6.956
13/12/2017 11:08		51.100	6.960
13/12/2017 11:09		49.250	6.964
Average		**50.5**	**6.5**

Referenced Data

	NOx
	mg/Nm^3 Reference O_2
13/12/2017 10:45	122.3
13/12/2017 10:46	124.4
13/12/2017 10:47	125.2
13/12/2017 10:48	125.1
13/12/2017 10:49	126.0
13/12/2017 10:54	114.7
13/12/2017 10:55	125.5
13/12/2017 10:56	133.7
13/12/2017 10:57	142.2
13/12/2017 10:58	139.6
13/12/2017 10:59	132.7
13/12/2017 11:06	132.8
13/12/2017 11:07	133.3
13/12/2017 11:08	134.7
13/12/2017 11:09	129.9

Average	**129.5**
Uncertainty of Measurement	**7.8**
Uncertainty as % of ELV	**3.91**
Standard Requirement	**<10%**



Parameter	Value
FT	177.8
Ambient Temp	9.5
A2 (Fuel Specific Factors)	0.66
Oxygen level in air	20.9
Measured oxygen	6.5

Formula = qA = (FT-AT) x (A2 / 21- O2) + B

FT - AT	168.3
A2 / 20.9- O2	0.045833
plus B fuel specific factors	0.009
Calculation of efficiency qA	7.72
%	**92.28**

Formula = qA = fx FT-AT/Co2

Appendix 4

Enva Portlaoise

2017 Groundwater Compliance Monitoring Quarter 1 (Jan – Mar 2017)

Document Control Sheet

Client:	Enva Ireland Ltd.
Project Title:	Enva Portlaoise 2016 Groundwater Compliance Monitoring
Document Title:	Quarter 4 (Oct – Dec 2016)
Document No:	MDE0973Rp0031

Text Pages:	47	Appendices:	-

Rev.	Status	Date	Author(s)		Reviewed By		Approved By	
D01	Draft	9th March 2017	DC		CR		CR	
A01	Client Approval	24th March 2017	DC		CR		CR	

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1 INTRODUCTION

1.1 BACKGROUND

RPS has been commissioned by Enva Ireland Ltd (Enva) to carry out groundwater quality monitoring for environmental compliance, at their facility in the Clonminam Industrial Estate, Portlaoise, Co Laois. Groundwater monitoring has being carried out in strict accordance with criteria set out in Schedule 4(ii) of the site's Industrial Emissions Licence, Register No. W0184-01.

Enva Ireland has been operating under Waste Licence Register No. W0184-01 since January 2004. The licence was amended by the Environmental Protection Agency in December 2013 to conform to the provisions and requirements of the Council Directive 2010/75/EU (Industrial Emissions Directive) and as such is deemed an Industrial Emissions Licence. Enva is required to submit a report to the EPA on a quarterly basis, outlining the existing groundwater quality underlying the site.

A suitably qualified environmental consultant from RPS, collected groundwater samples from a series of 8 monitoring wells (BH101, BH102, BH103, BH104B, MW01, MW02, MW03, MW04) within the site boundary on the 16th of February 2017. The samples underwent laboratory analysis for the suite of parameters specified in Schedule 4(ii) of Industrial Emissions Licence W0184-01. This report outlines the results of the Quarter 1 monitoring for 2017 and reviews historical data recorded at the site.

1.2 OBJECTIVES & SCOPE OF WORK

The specific objectives and scope of work are as follows:

- Review of previous data as provided by Enva Portlaoise;
- Graphical presentation of key compounds and trends; and
- Discussion of results for Quarter 1 2017 within the context of previous results and available guideline concentrations.

2 REVIEW OF PREVIOUS DATA

2.1 INFORMATION SOURCES

The following documents were reviewed as part of this project:

- Industrial Emissions Licence W0184-01 and any available EPA documents from the EPA website;
- Quarterly Groundwater Monitoring Reports (Quarter 1 2004 to Quarter 4 2005), URS;
- Quarterly Groundwater Monitoring Reports (Quarter 1 2006 to Quarter 4 2016), RPS;
- Summary Report on Trend of Contaminant Levels at Enva Ireland Ltd since 2005, Ref: MDE0647RP0001, RPS (2007);
- Groundwater Risk Assessment, Ref: MDE0788Rp0001, RPS (2008);
- Hydrogeological Review and Assessment Report, Ref MDE0973Rp0017F01, RPS (2014); and
- Baseline Environment Report, Ref: MDE0973Rp0104.

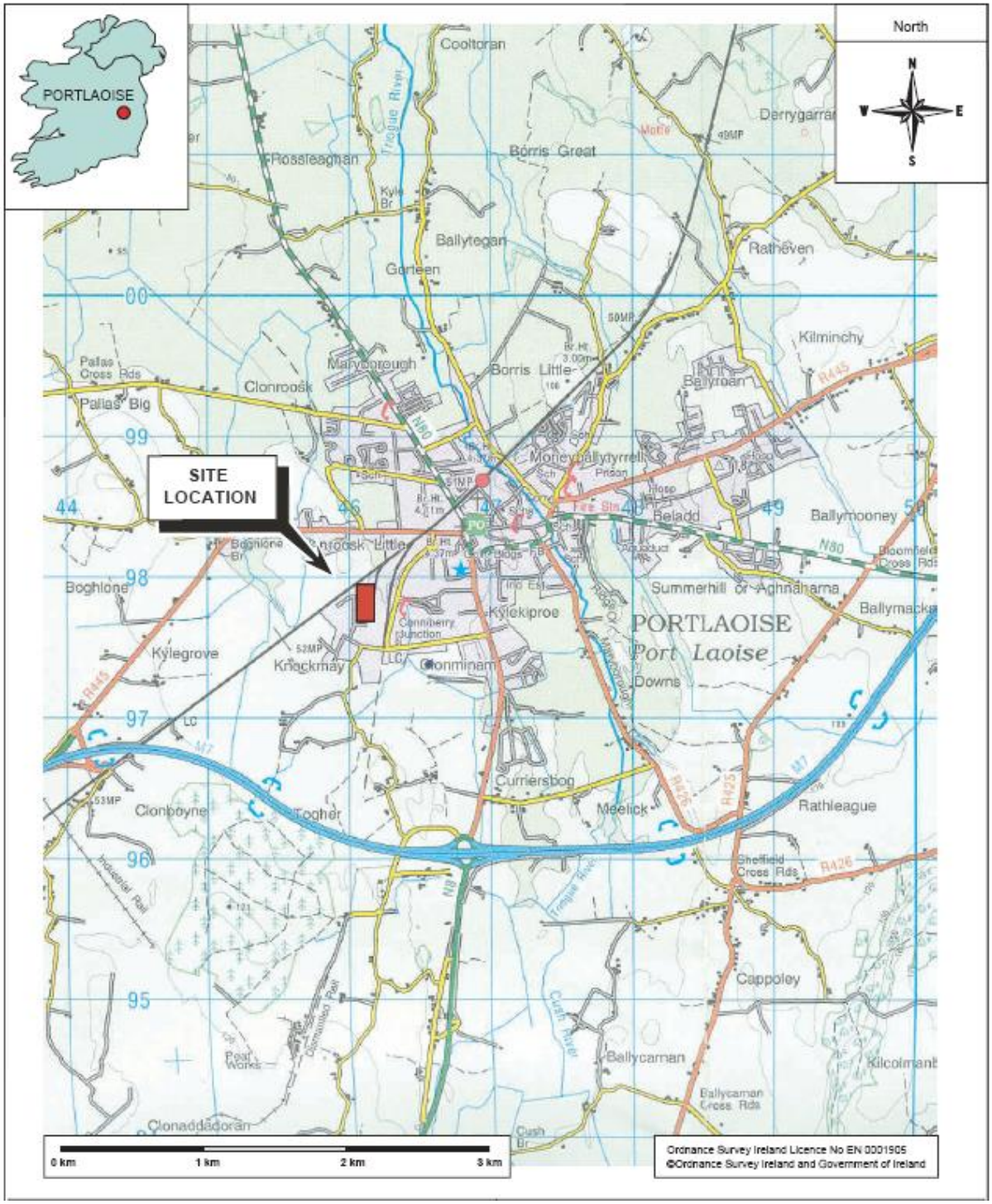
2.2 SITE SETTING

The site is located to the southwest of the town of Portlaoise immediately to the south of the Dublin to Cork railway line. The general area is gently undulating. The site slopes gently to the southwest but to the east of the site the ground slopes gently towards the River Triogue, which is located approximately 1.5 km to the east. The site occupies an area of approximately 1.5 hectares and comprises of an operational waste oil and contaminated soil treatment plant.

The site is located on the outskirts of Portlaoise in an area of agricultural and light industrial development. The site is bounded to the north and east by land belonging to Irish rail, comprising sidings and general storage areas. To the south is a vehicle repair garage, which is elevated above the level of the site by approximately 1.5 m. To the west the site is adjoined by further industrial land, as well as residential land. The site location is presented on **Figure 2.1**.

The site has been in operation since 1978, and the layout has remained relatively consistent. The site layout is presented on **Figure 3.1**. The site is largely covered in hardstanding with some open areas in the far north and northeast of the site. All oil and soil storage areas are suitably bunded and the general standard of housekeeping is good.

Figure 2.1 – Site Location



2.3 REGIONAL SETTING

2.3.1 Geology

The Geological Survey of Ireland indicates that the regional geology of Portlaoise is typified by Carboniferous Limestone. In the vicinity of the site itself the solid geology comprises the Ballysteen Formation, a micaceous-bioclastic limestone. This well-bedded limestone, with interbeds of shale, is extensively folded, with axes trending north-east to south-west, and becomes increasingly muddy towards the top of the formation. North-east to south-west trending faults are found in the region, with one located approximately 500m to the east of the site. The subsoils in the region comprise mainly Made Ground, around the industrial area, and Limestone Till in the surrounding regions.

2.3.2 Hydrogeology

The limestone is classified by the Geological Survey of Ireland (GSI) as a Locally Important Karstified Aquifer (Ll). Porosity is predominantly in the form of fractures, in this aquifer, however the muddy nature of this formation greatly reduces permeability. Vulnerability of this aquifer beneath the site is classified as high, with moderate vulnerability to the east of the site.

The public water supply for Portlaoise is derived from groundwater, utilising three groundwater abstraction well fields comprising of two abstraction wells in each well field. This supply currently comes from the Straboe area, approximately 5.5 km to the north-east of the site. The source protection zone for this water supply extends to within 3.2 km of the Enva site but does not encompass the Enva site.

The GSI record a number of other dug wells and boreholes within the Portlaoise area, including the boreholes installed on the site. The accuracy of the locations of these wells varies. One well, which was drilled in 1899 is recorded as being located immediately to the south of the Enva site. The use of this well is not known and its location is only accurate to 1 km. A second borehole, drilled in 1973 is recorded 1.5 km to the north of the site at Clonroosk; the accuracy of this location is also 1 km so it could be closer or further from the site. The use of this well is not known but its yield is recorded as being poor. There are no other wells recorded within 1 km of the site.

Enva is not aware of any abstraction boreholes within the immediate vicinity of their site.

2.4 SITE GROUND CONDITIONS

A total of eight boreholes have been drilled at the site and the general sequence of ground conditions is presented in **Table 2.1**.

Table 2.1 – Ground Conditions

Strata	Extent	Thickness	Description
Made Ground	BH104	0-3.5 m	Predominantly concrete, with hardcore fill, and clay.
Boulder Clay	All boreholes	<8.5 m	Includes fine to medium, well rounded gravels.
Sand and Gravel	Confined to south east corner of site (BH101, BH104 and MW03)	0-2 m	In general the transition from boulder clay to sand is gradual with changes from gravel, to sandy gravel, to sand.
Limestone Bedrock	Encountered in MW01, MW02 and MW03	Top of limestone ranges from 7.7m to 9m below ground level.	Pale grey, fine-grained bedrock, differentiated from boulders by its un-weathered nature.

The logs for each of the boreholes were previously presented as Appendix B in the RPS Groundwater Risk Assessment Report (Ref: MDE0788Rp0001).

2.4.1 Licence Conditions

The Industrial Emissions Licence requires the regular monitoring and sampling of boreholes BH101, BH102, BH103, BH104B, MW01, MW02, MW03 and MW04. The parameters requiring measurement or analysis are presented in **Table 2.2**.

Table 2.2 – Licence Parameters

Group	Parameters requiring Quarterly Measurement	Parameters requiring Annual Measurement
Field Parameters	Groundwater Level pH Temperature Dissolved Oxygen Electrical Conductivity Visual Inspection	Groundwater Level pH Temperature Dissolved Oxygen Electrical Conductivity Visual Inspection
Organics	Mineral Oil BTEX & MTBE PAHs Phenols VOCs SVOCs	Mineral Oil BTEX & MTBE PAHs Phenols VOCs SVOCs
Inorganics	-	Total Alkalinity, Calcium, Manganese, Sulphate, Cyanide (Total), Chloride, Sodium,

3 METHODOLOGY

Groundwater samples were collected from 8 no. on-site groundwater monitoring wells (BH101, BH102, BH103, BH104B, MW01, MW02, MW03, MW04) (**Figure 3.1**) using dedicated Waterra tubing, in accordance with RPS's standard sampling protocol. A non-return foot valve was fixed to the bottom of the tubing and inserted into the well, close to the base of the borehole. Separate tubing and foot valves were used at each monitoring well to eliminate the possibility of cross contamination.

Groundwater in the well casing is not considered representative of the groundwater quality at a given location. For this reason, three well volumes were purged from each well prior to collection of the groundwater sample. By the time purging was complete all field test water parameters (namely pH, Temperature, Electrical Conductivity and Dissolved Oxygen) were within 10% variance in three consecutive measurements. This ensured that the groundwater sample extracted from the monitoring borehole was representative of the water held in the subsurface strata and not water held stagnant in the borehole casing. The purged volumes were calculated on-site from the measured static water levels and total well depths using an electronic dip meter.

Groundwater samples were collected in laboratory supplied containers and stored in chilled cool boxes following sampling and during transit to the laboratory. A rigorous chain of custody procedure was used during the sample round.

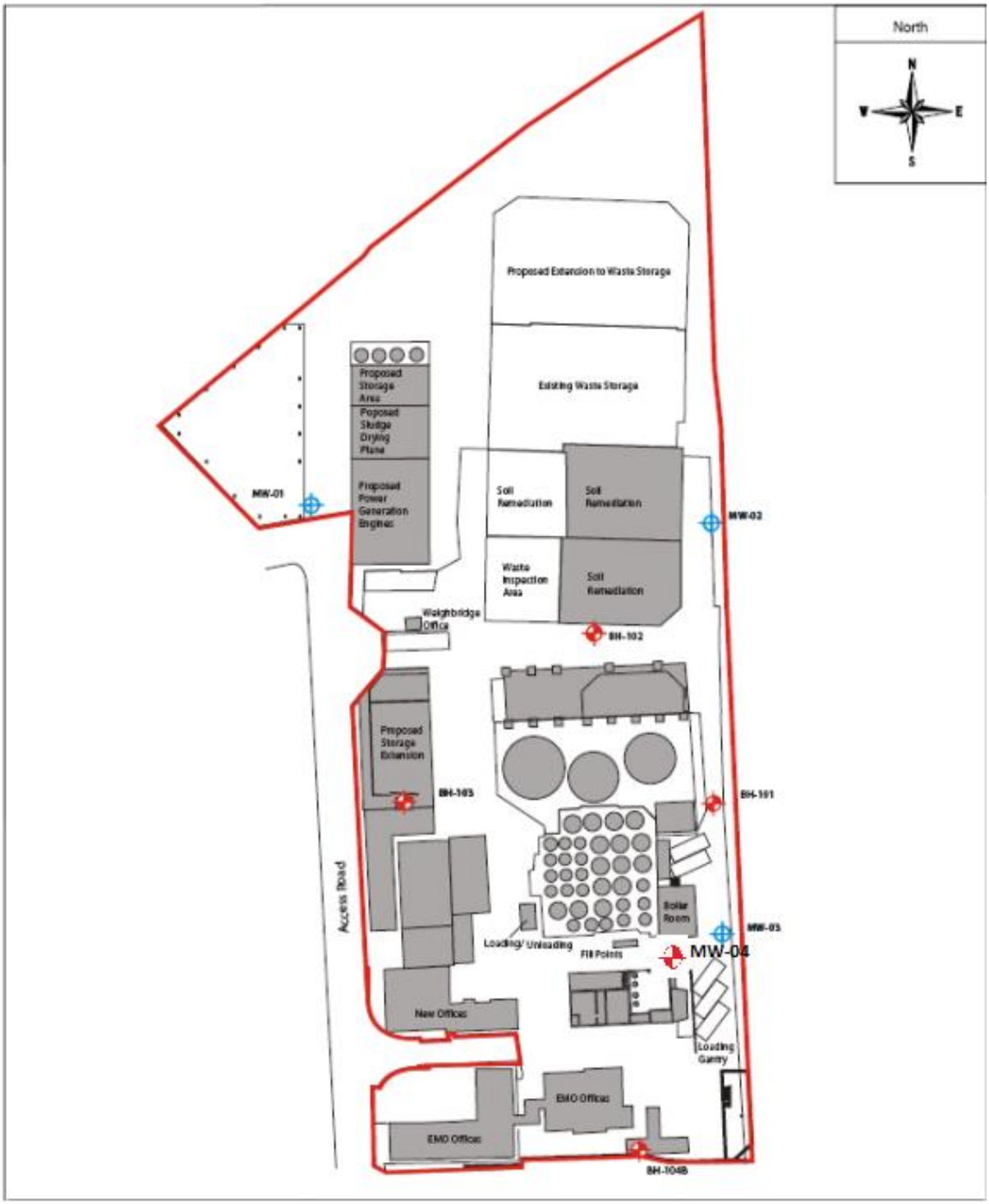
3.1 LABORATORY ANALYSIS

All groundwater samples were analysed at a UKAS accredited laboratory, ALS Environmental for the suite of analyses listed in **Table 3.1**. **Table 3.1** also indicates the analytical techniques used by the laboratory.

Table 3.1 – Analytical Methodologies – ALS Environmental

Parameter	Analytical Methodology
Phenols	GC-MS
Speciated PAHs	GC-MS
BTEX & MTBE	Headspace GC-MS
Petroleum Hydrocarbons	Headspace GC-MS
Volatile Organic compounds & Tentatively Identified Organic Compounds (VOCs & TICs)	Headspace GC-MS
Semi-Volatile Organic compounds & Tentatively Identified Organic Compounds (SVOCs & TICs)	GC-MS

Figure 3.1 – Site Layout Plan with Groundwater Monitoring Locations



Source: *URS Environmental Consultants (Ref: 45078497 Issue No. 1)*

3.2 PRESENTATION & INTERPRETATION OF RESULTS

The Quarter 1 2017 results are tabulated in **Section 4** and discussed with respect to previous results in **Section 5**. Results are compared against Groundwater Threshold Values (GTVs) outlined in the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No 9 of 2010), where available. Where GTVs are not available for parameters, results are compared against the Interim Guideline Values (IGVs) set out in the Environmental Protection Agency interim report, 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland'.

Previous monitoring reports (as listed in **Section 2.1**) provide details of contaminant concentrations since 2004. The data available within these reports has been reviewed and time series plots of key parameters have been compiled. Trends for chlorinated solvents, petroleum hydrocarbons and phenol parameters have been plotted.

Time series plots are presented in **Section 6** and include the results of this Quarter 1 2017 monitoring round. As the monitoring continues in accordance with the Industrial Emissions licence requirements, the plots will be updated with the results of subsequent rounds used to illustrate the results.

Time series plots are also provided for manual water levels where available from previous reports.

4 QUARTER 1 RESULTS FEBRUARY 2017

The results of all field measurements and laboratory analysis are presented in this section. Results are primarily compared against Groundwater Threshold Values (GTVs) outlined in the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No 9 of 2010), where available. Where GTVs are not available for parameters, results are compared against the Interim Guideline Values (IGVs) set out in the Environmental Protection Agency interim report, 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland'.

The results are discussed in relation to appropriate guideline values in **Section 5**. Results that are shown to be above the relevant threshold or guideline values are highlighted in bold and shaded. Results that are shown to be above the relevant laboratory detection limits are highlighted in italics.

Site-specific field parameter measurements were collected during the site visit as per RPS Water sampling protocol.

Groundwater samples from the 8 monitoring wells (BH101, BH102, BH103, BH104B, MW01, MW02, MW03, MW04) were collected within the site boundary on the 16th of February 2017 following the methodology outlined in Section 3. The samples were sent to ALS Environmental for laboratory analysis. ALS noted on receipt of analysis that the SVOC bottle for BH101 and LL phenol bottle for MW03 were empty on arrival. As such, the SVOC analysis for BH101 and phenol analysis for MW03 was unable to be carried out.

An additional sample for these two locations was undertaken on the 16th of February, following the methodology outlined in Section 3. The samples were submitted to the lab for SVOC analysis for BH101 and phenol analysis for MW03.

Table 4.1 – Groundwater Levels (Quarter 1, 2017)

Monitoring Well	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04
Depth (mbgl)	6.81	6.48	4.39	4.65	22.65	30.85	14.72	6.46
Static Water Level (mbgl)	4.31	3.16	1.81	1.01	2.53	3.49	4.43	4.00
Ground Level (mAOD)	103.06	102.55	101.16	101.52	102.10	103.12	102.77	-
Water Level (mAOD)	98.75	99.39	99.35	100.51	99.57	99.63	98.34	-
Free Phase Oil (mm)	No detection	No detection	No detection	No detection	No detection	No detection	No detection	No detection

mbgl = metres below ground level

Table 4.2 – Results of Field Parameters Measured at each Groundwater Monitoring Well (Quarter 1, 2017)

Monitoring Well	pH (pH Units)	Temperature (°C)	Conductivity (µS/cm)	Dissolved O_2 (ppm)	Observations
BH101	7.65	9.5	997	4.63	Light grey cloudy colouron purging, some sandy sediment
BH102	7.47	9.0	765	3.76	Slight brown on purging, clearer after 10L, some large suspended solids
BH103	7.45	8.7	794	3.88	Grey in colour and very little sediment
BH104B	8.57	9.8	699	4.36	Light grey/clear on purging, some sediment and slight oil sheen
MW01	7.57	9.5	743	4.86	Clear/slight grey colour, little suspended solids and sediment
MW02	7.68	8.1	761	3.90	Clear/grey on purging with very little suspended solids
MW03	7.24	9.3	**1379**	4.23	Grey colour on purging, some large suspended solids and fine sediment, very slight sheen and odour. Samples clear
MW04	6.58	8.2	**1311**	3.69	Cloudy light brown colour, some sandy sediment and very little suspended solids
Groundwater Threshold Value	-	-	1875	-	-
Interim EPA Guideline Values (Units as indicated)	>6.5 & <9.5	25°C	1000	No abnormal change	-

Note: Results above the relevant IGV are highlighted in bold.
Note: Results above the GTV are highlighted in bold and shaded.

Table 4.3 – Results of BTEX and MTBE

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Benzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.75	1.0
Toluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
Ethylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
m & p-xylene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10 Note 1
o-xylene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10 Note 1
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	***2.4***	***1.2***	-	30

Note: No specific IGV for parameter. IGV for Total Xylenes is used as guideline.
Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

Table 4.4 – Results of Speciated PAHs

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Naphthalene	µg/l	0.01	<0.01	<0.01	***0.018***	<0.01	***0.041***	<0.01	<0.01	***0.12***	-	1.0
Acenaphthylene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-
Acenaphthene	µg/l	0.01	<0.01	<0.01	***0.032***	<0.01	***0.061***	<0.01	***0.093***	***0.014***	-	-
Fluorene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	***0.018***	<0.01	***0.103***	***0.014***	-	-
Phenanthrene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-
Anthracene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	10,000
Fluoranthene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	***0.021***	<0.01	-	1.0
Pyrene	µg/l	0.01	<0.01	***0.014***	<0.01	***0.021***	<0.01	<0.01	***0.081***	<0.01	-	-
Benzo(a)anthracene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	***0.025***	<0.01	-	-
Chrysene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	***0.06***	<0.01	-	-
Benzo(b)fluoranthene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	***0.019***	<0.01	-	0.5

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Benzo(k)fluoranthene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	0.05
Benzo(a)pyrene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.033**	<0.01	-	0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	0.05
Dibenz(a,h)anthracene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-
Benzo(g,h,i)perylene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	***0.037***	<0.01	-	0.05
Total EPA-16 PAHs	µg/l	0.1	<0.01	***0.014***	***0.05***	***0.021***	**0.121**	<0.01	**0.47**	**0.148**	0.075	0.1

Note: Results above the relevant IGV are highlighted in bold.
Note: Results above the GTV are highlighted in bold and shaded.
Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

Table 4.5 – Results of Speciated Phenols

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Phenol	µg/l	5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	-	0.5
2,4,6-Trichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	200
2,4-Dichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2,4-Dimethylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Chlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	200
2-Methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	***3.48***	<1.0	-	-
2-Nitrophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
4-Chloro-3-methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
3+4-Methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	***2.19***	<1.0	-	-

Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

Table 4.6 – Results of Semi-Volatile Organic Compounds (SVOCs)

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Phenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.5
2-Chlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	200
Bis(2-chloroethyl)ether	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,3-Dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2-Dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
1,4-Dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Bis(2-chloroisopropyl)ether	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Hexachloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Nitrobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
3&4-Methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Isophorone	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Nitrophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2,4-Dimethylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Bis(2-chloroethoxy)methane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2,4-trichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.40
Naphthalene	µg/l	2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	1.0
2,4-Dichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Hexachlorobutadiene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.10
4-Chloro-3-methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2,4,6-Trichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	200
2,4,5-Trichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Methylnaphthalene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Chloronaphthalene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Dimethylphthalate	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
2,6-Dinitrotoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Acenaphthylene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Acenaphthene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2,4-Dinitrotoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Dibenzofuran	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
4-Chlorophenyl phenyl ether	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Diethylphthalate	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Fluorene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
4-Bromophenyl phenyl ether	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Hexachlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.03
Phenanthrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Anthracene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10,000
Pyrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzyl Butyl Phthalate	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzo(a)anthracene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Chrysene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzo(b)fluoranthene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.5
Benzo(k)fluoranthene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.05
Benzo(a)pyrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.01
Indeno(1,2,3-c,d)pyrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.05
Dibenz(a,h)anthracene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzo(g,h,i)perylene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Bis(2-ethylhexyl)phthalate	µg/l	5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	-	-

Note: Results above the relevant IGV are highlighted in bold.
Note: Results above the GTV are highlighted in bold and shaded.

Table 4.7 – Results of Volatile Organic Compounds (VOCs)

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Chloromethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Chloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	***5.8***	-	-
Bromomethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Vinyl Chloride	µg/l	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**0.5**	0.375	-
Trichlorofluoromethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,1-dichloroethene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	30
1,1-dichloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	***1.8***	***2.2***	-	-
Cis-1,2-dichloroethene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	***2.4***	***1.2***	-	30
2,2-Dichloropropane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,1,1-Trichloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	500
1,2-dichloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.25	-
1,1-Dichloropropene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Trans-1,2-dichloroethene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	1.0
1,2-dichloropropane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Trichloroethene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	70
Dibromomethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Bromodichloromethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Cis-1,3-dichloropropene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Trans-1,3-dichloropropene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Toluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
1,1,2-Trichloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,3-Dichloropropane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Dibromochloromethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Tetrachloroethene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	40
1,2-Dibromoethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Chlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	1.0
1,1,1,2-Tetrachloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Ethylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
m&p-Xylene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
Styrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
o-xylene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
Isopropylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Bromobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
N-Propylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Chlorotoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
4-Chlorotoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,3,5-Trimethylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Tert-Butylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2,4-Trimethylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Sec-Butylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,3-dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
P-Isopropyltoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2-dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
1,4-dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
n-Butylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2-Dibromo-3-chloropropane	µg/l	2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	-
1,2,4-Trichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.40
Hexachlorobutadiene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.10

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
1,2,3-Trichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-

Note: Results above the relevant IGV are highlighted in bold.
Note: Results above the GTV are highlighted in bold and shaded.
Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

Table 4.8 – Results of Total Petroleum Hydrocarbons (Aliphatic/Aromatic)

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Aliphatic > C10-C12	µg/l	10	<10	<10	<10	<10	<10	<10	<10	<10	-	-
Aliphatic > C12-C16	µg/l	10	<10	<10	<10	<10	<10	<10	<10	<10	-	-
Aliphatic > C16-C35	µg/l	10	<10	***11***	***15***	<10	***23***	<10	***40***	<10	-	-
Aliphatic > C35-C44	µg/l	10	<10	<10	<10	<10	<10	<10	<10	<10	-	-
Aliphatic > C10-C44	µg/l	10	<10	**11**	**15**	<10	**23**	<10	**40**	<10	-	10
Aromatic > C10-C12	µg/l	10	<10	<10	<10	<10	<10	<10	<10	***11***	-	-
Aromatic > C12-C16	µg/l	10	<10	<10	<10	<10	<10	<10	<10	***21***	-	-
Aromatic > C16-C21	µg/l	10	<10	<10	<10	<10	<10	<10	<10	<10	-	-
Aromatic > C21-C35	µg/l	10	<10	<10	<10	<10	<10	<10	***13***	<10	-	-
Aromatic > C35-C44	µg/l	10	<10	<10	<10	<10	<10	<10	<10	<10	-	-
Aromatic > C10-C44	µg/l	10	<10	<10	<10	<10	<10	<10	**13**	**32**	-	10

Note: Results above the relevant IGV are highlighted in bold.
Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

5 DISCUSSION OF QUARTER 1 RESULTS

The results of the Quarter 1 monitoring event for 2017 are presented in **Table 4.1** to **4.9** of this report. For the purpose of this report, the results are compared against the Groundwater Threshold Values (GTVs) outlined in the European Communities Environmental Objectives (Groundwater) Regulations (S.I. No. 9 of 2010) where available. Where GTVs are not available results are compared against the EPA Interim Guideline Values (IGV) as set out in the Interim Report *'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' 2004.* A discussion of the results and their significance is included below.

5.1 FIELD PARAMETERS

The results of the field parameters measured at each groundwater monitoring well are presented in Table 4.2. Groundwater samples recorded pH levels ranging between 6.58 and 8.57, all within the EPA Interim guideline range of ≥6.5 to ≤9.5. Temperature measurements ranged from 8.1°C to 9.5°C and were below the EPA IGV of 25°C.

Field measurements of Electrical Conductivity levels ranged between 699 µS/cm and 1379 µS/cm. Two measurements of Electrical Conductivity were above the IGV of 1000 µS/cm at MW03 (1379 µS/cm) and MW04 (1311 µS/cm), but all however were below the GTV limit of 1875 µS/cm.

Dissolved oxygen levels ranged between 3.69 and 4.86 ppm. Factors such as climate, nutrients in the water, suspended solids; organic wastes and groundwater inflow can all influence the dissolved oxygen values.

Observations relating to colour and odour varied from well to well as detailed in **Table 4.2**.

5.2 RESULTS OF BTEX & MTBE

The results of the **BTEX** and **MTBE** analysis are presented in **Table 4.3**. BTEX concentrations are below the associated GTVs and IGVs at all locations. All BTEX concentrations are also all below the laboratory of limit of detection at all locations. MTBE was detected at MW03 (2.4 µg/l) and MW04 (1.2 µg/l), however these concentrations below the IGV of 30 µg/l. MTBE was below the laboratory limit of detection and IGV at all other locations.

The previous detection of MTBE was in the Quarter 4 monitoring event of 2016 and recorded concentrations above the laboratory limit of detection at MW03 (1.5 µg/l) and MW04 (1.2 µg/l). MTBE was also above the laboratory limit of detection at MW03 (1.2 µg/l) during Quarter 3 2016, and at BH103 (1.2 µg/l), MW03 (1.8 µg/l) and MW04 (1.7 µg/) during Quarter 2 2016. These detections are still below the IGV limit however. Prior to this there was a detection of MTBE at BH104B in the Quarter 1 monitoring event of 2012 with a recorded concentration of 280 µg/l which is above the laboratory limit of detection. This was the only recorded exceedance in Quarter 1 2012.

Monitoring during Quarter 1 and Quarter 2 of 2010 detected exceedances of MTBE at BH103 at a concentration of 16 µg/l. Subsequent monitoring in 2010 recorded concentrations below the laboratory limit of detection. Prior to these 2010 monitoring events, concentrations of MTBE at BH103 were recorded at 63 µg/l in December 2009.

5.3 RESULTS OF SPECIATED POLYAROMATIC HYDROCARBONS (PAHS)

The results of the Speciated PAH analysis during this monitoring period are presented in **Table 4.4.**

The laboratory limit of detection for Total EPA-16 PAHs is 0.1 µg/l and has been lowered for comparison with the EPA IGV of 0.1 µg/l; however this is not accredited. This laboratory limit of detection is above the EPA GTV of 0.075 µg/l. To identify the compounds, which attributed to these concentrations, speciated PAH analysis was carried out, which reduces the limit of detection for individual parameters to 0.01 µg/l.

Total Polyaromatic Hydrocarbons were above the IGV limit of 0.1 µg/l at MW01 (0.124 µg/l), MW04 (0.47 µg/l) and MW03 (0.148 µg/l). Total PAHs were below the IGV of 0.1 µg/l and the GTV of 0.075 µg/l at all other locations.

Total PAHs were previously detected above the IGV at BH102 (0.124 µg/l) and MW03 (0.596 µg/l) during the Quarter 4 2016 monitoring event and were also above the IGV at BH103 (0.181 µg/l), BH104B (0.158 µg/l), MW03 (0.562 µg/l) and MW04 (0.151 µg/l) during the Quarter 3 2016 monitoring event.

The results of the speciated polycyclic aromatic hydrocarbon analysis detected a number of different compounds in BH101, BH102, BH103, BH104B, MW01, MW03 and MW04 above the laboratory limit of detection. However, with the exception of Benzo (a) pyrene at MW03 (0.033 µg/l), none of these compounds were above their respective IGV limits at any location.

5.4 RESULTS OF SPECIATED PHENOLS

During previous quarterly monitoring events and sample analysis, total monohydric phenol was determined and historically has been below the laboratory limit of detection of 10 µg/l since December 2008. It should be noted that the laboratory limit of detection was however above the IGV of 0.5 µg/l for phenols.

For this reason, samples were analysed for phenols to include chlorophenols. The results of the speciated phenols analysis are presented in **Table 4.5**. The speciated phenol analysis reduces the laboratory limit of detection to 1.0 µg/l for individual parameters.

The results of the current Quarter 1 2017 speciated phenol analysis confirm concentrations of phenols were below the laboratory limit of detection of 1.0 µg/l at all locations, with the exception of 2-Methylphenol (3.48 µg/l) and 3+4-Methylphenol (2.19 µg/l) in MW03. However, there is no IGV or GTV for either of these parameters

4-Chloro-3-methylphenol was detected at BH104B (1.37 µg/l) above the laboratory limit of detection during the Quarter 1 2015 analysis. With the exception of this, all other results are consistent with results since the 2012 quarterly monitoring events.

5.5 RESULTS OF SEMI-VOLATILE ORGANIC COMPOUNDS

The results of the Semi-Volatile Organic Compound analysis are presented in **Table 4.6**.

There are no GTVs for individual SVOC parameters. No SVOCs were detected above the relevant IGVs during this monitoring period, consistent with the results from the 2016, 2015 and 2014 monitoring periods. It should be noted that the laboratory limit of detection was however above the IGVs for some SVOCs, for example the result for 1,2,4-Trichlorobenzene was <1.0 µg/l but the IGV for this parameter is 0.40 µg/l, but testing at this limit is not accredited.

The Quarter 3 2013 monitoring event detected two SVOC compounds, Acenaphthene (1.1 µg/l) and Fluorene (1.5 µg/l) in MW03. Prior to this detection the Quarter 2 monitoring event of 2012 detected concentrations of Naphthalene and Acenaphthylene in MW03 at concentrations of 2.4 µg/l and 0.12 µ/l respectively.

5.6 RESULTS OF VOLATILE ORGANIC COMPOUNDS

The results of the Volatile Organic Compound analysis are presented in **Table 4.7**. Vinyl Chloride at MW03 (0.6 µg/l) and MW04 (0.5 µg/l) was detected above the GTV of 0.375 µg/l.

1,1-dichloroethane at MW03 (1.8 µg/l) and MW04 (3.9 µg/l), and MTBE at MW03 (1.6 µg/l) and MW04 (1.9 µg/l) were also detected. However, there is no GTV or IGV limit for 1,1-dichloroethane and the results are below the IGV for MTBE (30 µg/l). All other compounds were below their respective laboratory limits of detection.

Historic groundwater monitoring events detected some parameters above the laboratory limit of detection in November 2009, corresponding to Quarter 4 of 2009. Historically 1,1-Dichloroethane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, MTBE, n-butylbenzene, n-propylbenzene, o-xylene, p-isopropyltoluene, sec-butylbenzene and tert-butylbenzene were detected above the laboratory limits of detection.

The results of the Quarter 3 and Quarter 4 monitoring events of 2009 and all subsequent monitoring events indicate that there were no other exceedances of the GTVs or IGVs for specific parameters.

5.7 RESULTS OF TOTAL PETROLEUM HYDROCARBONS

In order to provide a more accurate profile of TPH within the groundwater, speciated hydrocarbon analysis using the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG) method was carried out on samples taken at all boreholes. The results of the TPH analysis are presented in **Table 4.8**.

The EPA IGV of 10 µg/l for Total Hydrocarbons is deemed comparable with the results for Total Petroleum Hydrocarbons. Some detections of TPH in both the aliphatic and aromatic range were observed during the current Quarter 1 2017 monitoring event. Detections were found in samples from the following wells; at BH102 detections in the aliphatic range C16-C35 (11 µg/l), at BH103 detections were in the aliphatic range C16-C35 (15 µg/l), at MW01 detections were in the aliphatic range C16-C35 (23 µg/l), at MW03 detections in the aliphatic range C16-C35 (40 µg/l) and in the aromatic range C21-C35 (13 µg/l), and at well MW04 detections were in the aromatic ranges C10-C12 (11 µg/l) and C12-C16 (21 µg/l).

The previous Quarter 4 monitoring event detected TPH in the wells BH102 in the aliphatic range C16-C35 (13 µg/l), BH103 in the aliphatic range C16-C35 (160 µg/l), C35-C44 (14 µg/l) and in the

aromatic range C21-C35 (47 µg/l), BH104B in the aromatic range C12-C16 (12µg/l), MW03 in the aliphatic range C16-C35 (14 µg/l), and MW04 in the aromatic ranges C10-C12 (13 µg/l) and C12-C16 (23 µg/l)

The Quarter 3 monitoring event detected TPH in the well BH103 in the aliphatic range C16-C35 (35 µg/l), C35-C44 (10 µg/l) and in the aromatic range C21-C35 (11 µg/l), at BH104B detections were in the aromatic range C12-C16 (25 µg/l), C16-C21 (12 µg/l) and at well MW04 detections were in the aromatic range C12-C16 (23 µg/l).

The Quarter 2 monitoring event of 2016 detected TPH in the well BH103 were in the aliphatic range C16-C35 (150 µg/l) and in the aromatic range C21-C35 (57 µg/l) and from well MW04 in the aromatic range C12-C16 (20 µg/l).

The Quarter 1 monitoring event of 2016 detected TPH in the aliphatic range C16-C35 (132 µg/l) at BH103 and in the aliphatic range C12-C16 (15 µg/l) at MW04.

The Quarter 4 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 (879 µg/l), C16-C21 (1380 µg/l) and C21-C35 (694 µg/l) at BH104B, C21-C35 at BH103 (60 µg/l) and C10-C12 (13 µg/l) and C12-C16 (21 µg/l) at MW04. TPH concentrations were detected in the aliphatic ranges C10-C12 (495 µg/l), C12-C16 (3080 µg/l) and C16-C35 (3360 µg/l) at BH104B and C16-C35 (231 µg/l) and C35-C44 (14 µg/l).

The Quarter 3 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 (39 µg/l), C16-C21 (37 µg/l) and C21-C35 (28 µg/l) at BH104B, C21-C35 at BH103 (17 µg/l) and C10-C12 (18 µg/l) and C12-C16 (29 µg/l) at MW04. TPH concentrations were detected in the aliphatic ranges C10-C12 (13 µg/l), C12-C16 (40 µg/l) and C16-C35 (62 µg/l) at BH104B and C16-C35 at BH103 (72 µg/l) and MW03 (14 µg/l).

The Quarter 2 monitoring event of 2015 detected TPH in the aromatic range C21-C35 at BH03 (509 µg/l). TPH concentrations were detected in the aliphatic ranges C16-C35 at BH103 (1760 µg/l) and BH104B (337 µg/l), and C12-C16 at BH104B (225 µg/l).

The Quarter 1 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 at wells MW03 (14 µg/l), MW04 (15 µg/l) and BH104B (27 µg/l), C16-C21 at BH104B (15 µg/l), and C21-C35 (14 µg/l) at BH103. TPH concentrations were detected in the aliphatic ranges C16-C35 and C35-C44 at MW03 (46 µg/l and 12 µg/l respectively), BH103 (54 µg/l) and BH104B (11 µg/l.

No detections of TPH in the aliphatic or aromatic range were observed in any shallow or deep monitoring well locations during the Quarter 4 monitoring event of 2014.

The Quarter 3 monitoring event of 2014 detected TPH concentrations in the aliphatic range at the shallow groundwater well BH104B. The TPH concentration detected was 410 µg/l. The speciated TPH ranges that contributed to the value of 410 µg/l were C12-C16 (150 µg/l), C16-C21 (250 µg/l) and C31-C35 (10 µg/l).

The Quarter 3, 2013 monitoring event detected TPH in the aliphatic range in one deep groundwater well, MW03. TPH of the range C10-C12 and C12-C16 were detected at concentrations of 200 µg/l and 190 µg/l respectively.

The Quarter 1, 2013 monitoring event detected aliphatic TPH of the range C12-C16, C16-C21 and C21-C35. TPH in the mid to high aromatic ranges were detected in BH103, BH104B and MW04 during the previous Quarter 1 2013 monitoring event. Aromatic TPH of the ranges C12-C16, C16-C21 and C21-C35 were detected in BH103, the ranges C10-C12, C12-C16 and C16-C21 were detected in BH104B and aromatic TPH of the ranges C10-C12 and C12-C16 were detected in MW04.

The Quarter 2 monitoring event of 2012 detected elevated TPH of the aliphatic range C12-C16, C16-C21 and C21-C25 in BH103. Hydrocarbons have been detected in borehole MW03 during Quarter 1 2010, in borehole BH104B during the Quarter 2 2010 monitoring event and in borehole BH104B and MW03 during the Quarter 3 2010 monitoring events. Hydrocarbons have also been detected in BH103, BH104B and MW03 in the Quarter 2 2011 monitoring event and in MW03 in the Quarter 3 and Quarter 4 2011. These detections are discussed further in **Section 6.2.3**.

6 HISTORICAL RESULTS & TRENDS

Time series plots are presented in this section and include the results of the Quarter 1 2017 monitoring round. As the monitoring continues in accordance with the Industrial Emissions Licence requirements, the plots will be updated with the results of subsequent rounds and used to illustrate the results.

6.1 GROUNDWATER LEVELS OVER TIME

Figure 6.1 to **Figure 6.3** below illustrates the manually recorded water levels using an electronic probe. The graphs show that groundwater levels can vary considerably between monitoring rounds.

Figure 6.2 illustrates groundwater elevations (mAOD) in shallow groundwater wells (BH101 to BH104B) ranging between approximately 98 mAOD and 102 mAOD.

Figure 6.3 illustrates groundwater elevation (mAOD) in the deeper groundwater wells (MW01 to MW03). The groundwater elevation (mAOD) for these deeper groundwater wells ranges from approximately 97.5 mAOD to approximately 100 mAOD.

Figure 6.1 – Ground Elevation (mAOD) in all Monitoring Wells

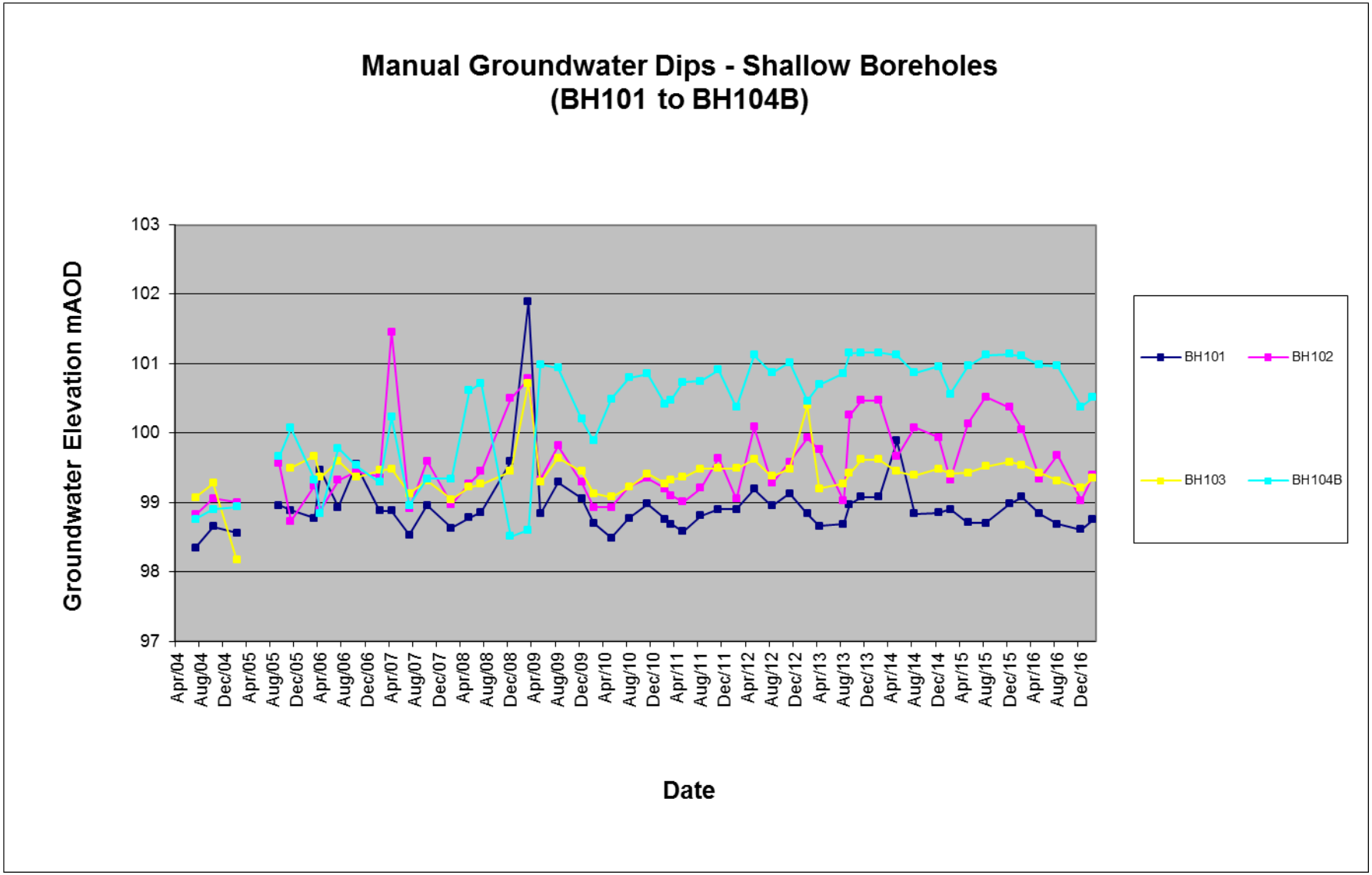


Figure 6.2 – Ground Elevation (mAOD) in Shallow Groundwater Monitoring Wells

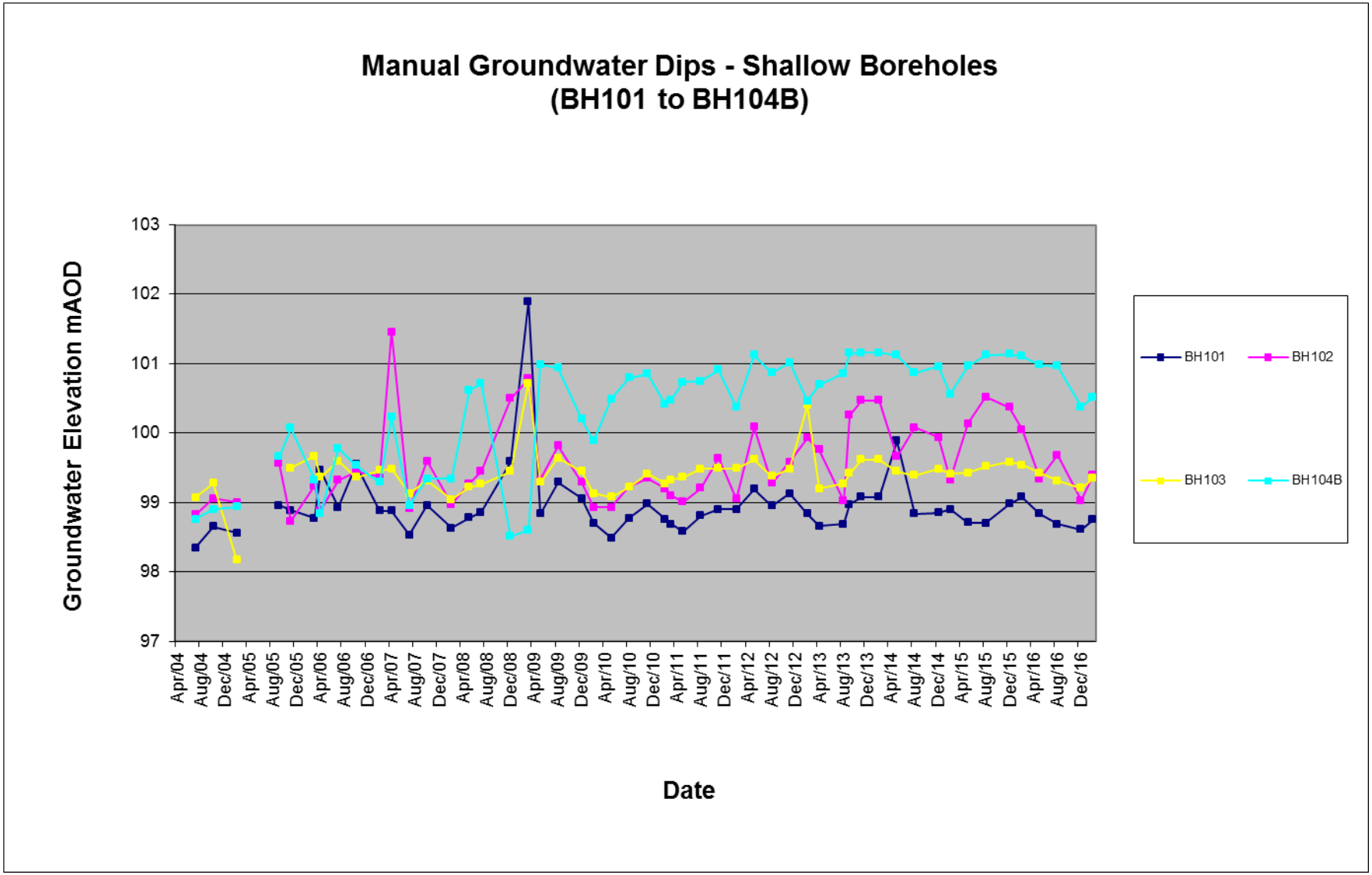
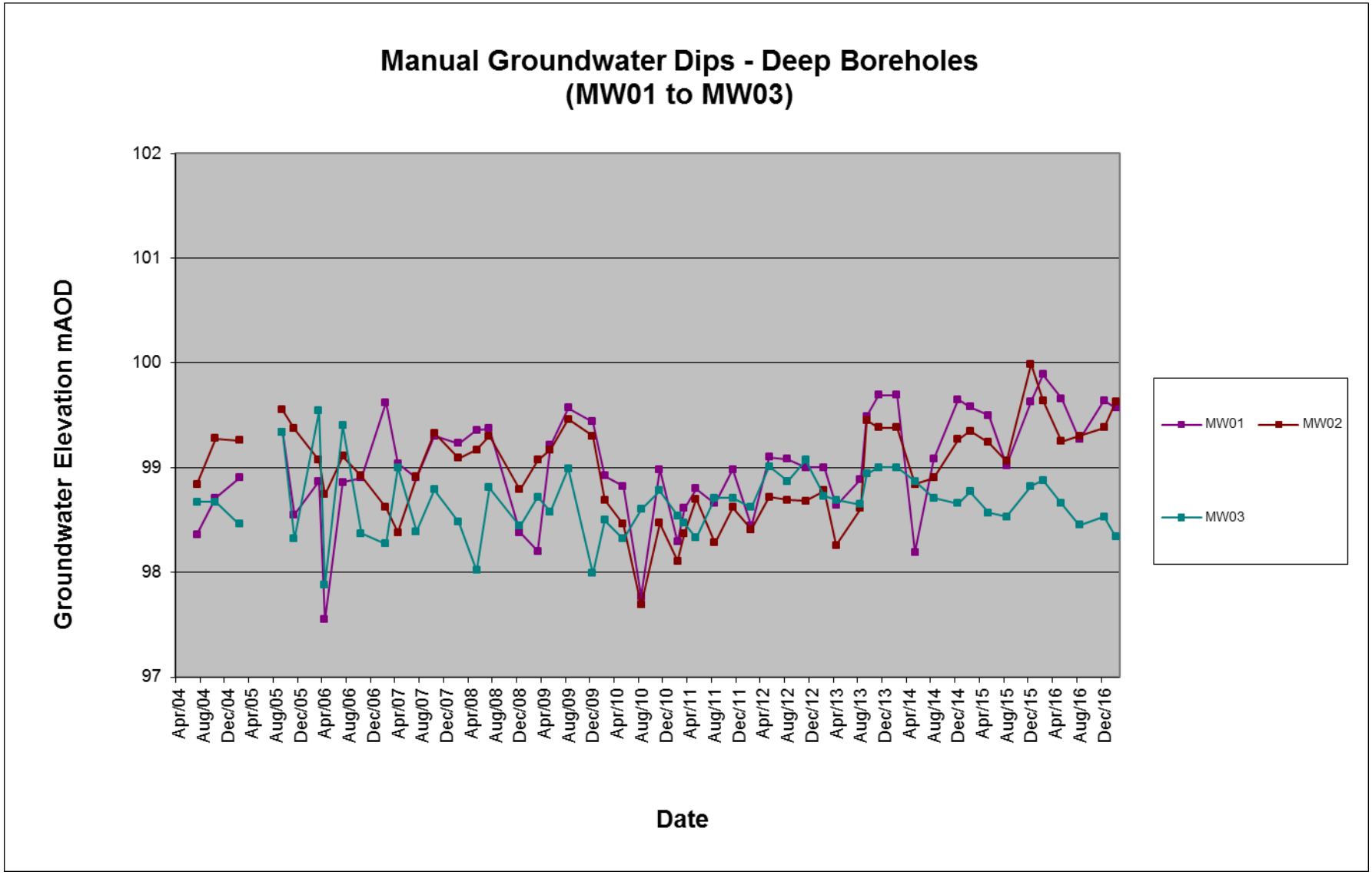


Figure 6.3 – Ground Elevation (mAOD) in Deep Groundwater Monitoring Wells



The groundwater levels generally show a similar pattern of fluctuation over time indicating a degree of connection between boreholes. The graphs demonstrate that groundwater levels can vary considerably between monitoring rounds; the general direction of flow in the shallow and deeper groundwater bearing unit is in an easterly or north easterly direction however there have been some occasional historic cases of groundwater flowing in a south-easterly direction.

In addition, monthly rainfall data for Oak Park, Carlow have been tabulated from Met Éireann to examine the relationship between compounds and rainfall events. The data from Oak Park was chosen as the weather station at Birr, Co. Offaly closed in October 2009. A summary of the rainfall data is in **Tables 6.1** to **6.5**.

Table 6.1 – Monthly Rainfall Data for Year 2013 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Rainfall (mm)	76.2	35.8	57.6	44.4	35.6	37.5	32.3	85.6	24.4	170.0	27.7	136.6

Table 6.2 – Monthly Rainfall Data for Year 2014 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Rainfall (mm)	147.2	176.7	65.0	52.6	78.6	61.9	24.6	122.1	18.2	138.2	165.6	47.7

Table 6.3 – Monthly Rainfall Data for Year 2015 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	66.0	36.3	53.5	26.3	89.4	29.7	79.4	83.0	17.9	56.8	110.0	270.9

Table 6.4 – Monthly Rainfall Data for Year 2016 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	110.9	95.7	40.6	64.3	61.6	61.7	29.6	46.0	97.4	32.3	26.3	80.2

Table 6.5 – Monthly Rainfall Data for Year 2017 for Oak Park, Carlow

Month	Jan	Feb	Mar
Rainfall (mm)	36.3	57.8	33.3

Note: Data for the most recent months are provisional.

6.2 GROUNDWATER CONCENTRATIONS OVER TIME

Groundwater quality trends have previously been examined in two reports (URS 2005 and RPS 2007). In addition, RPS carried out a groundwater risk assessment (Ref: MDE0788RP0001, dated November 2008) in which the general trend of contaminant concentrations over time was observed to be erratic with compounds rarely being detected in the same borehole on two consecutive monitoring rounds.

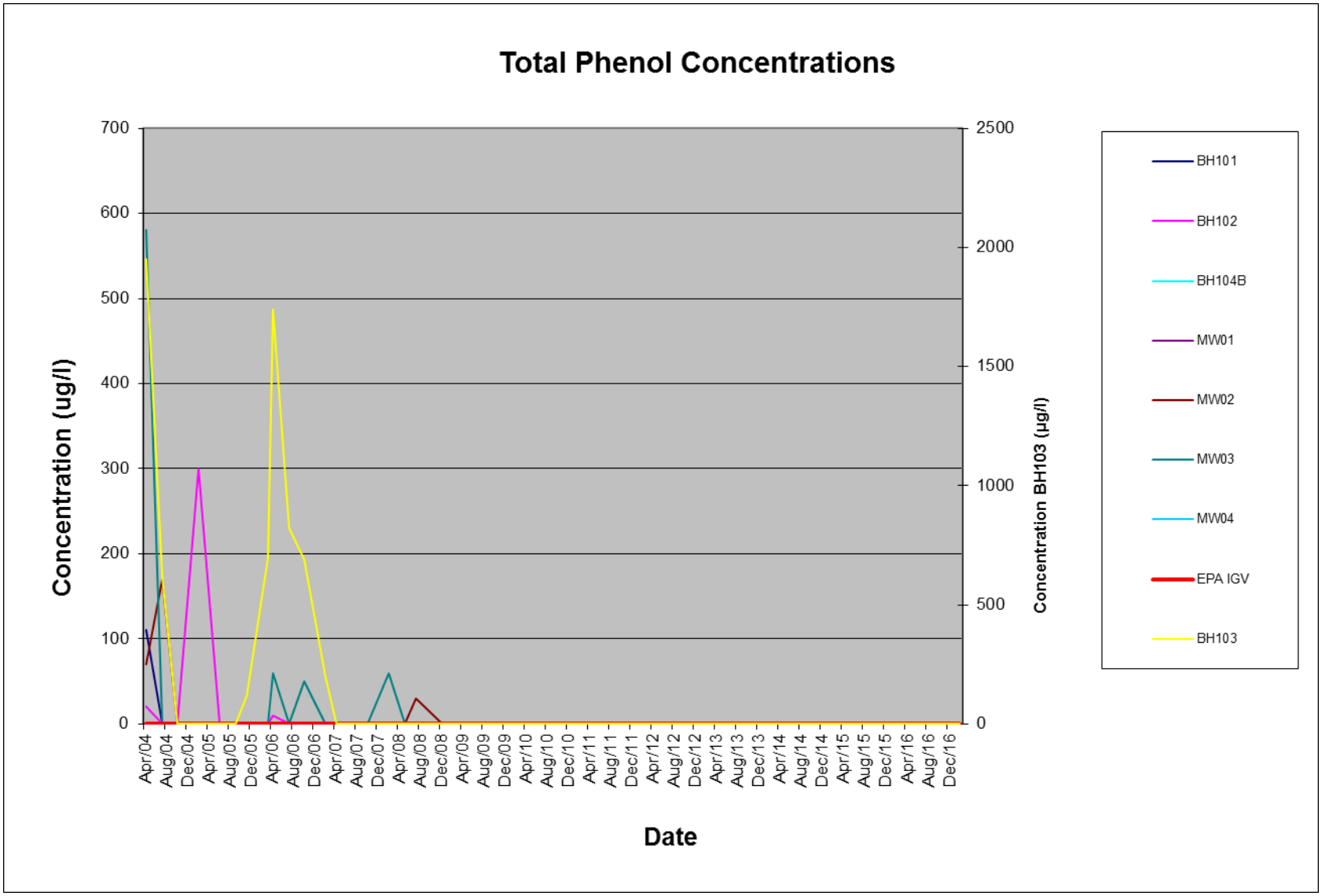
The data available within these reports has been reviewed and time series plots of key parameters have been compiled based on notable trends. Trends for phenols, petroleum hydrocarbons and chlorinated solvents have been plotted as outlined in the following sections.

6.2.1 Phenols

Phenols have been detected historically in all boreholes with the highest concentrations recorded in BH103. However concentrations in BH103 have declined since April 2007. Phenol concentrations have since been recorded below the IGV of 0.5 µg/l in all monitoring wells since December 2008 indicating natural attenuating conditions within the groundwater.

2,4-Dimethylphenol was detected at a concentration of 0.12 µg/l during the Quarter 1, 2010 monitoring event. There is no recommended IGV for this parameter. Subsequent to the Quarter 1 2010 monitoring event no detections of phenols have been noted at any monitoring location up to and including the previous Quarter 4 2016 monitoring event. 2-Methylphenol (3.48 µg/l) and 3+4-Methylphenol (2.19 µg/l) were detected in MW03 during the current Quarter 1 2017 monitoring event, however there is no IGV or GTV for either of these parameters.

Figure 6.4 – Phenol Concentrations in all Monitoring Wells



6.2.2 Polyclyclic Aromatic Hydrocarbons

Figures 6.5 and 6.6 below illustrate that PAHs (Polycyclic Aromatic Hydrocarbons) have previously been detected within all monitoring wells above the recommended EPA IGV of 0.1 µg/l. Historically the highest concentrations have been detected within MW03 and BH104B, with the highest concentration detected in March 2006 (107 µg/l) and in October 2007 (19.72 µg/l) respectively. In addition, a range of PAHs including Benzo(a)pyrene, Benzo(g,h,i)perylene, Indeno(1,2,3)cd pyrene, Fluoranthene and Naphthalene have previously been detected in MW03 with **Figures 6.7** to **6.13** illustrating some of the PAH compounds which were detected above their respective IGVs.

Since 2007 concentrations of PAH have shown a marked decrease and since 2010 detections of PAH have been confined to MW03, MW02 and BH104B. Concentrations of Total PAH above the IGV in 2010 were detected during the Quarter 1 monitoring event in MW03 (0.3 µg/l), Quarter 2 monitoring event in BH104B (1.2 µg/l) and Quarter 3 monitoring event in MW02 (2.0 µgl) and BH104B (0.2 µgl). There were no elevated concentrations of Total PAH during the Quarter 4 2010 monitoring event.

No Total PAH detections were recorded throughout 2011 and in Q1 of 2012. Total PAH was detected above the IGV in MW03 in the Q2 2012 monitoring event. No Total PAH exceedances were detected from Quarter 3 2012 to Quarter 4 2013 inclusive. Total PAHs were detected at a concentration of 2.62 µg/l in MW03 during the Q3 2013 monitoring event however; no detections above the laboratory limit were noted during the subsequent monitoring events up to and including the Quarter 2 2015 monitoring event.

Total PAHs were also above the GTV at BH103 (0.093 µg/l), BH104B (0.159 µg/l) and MW03 (0.586 µg/l) during Quarter 3 2015, at BH103 (0.21 µg/l), MW03 (0.986 µg/l) and MW04 (0.079 µg/l) during Quarter 4 2015, and at BH103 (0.123 µg/l), BH104B (0.159 µg/l) and MW04 (0.153 µg/l) during the Quarter 1 2016 monitoring event. During the Quarter 3 2016 monitoring event, Total PAHs were detected above the IGV at BH103 (0.181 µg/l), BH104B (0.158 µg/l), MW03 (0.562 µg/l) and MW04 (0.151 µg/l) during Quarter 3 2016, and similarly above the IGV at BH102 (0.124 µg/l) and at MW03 (0.596 µg/l) during the Quarter 4 monitoring event.

During the current Quarter 1 2017 monitoring event, Total Polycyclic Aromatic Hydrocarbons were detected above the IGV limit of 0.1 µg/l at MW01 (0.121 µg/l), MW03 (0.47 µg/l) and MW04 (0.148 µg/l).

Figure 6.7 illustrates that **Fluoranthene** was previously detected above the IGV of 1.0 µg/l in groundwater monitoring wells BH104B (October 2007, 1.33 µg/l) and MW03 (March 2006, 2.158 µg/l) only. The remaining monitoring wells recorded concentrations below the IGV of 1.0 µg/l. During the Quarter 1 2017 monitoring event Fluoranthene was detected above the limit of detection at MW03 (0.021 µg/l), however these detections do not exceed the IGV of 1.0 µg/l.

A similar trend to Fluoroanthene has been noted in **Figure 6.8**, with concentrations of **Naphthalene** recorded above the IGV of 1.0 µg/l in BH104B and MW03 only. 4 no. exceedances of the IGV were noted in BH104B in September 2005 (39 µg/l), March 2006 (1.069 µg/l), July 2006 (1.594 µg/l) and October 2007 (16.31 µg/l). Since October 2007, the concentrations in BH104B have decreased below the IGV. There have been 6 exceedances of the IGV of 1.0 µg/l in MW03, with the highest concentration detected in March 2006 (19.986 µg/l) and the most recent being the detected in the Quarter 2 2012 monitoring event (2.4 µg/l). The concentrations detected in August 2010 were

slightly above the laboratory limit of detection of 0.01 µg/l at BH104B (0.08 µg/l) and MW03 (0.05 µg/l); however these levels are deemed low. Concentrations of Naphthalene were below the EPA IGV limit of detection of 1.0 µg/l at all locations during the Quarter 4 2010, the 2011 and 2012 quarterly monitoring events and the Quarter 1 to Quarter 3 2014 monitoring periods, inclusive. No detections of Naphthalene were noted from the Quarter 4 2014 monitoring event to the Quarter 2 2015 monitoring event. Naphthalene was detected at BH101 (0.011 µg/l) and MW03 (0.031 µg/l) during Quarter 3 2015, and at BH103 (0.095 µg/l) and at MW04 (0.067 µg/l) during Quarter 4 2015.

Naphthalene was detected at BH104B (0.034 µg/l) and MW04 (0.153 µg/l) during the Quarter 1 2016 monitoring event, at BH103 (0.13 µg/l), BH104B (0.039 µg/l), MW03 (0.028 µg/l) and MW04 (0.12 µg/l) during Quarter 3 2016, and MW03 (0.036 µg/) during the Quarter 4 2016 monitoring event. During the current Quarter 1 2017 monitoring event, Naphthalene was detected above the laboratory limit of detection at BH103 (0.018 µg/l), MW01 (0.041 µg/l) and MW04 (0.12 µg/l). However, these are all still below the IGV of 1.0 µg/l.

Figure 6.9 illustrates the concentrations of **Benzo(g,h,i)perylene** in all monitoring wells over time. Elevated concentrations above the IGV were recorded at BH104B (0.087 µg/l) on one occasion in March 2006.

Figures 6.10 and 6.11 illustrate elevated concentrations above the IGV recorded at MW03 on 6 no. occasions with the most recent elevated concentration recorded during the Quarter 4 2015 monitoring event (0.053 µg/l). The previous elevated concentration detected was in Quarter 3 2015 (0.053 µg/l). The results of all monitoring events from 2010 to the Quarter 2 2015 monitoring event recorded concentrations below the laboratory limit of detection of 0.01 µg/l at all locations. Concentrations were also below the laboratory limit of detection at all locations during the Quarter 1 2016 monitoring event. Benzo(g,h,i)perylene was recorded in MW02 (0.011 µg/l) during Quarter 2 2016, in BH103 (0.015 µg/l) and MW03 (0.035 µg/l) during Quarter 3 2016, and in MW03 (0.036 µg/l) during Quarter 4 2016. However, these are below the IGV of 0.05 µg/l. During the current Quarter 1 2017 monitoring event, Benzo(g,h,i)perylene was recorded at MW03 (0.037 µg/l). However, this is still below the IGV of 0.05 µg/l.

Figures 6.12 and 6.13 illustrate the concentrations of **Benzo(a)pyrene** in all groundwater monitoring wells and indicates that Benzo(a)pyrene has been detected historically in all boreholes above the IGV of 0.01 µg/l. Similarly with the above mentioned trends, the highest concentrations have been detected in MW03 and BH104B. Concentrations have markedly decreased since March 2006 when an elevated concentration of 2.751 µg/l was detected in MW03, however there have been a number of detections above the IGV, with the most recent elevated level detected in December 2009. Elevated concentrations above the IGV were recorded in BH101, BH103 and MW01 during this same period.

The slightly higher concentrations of Benzo(g,h,i)perylene and Benzo(a)pyrene detected in Quarter 4, 2009 may be attributed to heavy rainfall, which occurred in November of 2009 and as a result possibly mobilized traces of these compounds from the soil. The static water levels for December 2009 ranged between 0.58 and 3.78 mbgl. Since December 2009, concentrations of compounds have notably decreased to below the IGVs.

Benzo(a)pyrene was detected above the IGV limit of 0.01 µg/l at MW03 (0.108 µg/l) during the Quarter 4 2015 monitoring event. Benzo(a)pyrene was also detected above the IGV at MW03 (0.052 µg/l) during the Quarter 3 2015 monitoring event. All other results of all monitoring events from

2010 to Quarter 2 2016 monitoring event did not detect other concentrations above the IGV Benzo(a)pyrene was detected at BH103 (0.04 µg/l) and MW03 (0.037 µg/l) during the previous Quarter 3 2016 monitoring event, and at MW03 (0.032 µg/l) during the current Quarter 4 2016 monitoring event. During the current Quarter 1 2017 monitoring event, Benzo(a)pyrene was detected above the limit of detection (0.01 µg/l) at MW03 (0.033 µg/l), which is above the IGV of 0.01 µg/l.

Figure 6.5 – PAH (Total) Concentrations in all Monitoring Wells

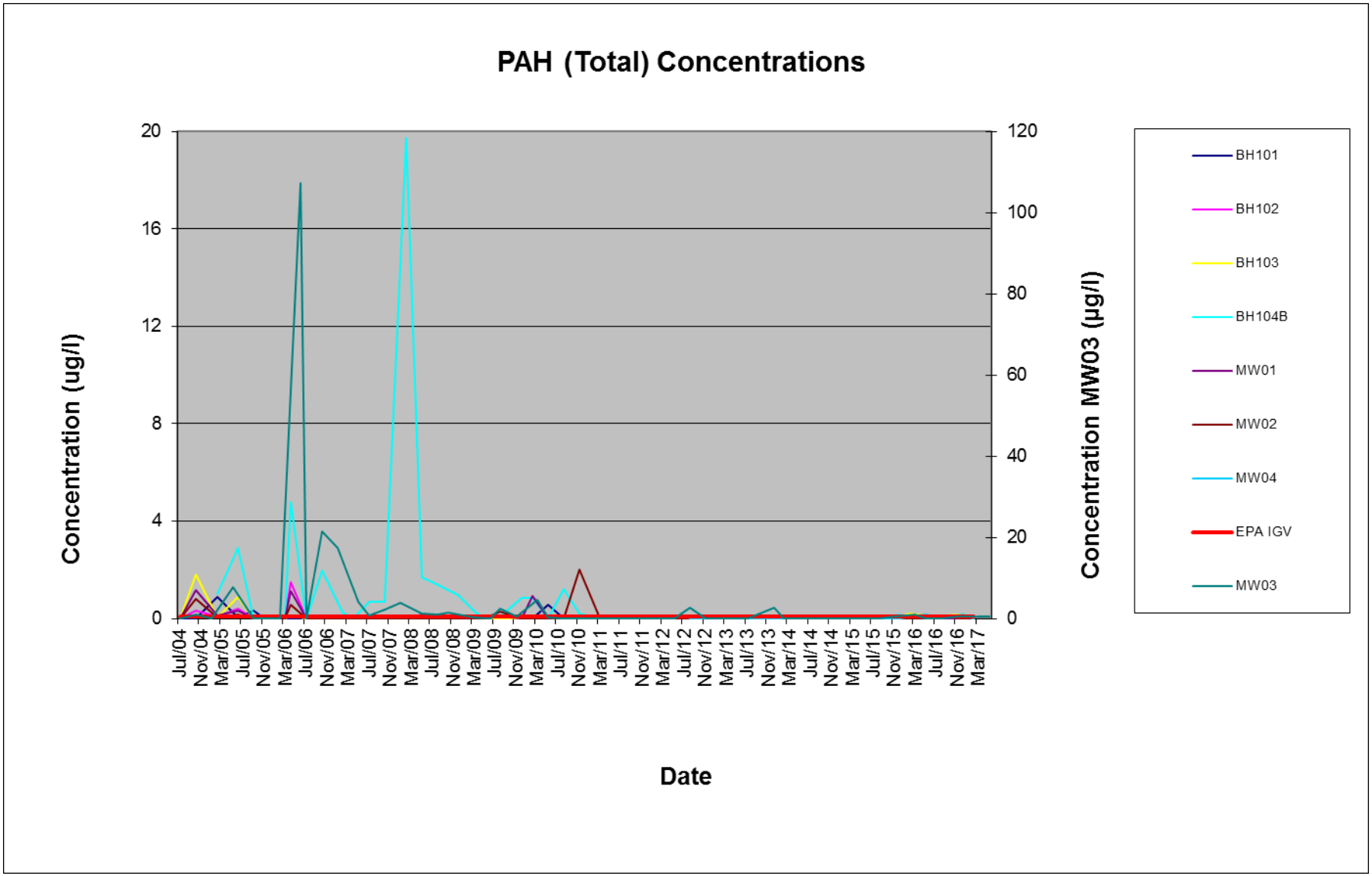


Figure 6.6 – PAH (Total) Concentrations in all Monitoring Wells Since 2010

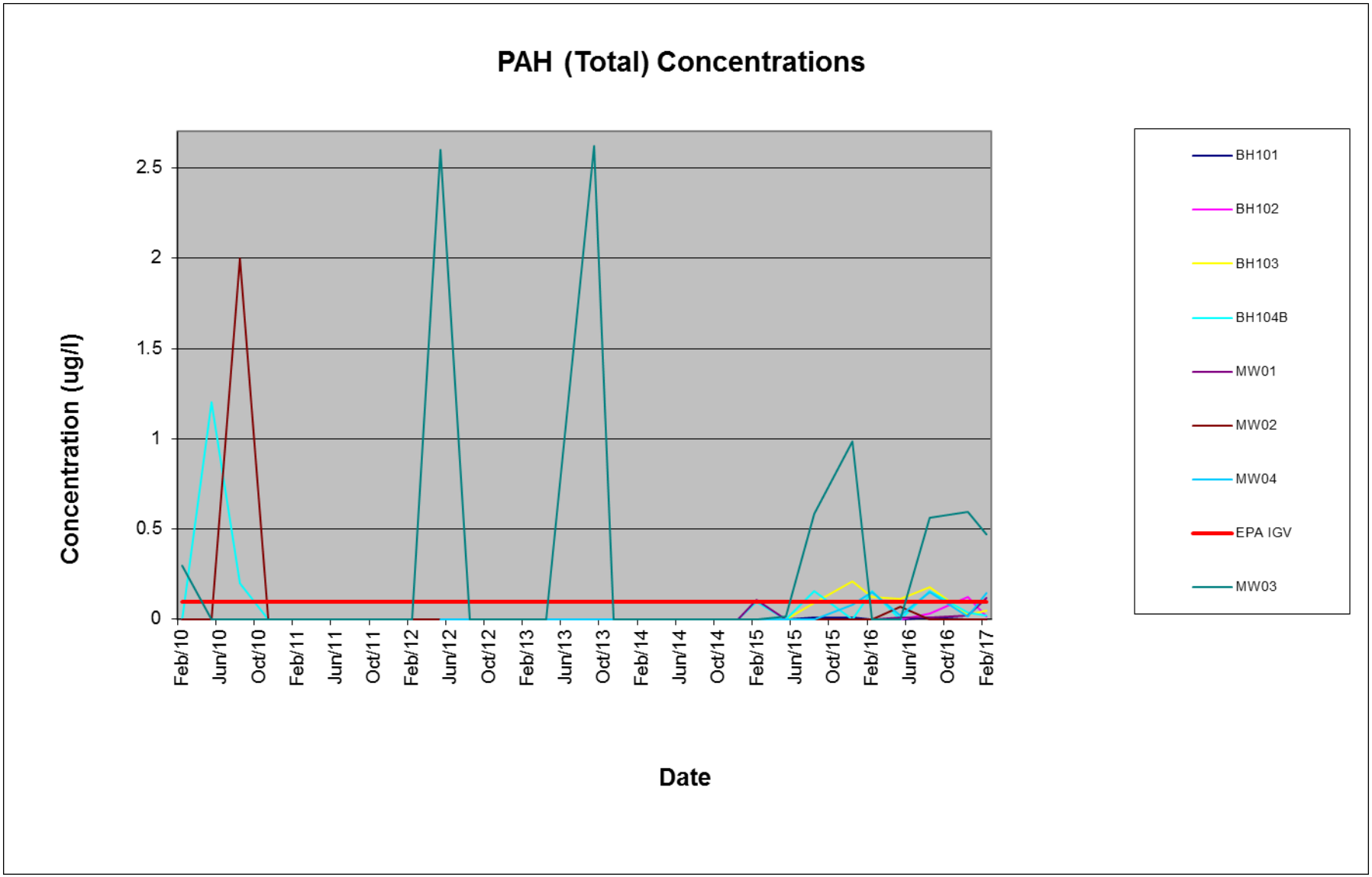


Figure 6.7 – Fluoroanthene Concentrations in all Monitoring Wells

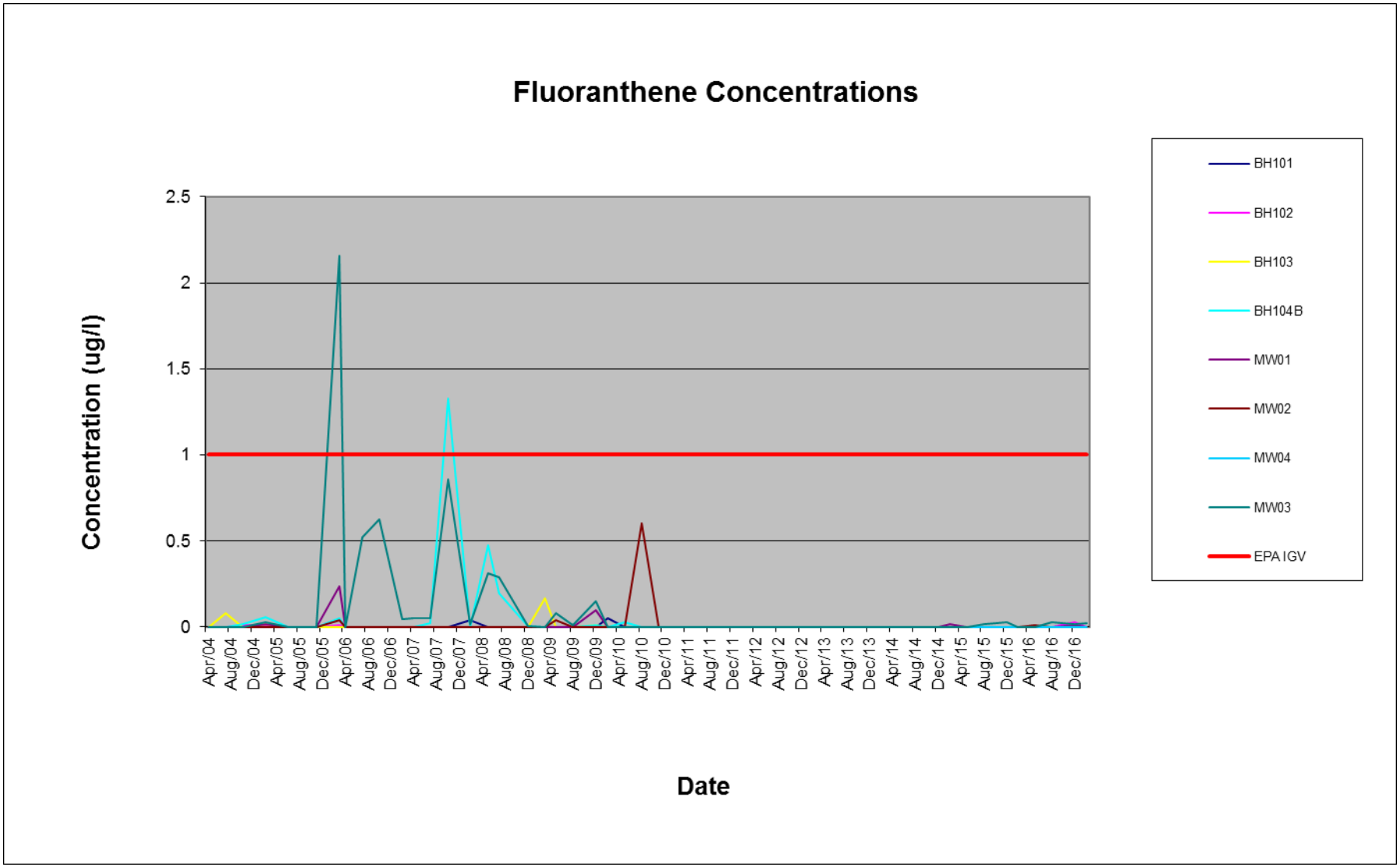


Figure 6.8 – Naphthalene Concentrations in all Monitoring Wells

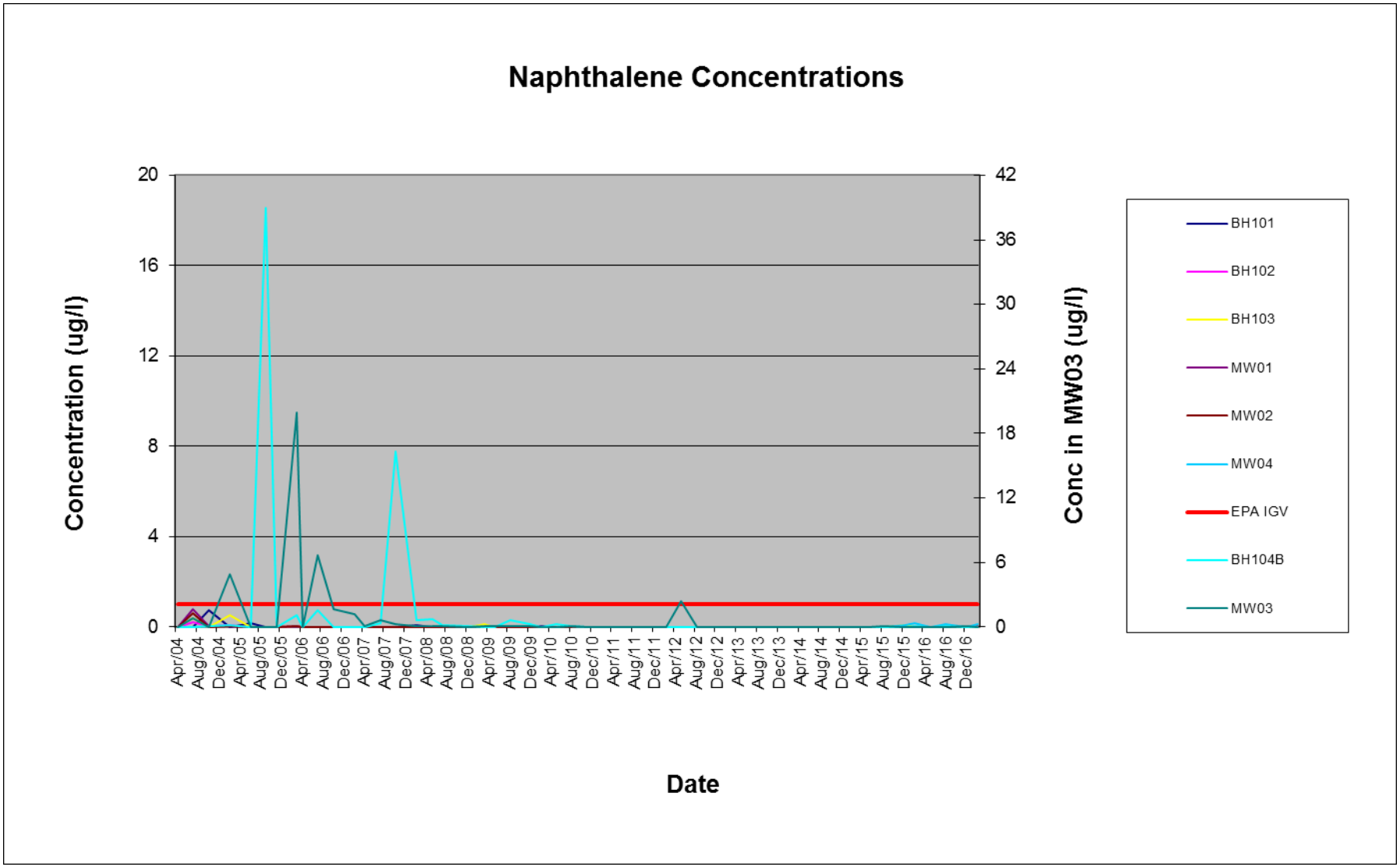


Figure 6.9 – Benzo (g,h,i) perylene Concentrations

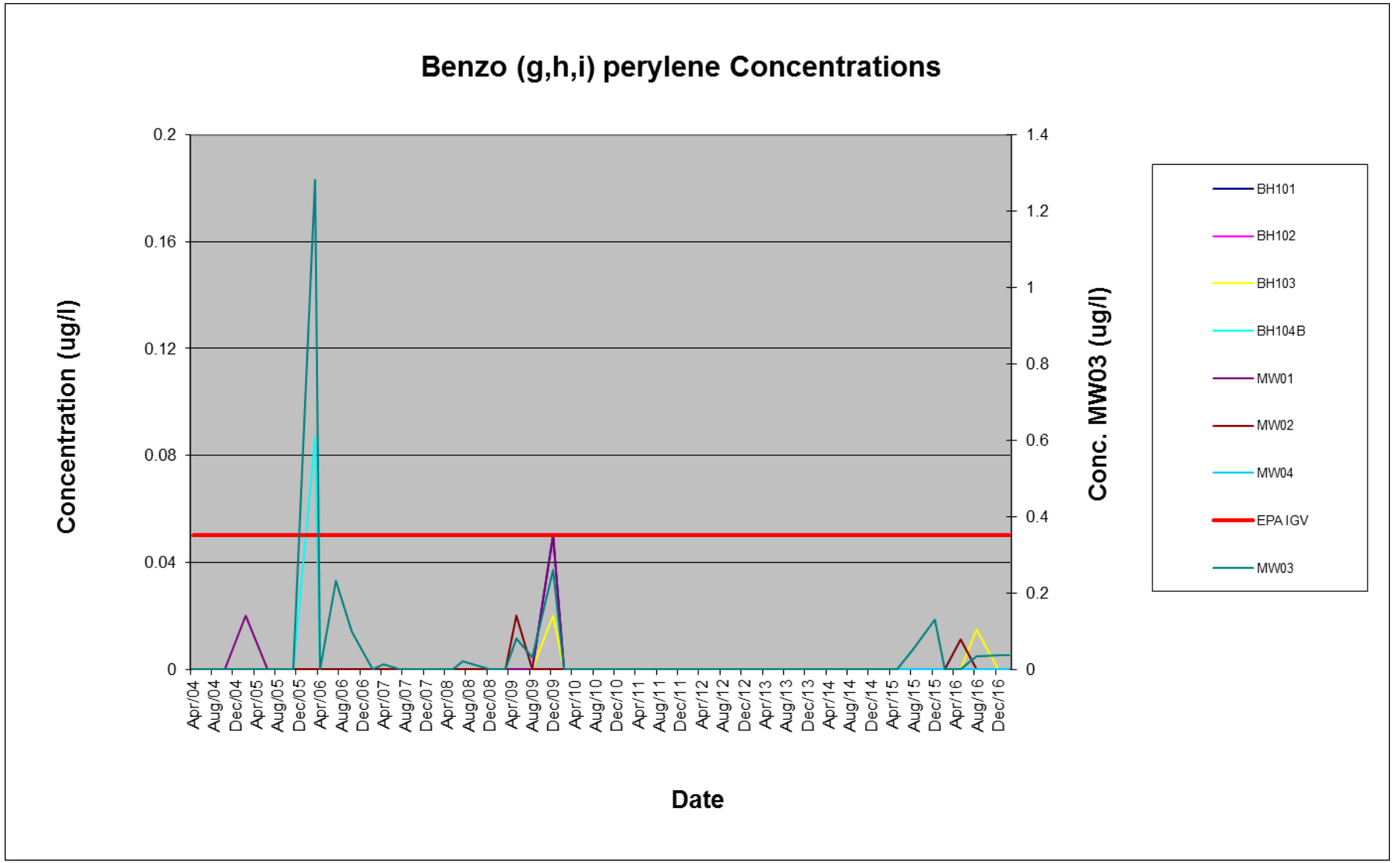


Figure 6.10 – Benzo (g,h,i) perylene in Monitoring Wells BH104B & MW03

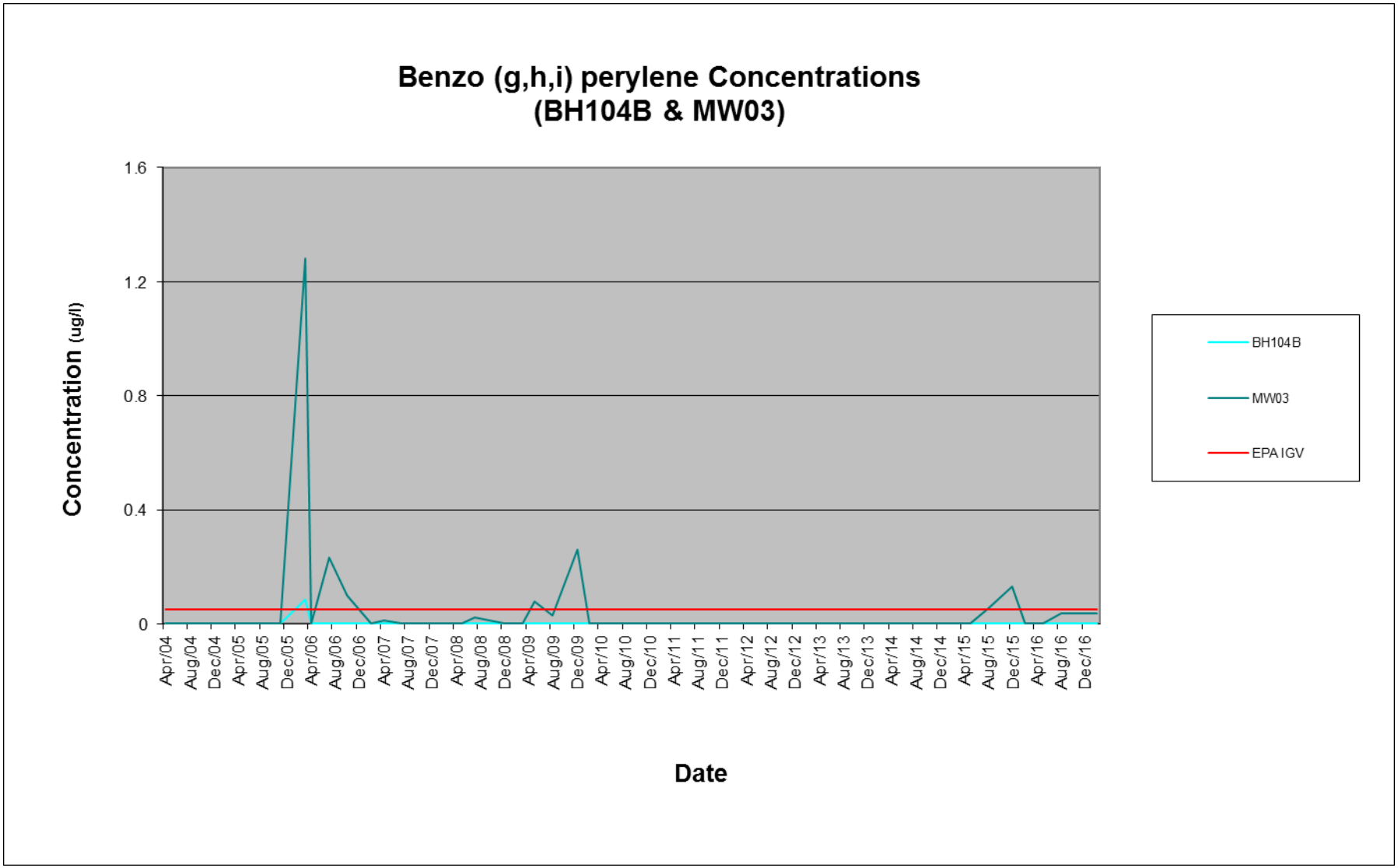


Figure 6.11 – Benzo (g,h,i) perylene in Monitoring Wells BH104B & MW03 Since 2010

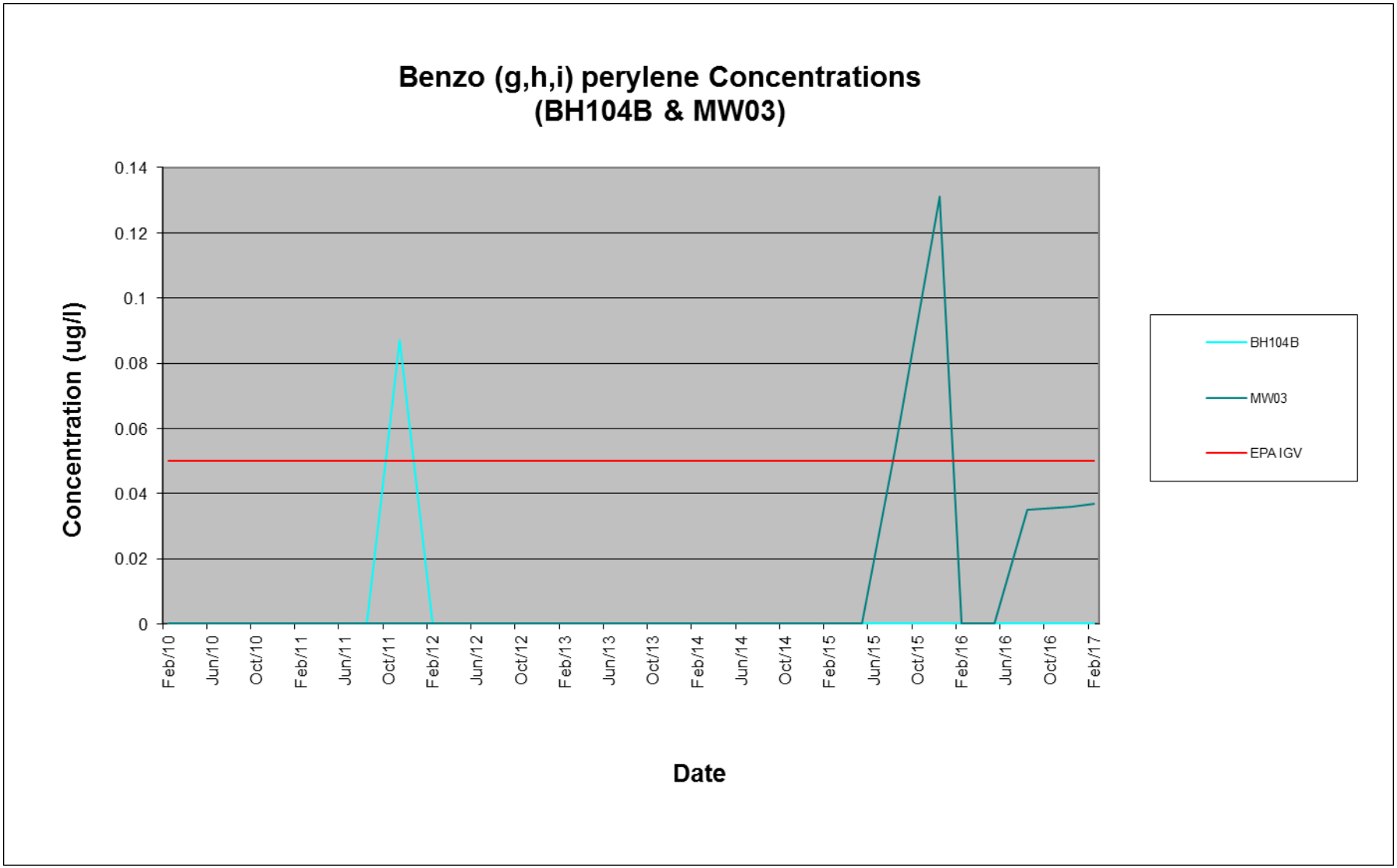


Figure 6.12 – Benzo (a) pyrene Concentrations in all Monitoring Wells

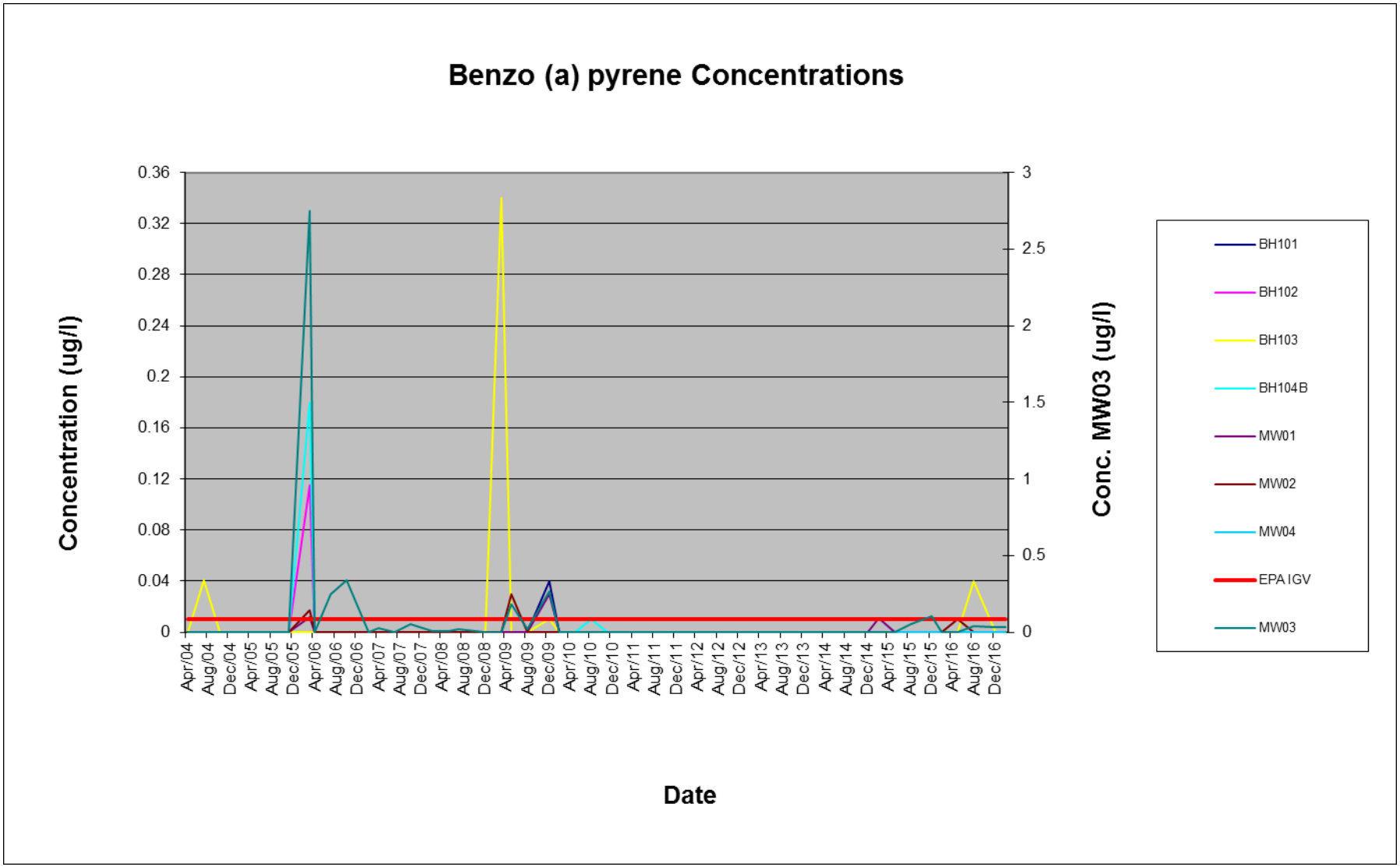
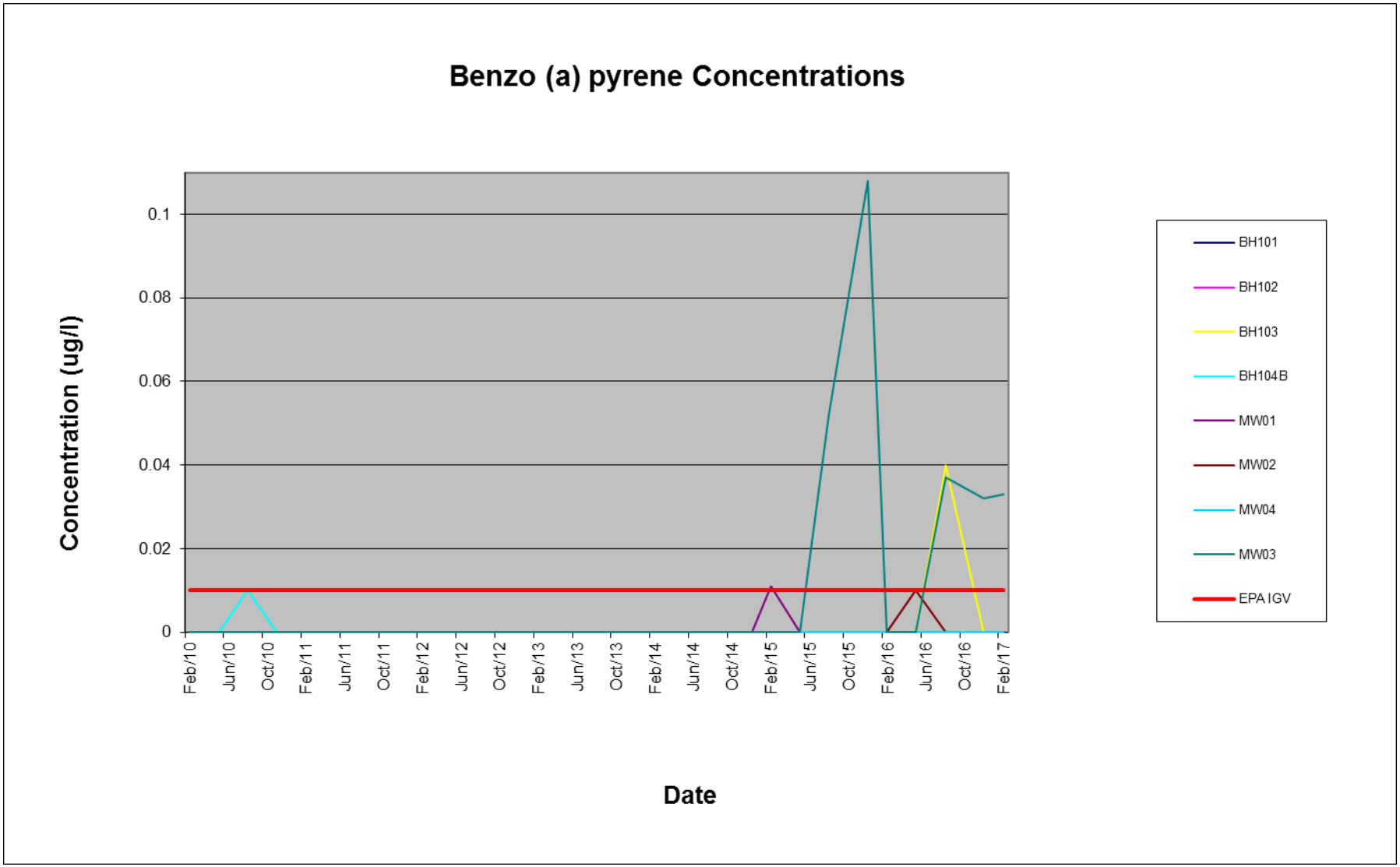


Figure 6.13 – Benzo (a) pyrene Concentrations in all Monitoring Wells Since 2010



6.2.3 Petroleum Hydrocarbons (TPH)

Historically **Total Petroleum Hydrocarbons (TPH)** including mineral oil, petrol range organics (PRO) and diesel range organics (DRO) have been detected within BH103, BH104B and MW03. Since 2009, speciated hydrocarbon analysis using the Total Hydrocarbon Criteria Working Group (TPHCWG) method has been carried out on all samples to obtain a more accurate profile of TPH within groundwater.

The results of the TPHCWG analysis has indicated that the predominant hydrocarbons detected are in the heavier chain carbon fractions, most notably in the carbon range C12-C16, C16-C21 and C21-C35. **Figure 6.14** illustrates the TPH analysis for the total TPH analysis from C10-C44 in all monitoring wells since 2009. The highest concentrations detected historically are at monitoring wells MW03, BH104B and BH103 respectively.

Previous quarterly monitoring reports have outlined the hydrocarbon trends recorded in each well since 2010. This report outlines the trends from 2013 up to and including the current monitoring report.

During the Quarter 1, 2013 monitoring event aromatic hydrocarbons were detected in BH103, BH104B and MW04. The predominant aromatic carbon range comprised C12-C16 (30 µg/l), C16-C21 (280 µg/l) and C21-C35 (100 µg/l) in BH103, C10-C12 (30 µg/l), C12-C16 (110 µg/l) and C16-C21 (80 µg/l) in BH104B and C10-C12 (20 µg/l) and C12-C16 (80 µg/l) in MW04. Aliphatic hydrocarbons were detected in BH103 in the ranges C12-C16 (70 µg/l), C16-C21 (100 µg/l) and C21-C35 (90 µg/l).

During the Quarter 2, 2013 monitoring event no aliphatic or aromatic hydrocarbons were detected at any location.

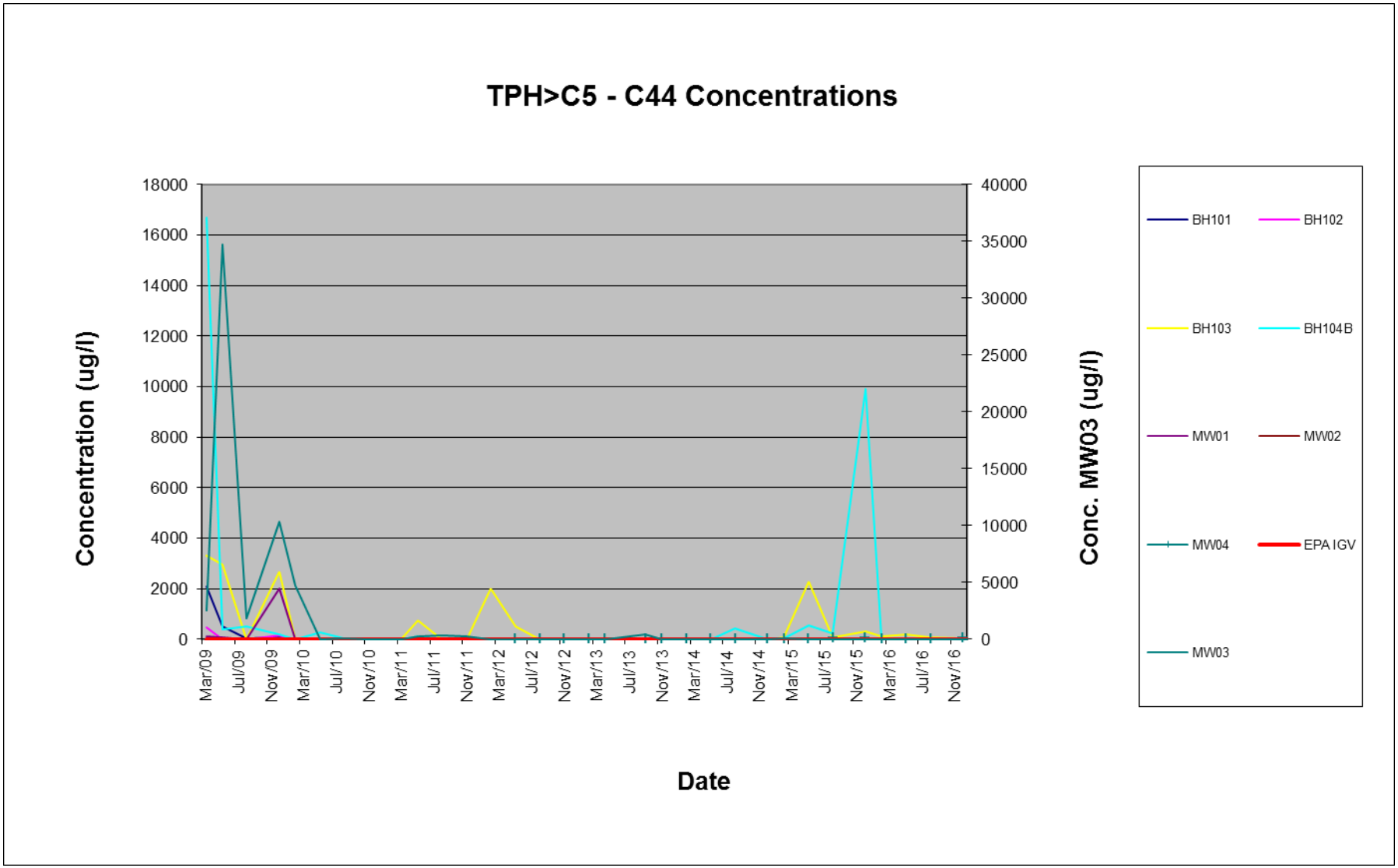
During the Quarter 3, 2013 monitoring event, hydrocarbons of the aliphatic range were detected in MW03 only. The detected aliphatic carbon range comprised C10-C16 (290 µg/l) and C12-C16 (190 µg/l). No detections of aromatic carbons were measured during the Quarter 3 2013 monitoring event.

Total Petroleum Hydrocarbons were not detected at any monitoring location during the Quarter 4, 2014 monitoring event. During the monitoring event for Quarter 3 2014 following ranges of the aliphatic hydrocarbons were recorded for BH104B; C12-C16 (150 µg/l), C16-C21 (250 µg/l) and C21-C35 (10 µg/l).

During the Quarter 1 2015 monitoring event, hydrocarbons were detected in MW03, MW04, BH103 and BH104B. The predominant aromatic carbon range comprised C21-C35 (14 µg/l) in BH103, C12-C16 (27 µg/l) and C16-C21 (15 µg/l) in BH104B, C12-C16 (14 µg/l) in MW03 and C12-C16 (15 µg/l) in MW04. Aliphatic hydrocarbons were detected in the ranges C16-C35 (54 µg/l) in BH103, C16-C35 (11 µg/l) in BH104B and C16-C35 (46 µg/l) and C35-C44 (12 µg/l) in MW03.

During the Quarter 2 2015 monitoring event, the TPH concentration in the aromatic C21-C35 range was detected at one shallow groundwater wells BH103 (509 µg/l). The TPH concentration in the aliphatic range was detected at C16-C35 (1760 µg/l) in BH103 and C12-C16 (225 µg/l) and C16-C35 (11 µg/l) in BH104B.

Figure 6.14 – TPH (Carbon Range C10-C44) in all Monitoring Wells



The Quarter 3 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 (39 µg/l), C16-C21 (37 µg/l) and C21-C35 (28 µg/l) at BH104B, C21-C35 at BH103 (17 µg/l) and C10-C12 (18 µg/l) and C12-C16 (29 µg/l) at MW04. TPH concentrations were detected in the aliphatic ranges C10-C12 (13 µg/l), C12-C16 (40 µg/l) and C16-C35 (62 µg/l) at BH104B and C16-C35 at BH103 (72 µg/l) and MW03 (14 µg/l).

The Quarter 4 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 (879 µg/l), C16-C21 (1380 µg/l) and C21-C35 (694 µg/l) at BH104B, C21-C35 at BH103 (60 µg/l) and C10-C12 (13 µg/l) and C12-C16 (21 µg/l) at MW04. TPH concentrations were detected in the aliphatic ranges C10-C12 (495 µg/l), C12-C16 (3080 µg/l) and C16-C35 (3360 µg/l) at BH104B and C16-C35 (231 µg/l) and C35-C44 (14 µg/l) at BH103.

The Quarter 1 2016 monitoring event detected TPH in samples from the well BH103 were in the aliphatic range C16-C35 (132 µg/l) and from well MW04 in the aromatic range C12-C16 (15 µg/l).

The Quarter 2 2016 monitoring event detected TPH in samples from the well BH103 and were in the aliphatic range C16-C35 (150 µg/l) and in the aromatic range C21-C35 (57 µg/l) and from well MW04 in the aromatic range C12-C16 (20 µg/l).

The Quarter 3 2016 monitoring event detected TPH in samples from the well BH103 in the aliphatic ranges C16-C35 (35 µg/l), C35-C44 (10 µg/l) and in the aromatic range C21-C35 (11 µg/l), well BH104B in the aromatic ranges C12-C16 (25 µg/l) and C16-C21 (12 µg/l) and from well MW04 in the aromatic range C12-C16 (23 µg/l).

During the previous Quarter 4 2016 monitoring event, TPH was detected in samples from the well BH102 in the aliphatic range C16-C35 (13 µg/l), well BH103 in the aliphatic ranges C16-C35 (160 µg/l), C35-C44 (14 µg/l) and in the aromatic range C21-C35 (47 µg/l), well BH104B in the aromatic ranges C12-C16 (12 µg/l), well MW03 in the aliphatic range C16-C35 (14 µg/l) and from well MW04 in the aromatic ranges the aromatic ranges C10-C12 (13 µg/l) and C12-C16 (23 µg/l).

During the current Quarter 1 2017 monitoring event, TPH was detected in samples from the well BH102 in the aliphatic range C16-C35 (11 µg/l), well BH103 in the aliphatic range C16-C35 (15 µg/l), well MW01 in the aliphatic range C16-C35 (23 µg/l), well MW03 in the aliphatic range C16-C35 (40 µg/l) and in the aromatic range C21-C35 (13 µg/l), and well MW04 in the aromatic ranges C10-C12 (11 µg/l) and C12-C16 (21 µg/l).

7 CONCLUSIONS

- In accordance with the criteria set out in Schedule 4(ii) of the site's Industrial Emissions Licence Register No. W0184-01, groundwater monitoring was carried out at the ENVA Ireland site on the 16th February 2017 corresponding to Quarter 1 of 2017. Samples were collected at 8 groundwater monitoring wells during this event.
- The results presented have been referenced against Groundwater Threshold Values (GTVs) outlined in the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. no 9 of 2010), where available. Where GTVs are not available for parameters, results are compared against the Interim Guideline Values (IGVs) set out in the Environmental Protection Agency interim report, 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland'.
- Results of the BTEX and MTBE demonstrate that the levels of Benzene, Toluene, Ethylbenzene, m&p Xylene, o-xylene and MTBE were all below the recommended EPA IGVs.
- The Quarter 1 2017 results of the polycyclic aromatic hydrocarbons indicate that Total PAHs were above the EPA IGV of 0.1 µg/l at three monitoring wells, MW01 (0.124 µg/l), MW03 (0.47 µg/l) and MW04 (0.148 µg/l).
- Vinyl Chloride at MW03 (0.6 µg/l) and MW04 (0.5 µg/l) was detected above the GTV of 0.375 µg/l. 1,1-dichloroethane in MW03 (1.8 µg/l) and MW04 (3.9 µg/l) were also detected. These results are above the laboratory limit of detection, however, there is no GTV or IGV limit for 1,1-dichloroethane. All other VOCs and SVOCs were below their respective laboratory limits of detection.
- Samples were analysed for speciated phenols to include chlorophenols and the results indicate that, with the exception of 2-Methylphenol (3.48 µg/l) and 3+4-Methylphenol (2.19 µg/l) we in MW03, there were no other detections above the laboratory limits of detection.
- For the current Quarter 1 2017 monitoring event, TPH detections in samples from well BH102 in the aliphatic range C16-C35 (11 µg/l), well BH103 in the aliphatic range C16-C35 (15 µg/l), well MW01 in the aliphatic range C16-C35 (23 µg/l), well MW03 in the aliphatic range C16-C35 (40 µg/l) and in the aromatic range C21-C35 (13 µg/l), and well MW04 in the aromatic ranges C10-C12 (11 µg/l) and C12-C16 (21 µg/l). Each of these is therefore over the limit of detection which is 10 µg/l. For the previous Quarter 4 2016 monitoring event, TPH detections in samples from the well BH102 in the aliphatic range C16-C35 (13 µg/l), well BH103 in the aliphatic ranges C16-C35 (160 µg/l), C35-C44 (14 µg/l) and in the aromatic range C21-C35 (47 µg/l), well BH104B in the aromatic ranges C12-C16 (12 µg/l), well MW03 in the aliphatic range C16-C35 (14 µg/l) and from well MW04 in the aromatic ranges the aromatic ranges C10-C12 (13 µg/l) and C12-C16 (23 µg/l). Quarter 3 2016, TPH detections in samples from the well BH103 were in the aliphatic range C16-C35 (35 µg/l) and C35-C44 (10 µg/l) and in the aromatic range C21-C35 (11 µg/l), at BH104B were in the aromatic range C12-C16 (25 µg/l) and C16-C21 (12 µg/l) and at well MW04 were in the aromatic range C12-C16 (23 µg/l). Quarter 2 2016, TPH detections in samples from the well BH103 were in the aliphatic range C16-C35 (150 µg/l) and in the aromatic range C21-C35 (57 µg/l), and from well MW04 in the aromatic range C12-C16 (20 µg/l).
- The general trend of contaminant concentrations over time continues to be somewhat variable with compounds not being continually detected in the same borehole on two or three consecutive monitoring rounds. In general, the contaminant levels detected at the Enva facility appear to indicate reducing contaminant concentrations over time with infrequent elevations in some parameters. Further monitoring is recommended to confirm these reductions.

Enva Portlaoise

2017 Groundwater Compliance Monitoring Quarter 2 (Apr – Jun 2017)

Document Control Sheet

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1 INTRODUCTION

1.1 BACKGROUND

RPS has been commissioned by Enva Ireland Ltd (Enva) to carry out groundwater quality monitoring for environmental compliance, at their facility in the Clonminam Industrial Estate, Portlaoise, Co Laois. Groundwater monitoring has being carried out in strict accordance with criteria set out in Schedule 4(ii) of the site's Industrial Emissions Licence, Register No. W0184-01.

Enva Ireland has been operating under Waste Licence Register No. W0184-01 since January 2004. The licence was amended by the Environmental Protection Agency in December 2013 to conform to the provisions and requirements of the Council Directive 2010/75/EU (Industrial Emissions Directive) and as such is deemed an Industrial Emissions Licence. Enva is required to submit a report to the EPA on a quarterly basis, outlining the existing groundwater quality underlying the site.

A suitably qualified environmental consultant from RPS, collected groundwater samples from a series of 8 monitoring wells (BH101, BH102, BH103, BH104B, MW01, MW02, MW03, MW04) within the site boundary on the 30th of May 2017. The samples underwent laboratory analysis for the suite of parameters specified in Schedule 4(ii) of Industrial Emissions Licence W0184-01. This report outlines the results of the Quarter 2 monitoring for 2017 and reviews historical data recorded at the site.

1.2 OBJECTIVES & SCOPE OF WORK

The specific objectives and scope of work are as follows:

- Review of previous data as provided by Enva Portlaoise;
- Graphical presentation of key compounds and trends; and
- Discussion of results for Quarter 2 2017 within the context of previous results and available guideline concentrations.

2 REVIEW OF PREVIOUS DATA

2.1 INFORMATION SOURCES

The following documents were reviewed as part of this project:

- Industrial Emissions Licence W0184-01 and any available EPA documents from the EPA website;
- Quarterly Groundwater Monitoring Reports (Quarter 1 2004 to Quarter 4 2005), URS;
- Quarterly Groundwater Monitoring Reports (Quarter 1 2006 to Quarter 4 2016), RPS;
- Quarterly Groundwater Monitoring Quarter 1 2017 Report, RPS;
- Summary Report on Trend of Contaminant Levels at Enva Ireland Ltd since 2005, Ref: MDE0647RP0001, RPS (2007);
- Groundwater Risk Assessment, Ref: MDE0788Rp0001, RPS (2008);
- Hydrogeological Review and Assessment Report, Ref MDE0973Rp0017F01, RPS (2014); and
- Baseline Environment Report, Ref: MDE0973Rp0104.

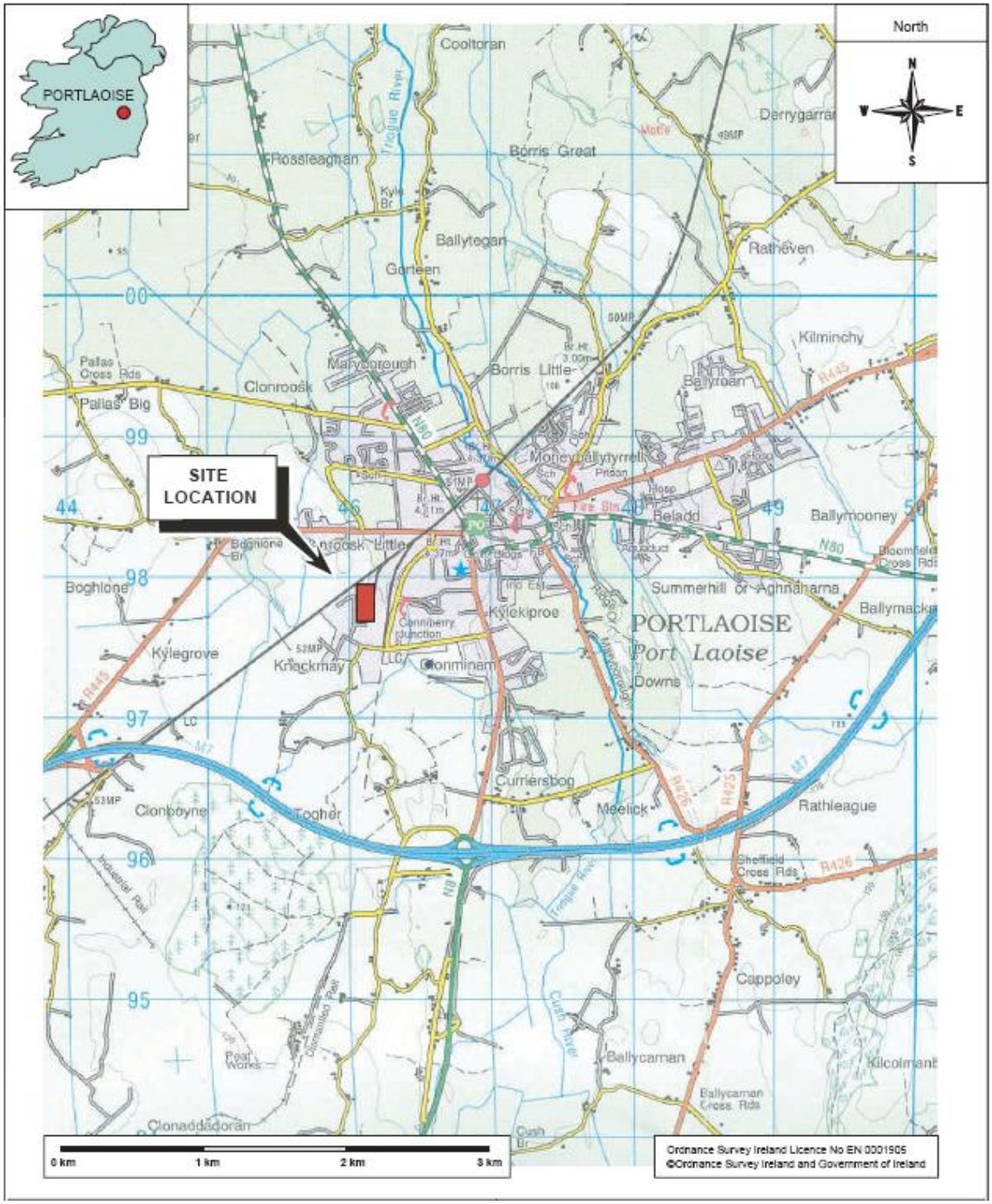
2.2 SITE SETTING

The site is located to the southwest of the town of Portlaoise immediately to the south of the Dublin to Cork railway line. The general area is gently undulating. The site slopes gently to the southwest but to the east of the site the ground slopes gently towards the River Triogue, which is located approximately 1.5 km to the east. The site occupies an area of approximately 1.5 hectares and comprises of an operational waste oil and contaminated soil treatment plant.

The site is located on the outskirts of Portlaoise in an area of agricultural and light industrial development. The site is bounded to the north and east by land belonging to Irish rail, comprising sidings and general storage areas. To the south is a vehicle repair garage, which is elevated above the level of the site by approximately 1.5 m. To the west the site is adjoined by further industrial land, as well as residential land. The site location is presented on **Figure 2.1**.

The site has been in operation since 1978, and the layout has remained relatively consistent. The site layout is presented on **Figure 3.1**. The site is largely covered in hardstanding with some open areas in the far north and northeast of the site. All oil and soil storage areas are suitably bunded and the general standard of housekeeping is good.

Figure 2.1 – Site Location



2.3 REGIONAL SETTING

2.3.1 Geology

The Geological Survey of Ireland indicates that the regional geology of Portlaoise is typified by Carboniferous Limestone. In the vicinity of the site itself the solid geology comprises the Ballysteen Formation, a micaceous-bioclastic limestone. This well-bedded limestone, with interbeds of shale, is extensively folded, with axes trending north-east to south-west, and becomes increasingly muddy towards the top of the formation. North-east to south-west trending faults are found in the region, with one located approximately 500m to the east of the site. The subsoils in the region comprise mainly Made Ground, around the industrial area, and Limestone Till in the surrounding regions.

2.3.2 Hydrogeology

The limestone is classified by the Geological Survey of Ireland (GSI) as a Locally Important Karstified Aquifer (Ll). Porosity is predominantly in the form of fractures, in this aquifer, however the muddy nature of this formation greatly reduces permeability. Vulnerability of this aquifer beneath the site is classified as high, with moderate vulnerability to the east of the site.

The public water supply for Portlaoise is derived from groundwater, utilising three groundwater abstraction well fields comprising of two abstraction wells in each well field. This supply currently comes from the Straboe area, approximately 5.5 km to the north-east of the site. The source protection zone for this water supply extends to within 3.2 km of the Enva site but does not encompass the Enva site.

The GSI record a number of other dug wells and boreholes within the Portlaoise area, including the boreholes installed on the site. The accuracy of the locations of these wells varies. One well, which was drilled in 1899 is recorded as being located immediately to the south of the Enva site. The use of this well is not known and its location is only accurate to 1 km. A second borehole, drilled in 1973 is recorded 1.5 km to the north of the site at Clonroosk; the accuracy of this location is also 1 km so it could be closer or further from the site. The use of this well is not known but its yield is recorded as being poor. There are no other wells recorded within 1 km of the site.

Enva is not aware of any abstraction boreholes within the immediate vicinity of their site.

2.4 SITE GROUND CONDITIONS

A total of eight boreholes have been drilled at the site and the general sequence of ground conditions is presented in **Table 2.1**.

Table 2.1 – Ground Conditions

Strata	Extent	Thickness	Description
Made Ground	BH104	0-3.5 m	Predominantly concrete, with hardcore fill, and clay.
Boulder Clay	All boreholes	<8.5 m	Includes fine to medium, well rounded gravels.
Sand and Gravel	Confined to south east corner of site (BH101, BH104 and MW03)	0-2 m	In general the transition from boulder clay to sand is gradual with changes from gravel, to sandy gravel, to sand.
Limestone Bedrock	Encountered in MW01, MW02 and MW03	Top of limestone ranges from 7.7m to 9m below ground level.	Pale grey, fine-grained bedrock, differentiated from boulders by its un-weathered nature.

The logs for each of the boreholes were previously presented as Appendix B in the RPS Groundwater Risk Assessment Report (Ref: MDE0788Rp0001).

2.4.1 Licence Conditions

The Industrial Emissions Licence requires the regular monitoring and sampling of boreholes BH101, BH102, BH103, BH104B, MW01, MW02, MW03 and MW04. The parameters requiring measurement or analysis are presented in **Table 2.2**.

Table 2.2 – Licence Parameters

Group	Parameters requiring Quarterly Measurement	Parameters requiring Annual Measurement
Field Parameters	Groundwater Level pH Temperature Dissolved Oxygen Electrical Conductivity Visual Inspection	Groundwater Level pH Temperature Dissolved Oxygen Electrical Conductivity Visual Inspection
Organics	Mineral Oil BTEX & MTBE PAHs Phenols VOCs SVOCs	Mineral Oil BTEX & MTBE PAHs Phenols VOCs SVOCs
Inorganics	-	Total Alkalinity, Calcium, Manganese, Sulphate, Cyanide (Total), Chloride, Sodium,

3 METHODOLOGY

Groundwater samples were collected from 8 no. on-site groundwater monitoring wells (BH101, BH102, BH103, BH104B, MW01, MW02, MW03, MW04) (**Figure 3.1**) using dedicated Waterra tubing, in accordance with RPS's standard sampling protocol. A non-return foot valve was fixed to the bottom of the tubing and inserted into the well, close to the base of the borehole. Separate tubing and foot valves were used at each monitoring well to eliminate the possibility of cross contamination.

Groundwater in the well casing is not considered representative of the groundwater quality at a given location. For this reason, three well volumes were purged from each well prior to collection of the groundwater sample. By the time purging was complete all field test water parameters (namely pH, Temperature, Electrical Conductivity and Dissolved Oxygen) were within 10% variance in three consecutive measurements. This ensured that the groundwater sample extracted from the monitoring borehole was representative of the water held in the subsurface strata and not water held stagnant in the borehole casing. The purged volumes were calculated on-site from the measured static water levels and total well depths using an electronic dip meter.

Groundwater samples were collected in laboratory supplied containers and stored in chilled cool boxes following sampling and during transit to the laboratory. A rigorous chain of custody procedure was used during the sample round.

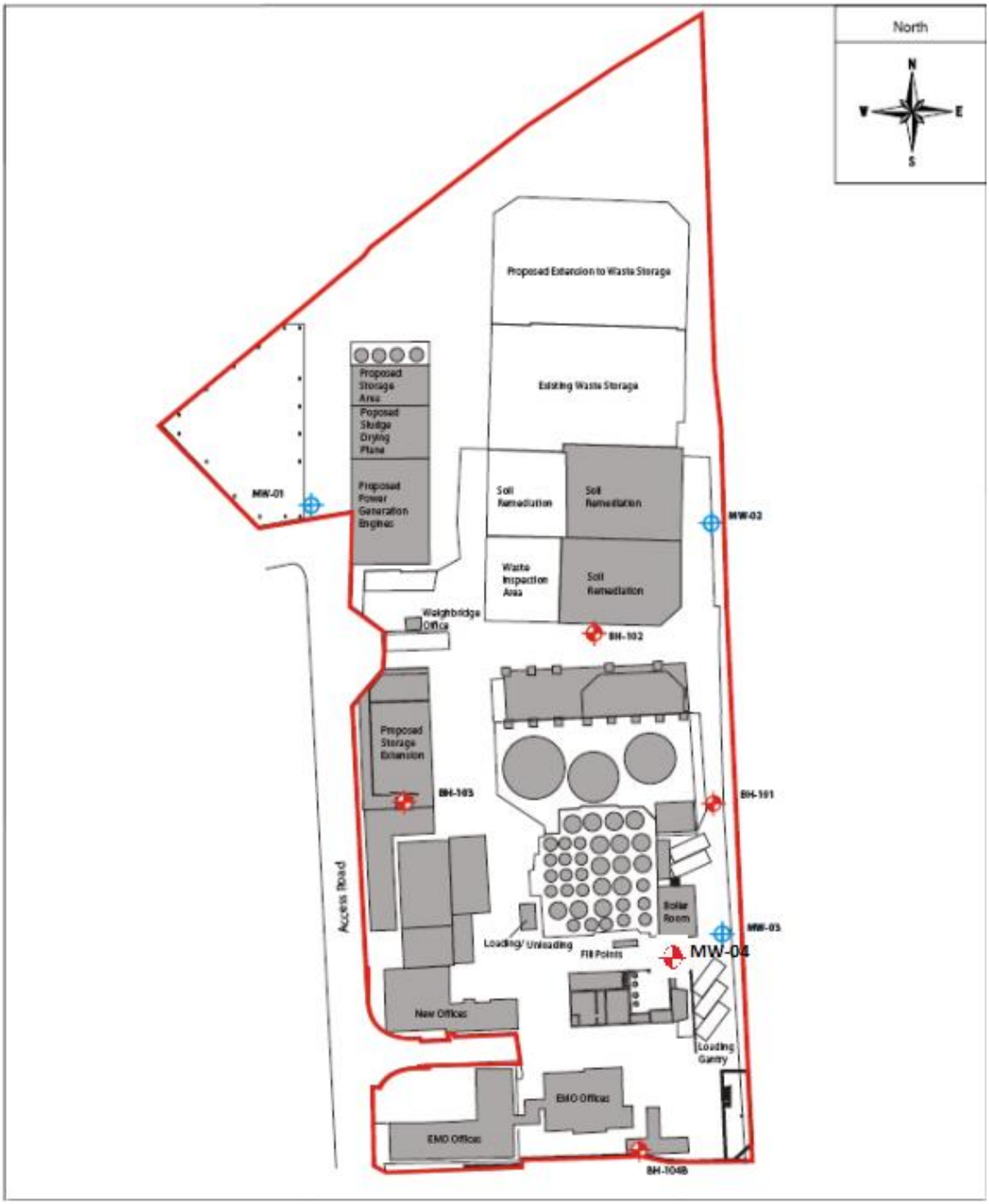
3.1 LABORATORY ANALYSIS

All groundwater samples were analysed at a UKAS accredited laboratory, ALS Environmental for the suite of analyses listed in **Table 3.1**. **Table 3.1** also indicates the analytical techniques used by the laboratory.

Table 3.1 – Analytical Methodologies – ALS Environmental

Parameter	Analytical Methodology
Phenols	GC-MS
Speciated PAHs	GC-MS
BTEX & MTBE	Headspace GC-MS
Petroleum Hydrocarbons	Headspace GC-MS
Volatile Organic compounds & Tentatively Identified Organic Compounds (VOCs & TICs)	Headspace GC-MS
Semi-Volatile Organic compounds & Tentatively Identified Organic Compounds (SVOCs & TICs)	GC-MS

Figure 3.1 – Site Layout Plan with Groundwater Monitoring Locations



Shallow Monitoring Well locations

Deep Monitoring Well locations

Source: *URS Environmental Consultants (Ref: 45078497 Issue No. 1)*

3.2 PRESENTATION & INTERPRETATION OF RESULTS

The Quarter 2 2017 results are tabulated in **Section 4** and discussed with respect to previous results in **Section 5**. Results are compared against Groundwater Threshold Values (GTVs) outlined in the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No 9 of 2010), where available. Where GTVs are not available for parameters, results are compared against the Interim Guideline Values (IGVs) set out in the Environmental Protection Agency interim report, 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland'.

Previous monitoring reports (as listed in **Section 2.1**) provide details of contaminant concentrations since 2004. The data available within these reports has been reviewed and time series plots of key parameters have been compiled. Trends for chlorinated solvents, petroleum hydrocarbons and phenol parameters have been plotted.

Time series plots are presented in **Section 6** and include the results of this Quarter 2 2017 monitoring round. As the monitoring continues in accordance with the Industrial Emissions licence requirements, the plots will be updated with the results of subsequent rounds used to illustrate the results.

Time series plots are also provided for manual water levels where available from previous reports.

4 QUARTER 2 RESULTS MAY 2017

The results of all field measurements and laboratory analysis are presented in this section. Results are primarily compared against Groundwater Threshold Values (GTVs) outlined in the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No 9 of 2010), where available. Where GTVs are not available for parameters, results are compared against the Interim Guideline Values (IGVs) set out in the Environmental Protection Agency interim report, '*Towards Setting Guideline Values for the Protection of Groundwater in Ireland*'.

The results are discussed in relation to appropriate guideline values in **Section 5**. Results that are shown to be above the relevant threshold or guideline values are highlighted in bold and shaded. Results that are shown to be above the relevant laboratory detection limits are highlighted in italics.

Site-specific field parameter measurements were collected during the site visit as per RPS Water sampling protocol.

Table 4.1 – Groundwater Levels (Quarter 2, 2017)

Monitoring Well	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04
Depth (mbgl)	6.77	6.49	4.43	4.70	22.65	30.86	9.30	6.47
Static Water Level (mbgl)	4.35	2.94	1.83	0.60	2.53	3.97	4.10	4.34
Ground Level (mAOD)	103.06	102.55	101.16	101.52	102.10	103.12	102.77	-
Water Level (mAOD)	98.71	99.61	99.35	100.56	99.57	99.15	98.67	-
Free Phase Oil (mm)	No detection	No detection	No detection	No detection	No detection	No detection	No detection	No detection

mbgl = metres below ground level

Table 4.2 – Results of Field Parameters Measured at each Groundwater Monitoring Well (Quarter 2, 2017)

Monitoring Well	pH (pH Units)	Temperature (°C)	Conductivity (µS/cm)	Dissolved O_2 (ppm)	Observations
BH101	7.87	12.0	980	3.94	Light cloudy brown colour, some sandy sediment
BH102	8.33	12.7	883	4.59	Slight brown colour turning clear, some suspended solids
BH103	7.85	11.6	904	3.48	Light grey colour, little sediment
BH104B	7.08	11.7	737	5.51	Light cloudy grey colour, clearer after 15L, fine white suspended solids, slight oil sheen. Samples slightly cloudy
MW01	7.66	13.0	786	4.35	Slight cloudy grey colour, little suspended solids and sediment
MW02	7.93	13.4	743	3.26	Grey on purging with very little suspended solids
MW03	7.27	13.9	**1412**	3.77	Cloudy grey colour on purging, some suspended solids and fine sediment, very slight sheen
MW04	7.24	12.4	**1523**	4.12	Cloudy light brown colour with some fine sediment
Groundwater Threshold Value	-	-	1875	-	-
Interim EPA Guideline Values (Units as indicated)	>6.5 & <9.5	25°C	1000	No abnormal change	-

Note: Results above the relevant IGV are highlighted in bold.
Note: Results above the GTV are highlighted in bold and shaded.

Table 4.3 – Results of BTEX and MTBE

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Benzene	µg/l	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	***0.39***	***0.49***	0.75	1.0
Toluene	µg/l	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	10
Ethylbenzene	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	***0.15***	<0.10	<0.10	-	10
m & p-xylene	µg/l	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	***0.47***	<0.20	<0.20	-	10 Note 1
o-xylene	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	***0.16***	<0.10	<0.10	-	10 Note 1
MTBE (Methyl Tertiary Butyl Ether)	µg/l	0.20	<0.20	<0.20	***0.81***	<0.20	<0.20	<0.20	***1.73***	***1.73***	-	30

Note: No specific IGV for parameter. IGV for Total Xylenes is used as guideline.
Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

Table 4.4 – Results of Speciated PAHs

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Naphthalene	µg/l	0.01	<0.10	<0.01	***0.066***	<0.04	<0.01	<0.01	***0.11***	***0.157***	-	1.0
Acenaphthylene	µg/l	0.01	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.02	<0.01	-	-
Acenaphthene	µg/l	0.01	<0.10	<0.01	***0.051***	<0.04	<0.01	<0.01	<0.02	***0.019***	-	-
Fluorene	µg/l	0.01	<0.10	<0.01	***0.01***	<0.04	<0.01	<0.01	<0.02	***0.019***	-	-
Phenanthrene	µg/l	0.01	<0.10	***0.01***	<0.01	<0.04	<0.01	<0.01	<0.02	<0.01	-	-
Anthracene	µg/l	0.01	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.02	<0.01	-	10,000
Fluoranthene	µg/l	0.01	<0.10	<0.01	<0.01	<0.04	***0.012***	<0.01	<0.02	<0.01	-	1.0
Pyrene	µg/l	0.01	<0.10	<0.01	<0.01	***0.049***	***0.012***	<0.01	<0.02	<0.01	-	-
Benzo(a)anthracene	µg/l	0.01	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.02	<0.01	-	-
Chrysene	µg/l	0.01	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.02	<0.01	-	-
Benzo(b)fluoranthene	µg/l	0.01	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.02	<0.01	-	0.5

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Benzo(k)fluoranthene	µg/l	0.01	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.02	<0.01	-	0.05
Benzo(a)pyrene	µg/l	0.01	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.02	<0.01	-	0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.02	<0.01	-	0.05
Dibenz(a,h)anthracene	µg/l	0.01	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.02	<0.01	-	-
Benzo(g,h,i)perylene	µg/l	0.01	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.02	<0.01	-	0.05
Total EPA-16 PAHs	µg/l	0.1	<0.10	***0.01***	**0.127**	***0.049***	***0.024***	<0.01	**0.11**	**0.194**	0.075	0.1

Note: Results above the relevant IGV are highlighted in bold.
Note: Results above the GTV are highlighted in bold and shaded.
Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

Table 4.5 – Results of Speciated Phenols

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Phenol	µg/l	5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	-	0.5
2,4,6-Trichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	200
2,4-Dichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2,4-Dimethylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Chlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	200
2-Methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Nitrophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
4-Chloro-3-methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
3+4-Methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-

Table 4.6 – Results of Semi-Volatile Organic Compounds (SVOCs)

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Phenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.5
2-Chlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	200
Bis(2-chloroethyl)ether	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,3-Dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2-Dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
1,4-Dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Bis(2-chloroisopropyl)ether	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Hexachloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Nitrobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
3&4-Methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Isophorone	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Nitrophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2,4-Dimethylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Bis(2-chloroethoxy)methane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2,4-trichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.40
Naphthalene	µg/l	2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	1.0
2,4-Dichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Hexachlorobutadiene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.10
4-Chloro-3-methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2,4,6-Trichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	200
2,4,5-Trichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Methylnaphthalene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Chloronaphthalene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Dimethylphthalate	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
2,6-Dinitrotoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Acenaphthylene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Acenaphthene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2,4-Dinitrotoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Dibenzofuran	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
4-Chlorophenyl phenyl ether	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Diethylphthalate	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	***1.3***	<1.0	<1.0	<1.0	-	-
Fluorene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
4-Bromophenyl phenyl ether	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Hexachlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.03
Phenanthrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Anthracene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10,000
Pyrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzyl Butyl Phthalate	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzo(a)anthracene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Chrysene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzo(b)fluoranthene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.5
Benzo(k)fluoranthene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.05
Benzo(a)pyrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.01
Indeno(1,2,3-c,d)pyrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.05
Dibenz(a,h)anthracene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzo(g,h,i)perylene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Bis(2-ethylhexyl)phthalate	µg/l	5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	-	-

Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

Table 4.7 – Results of Volatile Organic Compounds (VOCs)

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Chloromethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Chloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	***6.3***	***7.4***	-	-
Bromomethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Vinyl Chloride	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.4**	**0.49**	0.375	-
Trichlorofluoromethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,1-dichloroethene	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-	30
1,1-dichloroethane	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	***2.8***	***3.58***	-	-
Cis-1,2-dichloroethene	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/l	0.20	<0.20	<0.20	***0.81***	<0.20	<0.20	<0.20	***1.73***	***1.73***	-	30
2,2-Dichloropropane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,1,1-Trichloroethane	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-	500
1,2-dichloroethane	µg/l	1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.25	-
1,1-Dichloropropene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Trans-1,2-dichloroethene	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-	-
Benzene	µg/l	1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	***0.39***	***0.49***	-	1.0
1,2-dichloropropane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Trichloroethene	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-	70
Dibromomethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Bromodichloromethane	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-	-
Cis-1,3-dichloropropene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Trans-1,3-dichloropropene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Toluene	µg/l	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	10
<0.201,2-Trichloroethane	µg/l	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	-	-
1,3-Dichloropropane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Dibromochloromethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Tetrachloroethene	µg/l	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	-	40
1,2-Dibromoethane	µg/l	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-
Chlorobenzene	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-	1.0
1,1,1,2-Tetrachloroethane	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-	-
Ethylbenzene	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	***0.15***	<0.10	<0.10	-	10
m&p-Xylene	µg/l	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	***0.47***	<0.20	<0.20	-	10
Styrene	µg/l	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	-	-
o-xylene	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	***0.16***	<0.10	<0.10	-	10
Isopropylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Bromobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
N-Propylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Chlorotoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
4-Chlorotoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,3,5-Trimethylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Tert-Butylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2,4-Trimethylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Sec-Butylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,3-dichlorobenzene	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-	-
P-Isopropyltoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2-dichlorobenzene	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-	10
1,4-dichlorobenzene	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-	-
n-Butylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2-Dibromo-3-chloropropane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2,4-Trichlorobenzene	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-	0.40
Hexachlorobutadiene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.10

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
1,2,3-Trichlorobenzene	µg/l	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-	-

Note: Results above the relevant IGV are highlighted in bold.
Note: Results above the GTV are highlighted in bold and shaded.
Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

Table 4.8 – Results of Total Petroleum Hydrocarbons (Aliphatic/Aromatic)

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Aliphatic > C10-C12	µg/l	10	<10	<10	<10	<10	<10	<10	<10	<10	-	-
Aliphatic > C12-C16	µg/l	10	<10	<10	<10	***13***	<10	<10	<10	<10	-	-
Aliphatic > C16-C35	µg/l	10	<10	<10	***50***	***37***	<10	***12***	<10	<10	-	-
Aliphatic > C35-C44	µg/l	10	<10	<10	<10	<10	<10	<10	<10	<10	-	-
Aliphatic > C10-C44	µg/l	10	<10	<10	**50**	**50**	<10	**12**	<10	<10	-	10
Aromatic > C10-C12	µg/l	10	<10	<10	<10	<10	<10	<10	<10	<10	-	-
Aromatic > C12-C16	µg/l	10	<10	<10	<10	***15***	<10	<10	***18***	***29***	-	-
Aromatic > C16-C21	µg/l	10	<10	<10	<10	***20***	<10	<10	<10	<10	-	-
Aromatic > C21-C35	µg/l	10	<10	<10	<10	<10	<10	<10	<10	<10	-	-
Aromatic > C35-C44	µg/l	10	<10	<10	<10	<10	<10	<10	<10	<10	-	-
Aromatic > C10-C44	µg/l	10	<10	<10	<10	**35**	<10	<10	**18**	**29**	-	10

Note: Results above the relevant IGV are highlighted in bold.
Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

5 DISCUSSION OF QUARTER 2 RESULTS

The results of the Quarter 2 monitoring event for 2017 are presented in **Table 4.1** to **4.8** of this report. For the purpose of this report, the results are compared against the Groundwater Threshold Values (GTVs) outlined in the European Communities Environmental Objectives (Groundwater) Regulations (S.I. No. 9 of 2010) where available. Where GTVs are not available results are compared against the EPA Interim Guideline Values (IGV) as set out in the Interim Report *'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' 2004.* A discussion of the results and their significance is included below.

5.1 FIELD PARAMETERS

The results of the field parameters measured at each groundwater monitoring well are presented in Table 4.2. Groundwater samples recorded pH levels ranging between 7.08 and 8.33, all within the EPA Interim guideline range of ≥6.5 to ≤9.5. Temperature measurements ranged from 11.6°C to 13.9°C and were below the EPA IGV of 25°C.

Field measurements of Electrical Conductivity levels ranged between 737 µS/cm and 1523 µS/cm. Two measurements of Electrical Conductivity were above the IGV of 1000 µS/cm at MW03 (1412 µS/cm) and MW04 (1523 µS/cm), but all however were below the GTV limit of 1875 µS/cm.

Dissolved oxygen levels ranged between 3.26 and 5.51 ppm. Factors such as climate, nutrients in the water, suspended solids; organic wastes and groundwater inflow can all influence the dissolved oxygen values.

Observations relating to colour and odour varied from well to well as detailed in **Table 4.2**.

5.2 RESULTS OF BTEX & MTBE

The results of the **BTEX** and **MTBE** analysis are presented in **Table 4.3**. BTEX concentrations are below the associated GTVs and IGVs at all locations. MTBE was detected at BH103 (0.81 µg/l), MW03 (1.73 µg/l) and MW04 (1.73 µg/l), however these concentrations were below the IGV of 30 µg/l. MTBE was below the laboratory limit of detection and IGV at all other locations.

Previous detections of MTBE was in the Quarter 1 monitoring event of 2017 and recorded concentrations above the laboratory limit of detection at MW03 (2.4 µg/l) and MW04 (1.2 µg/l). MTBE was also above the laboratory limit of detection at MW03 (1.5 µg/l) and MW04 (1.2 µg/l) during Quarter 4 2016, and at MW03 (1.2 µg/l) during Quarter 3 2016 and MW04 (1.7 µg/) during Quarter 2 2016. These detections are still below the IGV limit however. Prior to this there was a detection of MTBE at BH104B in the Quarter 1 monitoring event of 2012 with a recorded concentration of 280 µg/l which is above the laboratory limit of detection. This was the only recorded exceedance in Quarter 1 2012.

Monitoring during Quarter 1 and Quarter 2 of 2010 detected exceedances of MTBE at BH103 at a concentration of 16 µg/l. Subsequent monitoring in 2010 recorded concentrations below the laboratory limit of detection. Prior to these 2010 monitoring events, concentrations of MTBE at BH103 were recorded at 63 µg/l in December 2009.

5.3 RESULTS OF SPECIATED POLYAROMATIC HYDROCARBONS (PAHS)

The results of the Speciated PAH analysis during this monitoring period are presented in **Table 4.4.**

The laboratory limit of detection for Total EPA-16 PAHs is 0.1 µg/l and has been lowered for comparison with the EPA IGV of 0.1 µg/l; however this is not accredited. This laboratory limit of detection is above the EPA GTV of 0.075 µg/l. To identify the compounds, which attributed to these concentrations, speciated PAH analysis was carried out, which reduces the limit of detection for individual parameters to 0.01 µg/l.

Total Polyaromatic Hydrocarbons were above the IGV limit of 0.1 µg/l at BH103 (0.127 µg/l), MW03 (0.11 µg/l) and MW04 (0.194 µg/l). Total PAHs were below the IGV of 0.1 µg/l and the GTV of 0.075 µg/l at all other locations.

Total PAHs were previously detected above the IGV at MW01 (0.121 µg/l), MW03 (0.47 µg/l) and MW04 (0.148 µg/l) during the Quarter 1 2017 monitoring event, and at BH102 (0.124 µg/l) and MW03 (0.596 µg/l) during the Quarter 4 2016 monitoring event.

The results of the speciated polycyclic aromatic hydrocarbon analysis detected a number of different compounds in BH102, BH103, BH104B, MW01, MW03 and MW04 above the laboratory limit of detection. However none of these compounds were above their respective IGV limits at any location.

5.4 RESULTS OF SPECIATED PHENOLS

During previous quarterly monitoring events and sample analysis, total monohydric phenol was determined and historically has been below the laboratory limit of detection of 10 µg/l since December 2008. It should be noted that the laboratory limit of detection was however above the IGV of 0.5 µg/l for phenols.

For this reason, samples were analysed for phenols to include chlorophenols. The results of the speciated phenols analysis are presented in **Table 4.5**. The speciated phenol analysis reduces the laboratory limit of detection to 1.0 µg/l for individual parameters.

The results of the current Quarter 2 2017 speciated phenol analysis confirm concentrations of phenols were below the laboratory limit of detection of 1.0 µg/l at all locations.

2-Methylphenol (3.48 µg/l) and 3+4-Methylphenol (2.19 µg/l) in MW03 were detected above the laboratory limit of detection during Quarter 1 2017, and 4-Chloro-3-methylphenol at BH104B (1.37 µg/l) above the laboratory limit of detection during the Quarter 1 2015 analysis. With the exception of these, all other results are consistent with results since the 2012 quarterly monitoring events.

5.5 RESULTS OF SEMI-VOLATILE ORGANIC COMPOUNDS

The results of the Semi-Volatile Organic Compound analysis are presented in **Table 4.6**.

There are no GTVs for individual SVOC parameters. Diethylphthalate which was detected above the laboratory limit of detection at MW01 (1.3 ug/l). However, there is no IGV for Diethylphthalate. No SVOCs were detected above the relevant IGVs during this monitoring period, consistent with the results from the 2016, 2015 and 2014 and Quarter 1 2017 monitoring periods. It should be noted that the laboratory limit of detection was however above the IGVs for some SVOCs, for example the result for 1,2,4-Trichlorobenzene was <1.0 µg/l but the IGV for this parameter is 0.40 µg/l, but testing at this limit is not accredited.

The Quarter 3 2013 monitoring event detected two SVOC compounds, Acenaphthene (1.1 µg/l) and Fluorene (1.5 µg/l) in MW03. Prior to this detection the Quarter 2 monitoring event of 2012 detected concentrations of Naphthalene and Acenaphthylene in MW03 at concentrations of 2.4 µg/l and 0.12 µ/l respectively.

5.6 RESULTS OF VOLATILE ORGANIC COMPOUNDS

The results of the Volatile Organic Compound analysis are presented in **Table 4.7**. Vinyl Chloride at MW03 (0.4 µg/l) and MW04 (0.49 µg/l) was detected above the GTV of 0.375 µg/l.

Chloroethane at MW03 (6.3 µg/l) and MW04 (7.4 µg/l), 1,1-dichloroethane at MW03 (2.8 µg/l) and MW04 (3.58 µg/l), MTBE at MW03 (1.73 µg/l) and MW04 (1.73 µg/l), Benzene at MW03 (0.39 µg/l) and MW04 (0.49 µg/l), and Ethylbenzene (0.15 µg/l), m&p-xylene (0.47 µg/l) and o-xylene (0.16 µg/l) at MW02 were also detected. However, all of these are below their respective limits. All other compounds were below their respective laboratory limits of detection.

Historic groundwater monitoring events detected some parameters above the laboratory limit of detection in November 2009, corresponding to Quarter 4 of 2009. Historically 1,1-Dichloroethane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, MTBE, n-butylbenzene, n-propylbenzene, o-xylene, p-isopropyltoluene, sec-butylbenzene and tert-butylbenzene were detected above the laboratory limits of detection.

The results of the Quarter 3 and Quarter 4 monitoring events of 2009 and all subsequent monitoring events indicate that there were no other exceedances of the GTVs or IGVs for specific parameters.

5.7 RESULTS OF TOTAL PETROLEUM HYDROCARBONS

In order to provide a more accurate profile of TPH within the groundwater, speciated hydrocarbon analysis using the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG) method was carried out on samples taken at all boreholes. The results of the TPH analysis are presented in **Table 4.8**.

The EPA IGV of 10 µg/l for Total Hydrocarbons is deemed comparable with the results for Total Petroleum Hydrocarbons. Some detections of TPH in both the aliphatic and aromatic range were observed during the current Quarter 2 2017 monitoring event.

Detections were found in samples from the following wells; at BH103 detections were in the aliphatic range C16-C35 (50 µg/l), at BH104B detections were in the aliphatic ranges C12-C16 (13 µg/l) and C16-C35 (37 µg/l), and in the aromatic ranges C12-C16 (15 µg/l) and C16-C21 (20 µg/l), at MW02 detections were in the aliphatic range C16-C35 (12 µg/l), at MW03 detections were in the

aromatic range C12-C16 (18 µg/l), and at well MW04 detections were in the aromatic range C12-C16 (29 µg/l).

The previous Quarter 1 2017 monitoring event detected TPH in the wells BH102 in the aliphatic range C16-C35 (11 µg/l), BH103 in the aliphatic range C16-C35 (15 µg/l at MW01 in the aliphatic range C16-C35 (23 µg/l), at MW03 in the aliphatic range C16-C35 (40 µg/l) and in the aromatic range C21-C35 (13 µg/l), and at well MW04 in the aromatic ranges C10-C12 (11 µg/l) and C12-C16 (21 µg/l).

The Quarter 4 2016 monitoring event detected TPH in the wells BH102 in the aliphatic range C16-C35 (13 µg/l), BH103 in the aliphatic range C16-C35 (160 µg/l), C35-C44 (14 µg/l) and in the aromatic range C21-C35 (47 µg/l), BH104B in the aromatic range C12-C16 (12µg/l), MW03 in the aliphatic range C16-C35 (14 µg/l), and MW04 in the aromatic ranges C10-C12 (13 µg/l) and C12-C16 (23 µg/l)

The Quarter 3 monitoring event detected TPH in the well BH103 in the aliphatic range C16-C35 (35 µg/l), C35-C44 (10 µg/l) and in the aromatic range C21-C35 (11 µg/l), at BH104B detections were in the aromatic range C12-C16 (25 µg/l), C16-C21 (12 µg/l) and at well MW04 detections were in the aromatic range C12-C16 (23 µg/l).

The Quarter 2 monitoring event of 2016 detected TPH in the well BH103 were in the aliphatic range C16-C35 (150 µg/l) and in the aromatic range C21-C35 (57 µg/l) and from well MW04 in the aromatic range C12-C16 (20 µg/l).

The Quarter 1 monitoring event of 2016 detected TPH in the aliphatic range C16-C35 (132 µg/l) at BH103 and in the aliphatic range C12-C16 (15 µg/l) at MW04.

The Quarter 4 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 (879 µg/l), C16-C21 (1380 µg/l) and C21-C35 (694 µg/l) at BH104B, C21-C35 at BH103 (60 µg/l) and C10-C12 (13 µg/l) and C12-C16 (21 µg/l) at MW04. TPH concentrations were detected in the aliphatic ranges C10-C12 (495 µg/l), C12-C16 (3080 µg/l) and C16-C35 (3360 µg/l) at BH104B and C16-C35 (231 µg/l) and C35-C44 (14 µg/l).

The Quarter 3 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 (39 µg/l), C16-C21 (37 µg/l) and C21-C35 (28 µg/l) at BH104B, C21-C35 at BH103 (17 µg/l) and C10-C12 (18 µg/l) and C12-C16 (29 µg/l) at MW04. TPH concentrations were detected in the aliphatic ranges C10-C12 (13 µg/l), C12-C16 (40 µg/l) and C16-C35 (62 µg/l) at BH104B and C16-C35 at BH103 (72 µg/l) and MW03 (14 µg/l).

The Quarter 2 monitoring event of 2015 detected TPH in the aromatic range C21-C35 at BH03 (509 µg/l). TPH concentrations were detected in the aliphatic ranges C16-C35 at BH103 (1760 µg/l) and BH104B (337 µg/l), and C12-C16 at BH104B (225 µg/l).

The Quarter 1 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 at wells MW03 (14 µg/l), MW04 (15 µg/l) and BH104B (27 µg/l), C16-C21 at BH104B (15 µg/l), and C21-C35 (14 µg/l) at BH103. TPH concentrations were detected in the aliphatic ranges C16-C35 and C35-C44 at MW03 (46 µg/l and 12 µg/l respectively), BH103 (54 µg/l) and BH104B (11 µg/l.

No detections of TPH in the aliphatic or aromatic range were observed in any shallow or deep monitoring well locations during the Quarter 4 monitoring event of 2014.

The Quarter 3 monitoring event of 2014 detected TPH concentrations in the aliphatic range at the shallow groundwater well BH104B. The TPH concentration detected was 410 µg/l. The speciated TPH ranges that contributed to the value of 410 µg/l were C12-C16 (150 µg/l), C16-C21 (250 µg/l) and C31-C35 (10 µg/l).

The Quarter 3, 2013 monitoring event detected TPH in the aliphatic range in one deep groundwater well, MW03. TPH of the range C10-C12 and C12-C16 were detected at concentrations of 200 µg/l and 190 µg/l respectively.

The Quarter 1, 2013 monitoring event detected aliphatic TPH of the range C12-C16, C16-C21 and C21-C35. TPH in the mid to high aromatic ranges were detected in BH103, BH104B and MW04 during the Quarter 1 2013 monitoring event. Aromatic TPH of the ranges C12-C16, C16-C21 and C21-C35 were detected in BH103, the ranges C10-C12, C12-C16 and C16-C21 were detected in BH104B and aromatic TPH of the ranges C10-C12 and C12-C16 were detected in MW04. These detections are discussed further in **Section 6.2.3**.

6 HISTORICAL RESULTS & TRENDS

Time series plots are presented in this section and include the results of the Quarter 2 2017 monitoring round. As the monitoring continues in accordance with the Industrial Emissions Licence requirements, the plots will be updated with the results of subsequent rounds and used to illustrate the results.

6.1 GROUNDWATER LEVELS OVER TIME

Figure 6.1 to **Figure 6.3** below illustrates the manually recorded water levels using an electronic probe. The graphs show that groundwater levels can vary considerably between monitoring rounds.

Figure 6.2 illustrates groundwater elevations (mAOD) in shallow groundwater wells (BH101 to BH104B) ranging between approximately 98 mAOD and 102 mAOD.

Figure 6.3 illustrates groundwater elevation (mAOD) in the deeper groundwater wells (MW01 to MW03). The groundwater elevation (mAOD) for these deeper groundwater wells ranges from approximately 97.5 mAOD to approximately 100 mAOD.

Figure 6.1 – Ground Elevation (mAOD) in all Monitoring Wells

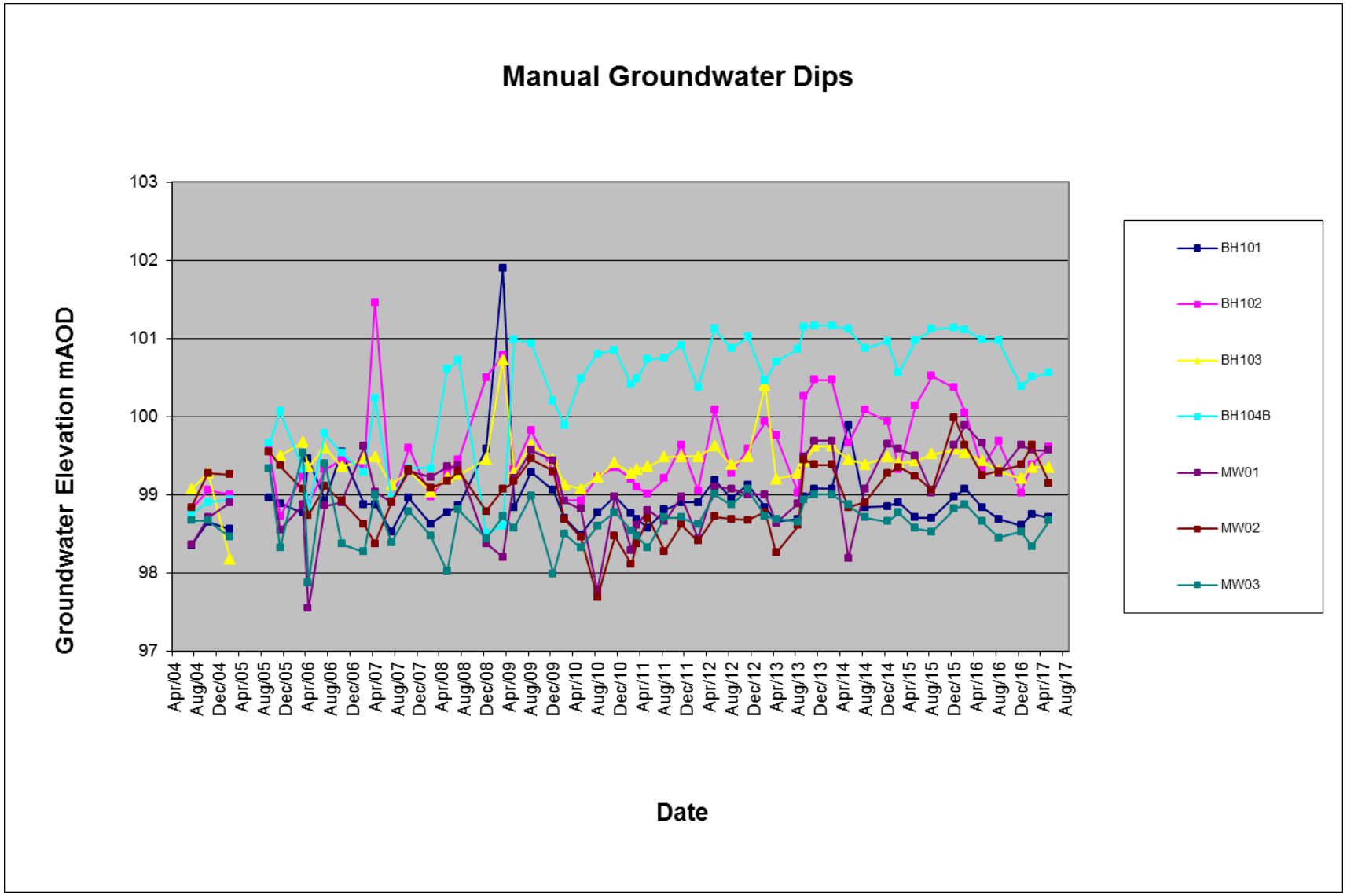


Figure 6.2 – Ground Elevation (mAOD) in Shallow Groundwater Monitoring Wells

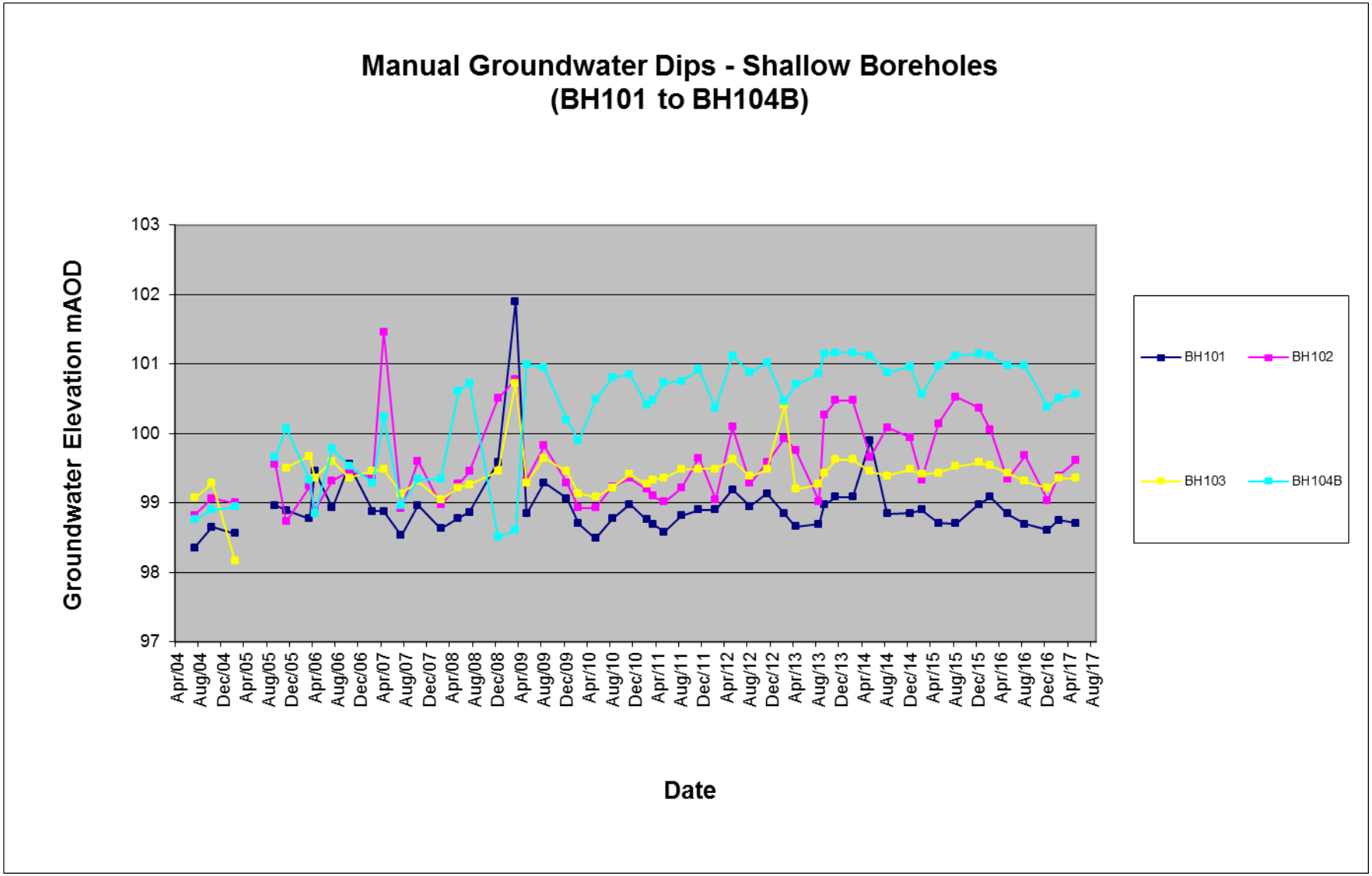
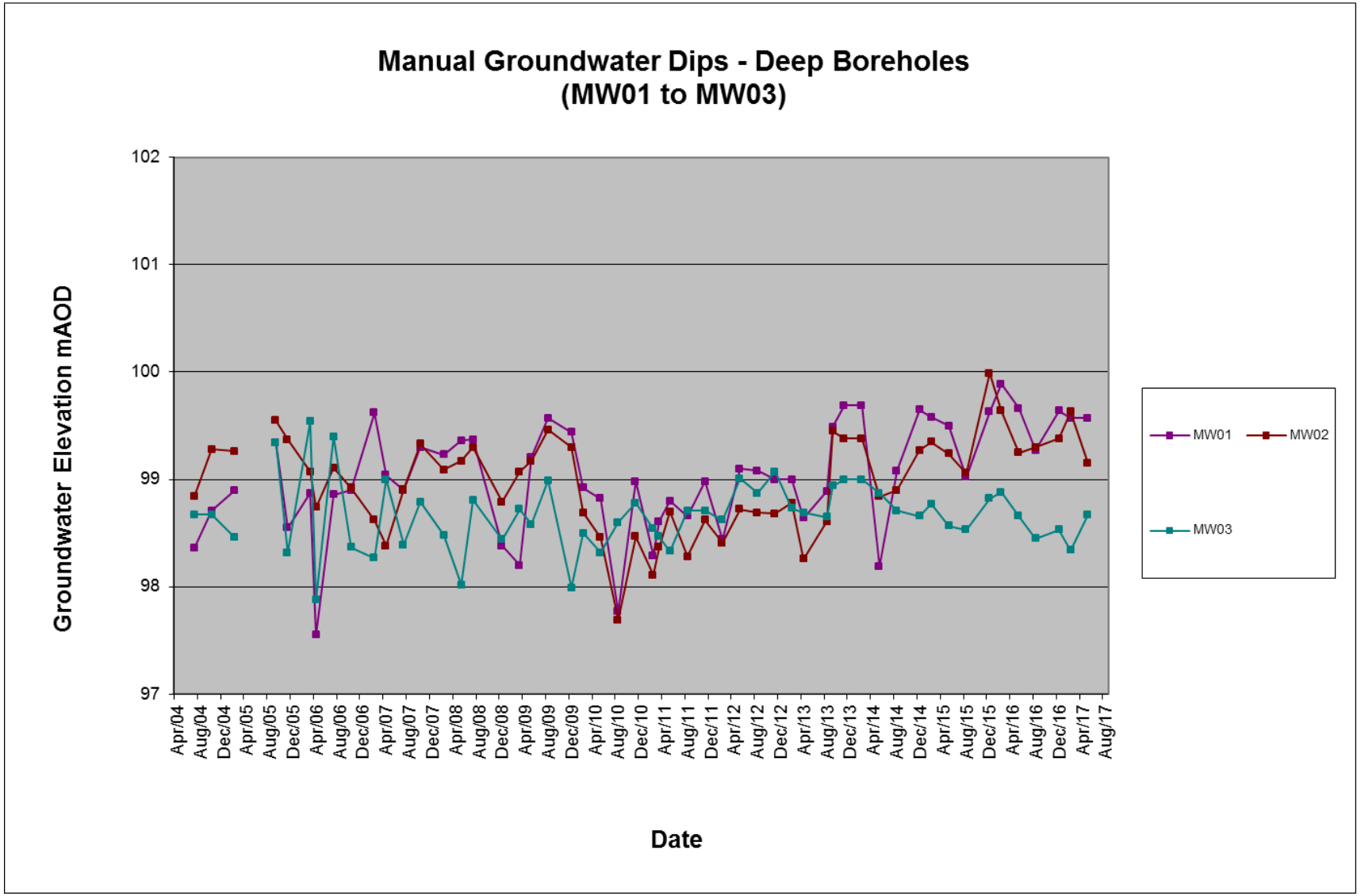


Figure 6.3 – Ground Elevation (mAOD) in Deep Groundwater Monitoring Wells



The groundwater levels generally show a similar pattern of fluctuation over time indicating a degree of connection between boreholes. The graphs demonstrate that groundwater levels can vary considerably between monitoring rounds; the general direction of flow in the shallow and deeper groundwater bearing unit is in an easterly or north easterly direction however there have been some occasional historic cases of groundwater flowing in a south-easterly direction.

In addition, monthly rainfall data for Oak Park, Carlow have been tabulated from Met Éireann to examine the relationship between compounds and rainfall events. The data from Oak Park was chosen as the weather station at Birr, Co. Offaly closed in October 2009. A summary of the rainfall data is in **Tables 6.1** to **6.5**.

Table 6.1 – Monthly Rainfall Data for Year 2013 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Rainfall (mm)	76.2	35.8	57.6	44.4	35.6	37.5	32.3	85.6	24.4	170.0	27.7	136.6

Table 6.2 – Monthly Rainfall Data for Year 2014 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Rainfall (mm)	147.2	176.7	65.0	52.6	78.6	61.9	24.6	122.1	18.2	138.2	165.6	47.7

Table 6.3 – Monthly Rainfall Data for Year 2015 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	66.0	36.3	53.5	26.3	89.4	29.7	79.4	83.0	17.9	56.8	110.0	270.9

Table 6.4 – Monthly Rainfall Data for Year 2016 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	110.9	95.7	40.6	64.3	61.6	61.7	29.6	46.0	97.4	32.3	26.3	80.2

Table 6.5 – Monthly Rainfall Data for Year 2017 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	Jun
Rainfall (mm)	36.3	57.8	66.6	15.8	81.8	91.0

6.2 GROUNDWATER CONCENTRATIONS OVER TIME

Groundwater quality trends have previously been examined in two reports (URS 2005 and RPS 2007). In addition, RPS carried out a groundwater risk assessment (Ref: MDE0788RP0001, dated November 2008) in which the general trend of contaminant concentrations over time was observed to be erratic with compounds rarely being detected in the same borehole on two consecutive monitoring rounds.

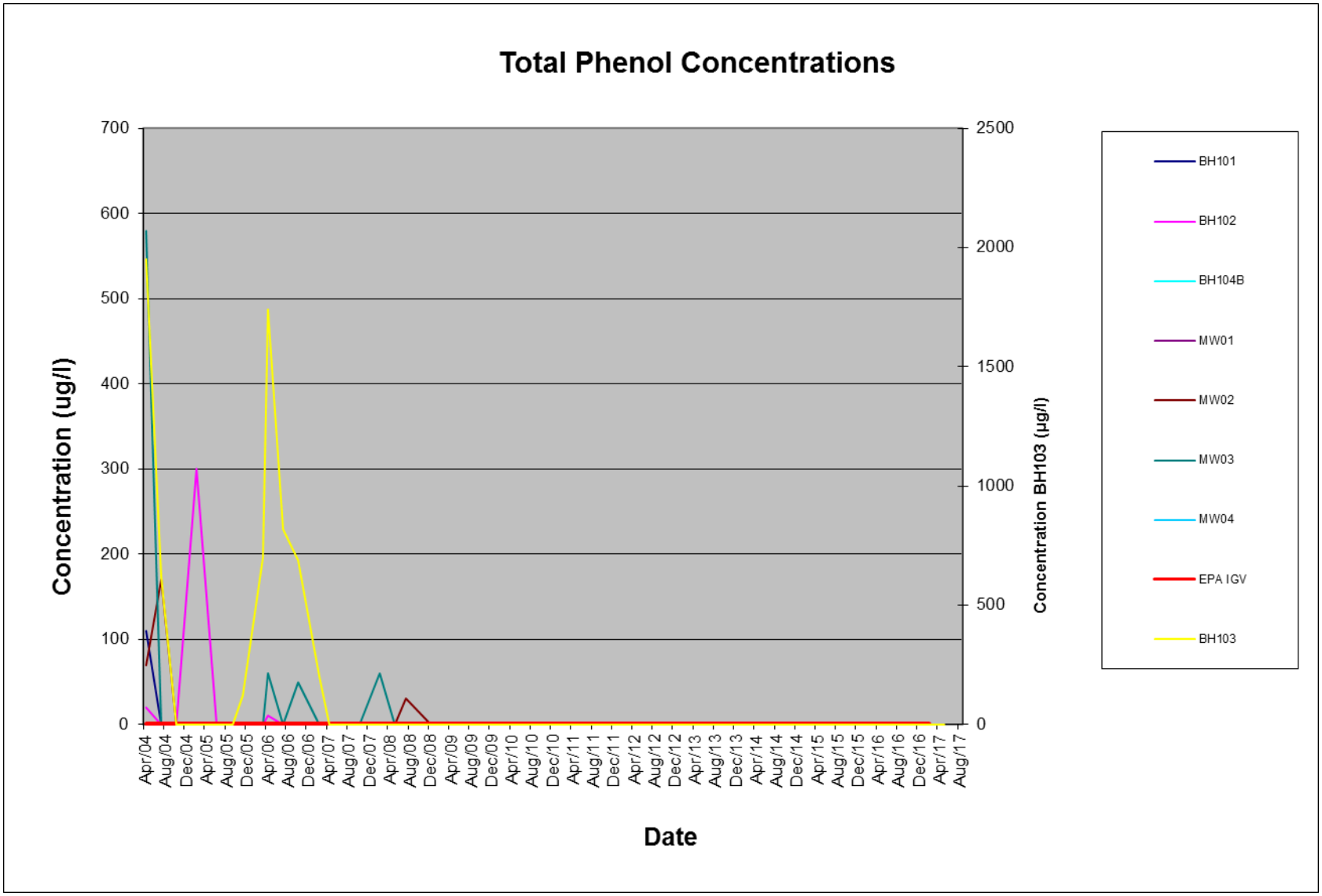
The data available within these reports has been reviewed and time series plots of key parameters have been compiled based on notable trends. Trends for phenols, petroleum hydrocarbons and chlorinated solvents have been plotted as outlined in the following sections.

6.2.1 Phenols

Phenols have been detected historically in all boreholes with the highest concentrations recorded in BH103. However concentrations in BH103 have declined since April 2007. Phenol concentrations have since been recorded below the IGV of 0.5 µg/l in all monitoring wells since December 2008 indicating natural attenuating conditions within the groundwater.

2,4-Dimethylphenol was detected at a concentration of 0.12 µg/l during the Quarter 1, 2010 monitoring event. There is no recommended IGV for this parameter. Subsequent to the Quarter 1 2010 monitoring event no detections of phenols have been noted at any monitoring location up to and including the current Quarter 2 2017 monitoring event, with the exception of 2-Methylphenol (3.48 µg/l) and 3+4-Methylphenol (2.19 µg/l) in MW03 during the previous Quarter 1 2017 monitoring event. However, there is no IGV or GTV for either of these parameters.

Figure 6.4 – Phenol Concentrations in all Monitoring Wells



6.2.2 Polyclyclic Aromatic Hydrocarbons

Figures 6.5 and 6.6 below illustrate that PAHs (Polycyclic Aromatic Hydrocarbons) have previously been detected within all monitoring wells above the recommended EPA IGV of 0.1 µg/l. Historically the highest concentrations have been detected within MW03 and BH104B, with the highest concentration detected in March 2006 (107 µg/l) and in October 2007 (19.72 µg/l) respectively. In addition, a range of PAHs including Benzo(a)pyrene, Benzo(g,h,i)perylene, Indeno(1,2,3)cd pyrene, Fluoranthene and Naphthalene have previously been detected in MW03 with **Figures 6.7** to **6.13** illustrating some of the PAH compounds which were detected above their respective IGVs.

Since 2007 concentrations of PAH have shown a marked decrease and since 2010 detections of PAH have been confined to MW03, MW02 and BH104B. Concentrations of Total PAH above the IGV in 2010 were detected during the Quarter 1 monitoring event in MW03 (0.3 µg/l), Quarter 2 monitoring event in BH104B (1.2 µg/l) and Quarter 3 monitoring event in MW02 (2.0 µgl) and BH104B (0.2 µgl). There were no elevated concentrations of Total PAH during the Quarter 4 2010 monitoring event.

No Total PAH detections were recorded throughout 2011 and in Q1 of 2012. Total PAH was detected above the IGV in MW03 in the Q2 2012 monitoring event. No Total PAH exceedances were detected from Quarter 3 2012 to Quarter 4 2013 inclusive. Total PAHs were detected at a concentration of 2.62 µg/l in MW03 during the Q3 2013 monitoring event however; no detections above the laboratory limit were noted during the subsequent monitoring events up to and including the Quarter 2 2015 monitoring event.

Total PAHs were also above the GTV at BH103 (0.093 µg/l), BH104B (0.159 µg/l) and MW03 (0.586 µg/l) during Quarter 3 2015, at BH103 (0.21 µg/l), MW03 (0.986 µg/l) and MW04 (0.079 µg/l) during Quarter 4 2015, and at BH103 (0.123 µg/l), BH104B (0.159 µg/l) and MW04 (0.153 µg/l) during the Quarter 1 2016 monitoring event. During the Quarter 2 2016 monitoring event, Total PAHs were detected above the IGV at BH103 (0.181 µg/l), BH104B (0.158 µg/l), MW03 (0.562 µg/l) and MW04 (0.151 µg/l) during Quarter 3 2016, and similarly above the IGV at BH102 (0.124 µg/l) and at MW03 (0.596 µg/l) during the Quarter 4 monitoring event. During the previous Quarter 1 2017 monitoring event, Total PAHS were detected above the IGV at MW01 (0.121 µg/l), MW03 (0.47 µg/l) and MW04 (0.148 µg/l).

During the current Quarter 2 2017 monitoring event, Total Polycyclic Aromatic Hydrocarbons were detected above the IGV limit of 0.1 µg/l at BH103 (0.127 µg/l), MW03 (0.11 µg/l) and MW04 (0.194 µg/l).

Figure 6.7 illustrates that **Fluoranthene** was previously detected above the IGV of 1.0 µg/l in groundwater monitoring wells BH104B (October 2007, 1.33 µg/l) and MW03 (March 2006, 2.158 µg/l) only. The remaining monitoring wells recorded concentrations below the IGV of 1.0 µg/l. During the Quarter 2 2017 monitoring event Fluoranthene was detected above the limit of detection at MW01 (0.012 µg/l), however this detection does not exceed the IGV of 1.0 µg/l.

A similar trend to Fluoroanthene has been noted in **Figure 6.8**, with concentrations of **Naphthalene** recorded above the IGV of 1.0 µg/l in BH104B and MW03 only. 4 no. exceedances of the IGV were noted in BH104B in September 2005 (39 µg/l), March 2006 (1.069 µg/l), July 2006 (1.594 µg/l) and October 2007 (16.31 µg/l). Since October 2007, the concentrations in BH104B have decreased below the IGV. There have been 6 exceedances of the IGV of 1.0 µg/l in MW03, with the highest

concentration detected in March 2006 (19.986 µg/l) and the most recent being the detected in the Quarter 2 2012 monitoring event (2.4 µg/l). The concentrations detected in August 2010 were slightly above the laboratory limit of detection of 0.01 µg/l at BH104B (0.08 µg/l) and MW03 (0.05 µg/l); however these levels are deemed low. Concentrations of Naphthalene were below the EPA IGV limit of detection of 1.0 µg/l at all locations during the Quarter 4 2010, the 2011 and 2012 quarterly monitoring events and the Quarter 1 to Quarter 3 2014 monitoring periods, inclusive. No detections of Naphthalene were noted from the Quarter 4 2014 monitoring event to the Quarter 2 2015 monitoring event. Naphthalene was detected at BH101 (0.011 µg/l) and MW03 (0.031 µg/l) during Quarter 3 2015, and at BH103 (0.095 µg/l) and at MW04 (0.067 µg/l) during Quarter 4 2015.

Naphthalene was detected at BH104B (0.034 µg/l) and MW04 (0.153 µg/l) during the Quarter 1 2016 monitoring event, at BH103 (0.13 µg/l), BH104B (0.039 µg/l), MW03 (0.028 µg/l) and MW04 (0.12 µg/l) during Quarter 3 2016, MW03 (0.036 µg/) during Quarter 4 2016, and at BH103 (0.018 µg/l), MW01 (0.041 µg/l) and MW04 (0.12 µg/l) during the Quarter 1 2017 monitoring event. During the current Quarter 2 2017 monitoring event, Naphthalene was detected above the laboratory limit of detection at BH103 (0.066 µg/l), MW03 (0.11 µg/l) and MW04 (0.157 µg/l). However, these are all still below the IGV of 1.0 µg/l.

Figure 6.9 illustrates the concentrations of **Benzo(g,h,i)perylene** in all monitoring wells over time. Elevated concentrations above the IGV were recorded at BH104B (0.087 µg/l) on one occasion in March 2006.

Figures 6.10 and 6.11 illustrate elevated concentrations above the IGV recorded at MW03 on 6 no. occasions with the most recent elevated concentration recorded during the Quarter 4 2015 monitoring event (0.053 µg/l). The previous elevated concentration detected was in Quarter 3 2015 (0.053 µg/l). The results of all monitoring events from 2010 to the Quarter 2 2015 monitoring event recorded concentrations below the laboratory limit of detection of 0.01 µg/l at all locations. Concentrations were also below the laboratory limit of detection at all locations during the Quarter 1 2016 monitoring event. Benzo(g,h,i)perylene was recorded in MW02 (0.011 µg/l) during Quarter 2 2016, in BH103 (0.015 µg/l) and MW03 (0.035 µg/l) during Quarter 3 2016, in MW03 (0.036 µg/l) during Quarter 4 2016, and in MW03 (0.037 µg/l) during the previous Quarter 1 2017 monitoring period. However, these are below the IGV of 0.05 µg/l. During the current Quarter 2 2017 monitoring event, Benzo(g,h,i)perylene was below the laboratory limit of detection at all locations.

Figures 6.12 and 6.13 illustrate the concentrations of **Benzo(a)pyrene** in all groundwater monitoring wells and indicates that Benzo(a)pyrene has been detected historically in all boreholes above the IGV of 0.01 µg/l. Similarly with the above mentioned trends, the highest concentrations have been detected in MW03 and BH104B. Concentrations have markedly decreased since March 2006 when an elevated concentration of 2.751 µg/l was detected in MW03, however there have been a number of detections above the IGV, with the most recent elevated level detected in December 2009. Elevated concentrations above the IGV were recorded in BH101, BH103 and MW01 during this same period.

The slightly higher concentrations of Benzo(g,h,i)perylene and Benzo(a)pyrene detected in Quarter 4, 2009 may be attributed to heavy rainfall, which occurred in November of 2009 and as a result possibly mobilized traces of these compounds from the soil. The static water levels for December 2009 ranged between 0.58 and 3.78 mbgl. Since December 2009, concentrations of compounds have notably decreased to below the IGVs.

Benzo(a)pyrene was detected above the IGV limit of 0.01 µg/l at MW03 (0.108 µg/l) during the Quarter 4 2015 monitoring event. Benzo(a)pyrene was also detected above the IGV at MW03 (0.052 µg/l) during the Quarter 3 2015 monitoring event. All other results of all monitoring events from 2010 to Quarter 2 2016 monitoring event did not detect other concentrations above the IGV. Benzo(a)pyrene was detected at BH103 (0.04 µg/l) and MW03 (0.037 µg/l) during the Quarter 3 2016 monitoring event, at MW03 (0.032 µg/l) during the Quarter 4 2016 monitoring event, and at MW03 (0.033 µg/l) during the previous Quarter 1 2017 monitoring event. During the current Quarter 2 2017 monitoring event, Benzo(a)pyrene was below the IGV of 0.01 µg/l and also below the limit of detection at all locations.

Figure 6.5 – PAH (Total) Concentrations in all Monitoring Wells

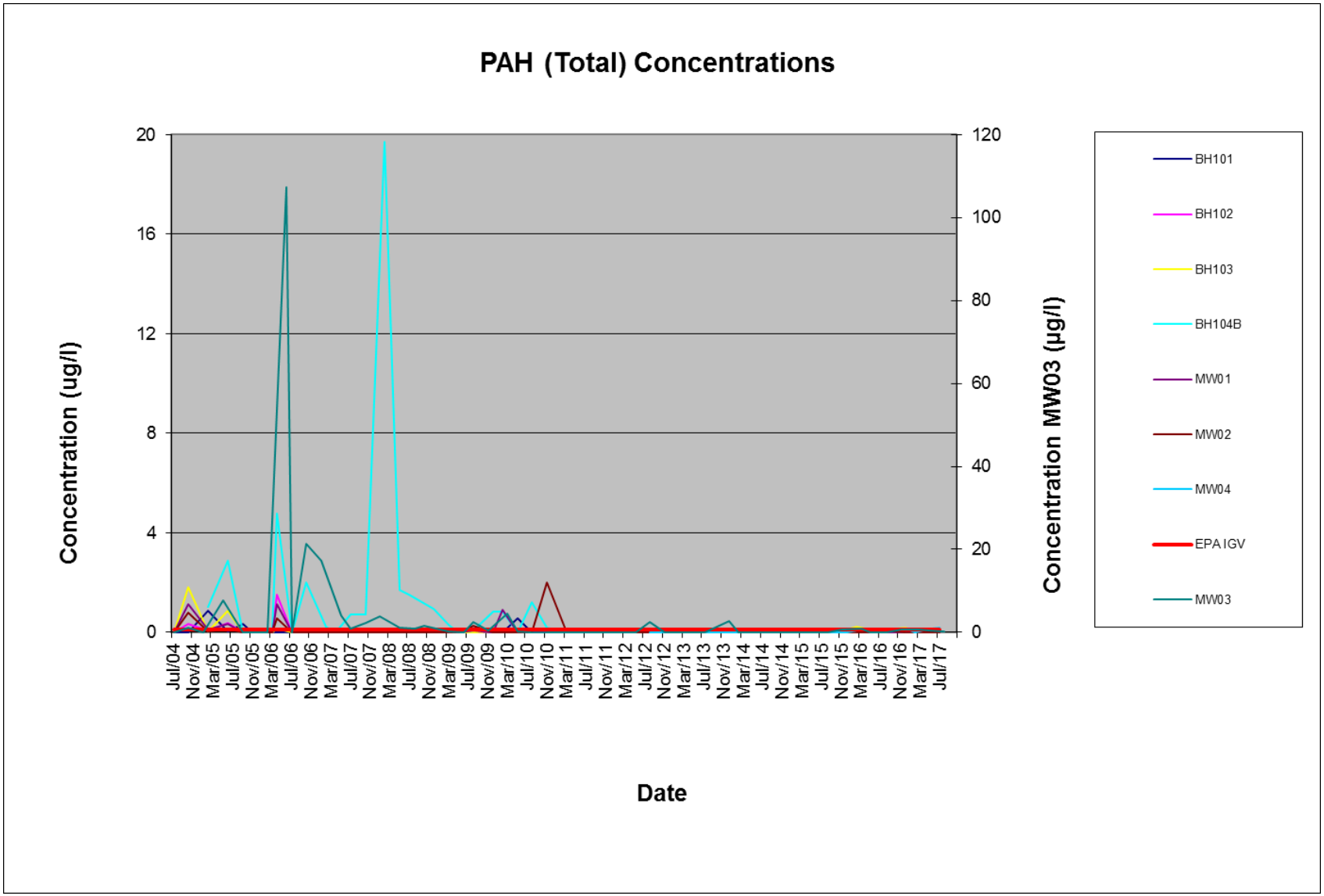


Figure 6.6 – PAH (Total) Concentrations in all Monitoring Wells Since 2010

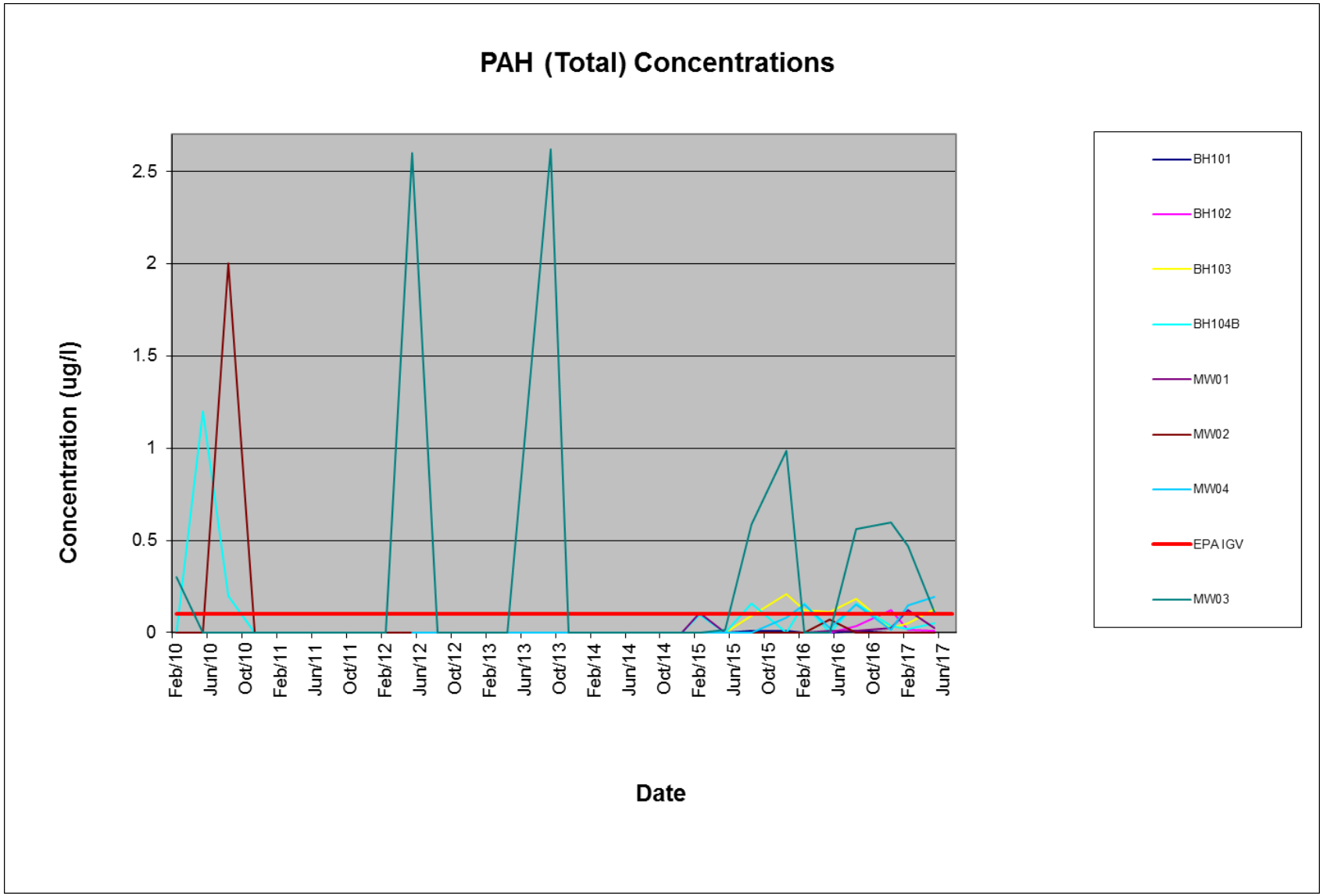


Figure 6.7 – Fluoroanthene Concentrations in all Monitoring Wells

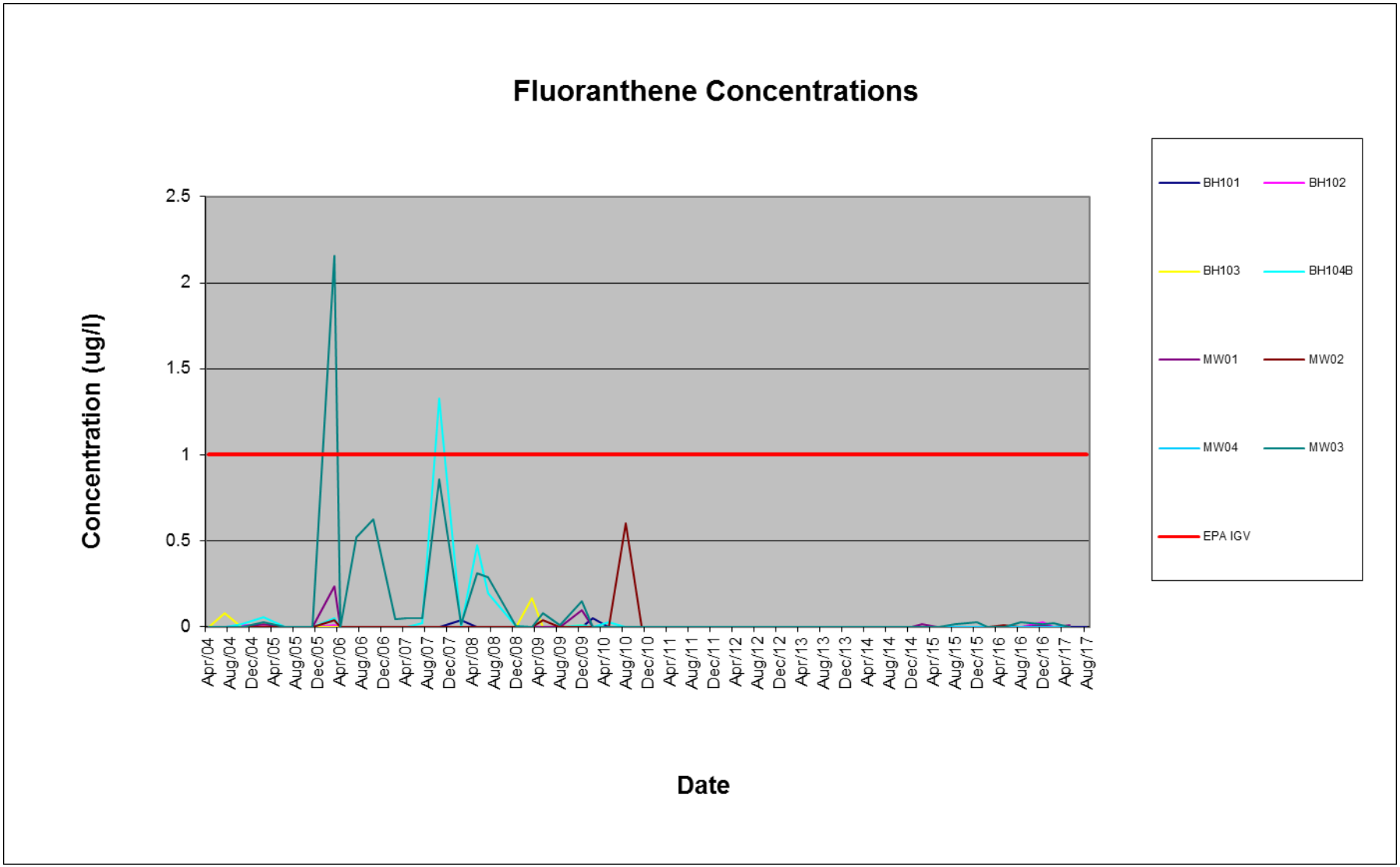


Figure 6.8 – Naphthalene Concentrations in all Monitoring Wells

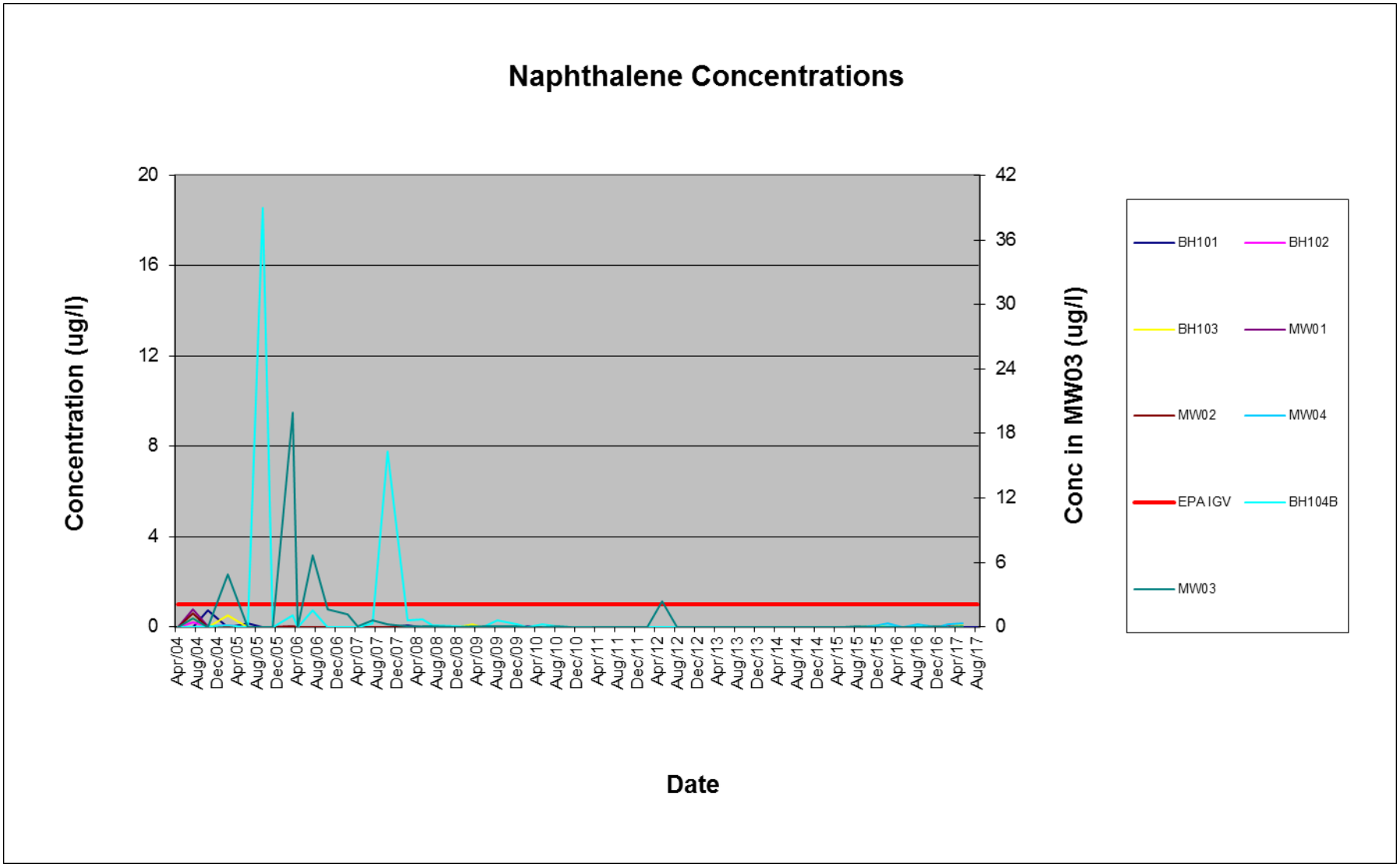


Figure 6.9 – Benzo (g,h,i) perylene Concentrations

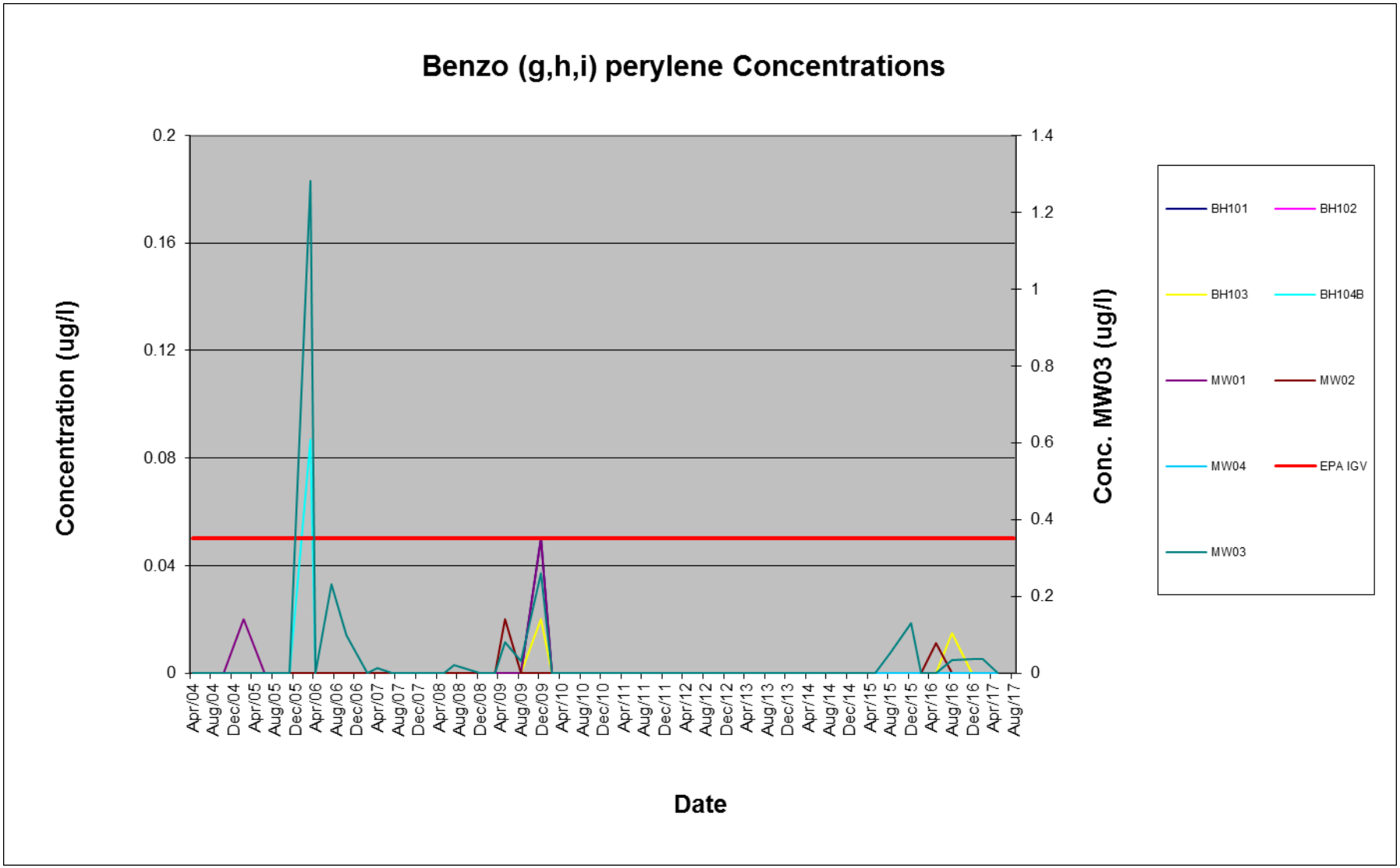


Figure 6.10 – Benzo (g,h,i) perylene in Monitoring Wells BH104B & MW03

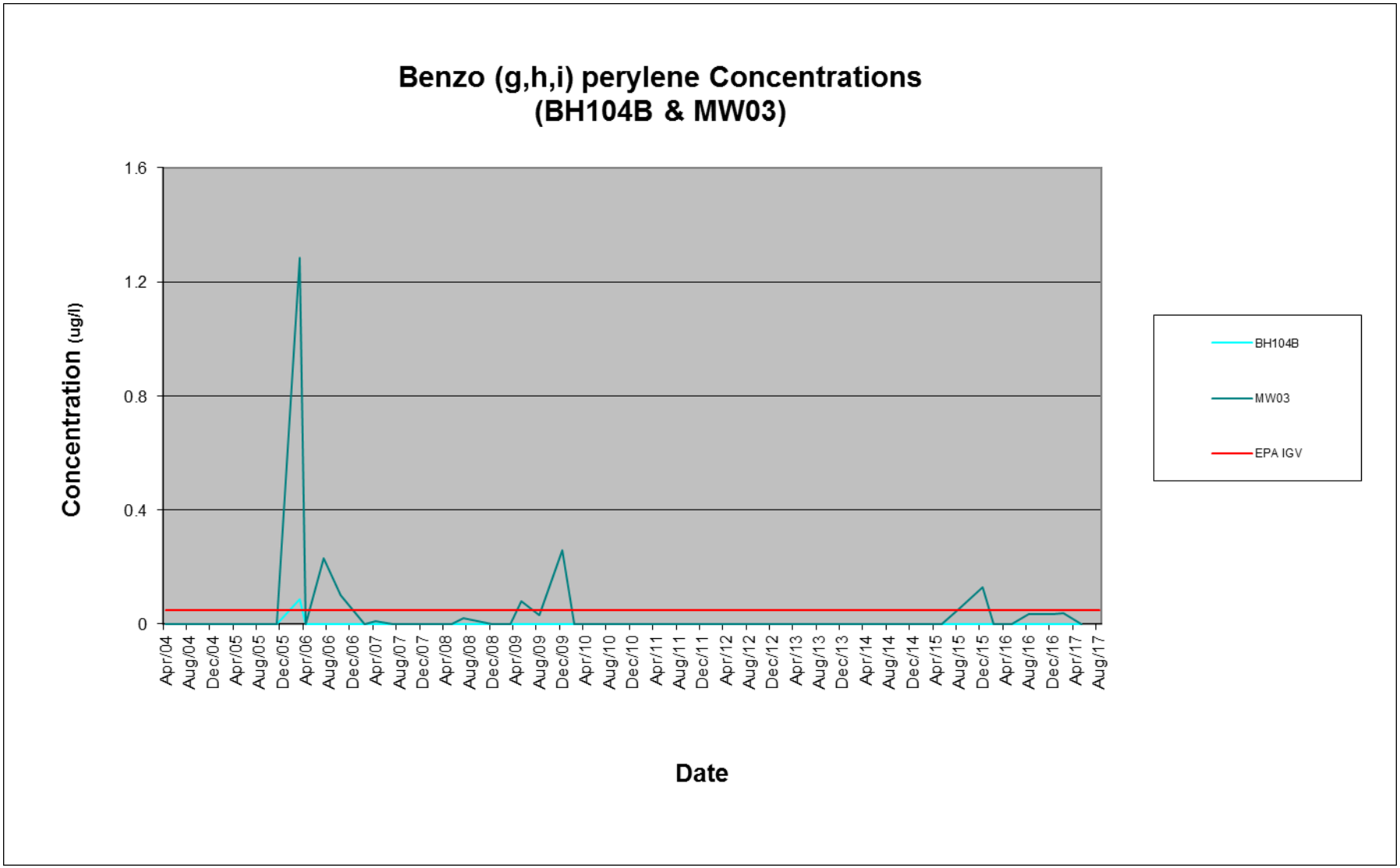


Figure 6.11 – Benzo (g,h,i) perylene in Monitoring Wells BH104B & MW03 Since 2010

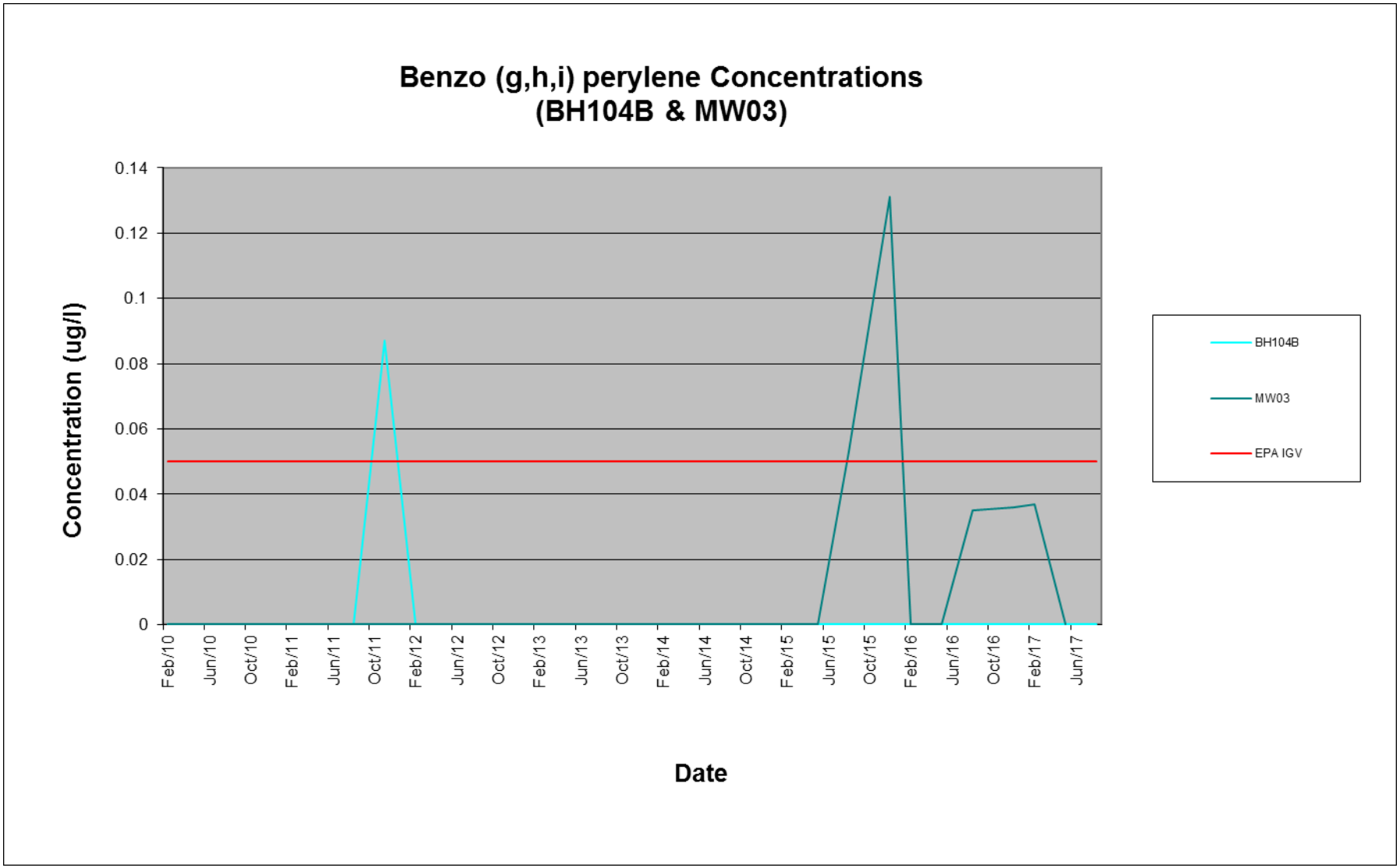


Figure 6.12 – Benzo (a) pyrene Concentrations in all Monitoring Wells

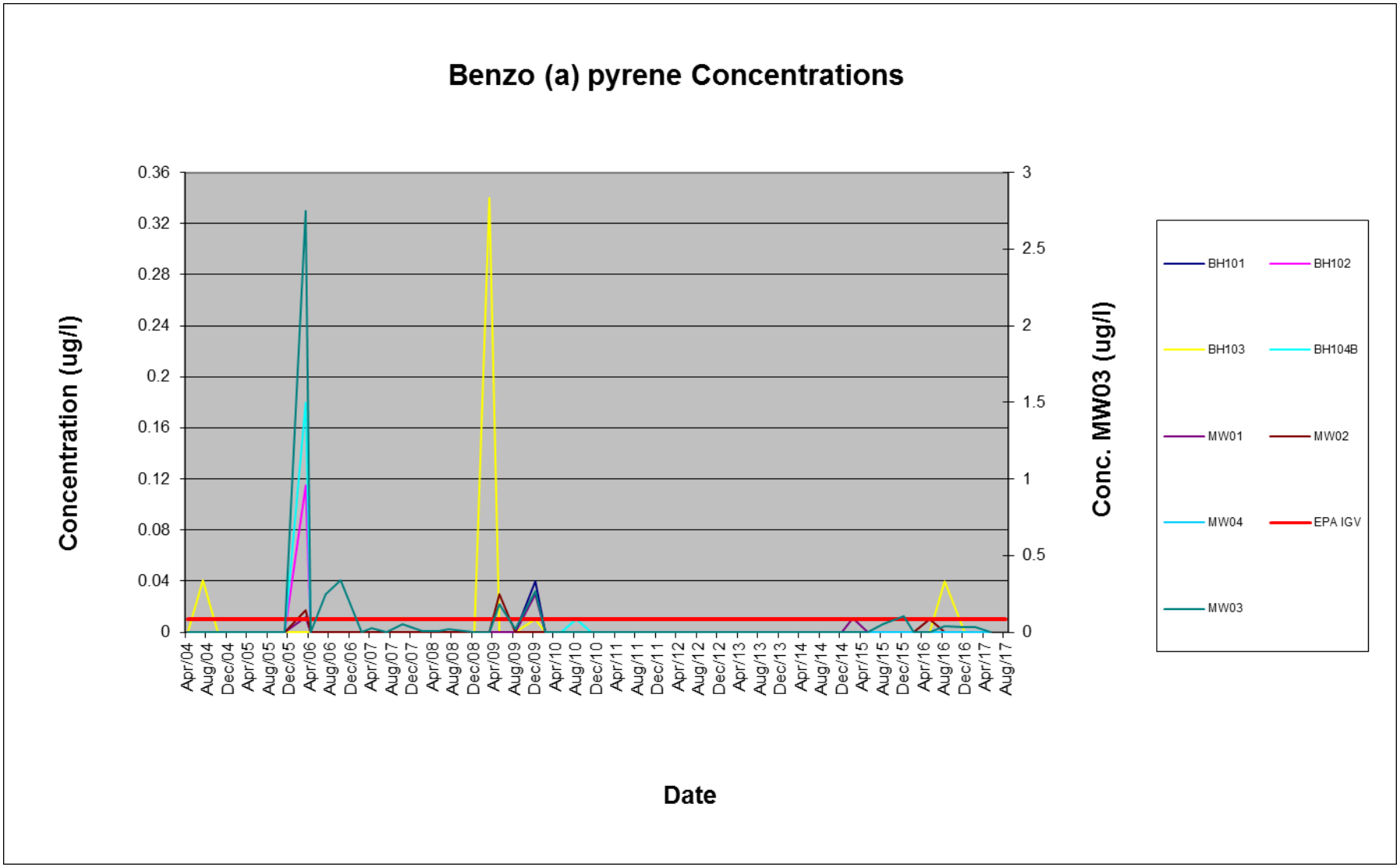
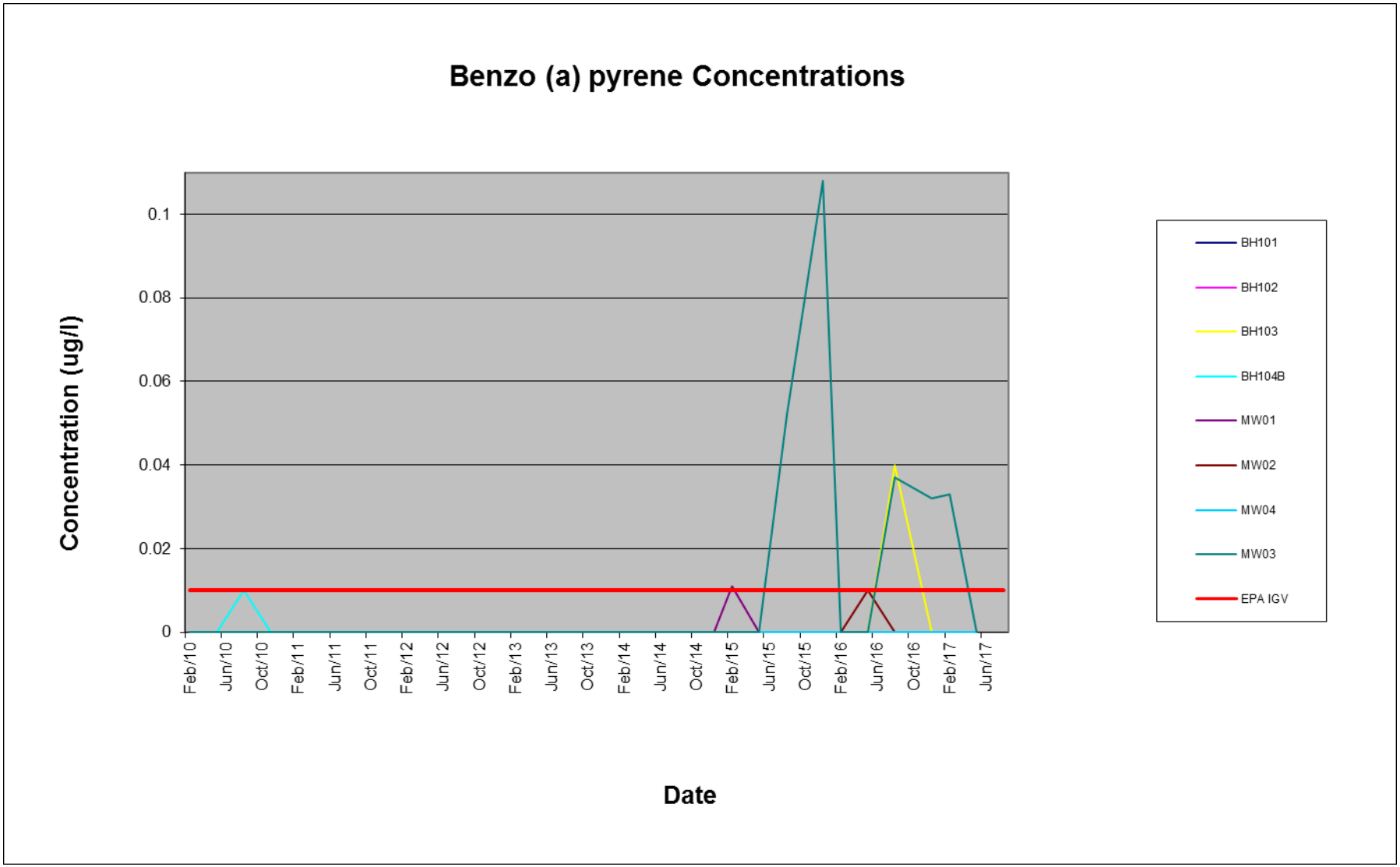


Figure 6.13 – Benzo (a) pyrene Concentrations in all Monitoring Wells Since 2010



6.2.3 Petroleum Hydrocarbons (TPH)

Historically **Total Petroleum Hydrocarbons (TPH)** including mineral oil, petrol range organics (PRO) and diesel range organics (DRO) have been detected within BH103, BH104B and MW03. Since 2009, speciated hydrocarbon analysis using the Total Hydrocarbon Criteria Working Group (TPHCWG) method has been carried out on all samples to obtain a more accurate profile of TPH within groundwater.

The results of the TPHCWG analysis has indicated that the predominant hydrocarbons detected are in the heavier chain carbon fractions, most notably in the carbon range C12-C16, C16-C21 and C21-C35. **Figure 6.14** illustrates the TPH analysis for the total TPH analysis from C10-C44 in all monitoring wells since 2009. The highest concentrations detected historically are at monitoring wells MW03, BH104B and BH103 respectively.

Previous quarterly monitoring reports have outlined the hydrocarbon trends recorded in each well since 2010. This report outlines the trends from 2013 up to and including the current monitoring report.

During the Quarter 1, 2013 monitoring event aromatic hydrocarbons were detected in BH103, BH104B and MW04. The predominant aromatic carbon range comprised C12-C16 (30 µg/l), C16-C21 (280 µg/l) and C21-C35 (100 µg/l) in BH103, C10-C12 (30 µg/l), C12-C16 (110 µg/l) and C16-C21 (80 µg/l) in BH104B and C10-C12 (20 µg/l) and C12-C16 (80 µg/l) in MW04. Aliphatic hydrocarbons were detected in BH103 in the ranges C12-C16 (70 µg/l), C16-C21 (100 µg/l) and C21-C35 (90 µg/l).

During the Quarter 2, 2013 monitoring event no aliphatic or aromatic hydrocarbons were detected at any location.

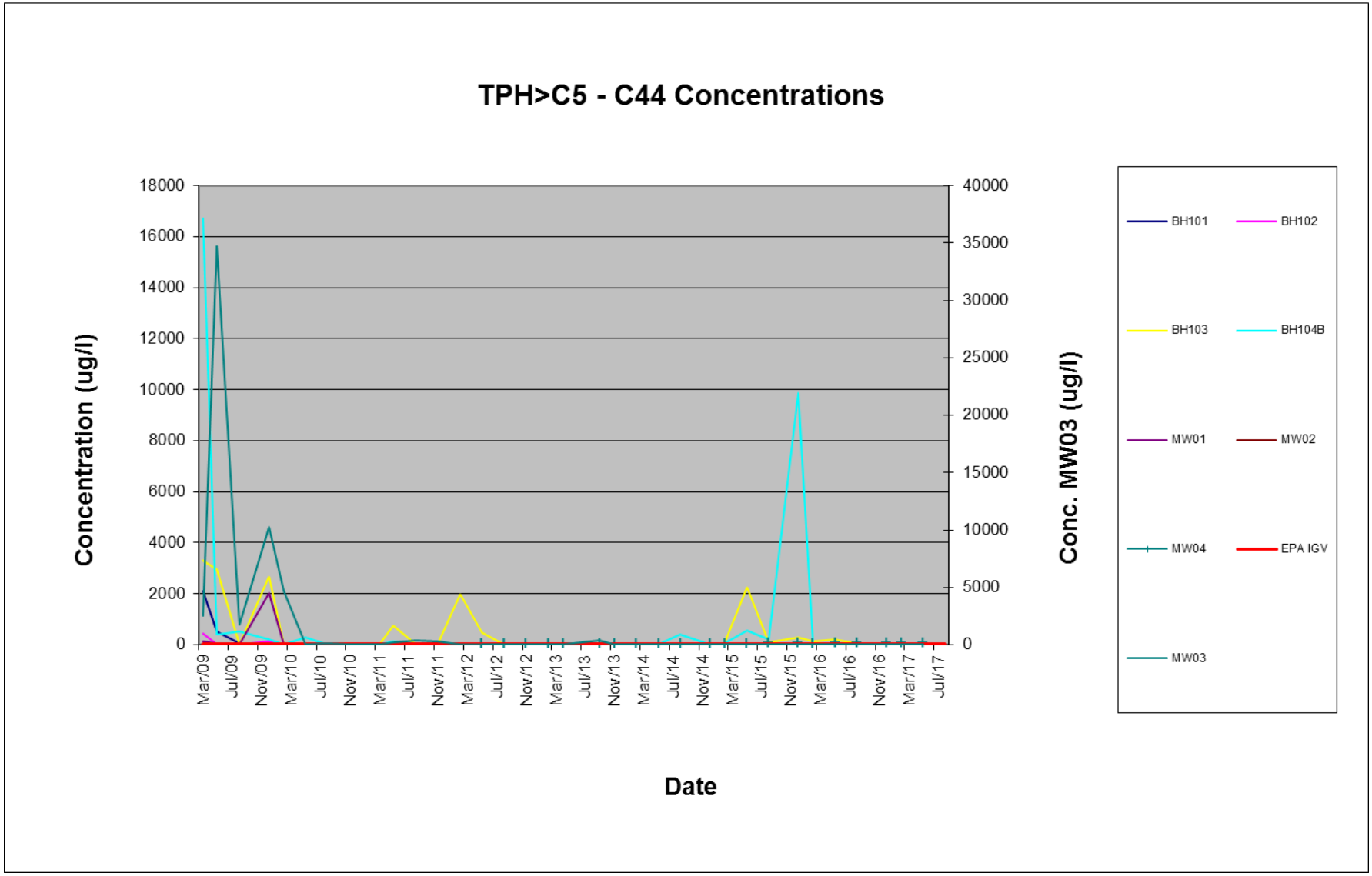
During the Quarter 3, 2013 monitoring event, hydrocarbons of the aliphatic range were detected in MW03 only. The detected aliphatic carbon range comprised C10-C16 (290 µg/l) and C12-C16 (190 µg/l). No detections of aromatic carbons were measured during the Quarter 3 2013 monitoring event.

Total Petroleum Hydrocarbons were not detected at any monitoring location during the Quarter 4, 2014 monitoring event. During the monitoring event for Quarter 3 2014 following ranges of the aliphatic hydrocarbons were recorded for BH104B; C12-C16 (150 µg/l), C16-C21 (250 µg/l) and C21-C35 (10 µg/l).

During the Quarter 1 2015 monitoring event, hydrocarbons were detected in MW03, MW04, BH103 and BH104B. The predominant aromatic carbon range comprised C21-C35 (14 µg/l) in BH103, C12-C16 (27 µg/l) and C16-C21 (15 µg/l) in BH104B, C12-C16 (14 µg/l) in MW03 and C12-C16 (15 µg/l) in MW04. Aliphatic hydrocarbons were detected in the ranges C16-C35 (54 µg/l) in BH103, C16-C35 (11 µg/l) in BH104B and C16-C35 (46 µg/l) and C35-C44 (12 µg/l) in MW03.

During the Quarter 2 2015 monitoring event, the TPH concentration in the aromatic C21-C35 range was detected at one shallow groundwater wells BH103 (509 µg/l). The TPH concentration in the aliphatic range was detected at C16-C35 (1760 µg/l) in BH103 and C12-C16 (225 µg/l) and C16-C35 (11 µg/l) in BH104B.

Figure 6.14 – TPH (Carbon Range C10-C44) in all Monitoring Wells



The Quarter 3 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 (39 µg/l), C16-C21 (37 µg/l) and C21-C35 (28 µg/l) at BH104B, C21-C35 at BH103 (17 µg/l) and C10-C12 (18 µg/l) and C12-C16 (29 µg/l) at MW04. TPH concentrations were detected in the aliphatic ranges C10-C12 (13 µg/l), C12-C16 (40 µg/l) and C16-C35 (62 µg/l) at BH104B and C16-C35 at BH103 (72 µg/l) and MW03 (14 µg/l).

The Quarter 4 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 (879 µg/l), C16-C21 (1380 µg/l) and C21-C35 (694 µg/l) at BH104B, C21-C35 at BH103 (60 µg/l) and C10-C12 (13 µg/l) and C12-C16 (21 µg/l) at MW04. TPH concentrations were detected in the aliphatic ranges C10-C12 (495 µg/l), C12-C16 (3080 µg/l) and C16-C35 (3360 µg/l) at BH104B and C16-C35 (231 µg/l) and C35-C44 (14 µg/l) at BH103.

The Quarter 1 2016 monitoring event detected TPH in samples from the well BH103 were in the aliphatic range C16-C35 (132 µg/l) and from well MW04 in the aromatic range C12-C16 (15 µg/l).

The Quarter 2 2016 monitoring event detected TPH in samples from the well BH103 and were in the aliphatic range C16-C35 (150 µg/l) and in the aromatic range C21-C35 (57 µg/l) and from well MW04 in the aromatic range C12-C16 (20 µg/l).

The Quarter 3 2016 monitoring event detected TPH in samples from the well BH103 in the aliphatic ranges C16-C35 (35 µg/l), C35-C44 (10 µg/l) and in the aromatic range C21-C35 (11 µg/l), well BH104B in the aromatic ranges C12-C16 (25 µg/l) and C16-C21 (12 µg/l) and from well MW04 in the aromatic range C12-C16 (23 µg/l).

The Quarter 4 2016 monitoring event detected TPH in samples from the well BH102 in the aliphatic range C16-C35 (13 µg/l), well BH103 in the aliphatic ranges C16-C35 (160 µg/l), C35-C44 (14 µg/l) and in the aromatic range C21-C35 (47 µg/l), well BH104B in the aromatic ranges C12-C16 (12 µg/l), well MW03 in the aliphatic range C16-C35 (14 µg/l) and from well MW04 in the aromatic ranges the aromatic ranges C10-C12 (13 µg/l) and C12-C16 (23 µg/l).

During the previous Quarter 1 2017 monitoring event, TPH was detected in samples from the well BH102 in the aliphatic range C16-C35 (11 µg/l), well BH103 in the aliphatic range C16-C35 (15 µg/l), well MW01 in the aliphatic range C16-C35 (23 µg/l), well MW03 in the aliphatic range C16-C35 (40 µg/l) and in the aromatic range C21-C35 (13 µg/l), and well MW04 in the aromatic ranges C10-C12 (11 µg/l) and C12-C16 (21 µg/l).

During the current Quarter 2 2017 monitoring event, TPH was detected in samples from the well BH103 in the aliphatic range C16-C35 (50 µg/l), well BH104B in well the aliphatic ranges C12-C16 (13 µg/l) and C16-C35 (37 µg/l), and in the aromatic ranges C12-C16 (15 µg/l) and C16-C21 (20 µg/l), well MW02 in the aliphatic range C16-C35 (12 µg/l), well MW03 in the aromatic range C12-C16 (18 µg/l), and well MW04 in the aromatic range C12-C16 (29 µg/l).

7 CONCLUSIONS

- In accordance with the criteria set out in Schedule 4(ii) of the site's Industrial Emissions Licence Register No. W0184-01, groundwater monitoring was carried out at the ENVA Ireland site on the 30th of May 2017 corresponding to Quarter 2 of 2017. Samples were collected at 8 groundwater monitoring wells during this event.
- The results presented have been referenced against Groundwater Threshold Values (GTVs) outlined in the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. no 9 of 2010), where available. Where GTVs are not available for parameters, results are compared against the Interim Guideline Values (IGVs) set out in the Environmental Protection Agency interim report, '*Towards Setting Guideline Values for the Protection of Groundwater in Ireland*'.
- Results of the BTEX and MTBE demonstrate that the levels of Benzene, Toluene, Ethylbenzene, m&p Xylene, o-xylene and MTBE were all below the recommended EPA IGVs.
- The Quarter 2 2017 results of the polycyclic aromatic hydrocarbons indicate that Total PAHs were above the EPA IGV of 0.1 µg/l at three monitoring wells, BH103 (0.127 µg/l), MW03 (0.11 µg/l) and MW04 (0.194 µg/l).
- Vinyl Chloride at MW03 (0.4 µg/l) and MW04 (0.49 µg/l) was detected above the GTV of 0.375 µg/l. A number of other individual VOCs were also detected above the laboratory limits at MW02, MW03 and MW04. However, all of these were below their respective limits. All other VOCs and SVOCs were below their respective laboratory limits of detection.
- Samples were analysed for speciated phenols to include chlorophenols and the results indicate that there were no detections above the laboratory limits of detection.
- For the current Quarter 2 2017 monitoring event, TPH detections in samples from BH103 in the aliphatic range C16-C35 (50 µg/l), well BH104B in well the aliphatic ranges C12-C16 (13 µg/l) and C16-C35 (37 µg/l), and in the aromatic ranges C12-C16 (15 µg/l) and C16-C21 (20 µg/l), well MW02 in the aliphatic range C16-C35 (12 µg/l), well MW03 in the aromatic range C12-C16 (18 µg/l), and well MW04 in the aromatic range C12-C16 (29 µg/l). Each of these is therefore over the limit of detection which is 10 µg/l. For the previous Quarter 1 2017 monitoring event, TPH detections in samples from the well BH102 in the aliphatic range C16-C35 (11 µg/l), well BH103 in the aliphatic range C16-C35 (15 µg/l), well MW01 in the aliphatic range C16-C35 (23 µg/l), well MW03 in the aliphatic range C16-C35 (40 µg/l) and in the aromatic range C21-C35 (13 µg/l), and well MW04 in the aromatic ranges C10-C12 (11 µg/l) and C12-C16 (21 µg/l).
- The general trend of contaminant concentrations over time continues to be somewhat variable with compounds not being continually detected in the same borehole on two or three consecutive monitoring rounds. In general, the contaminant levels detected at the Enva facility appear to indicate reducing contaminant concentrations over time with infrequent elevations in some parameters. Further monitoring is recommended to confirm these reductions.

Enva Portlaoise

2017 Groundwater Compliance Monitoring Quarter 3 (Jul – Sep 2017)

Document Control Sheet

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1 INTRODUCTION

1.1 BACKGROUND

RPS has been commissioned by Enva Ireland Ltd (Enva) to carry out groundwater quality monitoring for environmental compliance, at their facility in the Clonminam Industrial Estate, Portlaoise, Co Laois. Groundwater monitoring has being carried out in strict accordance with criteria set out in Schedule 4(ii) of the site's Industrial Emissions Licence, Register No. W0184-02.

Enva Ireland has been operating under Industrial Emissions Licence Register No. W0184-02 since June 2017, having replaced the previous Waste licence, W0184-01, granted in January 2004. Enva is required to submit a report to the EPA on a quarterly basis, outlining the existing groundwater quality underlying the site.

A suitably qualified environmental consultant from RPS, collected groundwater samples from a series of 8 monitoring wells (BH101, BH102, BH103, BH104B, MW01, MW02, MW03, MW04) within the site boundary on the 28th of August 2017. The samples underwent laboratory analysis for the suite of parameters specified in Schedule C.6 of Industrial Emissions Licence W0184-02. This report outlines the results of the Quarter 3 monitoring for 2017 and reviews historical data recorded at the site.

1.2 OBJECTIVES & SCOPE OF WORK

The specific objectives and scope of work are as follows:

- Review of previous data as provided by Enva Portlaoise;
- Graphical presentation of key compounds and trends; and
- Discussion of results for Quarter 3 2017 within the context of previous results and available guideline concentrations.

2 REVIEW OF PREVIOUS DATA

2.1 INFORMATION SOURCES

The following documents were reviewed as part of this project:

- Industrial Emissions Licence W0184-02 and any available EPA documents from the EPA website;
- Quarterly Groundwater Monitoring Reports (Quarter 1 2004 to Quarter 4 2005), URS;
- Quarterly Groundwater Monitoring Reports (Quarter 1 2006 to Quarter 2 2017), RPS;
- Summary Report on Trend of Contaminant Levels at Enva Ireland Ltd since 2005, Ref: MDE0647RP0001, RPS (2007);
- Groundwater Risk Assessment, Ref: MDE0788Rp0001, RPS (2008);
- Hydrogeological Review and Assessment Report, Ref MDE0973Rp0017F01, RPS (2014); and
- Baseline Environment Report, Ref: MDE0973Rp0104.

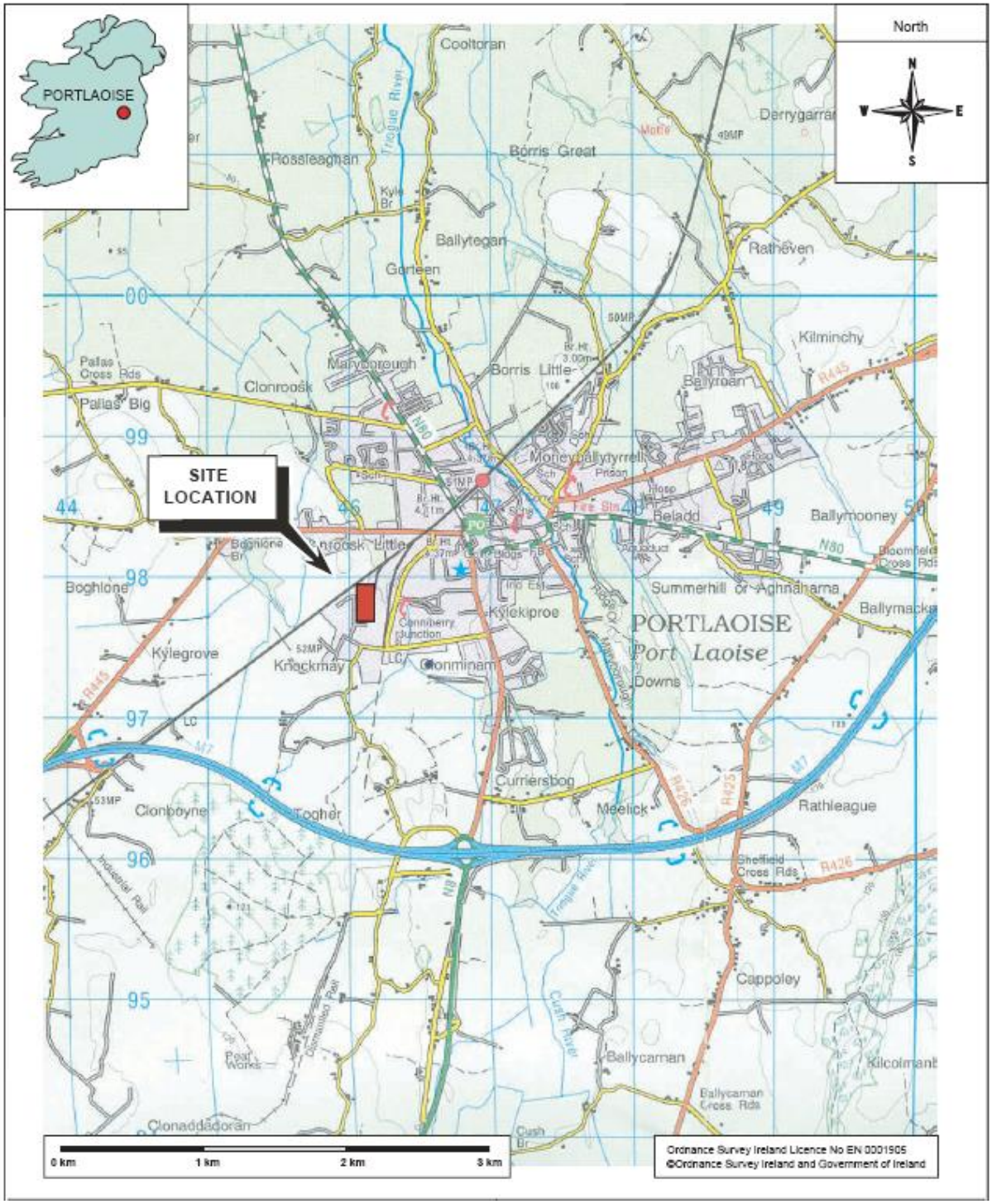
2.2 SITE SETTING

The site is located to the southwest of the town of Portlaoise immediately to the south of the Dublin to Cork railway line. The general area is gently undulating. The site slopes gently to the southwest but to the east of the site the ground slopes gently towards the River Triogue, which is located approximately 1.5 km to the east. The site occupies an area of approximately 1.5 hectares and comprises of an operational waste oil and contaminated soil treatment plant.

The site is located on the outskirts of Portlaoise in an area of agricultural and light industrial development. The site is bounded to the north and east by land belonging to Irish rail, comprising sidings and general storage areas. To the south is a vehicle repair garage, which is elevated above the level of the site by approximately 1.5 m. To the west the site is adjoined by further industrial land, as well as residential land. The site location is presented on **Figure 2.1**.

The site has been in operation since 1978, and the layout has remained relatively consistent. The site layout is presented on **Figure 3.1**. The site is largely covered in hardstanding with some open areas in the far north and northeast of the site. All oil and soil storage areas are suitably bunded and the general standard of housekeeping is good.

Figure 2.1 – Site Location



2.3 REGIONAL SETTING

2.3.1 Geology

The Geological Survey of Ireland indicates that the regional geology of Portlaoise is typified by Carboniferous Limestone. In the vicinity of the site itself the solid geology comprises the Ballysteen Formation, a micaceous-bioclastic limestone. This well-bedded limestone, with interbeds of shale, is extensively folded, with axes trending north-east to south-west, and becomes increasingly muddy towards the top of the formation. North-east to south-west trending faults are found in the region, with one located approximately 500m to the east of the site. The subsoils in the region comprise mainly Made Ground, around the industrial area, and Limestone Till in the surrounding regions.

2.3.2 Hydrogeology

The limestone is classified by the Geological Survey of Ireland (GSI) as a Locally Important Karstified Aquifer (Ll). Porosity is predominantly in the form of fractures, in this aquifer, however the muddy nature of this formation greatly reduces permeability. Vulnerability of this aquifer beneath the site is classified as high, with moderate vulnerability to the east of the site.

The public water supply for Portlaoise is derived from groundwater, utilising three groundwater abstraction well fields comprising of two abstraction wells in each well field. This supply currently comes from the Straboe area, approximately 5.5 km to the north-east of the site. The source protection zone for this water supply extends to within 3.2 km of the Enva site but does not encompass the Enva site.

The GSI record a number of other dug wells and boreholes within the Portlaoise area, including the boreholes installed on the site. The accuracy of the locations of these wells varies. One well, which was drilled in 1899 is recorded as being located immediately to the south of the Enva site. The use of this well is not known and its location is only accurate to 1 km. A second borehole, drilled in 1973 is recorded 1.5 km to the north of the site at Clonroosk; the accuracy of this location is also 1 km so it could be closer or further from the site. The use of this well is not known but its yield is recorded as being poor. There are no other wells recorded within 1 km of the site.

Enva is not aware of any abstraction boreholes within the immediate vicinity of their site.

2.4 SITE GROUND CONDITIONS

A total of eight boreholes have been drilled at the site and the general sequence of ground conditions is presented in **Table 2.1**.

Table 2.1 – Ground Conditions

Strata	Extent	Thickness	Description
Made Ground	BH104	0-3.5 m	Predominantly concrete, with hardcore fill, and clay.
Boulder Clay	All boreholes	<8.5 m	Includes fine to medium, well rounded gravels.
Sand and Gravel	Confined to south east corner of site (BH101, BH104 and MW03)	0-2 m	In general the transition from boulder clay to sand is gradual with changes from gravel, to sandy gravel, to sand.
Limestone Bedrock	Encountered in MW01, MW02 and MW03	Top of limestone ranges from 7.7m to 9m below ground level.	Pale grey, fine-grained bedrock, differentiated from boulders by its un-weathered nature.

The logs for each of the boreholes were previously presented as Appendix B in the RPS Groundwater Risk Assessment Report (Ref: MDE0788Rp0001).

2.4.1 Licence Conditions

The Industrial Emissions Licence requires the regular monitoring and sampling of boreholes BH101, BH102, BH103, BH104B, MW01, MW02, MW03 and MW04. The parameters requiring measurement or analysis are presented in **Table 2.2**.

Table 2.2 – Licence Parameters

Group	Parameters requiring Quarterly Measurement	Parameters requiring Annual Measurement
Field Parameters	Groundwater Level pH Temperature Dissolved Oxygen Electrical Conductivity Visual Inspection	Groundwater Level pH Temperature Dissolved Oxygen Electrical Conductivity Visual Inspection
Organics	Mineral Oil BTEX & MTBE PAHs Phenols VOCs SVOCs	Mineral Oil BTEX & MTBE PAHs Phenols VOCs SVOCs
Inorganics	-	Total Alkalinity, Calcium, Manganese, Sulphate, Cyanide (Total), Chloride, Sodium,

3 METHODOLOGY

Groundwater samples were collected from 8 no. on-site groundwater monitoring wells (BH101, BH102, BH103, BH104B, MW01, MW02, MW03, MW04) (**Figure 3.1**) using dedicated Waterra tubing, in accordance with RPS's standard sampling protocol. A non-return foot valve was fixed to the bottom of the tubing and inserted into the well, close to the base of the borehole. Separate tubing and foot valves were used at each monitoring well to eliminate the possibility of cross contamination.

Groundwater in the well casing is not considered representative of the groundwater quality at a given location. For this reason, three well volumes were purged from each well prior to collection of the groundwater sample. By the time purging was complete all field test water parameters (namely pH, Temperature, Electrical Conductivity and Dissolved Oxygen) were within 10% variance in three consecutive measurements. This ensured that the groundwater sample extracted from the monitoring borehole was representative of the water held in the subsurface strata and not water held stagnant in the borehole casing. The purged volumes were calculated on-site from the measured static water levels and total well depths using an electronic dip meter.

Groundwater samples were collected in laboratory supplied containers and stored in chilled cool boxes following sampling and during transit to the laboratory. A rigorous chain of custody procedure was used during the sample round.

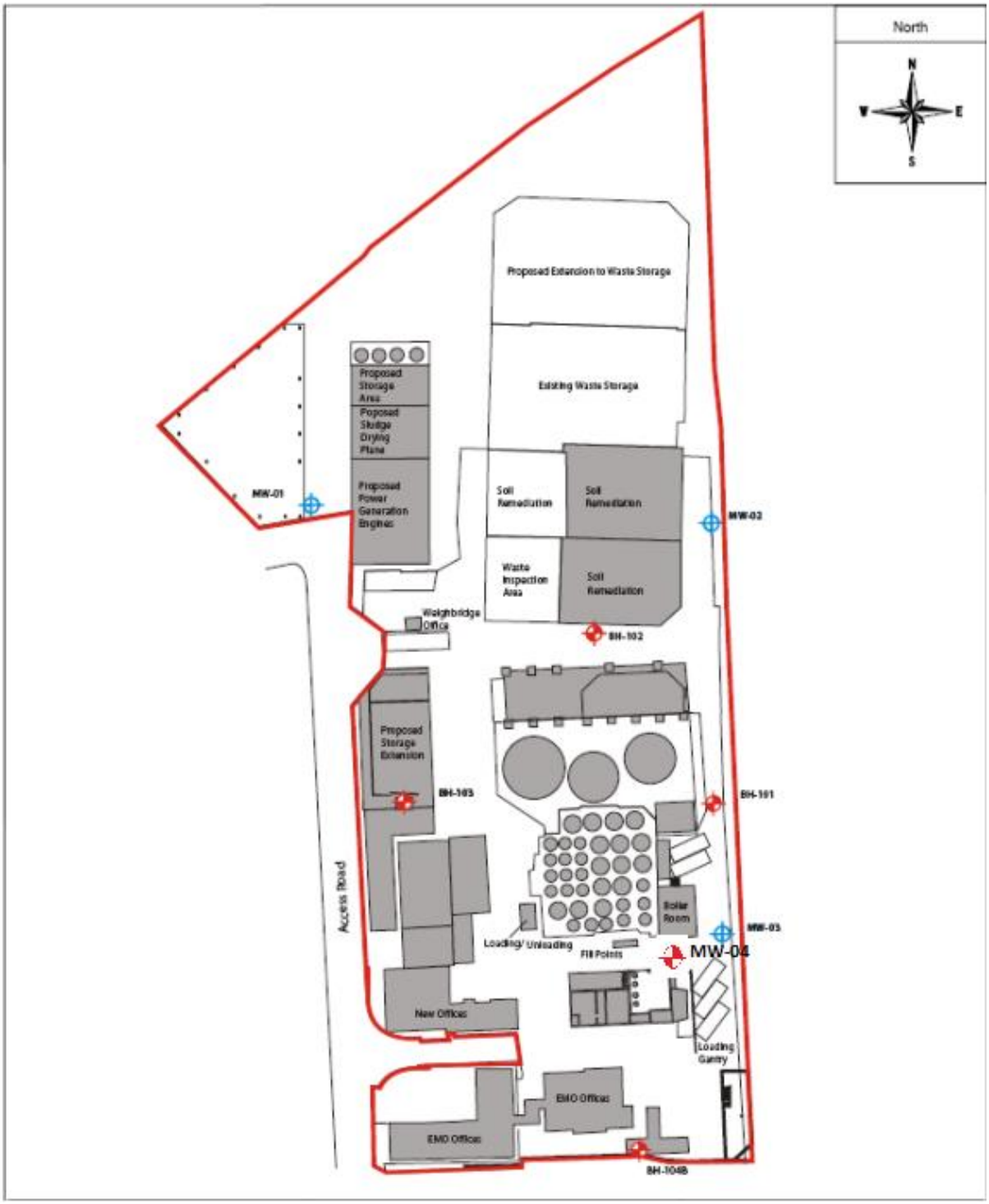
3.1 LABORATORY ANALYSIS

All groundwater samples were analysed at a UKAS accredited laboratory, ALS Environmental for the suite of analyses listed in **Table 3.1**. **Table 3.1** also indicates the analytical techniques used by the laboratory.

Table 3.1 – Analytical Methodologies – ALS Environmental

Parameter	Analytical Methodology
Phenols	GC-MS
Speciated PAHs	GC-MS
BTEX & MTBE	Headspace GC-MS
Petroleum Hydrocarbons	Headspace GC-MS
Volatile Organic compounds & Tentatively Identified Organic Compounds (VOCs & TICs)	Headspace GC-MS
Semi-Volatile Organic compounds & Tentatively Identified Organic Compounds (SVOCs & TICs)	GC-MS

Figure 3.1 – Site Layout Plan with Groundwater Monitoring Locations



Shallow Monitoring Well locations

Deep Monitoring Well locations

Source: *URS Environmental Consultants (Ref: 45078497 Issue No. 1)*

3.2 PRESENTATION & INTERPRETATION OF RESULTS

The Quarter 3 2017 results are tabulated in **Section 4** and discussed with respect to previous results in **Section 5**. Results are compared against Groundwater Threshold Values (GTVs) outlined in the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No 9 of 2010), where available. Where GTVs are not available for parameters, results are compared against the Interim Guideline Values (IGVs) set out in the Environmental Protection Agency interim report, 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland'.

Previous monitoring reports (as listed in **Section 2.1**) provide details of contaminant concentrations since 2004. The data available within these reports has been reviewed and time series plots of key parameters have been compiled. Trends for chlorinated solvents, petroleum hydrocarbons and phenol parameters have been plotted.

Time series plots are presented in **Section 6** and include the results of this Quarter 3 2017 monitoring round. As the monitoring continues in accordance with the Industrial Emissions licence requirements, the plots will be updated with the results of subsequent rounds used to illustrate the results.

Time series plots are also provided for manual water levels where available from previous reports.

4 QUARTER 3 RESULTS AUGUST 2017

The results of all field measurements and laboratory analysis are presented in this section. Satisfactory calibration of the Dissolved Oxygen meter was unable to be achieved on the day of monitoring. This resulted in a lack of field measurements. Results are primarily compared against Groundwater Threshold Values (GTVs) outlined in the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No 9 of 2010), where available. Where GTVs are not available for parameters, results are compared against the Interim Guideline Values (IGVs) set out in the Environmental Protection Agency interim report, '*Towards Setting Guideline Values for the Protection of Groundwater in Ireland*'.

The results are discussed in relation to appropriate guideline values in **Section 5**. Results that are shown to be above the relevant threshold or guideline values are highlighted in bold and shaded. Results that are shown to be above the relevant laboratory detection limits are highlighted in italics.

Site-specific field parameter measurements were collected during the site visit as per RPS Water sampling protocol.

Table 4.1 – Groundwater Levels (Quarter 3, 2017)

Monitoring Well	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04
Depth (mbgl)	6.68	6.41	4.40	4.71	22.56	30.84	9.72	6.42
Static Water Level (mbgl)	4.19	3.21	1.75	0.49	2.36	3.62	4.01	3.89
Ground Level (mAOD)	103.06	102.55	101.16	101.52	102.10	103.12	102.77	-
Water Level (mAOD)	98.87	99.34	99.41	101.03	99.74	99.50	98.76	-
Free Phase Oil (mm)	No detection	No detection	No detection	No detection	No detection	No detection	No detection	No detection

mbgl = metres below ground level

Table 4.2 – Results of Field Parameters Measured at each Groundwater Monitoring Well (Quarter 3, 2017)

Monitoring Well	pH (pH Units)	Temperature (°C)	Conductivity (µS/cm)	Dissolved O_2 (ppm)	Observations
BH101	7.63	11.1	**1011**	-	Light cloudy brown colour, some sediment
BH102	8.21	12.0	873	-	Clear but slight sheen, some suspended solids
BH103	8.02	11.9	878	-	Light grey colour, little sediment
BH104B	7.28	11.3	775	-	Light cloudy colour, clearer after 10L, slight oil sheen and initial odour
MW01	7.54	12.4	809	-	Dark cloudy brown colour, some sediment
MW02	7.99	12.7	765	-	Slight cloudy brown colour, clearer after 15L. Very little suspended solids
MW03	7.33	13.1	**1352**	-	Cloudy grey colour on purging, some suspended solids and fine sediment
MW04	7.41	12.2	**1421**	-	Cloudy light brown colour with high level of sediment
Groundwater Threshold Value	-	-	1875	-	-
Interim EPA Guideline Values (Units as indicated)	>6.5 & <9.5	25°C	1000	No abnormal change	-

Note: Results above the relevant IGV are highlighted in bold.
Note: Results above the GTV are highlighted in bold and shaded.

Table 4.3 – Results of BTEX and MTBE

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Benzene	µg/l	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	0.75	1.0
Toluene	µg/l	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	-	10
Ethylbenzene	µg/l	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	-	10
m & p-xylene	µg/l	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	-	10 Note 1
o-xylene	µg/l	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	-	10 Note 1
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1.00	<1.00	<1.00	***1.2***	<1.00	<1.00	<1.00	***2.7***	***2***	-	30

Note: No specific IGV for parameter. IGV for Total Xylenes is used as guideline.
Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

Table 4.4 – Results of Speciated PAHs

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Naphthalene	µg/l	0.01	<0.01	<0.01	***0.04***	***0.024***	<0.01	<0.01	<0.10	***0.161***	-	1.0
Acenaphthylene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	-	-
Acenaphthene	µg/l	0.01	<0.01	<0.01	***0.054***	***0.03***	<0.01	<0.01	<0.10	<0.10	-	-
Fluorene	µg/l	0.01	<0.01	<0.01	***0.013***	***0.053***	<0.01	<0.01	<0.10	<0.10	-	-
Phenanthrene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	***0.017***	<0.01	<0.10	<0.10	-	-
Anthracene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	-	10,000
Fluoranthene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	***0.052***	<0.01	<0.10	<0.10	-	1.0
Pyrene	µg/l	0.01	<0.01	<0.01	<0.01	***0.032***	***0.038***	<0.01	<0.10	<0.10	-	-
Benzo(a)anthracene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	-	-
Chrysene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	***0.014***	<0.01	<0.10	<0.10	-	-
Benzo(b)fluoranthene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	***0.012***	<0.01	<0.10	<0.10	-	0.5

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Benzo(k)fluoranthene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	-	0.05
Benzo(a)pyrene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	-	0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	-	0.05
Dibenz(a,h)anthracene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	-	-
Benzo(g,h,i)perylene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	***0.013***	<0.01	<0.10	<0.10	-	0.05
Total EPA-16 PAHs	µg/l	0.1	<0.01	<0.01	**0.108**	**0.139**	**0.145**	<0.01	<0.10	**0.161**	0.075	0.1

Note: Results above the relevant IGV are highlighted in bold.
Note: Results above the GTV are highlighted in bold and shaded.
Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

Table 4.5 – Results of Speciated Phenols

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Phenol	µg/l	5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	-	0.5
2,4,6-Trichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	200
2,4-Dichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2,4-Dimethylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Chlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	200
2-Methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Nitrophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
4-Chloro-3-methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
3+4-Methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-

Table 4.6 – Results of Semi-Volatile Organic Compounds (SVOCs)

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Phenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.5
2-Chlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	200
Bis(2-chloroethyl)ether	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,3-Dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2-Dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
1,4-Dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Bis(2-chloroisopropyl)ether	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Hexachloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Nitrobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
3&4-Methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Isophorone	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Nitrophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2,4-Dimethylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Bis(2-chloroethoxy)methane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2,4-trichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.40
Naphthalene	µg/l	2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	1.0
2,4-Dichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Hexachlorobutadiene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.10
4-Chloro-3-methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2,4,6-Trichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	200
2,4,5-Trichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Methylnaphthalene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Chloronaphthalene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Dimethylphthalate	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
2,6-Dinitrotoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Acenaphthylene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Acenaphthene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2,4-Dinitrotoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Dibenzofuran	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
4-Chlorophenyl phenyl ether	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Diethylphthalate	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	***1.4***	<1.0	<1.0	<1.0	-	-
Fluorene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
4-Bromophenyl phenyl ether	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Hexachlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.03
Phenanthrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Anthracene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10,000
Pyrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzyl Butyl Phthalate	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzo(a)anthracene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Chrysene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzo(b)fluoranthene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.5
Benzo(k)fluoranthene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.05
Benzo(a)pyrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.01
Indeno(1,2,3-c,d)pyrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.05
Dibenz(a,h)anthracene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzo(g,h,i)perylene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Bis(2-ethylhexyl)phthalate	µg/l	5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	-	-

Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

Table 4.7 – Results of Volatile Organic Compounds (VOCs)

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Chloromethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Chloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	***10***	-	-
Bromomethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Vinyl Chloride	µg/l	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.375	-
Trichlorofluoromethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,1-dichloroethene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	30
1,1-dichloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	***1.7***	***3.3***	-	-
Cis-1,2-dichloroethene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1.0	<1.0	<1.0	***1.2***	<1.0	<1.0	<1.0	***2.7***	***2***	-	30
2,2-Dichloropropane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,1,1-Trichloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	500
1,2-dichloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.25	-
1,1-Dichloropropene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Trans-1,2-dichloroethene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	1.0
1,2-dichloropropane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Trichloroethene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	70
Dibromomethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Bromodichloromethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Cis-1,3-dichloropropene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Trans-1,3-dichloropropene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Toluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
1,1,2-Trichloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,3-Dichloropropane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Dibromochloromethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Tetrachloroethene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	40
1,2-Dibromoethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Chlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	1.0
1,1,1,2-Tetrachloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Ethylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
m&p-Xylene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
Styrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
o-xylene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
Isopropylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Bromobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
N-Propylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Chlorotoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
4-Chlorotoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,3,5-Trimethylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Tert-Butylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2,4-Trimethylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Sec-Butylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,3-dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
P-Isopropyltoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2-dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
1,4-dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
n-Butylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2-Dibromo-3-chloropropane	µg/l	1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	-
1,2,4-Trichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.40
Hexachlorobutadiene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.10

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
1,2,3-Trichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-

Note: Results above the relevant IGV are highlighted in bold.
Note: Results above the GTV are highlighted in bold and shaded.
Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

Table 4.8 – Results of Total Petroleum Hydrocarbons (Aliphatic/Aromatic)

Parameter	Units	Laboratory Limit of Detection	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	MW04	GTV	IGV
Aliphatic > C10-C12	µg/l	10	<40	<10	<40	<10	<40	<10	<40	<10	-	-
Aliphatic > C12-C16	µg/l	10	<40	<10	<40	<10	<40	<10	<40	<10	-	-
Aliphatic > C16-C35	µg/l	10	<40	<10	***177***	<10	***120***	<10	***61***	<10	-	-
Aliphatic > C35-C44	µg/l	10	<40	<10	<40	<10	<40	<10	<40	<10	-	-
Aliphatic > C10-C44	µg/l	10	<40	<10	**177**	<10	**120**	<10	**61**	<10	-	10
Aromatic > C10-C12	µg/l	10	<40	<10	<40	<10	<40	<10	<40	***17***	-	-
Aromatic > C12-C16	µg/l	10	<40	<10	<40	<10	<40	<10	<40	***24***	-	-
Aromatic > C16-C21	µg/l	10	<40	<10	<40	<10	<40	<10	<40	<10	-	-
Aromatic > C21-C35	µg/l	10	<40	<10	***71***	<10	<40	<10	***40***	<10	-	-
Aromatic > C35-C44	µg/l	10	<40	<10	<40	<10	<40	<10	<40	<10	-	-
Aromatic > C10-C44	µg/l	10	<40	<10	**71**	<10	<40	<10	**40**	**41**	-	10

Note: Results above the relevant IGV are highlighted in bold.
Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

5 DISCUSSION OF QUARTER 3 RESULTS

The results of the Quarter 3 monitoring event for 2017 are presented in **Table 4.1** to **4.8** of this report. For the purpose of this report, the results are compared against the Groundwater Threshold Values (GTVs) outlined in the European Communities Environmental Objectives (Groundwater) Regulations (S.I. No. 9 of 2010) where available. Where GTVs are not available results are compared against the EPA Interim Guideline Values (IGV) as set out in the Interim Report *'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' 2004.* A discussion of the results and their significance is included below.

5.1 FIELD PARAMETERS

The results of the field parameters measured at each groundwater monitoring well are presented in Table 4.2. Groundwater samples recorded pH levels ranging between 7.28 and 8.21, all within the EPA Interim guideline range of ≥6.5 to ≤9.5. Temperature measurements ranged from 11.1°C to 13.1°C and were below the EPA IGV of 25°C.

Field measurements of Electrical Conductivity levels ranged between 765 µS/cm and 1421 µS/cm. Three measurements of Electrical Conductivity were above the IGV of 1000 µS/cm at BH101 (1011 µS/cm), MW03 (1352 µS/cm) and MW04 (1421 µS/cm), but all however were below the GTV limit of 1875 µS/cm.

Satisfactory calibration of the Dissolved Oxygen meter was unable to be achieved on the day of monitoring. This resulted in a lack of field measurements.

Observations relating to colour and odour varied from well to well as detailed in **Table 4.2**.

5.2 RESULTS OF BTEX & MTBE

The results of the **BTEX** and **MTBE** analysis are presented in **Table 4.3**. BTEX concentrations are below the limit of detection at all locations. MTBE was detected at BH103 (1.2 µg/l), MW03 (2.7 µg/l) and MW04 (2.0 µg/l), however these concentrations were below the IGV of 30 µg/l. MTBE was below the laboratory limit of detection and IGV at all other locations.

Previous detections of MTBE was in the Quarter 2 monitoring event of 2017 and recorded concentrations above the laboratory limit of detection at BH103 (0.81 µg/l), MW03 (1.73 µg/l) and MW04 (1.73 µg/l). MTBE was also above the laboratory limit of detection at MW03 (2.4 µg/l) and MW04 (1.2 µg/l) during Quarter 1 2017, at MW03 (1.5 µg/l) and MW04 (1.2 µg/l) during Quarter 4 2016, and at MW03 (1.2 µg/l) during Quarter 3 2016. These detections are still below the IGV limit however. Prior to this there was a detection of MTBE at BH104B in the Quarter 1 monitoring event of 2012 with a recorded concentration of 280 µg/l which is above the laboratory limit of detection. This was the only recorded exceedance in Quarter 1 2012.

Monitoring during Quarter 1 and Quarter 2 of 2010 detected exceedances of MTBE at BH103 at a concentration of 16 µg/l. Subsequent monitoring in 2010 recorded concentrations below the laboratory limit of detection. Prior to these 2010 monitoring events, concentrations of MTBE at BH103 were recorded at 63 µg/l in December 2009.

5.3 RESULTS OF SPECIATED POLYCYCLIC AROMATIC HYDROCARBONS (PAHS)

The results of the Speciated PAH analysis during this monitoring period are presented in **Table 4.4.**

The laboratory limit of detection for Total EPA-16 PAHs is 0.1 µg/l and has been lowered for comparison with the EPA IGV of 0.1 µg/l; however this is not accredited. This laboratory limit of detection is above the EPA GTV of 0.075 µg/l. To identify the compounds, which attributed to these concentrations, speciated PAH analysis was carried out, which reduces the limit of detection for individual parameters to 0.01 µg/l.

Total polycyclic aromatic hydrocarbons were above the IGV limit of 0.1 µg/l at BH103 (0.108 µg/l), BH104B (0.139 µg/l), MW01 (0.145 µg/l), and MW04 (0.161 µg/l). Total PAHs were below the IGV of 0.1 µg/l and the GTV of 0.075 µg/l at all other locations.

Total PAHs were previously detected above the IGV at BH103 (0.127 µg/l), MW03 (0.11 µg/l) and MW04 (0.194 µg/l) during Quarter 2 2017, at MW01 (0.121 µg/l), MW03 (0.47 µg/l) and MW04 (0.148 µg/l) during the Quarter 1 2017, and at BH102 (0.124 µg/l) and MW03 (0.596 µg/l) during the Quarter 4 2016 monitoring event.

The results of the speciated polycyclic aromatic hydrocarbon analysis detected a number of different compounds in BH103, BH104B, MW01 and MW04 above the laboratory limit of detection. However none of these compounds were above their respective IGV limits at any location.

5.4 RESULTS OF SPECIATED PHENOLS

During previous quarterly monitoring events and sample analysis, total monohydric phenol was determined and historically has been below the laboratory limit of detection of 10 µg/l since December 2008. It should be noted that the laboratory limit of detection was however above the IGV of 0.5 µg/l for phenols.

For this reason, samples were analysed for phenols to include chlorophenols. The results of the speciated phenols analysis are presented in **Table 4.5**. The speciated phenol analysis reduces the laboratory limit of detection to 1.0 µg/l for individual parameters.

The results of the current Quarter 3 2017 speciated phenol analysis confirm concentrations of phenols were below the laboratory limit of detection of 1.0 µg/l at all locations.

2-Methylphenol (3.48 µg/l) and 3+4-Methylphenol (2.19 µg/l) in MW03 were detected above the laboratory limit of detection during Quarter 1 2017, and 4-Chloro-3-methylphenol at BH104B (1.37 µg/l) above the laboratory limit of detection during the Quarter 1 2015 analysis. With the exception of these, all other results are consistent with results since the 2012 quarterly monitoring events.

5.5 RESULTS OF SEMI-VOLATILE ORGANIC COMPOUNDS

The results of the Semi-Volatile Organic Compound analysis are presented in **Table 4.6**.

There are no GTVs for individual SVOC parameters. Diethylphthalate was detected above the laboratory limit of detection at MW01 (1.4 µg/l). However, there is no IGV for Diethylphthalate. No SVOCs were detected above the relevant IGVs during this monitoring period, consistent with the results from the previous 2017, 2016, 2015 and 2014 monitoring periods. It should be noted that the laboratory limit of detection was however above the IGVs for some SVOCs, for example the result for 1,2,4-Trichlorobenzene was <1.0 µg/l but the IGV for this parameter is 0.40 µg/l, but testing at this limit is not accredited.

The Quarter 3 2013 monitoring event detected two SVOC compounds, Acenaphthene (1.1 µg/l) and Fluorene (1.5 µg/l) in MW03. Prior to this detection the Quarter 2 monitoring event of 2012 detected concentrations of Naphthalene and Acenaphthylene in MW03 at concentrations of 2.4 µg/l and 0.12 µg/l respectively.

5.6 RESULTS OF VOLATILE ORGANIC COMPOUNDS

The results of the Volatile Organic Compound analysis are presented in **Table 4.7**.

Chloroethane at MW04 (10 µg/l), 1,1-dichloroethane at MW03 (1.7 µg/l) and MW04 (3.3 µg/l), and MTBE at BH103 (1.2 µg/l), MW03 (2.7 µg/l) and MW04 (2.0 µg/l) were the only compounds detected above the limit of detection during the Quarter 3 2017 monitoring event. However, these are below their respective limits and all other compounds are below their respective laboratory limits of detection.

Historic groundwater monitoring events detected some parameters above the laboratory limit of detection in November 2009, corresponding to Quarter 4 of 2009. Historically 1,1-Dichloroethane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, MTBE, n-butylbenzene, n-propylbenzene, o-xylene, p-isopropyltoluene, sec-butylbenzene and tert-butylbenzene were detected above the laboratory limits of detection, where applicable.

The results of the Quarter 3 and Quarter 4 monitoring events of 2009 and all subsequent monitoring events indicate that there were no other exceedances of the GTVs or IGVs for specific parameters.

5.7 RESULTS OF TOTAL PETROLEUM HYDROCARBONS

In order to provide a more accurate profile of TPH within the groundwater, speciated hydrocarbon analysis using the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG) method was carried out on samples taken at all boreholes. The results of the TPH analysis are presented in **Table 4.8**.

The EPA IGV of 10 µg/l for Total Hydrocarbons is deemed comparable with the results for Total Petroleum Hydrocarbons. Some detections of TPH in both the aliphatic and aromatic range were observed during the current Quarter 3 2017 monitoring event.

Detections were found in samples from the following wells; at BH103 detections were in the aliphatic range C16-C35 (177 µg/l) and in the aromatic range C21-C35 (71 µg/l), at MW01 detections were in the aliphatic range C16-C35 (120 µg/l), at MW03 detections were in the aliphatic range C16-C35 (61 µg/l) and in the aromatic range C21-C35 (40 µg/l), and at well MW04 detections were in the aromatic ranges C10-C12 (17 µg/l) and C12-C16 (24 µg/l).

The previous Quarter 2 2017 monitoring event detected TPH in the wells BH103 in the aliphatic range C16-C35 (50 µg/l), at BH104B in the aliphatic ranges C12-C16 (13 µg/l) and C16-C35 (37 µg/l), and in the aromatic ranges C12-C16 (15 µg/l) and C16-C21 (20 µg/l), at MW02 in the aliphatic range C16-C35 (12 µg/l), at MW03 in the aromatic range C12-C16 (18 µg/l), and at well MW04 in the aromatic range C12-C16 (29 µg/l).

The Quarter 1 2017 monitoring event detected TPH in the wells BH102 in the aliphatic range C16-C35 (11 µg/l), BH103 in the aliphatic range C16-C35 (15 µg/l at MW01 in the aliphatic range C16-C35 (23 µg/l), at MW03 in the aliphatic range C16-C35 (40 µg/l) and in the aromatic range C21-C35 (13 µg/l), and at well MW04 in the aromatic ranges C10-C12 (11 µg/l) and C12-C16 (21 µg/l).

The Quarter 4 2016 monitoring event detected TPH in the wells BH102 in the aliphatic range C16-C35 (13 µg/l), BH103 in the aliphatic range C16-C35 (160 µg/l), C35-C44 (14 µg/l) and in the aromatic range C21-C35 (47 µg/l), BH104B in the aromatic range C12-C16 (12µg/l), MW03 in the aliphatic range C16-C35 (14 µg/l), and MW04 in the aromatic ranges C10-C12 (13 µg/l) and C12-C16 (23 µg/l)

The Quarter 3 monitoring event detected TPH in the well BH103 in the aliphatic range C16-C35 (35 µg/l), C35-C44 (10 µg/l) and in the aromatic range C21-C35 (11 µg/l), at BH104B detections were in the aromatic range C12-C16 (25 µg/l), C16-C21 (12 µg/l) and at well MW04 detections were in the aromatic range C12-C16 (23 µg/l).

The Quarter 2 monitoring event of 2016 detected TPH in the well BH103 were in the aliphatic range C16-C35 (150 µg/l) and in the aromatic range C21-C35 (57 µg/l) and from well MW04 in the aromatic range C12-C16 (20 µg/l).

The Quarter 1 monitoring event of 2016 detected TPH in the aliphatic range C16-C35 (132 µg/l) at BH103 and in the aliphatic range C12-C16 (15 µg/l) at MW04.

The Quarter 4 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 (879 µg/l), C16-C21 (1380 µg/l) and C21-C35 (694 µg/l) at BH104B, C21-C35 at BH103 (60 µg/l) and C10-C12 (13 µg/l) and C12-C16 (21 µg/l) at MW04. TPH concentrations were detected in the aliphatic ranges C10-C12 (495 µg/l), C12-C16 (3080 µg/l) and C16-C35 (3360 µg/l) at BH104B and C16-C35 (231 µg/l) and C35-C44 (14 µg/l).

The Quarter 3 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 (39 µg/l), C16-C21 (37 µg/l) and C21-C35 (28 µg/l) at BH104B, C21-C35 at BH103 (17 µg/l) and C10-C12 (18 µg/l) and C12-C16 (29 µg/l) at MW04. TPH concentrations were detected in the aliphatic ranges C10-C12 (13 µg/l), C12-C16 (40 µg/l) and C16-C35 (62 µg/l) at BH104B and C16-C35 at BH103 (72 µg/l) and MW03 (14 µg/l).

The Quarter 2 monitoring event of 2015 detected TPH in the aromatic range C21-C35 at BH03 (509 µg/l). TPH concentrations were detected in the aliphatic ranges C16-C35 at BH103 (1760 µg/l) and BH104B (337 µg/l), and C12-C16 at BH104B (225 µg/l).

The Quarter 1 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 at wells MW03 (14 µg/l), MW04 (15 µg/l) and BH104B (27 µg/l), C16-C21 at BH104B (15 µg/l), and C21-C35 (14 µg/l) at BH103. TPH concentrations were detected in the aliphatic ranges C16-C35 and C35-C44 at MW03 (46 µg/l and 12 µg/l respectively), BH103 (54 µg/l) and BH104B (11 µg/l.

No detections of TPH in the aliphatic or aromatic range were observed in any shallow or deep monitoring well locations during the Quarter 4 monitoring event of 2014.

The Quarter 3 monitoring event of 2014 detected TPH concentrations in the aliphatic range at the shallow groundwater well BH104B. The TPH concentration detected was 410 µg/l. The speciated TPH ranges that contributed to the value of 410 µg/l were C12-C16 (150 µg/l), C16-C21 (250 µg/l) and C31-C35 (10 µg/l).

The Quarter 3, 2013 monitoring event detected TPH in the aliphatic range in one deep groundwater well, MW03. TPH of the range C10-C12 and C12-C16 were detected at concentrations of 200 µg/l and 190 µg/l respectively.

The Quarter 1, 2013 monitoring event detected aliphatic TPH of the range C12-C16, C16-C21 and C21-C35. TPH in the mid to high aromatic ranges were detected in BH103, BH104B and MW04 during the Quarter 1 2013 monitoring event. Aromatic TPH of the ranges C12-C16, C16-C21 and C21-C35 were detected in BH103, the ranges C10-C12, C12-C16 and C16-C21 were detected in BH104B and aromatic TPH of the ranges C10-C12 and C12-C16 were detected in MW04. These detections are discussed further in **Section 6.2.3**.

6 HISTORICAL RESULTS & TRENDS

Time series plots are presented in this section and include the results of the Quarter 3 2017 monitoring round. As the monitoring continues in accordance with the Industrial Emissions Licence requirements, the plots will be updated with the results of subsequent rounds and used to illustrate the results.

6.1 GROUNDWATER LEVELS OVER TIME

Figure 6.1 to **Figure 6.3** below illustrates the manually recorded water levels using an electronic probe. The graphs show that groundwater levels can vary considerably between monitoring rounds.

Figure 6.2 illustrates groundwater elevations (mAOD) in shallow groundwater wells (BH101 to BH104B) ranging between approximately 98 mAOD and 102 mAOD.

Figure 6.3 illustrates groundwater elevation (mAOD) in the deeper groundwater wells (MW01 to MW03). The groundwater elevation (mAOD) for these deeper groundwater wells ranges from approximately 97.5 mAOD to approximately 100 mAOD.

Figure 6.1 – Ground Elevation (mAOD) in all Monitoring Wells

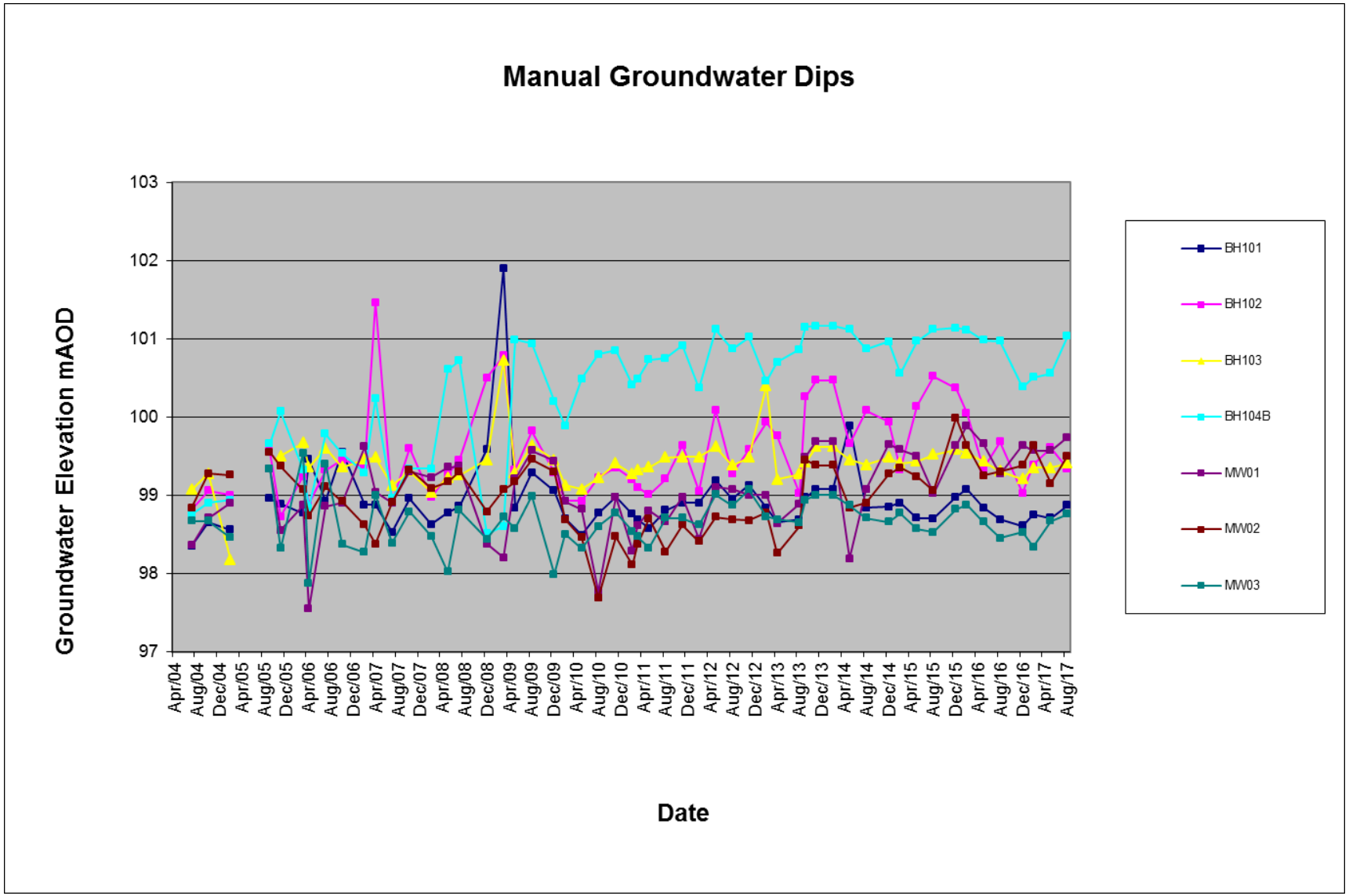


Figure 6.2 – Ground Elevation (mAOD) in Shallow Groundwater Monitoring Wells

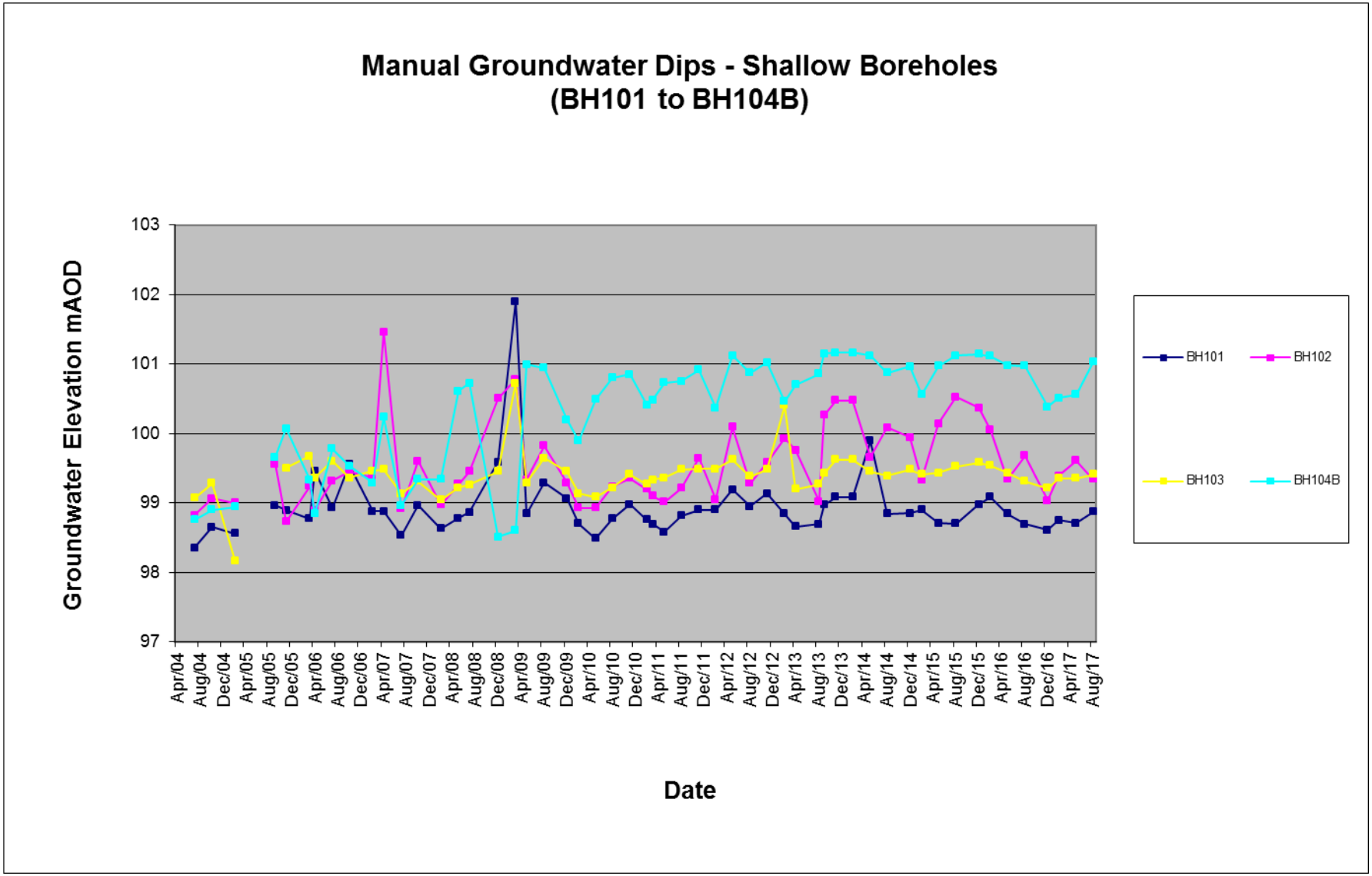
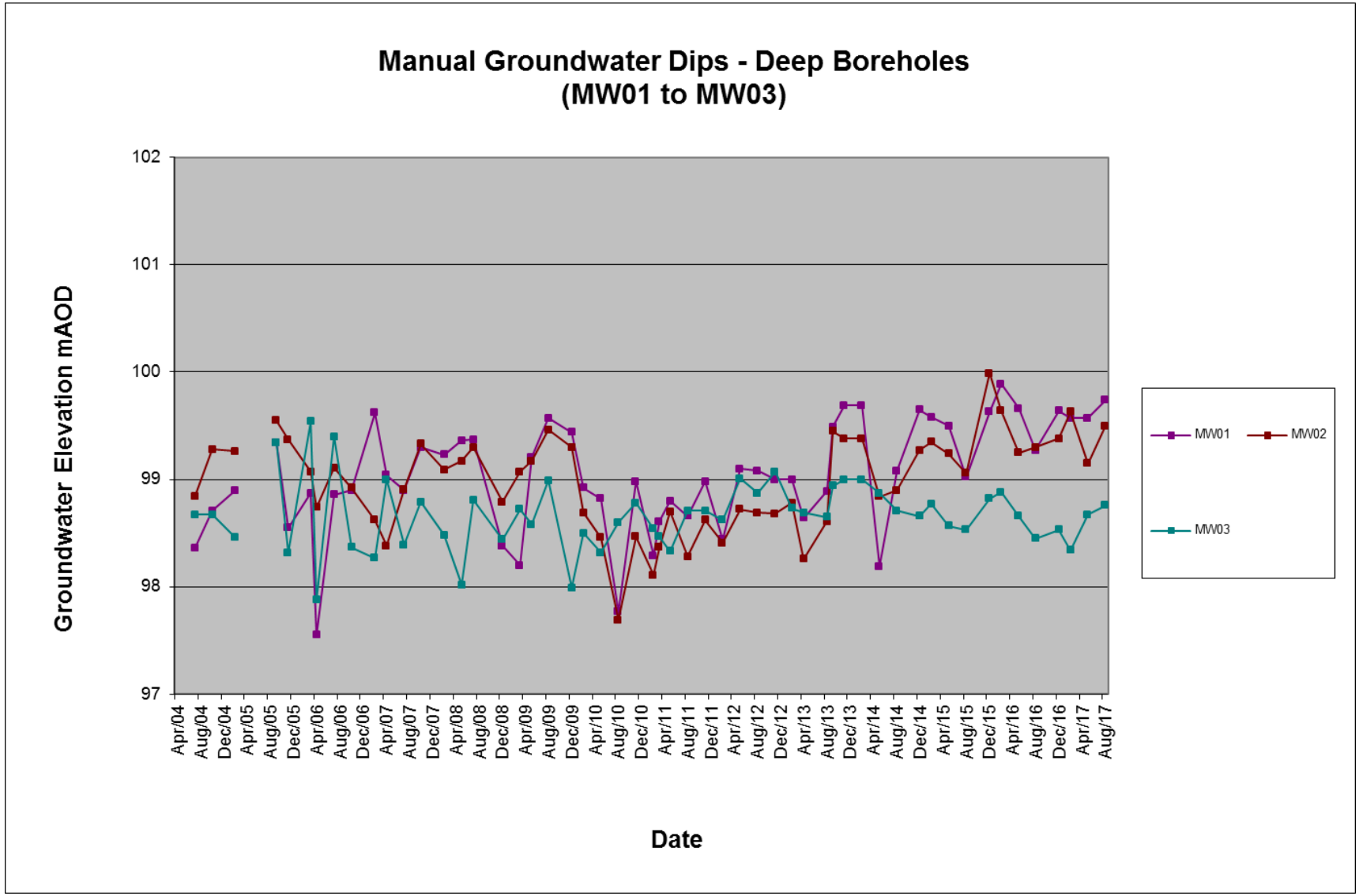


Figure 6.3 – Ground Elevation (mAOD) in Deep Groundwater Monitoring Wells



The groundwater levels generally show a similar pattern of fluctuation over time indicating a degree of connection between boreholes. The graphs demonstrate that groundwater levels can vary considerably between monitoring rounds; the general direction of flow in the shallow and deeper groundwater bearing unit is in an easterly or north easterly direction however there have been some occasional historic cases of groundwater flowing in a south-easterly direction.

In addition, monthly rainfall data for Oak Park, Carlow have been tabulated from Met Éireann to examine the relationship between compounds and rainfall events. The data from Oak Park was chosen as the weather station at Birr, Co. Offaly closed in October 2009. A summary of the rainfall data is in **Tables 6.1** to **6.5**.

Table 6.1 – Monthly Rainfall Data for Year 2013 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Rainfall (mm)	76.2	35.8	57.6	44.4	35.6	37.5	32.3	85.6	24.4	170.0	27.7	136.6

Table 6.2 – Monthly Rainfall Data for Year 2014 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Rainfall (mm)	147.2	176.7	65.0	52.6	78.6	61.9	24.6	122.1	18.2	138.2	165.6	47.7

Table 6.3 – Monthly Rainfall Data for Year 2015 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	66.0	36.3	53.5	26.3	89.4	29.7	79.4	83.0	17.9	56.8	110.0	270.9

Table 6.4 – Monthly Rainfall Data for Year 2016 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	110.9	95.7	40.6	64.3	61.6	61.7	29.6	46.0	97.4	32.3	26.3	80.2

Table 6.5 – Monthly Rainfall Data for Year 2017 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep
Rainfall (mm)	36.3	57.8	66.6	15.8	81.8	91.0	52.7	62.3	91.3

6.2 GROUNDWATER CONCENTRATIONS OVER TIME

Groundwater quality trends have previously been examined in two reports (URS 2005 and RPS 2007). In addition, RPS carried out a groundwater risk assessment (Ref: MDE0788RP0001, dated November 2008) in which the general trend of contaminant concentrations over time was observed to be erratic with compounds rarely being detected in the same borehole on two consecutive monitoring rounds.

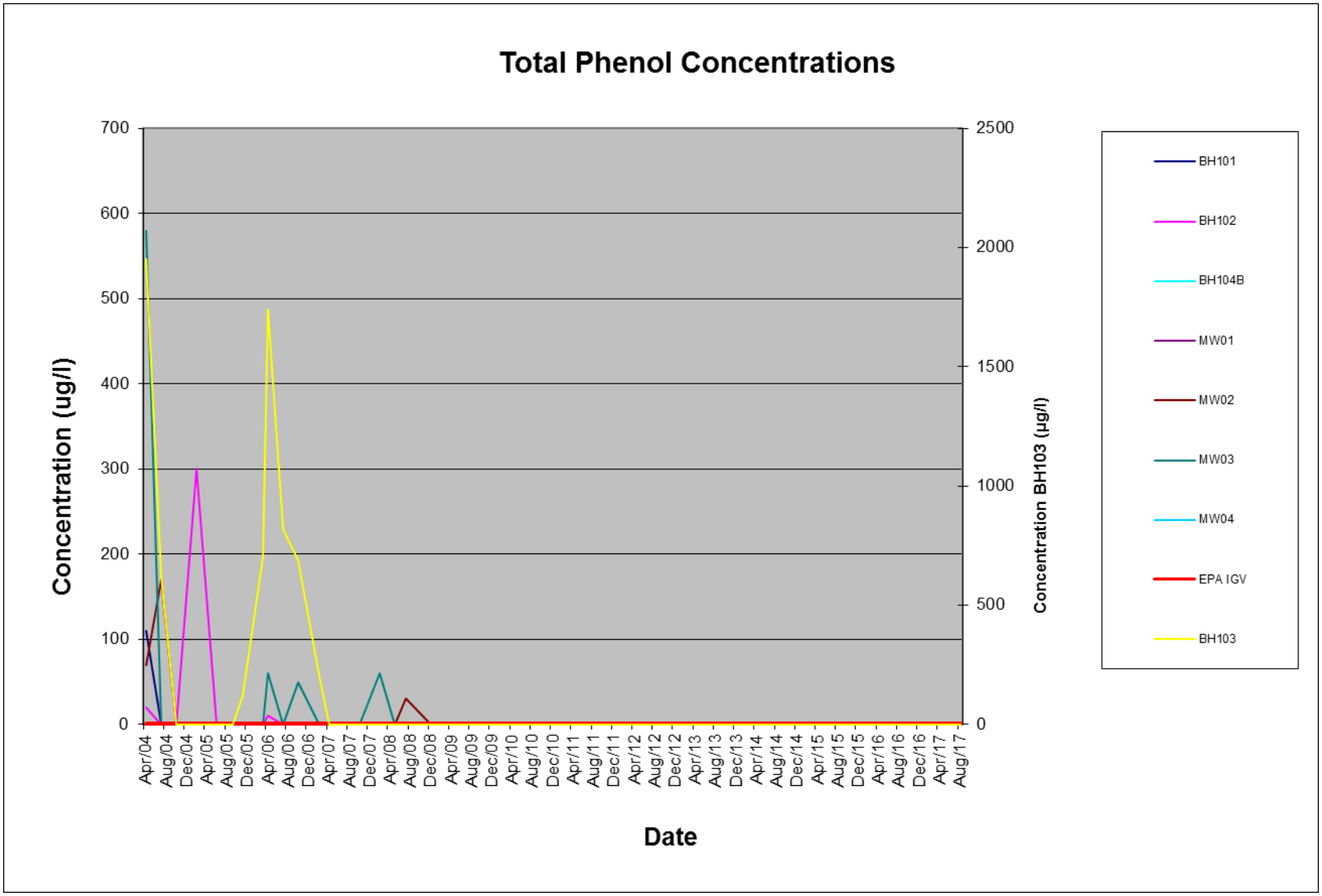
The data available within these reports has been reviewed and time series plots of key parameters have been compiled based on notable trends. Trends for phenols, petroleum hydrocarbons and chlorinated solvents have been plotted as outlined in the following sections.

6.2.1 Phenols

Phenols have been detected historically in all boreholes with the highest concentrations recorded in BH103. However concentrations in BH103 have declined since April 2007. Phenol concentrations have since been recorded below the IGV of 0.5 µg/l in all monitoring wells since December 2008 indicating natural attenuating conditions within the groundwater.

2,4-Dimethylphenol was detected at a concentration of 0.12 µg/l during the Quarter 1, 2010 monitoring event. There is no recommended IGV for this parameter. Subsequent to the Quarter 1 2010 monitoring event no detections of phenols have been noted at any monitoring location up to and including the current Quarter 3 2017 monitoring event, with the exception of 2-Methylphenol (3.48 µg/l) and 3+4-Methylphenol (2.19 µg/l) in MW03 during the Quarter 1 2017 monitoring event. However, there is no IGV or GTV for either of these parameters.

Figure 6.4 – Phenol Concentrations in all Monitoring Wells



6.2.2 Polycyclic Aromatic Hydrocarbons

Figures 6.5 and 6.6 below illustrate that PAHs (Polycyclic Aromatic Hydrocarbons) have previously been detected within all monitoring wells above the recommended EPA IGV of 0.1 µg/l. Historically the highest concentrations have been detected within MW03 and BH104B, with the highest concentration detected in March 2006 (107 µg/l) and in October 2007 (19.72 µg/l) respectively. In addition, a range of PAHs including Benzo(a)pyrene, Benzo(g,h,i)perylene, Indeno(1,2,3)cd pyrene, Fluoranthene and Naphthalene have previously been detected in MW03 with **Figures 6.7** to **6.13** illustrating some of the PAH compounds which were detected above their respective IGVs.

Since 2007 concentrations of PAH have shown a marked decrease and since 2010 detections of PAH have been confined to MW03, MW02 and BH104B. Concentrations of Total PAH above the IGV in 2010 were detected during the Quarter 1 monitoring event in MW03 (0.3 µg/l), Quarter 2 monitoring event in BH104B (1.2 µg/l) and Quarter 3 monitoring event in MW02 (2.0 µg/l) and BH104B (0.2 µg/l). There were no elevated concentrations of Total PAH during the Quarter 4 2010 monitoring event.

No Total PAH detections were recorded throughout 2011 and in Q1 of 2012. Total PAH was detected above the IGV in MW03 in the Q2 2012 monitoring event. No Total PAH exceedances were detected from Quarter 3 2012 to Quarter 4 2013 inclusive. Total PAHs were detected at a concentration of 2.62 µg/l in MW03 during the Q3 2013 monitoring event however; no detections above the laboratory limit were noted during the subsequent monitoring events up to and including the Quarter 2 2015 monitoring event.

Total PAHs were also above the GTV at BH103 (0.093 µg/l), BH104B (0.159 µg/l) and MW03 (0.586 µg/l) during Quarter 3 2015, at BH103 (0.21 µg/l), MW03 (0.986 µg/l) and MW04 (0.079 µg/l) during Quarter 4 2015, and at BH103 (0.123 µg/l), BH104B (0.159 µg/l) and MW04 (0.153 µg/l) during the Quarter 1 2016 monitoring event. Total PAHs were detected above the IGV at BH103 (0.181 µg/l), BH104B (0.158 µg/l), MW03 (0.562 µg/l) and MW04 (0.151 µg/l) during Quarter 3 2016, at BH102 (0.124 µg/l) and MW03 (0.596 µg/l) during Quarter 4 2016, and at MW01 (0.121 µg/l), MW03 (0.47 µg/l) and MW04 (0.148 µg/l) during the Quarter 1 2017 monitoring event. During the previous Quarter 2 2017 monitoring event, Total PAHs were detected above the IGV at BH103 (0.127 µg/l), MW03 (0.11 µg/l) and MW04 (0.194 µg/l).

During the current Quarter 3 2017 monitoring event, Total Polycyclic Aromatic Hydrocarbons were detected above the IGV limit of 0.1 µg/l at BH103 (0.108 µg/l), BH104B (0.139 µg/l), MW01 (0.145 µg/l) and MW04 (0.161 µg/l).

Figure 6.7 illustrates that **Fluoranthene** was previously detected above the IGV of 1.0 µg/l in groundwater monitoring wells BH104B (October 2007, 1.33 µg/l) and MW03 (March 2006, 2.158 µg/l) only. The remaining monitoring wells recorded concentrations below the IGV of 1.0 µg/l. During the Quarter 3 2017 monitoring event Fluoranthene was detected above the limit of detection at MW01 (0.052 µg/l), however this detection does not exceed the IGV of 1.0 µg/l.

A similar trend to Fluoranthene has been noted in **Figure 6.8**, with concentrations of **Naphthalene** recorded above the IGV of 1.0 µg/l in BH104B and MW03 only. 4 no. exceedances of the IGV were noted in BH104B in September 2005 (39 µg/l), March 2006 (1.069 µg/l), July 2006 (1.594 µg/l) and October 2007 (16.31 µg/l). Since October 2007, the concentrations in BH104B have decreased below the IGV. There have been 6 exceedances of the IGV of 1.0 µg/l in MW03, with the highest

concentration detected in March 2006 (19.986 µg/l) and the most recent being the detected in the Quarter 2 2012 monitoring event (2.4 µg/l). The concentrations detected in August 2010 were slightly above the laboratory limit of detection of 0.01 µg/l at BH104B (0.08 µg/l) and MW03 (0.05 µg/l); however these levels are deemed low. Concentrations of Naphthalene were below the EPA IGV limit of detection of 1.0 µg/l at all locations during the Quarter 4 2010, the 2011 and 2012 quarterly monitoring events and the Quarter 1 to Quarter 3 2014 monitoring periods, inclusive. No detections of Naphthalene were noted from the Quarter 4 2014 monitoring event to the Quarter 2 2015 monitoring event. Naphthalene was detected at BH101 (0.011 µg/l) and MW03 (0.031 µg/l) during Quarter 3 2015, and at BH103 (0.095 µg/l) and at MW04 (0.067 µg/l) during Quarter 4 2015.

Naphthalene was detected at BH104B (0.034 µg/l) and MW04 (0.153 µg/l) during the Quarter 1 2016 monitoring event, at BH103 (0.13 µg/l), BH104B (0.039 µg/l), MW03 (0.028 µg/l) and MW04 (0.12 µg/l) during Quarter 3 2016, MW03 (0.036 µg/) during Quarter 4 2016, at BH103 (0.018 µg/l), MW01 (0.041 µg/l) and MW04 (0.12 µg/l) during Quarter 1 2017, and at BH103 (0.066 µg/l), MW03 (0.11 µg/l) and MW04 (0.157 µg/l) during the Quarter 2 2017 monitoring event. During the current Quarter 3 2017 monitoring event, Naphthalene was detected above the laboratory limit of detection at BH103 (0.04 µg/l), BH104B (0.024 µg/l) and MW04 (0.161 µg/l). However, these are all still below the IGV of 1.0 µg/l.

Figure 6.9 illustrates the concentrations of **Benzo(g,h,i)perylene** in all monitoring wells over time. Elevated concentrations above the IGV were recorded at BH104B (0.087 µg/l) on one occasion in March 2006.

Figures 6.10 and 6.11 illustrate elevated concentrations above the IGV recorded at MW03 on 6 no. occasions with the most recent elevated concentration recorded during the Quarter 4 2015 monitoring event (0.053 µg/l). The previous elevated concentration detected was in Quarter 3 2015 (0.053 µg/l). The results of all monitoring events from 2010 to the Quarter 2 2015 monitoring event recorded concentrations below the laboratory limit of detection of 0.01 µg/l at all locations. Concentrations were also below the laboratory limit of detection at all locations during the Quarter 1 2016 monitoring event. Benzo(g,h,i)perylene was recorded in MW02 (0.011 µg/l) during Quarter 2 2016, in BH103 (0.015 µg/l) and MW03 (0.035 µg/l) during Quarter 3 2016, in MW03 (0.036 µg/l) during Quarter 4 2016, and in MW03 (0.037 µg/l) during the Quarter 1 2017 monitoring period. However, these are below the IGV of 0.05 µg/l. During the previous Quarter 2 2017 and current Quarter 3 2017 monitoring events, Benzo(g,h,i)perylene was below the laboratory limit of detection at all locations with the exception of MW01 (0.013 µg/l).

Figures 6.12 and 6.13 illustrate the concentrations of **Benzo(a)pyrene** in all groundwater monitoring wells and indicate that Benzo(a)pyrene has been detected historically in all boreholes above the IGV of 0.01 µg/l. Similarly with the above mentioned trends, the highest concentrations have been detected in MW03 and BH104B. Concentrations have markedly decreased since March 2006 when an elevated concentration of 2.751 µg/l was detected in MW03; however there have been a number of detections above the IGV, with the most recent elevated level detected in December 2009. Elevated concentrations above the IGV were recorded in BH101, BH103 and MW01 during this same period.

The slightly higher concentrations of Benzo(g,h,i)perylene and Benzo(a)pyrene detected in Quarter 4, 2009 may be attributed to heavy rainfall, which occurred in November of 2009 and as a result possibly mobilized traces of these compounds from the soil. The static water levels for December 2009 ranged between 0.58 and 3.78 mbgl. Since December 2009, concentrations of compounds have notably decreased to below the IGVs.

Benzo(a)pyrene was detected above the IGV limit of 0.01 µg/l at MW03 (0.108 µg/l) during the Quarter 4 2015 monitoring event. Benzo(a)pyrene was also detected above the IGV at MW03 (0.052 µg/l) during the Quarter 3 2015 monitoring event. All other results of all monitoring events from 2010 to Quarter 2 2016 monitoring event did not detect other concentrations above the IGV. Benzo(a)pyrene was detected at BH103 (0.04 µg/l) and MW03 (0.037 µg/l) during the Quarter 3 2016 monitoring event, at MW03 (0.032 µg/l) during the Quarter 4 2016 monitoring event, and at MW03 (0.033 µg/l) during the Quarter 1 2017 monitoring event. During the previous Quarter 2 2017 and current Quarter 3 2017 monitoring events, Benzo(a)pyrene was below the IGV of 0.01 µg/l and also below the limit of detection at all locations.

Figure 6.5 – PAH (Total) Concentrations in all Monitoring Wells

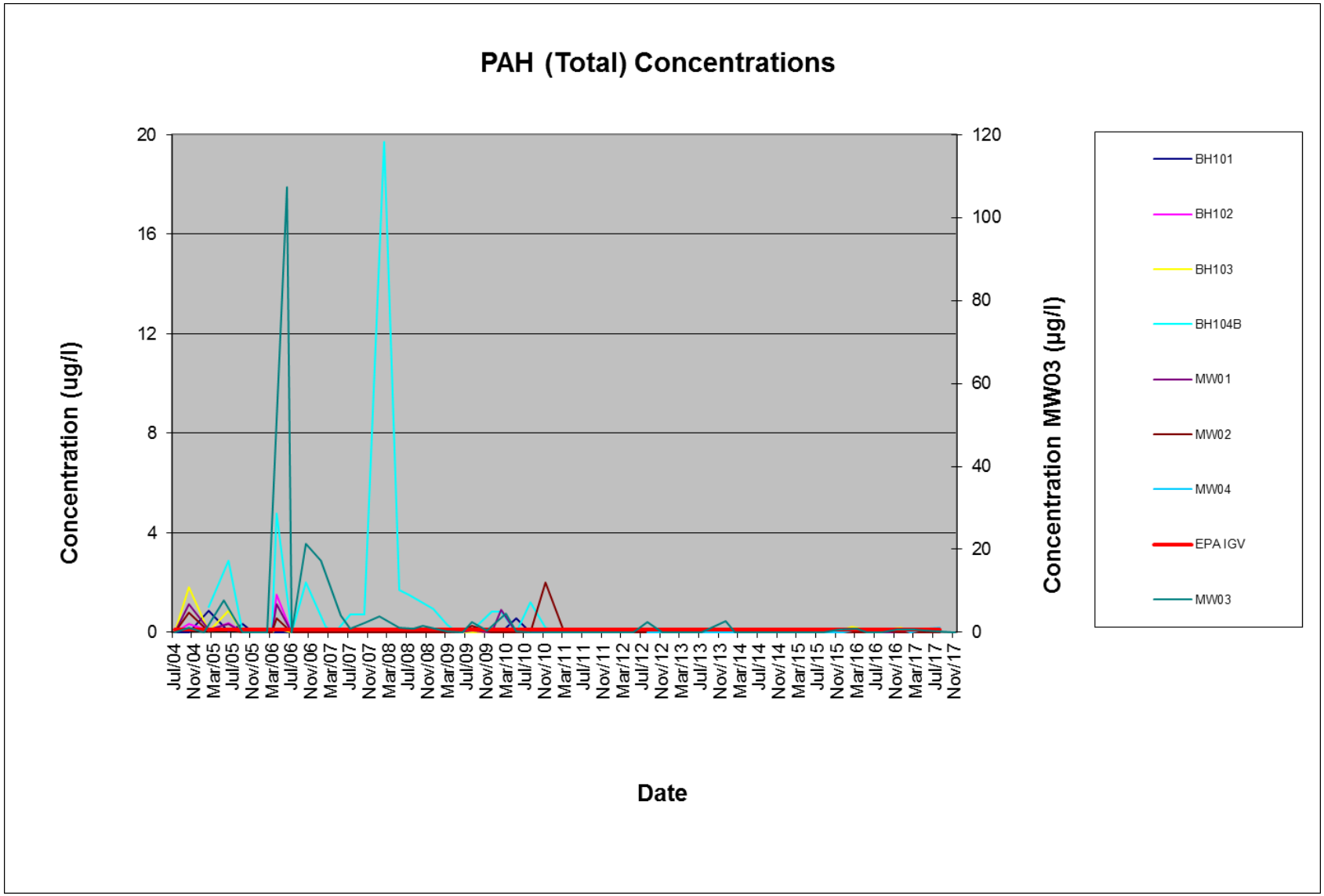


Figure 6.6 – PAH (Total) Concentrations in all Monitoring Wells Since 2010

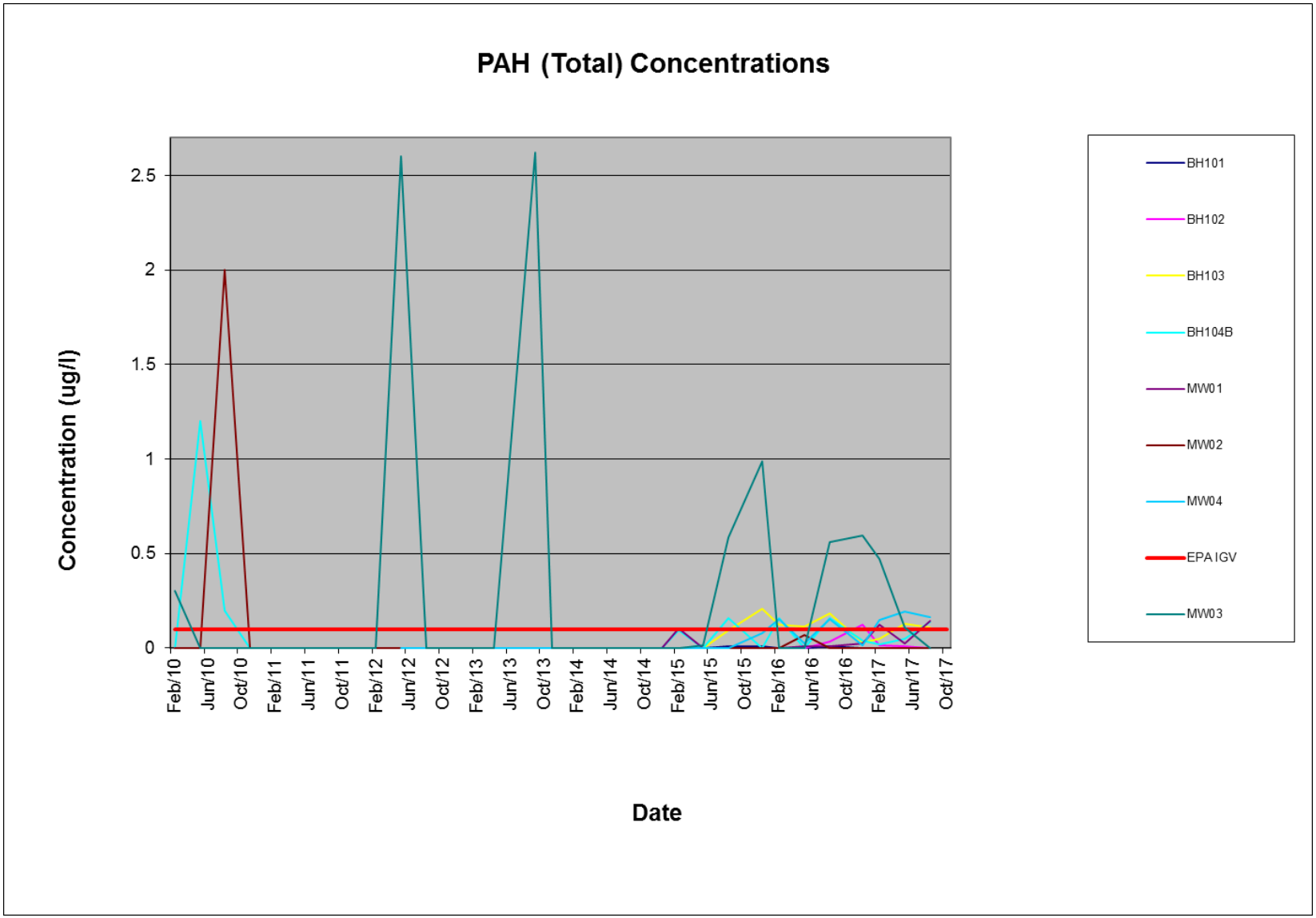


Figure 6.7 – Fluoranthene Concentrations in all Monitoring Wells

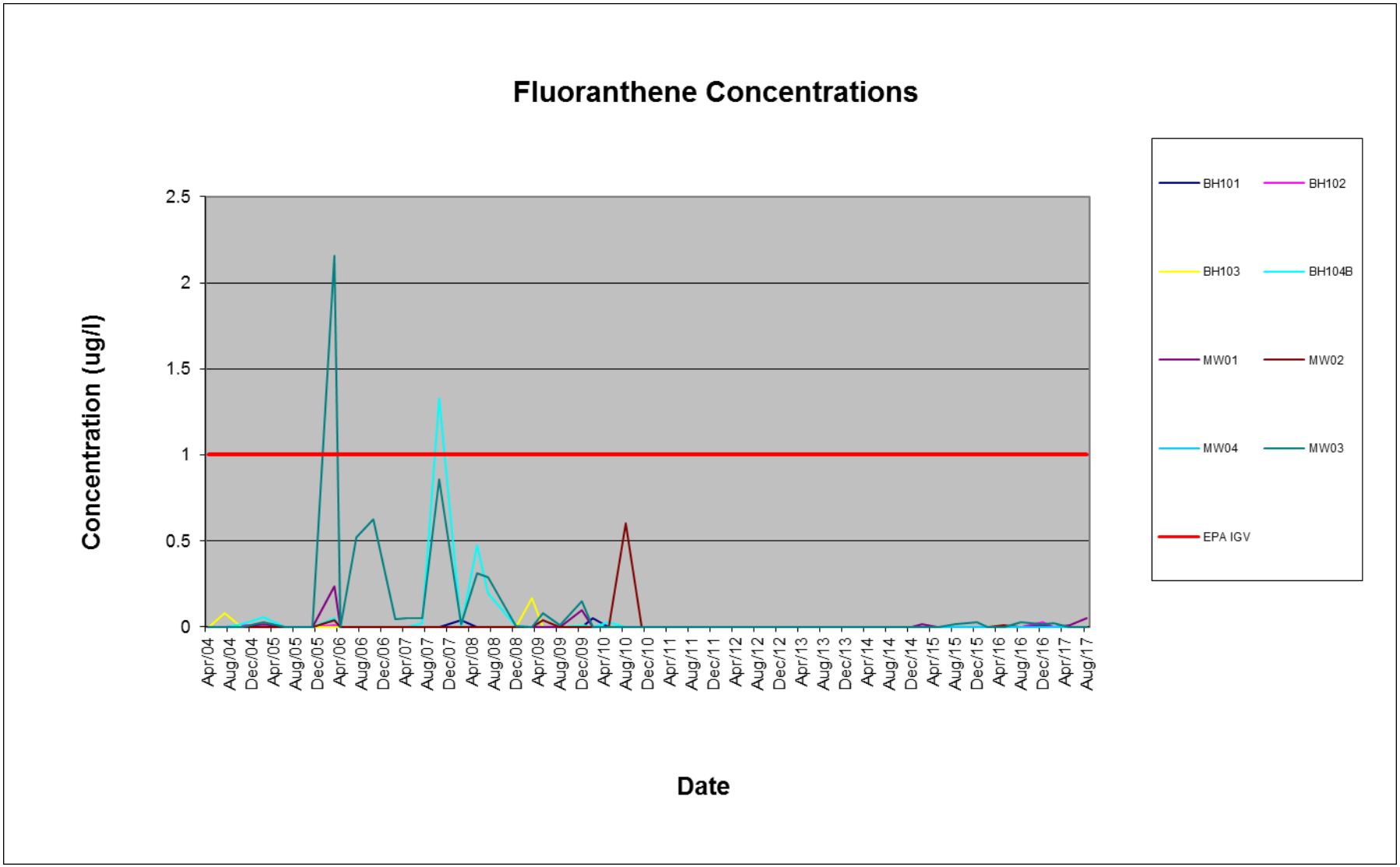


Figure 6.8 – Naphthalene Concentrations in all Monitoring Wells

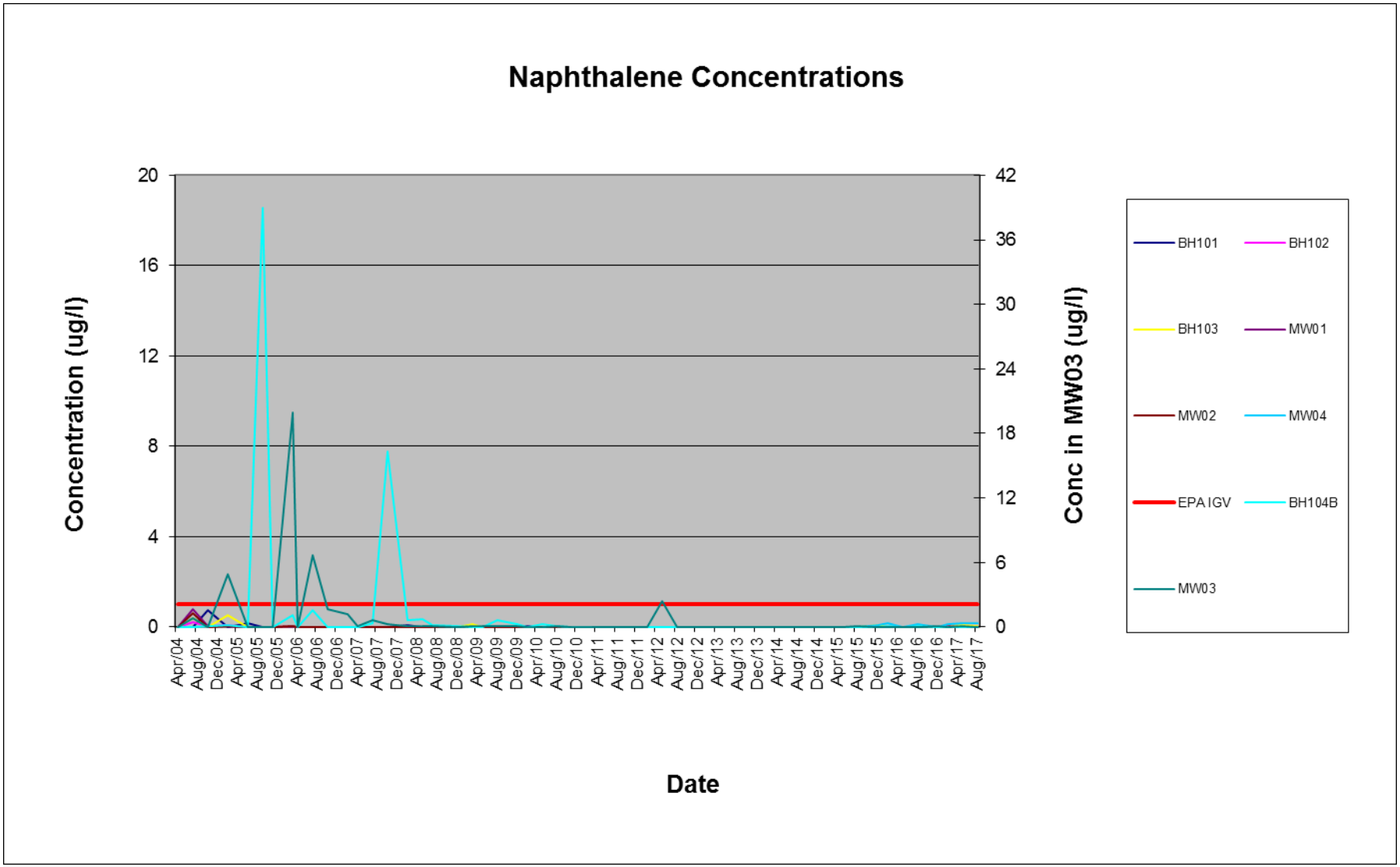


Figure 6.9 – Benzo (g,h,i) perylene Concentrations

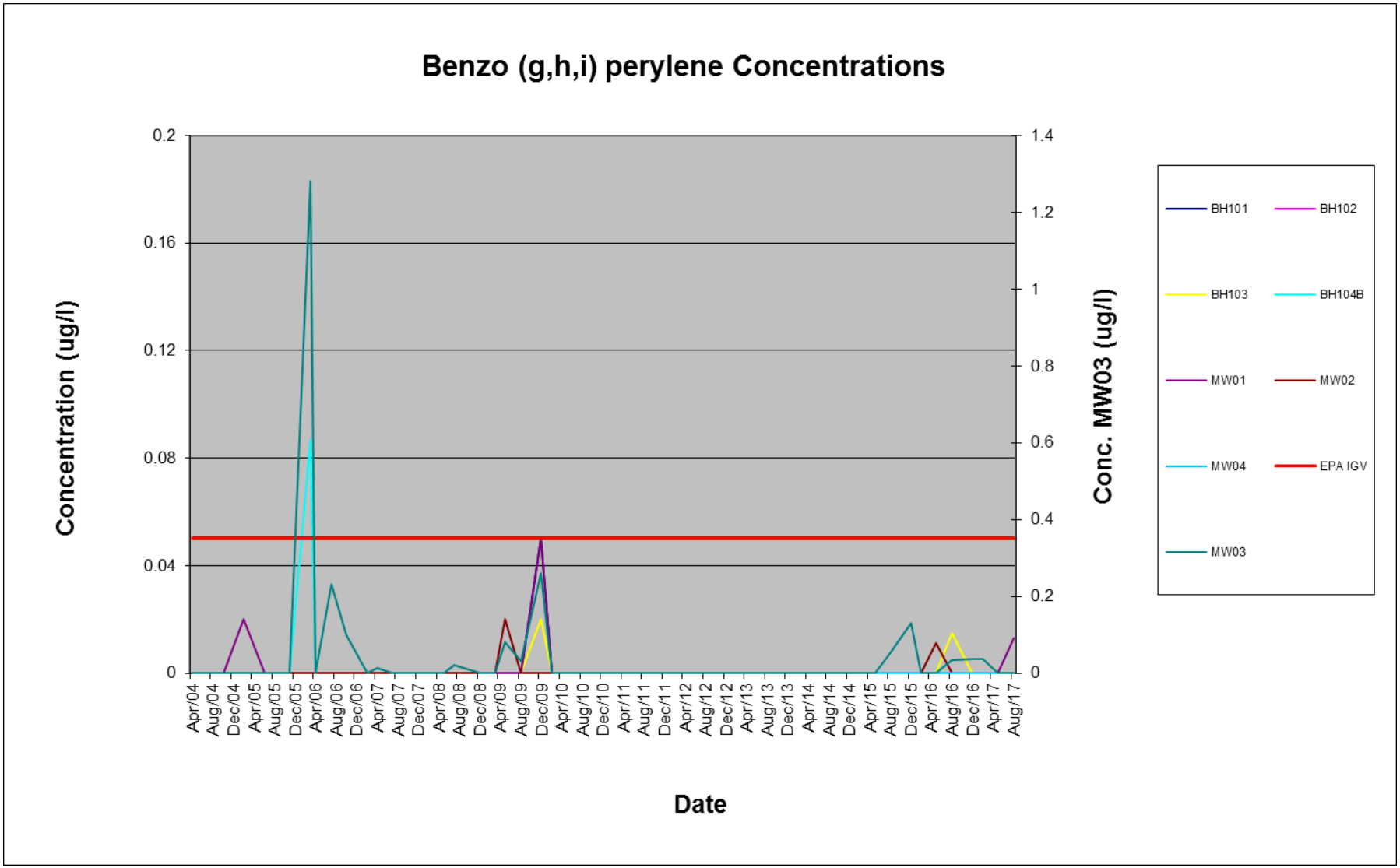


Figure 6.10 – Benzo (g,h,i) perylene in Monitoring Wells BH104B & MW03

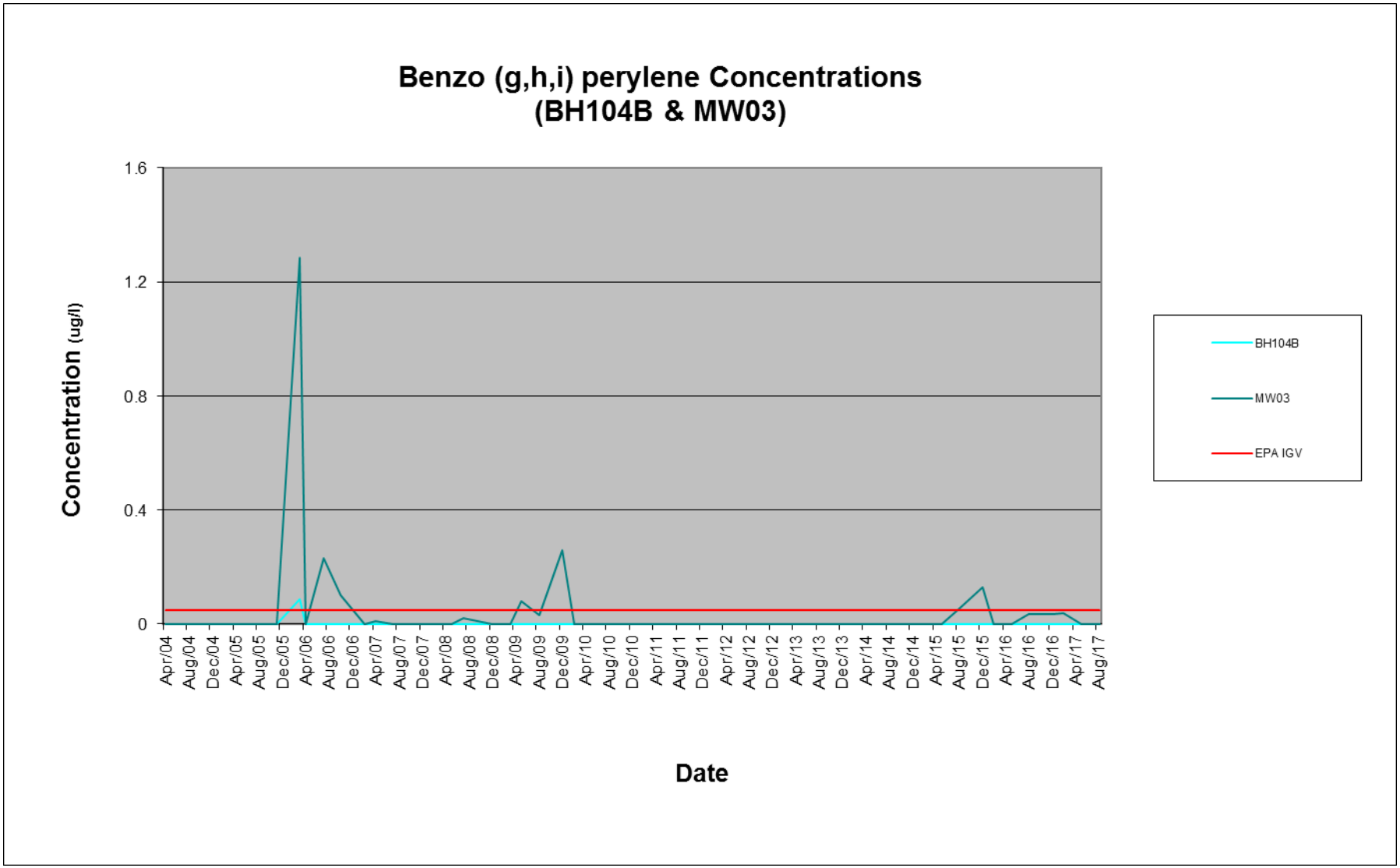


Figure 6.11 – Benzo (g,h,i) perylene in Monitoring Wells BH104B & MW03 Since 2010

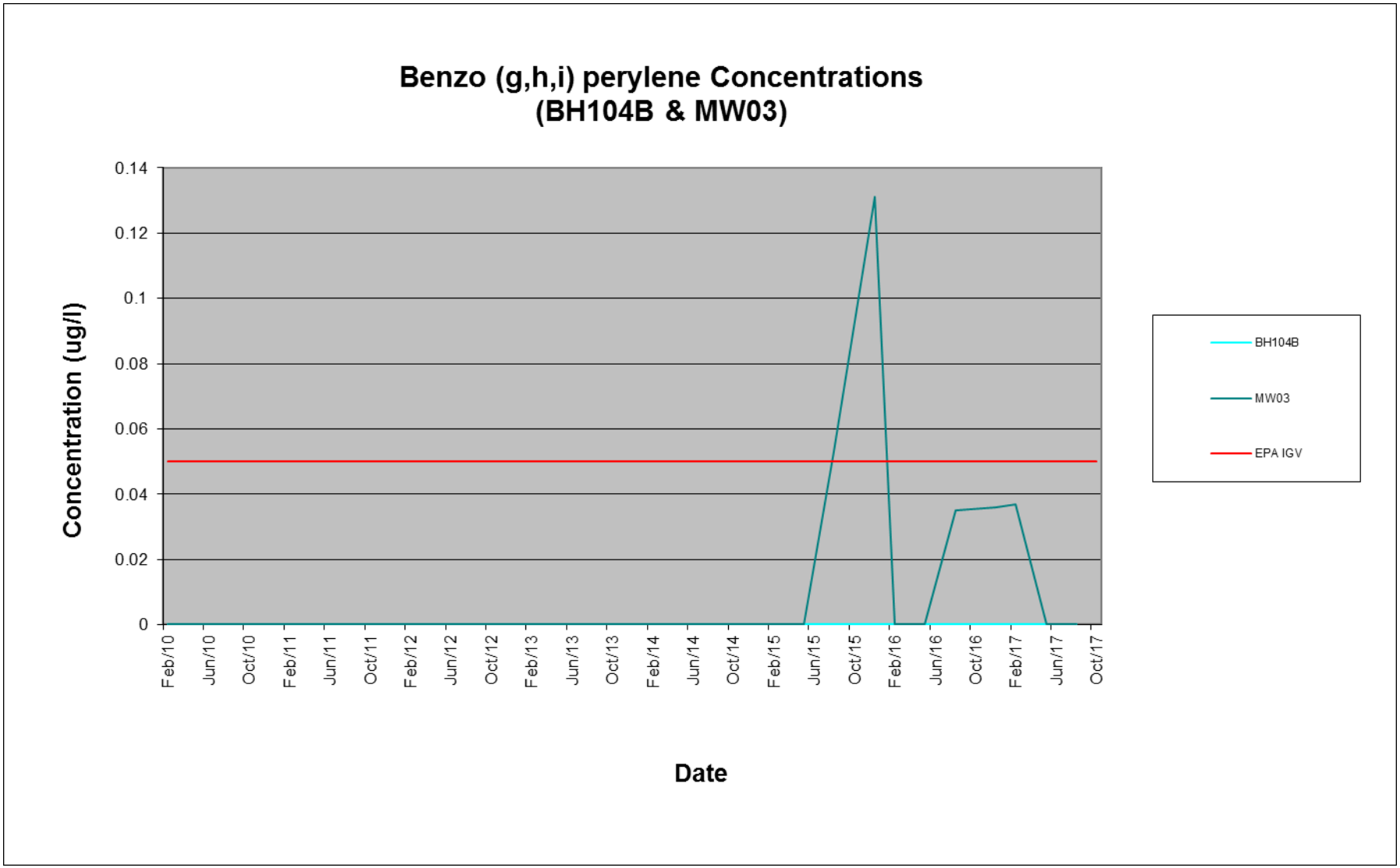


Figure 6.12 – Benzo (a) pyrene Concentrations in all Monitoring Wells

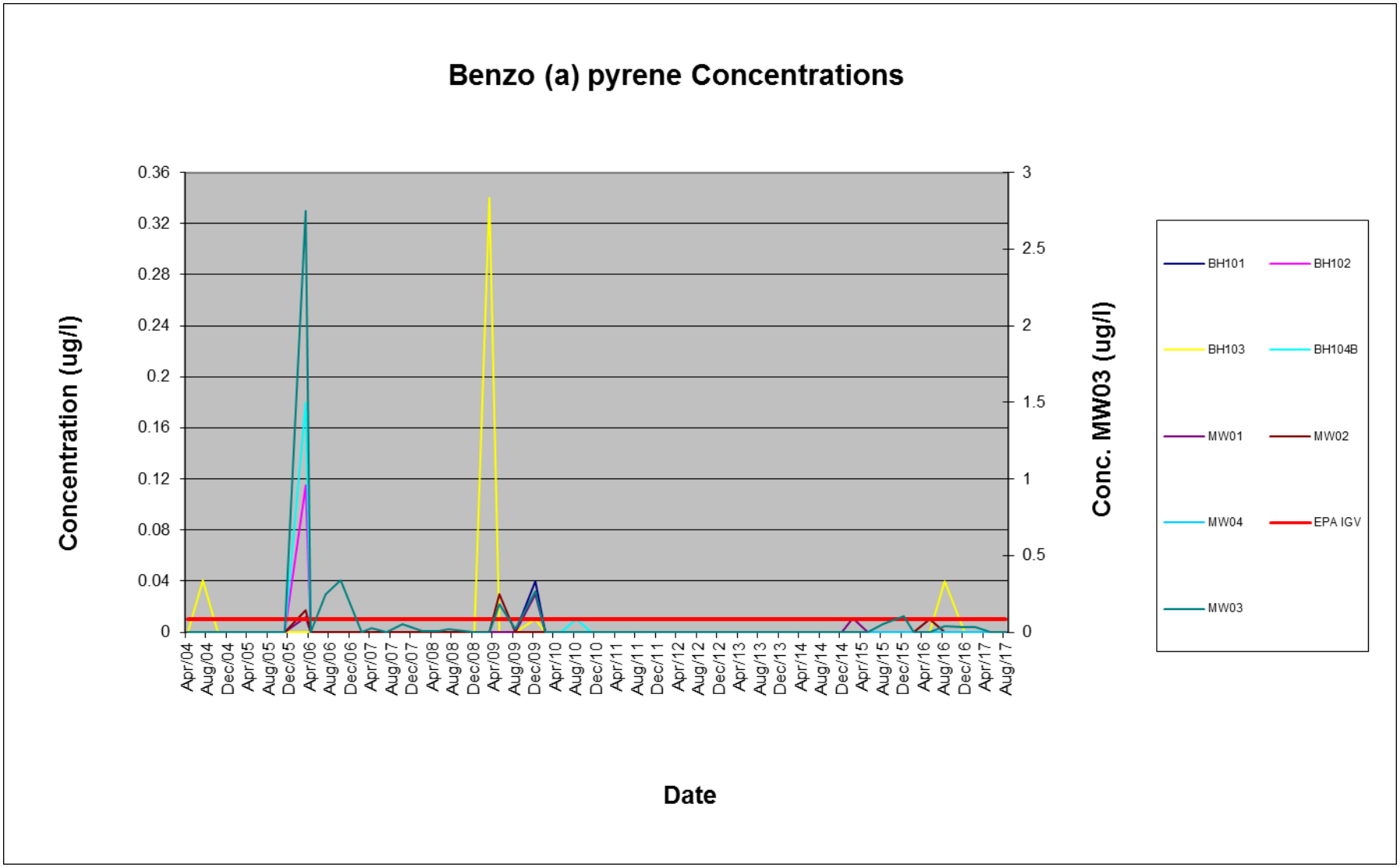
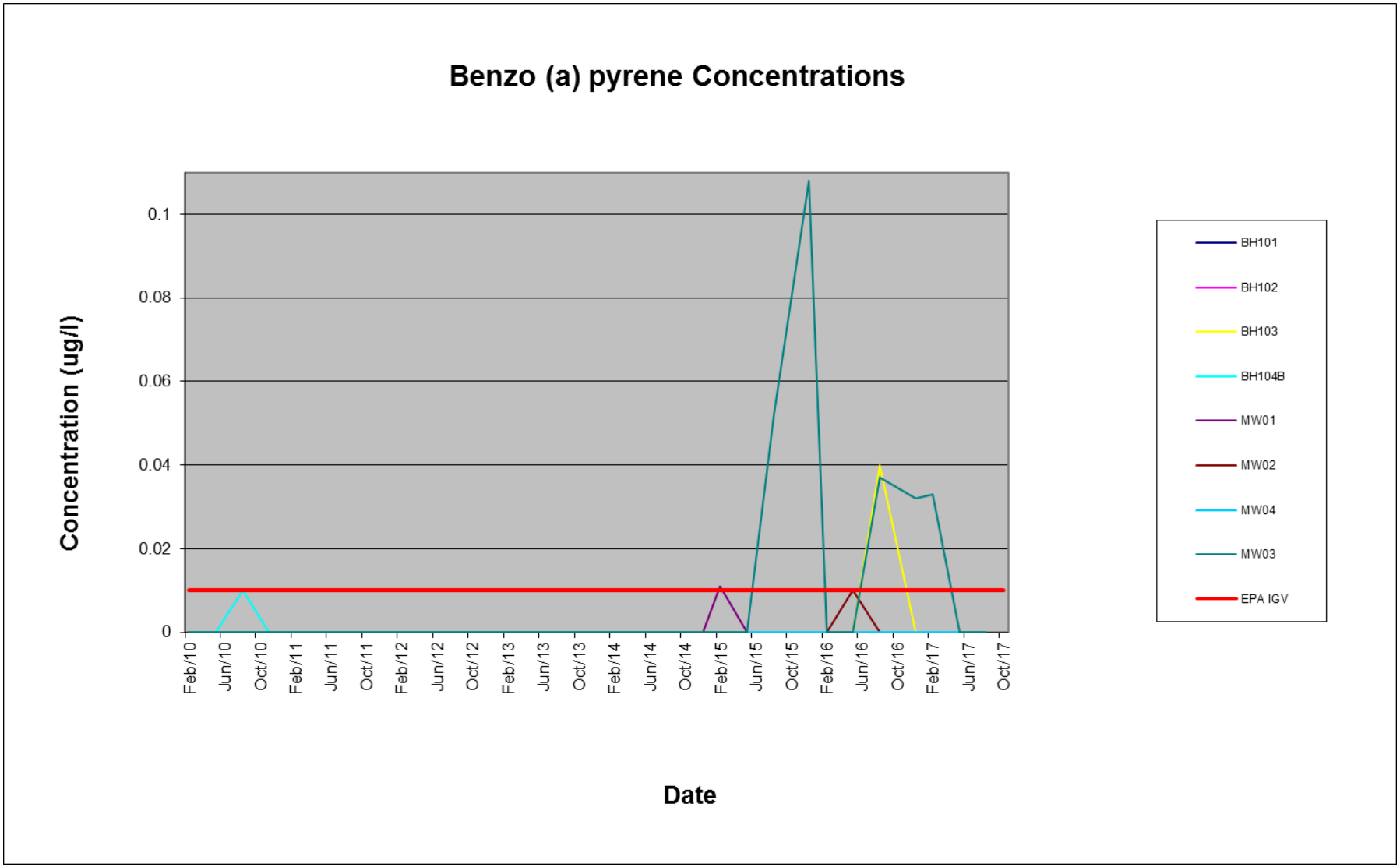


Figure 6.13 – Benzo (a) pyrene Concentrations in all Monitoring Wells Since 2010



6.2.3 Total Petroleum Hydrocarbons (TPH)

Historically **Total Petroleum Hydrocarbons (TPH)** including mineral oil, petrol range organics (PRO) and diesel range organics (DRO) have been detected within BH103, BH104B and MW03. Since 2009, speciated hydrocarbon analysis using the Total Hydrocarbon Criteria Working Group (TPHCWG) method has been carried out on all samples to obtain a more accurate profile of TPH within groundwater.

The results of the TPHCWG analysis has indicated that the predominant hydrocarbons detected are in the heavier chain carbon fractions, most notably in the carbon range C12-C16, C16-C21 and C21-C35. **Figure 6.14** illustrates the TPH analysis for the total TPH analysis from C10-C44 in all monitoring wells since 2009. The highest concentrations detected historically are at monitoring wells MW03, BH104B and BH103 respectively.

Previous quarterly monitoring reports have outlined the hydrocarbon trends recorded in each well since 2010. This report outlines the trends from 2013 up to and including the current monitoring report.

During the Quarter 1, 2013 monitoring event aromatic hydrocarbons were detected in BH103, BH104B and MW04. The predominant aromatic carbon range comprised C12-C16 (30 µg/l), C16-C21 (280 µg/l) and C21-C35 (100 µg/l) in BH103, C10-C12 (30 µg/l), C12-C16 (110 µg/l) and C16-C21 (80 µg/l) in BH104B and C10-C12 (20 µg/l) and C12-C16 (80 µg/l) in MW04. Aliphatic hydrocarbons were detected in BH103 in the ranges C12-C16 (70 µg/l), C16-C21 (100 µg/l) and C21-C35 (90 µg/l).

During the Quarter 2, 2013 monitoring event no aliphatic or aromatic hydrocarbons were detected at any location.

During the Quarter 3, 2013 monitoring event, hydrocarbons of the aliphatic range were detected in MW03 only. The detected aliphatic carbon range comprised C10-C16 (290 µg/l) and C12-C16 (190 µg/l). No detections of aromatic carbons were measured during the Quarter 3 2013 monitoring event. Total Petroleum Hydrocarbons were not detected at any monitoring location during the Quarter 4, 2013, and Quarter 1 and Quarter 2, 2014 monitoring events.

During the monitoring event for Quarter 3 2014 following ranges of the aliphatic hydrocarbons were recorded for BH104B; C12-C16 (150 µg/l), C16-C21 (250 µg/l) and C21-C35 (10 µg/l).Total Petroleum Hydrocarbons were not detected at any monitoring location during the Quarter 4, 2014 monitoring event.

During the Quarter 1 2015 monitoring event, hydrocarbons were detected in MW03, MW04, BH103 and BH104B. The predominant aromatic carbon range comprised C21-C35 (14 µg/l) in BH103, C12-C16 (27 µg/l) and C16-C21 (15 µg/l) in BH104B, C12-C16 (14 µg/l) in MW03 and C12-C16 (15 µg/l) in MW04. Aliphatic hydrocarbons were detected in the ranges C16-C35 (54 µg/l) in BH103, C16-C35 (11 µg/l) in BH104B and C16-C35 (46 µg/l) and C35-C44 (12 µg/l) in MW03.

During the Quarter 2 2015 monitoring event, the TPH concentration in the aromatic C21-C35 range was detected at one shallow groundwater wells BH103 (509 µg/l). The TPH concentration in the aliphatic range was detected at C16-C35 (1760 µg/l) in BH103 and C12-C16 (225 µg/l) and C16-C35 (11 µg/l) in BH104B.

The Quarter 3 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 (39 µg/l), C16-C21 (37 µg/l) and C21-C35 (28 µg/l) at BH104B, C21-C35 at BH103 (17 µg/l) and C10-C12 (18 µg/l) and C12-C16 (29 µg/l) at MW04. TPH concentrations were detected in the aliphatic ranges C10-C12 (13 µg/l), C12-C16 (40 µg/l) and C16-C35 (62 µg/l) at BH104B and C16-C35 at BH103 (72 µg/l) and MW03 (14 µg/l).

The Quarter 4 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 (879 µg/l), C16-C21 (1380 µg/l) and C21-C35 (694 µg/l) at BH104B, C21-C35 at BH103 (60 µg/l) and C10-C12 (13 µg/l) and C12-C16 (21 µg/l) at MW04. TPH concentrations were detected in the aliphatic ranges C10-C12 (495 µg/l), C12-C16 (3080 µg/l) and C16-C35 (3360 µg/l) at BH104B and C16-C35 (231 µg/l) and C35-C44 (14 µg/l) at BH103.

The Quarter 1 2016 monitoring event detected TPH in samples from the well BH103 were in the aliphatic range C16-C35 (132 µg/l) and from well MW04 in the aromatic range C12-C16 (15 µg/l).

The Quarter 2 2016 monitoring event detected TPH in samples from the well BH103 and were in the aliphatic range C16-C35 (150 µg/l) and in the aromatic range C21-C35 (57 µg/l) and from well MW04 in the aromatic range C12-C16 (20 µg/l).

The Quarter 3 2016 monitoring event detected TPH in samples from the well BH103 in the aliphatic ranges C16-C35 (35 µg/l), C35-C44 (10 µg/l) and in the aromatic range C21-C35 (11 µg/l), well BH104B in the aromatic ranges C12-C16 (25 µg/l) and C16-C21 (12 µg/l) and from well MW04 in the aromatic range C12-C16 (23 µg/l).

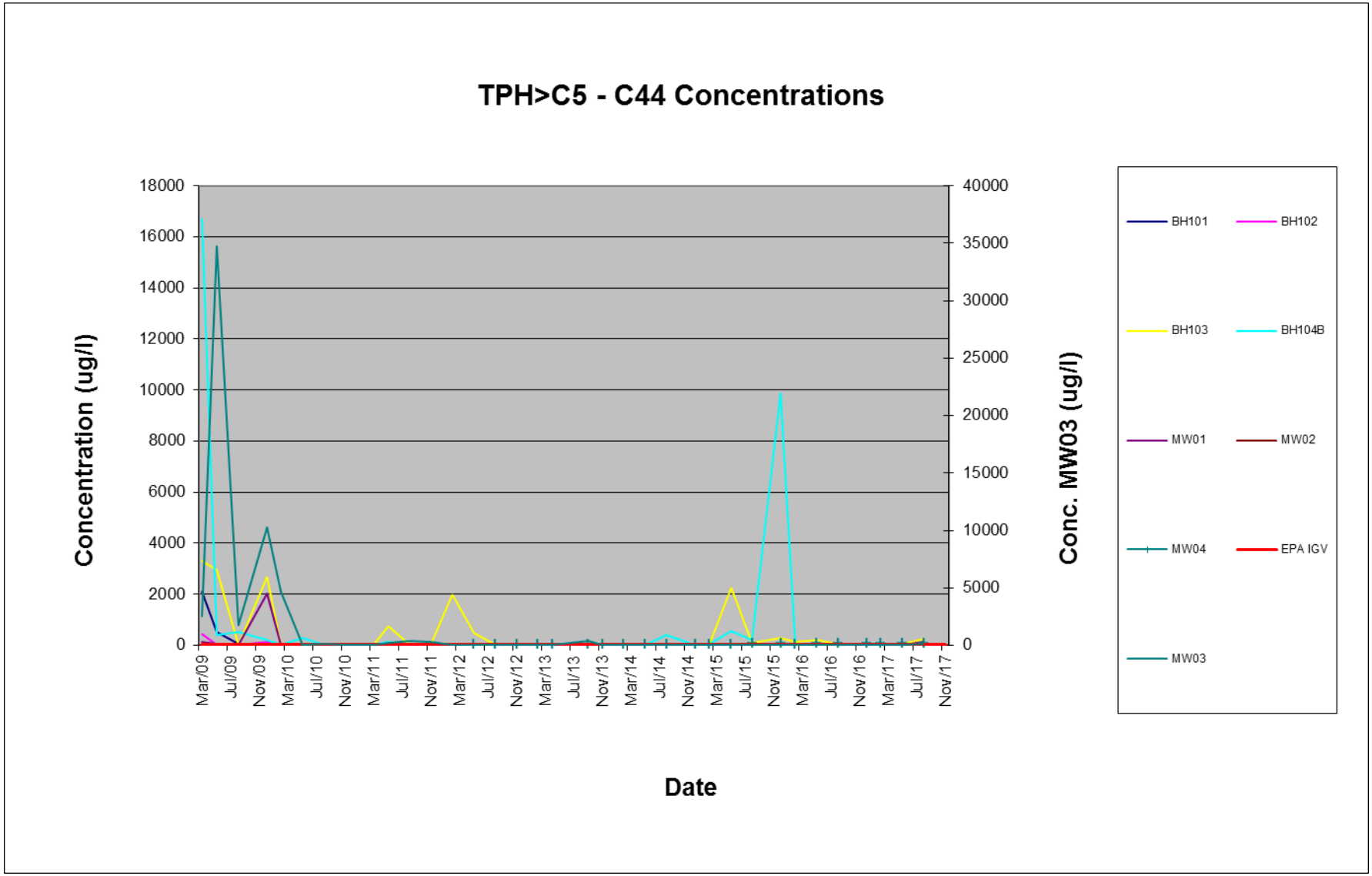
The Quarter 4 2016 monitoring event detected TPH in samples from the well BH102 in the aliphatic range C16-C35 (13 µg/l), well BH103 in the aliphatic ranges C16-C35 (160 µg/l), C35-C44 (14 µg/l) and in the aromatic range C21-C35 (47 µg/l), well BH104B in the aromatic ranges C12-C16 (12 µg/l), well MW03 in the aliphatic range C16-C35 (14 µg/l) and from well MW04 in the aromatic ranges the aromatic ranges C10-C12 (13 µg/l) and C12-C16 (23 µg/l).

The Quarter 1 2017 monitoring event, TPH was detected in samples from the well BH102 in the aliphatic range C16-C35 (11 µg/l), well BH103 in the aliphatic range C16-C35 (15 µg/l), well MW01 in the aliphatic range C16-C35 (23 µg/l), well MW03 in the aliphatic range C16-C35 (40 µg/l) and in the aromatic range C21-C35 (13 µg/l), and well MW04 in the aromatic ranges C10-C12 (11 µg/l) and C12-C16 (21 µg/l).

During the previous Quarter 2 2017 monitoring event, TPH was detected in samples from the well BH103 in the aliphatic range C16-C35 (50 µg/l), well BH104B in well the aliphatic ranges C12-C16 (13 µg/l) and C16-C35 (37 µg/l), and in the aromatic ranges C12-C16 (15 µg/l) and C16-C21 (20 µg/l), well MW02 in the aliphatic range C16-C35 (12 µg/l), well MW03 in the aromatic range C12-C16 (18 µg/l), and well MW04 in the aromatic range C12-C16 (29 µg/l).

During the current Quarter 3 2017 monitoring event, TPH was detected in samples from the well BH103 in the aliphatic range C16-C35 (177 µg/l) and in the aromatic range C21-C35 (71 µg/l), well MW01 in the aliphatic range C16-C35 (120 µg/l), well MW03 in the aliphatic range C16-C35 (61 µg/l) and in the aromatic range C21-C35 (40 µg/l), and well MW04 in the aromatic ranges C10-C12 (17 µg/l) and C12-C16 (24 µg/l).

Figure 6.14 – TPH (Carbon Range C10-C44) in all Monitoring Wells



7 CONCLUSIONS

- In accordance with the criteria set out in Schedule 4(ii) of the site's Industrial Emissions Licence Register No. W0184-02, groundwater monitoring was carried out at the ENVA Ireland site on the 28th of August 2017 corresponding to Quarter 3 of 2017. Samples were collected at 8 groundwater monitoring wells during this event.
- The results presented have been referenced against Groundwater Threshold Values (GTVs) outlined in the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. no 9 of 2010), where available. Where GTVs are not available for parameters, results are compared against the Interim Guideline Values (IGVs) set out in the Environmental Protection Agency interim report, '*Towards Setting Guideline Values for the Protection of Groundwater in Ireland*'.
- Results of the BTEX and MTBE demonstrate that the levels of Benzene, Toluene, Ethylbenzene, m&p Xylene, o-xylene and MTBE were all below the recommended EPA IGVs.
- The Quarter 3 2017 results of the polycyclic aromatic hydrocarbons indicate that Total PAHs were above the EPA IGV of 0.1 µg/l at four monitoring wells, BH103 (0.108 µg/l), BH104B (0.139 µg/l), MW01 (0.145 µg/l) and MW04 (0.161 µg/l).
- Diethylphthalate was detected above the laboratory limit of detection at MW01 (1.4 µg/l). However, there is no IGV for Diethylphthalate.
- 1,1-dichloroethane at MW03 (1.7 µg/l) and MW04 (3.3 µg/l), and MTBE at BH103 (1.2 µg/l), MW03 (2.7 µg/l) and MW04 (2.0 µg/l) were detected above the laboratory limits of detection. All other VOCs and SVOCs were below their respective laboratory limits of detection.
- Samples were analysed for speciated phenols to include chlorophenols and the results indicate that there were no detections above the laboratory limits of detection.
- For the current Quarter 3 2017 monitoring event, TPH detections in samples from BH103 in the aliphatic range C16-C35 (177 µg/l) and in the aromatic range C21-C35 (71 µg/l), well MW01 in the aliphatic range C16-C35 (120 µg/l), well MW03 in the aliphatic range C16-C35 (61 µg/l) and in the aromatic range C21-C35 (40 µg/l), and well MW04 in the aromatic ranges C10-C12 (17 µg/l) and C12-C16 (24 µg/l). Each of these is therefore over the limit of detection which is 10 µg/l. For the previous Quarter 2 2017 monitoring event, TPH detections in samples from the well BH103 in the aliphatic range C16-C35 (50 µg/l), well BH104B in well the aliphatic ranges C12-C16 (13 µg/l) and C16-C35 (37 µg/l), and in the aromatic ranges C12-C16 (15 µg/l) and C16-C21 (20 µg/l), well MW02 in the aliphatic range C16-C35 (12 µg/l), well MW03 in the aromatic range C12-C16 (18 µg/l), and well MW04 in the aromatic range C12-C16 (29 µg/l).
- The general trend of contaminant concentrations over time continues to be somewhat variable with compounds not being continually detected in the same borehole on two or three consecutive monitoring rounds. In general, the contaminant levels detected at the Enva facility appear to indicate reducing contaminant concentrations over time with infrequent elevations in some parameters. Further monitoring is recommended to confirm these reductions.

Enva Portlaoise

2017 Groundwater Compliance Monitoring Quarter 4 (Oct – Dec 2017)

Document Control Sheet

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1 INTRODUCTION

1.1 BACKGROUND

RPS has been commissioned by Enva Ireland Ltd (Enva) to carry out groundwater quality monitoring for environmental compliance, at their facility in the Clonminam Industrial Estate, Portlaoise, Co Laois. Groundwater monitoring has being carried out in strict accordance with criteria set out in Schedule 4(ii) of the site's Industrial Emissions Licence, Register No. W0184-02.

Enva Ireland has been operating under Industrial Emissions Licence Register No. W0184-02 since June 2017, having replaced the previous Waste licence, W0184-01, granted in January 2004. Enva is required to submit a report to the EPA on a quarterly basis, outlining the existing groundwater quality underlying the site.

A suitably qualified environmental consultant from RPS collected groundwater samples from a series of 8 monitoring wells within the site boundary on the 14th of November 2017. These on-site wells have been renamed under the current licence, W0184-02, as follows: GW1, formerly BH101; GW2, formerly BH102; GW3, formerly BH103; GW4, formerly BH104B; GW5, formerly MW01; GW6, formerly MW02; GW7, formerly MW03; and GW8, formerly MW04). The samples underwent laboratory analysis for the suite of parameters specified in Schedule C.6 of Industrial Emissions Licence W0184-02. This report outlines the results of the Quarter 4 monitoring for 2017 and reviews historical data recorded at the site.

1.2 OBJECTIVES & SCOPE OF WORK

The specific objectives and scope of work are as follows:

- Review of previous data as provided by Enva Portlaoise;
- Graphical presentation of key compounds and trends; and
- Discussion of results for Quarter 4 2017 within the context of previous results and available guideline concentrations.

2 REVIEW OF PREVIOUS DATA

2.1 INFORMATION SOURCES

The following documents were reviewed as part of this project:

- Industrial Emissions Licence W0184-02 and any available EPA documents from the EPA website;
- Quarterly Groundwater Monitoring Reports (Quarter 1 2004 to Quarter 4 2005), URS;
- Quarterly Groundwater Monitoring Reports (Quarter 1 2006 to Quarter 3 2017), RPS;
- Summary Report on Trend of Contaminant Levels at Enva Ireland Ltd since 2005, Ref: MDE0647RP0001, RPS (2007);
- Groundwater Risk Assessment, Ref: MDE0788Rp0001, RPS (2008);
- Hydrogeological Review and Assessment Report, Ref MDE0973Rp0017F01, RPS (2014); and
- Baseline Environment Report, Ref: MDE0973Rp0104.

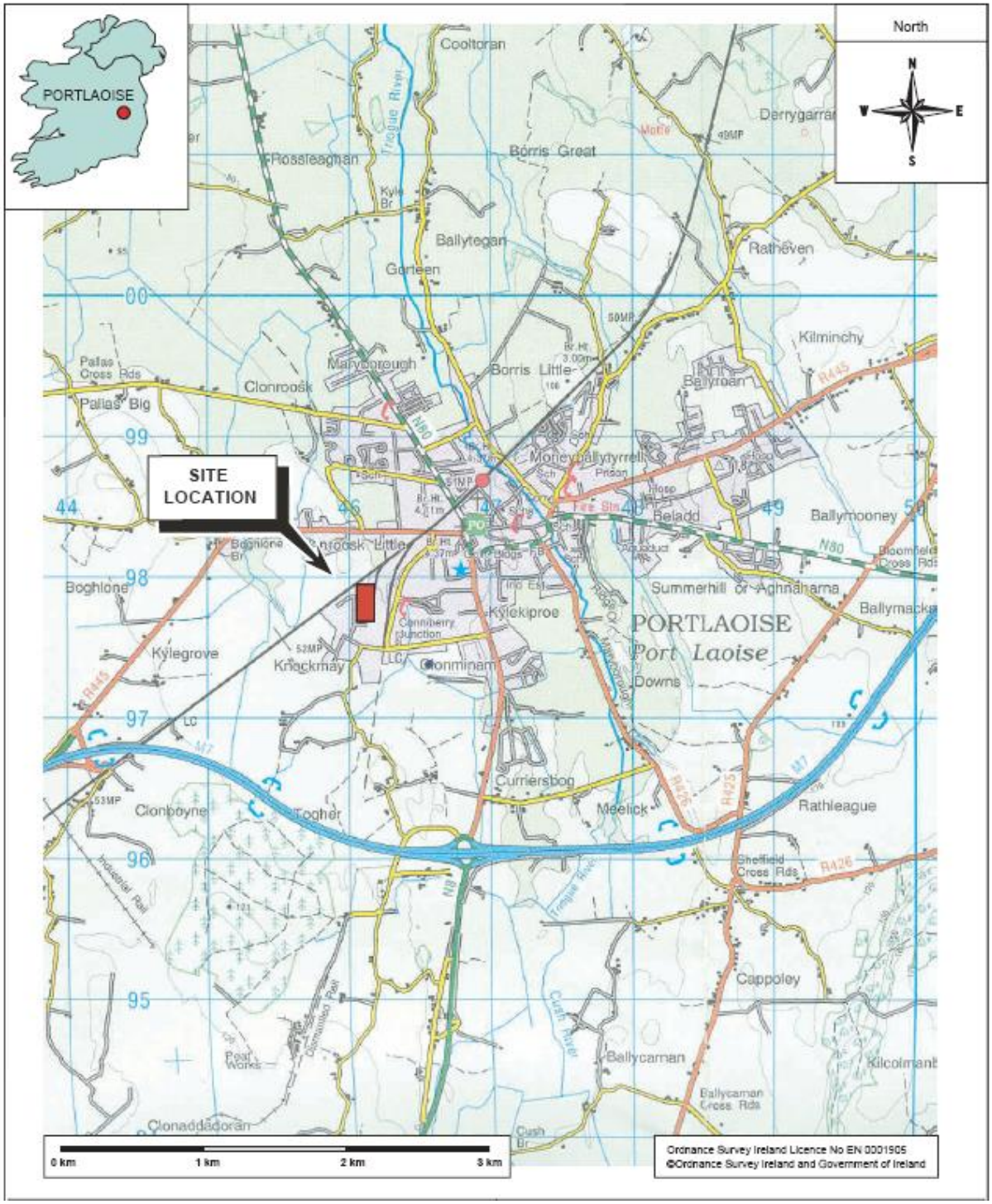
2.2 SITE SETTING

The site is located to the southwest of the town of Portlaoise immediately to the south of the Dublin to Cork railway line. The general area is gently undulating. The site slopes gently to the southwest but to the east of the site the ground slopes gently towards the River Triogue, which is located approximately 1.5 km to the east. The site occupies an area of approximately 1.5 hectares and comprises of an operational waste oil and contaminated soil treatment plant.

The site is located on the outskirts of Portlaoise in an area of agricultural and light industrial development. The site is bounded to the north and east by land belonging to Irish rail, comprising sidings and general storage areas. To the south is a vehicle repair garage, which is elevated above the level of the site by approximately 1.5 m. To the west the site is adjoined by further industrial land, as well as residential land. The site location is presented on **Figure 2.1**.

The site has been in operation since 1978, and the layout has remained relatively consistent. The site layout is presented on **Figure 3.1**. The site is largely covered in hardstanding with some open areas in the far north and northeast of the site. All oil and soil storage areas are suitably bunded and the general standard of housekeeping is good.

Figure 2.1 – Site Location



2.3 REGIONAL SETTING

2.3.1 Geology

The Geological Survey of Ireland indicates that the regional geology of Portlaoise is typified by Carboniferous Limestone. In the vicinity of the site itself the solid geology comprises the Ballysteen Formation, a micaceous-bioclastic limestone. This well-bedded limestone, with interbeds of shale, is extensively folded, with axes trending north-east to south-west, and becomes increasingly muddy towards the top of the formation. North-east to south-west trending faults are found in the region, with one located approximately 500m to the east of the site. The subsoils in the region comprise mainly Made Ground, around the industrial area, and Limestone Till in the surrounding regions.

2.3.2 Hydrogeology

The limestone is classified by the Geological Survey of Ireland (GSI) as a Locally Important Karstified Aquifer (Ll). Porosity is predominantly in the form of fractures, in this aquifer, however the muddy nature of this formation greatly reduces permeability. Vulnerability of this aquifer beneath the site is classified as high, with moderate vulnerability to the east of the site.

The public water supply for Portlaoise is derived from groundwater, utilising three groundwater abstraction well fields comprising of two abstraction wells in each well field. This supply currently comes from the Straboe area, approximately 5.5 km to the north-east of the site. The source protection zone for this water supply extends to within 3.2 km of the Enva site but does not encompass the Enva site.

The GSI record a number of other dug wells and boreholes within the Portlaoise area, including the boreholes installed on the site. The accuracy of the locations of these wells varies. One well, which was drilled in 1899 is recorded as being located immediately to the south of the Enva site. The use of this well is not known and its location is only accurate to 1 km. A second borehole, drilled in 1973 is recorded 1.5 km to the north of the site at Clonroosk; the accuracy of this location is also 1 km so it could be closer or further from the site. The use of this well is not known but its yield is recorded as being poor. There are no other wells recorded within 1 km of the site.

Enva is not aware of any abstraction boreholes within the immediate vicinity of their site.

2.4 SITE GROUND CONDITIONS

A total of eight boreholes have been drilled at the site and the general sequence of ground conditions is presented in **Table 2.1**.

Table 2.1 – Ground Conditions

Strata	Extent	Thickness	Description
Made Ground	GW4	0-3.5 m	Predominantly concrete, with hardcore fill, and clay.
Boulder Clay	All boreholes	<8.5 m	Includes fine to medium, well rounded gravels.
Sand and Gravel	Confined to south east corner of site (GW1, GW4 and GW7)	0-2 m	In general the transition from boulder clay to sand is gradual with changes from gravel, to sandy gravel, to sand.
Limestone Bedrock	Encountered in GW5, GW6 and GW7.	Top of limestone ranges from 7.7m to 9m below ground level.	Pale grey, fine-grained bedrock, differentiated from boulders by its un-weathered nature.

The logs for each of the boreholes were previously presented as Appendix B in the RPS Groundwater Risk Assessment Report (Ref: MDE0788Rp0001).

2.4.1 Licence Conditions

The Industrial Emissions Licence requires the regular monitoring and sampling of boreholes GW1, GW2, GW3, GW4, GW5, GW6, GW7 and GW8. The parameters requiring measurement or analysis are presented in **Table 2.2**.

Table 2.2 – Licence Parameters

Group	Parameters requiring Quarterly Measurement	Parameters requiring Annual Measurement
Field Parameters	Groundwater Level pH Temperature Dissolved Oxygen Electrical Conductivity Visual Inspection	Groundwater Level pH Temperature Dissolved Oxygen Electrical Conductivity Visual Inspection
Organics	Mineral Oil BTEX & MTBE PAHs Phenols VOCs SVOCs	Mineral Oil BTEX & MTBE PAHs Phenols VOCs SVOCs
Inorganics	-	Total Alkalinity, Calcium, Manganese, Sulphate, Cyanide (Total), Chloride, Sodium,

3 METHODOLOGY

Groundwater samples were collected from 8 no. on-site groundwater monitoring wells (GW1, formerly BH101; GW2, formerly BH102; GW3, formerly BH103; GW4, formerly BH104B; GW5, formerly MW01; GW6, formerly MW02; GW7, formerly MW03; and GW8, formerly MW04) using dedicated Waterra tubing, in accordance with RPS's standard sampling protocol. A non-return foot valve was fixed to the bottom of the tubing and inserted into the well, close to the base of the borehole. Separate tubing and foot valves were used at each monitoring well to eliminate the possibility of cross contamination.

Groundwater in the well casing is not considered representative of the groundwater quality at a given location. For this reason, three well volumes were purged from each well prior to collection of the groundwater sample. By the time purging was complete all field test water parameters (namely pH, Temperature, Electrical Conductivity and Dissolved Oxygen) were within 10% variance in three consecutive measurements. This ensured that the groundwater sample extracted from the monitoring borehole was representative of the water held in the subsurface strata and not water held stagnant in the borehole casing. The purged volumes were calculated on-site from the measured static water levels and total well depths using an electronic dip meter.

Groundwater samples were collected in laboratory supplied containers and stored in chilled cool boxes following sampling and during transit to the laboratory. A rigorous chain of custody procedure was used during the sample round.

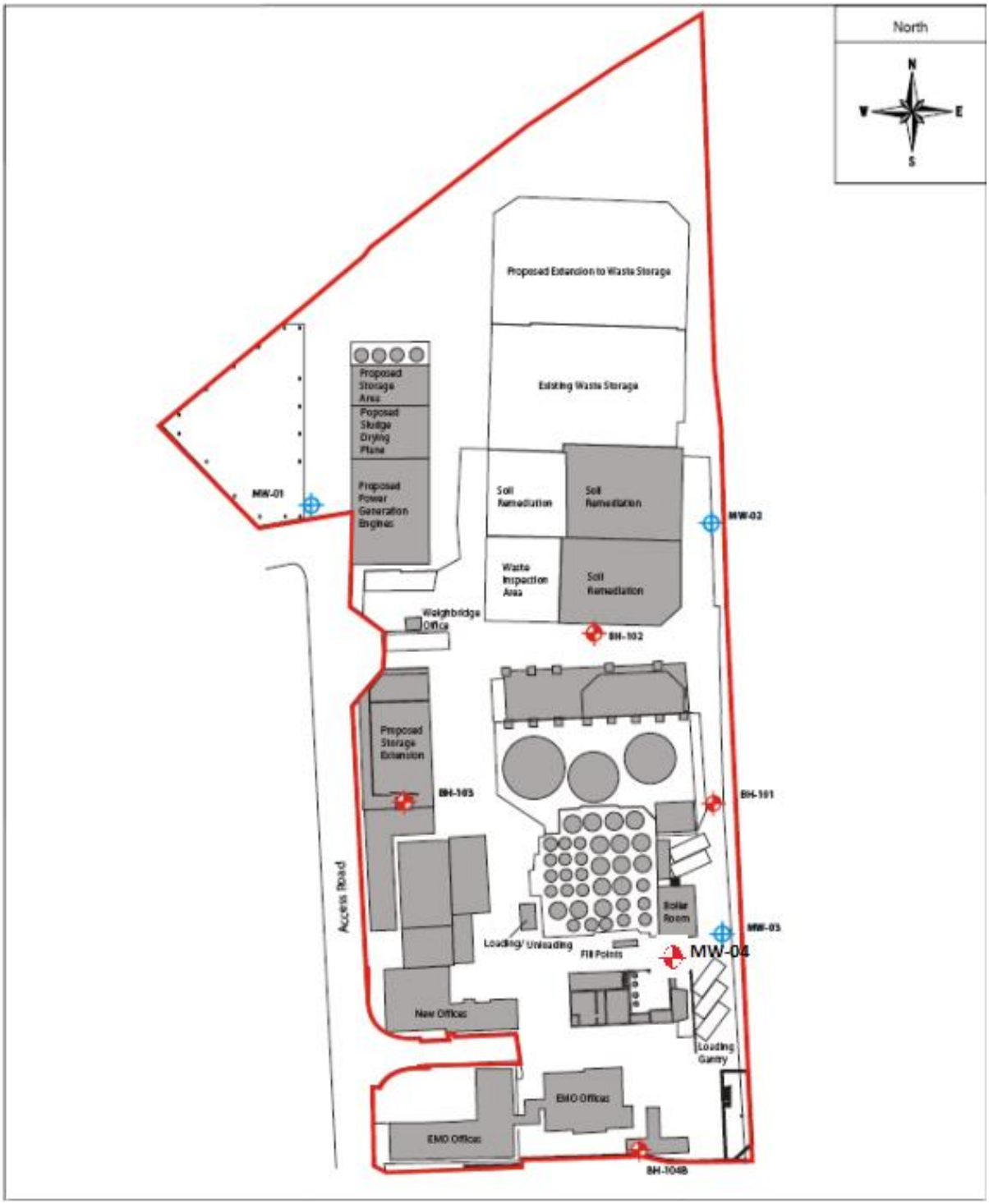
3.1 LABORATORY ANALYSIS

All groundwater samples were analysed at a UKAS accredited laboratory, ALS Environmental for the suite of analyses listed in **Table 3.1**. **Table 3.1** also indicates the analytical techniques used by the laboratory.

Table 3.1 – Analytical Methodologies – ALS Environmental

Parameter	Analytical Methodology
Phenols	GC-MS
Speciated PAHs	GC-MS
BTEX & MTBE	Headspace GC-MS
Petroleum Hydrocarbons	Headspace GC-MS
Volatile Organic compounds & Tentatively Identified Organic Compounds (VOCs & TICs)	Headspace GC-MS
Semi-Volatile Organic compounds & Tentatively Identified Organic Compounds (SVOCs & TICs)	GC-MS

Figure 3.1 – Site Layout Plan with Groundwater Monitoring Locations



Source: *URS Environmental Consultants (Ref: 45078497 Issue No. 1)*

3.2 PRESENTATION & INTERPRETATION OF RESULTS

The Quarter 4 2017 results are tabulated in **Section 4** and discussed with respect to previous results in **Section 5**. Results are compared against Groundwater Threshold Values (GTVs) outlined in the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No 9 of 2010), where available. Where GTVs are not available for parameters, results are compared against the Interim Guideline Values (IGVs) set out in the Environmental Protection Agency interim report, 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland'.

Previous monitoring reports (as listed in **Section 2.1**) provide details of contaminant concentrations since 2004. The data available within these reports has been reviewed and time series plots of key parameters have been compiled. Trends for chlorinated solvents, petroleum hydrocarbons and phenol parameters have been plotted.

Time series plots are presented in **Section 6** and include the results of this Quarter 4 2017 monitoring round. As the monitoring continues in accordance with the Industrial Emissions licence requirements, the plots will be updated with the results of subsequent rounds used to illustrate the results.

Time series plots are also provided for manual water levels where available from previous reports.

4 QUARTER 4 RESULTS NOVEMBER 2017

The results of all field measurements and laboratory analysis are presented in this section. Satisfactory calibration of the Dissolved Oxygen meter was unable to be achieved on the day of monitoring. This resulted in a lack of field measurements. Results are primarily compared against Groundwater Threshold Values (GTVs) outlined in the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No 9 of 2010) & Amendment 2016 (S.I. No 366 of 2016), where available. Where GTVs are not available for parameters, results are compared against the Interim Guideline Values (IGVs) set out in the Environmental Protection Agency interim report, '*Towards Setting Guideline Values for the Protection of Groundwater in Ireland*'.

The results are discussed in relation to appropriate guideline values in **Section 5**. Results that are shown to be above the relevant threshold or guideline values are highlighted in bold and shaded. Results that are shown to be above the relevant laboratory detection limits are highlighted in italics.

Site-specific field parameter measurements were collected during the site visit as per RPS Water sampling protocol.

Table 4.1 – Groundwater Levels (Quarter 4, 2017)

Monitoring Well	GW1 (formerly BH101)	GW2 (formerly BH102)	GW3 (formerly BH103)	GW4 (formerly BH104B)	GW5 (formerly MW01)	GW6 (formerly MW02)	GW7 (formerly MW03)	GW8 (formerly MW04)
Depth (mbgl)	6.75	6.44	4.29	4.67	22.77	30.84	9.72	6.35
Static Water Level (mbgl)	4.08	2.26	1.72	0.37	2.71	3.77	4.09	3.76
Ground Level (mAOD)	103.06	102.55	101.16	101.52	102.10	103.12	102.77	-
Water Level (mAOD)	98.98	100.29	99.44	101.15	99.39	99.35	98.68	-
Free Phase Oil (mm)	No detection	No detection	No detection	No detection	No detection	No detection	No detection	No detection

mbgl = metres below ground level

Table 4.2 – Results of Field Parameters Measured at each Groundwater Monitoring Well (Quarter 4, 2017)

Monitoring Well	pH (pH Units)	Temperature (°C)	Conductivity (µS/cm)	Dissolved O_2 (ppm)	Observations
GW1 (formerly BH101)	7.41	13.1	**1106**	5.52	Clear on purging with little suspended solids
GW2 (formerly BH102)	7.53	13.1	407	3.37	Clear but some suspended solids
GW3 (formerly BH103)	6.97	13.0	736	2.88	Cloudy grey/brown colour with some sediment
GW4 (formerly BH104B)	7.29	12.0	762	3.20	Clear on purging but with some suspended solids. Slight sheen and no odour
GW5 (formerly MW01)	7.31	12.0	659	3.65	Some sediment but samples clear
GW6 (formerly MW02)	7.60	13.2	711	3.07	Clear on purging, slight odour
GW7 (formerly MW03)	7.12	13.0	**1223**	2.93	Clear/slightly cloudy with slight sheen and odour
GW8 (formerly MW04)	6.99	13.2	**1511**	3.22	Light cloudy brown, slight odour and high level of sandy sediment
Groundwater Threshold Value	-	-	1875	-	-
Interim EPA Guideline Values (Units as indicated)	>6.5 & <9.5	25°C	1000	No abnormal change	-

Note: Results above the relevant IGV are highlighted in bold.
Note: Results above the GTV are highlighted in bold and shaded.

Table 4.3 – Results of BTEX and MTBE

Parameter	Units	Laboratory Limit of Detection	GW1 (formerly BH101)	GW2 (formerly BH102)	GW3 (formerly BH103)	GW4 (formerly BH104B)	GW5 (formerly MW01)	GW6 (formerly MW02)	GW7 (formerly MW03)	GW8 (formerly MW04)	GTV	IGV
Benzene	µg/l	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	0.75	1.0
Toluene	µg/l	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	525	10
Ethylbenzene	µg/l	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	-	10
m & p-xylene	µg/l	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	-	10 Note 1
o-xylene	µg/l	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	-	10 Note 1
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	***8.7***	***1.8***	10	30

Note: No specific IGV for parameter. IGV for Total Xylenes is used as guideline.
Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

Table 4.4 – Results of Speciated PAHs

Parameter	Units	Laboratory Limit of Detection	GW1 (formerly BH101)	GW2 (formerly BH102)	GW3 (formerly BH103)	GW4 (formerly BH104B)	GW5 (formerly MW01)	GW6 (formerly MW02)	GW7 (formerly MW03)	GW8 (formerly MW04)	GTV	IGV
Naphthalene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	***0.107***	-	1.0
Acenaphthylene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	-	-
Acenaphthene	µg/l	0.01	<0.01	<0.01	***0.031***	<0.01	<0.01	<0.01	***0.02***	***0.012***	-	-
Fluorene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	***0.016***	***0.028***	-	-
Phenanthrene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	-	-
Anthracene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	-	10,000
Fluoranthene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	***0.011***	<0.10	-	1.0
Pyrene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	***0.078***	<0.10	-	-
Benzo(a)anthracene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	***0.021***	<0.10	-	-
Chrysene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	-	-

Parameter	Units	Laboratory Limit of Detection	GW1 (formerly BH101)	GW2 (formerly BH102)	GW3 (formerly BH103)	GW4 (formerly BH104B)	GW5 (formerly MW01)	GW6 (formerly MW02)	GW7 (formerly MW03)	GW8 (formerly MW04)	GTV	IGV
Benzo(b)fluoranthene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	***0.02***	<0.10	-	0.5
Benzo(k)fluoranthene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	-	0.05
Benzo(a)pyrene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.036**	<0.10	-	0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	-	0.05
Dibenz(a,h)anthracene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	-	-
Benzo(g,h,i)perylene	µg/l	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	***0.041***	<0.10	-	0.05
Total EPA-16 PAHs	µg/l	0.1	<0.01	<0.01	***0.031***	<0.01	<0.01	<0.01	**0.243**	**0.147**	0.075	0.1

Note: Results above the relevant IGV are highlighted in bold.
Note: Results above the GTV are highlighted in bold and shaded.
Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

Table 4.5 – Results of Speciated Phenols

Parameter	Units	Laboratory Limit of Detection	GW1 (formerly BH101)	GW2 (formerly BH102)	GW3 (formerly BH103)	GW4 (formerly BH104B)	GW5 (formerly MW01)	GW6 (formerly MW02)	GW7 (formerly MW03)	GW8 (formerly MW04)	GTV	IGV
Phenol	µg/l	5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	-	0.5
2,4,6-Trichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	*1.12*	<1.0	<1.0	-	200
2,4-Dichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2,4-Dimethylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Chlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	200
2-Methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Nitrophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
4-Chloro-3-methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
3+4-Methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-

Table 4.6 – Results of Semi-Volatile Organic Compounds (SVOCs)

Parameter	Units	Laboratory Limit of Detection	GW1 (formerly BH101)	GW2 (formerly BH102)	GW3 (formerly BH103)	GW4 (formerly BH104B)	GW5 (formerly MW01)	GW6 (formerly MW02)	GW7 (formerly MW03)	GW8 (formerly MW04)	GTV	IGV
Phenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.5
2-Chlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	200
Bis(2-chloroethyl)ether	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,3-Dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2-Dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
1,4-Dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Bis(2-chloroisopropyl)ether	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Hexachloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Nitrobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
3&4-Methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Isophorone	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Nitrophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2,4-Dimethylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Bis(2-chloroethoxy)methane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2,4-trichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.40
Naphthalene	µg/l	2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	1.0
2,4-Dichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Hexachlorobutadiene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.10
4-Chloro-3-methylphenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2,4,6-Trichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	200
2,4,5-Trichlorophenol	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Methylnaphthalene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-

Parameter	Units	Laboratory Limit of Detection	GW1 (formerly BH101)	GW2 (formerly BH102)	GW3 (formerly BH103)	GW4 (formerly BH104B)	GW5 (formerly MW01)	GW6 (formerly MW02)	GW7 (formerly MW03)	GW8 (formerly MW04)	GTV	IGV
2-Chloronaphthalene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Dimethylphthalate	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2,6-Dinitrotoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Acenaphthylene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Acenaphthene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2,4-Dinitrotoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Dibenzofuran	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
4-Chlorophenyl phenyl ether	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Diethylphthalate	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Fluorene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
4-Bromophenyl phenyl ether	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Hexachlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.03
Phenanthrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Anthracene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10,000
Pyrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzyl Butyl Phthalate	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzo(a)anthracene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Chrysene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzo(b)fluoranthene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.5
Benzo(k)fluoranthene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.05
Benzo(a)pyrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.01
Indeno(1,2,3-c,d)pyrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.05
Dibenz(a,h)anthracene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzo(g,h,i)perylene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-

Parameter	Units	Laboratory Limit of Detection	GW1 (formerly BH101)	GW2 (formerly BH102)	GW3 (formerly BH103)	GW4 (formerly BH104B)	GW5 (formerly MW01)	GW6 (formerly MW02)	GW7 (formerly MW03)	GW8 (formerly MW04)	GTV	IGV
Bis(2-ethylhexyl)phthalate	µg/l	5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	-	-

Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

Table 4.7 – Results of Volatile Organic Compounds (VOCs)

Parameter	Units	Laboratory Limit of Detection	GW1 (formerly BH101)	GW2 (formerly BH102)	GW3 (formerly BH103)	GW4 (formerly BH104B)	GW5 (formerly MW01)	GW6 (formerly MW02)	GW7 (formerly MW03)	GW8 (formerly MW04)	GTV	IGV
Chloromethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Chloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	***1.1***	***8.9***	-	-
Bromomethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Vinyl Chloride	µg/l	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.375	-
Trichlorofluoromethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,1-dichloroethene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	30
1,1-dichloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	***2.3***	***3.1***	-	-
Cis-1,2-dichloroethene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	***8.7***	***1.8***	10	30
2,2-Dichloropropane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,1,1-Trichloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	500
1,2-dichloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.25	-
1,1-Dichloropropene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Trans-1,2-dichloroethene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Benzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.75	1.0
1,2-dichloropropane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Trichloroethene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7.5	70
Dibromomethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-

Parameter	Units	Laboratory Limit of Detection	GW1 (formerly BH101)	GW2 (formerly BH102)	GW3 (formerly BH103)	GW4 (formerly BH104B)	GW5 (formerly MW01)	GW6 (formerly MW02)	GW7 (formerly MW03)	GW8 (formerly MW04)	GTV	IGV
Bromodichloromethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Cis-1,3-dichloropropene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Trans-1,3-dichloropropene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Toluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	525	10
1,1,2-Trichloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,3-Dichloropropane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Dibromochloromethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Tetrachloroethene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7.5	40
1,2-Dibromoethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Chlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	1.0
1,1,1,2-Tetrachloroethane	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Ethylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
m&p-Xylene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
Styrene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
o-xylene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
Isopropylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Bromobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
N-Propylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
2-Chlorotoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
4-Chlorotoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,3,5-Trimethylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Tert-Butylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2,4-Trimethylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
Sec-Butylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,3-dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
P-Isopropyltoluene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-

Parameter	Units	Laboratory Limit of Detection	GW1 (formerly BH101)	GW2 (formerly BH102)	GW3 (formerly BH103)	GW4 (formerly BH104B)	GW5 (formerly MW01)	GW6 (formerly MW02)	GW7 (formerly MW03)	GW8 (formerly MW04)	GTV	IGV
1,2-dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	10
1,4-dichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
n-Butylbenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
1,2-Dibromo-3-chloropropane	µg/l	1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	-
1,2,4-Trichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.40
Hexachlorobutadiene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	0.10
1,2,3-Trichlorobenzene	µg/l	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-

Note: Results above the relevant IGV are highlighted in bold.
Note: Results above the GTV are highlighted in bold and shaded.
Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

Table 4.8 – Results of Total Petroleum Hydrocarbons (Aliphatic/Aromatic)

Parameter	Units	Laboratory Limit of Detection	GW1 (formerly BH101)	GW2 (formerly BH102)	GW3 (formerly BH103)	GW4 (formerly BH104B)	GW5 (formerly MW01)	GW6 (formerly MW02)	GW7 (formerly MW03)	GW8 (formerly MW04)	GTV	IGV
Aliphatic > C10-C12	µg/l	10	<10	<10	<40	<10	<10	<10	<40	<40	-	-
Aliphatic > C12-C16	µg/l	10	<10	***15***	<40	<10	<10	<10	<40	<40	-	-
Aliphatic > C16-C35	µg/l	10	<10	***70***	***263***	<10	***49***	<10	<40	<40	-	-
Aliphatic > C35-C44	µg/l	10	<10	***13***	<40	<10	<10	<10	<40	<40	-	-
Aliphatic > C10-C44	µg/l	10	<10	**98**	**263**	<10	**49**	<10	<40	<40	-	10
Aromatic > C10-C12	µg/l	10	<10	<10	<40	<10	<10	<10	<40	<40	-	-
Aromatic > C12-C16	µg/l	10	<10	<10	<40	<10	<10	<10	<40	<40	-	-
Aromatic > C16-C21	µg/l	10	<10	<10	<40	<10	<10	<10	<40	<40	-	-
Aromatic > C21-C35	µg/l	10	<10	<10	***89***	<10	***11***	<10	<40	<40	-	-
Aromatic > C35-C44	µg/l	10	<10	<10	<40	<10	<10	<10	<40	<40	-	-
Aromatic > C10-C44	µg/l	10	<10	<10	**89**	<10	**11**	<10	<40	<40		10

Note: Results above the relevant IGV are highlighted in bold.
Note: Results above the relevant laboratory limit of detection are highlighted in bold italics.

Table 4.9 – Results of Inorganic Analysis

Parameter	Units	Laboratory Limit of Detection	GW1 (formerly BH101)	GW2 (formerly BH102)	GW3 (formerly BH103)	GW4 (formerly BH104B)	GW5 (formerly MW01)	GW6 (formerly MW02)	GW7 (formerly MW03)	GW8 (formerly MW04)	GTV	IGV
Total Alkalinity	mg/l	10	343	313	356	188	324	301	384	348	-	No abnormal change
Calcium	mg/l	0.2	138	79.3	200	57.5	62.8	58.2	112	**430**	-	200
Manganese	mg/l	0.007	0.0258	**0.083**	**1.28**	0.0428	0.0454	0.0135	**0.555**	**4.96**	-	0.05
Sulphate	mg/l	0.1	38.9	5.6	25.57	12.1	13	17.8	8.8	<4.4	187.5	200
Cyanide (Total)	mg/l	0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	0.375	0.01
Chloride	mg/l	4	**122**	6.1	**33.5**	13.8	12.4	13.4	**141**	**269**	187.5	30
Sodium	mg/l	0.1	76.5	3.72	10.3	11.4	21	19.3	84.1	124	150	150

Note: Results above the relevant IGV are highlighted in bold.
Note: Results above the GTV are highlighted in bold and shaded.

5 DISCUSSION OF QUARTER 4 RESULTS

The results of the Quarter 4 monitoring event for 2017 are presented in **Table 4.1** to **4.9** of this report. For the purpose of this report, the results are compared against the Groundwater Threshold Values (GTVs) outlined in the European Communities Environmental Objectives (Groundwater) Regulations (S.I. No. 9 of 2010) where available. Where GTVs are not available results are compared against the EPA Interim Guideline Values (IGV) as set out in the Interim Report *'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' 2004.* A discussion of the results and their significance is included below.

5.1 FIELD PARAMETERS

The results of the field parameters measured at each groundwater monitoring well are presented in Table 4.2. Groundwater samples recorded pH levels ranging between 6.97 and 7.60, all within the EPA Interim guideline range of ≥6.5 to ≤9.5. Temperature measurements ranged from 12.0°C to 13.2°C and were below the EPA IGV of 25°C.

Field measurements of Electrical Conductivity levels ranged between 407 µS/cm and 1511 µS/cm. Three measurements of Electrical Conductivity were above the IGV of 1000 µS/cm at GW1 (1106 µS/cm), GW7 (1223 µS/cm) and GW8 (1511 µS/cm), but all however were below the GTV limit of 1875 µS/cm.

Dissolved oxygen levels ranged between 2.88 and 5.52 ppm. Factors such as climate, nutrients in the water, suspended solids; organic wastes and groundwater inflow can all influence the dissolved oxygen values.

Observations relating to colour and odour varied from well to well as detailed in **Table 4.2**.

5.2 RESULTS OF BTEX & MTBE

The results of the **BTEX** and **MTBE** analysis are presented in **Table 4.3**. BTEX concentrations are below the limit of detection at all locations. MTBE was detected at GW7 (8.7 µg/l) and GW8 (1.8 µg/l), however these concentrations were below the GTV of 10 µg/l and the IGV of 30 µg/l. MTBE was below the laboratory limit of detection and IGV at all other locations.

Previous detections of MTBE was in the Quarter 3 monitoring event of 2017 and recorded concentrations above the laboratory limit of detection at GW3 (1.2 µg/l), GW7 (2.7 µg/l) and GW8 (2.0 µg/l). MTBE was also above the laboratory limit of detection at GW3 (0.81 µg/l), GW7 (1.73 µg/l) and GW8 (1.73 µg/l) during Quarter 2 2017, at GW7 (2.4 µg/l) and GW8 (1.2 µg/l) during Quarter 1 2017, at GW7 (1.5 µg/l) and GW8 (1.2 µg/l) during Quarter 4 2016, and at GW7 (1.2 µg/l) during Quarter 3 2016. These detections are still below the GTV limit however. Prior to this there was a detection of MTBE at BH104B in the Quarter 1 monitoring event of 2012 with a recorded concentration of 280 µg/l which is above the GTV. This was the only recorded exceedance in Quarter 1 2012.

Monitoring during Quarter 1 and Quarter 2 of 2010 detected exceedances of MTBE at GW3 at a concentration of 16 µg/l. Subsequent monitoring in 2010 recorded concentrations below the

laboratory limit of detection. Prior to these 2010 monitoring events, concentrations of MTBE at GW3 were recorded at 63 µg/l in December 2009.

5.3 RESULTS OF SPECIATED POLYCYCLIC AROMATIC HYDROCARBONS (PAHS)

The results of the Speciated PAH analysis during this monitoring period are presented in **Table 4.4.**

The laboratory limit of detection for Total EPA-16 PAHs is 0.1 µg/l and has been lowered for comparison with the EPA IGV of 0.1 µg/l; however this is not accredited. This laboratory limit of detection is above the EPA GTV of 0.075 µg/l. To identify the compounds, which attributed to these concentrations, speciated PAH analysis was carried out, which reduces the limit of detection for individual parameters to 0.01 µg/l.

Total polycyclic aromatic hydrocarbons were above the IGV limit of 0.1 µg/l at GW7 (0.243 µg/l), and GW8 (0.147 µg/l). Total PAHs were below the IGV of 0.1 µg/l and the GTV of 0.075 µg/l at all other locations.

Total PAHs were previously detected above the IGV at GW3 (0.108 µg/l), GW4 (0.139 µg/l), GW5 (0.145 µg/l), and GW8 (0.161 µg/l) during Quarter 3 2017, GW3 (0.127 µg/l), GW7 (0.11 µg/l) and GW8 (0.194 µg/l) during Quarter 2 2017, at GW5 (0.121 µg/l), GW7 (0.47 µg/l) and GW8 (0.148 µg/l) during the Quarter 1 2017 monitoring event.

The results of the speciated polycyclic aromatic hydrocarbon analysis detected a number of different compounds in GW3, GW4, GW5 and GW8 above the laboratory limit of detection. Benzo(a)pyrene was detected at GW7 (0.036 µg/l) above the IGV of 0.01 µg/l. However none of the other compounds were above their respective IGV limits at any location.

5.4 RESULTS OF SPECIATED PHENOLS

During previous quarterly monitoring events and sample analysis, total monohydric phenol was determined and historically has been below the laboratory limit of detection of 10 µg/l since December 2008. It should be noted that the laboratory limit of detection is above the IGV of 0.5 µg/l for phenols.

For this reason, samples were analysed for phenols to include chlorophenols. The results of the speciated phenols analysis are presented in **Table 4.5**. The speciated phenol analysis reduces the laboratory limit of detection to 1.0 µg/l for individual parameters.

The results of the current Quarter 4 2017 speciated phenol analysis confirm concentrations of phenols were below the laboratory limit of detection of 1.0 µg/l at all locations.

2-Methylphenol (3.48 µg/l) and 3+4-Methylphenol (2.19 µg/l) in GW7 were detected above the laboratory limit of detection during Quarter 1 2017, and 4-Chloro-3-methylphenol at GW4 (1.37 µg/l) above the laboratory limit of detection during the Quarter 1 2015 analysis. With the exception of these, all other results are consistently below detection limit since the 2012 quarterly monitoring events.

5.5 RESULTS OF SEMI-VOLATILE ORGANIC COMPOUNDS

The results of the Semi-Volatile Organic Compound analysis are presented in **Table 4.6**.

There are no GTVs for individual SVOC parameters. No SVOCs were detected above the relevant IGVs during this monitoring period, consistent with the results from the previous 2017, 2016, 2015 and 2014 monitoring periods. It should be noted that the laboratory limit of detection was however above the IGVs for some SVOCs, for example the result for 1,2,4-Trichlorobenzene was <1.0 µg/l but the IGV for this parameter is 0.40 µg/l, but testing at this limit is not accredited.

The Quarter 3 2013 monitoring event detected two SVOC compounds, Acenaphthene (1.1 µg/l) and Fluorene (1.5 µg/l) in GW7. Prior to this detection the Quarter 2 monitoring event of 2012 detected concentrations of Naphthalene and Acenaphthylene in GW7 at concentrations of 2.4 µg/l and 0.12 µg/l respectively.

5.6 RESULTS OF VOLATILE ORGANIC COMPOUNDS

The results of the Volatile Organic Compound analysis are presented in **Table 4.7**.

Chloroethane at GW7 (1.1 µg/l) and GW8 (8.9 µg/l), 1,1-dichloroethane at GW7 (2.3 µg/l) and GW8 (3.1 µg/l), and MTBE at GW7 (8.7 µg/l) and GW8 (1.8 µg/l) were the only compounds detected above the limit of detection during the Quarter 4 2017 monitoring event. However, these are below their respective limits and all other compounds are below their respective laboratory limits of detection.

Historic groundwater monitoring events detected some parameters above the laboratory limit of detection in November 2009, corresponding to Quarter 4 of 2009. Historically 1,1-Dichloroethane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, MTBE, n-butylbenzene, n-propylbenzene, o-xylene, p-isopropyltoluene, sec-butylbenzene and tert-butylbenzene were detected above the laboratory limits of detection, where applicable.

The results of the Quarter 3 and Quarter 4 monitoring events of 2009 and all subsequent monitoring events indicate that there were no other exceedances of the GTVs or IGVs for specific parameters.

5.7 RESULTS OF TOTAL PETROLEUM HYDROCARBONS

In order to provide a more accurate profile of TPH within the groundwater, speciated hydrocarbon analysis using the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG) method was carried out on samples taken at all boreholes. The results of the TPH analysis are presented in **Table 4.8**.

The EPA IGV of 10 µg/l for Total Hydrocarbons is deemed comparable with the results for Total Petroleum Hydrocarbons. Some detections of TPH in both the aliphatic and aromatic range were observed during the current Quarter 4 2017 monitoring event.

Detections were found in samples from the following wells; at GW2 detections were in the aliphatic ranges C12-C16 (15 µg/l), C16-C35 (70 µg/l) and C35-C44 (13 µg/l), at GW3 detections were the

aliphatic range C16-C35 (263 µg/l) and in the aromatic range C21-C35 (89 µg/l), and at GW5 detections were in the aliphatic range C16-C35 (49 µg/l) and in the aromatic range C21-C35 (11 µg/l).

The previous Quarter 3 2017 monitoring event detected TPH in the wells; at GW3 in the aliphatic range C16-C35 (177 µg/l) and in the aromatic range C21-C35 (71 µg/l), at GW5 in the aliphatic range C16-C35 (120 µg/l), at GW7 in the aliphatic range C16-C35 (61 µg/l) and in the aromatic range C21-C35 (40 µg/l), and at well GW8 in the aromatic ranges C10-C12 (17 µg/l) and C12-C16 (24 µg/l).

The Quarter 2 2017 monitoring event detected TPH in the wells; at GW3 in the aliphatic range C16-C35 (50 µg/l), at GW4 in the aliphatic ranges C12-C16 (13 µg/l) and C16-C35 (37 µg/l), and in the aromatic ranges C12-C16 (15 µg/l) and C16-C21 (20 µg/l), at GW6 in the aliphatic range C16-C35 (12 µg/l), at GW7 in the aromatic range C12-C16 (18 µg/l), and at well GW8 in the aromatic range C12-C16 (29 µg/l).

The Quarter 1 2017 monitoring event detected TPH in the wells GW2 in the aliphatic range C16-C35 (11 µg/l), GW3 in the aliphatic range C16-C35 (15 µg/l at GW5 in the aliphatic range C16-C35 (23 µg/l), at GW7 in the aliphatic range C16-C35 (40 µg/l) and in the aromatic range C21-C35 (13 µg/l), and at well GW8 in the aromatic ranges C10-C12 (11 µg/l) and C12-C16 (21 µg/l).

The Quarter 4 2016 monitoring event detected TPH in the wells GW2 in the aliphatic range C16-C35 (13 µg/l), GW3 in the aliphatic range C16-C35 (160 µg/l), C35-C44 (14 µg/l) and in the aromatic range C21-C35 (47 µg/l), GW4 in the aromatic range C12-C16 (12µg/l), GW7 in the aliphatic range C16-C35 (14 µg/l), and GW8 in the aromatic ranges C10-C12 (13 µg/l) and C12-C16 (23 µg/l)

The Quarter 3 monitoring event detected TPH in the well GW3 in the aliphatic range C16-C35 (35 µg/l), C35-C44 (10 µg/l) and in the aromatic range C21-C35 (11 µg/l), at GW4 detections were in the aromatic range C12-C16 (25 µg/l), C16-C21 (12 µg/l) and at well GW8 detections were in the aromatic range C12-C16 (23 µg/l).

The Quarter 2 monitoring event of 2016 detected TPH in the well GW3 were in the aliphatic range C16-C35 (150 µg/l) and in the aromatic range C21-C35 (57 µg/l) and from well GW8 in the aromatic range C12-C16 (20 µg/l).

The Quarter 1 monitoring event of 2016 detected TPH in the aliphatic range C16-C35 (132 µg/l) at GW3 and in the aliphatic range C12-C16 (15 µg/l) at GW8.

The Quarter 4 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 (879 µg/l), C16-C21 (1380 µg/l) and C21-C35 (694 µg/l) at GW4, C21-C35 at GW3 (60 µg/l) and C10-C12 (13 µg/l) and C12-C16 (21 µg/l) at GW8. TPH concentrations were detected in the aliphatic ranges C10-C12 (495 µg/l), C12-C16 (3080 µg/l) and C16-C35 (3360 µg/l) at GW4 and C16-C35 (231 µg/l) and C35-C44 (14 µg/l).

The Quarter 3 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 (39 µg/l), C16-C21 (37 µg/l) and C21-C35 (28 µg/l) at GW4, C21-C35 at GW3 (17 µg/l) and C10-C12 (18 µg/l) and C12-C16 (29 µg/l) at GW8. TPH concentrations were detected in the aliphatic ranges C10-C12 (13 µg/l), C12-C16 (40 µg/l) and C16-C35 (62 µg/l) at GW4 and C16-C35 at GW3 (72 µg/l) and GW7 (14 µg/l).

The Quarter 2 monitoring event of 2015 detected TPH in the aromatic range C21-C35 at BH03 (509 µg/l). TPH concentrations were detected in the aliphatic ranges C16-C35 at GW3 (1760 µg/l) and GW4 (337 µg/l), and C12-C16 at GW4 (225 µg/l).

The Quarter 1 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 at wells GW7 (14 µg/l), GW8 (15 µg/l) and GW4 (27 µg/l), C16-C21 at GW4 (15 µg/l), and C21-C35 (14 µg/l) at GW3. TPH concentrations were detected in the aliphatic ranges C16-C35 and C35-C44 at GW7 (46 µg/l and 12 µg/l respectively), GW3 (54 µg/l) and GW4 (11 µg/l).

6 HISTORICAL RESULTS & TRENDS

Time series plots are presented in this section and include the results of the Quarter 4 2017 monitoring round. As the monitoring continues in accordance with the Industrial Emissions Licence requirements, the plots will be updated with the results of subsequent rounds and used to illustrate the results.

6.1 GROUNDWATER LEVELS OVER TIME

Figure 6.1 to **Figure 6.3** below illustrates the manually recorded water levels using an electronic probe. The graphs show that groundwater levels can vary considerably between monitoring rounds.

Figure 6.2 illustrates groundwater elevations (mAOD) in shallow groundwater wells (GW1 to GW4) ranging between approximately 98 mAOD and 102 mAOD.

Figure 6.3 illustrates groundwater elevation (mAOD) in the deeper groundwater wells (GW5 to GW7). The groundwater elevation (mAOD) for these deeper groundwater wells ranges from approximately 97.5 mAOD to approximately 100 mAOD.

Figure 6.1 – Ground Elevation (mAOD) in all Monitoring Wells

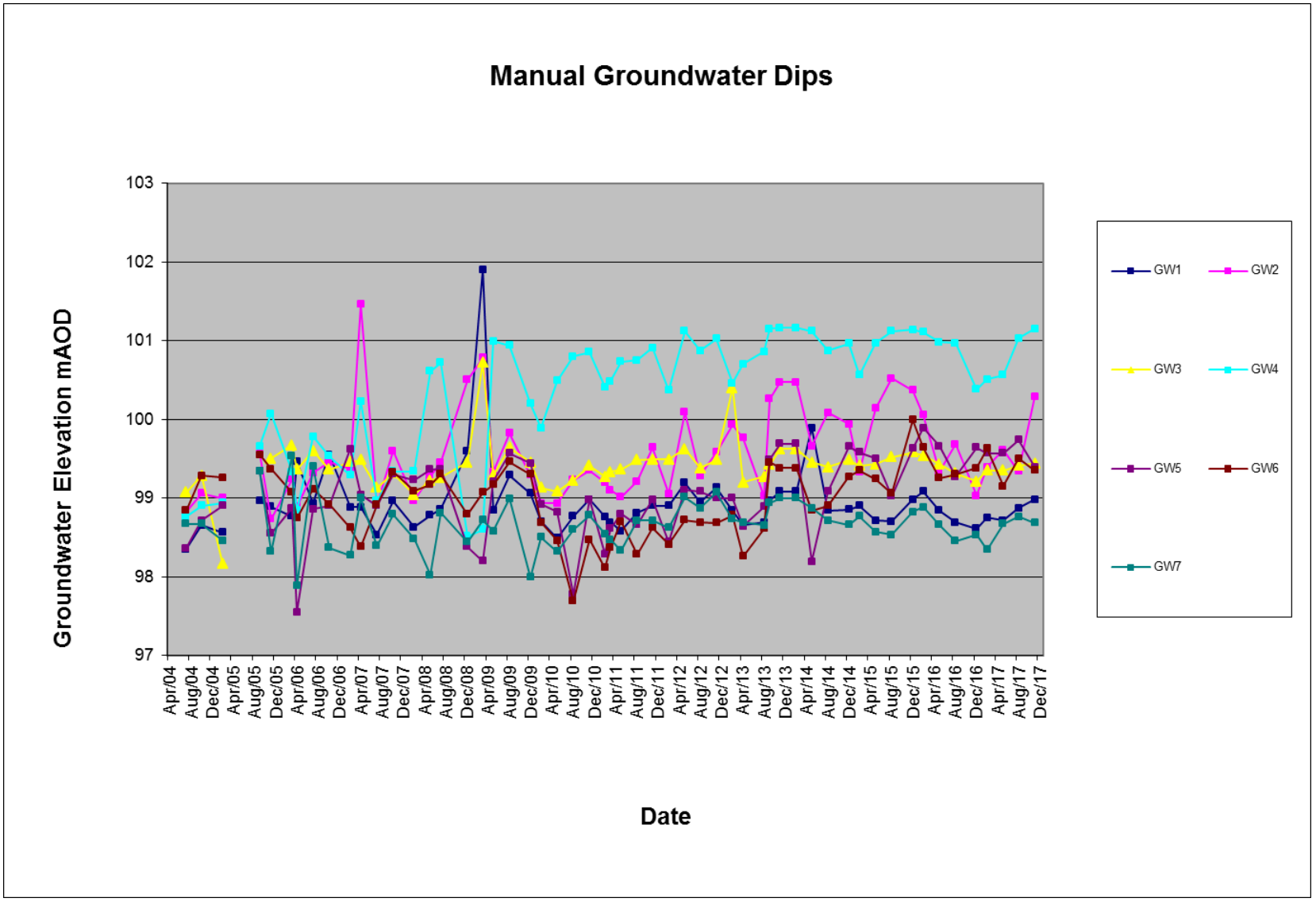


Figure 6.2 – Ground Elevation (mAOD) in Shallow Groundwater Monitoring Wells

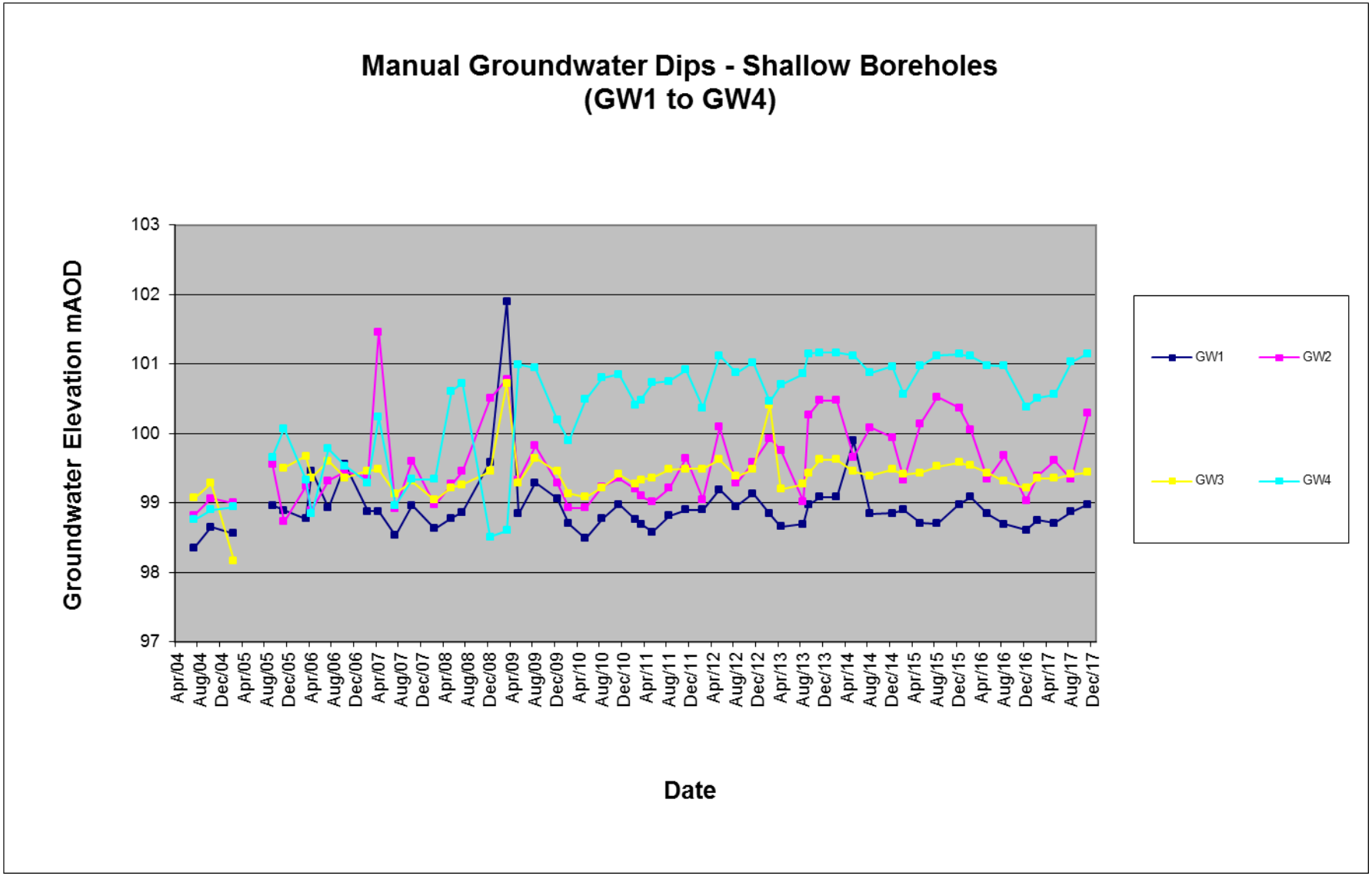
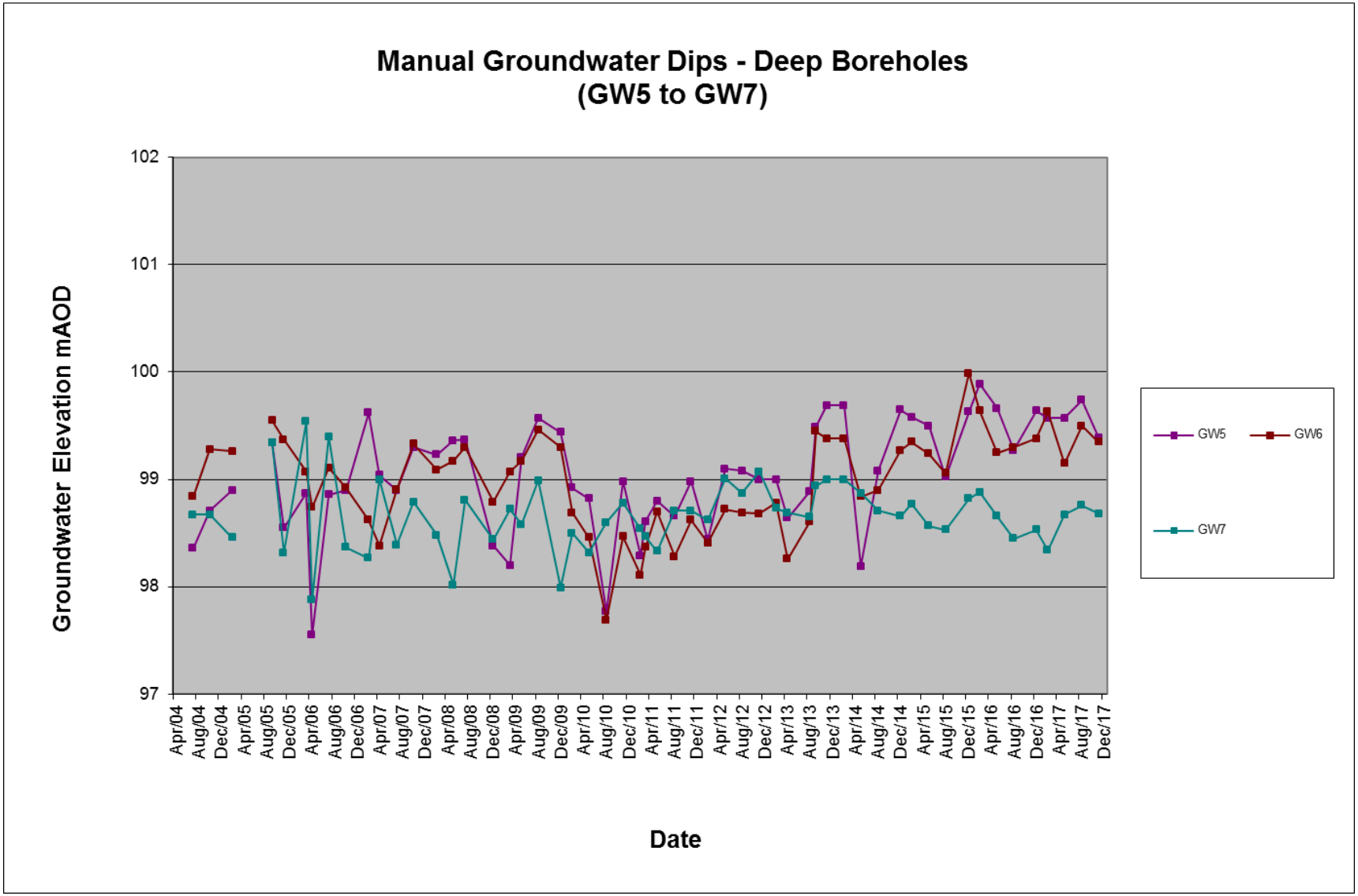


Figure 6.3 – Ground Elevation (mAOD) in Deep Groundwater Monitoring Wells



The groundwater levels generally show a similar pattern of fluctuation over time indicating a degree of connection between boreholes. The graphs demonstrate that groundwater levels can vary considerably between monitoring rounds; the general direction of flow in the shallow and deeper groundwater bearing unit is in an easterly or north easterly direction however there have been some occasional historic cases of groundwater flowing in a south-easterly direction.

In addition, monthly rainfall data for Oak Park, Carlow have been tabulated from Met Éireann to examine the relationship between compounds and rainfall events. The data from Oak Park was chosen as the weather station at Birr, Co. Offaly closed in October 2009. A summary of the rainfall data is in **Tables 6.1** to **6.5**.

Table 6.1 – Monthly Rainfall Data for Year 2013 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Rainfall (mm)	76.2	35.8	57.6	44.4	35.6	37.5	32.3	85.6	24.4	170.0	27.7	136.6

Table 6.2 – Monthly Rainfall Data for Year 2014 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Rainfall (mm)	147.2	176.7	65.0	52.6	78.6	61.9	24.6	122.1	18.2	138.2	165.6	47.7

Table 6.3 – Monthly Rainfall Data for Year 2015 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	66.0	36.3	53.5	26.3	89.4	29.7	79.4	83.0	17.9	56.8	110.0	270.9

Table 6.4 – Monthly Rainfall Data for Year 2016 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	110.9	95.7	40.6	64.3	61.6	61.7	29.6	46.0	97.4	32.3	26.3	80.2

Table 6.5 – Monthly Rainfall Data for Year 2017 for Oak Park, Carlow

Month	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	36.3	57.8	66.6	15.8	81.8	91.0	52.7	62.3	91.3	62.9	n/a	84.2

6.2 GROUNDWATER CONCENTRATIONS OVER TIME

Groundwater quality trends have previously been examined in two reports (URS 2005 and RPS 2007). In addition, RPS carried out a groundwater risk assessment (Ref: MDE0788RP0001, dated November 2008) in which the general trend of contaminant concentrations over time was observed to be erratic with compounds rarely being detected in the same borehole on two consecutive monitoring rounds.

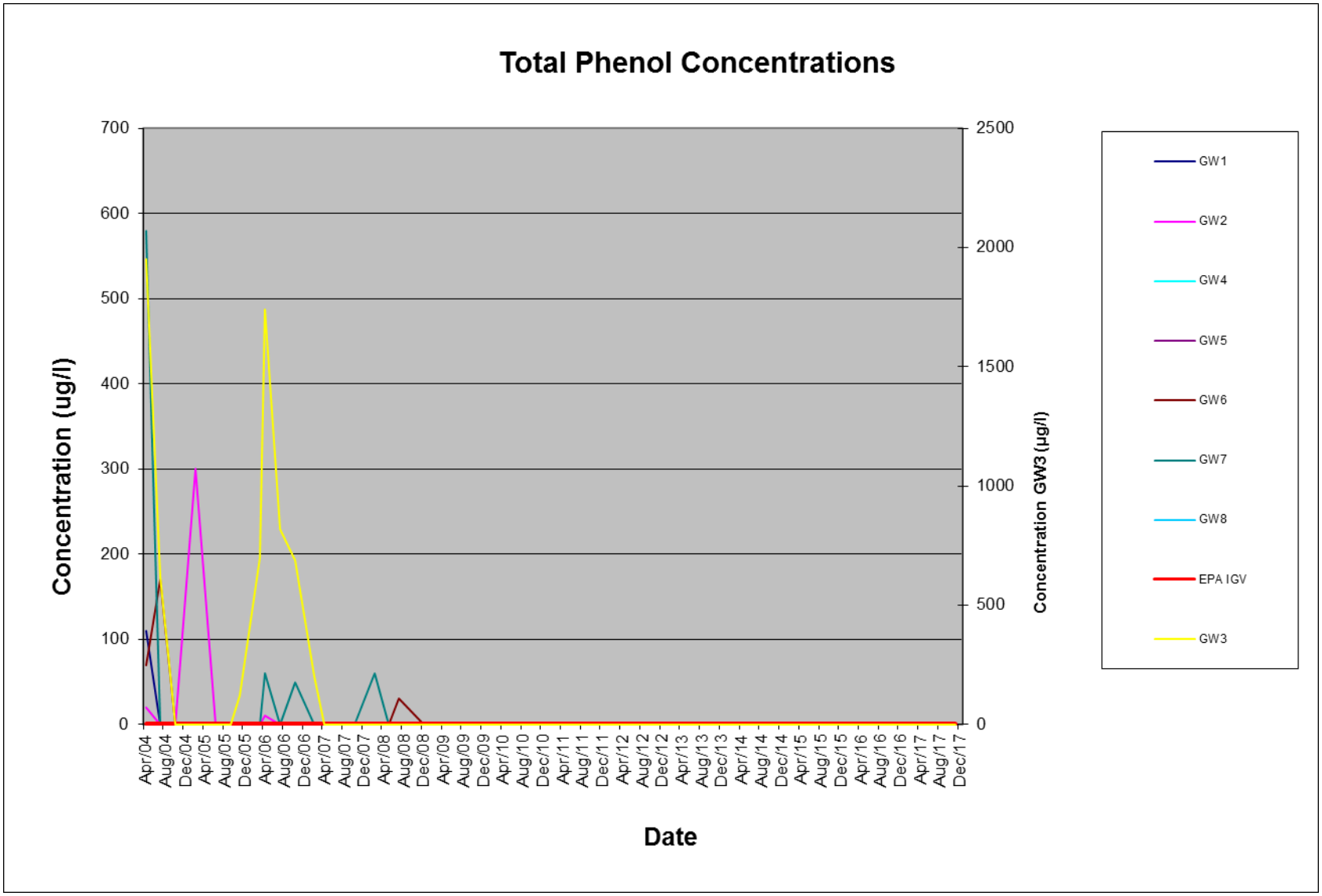
The data available within these reports has been reviewed and time series plots of key parameters have been compiled based on notable trends. Trends for phenols, petroleum hydrocarbons and chlorinated solvents have been plotted as outlined in the following sections.

6.2.1 Phenols

Phenols have been detected historically in all boreholes with the highest concentrations recorded in GW3. However concentrations in GW3 have declined since April 2007. Phenol concentrations have since been recorded below the IGV of 0.5 µg/l in all monitoring wells since December 2008 indicating natural attenuating conditions within the groundwater.

2,4-Dimethylphenol was detected at a concentration of 0.12 µg/l during the Quarter 1, 2010 monitoring event. There is no recommended IGV for this parameter. Subsequent to the Quarter 1 2010 monitoring event no detections of phenols have been noted at any monitoring location up to and including the current Quarter 4 2017 monitoring event, with the exception of 2-Methylphenol (3.48 µg/l) and 3+4-Methylphenol (2.19 µg/l) in GW7 during the Quarter 1 2017 monitoring event. However, there is no IGV or GTV for either of these parameters.

Figure 6.4 – Phenol Concentrations in all Monitoring Wells



6.2.2 Polycyclic Aromatic Hydrocarbons

Figures 6.5 and 6.6 below illustrate that PAHs (Polycyclic Aromatic Hydrocarbons) have previously been detected within all monitoring wells above the recommended EPA IGV of 0.1 µg/l. Historically the highest concentrations have been detected within GW7 and GW4, with the highest concentration detected in March 2006 (107 µg/l) and in October 2007 (19.72 µg/l) respectively. In addition, a range of PAHs including Benzo(a)pyrene, Benzo(g,h,i)perylene, Indeno(1,2,3)cd pyrene, Fluoranthene and Naphthalene have previously been detected in GW7 with **Figures 6.7** to **6.13** illustrating some of the PAH compounds which were detected above their respective IGVs.

Since 2007 concentrations of PAH have shown a marked decrease and since 2010 elevated concentrations of PAH have been largely confined to GW7, GW6 and GW4. Concentrations of Total PAH above the GTV in 2010 were detected during the Quarter 1 monitoring event in GW7 (0.3 µg/l), Quarter 2 monitoring event in GW4 (1.2 µg/l) and Quarter 3 monitoring event in GW6 (2.0 µg/l) and GW4 (0.2 µg/l). There were no elevated concentrations of Total PAH during the Quarter 4 2010 monitoring event.

No Total PAH detections were recorded throughout 2011 and in Q1 of 2012. Total PAH was detected above the IGV in GW7 in the Q2 2012 monitoring event. No Total PAH exceedances were detected from Quarter 3 2012 to Quarter 4 2013 inclusive. Total PAHs were detected at a concentration of 2.62 µg/l in GW7 during the Q3 2013 monitoring event however; no detections above the laboratory limit were noted during the subsequent monitoring events up to and including the Quarter 2 2015 monitoring event.

Total PAHs were also above the GTV at GW3 (0.093 µg/l), GW4 (0.159 µg/l) and GW7 (0.586 µg/l) during Quarter 3 2015, at GW3 (0.21 µg/l), GW7 (0.986 µg/l) and GW8 (0.079 µg/l) during Quarter 4 2015, and at GW3 (0.123 µg/l), GW4 (0.159 µg/l) and GW8 (0.153 µg/l) during the Quarter 1 2016 monitoring event. Total PAHs were detected above the GTV at GW3 (0.181 µg/l), GW4 (0.158 µg/l), GW7 (0.562 µg/l) and GW8 (0.151 µg/l) during Quarter 3 2016, at GW2 (0.124 µg/l) and GW7 (0.596 µg/l) during Quarter 4 2016, at GW5 (0.121 µg/l), GW7 (0.47 µg/l) and GW8 (0.148 µg/l) during Quarter 1 2017, and at GW3 (0.127 µg/l), GW7 (0.11 µg/l) and GW8 (0.194 µg/l) during the Quarter 2 2017 monitoring event. During the previous Quarter 3 2017 monitoring event, Total PAHs were detected above the GTV at GW3 (0.108 µg/l), GW4 (0.139 µg/l), GW5 (0.145 µg/l) and GW8 (0.161 µg/l).

During the current Quarter 4 2017 monitoring event, Total Polycyclic Aromatic Hydrocarbons were detected above the IGV limit of 0.1 µg/l and GTV of 0.075 µg/l at GW7 (0.243 µg/l) and GW8 (0.147 µg/l).

Figure 6.7 illustrates that **Fluoranthene** was previously detected above the IGV of 1.0 µg/l in groundwater monitoring wells GW4 (October 2007, 1.33 µg/l) and GW7 (March 2006, 2.158 µg/l) only. The remaining monitoring wells recorded concentrations below the IGV of 1.0 µg/l. During the Quarter 4 2017 monitoring event Fluoranthene was detected above the limit of detection at GW7 (0.011 µg/l), however this detection does not exceed the IGV of 1.0 µg/l.

A similar trend to Fluoranthene has been noted in **Figure 6.8**, with historic concentrations of **Naphthalene** recorded above the IGV of 1.0 µg/l in GW4 and GW7 only. 4 no. exceedances of the IGV were noted in GW4 in September 2005 (39 µg/l), March 2006 (1.069 µg/l), July 2006 (1.594 µg/l) and October 2007 (16.31 µg/l). Since October 2007, the concentrations in GW4 have decreased

below the IGV. There have been 6 exceedances of the IGV of 1.0 µg/l in GW7, with the highest concentration detected in March 2006 (19.986 µg/l) and the most recent being the detected in the Quarter 2 2012 monitoring event (2.4 µg/l). The concentrations detected in August 2010 were slightly above the laboratory limit of detection of 0.01 µg/l at GW4 (0.08 µg/l) and GW7 (0.05 µg/l); however these levels are deemed low. Concentrations of Naphthalene were below the EPA IGV limit of detection of 1.0 µg/l at all locations during the Quarter 4 2010, the 2011 and 2012 quarterly monitoring events and the Quarter 1 to Quarter 3 2014 monitoring periods, inclusive. No detections of Naphthalene were noted from the Quarter 4 2014 monitoring event to the Quarter 2 2015 monitoring event. Naphthalene was detected at GW1 (0.011 µg/l) and GW7 (0.031 µg/l) during Quarter 3 2015, and at GW3 (0.095 µg/l) and at GW8 (0.067 µg/l) during Quarter 4 2015, but were below the IGV.

Naphthalene was also detected at GW4 (0.034 µg/l) and GW8 (0.153 µg/l) during the Quarter 1 2016 monitoring event, at GW3 (0.13 µg/l), GW4 (0.039 µg/l), GW7 (0.028 µg/l) and GW8 (0.12 µg/l) during Quarter 3 2016, GW7 (0.036 µg/) during Quarter 4 2016, at GW3 (0.018 µg/l), GW5 (0.041 µg/l) and GW8 (0.12 µg/l) during Quarter 1 2017, and at GW3 (0.066 µg/l), GW7 (0.11 µg/l) and GW8 (0.157 µg/l) during the Quarter 2 2017 monitoring event. During the previous Quarter 3 2017 monitoring event, Naphthalene was detected above the laboratory limit of detection at GW3 (0.04 µg/l), GW4 (0.024 µg/l) and GW8 (0.161 µg/l). During the current Quarter 4 2017 monitoring event, Naphthalene was detected above the laboratory limit of detection at GW8 (0.107 µg/l). However, these are all still below the IGV of 1.0 µg/l.

Figure 6.9 illustrates the concentrations of **Benzo(g,h,i)perylene** in all monitoring wells over time. Elevated concentrations above the IGV were recorded at GW4 (0.087 µg/l) and GW7 (1.283 µg/l) on one occasion in March 2006.

Figures 6.10 and 6.11 illustrate elevated concentrations above the IGV recorded at GW7 on 6 no. occasions with the most recent elevated concentration recorded during the Quarter 4 2015 monitoring event (0.053 µg/l). The previous elevated concentration detected was in Quarter 3 2015 (0.053 µg/l). The results of all monitoring events from 2010 to the Quarter 2 2015 monitoring event recorded concentrations below the laboratory limit of detection of 0.01 µg/l at all locations. Concentrations were also below the laboratory limit of detection at all locations during the Quarter 1 2016 monitoring event. Benzo(g,h,i)perylene was recorded in GW6 (0.011 µg/l) during Quarter 2 2016, in GW3 (0.015 µg/l) and GW7 (0.035 µg/l) during Quarter 3 2016, in GW7 (0.036 µg/l) during Quarter 4 2016, in GW7 (0.037 µg/l) during Quarter 1 2017, and below the limit of detection at locations during the Quarter 2 2017 monitoring period. During the previous Quarter 3 2017 monitoring event Benzo(g,h,i)perylene detected in GW5 (0.013 µg/l). During the current Quarter 4 2017 monitoring event Benzo(g,h,i)perylene detected in GW7 (0.041 µg/l). However, these are below the IGV of 0.05 µg/l.

Figures 6.12 and 6.13 illustrate the concentrations of **Benzo(a)pyrene** in all groundwater monitoring wells and indicate that Benzo(a)pyrene has been detected historically in all boreholes above the IGV of 0.01 µg/l. Similarly with the above mentioned trends, the highest concentrations have been detected in GW7 and GW4. Concentrations have markedly decreased since March 2006 when an elevated concentration of 2.751 µg/l was detected in GW7; however there have been a number of detections above the IGV, with the most recent elevated level detected in December 2009. Elevated concentrations above the IGV were recorded in GW1, GW3 and GW5 during this same period.

The slightly higher concentrations of Benzo(g,h,i)perylene and Benzo(a)pyrene detected in Quarter 4, 2009 may be attributed to heavy rainfall, which occurred in November of 2009 and as a result

possibly mobilized traces of these compounds from the soil. The static water levels for December 2009 ranged between 0.58 and 3.78 mbgl. Since December 2009, concentrations of compounds have notably decreased to below the IGVs.

Benzo(a)pyrene was detected above the IGV limit of 0.01 µg/l at GW7 (0.108 µg/l) during the Quarter 4 2015 monitoring event. Benzo(a)pyrene was also detected above the IGV at GW7 (0.052 µg/l) during the Quarter 3 2015 monitoring event. All other results of all monitoring events from 2010 to Quarter 2 2016 monitoring event did not detect other concentrations above the IGV. Benzo(a)pyrene was detected at GW3 (0.04 µg/l) and GW7 (0.037 µg/l) during the Quarter 3 2016 monitoring event, at GW7 (0.032 µg/l) during Quarter 4 2016, and at GW7 (0.033 µg/l) during the Quarter 1 2017 monitoring event. During the Quarter 2 2017 and previous Quarter 3 2017 monitoring events, Benzo(a)pyrene was below the IGV of 0.01 µg/l and also below the limit of detection at all locations. During the current Quarter 4 2017 monitoring event, Benzo(a)pyrene was detected at GW7 (0.036 µg/l) but below the limit of detection at all other locations.

Figure 6.5 – PAH (Total) Concentrations in all Monitoring Wells

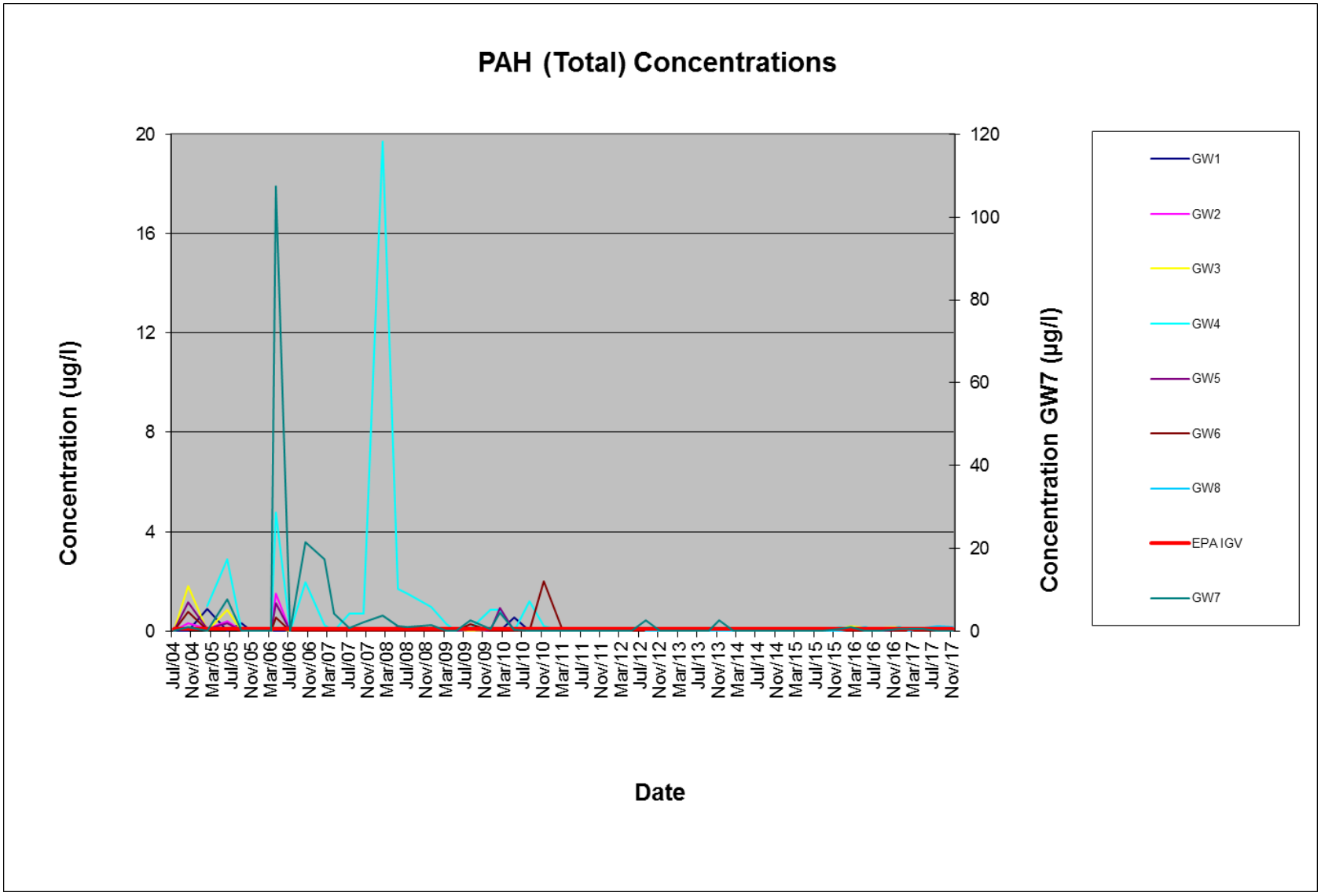


Figure 6.6 – PAH (Total) Concentrations in all Monitoring Wells Since 2010

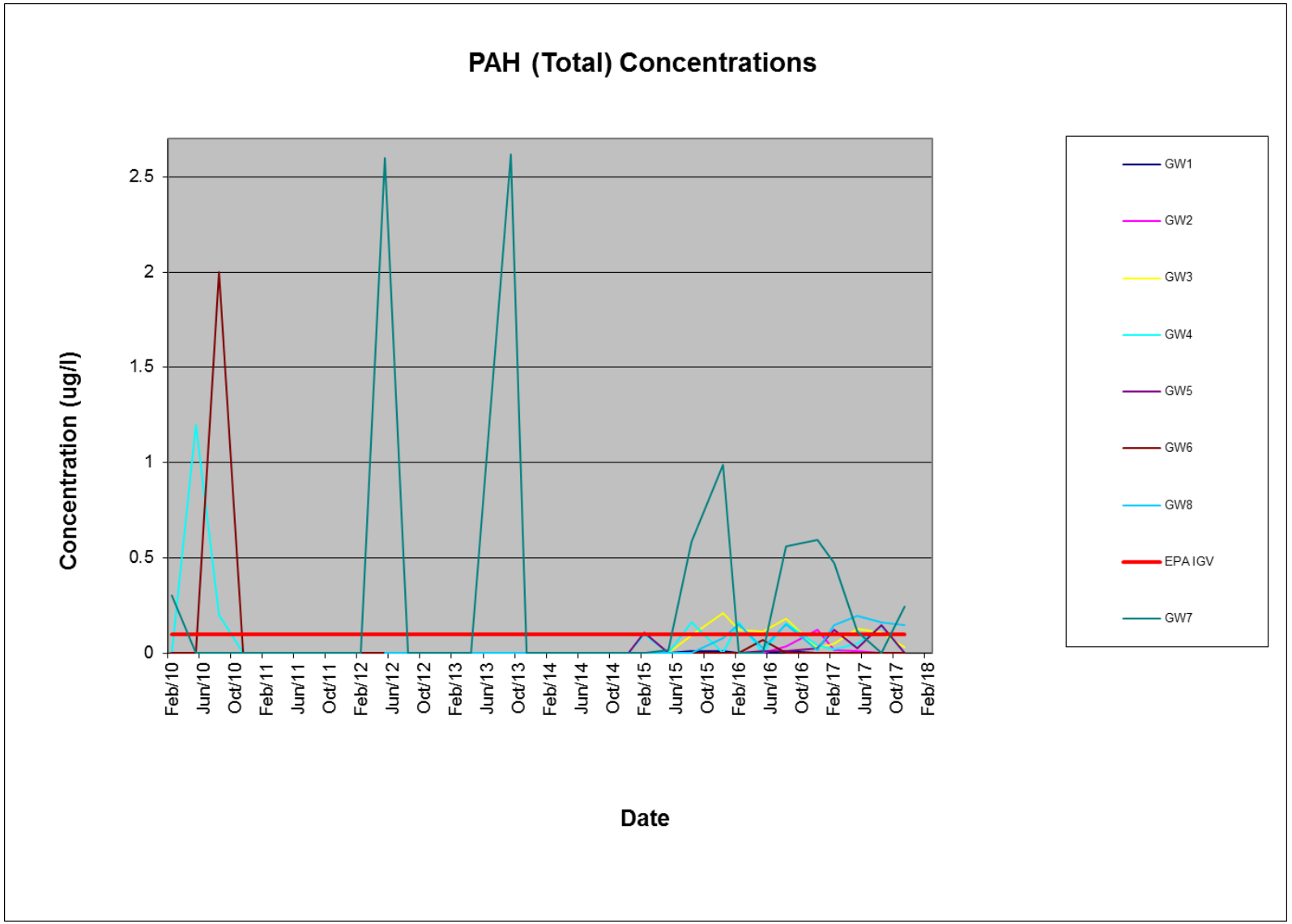


Figure 6.7 – Fluoranthene Concentrations in all Monitoring Wells

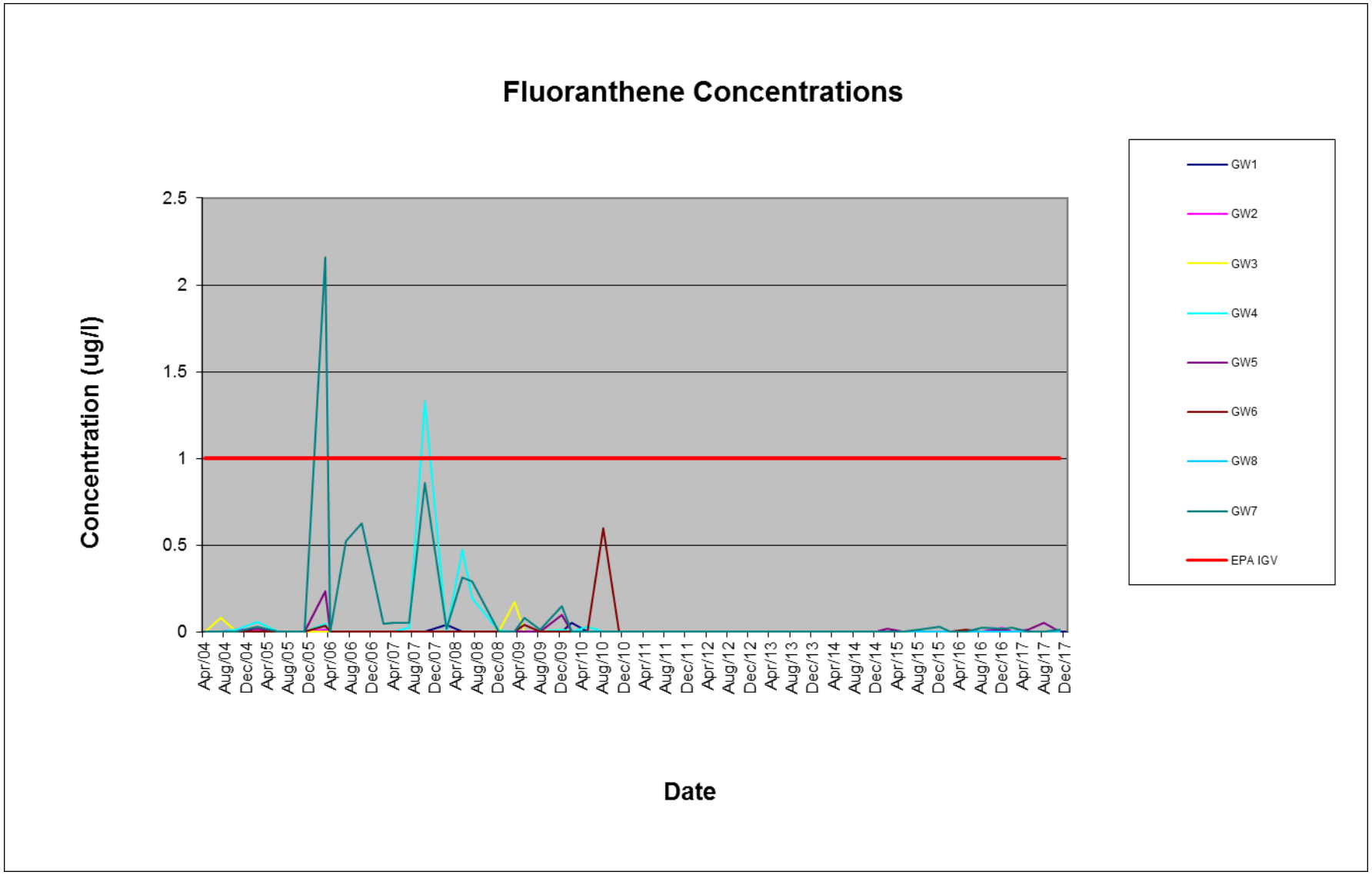


Figure 6.8 – Naphthalene Concentrations in all Monitoring Wells

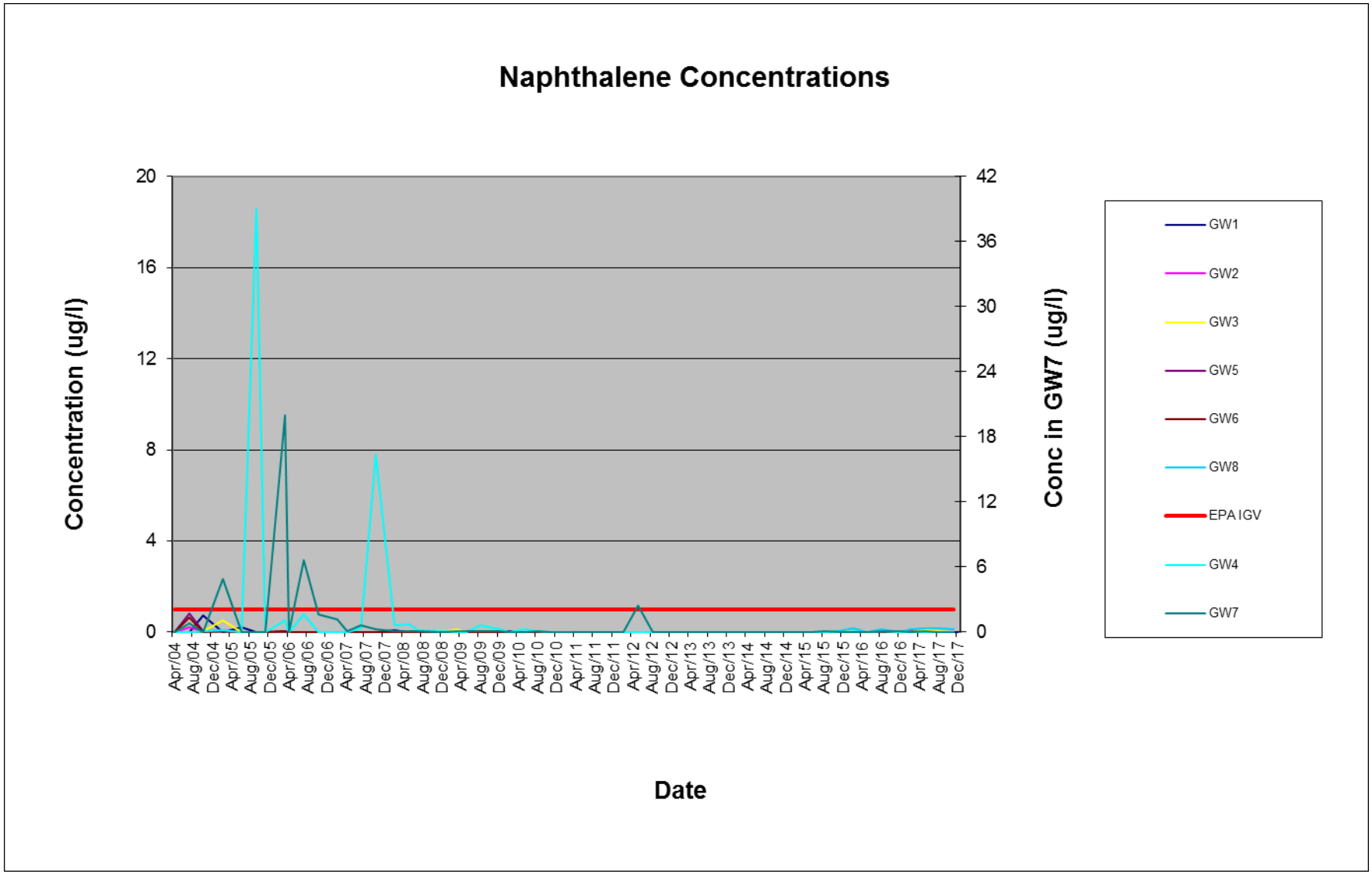


Figure 6.9 – Benzo (g,h,i) perylene Concentrations

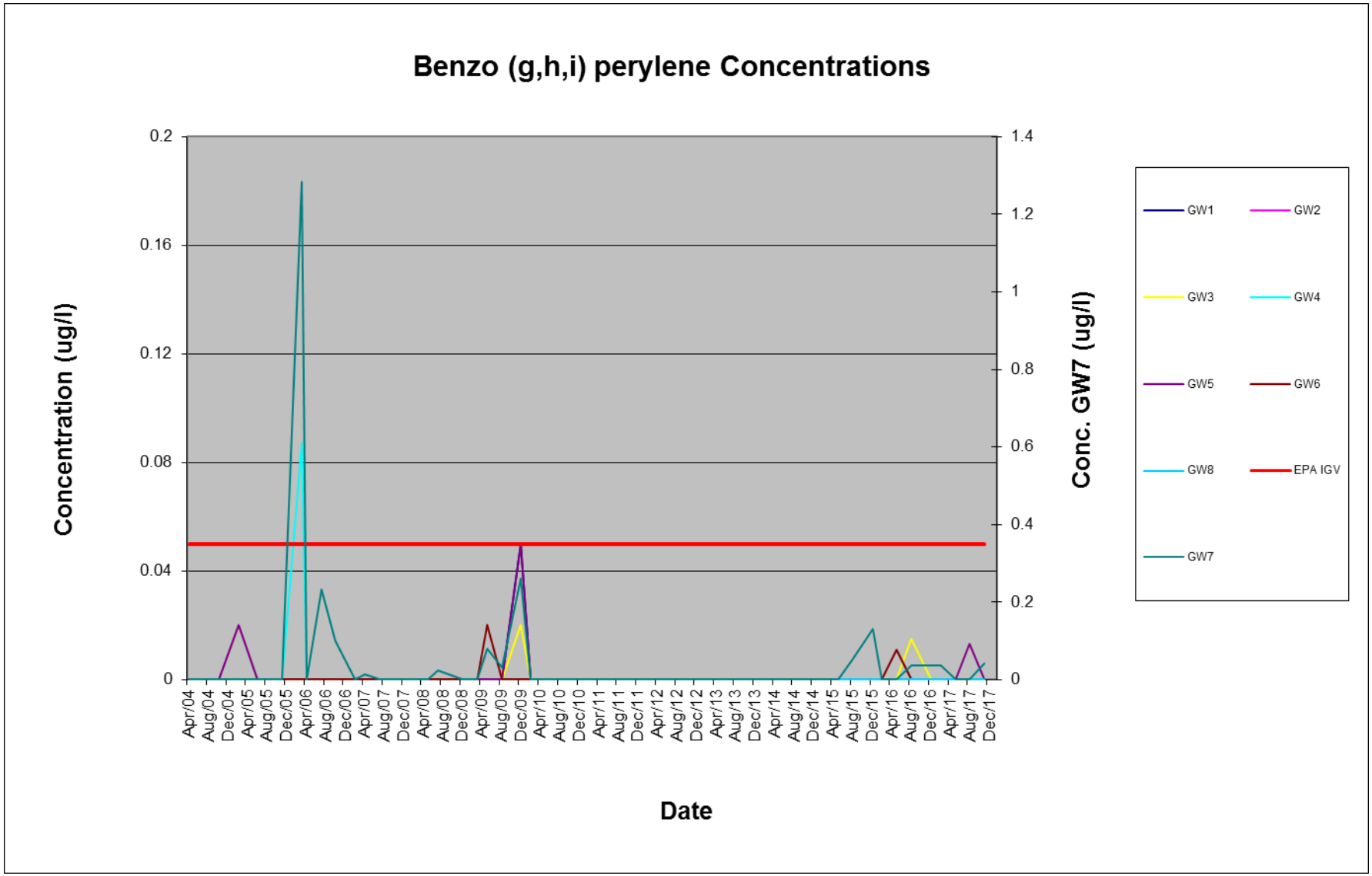


Figure 6.10 – Benzo (g,h,i) perylene in Monitoring Wells GW4 & GW7

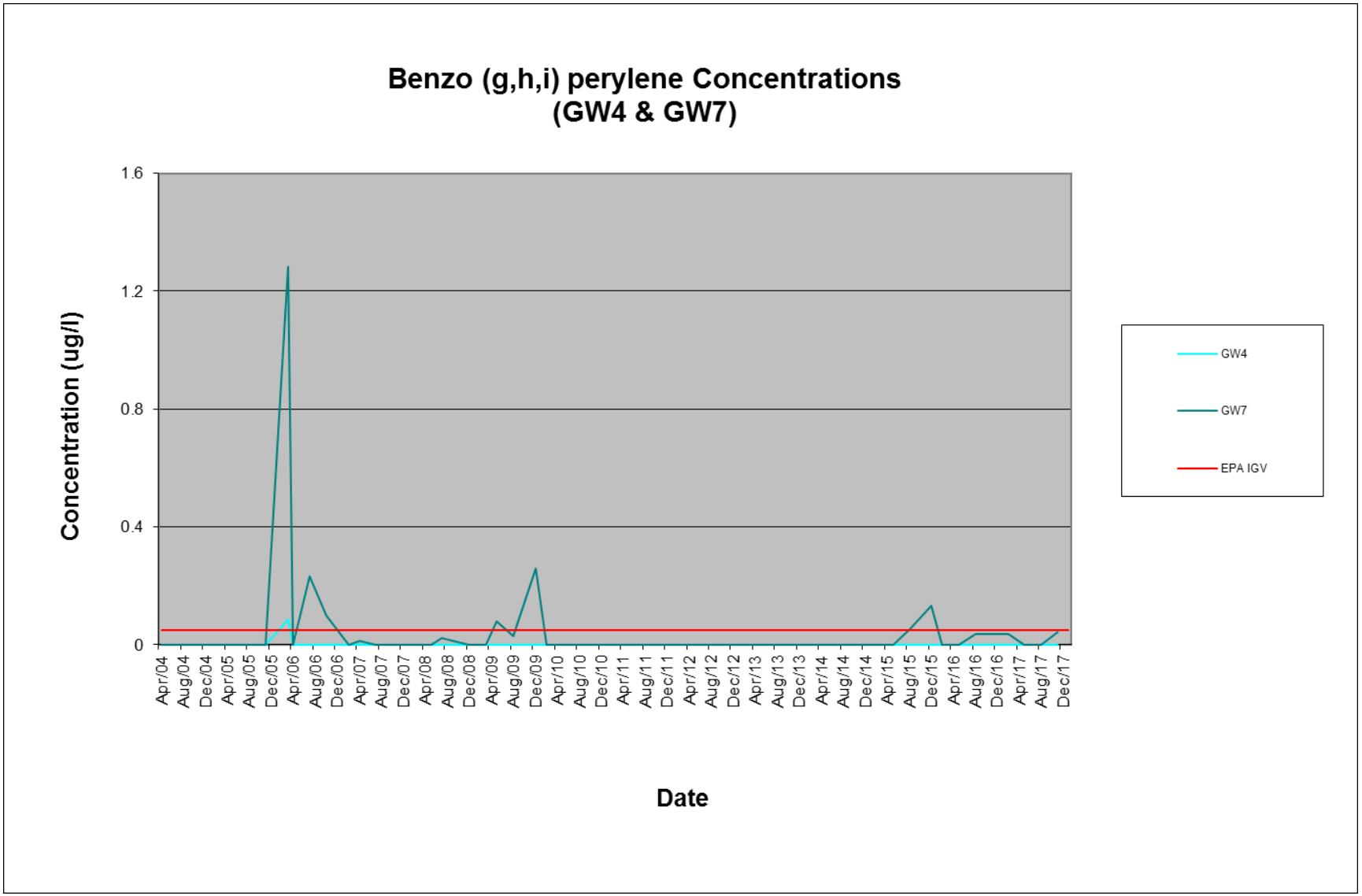


Figure 6.11 – Benzo (g,h,i) perylene in Monitoring Wells GW4 & GW7 Since 2010

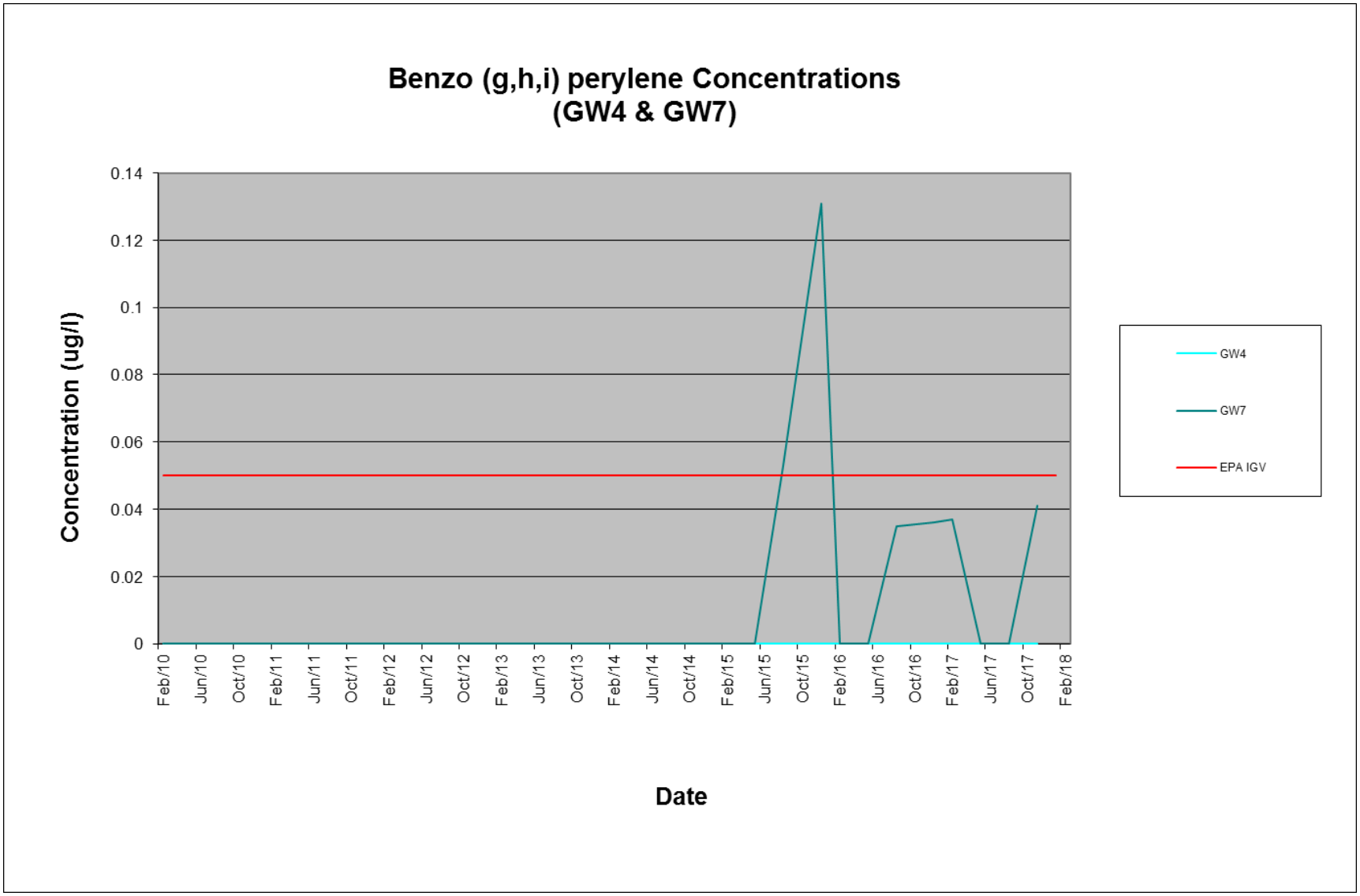


Figure 6.12 – Benzo (a) pyrene Concentrations in all Monitoring Wells

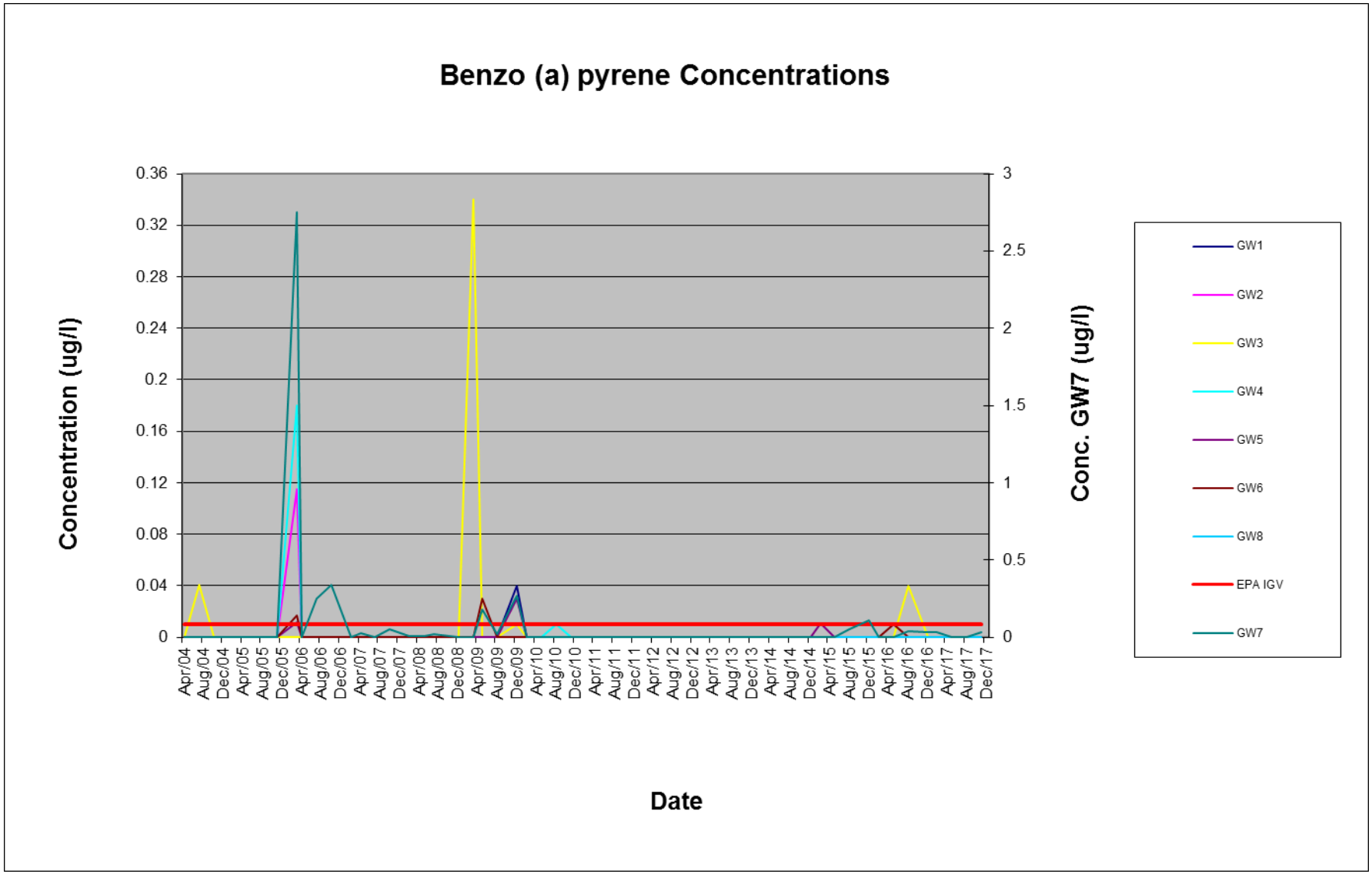
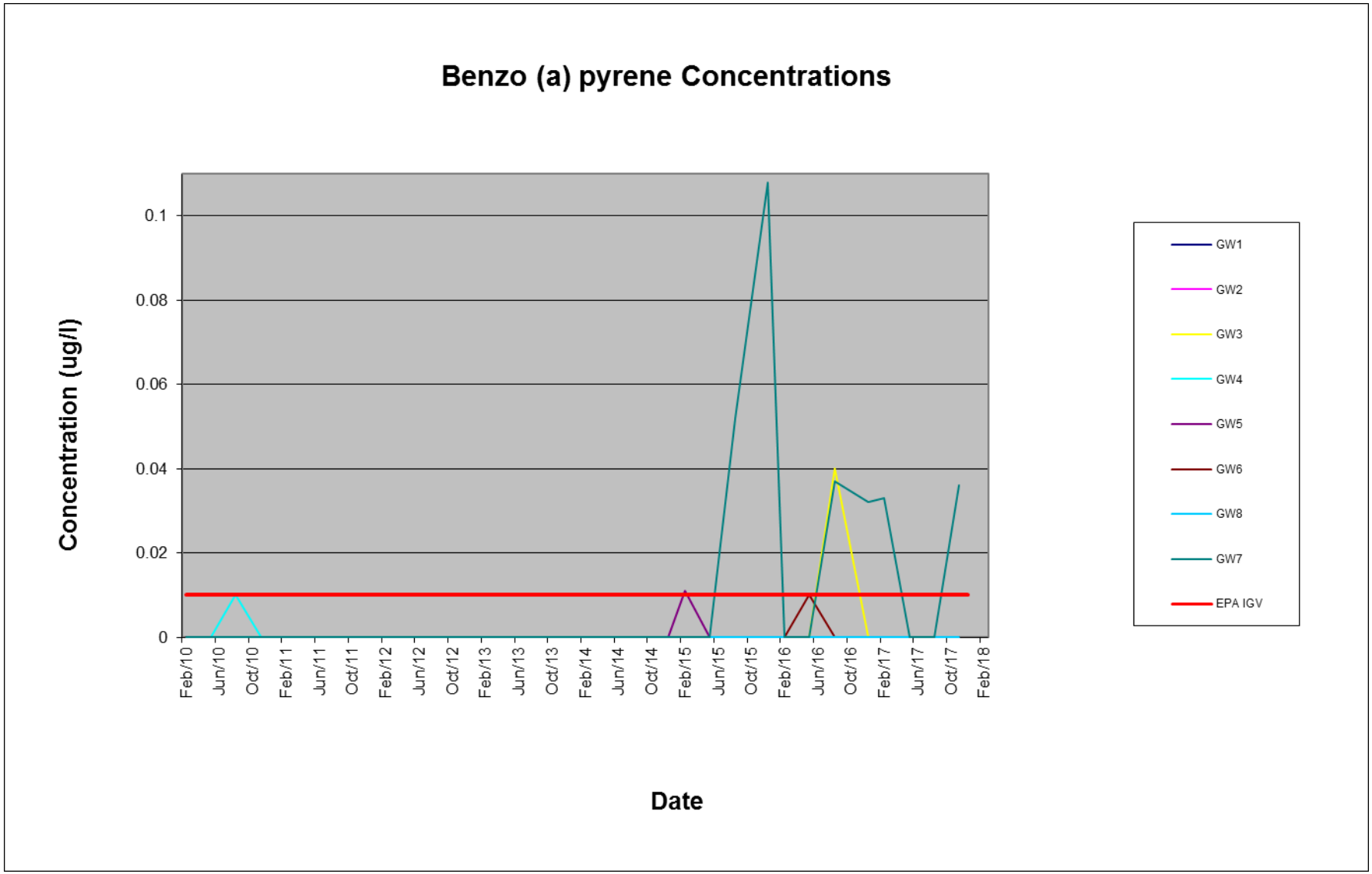


Figure 6.13 – Benzo (a) pyrene Concentrations in all Monitoring Wells Since 2010



6.2.3 Total Petroleum Hydrocarbons (TPH)

Historically **Total Petroleum Hydrocarbons (TPH)** including mineral oil, petrol range organics (PRO) and diesel range organics (DRO) have been detected within GW3, GW4 and GW7. Since 2009, speciated hydrocarbon analysis using the Total Hydrocarbon Criteria Working Group (TPHCWG) method has been carried out on all samples to obtain a more accurate profile of TPH within groundwater.

The results of the TPHCWG analysis has indicated that the predominant hydrocarbons detected are in the heavier chain carbon fractions, most notably in the carbon range C12-C16, C16-C21 and C21-C35. **Figure 6.14** illustrates the TPH analysis for the total TPH analysis from C10-C44 in all monitoring wells since 2009. The highest concentrations detected historically are at monitoring wells GW7, GW4 and GW3 respectively.

Previous quarterly monitoring reports have outlined the hydrocarbon trends recorded in each well since 2010. This report outlines the trends from 2015 up to and including the current monitoring report.

During the Quarter 1 2015 monitoring event, hydrocarbons were detected in GW7, GW8, GW3 and GW4. The predominant aromatic carbon range comprised C21-C35 (14 µg/l) in GW3, C12-C16 (27 µg/l) and C16-C21 (15 µg/l) in GW4, C12-C16 (14 µg/l) in GW7 and C12-C16 (15 µg/l) in GW8. Aliphatic hydrocarbons were detected in the ranges C16-C35 (54 µg/l) in GW3, C16-C35 (11 µg/l) in GW4 and C16-C35 (46 µg/l) and C35-C44 (12 µg/l) in GW7.

During the Quarter 2 2015 monitoring event, the TPH concentration in the aromatic C21-C35 range was detected at one shallow groundwater wells GW3 (509 µg/l). The TPH concentration in the aliphatic range was detected at C16-C35 (1760 µg/l) in GW3 and C12-C16 (225 µg/l) and C16-C35 (11 µg/l) in GW4.

The Quarter 3 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 (39 µg/l), C16-C21 (37 µg/l) and C21-C35 (28 µg/l) at GW4, C21-C35 at GW3 (17 µg/l) and C10-C12 (18 µg/l) and C12-C16 (29 µg/l) at GW8. TPH concentrations were detected in the aliphatic ranges C10-C12 (13 µg/l), C12-C16 (40 µg/l) and C16-C35 (62 µg/l) at GW4 and C16-C35 at GW3 (72 µg/l) and GW7 (14 µg/l).

The Quarter 4 monitoring event of 2015 detected TPH in the aromatic ranges C12-C16 (879 µg/l), C16-C21 (1380 µg/l) and C21-C35 (694 µg/l) at GW4, C21-C35 at GW3 (60 µg/l) and C10-C12 (13 µg/l) and C12-C16 (21 µg/l) at GW8. TPH concentrations were detected in the aliphatic ranges C10-C12 (495 µg/l), C12-C16 (3080 µg/l) and C16-C35 (3360 µg/l) at GW4 and C16-C35 (231 µg/l) and C35-C44 (14 µg/l) at GW3.

The Quarter 1 2016 monitoring event detected TPH in samples from the well GW3 were in the aliphatic range C16-C35 (132 µg/l) and from well GW8 in the aromatic range C12-C16 (15 µg/l).

The Quarter 2 2016 monitoring event detected TPH in samples from the well GW3 and were in the aliphatic range C16-C35 (150 µg/l) and in the aromatic range C21-C35 (57 µg/l) and from well GW8 in the aromatic range C12-C16 (20 µg/l).

The Quarter 3 2016 monitoring event detected TPH in samples from the well GW3 in the aliphatic ranges C16-C35 (35 µg/l), C35-C44 (10 µg/l) and in the aromatic range C21-C35 (11 µg/l), well GW4 in the aromatic ranges C12-C16 (25 µg/l) and C16-C21 (12 µg/l) and from well GW8 in the aromatic range C12-C16 (23 µg/l).

The Quarter 4 2016 monitoring event detected TPH in samples from the well GW2 in the aliphatic range C16-C35 (13 µg/l), well GW3 in the aliphatic ranges C16-C35 (160 µg/l), C35-C44 (14 µg/l) and in the aromatic range C21-C35 (47 µg/l), well GW4 in the aromatic ranges C12-C16 (12 µg/l), well GW7 in the aliphatic range C16-C35 (14 µg/l) and from well GW8 in the aromatic ranges the aromatic ranges C10-C12 (13 µg/l) and C12-C16 (23 µg/l).

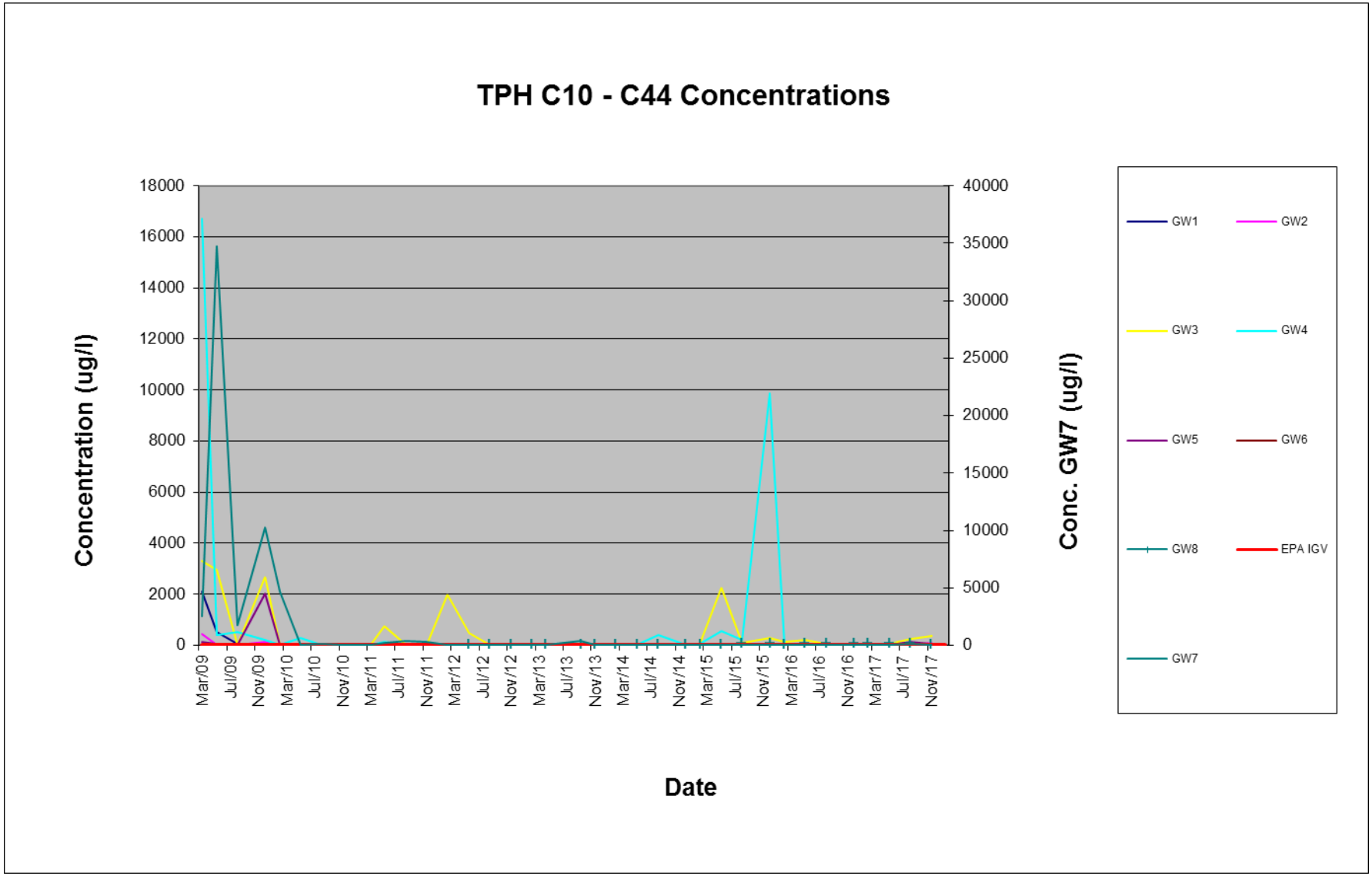
The Quarter 1 2017 monitoring event detected TPH in samples from the well GW2 in the aliphatic range C16-C35 (11 µg/l), well GW3 in the aliphatic range C16-C35 (15 µg/l), well GW5 in the aliphatic range C16-C35 (23 µg/l), well GW7 in the aliphatic range C16-C35 (40 µg/l) and in the aromatic range C21-C35 (13 µg/l), and well GW8 in the aromatic ranges C10-C12 (11 µg/l) and C12-C16 (21 µg/l).

The Quarter 2 2017 monitoring event detected TPH in samples from the well GW3 in the aliphatic range C16-C35 (50 µg/l), well GW4 in well the aliphatic ranges C12-C16 (13 µg/l) and C16-C35 (37 µg/l), and in the aromatic ranges C12-C16 (15 µg/l) and C16-C21 (20 µg/l), well GW6 in the aliphatic range C16-C35 (12 µg/l), well GW7 in the aromatic range C12-C16 (18 µg/l), and well GW8 in the aromatic range C12-C16 (29 µg/l).

During the previous Quarter 3 2017 monitoring event, TPH was detected in samples from the well GW3 in the aliphatic range C16-C35 (177 µg/l) and in the aromatic range C21-C35 (71 µg/l), well GW5 in the aliphatic range C16-C35 (120 µg/l), well GW7 in the aliphatic range C16-C35 (61 µg/l) and in the aromatic range C21-C35 (40 µg/l), and well GW8 in the aromatic ranges C10-C12 (17 µg/l) and C12-C16 (24 µg/l).

During the current Quarter 4 2017 monitoring event, TPH was detected in samples from the well GW2 in the aliphatic ranges C12-C16 (15 µg/l), C16-C35 (70 µg/l) and C35-C44 (13 µg/l), well GW3 in the aliphatic range C16-C35 (263 µg/l) and in the aromatic range C21-C35 (89 µg/l), and in well GW5 in the aliphatic range C16-C35 (49 µg/l) and in the aromatic range C21-C35 (11 µg/l).

Figure 6.14 – TPH (Carbon Range C10-C44) in all Monitoring Wells



7 CONCLUSIONS

- In accordance with the criteria set out in Schedule 4(ii) of the site's Industrial Emissions Licence Register No. W0184-02, groundwater monitoring was carried out at the ENVA Ireland site on the 14th of November 2017 corresponding to Quarter 4 of 2017. Samples were collected at 8 groundwater monitoring wells during this event.
- The results presented have been referenced against Groundwater Threshold Values (GTVs) outlined in the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. no 9 of 2010), where available. Where GTVs are not available for parameters, results are compared against the Interim Guideline Values (IGVs) set out in the Environmental Protection Agency interim report, '*Towards Setting Guideline Values for the Protection of Groundwater in Ireland*'.
- Results of the BTEX and MTBE demonstrate that the levels of Benzene, Toluene, Ethylbenzene, m&p Xylene, o-xylene were all below the recommended EPA IGVs. MTBE was detected at GW7 (8.7 µg/l) and GW8 (1.8 µg/l), however these concentrations are below the GTV.
- The Quarter 4 2017 results of the polycyclic aromatic hydrocarbons indicate that Total PAHs were above the GTV of 0.075 µg/l and the EPA IGV of 0.1 µg/l at two monitoring wells, GW7 (0.243 µg/l) and GW8 (0.147 µg/l).
- Chloroethane at GW7 (1.1 µg/l) and GW8 (8.9 µg/l), 1,1-dichloroethane at GW7 (2.3 µg/l) and GW8 (3.1 µg/l), and MTBE at GW7 (8.7 µg/l) and GW8 (1.8 µg/l) were detected above the laboratory limits of detection. All other VOCs and SVOCs were below their respective laboratory limits of detection.
- Samples were analysed for speciated phenols to include chlorophenols and the results indicate that there were no detections above the laboratory limits of detection.
- For the current Quarter 4 2017 monitoring event, TPH detections in samples from GW2 in the aliphatic ranges C12-C16 (15 µg/l), C16-C35 (70 µg/l) and C35-C44 (13 µg/l), well GW3 in the aliphatic range C16-C35 (263 µg/l) and in the aromatic range C21-C35 (89 µg/l), and in well GW5 in the aliphatic range C16-C35 (49 µg/l) and in the aromatic range C21-C35 (11 µg/l). Each of these is therefore over the limit of detection which is 10 µg/l. For the previous Quarter 3 2017 monitoring event, TPH detections in samples from the well GW3 in the aliphatic range C16-C35 (177 µg/l) and in the aromatic range C21-C35 (71 µg/l), well GW5 in the aliphatic ranges C16-C35 (120 µg/l), well GW7 in the aliphatic range C16-C35 (61 µg/l) and in the aromatic range C21-C35 (40 µg/l), and well GW8 in the aromatic ranges C10-C12 (17 µg/l) and C12-C16 (24 µg/l).
- The general trend of contaminant concentrations over time continues to be somewhat variable with compounds not being continually detected in the same borehole on two or three consecutive monitoring rounds. In general, the contaminant levels detected at the Enva facility appear to indicate reducing contaminant concentrations over time with infrequent elevations in some parameters. Further monitoring is recommended to confirm these reductions.

Appendix 5

Enva Ireland Limited

2017 CSM Update

Report for:
Enva Ireland Ltd

Date:
1st February 2018

Report No.:
BRE17017Rp01A02

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The Capel Building,
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Galway.

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Client:	Enva Ireland Ltd
Client Details:	Clonminam Industrial Estate. Portlaoise, Co Laois

Document Production / Approval Record

	Name	Signature	Date	Position
Prepared by (consultant /professional)	Niall Mitchell / Grainne Barron		01/02/2018	Hydrogeologist /Chartered Engineer
Approved by (consultant /professional)	Niall Mitchell		01/02/2018	Hydrogeologist /Chartered Engineer

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The conclusions and recommendations contained in this report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate. Information obtained by BREL has not been independently verified by BREL, unless otherwise stated in the report. Where assessments of works or costs identified in this report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

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Where field investigations are carried out, these have been restricted to a level of detail required to meet the stated objectives of the services. The results of any measurements taken may vary spatially or with time and further confirmatory measurements should be made after any significant delay in issuing this report.

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1 INTRODUCTION

1.1 INTRODUCTION

BlueRock Environmental Ltd was requested to undertake an update of the previous 2014 Conceptual Site Model and Hydrogeological Risk Assessment previous undertaken at the Enva Ireland (Enva) facility at Clonminam Industrial Estate, Portlaoise, Co. Laois. The most recent assessment for the facility is outlined in an RPS report (MDE0788Rp00017F01) produced for Enva in 2014 taking account of quarterly groundwater monitoring between 2014 and 2018.

This updated hydrogeological CSM report has been undertaken in accordance with Condition 6.15 of the recently issued revised EPA licence No. W0184-02 issued on the 15th June 2017 and in accordance with recent correspondence from the EPA, Ref: RI008474.

6.15 Ground Water

6.15.1 The licensee shall annually assess groundwater monitoring data and determine compliance under this licence with the European Communities Environmental Objectives (Groundwater) Regulations 2010 as amended.

6.15.2 A report on this assessment shall be included in the AER.

6.15.3 The licensee shall, in the event of a failure to demonstrate compliance with the European Communities Environmental Objectives (Groundwater) Regulations 2010 as amended or if instructed by the Agency, arrange for the completion, by an appropriately qualified consultant/professional, of a hydrogeological risk assessment to:

- *i. identify the risk of groundwater contamination arising from licensed activities;*
- *ii. assess the impact of extant groundwater contamination;*
- *iii. propose preventative and, as appropriate, remedial actions to be undertaken;*
- *iv. propose groundwater compliance values to be maintained at compliance points; and,*
- *v. address other matters that may be identified by the Agency.*

6.15.4 A hydrogeological risk assessment prepared under this condition shall be submitted to the Agency according to a schedule to be directed by the Agency.

6.15.5 The licensee shall implement the following according to a schedule to be agreed or directed by the Agency:

- *i. any proposals or recommendations arising from a hydrogeological risk assessment;*
- *ii. the installation of new groundwater monitoring boreholes where necessary to characterise groundwater quality; and*
- *iii. any other matters that may be directed by the Agency.*

The recent EPA correspondence is included in **Appendix A**.

1.2 SCOPE OF WORK

The following scope of works was undertaken during the completion of this assessment:

1. A detailed review of all previous RPS monitoring data and risk assessments undertaken at the facility including quarterly groundwater monitoring results.
2. Develop an up-to-date CSM and Risk Assessment for the facility based on the information provided and the EPA licence requirements.

1.3 PREVIOUS REPORTS

A number of reports and water quality laboratory data were reviewed relating to the facility – see **Table 1.1** below.

Report Title	Author and Date
Groundwater Risk Assessment Report - MDE0788Rp0001	RPS, 20/11/2008
Hydrogeological Review and Assessment Report - MDE0973Rp0017F01	RPS, 09/06/2014
Quarterly Groundwater Monitoring Data – RPS Consultants	2004 - 2017

Table 1.1 Previous Reports & Data

NOTE

As part of the licence review process and the granting of a new EPA licence in mid-2017, all monitoring wells on site have been relabelled as outlined in **Table 1.2** below.

Shallow Wells		Bedrock Wells	
Former Borehole ID	**New Borehole ID**	**Former Borehole ID**	**New Borehole ID**
BH101	GW1	MW01	GW5
BH102	GW2	MW02	GW6
BH103	GW3	MW03	GW7
BH104b	GW4		
MW04	GW8		

Table 1.2 Amended Monitoring Well Labels

This report is based on the spreadsheet data supplied by RPS consultants and the 2008 and 2014 CSM reports. BREL take no responsibility in relation to the accuracy of the data provided.

It should be noted that in 2004 borehole BH104 was converted to a ground sump and a new borehole was drilled labelled as BH104b. BH104 sump remains on site and is located in close proximity to BH104b.

2 BACKGROUND SITE INFORMATION

2.1 SITE LOCATION AND SETTING

Enva Ireland operates a waste treatment and management facility to the south-west of Portlaoise town in Clonminam Industrial Estate. The site occupies an area of approximately 1.5 hectares and comprises of a packaged waste storage area, waste oil and contaminated soil treatment plant. The site is bounded to the north and east by land belonging to Irish Rail, comprising sidings and general storage areas. To the south is a vehicle repair garage, which is elevated above the level of the site by approximately 1.5 m. To the west, the site is adjoined by further industrial land, as well as residential land. The site location is shown in **Figure 2.1**.

The site has been in operation since 1978, and the layout and site function have remained relatively consistent. The site layout is shown on **Figure 2.2**. The site is largely covered in hardstanding surface. All oil and soil storage areas are suitably bunded and the general standard of housekeeping is good.

The wider regional area in which the site is located is gently undulating. The site itself slopes gently to the south west but to the east of the site the ground slopes gently towards the River Triogue, located approximately 1.5 km to the east.

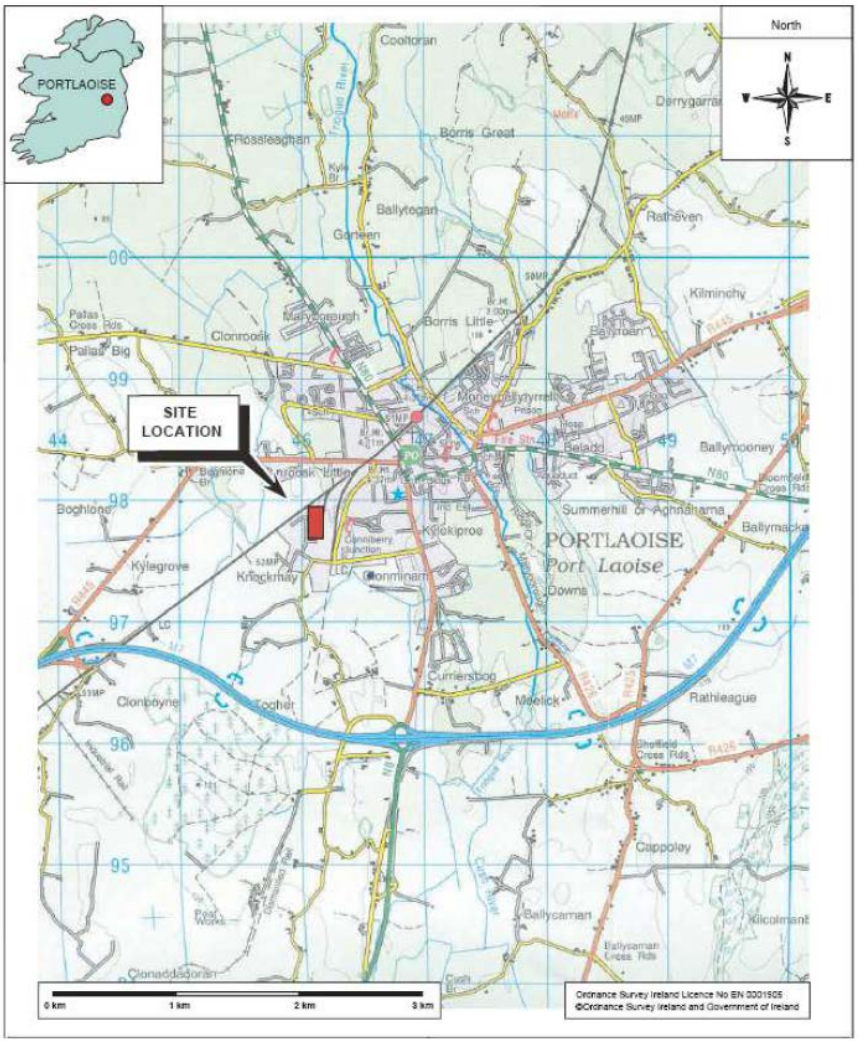


Figure 2.1 Site Location

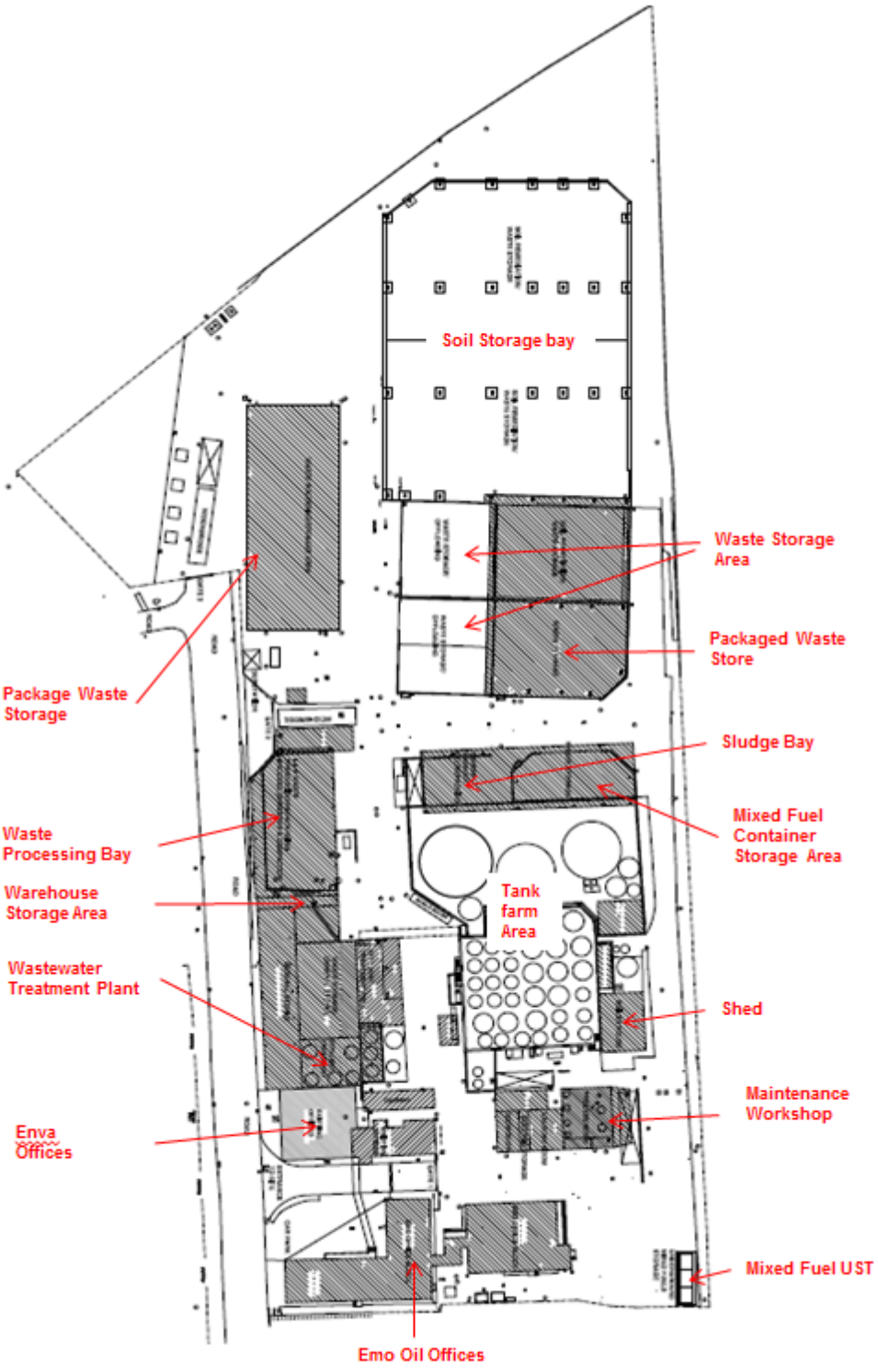


Figure 2.2 Site Layout

2.2 SITE DESCRIPTION

The Enva facility accepts waste oils, packaged waste, mixed fuels and contaminated soil under the waste licence W0184-02. Waste oils are processed on-site to form a new final fuel product which is tested in the in-house laboratory prior to transportation and distribution from the site. Accepted waste oils and the new final fuel product are stored in bulk storage tanks in the fully bunded tank farm. Packaged waste includes mixed plastic packaging, paint, solid oily waste, filters and batteries. Packaged waste is stored on site in a bunded area where it is segregated before being transported to relevant waste disposal or recovery facilities. Contaminated soil is directed to designated soil storage bays where it undergoes treatment through bio-remediation and soil stabilisation.

The Enva site consists of the following infrastructure;

- Administration building including on-site laboratory
- Maintenance workshop
- Mixed fuel underground storage tank
- No 3. unloading gantries
- Bunded waste storage areas
- Enclosed process building for storage for oily rags and filters
- Bunded mixed fuel storage tank
- Bunded oil tank farm consisting of 42 storage tanks.
- Bunded soil storage bay
- Sludge holding area
- Bunded wastewater lime treatment plant for treatment of wastewater
- Boiler house

Bunds are integrity tested on a 3 yearly basis with the most recent testing undertaken in 2017. BREL understands that all integrity testing results have described the bunds as being in adequate condition and fit for purpose. All bunds will be integrity tested again in 2018 as per Enva's waste licence requirements.

The wastewater lime treatment plant is fully bunded and treated effluent is discharged to sewer and ultimately the Portlaoise waste water treatment plant. Treated effluent is sampled prior to release from the wastewater treatment plant.

All surfaces are covered in hardstanding cover with the exception of a section of open ground to the east of the soil storage bay. The section of open ground is used for storage of clean redundant plant. A surface water drainage system is in place to capture run-off from roofs and the hardstanding concrete yard. The surface water drainage system is fitted with three Class I interceptors. The two interceptors located on the line that discharges surface water off site to the municipal network are installed with shut-off valves.

Underground foul sewer and surface water drainage pipelines were inspected in June 2016 at a number of locations and their integrity was considered sufficient.

2.3 REGIONAL & SITE GEOLOGY

The Geological Survey of Ireland indicates that the regional geology of Portlaoise is typified by Carboniferous Limestone. In the vicinity of the site itself the solid geology comprises the Ballysteen Formation, a micaceous-bioclastic limestone. This well-bedded limestone, with interbeds of shale, is extensively folded, with axes trending north-east to south-west, and becomes increasingly muddy towards the top of the formation. North-east to south-west trending faults are found in the region, with one located approximately 500m to the east of the site. The subsoil's in the region comprise mainly Made Ground, around the industrial area, and Limestone Till in the surrounding regions.

The Enva facility lies on limestone bedrock which is overlain by glacial clayey sands and boulder clay.

The glacial subsoil consists of gravelly clay and loose clayey sand at a thickness of between 4.5 m and 9.0 m above the underlying limestone bedrock. A 3.5 m depth of made ground has been identified in the southern portion of the site close to the southern site boundary. The made ground is underlain by sand and gravel above the bedrock.

A total of eight boreholes have been drilled at the site and the general sequence of ground conditions is presented in **Table 2.1**. The logs for each of the boreholes are presented as **Appendix B**.

A schematic cross section of ground conditions across the site is presented as **Figure A.**

Strata	Extent	Thickness	Description
Made Ground	BH104	0 – 3.5m	Dominantly concrete, with hardcore fill and clay
Boulder Clay	All boreholes	<8.5m	Includes fine to medium, well rounded gravels
Sand and Gravel	Confined to south east corner of site (BH101, BH104 and MW03)	0 – 2.0m	In general, the transition from boulder clay to sand is gradual with changes from gravel to sandy gravel to sand.
Limestone Bedrock	Encountered in MW01, MW02 and MW03	Not penetrated. Top of limestone ranges from 7.5 m to 9.0 metres below ground level.	Pale grey, fine grained bedrock, differentiated from boulders by unweathered nature.

Table 2.1 Summary of Site Geology

2.4 HYDROGEOLOGY

2.4.1 Aquifer Classification & Vulnerability

The limestone bedrock is Dinatian Pure Bedded Limestone and has been categorised as a Locally Important Aquifer which is moderately productive only in local zones (Ll). The new national groundwater vulnerability map issued by the Geological Survey of Ireland (Jan 2014) indicates the north eastern area of the site is defined as high vulnerability and the southern area of the site is mapped as moderate vulnerability.

A Regionally Important Karstifed Aquifer (Rk) lies approximately 0.5 km to the east of the Enva site (see **Figure 2.3**). This regionally important aquifer provides groundwater supply to the Portlaoise and Meelick public water systems. Each system has a dedicated source protection scheme developed within both inner and outer protection zones delineated.

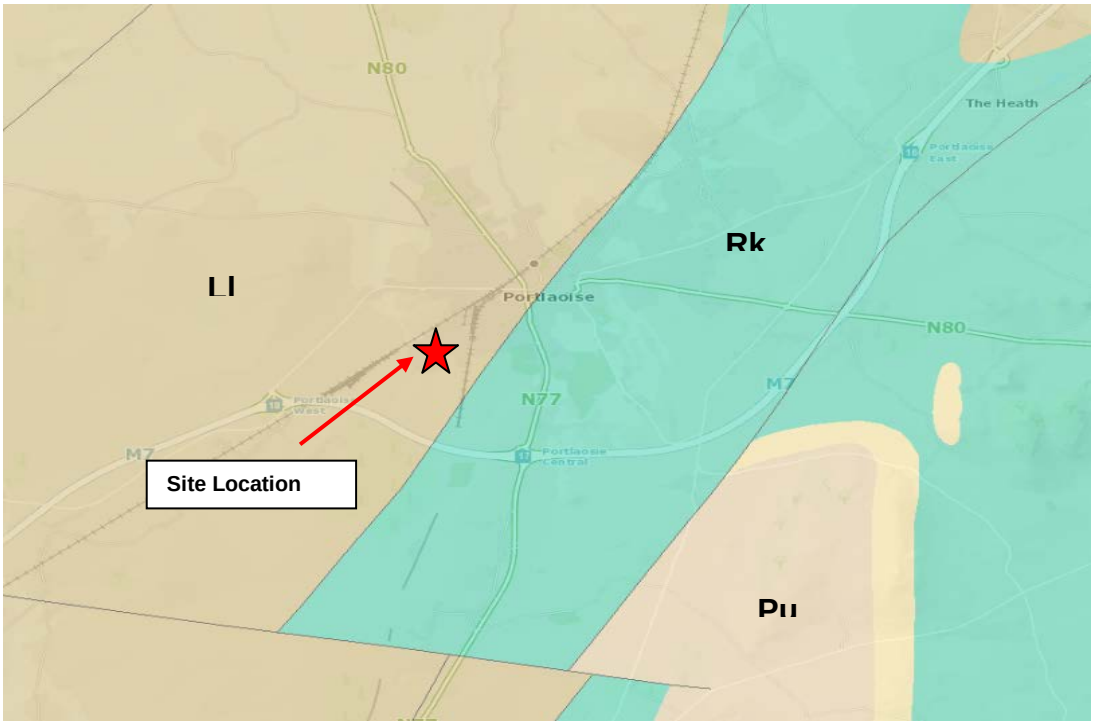


Figure 2.3 Groundwater Bedrock Aquifers

The Portlaoise Source Protection Zone (SPZ) comprises three groundwater abstraction well fields, comprising of two abstraction wells each, supply the Portlaoise public water system. The abstraction well fields are located to the north and north-east of Enva. The source protection zone for the abstraction well fields extends to within 3.5 km of the Enva site.

The Meelick SPZ is located approximately 1.85 metres southeast of Enva with the Inner Protection Zone the closest area to the Enva facility.

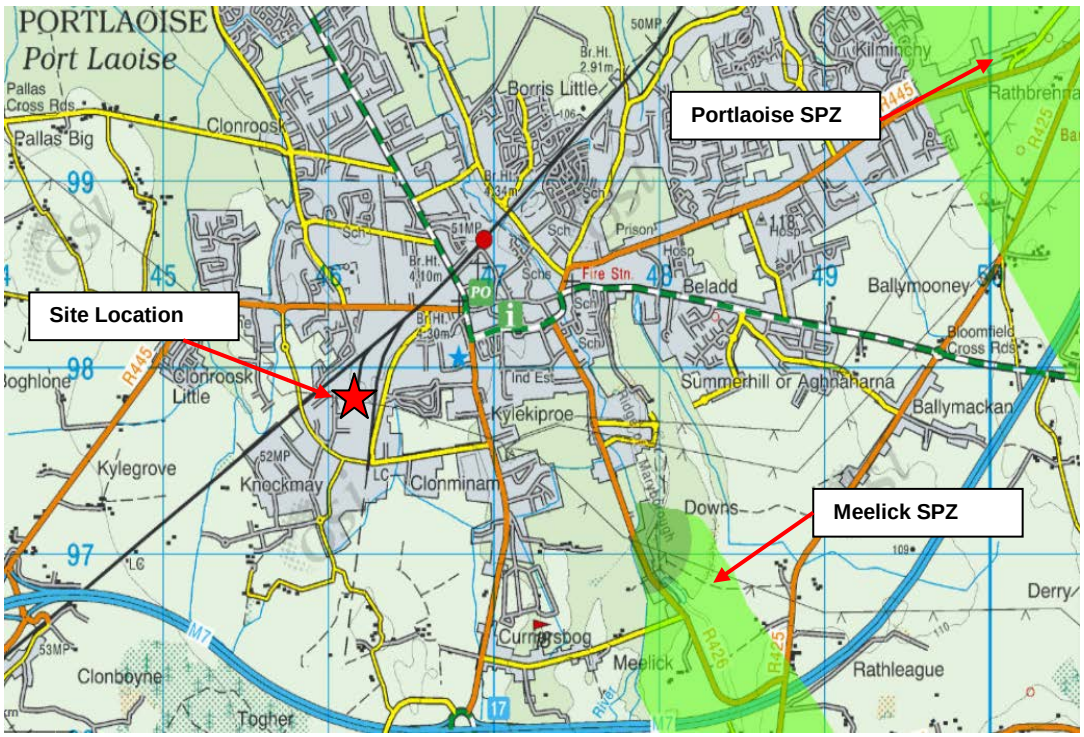


Figure 2.2 Source Protection Zones

The GSI8/ have mapped annual groundwater recharge in the Portlaoise area as being between 101 mm/yr and 150 mm/yr. Direct groundwater recharge across the Enva site is likely to be lower than this range due to the hardstanding cover. The area of open ground to the north east of the site will afford some recharge to the underlying groundwater. Groundwater quality status mapping from the Environmental Protection Agency (EPA) Envision website, indicates that groundwater quality in the Portlaoise area has a 'Good' status under the EU Water Framework Directive criteria.

2.4.2 Shallow Groundwater

Shallow groundwater in the glacial subsoil, above the limestone bedrock, has the potential for connection to the deep groundwater through a diffuse network of factures and fissures in the limestone. Bi-annual groundwater flow mapping at the site indicates that shallow groundwater flows eastwards towards the River Triogue. It is thought that shallow groundwater is in hydraulic continuity with the River Triogue.

Groundwater levels were historically automatically logged using data loggers from June 2008 to October 2008. Data logger and rainfall data revealed at this time that shallow groundwater had an almost instantaneous response to rainfall which may be indicative of low storage potential in the subsoil. Direct recharge potential to the subsoil from the rainfall was considered to be low due to the hardstanding that covers much of the site.

Five shallow groundwater monitoring wells are present on site, GW1 (formerly BH101), GW2 (formerly BH102), GW3 (formerly BH103), GW4 (formerly BH104B) and GW8 (formerly MW04) – see **Figure 2.5**. Four wells were drilled in 2001 and were drilled to depths of 5.7 mbgl to 6.8 mbgl. An additional well, GW8/MW04, was drilled in 2011 to a depth of 7.5 mbgl.

2.4.3 Deep Bedrock Groundwater

Deep groundwater in the limestone bedrock flows within fractures in the limestone. Deep groundwater flow direction has been mapped to flow in varying directions on different occasions. In 2005 URS mapped groundwater to flow in a south-south easterly direction, while RPS mapping in 2005 determined that groundwater flow was to the north.

The most recent groundwater mapping of the deep groundwater indicates that flow is in a north easterly direction. The variation in groundwater flow direction in the deep groundwater may be due to the fact that the monitoring boreholes are screened within fracture zones at different depths and no vertical connection has been proven between these fracture zones. Groundwater contour mapping of the deep groundwater assumes that a connection exists between the fractures zones however this may not be the case and groundwater may be flowing along several different planes.

A comparison between data logger data and rainfall data from June 2008 to October 2008 indicates that deep groundwater shows a response to rainfall events. Recharge to the deep groundwater will be restricted by the overlying low permeability subsoil and the hardstanding cover at the surface. Three deep groundwater monitoring wells are located on site, GW1 (formerly MW01), GW2 (formerly MW02) and GW3 (formerly MW03) – see **Figure 2.5**. The deep groundwater monitoring wells were drilled in 2004 to depths of between 15 mbgl and 32 mbgl.

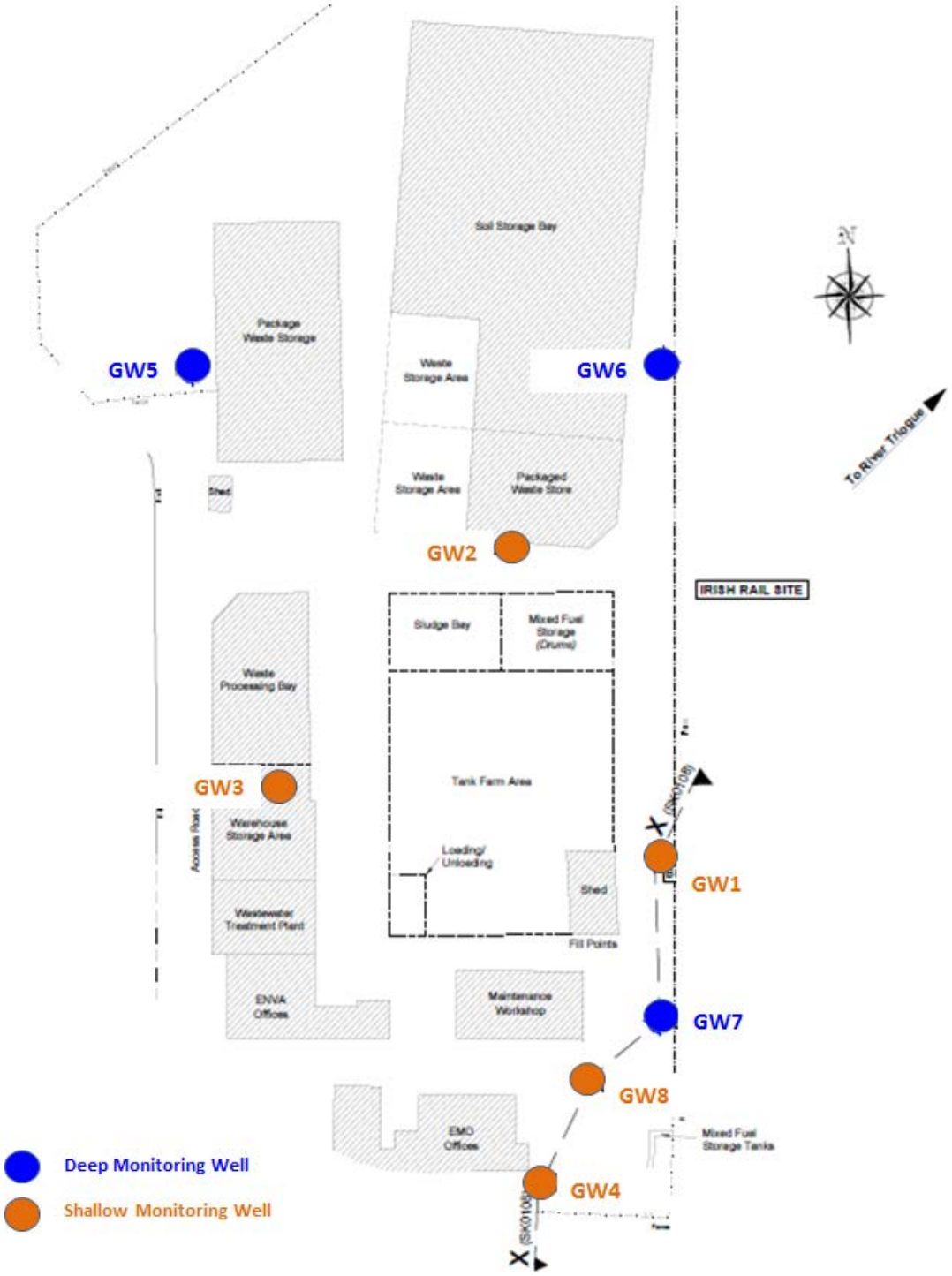


Figure 2.3 Monitoring Well Locations

2.5 HYDROLOGY/SITE DRAINAGE

The River Triogue flows in a northerly direction through the eastern region of Portlaoise town and is approximately 1.5 km from the Enva site. South of Portlaoise town the River Triogue has a Q-rating of 4 corresponding to a 'Good' quality status under the Water Framework Directive. The quality status of the River Triogue was measured at an EPA monitoring point adjacent to The Portlaoise Golf Club along the Wells Road. Approximately 2 km north of Portlaoise at Ballytegan the Triogue River has a Q-rating of 2-3 indicating a 'Poor' quality status.

2.6 SENSITIVE SITES

The following sensitive receptors have been identified in relation to the Enva site:

- Locally Important Limestone Aquifer (Ll);
- Regionally Important Karstified Aquifer (Rk) 0.5km east of the site; and,
- River Triogue approximately 1.5 km to the east of the site.
- Meelick SPZ located approximately 1.8 km southeast of the site.

3 REVIEW OF 2008 GROUNDWATER RISK ASSESSMENT

The 2008 assessment was undertaken in response to an EPA audit report in 2007 and a request for further information in relation to Enva's response to the audit report. The groundwater risk assessment report covered the following topics:

- Review of previous information
- Review of site environmental setting
- Identification of contaminants and contaminant trends
- Conceptual Site Model
- Risk Assessment in accordance with UK Remedial Targets Methodology
- Free-phase product monitoring

The 2008 hydrogeological assessment was undertaken using a number of information sources including previous intrusive investigations on site, borehole logs, quarterly monitoring reports, installation of automatic data loggers, targeted groundwater sampling and measurement of free product.

A summary of the 2008 groundwater risk assessment report is provided in **Section 3.1** below and a review of the report is provided in **Section 3.2**

3.1 SUMMARY OF 2008 GROUNDWATER RISK ASSESSMENT REPORT

3.1.1 Groundwater Flow

Groundwater was encountered, during drilling, within fractures in the limestone bedrock in boreholes MW01, MW02 and MW03 at depths of 22mbgl (80.1mAOD), 29mbgl (74.12mAOD) and 7.8mbgl (94.97mAOD) respectively. Stabilised groundwater levels within the limestone ranged from approximately 98 to 100 mOD indicating that the groundwater is confined by the relatively low permeability rock matrix and overlying drift deposits.

Shallow groundwater was also encountered within the drift deposits at depths of between 1.5mbgl (99.66mAOD) and 4.5mbgl (98.27mAOD). Stabilised levels in the drift deposits also ranged from approximately 89 m to 100 mOD. This water was interpreted to be perched upon the relatively low permeability bedrock although there is potential for connection with deeper groundwater through vertical or sub-vertical fractures.

Groundwater levels were measured manually since 2004 and utilising automated dataloggers within selected monitoring wells in 2008. The resulting graphs showed that groundwater levels vary significantly between monitoring rounds and that the location of the up-gradient and down gradient holes also vary meaning that groundwater changes direction over time.

3.1.2 Potential Sources of Contamination

Quarterly groundwater monitoring events in 2008 detected chlorinated solvents, petroleum hydrocarbons and phenols at a number of groundwater monitoring wells. The 2008 groundwater risk assessment report outlined several potential on-site and off-site sources of the detected organic contamination. These sources are outlined below. Chlorinated solvents and phenols have not been detected at any monitoring location at the Enva facility since 2009.

1. **Soil remediation and storage area in the north of the site**

This area is covered with hardstanding. No soil contamination was noted in BH102, MW02 or MW01 during drilling and observations of contamination in groundwater are generally within the south of the site. This area is therefore not considered to be a source.

2. Tank farm area and fill points in the centre of the site

The tank farm area was appropriately bunded and located on hard-standing. This area was therefore not considered a source.

3. Sludge bay to the north of the tank farm

A trial pit was excavated beneath the sludge bay in September 2004 and did not detect any evidence of contamination. This area was therefore not considered to be a source.

4. Mixed fuel tank in the south-east corner of the site

This tank had been in use since 2006. The tank was fitted with a leak detection system and was pressure tested. The mixed fuel tank was therefore not considered to be a source.

5. Surface water drainage system, oil interceptors

These are located at the northern end of the site, one beside the waste oil processing plant, and the other north of GW5/BH103, and were regularly maintained. They were not considered to be a source.

6. Former vehicle repair workshop in the south of the site in the vicinity of BH104B

This operation was closed in 1990. An oily sheen and odour was detected in soils whilst drilling BH104 but no free product was recorded until 2004. The analysis of the product recovered indicated that it was unweathered diesel which is not consistent with the closure of the garage over 10 years prior to this.

7. Former oil reception sump in the east of the site in the vicinity of MW03

Some localised remediation of soils was undertaken in this area but a residual source may remain. Contaminants detected within MW03 were considered to be potentially consistent with the contents of waste oil tanks.

8. Accidental spillage

There were no reportable incidents of spillages since boreholes were first installed on the site in 2001.

9. LNAPL within BH104

It was considered possible that the contamination observed in groundwater observed in MW03 could be a result of vertical migration of contaminants along preferential pathways created by fractures within the limestone bedrock. Although both MW03 and BH104 recorded the presence of hydrocarbons their detailed chemical signatures varied.

10. Operational automotive repair business

An automotive repair business was present immediately to the south of the site, and immediately adjacent to BH104B. The adjoining site was elevated by approximately 1.5 m relative to the Enva site and at the time of the monitoring round in July 2008, drums of unknown liquids were being stored in an unbunded area immediately adjacent to the site boundary, although no evidence of leakage was observed on the retaining wall.

11. Irish Rail operations

Land immediately to the north and east of the site was occupied by Irish Rail and used for the storage of railway sleepers which were stored uncovered on open ground. It was thought that Irish Rail had operated at this location since before the Enva facility was established. Railway land was considered a potential source of metal, TPH and PAH contamination. Railway sleepers are commonly treated with creosote which is a source of PAH contamination.

3.1.3 2008 Conceptual Site Model (CSM)

A Conceptual Site Model (CSM) was developed for the Enva Portlaoise site in 2008 using the source–pathway receptor linkage approach. The CSM is outlined below.

- **Sources**

The film of free product observed within BH104 and GW7/MW03 was described as representing secondary sources of contamination. The primary sources were unknown and were deemed to be derived from historical activities at the site or off-site sources. The two secondary sources of contamination identified included the following:

Light Non-Aqueous Phase Liquid (LNAPL) in vicinity of BH104
The film of product (<2mm thick) in BH104 was identified as diesel. Diesel is comprised of approximately 98% Aliphatic (straight chain) hydrocarbons and 2% Aromatic (ringed) hydrocarbons which implied a low mobility hydrocarbon material in this area. Aromatic compounds are more mobile in groundwater than aliphatic compounds and therefore, dissolved phase contaminants derived from the free phase diesel are likely to comprise predominantly aromatic compounds. Being more mobile these compounds were determined to generally present a greater risk to groundwater and surface water receptors. Polycyclic Aromatic Hydrocarbons (PAHs) were also detected within groundwater.

Free product in GW7/MW03
The free product in GW7/MW03 was unidentified and its exact positioning in relation to the water table was determined to be unknown. The groundwater analysis did not record any hydrocarbons in this area suggested that this product was immobile and did not mix readily with water. 1,1 Dichloroethane. and PAHs have been historically detected within the groundwater at this location.

- **Pathways**

It was considered that the main pathway for contaminants to enter groundwater was via dissolution from NAPL and migration in the direction of groundwater flow. In the case of the LNAPL film within BH104 sump, groundwater flow was assumed to be taking place predominantly within the glacial deposits in the direction of GW1/BH101, which is located adjacent to the eastern site boundary.

In the case of product film within GW7/MW03, groundwater flow was reported to be occurring within a discrete fracture zone at a depth of approximately 15 mbgl. The direction of flow and the degree of connectivity with other fracture zones within the bedrock was not determined. The potential for vertical dissolved phase migration of contaminants along preferential pathways created by vertical fractures within the limestone was considered a possibility. Along the lateral migration pathway contaminants were considered likely to be subject to the attenuation processes of dispersion, adsorption, biodegradation and restriction of floating by free phase (LNAPL) product migration within vertically/steeply inclined fractured limestone.

- **Receptors**

The following receptors were considered:

- Shallow groundwater within the glacial deposits immediately beneath the site;
- Deeper groundwater within limestone bedrock immediately beneath the site;
- The wider limestone aquifer which is used for the abstraction of drinking water from an abstraction point 6 km distance from the site;
- The River Triogue 1.5 km to the east of the site; and,
- Meelick SPZ.

3.1.3 Risk Assessment in accordance with UK Remedial Targets Methodology

The objective of the risk assessment undertaken in 2008 was to assess the potential risks that the identified contaminants could have on the receptors outlined in the CSM. The risk assessment approach adhered to the UK Remedial Target Methodology for Hydrogeological Assessment of Land Contamination (EA, 2007).

The eastern groundwater monitoring well, GW1/BH101, was selected as the most appropriate compliance point for the assessment based on interpreted groundwater flow direction.

Aliphatic and aromatic hydrocarbons of the range C8-C10 and C10-C12, Naphthalene and Benzo(a)pyrene were the contaminants chosen to be assessed in the risk assessment process. Aquifer properties and contaminant transport constraints were derived from site measurements where possible and literature values. Where literature values were used conservative values were taken in all cases.

Tier 3 of the risk assessment considered contaminant concentrations after attenuation within the aquifer along the contaminant travel pathway. The risk assessment for the Enva site determined that none of the contaminants recorded concentrations greater than the relevant environmental compliance criteria at the compliance point.

The conclusion outlined in the 2008 groundwater risk assessment reported that the thin LNAPL in GW4/BH104B and the unidentified product within GW7/MW03 represented a source of dissolved phase concentrations within groundwater. The compounds that comprised these products were considered to be hydrophobic and would not preferentially partition into the dissolved phase. Significant off-site migration was determined to be therefore unlikely and these contaminants were not considered to present a risk to the wider shallow and deep groundwater. This was subsequently confirmed by the quantitative risk assessment.

Free Phase Product Monitoring

The risk assessment report made the following commentary on the likely transport mechanisms of free product detected in GW4/BH104B and GW7/MW03:

- The only measureable thickness (<2mm) of product related to GW4/BH104B was in the adjacent BH104 sump. As the product related to GW4/BH104b is lighter than water it was considered likely to spread out across the surface of the water. Product migration is controlled by the direction of groundwater flow and physical features within the aquifer.

- The product associated with GW7/MW03 was different in character to GW4/BH104B with no recordable thickness of this product was recorded at any location. It was thought that the product at GW7/MW03 was a dense non-aqueous phase liquid (DNAPL) which is generally immobile and would sink to the base of the water column. Within the fractured limestone aquifer DNAPL may collect in pockets within the fractures however the risk assessment and the groundwater analysis demonstrated that product within GW7/MW03 was not giving rise to a significant dissolved phase plume.

4 2014 GROUNDWATER RISK ASSESSMENT

This 2014 hydrogeological assessment provided an update to the 2008 hydrogeological assessment. It evaluated the potential risk that the Enva facility posed to sensitive receptors in an effort to confirm that the site was compliant with SI no 9 of 2010. The assessment utilised the following information sources to develop source-pathway-receptor risk factors for the Enva facility:

- The 2008 Groundwater Risk Assessment Report produced by RPS (MDE0788RP0001);
- Groundwater flow direction maps from 2011 to 2013; and,
- Quarterly groundwater monitoring reports from 2008 to 2013.

4.1 GROUNDWATER FLOW MAPPING

The report determined that shallow groundwater flows fluctuated from an east to north-easterly direction. Deep groundwater flow mapping has shown that deep groundwater is flowing in a north easterly direction. This flow mapping suggested that GW1/BH101 is the most relevant downgradient well associated with the shallow groundwater aquifer and that GW2/MW02 is the most relevant downgradient well associated with the deep groundwater aquifer; however, GW7/MW03 is located adjacent to the eastern boundary in the southern portion of the site and therefore was also considered when discussing off site migration of contaminants within the deep groundwater body.

4.2 UPDATED RISK ASSESSMENT

A CSM was developed in 2014 utilising the EPA Guidance on Authorisation of Discharges to Groundwater. The source-pathway-receptor (SPR) risk factors were then utilised to assess the potential risk to the sensitive receptors. The SPRs identified in the 2008 report were reassessed and an updated list of SPRs considered. T

A number of potential sources were considered across the site including the following:

1. Mixed Fuel Storage Tank Farm;
2. Maintenance Workshop;
3. Unloading Gantries Made Ground to the South of the Site;
4. Made Ground to the South of the Site; and,
5. Residuals from a Former Oil Reception Sump in the Vicinity of MW03.

A number of potential and known pathways were considered and the risks posed to downgradient sensitive receptors were considered to be low for each identified SPR linkage.

4.3 2014 UPDATED CSM

The 2014 CSM report was updated based on the 2008 CSM and the quarterly groundwater monitoring data between 2011 and 2013. The updated hydrogeological assessment made the following conclusions;

1. The River Triogue, the Locally Important Limestone Aquifer (Ll) beneath the site and the Regionally Important Karstified Aquifer (Rk) east of the site were identified as sensitive receptors of the site. Shallow groundwater flow direction in the boulder clay was interpreted to the east towards the River Triogue which is located 1.5 km downgradient. Deep groundwater flow direction in the Locally Important Limestone Aquifer was interpreted to be in a northeasterly direction towards the Regionally Important Limestone Aquifer.
2. Trend analysis of quarterly monitoring data from 2008 to 2013 identified manganese, iron, chloride and nickel as inorganic parameters that were detected above the relevant water quality standards, predominately at monitoring locations GW4/BH104b and GW7/MW03. Manganese and iron are naturally occurring metals; however detected levels of both parameters were determined to be attributed to an anoxic environment where contamination may be naturally attenuating. It was reported that chloride and nickel levels may have been related to a contamination source however no known sources of either chloride or nickel were identified on the Enva site. Detections of PAHs and TPHs were also intermittent since May 2012 and these detections were confined to GW7/MW03.
3. Detections of parameters above the relevant water quality standards were confined to groundwater monitoring wells in the south-east of the site, namely GW4/BH104B, GW8/MW04 and GW7/MW03. Six potential sources of the elevated parameters were identified. Of the six potential sources, four were linked to accidental historical spillages during normal operations; however, no accidental spillages were recorded at the Enva facility. The concrete hardstanding ground cover, suitable bunding of sources and collection of run-off by an integrity tested surface water drainage system were determined to negate the pathway for surface contaminants to reach groundwater.
4. Made ground in the southern area of the site i.e. beneath GW4/BH104B, was considered as a potential source of contamination. No parameters were detected above the relevant water quality standards at GW4/BH104B between 2012 and 2013, with the exception of iron which was detected at a concentration equal to the GTV of 0.2 mg/l in Q4 2013. As groundwater quality at GW4/BH104B was not considered to be contaminated, it was concluded that if a source was present in the made ground it had been attenuated and did not pose a risk to sensitive receptors at the time.
5. A former oil reception sump in the vicinity of GW7/MW03 was identified as a potential source during the 2008 hydrogeological assessment. As GW7/MW03 was reportedly the only monitoring location where hydrocarbon contaminants were detected at the time, the 2014 CSM report determined that the former oil reception sump was a potential source. The source-pathway-receptor assessment of the risk associated with this potential source was however deemed to be low. The hydrocarbon contamination associated with GW7/MW03 was characterised as highly immobile and immiscible in the 2008 groundwater risk assessment report and trend analysis since 2008 indicated that the source was naturally attenuating. In addition to the immobile nature of the source, the 2014 report determined that dilution and dispersion would reduce contaminant concentrations downgradient at the Rk aquifer and the River Triogue resulting in a low level risk to both receptors.

The updated hydrogeological assessment concluded that the Enva facility was not posing a risk to sensitive receptors and is in compliance with the European Communities Environmental Objectives (Groundwater) Regulations 2010 (SI no 9 of 2010).

5 2017 GROUNDWATER FLOW INTERPRETATION

A review of groundwater flows across the site and data from 8 no. rounds of groundwater monitoring in 2016 and 2017 were assessed. Groundwater contour maps were developed for each sampling event in 2017 and are included in **Appendix B**. Groundwater level graphs are provided in the following sections and in **Appendix C**.

5.1.1 Shallow Groundwater

In general, shallow groundwater appears to be consistently flowing in a northeasterly direction across the site in the southern region of the site and possibly in a southeasterly and occasionally southwesterly direction in the northern region of the site.

The manual dip levels suggest the presence of a groundwater flow divide running in a line between GW1/BH101 (in the east) to GW3/BH103 (in the west). To the north of this line groundwater flow (from GW2/BH102) appears to be towards the southwest or the southeast. To the south of the line (from GW4/BH104b) groundwater predominantly flows in a northeasterly direction towards GW1/BH101 and historically and occasionally to the northwest towards GW3/BH103. There is no regular seasonal trend to the fluctuation in groundwater flow direction and it is likely to be due to preferential recharge in particular areas and may also be influenced by upward flow of groundwater with the deeper bedrock.

The information from the automated data loggers show GW4/BH104B to be the consistently up-gradient borehole, however as the logger from GW1/BH101 was lost prior to downloading of the data and the logger from GW3/BH103 was lost after only six weeks, it was not possible to examine the connection between GW1/BH101 and GW3/BH103.

Based on groundwater levels recorded throughout 2016 and 2017 (see **Figure 5.1** and **Appendix C**) shallow groundwater flow direction is consistently to the northeast in the southern region of the site. This water is believed to be perched upon the relatively low permeability bedrock although there is water through vertical or sub-vertical fractures. The installation details for each of the boreholes are provided on the borehole logs in **Appendix B**.

It is noted that wells head levels have not been confirmed and it recommended that a re-survey of all well heads is undertaken to confirm groundwater levels relative to Ordnance Datum. It is also noted that no well head level has been recorded for GW8/MW04 to-date.

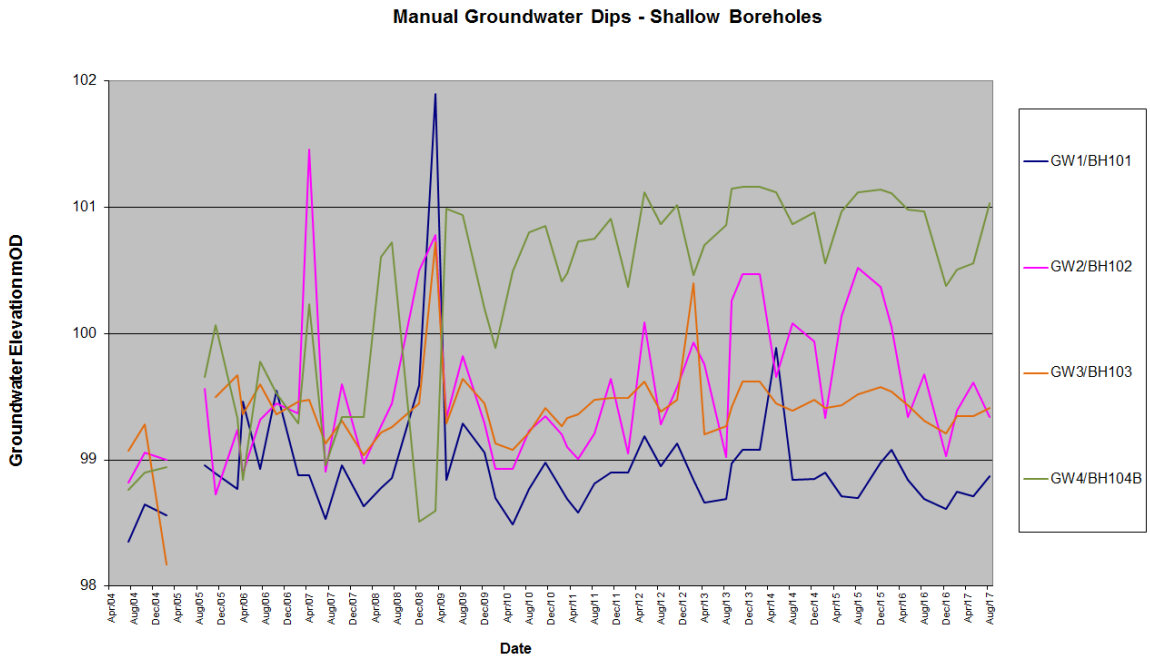


Figure 5.1 Groundwater Levels – Shallow Boreholes

The automated data loggers historically recorded an almost instantaneous response to rainfall in the shallow boreholes indicating high recharge potential within the area. The majority of the site is covered with hard-standing however the Irish rail site to the east is not covered and will allow infiltration of rainfall. The hydraulic gradient within the shallow groundwater was previous estimated as ranging between 0.005 and 0.06. However, for the majority of cases it is in the region of 0.01.

5.1.2 Bedrock Groundwater

In 2005 URS mapped bedrock groundwater to flow in a south to southeasterly direction, while RPS mapping in 2008 determined that bedrock groundwater flow was to the north. Subsequent monitoring by RPS reported bedrock groundwater to be consistently flowing in a northeasterly direction.

BREL undertook a review of bedrock groundwater levels and determined bedrock groundwater to be predominantly flowing in a southeasterly direction since 2014. (see **Figure 5.2** and **Appendix C**). Prior to 2014 groundwater levels vary significantly with the downgradient well GW7/MW03 on occasion representing an upgradient location

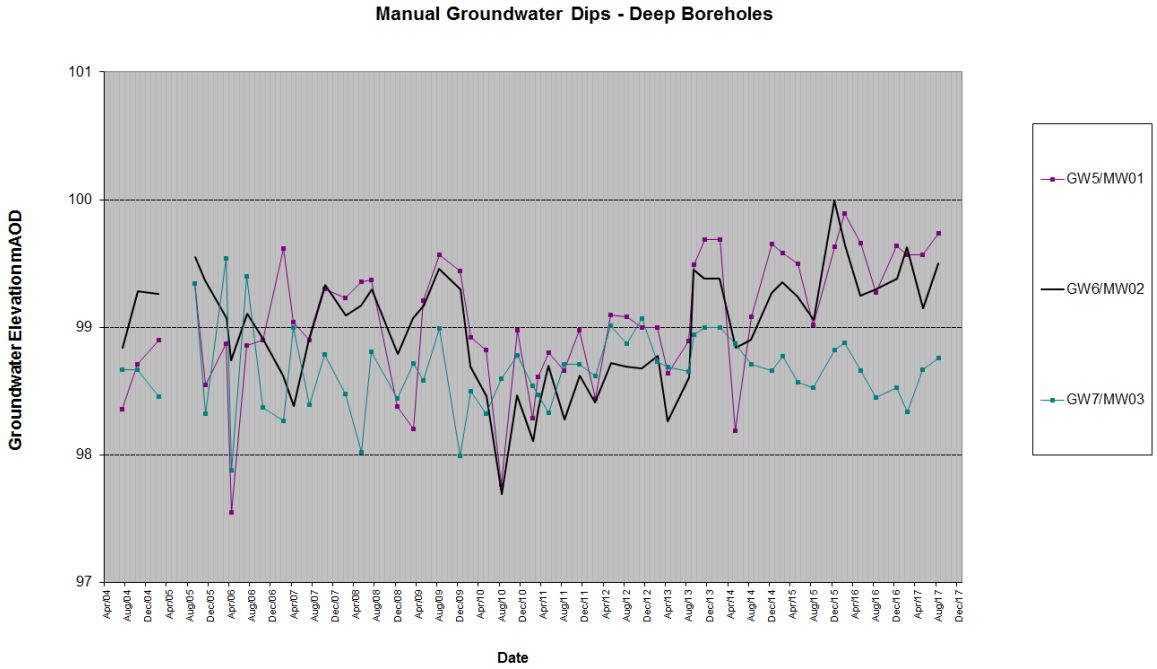


Figure 5.2 Groundwater Levels – Bedrock Boreholes

Stabilised groundwater levels within the bedrock wells and the screen depths suggest that groundwater is confined by the relatively low permeability rock matrix and the overlying drift deposits (see **Table 5.1**).

The recorded significant variations in groundwater flow direction over time are likely to be due to the fact that the monitoring boreholes are screened within three different fracture zones with a vertical separation of up to 15 m between screened horizons. A vertical connection between these fracture zones is likely but has not been proven and as such the assumption of a linear variation in groundwater level between these holes (such as assumed when drawing contour plots) is questionable as the water is potentially being transmitted on three different planes. Any connection between these fracture zones will be greatly influenced by the nature and orientation of fracturing within the bedrock and external factors such as changes to recharge patterns (influenced by changes in land use and geological morphology) and abstraction of water.

The automated data loggers historically recorded instant and significant changes in the groundwater level within the bedrock in response to purging of the well for sampling. This response illustrates that the bedrock aquifer is characterised by low permeability matrix and low storage potential with flow occurring within fractures. The automated groundwater monitoring data also demonstrates that groundwater within the bedrock records a response in relation to rainfall, which indicates that recharge to the deeper bedrock aquifer is occurring. This recharge is likely to be occurring over open-ground surrounding the site, particularly to the west (within 1km of the site) where bedrock is known to be close to surface. Based on the low permeability nature of the bedrock matrix this response indicates that vertical or sub-vertical fractures are present within the bedrock and provide preferential pathways for vertical migration of ground water within the bedrock.

Monitoring Well	GW1/BH101	GW2/BH102	GW3/BH103	GW4/BH104b	GW8/MW04	GW5/MW01	GW6/MW02	GW7/MW03
Depth (mbgl)	6.68	6.41	4.40	4.71	-	2.36	3.62	9.75
Static Water Level (mbgl)	4.19	3.21	1.75	0.49	3.89	2.36	3.62	4.01
Ground Level (mOD)	103.06	102.55	101.16	101.52	-	102.10	103.12	102.77
Water Level (mOD)	98.87	99.34	99.41	101.03	-	99.74	99.50	98.76
Total Depth (mbgl)	6.71	6.48	4.35	4.72	6.42	22.59	22.96	14.69
Screen Depth (mbgl)	4.0 – 6.8	3.0 6.8	1.25 – 5.7	1.5 – 6.8	1.5 – 6.8	20.0 – 23.0	23.0 – 32.0	7.5 – 15.0

Total depth measured 4th January 2018 mOD = metres Ordnance Datum mbgl = metres below ground level

Table 5.1 Groundwater Levels & Well Depths – Q3 Monitoring 2017

6 2017 GROUNDWATER QUALITY & TREND ANALYSIS

A review and interpretation of groundwater quality across the Enva facility between 2014 and 2017 is provided below. The most recent round of monitoring data is stated at the beginning of each section and a summary of all results is provided in **Appendix D** and all laboratory certificates for 2017 provided in **Appendix E**.

It should be noted that no graphs were provided for the hydrocarbon and organic parameters as it was considered that the tables provided in **Appendix D** would provide a clearer trend over time.

6.1 GUIDELINE VALUES

All groundwater quality results were screened against the 2010 Groundwater Regulations[1] and the Environmental Protection Agency Interim Guideline Values (IGVs) which are considered to provide an initial, albeit very conservative, screening tools.

6.2 ORGANICS

6.2.1 Total Petroleum Hydrocarbons

The November 2017 sampling event recorded elevated TPH levels within 3 no. monitoring wells only i.e. GW2/BH102 (98 µg/l), GW3/BH103 (351 µg/l) and GW5/MW01 (60 µg/l). The EPA IGV for TPH is 10 µg/l.

No detections of Total Petroleum Hydrocarbons (TPHs) were detected above the EPA IGV in any monitoring well across the site between August 2012 and December 2014 with the exception of isolated elevated levels within GW7/MW03 (i.e. 390 µg/l September 2013) and GW4/BH104b (i.e. 410 µg/ August 2014).

Between 2015 and 2017 elevated levels of TPH were consistently detected within a number of wells i.e. GW3/BH103, GW4/BH104b and GW8/MW04. It is noted that elevated levels of TPH were historically recorded within these monitoring wells i.e. prior to 2010. Also of note is the recent TPH detections in 2017 recorded within wells GW2/BH102, GW5/MW01, GW6/MW02 and GW7/MW03 ranging between 11 and 120 µg/l (see **Appendix D**).

GW3/BH103

The most recent round of monitoring in November 2017 within this well recorded an elevated TPH level of 351 µg/l (see **Appendix D**).

Elevated levels of TPH were consistently recorded within GW3/MW103 between February 2015 and November 2017 ranging between 15 µg/l (February 2017) and 2,269 µg/l (May 2015). From May 2015, the levels broadly reduced over time to a level of 15 µg/l in February 2017; however they have since started to increase steadily again since February 2017 with the most recent level of 351 µg/l recorded in November 2017.

[1] Statutory Instruments, SI No. 9 of 2010 - European Communities Environmental Objectives (Groundwater) Regulations, 2010

The hydrocarbon signature is predominantly recorded within the Aliphatic C16-C35 carbon range with a notably lower proportion within the aromatic, more mobile, phase when detected. No detections of aromatics were initially recorded during the February and May 2017 monitoring data; however the aromatics have since been detected in subsequent rounds of monitoring in August and November 2017 ranging between 71 and 89 µg/l suggesting a mobile component to this contaminant.

With respect to the aliphatic bands, all of the measured concentrations exceeded the respective pure phase solubility for that band. The same is also true for the aromatic bands when detected. This would suggest the presence of a NAPL at this location. This is supported by the fact that the proportion of aliphatic to aromatic compounds varied between samples and monitoring visits indicating differences in the nature of the sample collected, which probably relate to the amount of NAPL captured within the sample.

It was previously reported that historical TPH detections at GW3/BH103 may have been as a result of surface contamination entering the groundwater monitoring well. GW3/BH103 is located in a storage shed to the west of the facility. The storage shed has a hard standing floor and is generally used to store IBCs and small machinery. The monitoring well BH103 was covered with an ill-fitting flush cover with no closing screws until August 2012. The absence of a fully sealed cover on BH103 may have allowed small leaks from the machinery or IBCs to enter the groundwater. The well cover and headworks at BH103, and at all groundwater monitoring wells, were upgraded in August 2012 to provide better protection to groundwater monitoring wells from surface ingress. The resulting groundwater quality results confirmed the success of this activity with non-detections recorded between August 2012 and February 2015. However a recent site inspection undertaken by BREL in January 2018, observed pondered surface water within the wellhead of the well surrounding the open standpipe. A slight hydrocarbon sheen was observed on this water.

Based on the above, the source of the recently elevated TPH levels detected within this monitoring well is unclear. BREL are aware of a number of underground interceptors and sumps present in the general vicinity of this well that may potentially be contributing to the TPH levels being detected. The well is surrounding by concrete hardstanding and no evidence of spillages were observed or recorded on site.

GW4/BH104b

The most recent round of monitoring in November 2017 in GW4/BH104b recorded a TPH level of <10 µg/l.

Elevated levels of TPH were historically recorded within GW4/MW104b ranging between 53 and 9,890 µg/l during the monitoring events between 2014 and 2015. The levels significantly reduced from February 2016 to below laboratory limits of detection (i.e. <10 µg/l). Since February 2016 the levels recorded ranged between <10 µg/l and 85 µg/l with no obvious trend. The most recent monitoring in August 2017 and November 2017 recording levels <10 µg/l.

When detected the hydrocarbon material within this well was found to be predominantly within the aliphatic C12-C16 and C16-C35 carbons bands and to a lesser extent within similar aromatic bands. The levels recorded since 2015 occasionally exceeded the respective solubility levels for the individual carbon bands and suggest a possible presence of NAPL in the general area when detected. The non-detections subsequently recorded suggest that a source in the general vicinity of the well may only be intermittently contaminating groundwater in the area. The signature is also suggestive of a diesel based source.

The levels recorded in 2017 do not appear to represent a source of hydrocarbon contamination in the general vicinity of the well; however it is noted that non-detections were previously recorded at this location between 2011 and 2014 with subsequent detections again occurring between February 2015 and December 2016. A hydrocarbon sheen and odour was noted on all samples from this monitoring well during each of the 2017 sampling events. On-going monitoring is recommended to determine the persistency of the non-detections at this location. The high levels detected recorded in December 2015 are notable; however the levels have dramatically reduced since this period. The rational for this sudden reduction is unclear with possible explanations including:

- An upgradient source of contamination to the south of the Enva facility intermittently releasing hydrocarbons to groundwater;
- A soil source remaining within the subsoils in the vicinity of the well intermittently releasing hydrocarbons to groundwater;
- Sampling procedure error;
- Laboratory error; or,
- Surface water runoff entering the well via the well head due to a non-sealed cover. It is noted a new well head covers were installed across the site; however water was noted to be ponded within the installation close to the top of the open well head.

In summary, the hydrocarbon levels recorded since February 2016 within GW4/BH104b are considered to be low with occasional spikes of slightly elevated levels. The most recent monitoring in August 2017 and November 2017 recorded levels <10 µg/l. The levels do not appear to represent a source of hydrocarbon in the vicinity of the well although on-going monitoring is warranted to confirm this.

GW8/MW04

The most recent round of monitoring in November 2017 recorded a TPH level of <40 µg/l within GW8/MW04; however the laboratory limit of detection is considered too high and a reduced level is required for future sampling events.

No detections of Total Petroleum Hydrocarbons (TPHs) were detected in GW8/MW04 between August 2012 and December 2014. However, from February 2015 onwards, relatively steady and consistent levels of TPH ranging between 15 µg/l and 47 µg/l have been recorded.

The hydrocarbon signature from GW8/MW04 suggests a dissolved phase mobile hydrocarbon within the aromatic C10-C16 carbon range only. The consistent presence of low level Naphthalene confirms the mobile phase of this material. The levels recorded do not exceed their respective solubility phase levels and therefore do not represent a source of NAPL. The source of this hydrocarbon is potentially from an upgradient source in the vicinity of GW4/BH104b or alternatively within the area of the sump formerly excavated at BH104. However it is noted that the signature of the hydrocarbon detected within GW8/MW04 is at odds to that detected upgradient of this location which suggests a source in closer proximity to the well itself. The waste oil UST located in the southeastern corner of the site containing mixed petrol and kerosene is considered a possibility although this tank is integrity tested periodically with no leaks detected.

GW7/MW03

The most recent round of monitoring in November 2017 recorded a TPH level of <40 µg/l within GW7/MW07; however the laboratory limit of detection is considered too high and a reduced level is required for future sampling events.

From February 2015 onwards sporadic detections of hydrocarbons were recorded ranging between 14 µg/l and 102 µg/l within monitoring well GW7/MW03. The hydrocarbon signature represents a dissolved phase hydrocarbon predominantly within the aliphatic C16-C35 range and to a lesser extent aromatic C21 – C35 carbon range.

The previous 2008 and 2014 CSMs concluded that the hydrocarbons historically recorded at this location were characterised as highly immobile and immiscible DNAPL that was naturally attenuating over time. The hydrocarbon levels recorded in 2017 suggest that the natural attenuation of this material did in fact occur post 2008; however the recent increasing trend warrants further consideration and monitoring.

It is noted that the hydrocarbons detected within this well have a slightly different signature to that recorded within upgradient wells GW8/MW04 and GW4/BH104b is likely to be attributed to the former sump was that previously located and excavated in this area. The more recent hydrocarbon detections

potentially suggest a residual source of hydrocarbons within the shallow subsoils in this area. On-going monitoring is recommended to confirm the persistency of these detections.

GW5/MW01

Detections of hydrocarbons above the EPA IGV were recorded within GW5/MW01 during 3 no. sampling events in 2017 i.e. February 2017 (23 µg/l), August 2017 (120 µg/l) and November 2017 (60 µg/l). The levels represent an increase with non-detections recorded over the previous 7 years. It is noted that high levels were historically recorded at this location in March 2009 with a level of 16.7 mg/l recorded. The well is located in proximity to a wheel wash and its associated drainage system and the recent detections may be attributed to this activity.

The signature of the hydrocarbons detected is within the aliphatic C16-C35 range which is indicative of a heavier end oil.

GW1/BH101, GW2/BH102 and GW6/MW02

No detections of TPH were recorded within GW2/BH102 and GW6/MW02 with the exception of some isolated detections, as follows:

- Two detections of 11 µg/l and 98 µg/l were recorded within GW2/BH02 with the higher level recorded in November 2017;
- A single detection of 12 µg/l was recorded in GW6/MW02 in May 2017.

The levels detected are considered to be minor and do not represent a source of contamination at these locations. No detections were recorded within GW1/BH101.

6.2.2 BTEX & MTBE

BTEX

No detections of BTEX were recorded across the site during the August and November 2017 sampling events. Benzene has not been detected in any monitoring wells across the site between 2014 and 2017 with the exception of 2 no. trace detections recorded within GW7/MW03 and GW8/MW04 in May 2017 i.e. 0.39 and 0.49 µg/l respectively. The 2010 GTV for Benzene is 0.75 µg/l.

A single detection of Toluene of 1.2 µg/l was detected in GW7/MW03 in August 2016 only. No detections were recorded above the laboratory limit of detection prior to or after this sampling event.

A single detection of Ethylbenzene (0.15 µg/l), p&m xylene (0.47 µg/l) and o-xylene (0.16 µg/l) was detected in GW6/MW02 in May 2016 only. No detections were recorded above the laboratory limit of detection prior to or after this sampling event.

MTBE

No detections of MTBE were recorded in any wells across the site during the November 2017 sampling event with the exception of GW7/MW03 (8.7 µg/l) and GW8/MW04 (1.8 µg/l). The EPA IGV for MTBE is 30 µg/l.

No detections of MTBE were detected in any monitoring well across the site between February 2014 and December 2014. Consistent trace detections of MTBE were subsequently detected in wells GW7/MW03 and GW8/MW04 ranging between 1.2 and 8.7 µg/l between 2015 and 2017. The levels of MTBE recorded within these two relatively proximate wells are similar during all sampling events between 2015 and 2017 which possible suggests a similar source. The non-detections of MTBE within GW4/MW104b provided additional evidence of a diesel source at this southern location.

Occasional detections of MTBE were recorded in GW2/BH102 between 2015 and 2017 ranging between 0.81 and 3.1 µg/l.

6.2.3 Polycyclic Aromatic Hydrocarbons (PAHs)

Benzo(a)pyrene

No detections of benzo(a)pyrene were recorded across the site during the November 2017 sampling event with the exception of well GW7/MW03 (0.036 µg/l). The EPA IGV for benzo(a)pyrene is 0.01 µg/l.

Isolated and trace levels of benzo(a)pyrene above the laboratory limit of detection were recorded within wells GW3/BH103 and GW5/MW01 between February 2014 and November 2017. The detections recorded within GW7/MW03 have been generally recorded at consistent levels ranging between 0.032 and 0.108 µg/l between August 2015 and November 2017.

Benzo (g,h,i) perylene

No detections of benzo(g,h,i)perylene were recorded across the site during the November 2017 sampling event with the exception of well GW7/MW03 (0.041 µg/l). The EPA IGV for benzo(g,h,i)perylene is 0.05 µg/l. The detections recorded within GW7/MW03 have been generally recorded at consistent levels ranging between 0.035 and 0.131 µg/l between August 2015 and November 2017.

Isolated and trace levels of benzo(g,h,i)perylene above the laboratory limit of detection were recorded within well GW3/BH103 only in August 2016 only.

Naphthalene

No detections of Naphthalene have been recorded above the EPA IGV of 1 µg/l since February 2014.

Trace detections above the laboratory limit of detection have been recorded predominantly within GW3/BH103 (ranging between 0.018 µg/l and 0.095 µg/l), GW7/MW03 (ranging between 0.028 µg/l and 0.11 µg/l) and GW8/MW04 (ranging between 0.067 and 0.161 µg/l). Isolated and trace detections were recorded within wells GW4/BH104b and GW5/MW01.

As Naphthalene is generally the most abundant compound in areas of notable hydrocarbons it is unsurprising to it being detected as it is the most soluble and mobile constituent.

Total PAH

The EPA IGV for Total PAHs is 0.1 µg/l. Detections of total PAH slightly above the EPA IGV during the November 2017 sampling event were recorded in GW7/MW03 (0.243 µg/l) and GW8/MW04 (0.147 g/l).

Levels of total PAH slightly above the IGV between February 2014 and November 2017 were recorded in wells GW3/BH103 (ranging between 0.108 and 0.21 µg/l), GW4/BH104b (ranging between 0.139 and 0.159 µg/l), GW5/MW01 (ranging between 0.106 and 0.145 µg/l), GW7/MW03 (ranging between 0.11 and 0.986 µg/l) and GW8/MW04 (ranging between 0.147 and 0.194 µg/l).

The remaining detections of Total PAH were not recorded above their respective thresholds.

6.2.4 Total Phenols

No detections of Total Phenols were detected within groundwater across the site since 2014.

6.3 CHLORINATED SOLVENTS

Although previously detected in GW7/MW03 prior to 2008, no detections of **1,1,1 Trichloroethane (TCA)** have been recorded across the site since 2008.

Dichloromethane (DCM) was previously detected across the site prior to 2006. However no detections of DCM have been recorded since November 2005. The presence of DCM was previously attributed to laboratory testing procedures and was not considered representative of contamination at the site.

Chlorinated solvent **1,1 Dichloroethane (DCA)** has repeatedly been detected within shallow groundwater in GW8/MW04 above the IGV of 3 µg/l. The levels recorded since February 2014 ranged between 3.1 and 10.7 µg/l. A downward trend is event from the data which suggests the degradation of the chlorinated solvent is occurring; however it is noted that the DCA levels have stabilised somewhat since mid-2016. This solvent is associated with degreasers used in automotive manufacture and repair. Low levels of DCA have been detected in GW7/MW03 since February 2015 although are below the EPA IGV. The levels ranged between <1.0 and 2.8 µg/l.

Detections of **Chloroethane (CA)** have been recorded consistently within GW8/MW04 ranging between 1.2 and 12.6 µg/l between August 2015 and November 2017. Occasional detections ranging between 1.1 and 6.3 µg/l were recorded within GW7/MW03 during this same period. Its presence in groundwater is likely the result of the dehydrochlorination of 1, 1-DCA.

Elevated levels of **Vinyl Chloride (VC)** have been recorded within GW8/MW04 between May 2016 and February 2017 ranging between 0.5 and 1.1 g/l. The 2010 GTV for VC is 0.375 µg/l. Elevated detections of VC were also recorded within GW7/MW03 in August 2016 and February 2017 at 0.6 µg/l on both occasions. No detections of VC have been recorded above the laboratory limit of detection during the August and November 2017 sampling events. However, it is noted that the laboratory limit of detection for VC is above the 2010 GTV and lower limits are recommended for any future monitoring events.

6.4 INORGANICS

6.4.1 Manganese

Manganese has been detected above the IGV of 0.05 mg/l at all monitoring locations, with the exception of GW1/BH101 and GW6/MW02, during one or more monitoring events from 2014 to 2017. No GTV or EQS is available for manganese.

The 2017 sampling event in November recorded elevated level of manganese in 4 no. wells i.e. GW2/BH102, GW3/BH103, GW7/MW03 and GW8/MW04 ranging between 83 and 1,280 µg/l. It is noted that the levels have been broadly reducing over time within all wells with the exception of GW8/MW04. The most recent round of sampling in November 2017 recorded the highest level of manganese recorded to-date at this location and represents an increasing trend (see **Figure 6.1**).

Manganese is a naturally occurring metal with low toxicity however it may cause staining and taste problems in drinking water. The low levels of manganese detected across the majority of the site in both the shallow and deep groundwater are likely to be naturally occurring; however the elevated levels recorded in GW8/MW04 should be monitored in future monitoring events as it may be attributed to anoxic conditions due to contaminant breakdown.

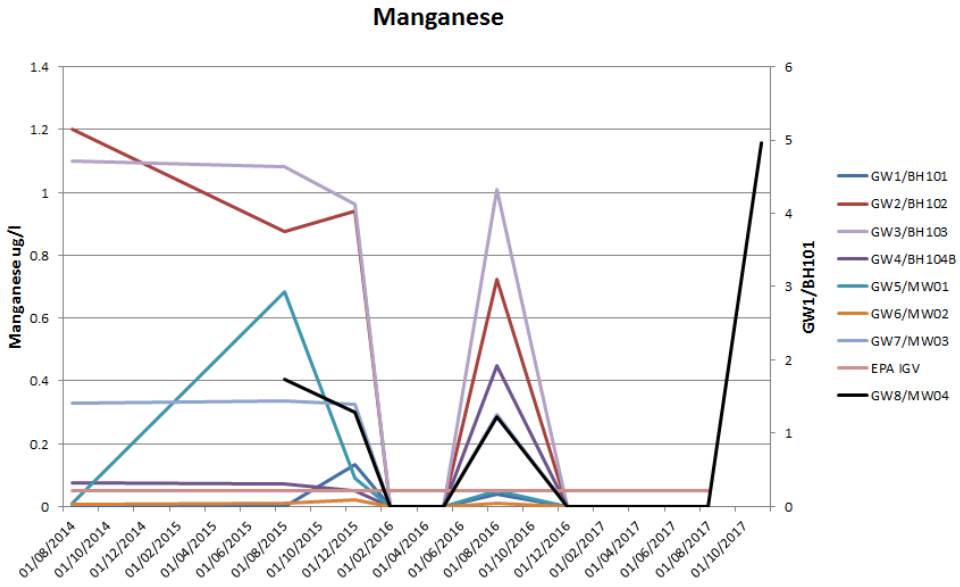


Figure 6.1 Manganese Levels 2014-2017

6.4.2 Iron

Elevated levels of iron have been consistently recorded above the EPA IGV across the site since 2014 with the exception of GW7/MW03 where only trace levels were recorded (see **Figure 6.2**). Consistently high levels were recorded within wells GW3/BH04 (between 0.27 and 16.4 mg/l) and GW8/MW04 (between 0.8 and 16.0 mg/l). These two locations are representative of localised hydrocarbon hotspots in these areas. The natural occurrence of manganese and iron in groundwater can increase in anoxic conditions and may be an indicator of contaminant attenuation. The high detections of both these parameters in GW8/MW04 and GW3/BH103 during the recent monitoring period are an indication of contamination present in groundwater.

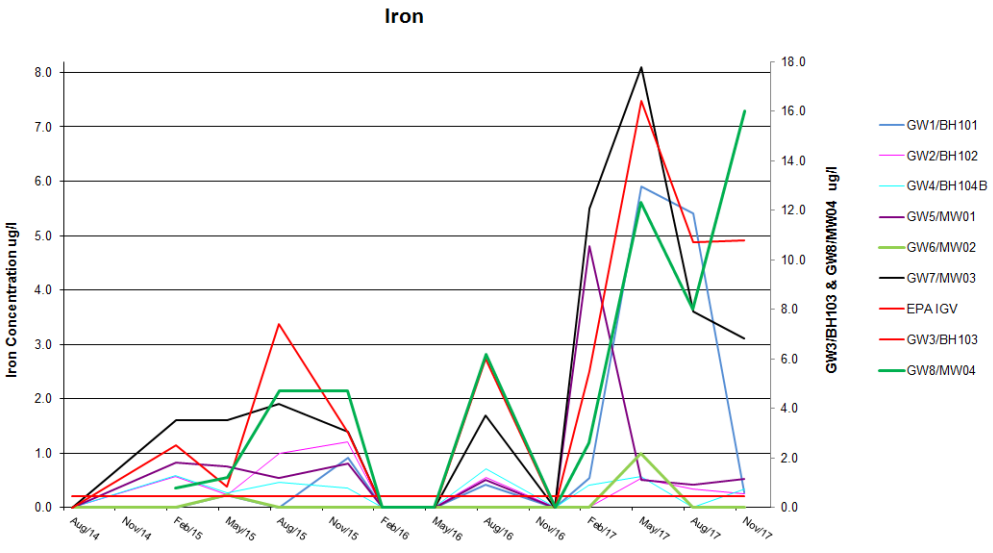


Figure 6.2 Iron Levels 2014-2017

6.4.3 Chloride

Chloride has been recorded above the GTV of 187.5 mg/l within wells GW1/BH101, GW7/MW03 and GW8/MW04 during the most recent round of groundwater monitoring in November 2017 ranging between 6.1 and 269 mg/l. The elevated levels are consistently recorded within these wells with levels significantly lower recorded across the remainder of the site since 2014.

The elevated levels recorded within GW8/MW04 are suggestive of a contaminant hotspot at this location similar to the elevated levels of iron and manganese within this well.

Chloride may be an indication of water pollution from both industrial and sewage sources. There is no evidence that any of the material handled on the Enva site contains chloride.

6.4.4 Dissolved Oxygen

Dissolved oxygen recorded during each sampling event generally ranges from 2 to 8 ppm indicating that groundwater is slightly depleted in oxygen across much of the site. Changes in concentration of dissolved oxygen correspond reasonably well with changes in water level and indicate recharge by oxygen rich rainwater. The results indicate that the aquifer may be capable of supporting aerobic degradation.

6.5 HEAVY METALS

6.5.1 Nickel

Elevated levels of Nickel were recorded in 3 no. monitoring wells during the November 2017 sampling event i.e. GW3/BH103 (0.25 mg/l), GW7/MW03 (0.36 mg/l) and GW8/MW04 (0.176 mg/l). The GTV for Nickel is 0.015 mg/l.

Elevated levels of nickel have consistently been detected above the GTV in the deep groundwater monitoring well, GW7MW03, between 2014 and November 2017 ranging between 0.036 and 0.106 mg/l. Similar elevated levels were recorded within GW8/MW04 during the same period. Isolated elevated levels of Nickel were recorded across the site within the remaining wells. It is noted that the monitoring events between May and November 2017 recorded slightly elevated levels of nickel in well GW3/BH103 ranging between 0.025 and 0.03 mg/l.

Nickel sources include naturally occurring minerals and industrial waste. No known sources of nickel have been identified at the Enva site. It is also noted that the levels recorded across the site are considered to be relatively low and do not represent a source of contamination at the site.

6.5.2 Arsenic

Consistently elevated levels of arsenic were recorded within well GW3/BH103 above the 2010 GTV (7.5 µg/l) between August 2015 and November 2017. Levels ranged between 7.6 and 29 µg/l. The levels recorded albeit relatively low are demonstrating a slightly upward trend. Isolated and minor exceedances were recorded in GW8/MW04 on two occasions at 11 µg/l on both occasions between 2014 and 2017.

6.5.3 Copper

There were no recorded exceedances of Copper above the 2010 GTV (i.e. 1,500 µg/l) between 2014 and 2017.

6.5.4 Lead

Elevated levels of lead were recorded in a single monitoring well during the November 2017 sampling event i.e. GW3/BH103 at a level of 207 µg/l.

Consistently elevated levels of lead were recorded within well GW3/BH103 above the 2010 GTV of 18.75 µg/l ranging between 39 and 679 µg/l. Isolated exceedances of the GTV were sporadically recorded across the site between 2014 and 2017. It is noted that two consecutive exceedances were recorded in May and August ranging between 20 and 40 µg/l within well GW1/BH101 although no exceedance was recorded during the November 2017 sampling event. The source of these detections is unclear based on interpreted groundwater flow direction.

7 POTENTIAL SOURCES

Potential sources are discussed below and outlined in **Figure 7.1**.

1. **Mixed Fuel Container Storage Area**

The mixed fuel container storage area is located in a bunded area above hardstanding ground. The associated bund is integrity tested every 3 years with the most recent testing undertaken in 2015 and was deemed fit for purpose.

2. Tank Farm

The tank farm in the centre of the site consists of 42 no. storage tanks containing waste oils and regenerated fuel products. The tank farm is bunded by a concrete bund which was integrity tested in 2015. The bunding is visually inspected weekly as per the licence Condition 6.10 and will be integrity tested again in 2018.

3. Underground Waste Mixed Fuel Tank

A 30,000 litre Underground Storage Tank (UST) is located in the southeastern corner of the site that is used to temporary store waste petrol and kerosene. The UST is currently not in use.

4. Former oil reception sump in the east of the site in the vicinity of GW7/MW03

Some localised remediation of soils was undertaken in this area but a residual source may remain. Contaminants detected within GW7/MW03 could be consistent with the contents of former waste oil tanks in this area.

5. Maintenance Workshop

A small maintenance workshop is located to the west of GW7/MW03. The maintenance workshop has a hardstanding floor and no drums or liquid containers are stored here. Surface run-off or accidental spillages from the maintenance workshop are contained in the workshop area. Self-contained bunds are in available in this area if required. No accidental spillages have been reported at the maintenance workshop.

6. Unloading Gantries

The Enva unloading gantries are located to the east of the production office and west of the tank farm. Oils and fuels are pumped to and from the tank farm from this location. Activities at the unloading gantries are carried out by trained operators and over hardstanding ground. No accidental spillages have been reported to-date in relation to the unloading gantries. Any accidental spillages would be directed to the surface water drainage system, which would contain the spillage and direct them to the on-site oil-water interceptors.

7. Surface water Drainage System, Oil interceptors & Sumps

Three interceptors are present across the site located at the northern and western regions of the site. A third interceptor is located south of the tank farm. A CCTV survey was undertaken in June 2016 of the drainage system with no faults noted within the system.

Although regularly inspected and cleaned, no integrity testing of the oil-water interceptors and drainage sumps has been undertaken to-date.

8. Wheel Wash in the north of the site

Recent detections of hydrocarbons within GW5/MW01 during 3 no. sampling events in 2017 suggest a recent impact to groundwater in this area. The source is unclear and is potentially attributed to the proximate wheel wash facility and its associated drainage system.

9. Storage Shed in western region of site

The monitoring well, GW3/BH103, located in close proximity to this shed previously reported that historical TPH detections may have been as a result of surface contamination entering the groundwater monitoring well. The well cover and headworks were upgraded in August 2012 to provide better protection to groundwater monitoring wells from surface ingress. The resulting groundwater quality results confirmed the success of this activity with non-detections recorded between August 2012 and February 2015. However a recent site inspection undertaken by BREL in January 2018, observed ponded surface water within the wellhead of the well surrounding the open standpipe. A slight hydrocarbon sheen was also observed on this water.

Based on the above, the source of the recently elevated TPH levels detected within this monitoring well is potential attributed to surface water runoff to the well or by its proximity to interceptors and collection sumps in the general vicinity of this well.

It is noted that no observed surface staining was observed during the site visit nor has there been any reported spill in the area. Therefore activities above-ground in this area are unlikely to be the source of the recent hydrocarbon detections at this location.

10. Irish Rail Site

Land immediately to the north and east of the site is occupied by Irish Rail and used for the storage of railway sleepers. These are stored uncovered on open ground. Railway land can be a potential source of metal, TPH and PAH contamination. Railway sleepers are commonly treated with creosote which is a source of PAH contamination. Given the difficulty in interpreting groundwater flow within the bedrock aquifer across the Enva facility, it is unclear if the Irish Rail is contributing to the hydrocarbon contamination detection within GW7/MW03. However, it is unlikely that the Irish Rail site is impacting on other identified areas of impact across the Enva facility.

11. Soil remediation and storage area in the north of the site

This area is covered with hard- standing. No soil contamination was noted in boreholes GW2/BH102, GW6/MW02 or GW5/MW01 during drilling and observations of contamination in groundwater are generally within the south of the site. This area is therefore not considered to be a source.

12. Sludge bay to the north of the tank farm

A trial pit was excavated beneath the sludge bay in September 2004 and did not detect any evidence of contamination. This area is therefore not considered to be a source.

13. Former vehicle repair workshop in the south of the site in the vicinity of GW4/BH104b

This operation was closed in 1990. An oily sheen and odour was detected in soils whilst drilling BH104 but no free product was recorded until 2004. The analysis of the product recovered historically indicated that it was unweathered diesel which is not consistent with the closure of the garage over 10 years prior to this. The presence of chlorinated solvents in the groundwater historically in this area suggest that the garage could be a potential source although it is not consistent with the chronology of observed contamination in BH104. This former workshop is therefore not considered to be a source.

14. Accidental spillage

There have been no recorded incidents of spillages since the boreholes were first installed on the site in 2001 and are therefore not considered to be a source.

15. LNAPL in BH104 Sump

LNAPL was historically detected within BH104 that was subsequently converted into a sump location. Groundwater pumping was historically undertaken within this sump. No detections of oil were observed on the water surface within this sump during the recent site visit in January 2018 and therefore is not considered to be acting as a source of contamination at the site.

8 2017 UPDATED CSM & HYDROGEOLOGICAL ASSESSMENT

BREL have developed an update to the 2014 CSM report taking into consideration the findings and data recorded in the 2008 and 2014 CSM reports and quarterly groundwater monitoring between 2014 and 2017.

8.1 SOURCE ZONES

There have been no intentional or reported discharges to ground or groundwater associated with any operation at the Enva site to-date. The site is covered in concrete hardstanding with the exception of a thin margin along the eastern site boundary.

Despite no intentional discharges to ground quarterly groundwater monitoring trends from 2014 to 2017 have identified some inorganic and organic parameters whose concentrations have been detected above relevant groundwater quality standards.

Manganese, iron, chloride and nickel are inorganic parameters that have been detected above the relevant water quality standards, predominately at monitoring locations GW7/MW03 and GW8/MW04 and to a lesser extent GW1/BH01 and GW3/BH03. Manganese and iron are naturally occurring metals; however detected levels of both parameters may increase in anoxic environments where contamination may be naturally attenuating and therefore may be indicative of a contaminative source in GW3/BH03, GW7/MW03 and GW8/MW04. Chloride and nickel may be related to a contamination source however no known sources of either chloride or nickel have been identified on-site. Elevated levels of lead are consistently detected within GW3/MW03.

PAHs and TPHs are organic compounds that have been detected in the groundwater at Enva. Detections of PAHs and TPHs were previously intermittent however in recent times consistently elevated levels of TPH have been detected within GW3/MW03, GW4/BH104b and GW8/MW04 and to a lesser extent GW7/MW03.

The spatial pattern of detections of both inorganic and organic parameters above the water quality standards has facilitated the identification of a number of potential source zones of non-intentional discharges to ground in the western and southern regions of the facility. These are outlined on **Figure 8.1.**

1. **Made Ground to the South of the Site in the vicinity of GW4/BH104b**

The borehole log for GW4/BH104B describes a 3.5 m depth of made ground beneath the site at this location. Below the made ground the geology is sand and gravel above the limestone bedrock. The extent and origin of the made ground is unknown. A contamination source in the made ground could potentially leach through the sand and gravel to the limestone bedrock or migrate horizontally in a northeasterly direction in the direction of shallow groundwater flow.

Although the levels of hydrocarbon recently detected in this location since 2016 are considered to be low to moderate, when detected, they do not appear to represent a source of hydrocarbon in the vicinity of the well.

A more plausible source is an off-site former garage with a former diesel source located upgradient and to the south of the Enva facility – see **Section 7.1**.

2. **Residuals from a Former Oil Reception Sump in the vicinity of GW7/MW03**

The former oil reception sump was identified as a source in the 2008 groundwater risk assessment report. The oil reception sump was removed in 2003 and the 2008 report states that some localised remediation of soils was undertaken at this location. Soil remediation at this location may not have completely removed the source and a residual source may remain. The presence of hydrocarbons and chlorinated solvents above the water quality standards at GW7/MW03 and GW8/MW04 may be an indication that a contamination source is present at this location with some evidence of natural

attenuation reducing the source over time. The 2008 report identified the contamination at GW7/MW03 to be immobile and not readily miscible with water suggesting that if a source is present here it is confined within the immediate area of the former sump. However more recent laboratory data suggests that aromatic fraction of the hydrocarbon material is likely to be slightly more mobile than previously interpreted.

3. **Made Ground in the west of the site at the Warehouse Storage Area in vicinity of GW3/BH103**

Previous detections of hydrocarbon odours were recorded during the drilling of this borehole.

Elevated levels of TPH were recorded within GW3/BH103 between February 2015 and November 2017 ranging between 15 µg/l (February 2017) and 2,269 µg/l (May 2015). The levels reduced between May 2015 and December 2016; however they have since started to increase steadily again since February 2017 with the most recent level of 351 µg/l recorded in November 2017.

It was previously reported that historical TPH detections at BH103 may have been as a result of surface contamination entering the groundwater monitoring well. The well cover and headworks at BH103, and at all groundwater monitoring wells, were upgraded in August 2012 to provide better protection to groundwater monitoring wells from surface ingress. The resulting groundwater quality results confirmed the success of this activity with non-detections recorded between August 2012 and February 2015.

The source of the hydrocarbons detected in this location is unclear; however the proximity of the well to a number of wash bay sumps and interceptor tanks in the area may potentially be impacting on water quality at the well.

4. **Made Ground in the vicinity of GW8/MW04**

The detections of hydrocarbons within this well, with a dissimilar signature to hydrocarbons recorded within upgradient well GW4/BH104b would suggest an alternative source of contamination in this area. Historically impacted made ground in the vicinity of this well is a possibility. Similarly the proximity of the 30,000 litre mixed fuel (i.e. petrol and kerosene) underground tank is also considered a potential source to the hydrocarbons detected.

5. **Wheel Wash/Drainage System in the vicinity of GW5/MW01**

The detections of hydrocarbons in GW5/MW01 in 2017 suggest an impact from the proximate wheel wash and/or its associated drainage system.

6. **Off-Site Sources**

As discussed previously an automotive repair business is present immediately to the south and upgradient of the site. The adjoining site is elevated by approximately 1.5 m relative to the Enva site. The former storage of diesel in this location is considered a likely source to the hydrocarbon detected in GW4/BH104b.

Land immediately to the north and east of the site is occupied by Irish Rail and used for the storage of railway sleepers. These are stored uncovered on open ground. Railway land can be a potential source of metal, TPH and PAH contamination. Railway sleepers are commonly treated with creosote which is a source of PAH contamination. It is unclear if the Irish Rail is contributing to the hydrocarbon contamination detection within GW7/MW03. It is unlikely that the Irish Rail site is impacting on other identified areas of impact across the Enva facility.

8.2 PATHWAYS

The pathways that could potentially link the identified sources to the site's receptors, and the constraints on these pathways are outlined in this section. Flows to and within the shallow groundwater and the deep groundwater underlying the Enva site are the primary pathways by which sources can potentially impact the Locally Important Limestone Aquifer directly underlying the site, the adjacent Regionally Important Aquifer, the River Triogue and Meelick SPZ.

- **Vertical Migration from Surface to Groundwater**

Contamination from sources at the surface has the potential to migrate from the surface into the subsoil in areas of exposed ground. The hardstanding cover across much of the Enva site, bunding of identified sources and the surface water drainage system which collects surface water run-off, negate this potential. All bunds were appropriately tested every 3 years as per the EPA licence requirements.

The surface water drainage system is fitted with 3 no. interceptors on the site and the interceptor located at the point where surface water is discharged off site to the municipal drain, is fitted has a shut-off valve installed. Groundwater monitoring wells may present a pathway for surface water to migrate into the groundwater through absent or damaged well covers. All groundwater monitoring well covers and head works were improved in August 2012 to protect the underlying groundwater from surface water ingress; however a number of wells when inspected in January 2018 had surface water present within the well head works close to the open well head pipe which increases the risk of surface water ingress to a number of these wells.

- **Vertical Groundwater Flow**

In the event that contaminants migrate from the surface to the subsoil vertical groundwater flow from the shallow groundwater to the deep groundwater may become a pathway. The GSI vulnerability mapping of moderate to high for the Enva site suggests that if contaminants migrate from the surface, the deep groundwater is be moderately to highly vulnerable to receiving that contamination. Dissolved phase contaminants will be transported vertically, within the groundwater, down through the subsoil into the deep bedrock aquifer. The boulder clay subsoil overlying the bedrock aquifer is a sandy gravelly clay generally offering moderate protection to the underlying aquifer. Vertical groundwater flows may also occur within the deep limestone aquifer where fractures on different horizontal planes connect. Contaminants that do not dissolve in water are known as non-aqueous phase liquids (NAPLs) and these contaminants will float on the top of the shallow groundwater or sink to the bottom of the limestone aquifer depending on their density. Dense NAPLs tend to follow vertical groundwater flow down through the aquifer. This movement will be constrained by the presence of fractures in the limestone aquifer.

- **Lateral Groundwater Flow**

Dissolved phase and NAPL contamination that enters the shallow groundwater or the deep groundwater aquifer will be transported laterally in the direction of groundwater flow. Groundwater flow beneath the Enva site is predominantly to the north or north-east, towards the Regionally Important Aquifer 0.5 km east of the site and the River Triogue 1.5 km east of the site. However occasionally groundwater within the bedrock is to the south and southeast. Dissolved phase contaminants will be transported within the shallow and deep groundwater and less dense NAPL will be transported on the shallow groundwater surface. Dilution and dispersion of contamination will occur with lateral transport meaning that contaminant concentrations at the receptor will be lower than those at the source. Lateral movement of dense NAPL in the deep aquifer will be confined by the presence of fractures in the limestone bedrock and the contaminant may be immobile if no fractures are present.

8.3 RECEPTOR

- **Locally Important Limestone Aquifer (Ll)**

The limestone bedrock aquifer beneath the Enva site is classified by the GSI as a Locally Important Aquifer, moderately productive in local zones. The vulnerability of the aquifer has been assessed as moderate to high and groundwater in the area has a 'Good' Water Framework Directive status as assessed between 2007 and 2009.

- **Regionally Important Karstified Aquifer (Rk)**

The Regionally Important Karstified Aquifer lies approximately 0.5 km from the Enva site. The aquifer is moderately vulnerability according to GSI mapping and has a 'Good' Water Framework Directive status. The aquifer contributes to the Portlaoise public water supply with two abstraction well fields located to the north and north east of the Enva site. The outer extent of source protection zones defined for the abstraction well fields are 3.2 km from the Enva site.

- **River Triogue**

The River Triogue is located approximately 1.5 km east of the Enva site and flows in a northerly direction through Portlaoise town. Upgradient of Portlaoise town the River Triogue has a Good quality status under the Water Framework Directive. Downgradient of Portlaoise and the Enva site the river has been assessed as having 'Poor' quality under the Water Framework Directive.

- **Meelick SPZ**

The Meelick public supply borehole is located approximately 2 km southeast of the Enva facility. The Enva site is approximately 1.85km from the source protection zone around the well. Shallow groundwater across the area of the site with hydrocarbon detected generally flows in a northeasterly direction and not towards the Meelick SPZ. Bedrock groundwater has been interpreted to flow in a southeasterly direction towards the SPZ. However, the interpretation of the flow direction is questionable to the varying well installations and the connectively between each of the bedrock monitoring wells.

8.4 RISK ASSESSMENT

This section assesses the potential risk that conditions at the Enva facility could pose to off-site sensitive receptors. The sensitive receptors are those outlined in **Section 7.1** and discussed in **Sections 7.2 to 7.4**. The risk assessment is carried out using the source-pathway-receptor linkages philosophy and in accordance with the risk screening approach outlined in the EPA Guidance on Authorisation of Discharges to Groundwater. The process of assessing Enva's risk to the sensitive receptors will determine Enva's compliance with SI no 9 of 2010, as per Section 6.15.1 of the their waste Licence.

Table 8.1 below presents the source-pathway-receptor risk factors that have been identified as relevant to the Enva facility under the updated hydrogeological assessment process.

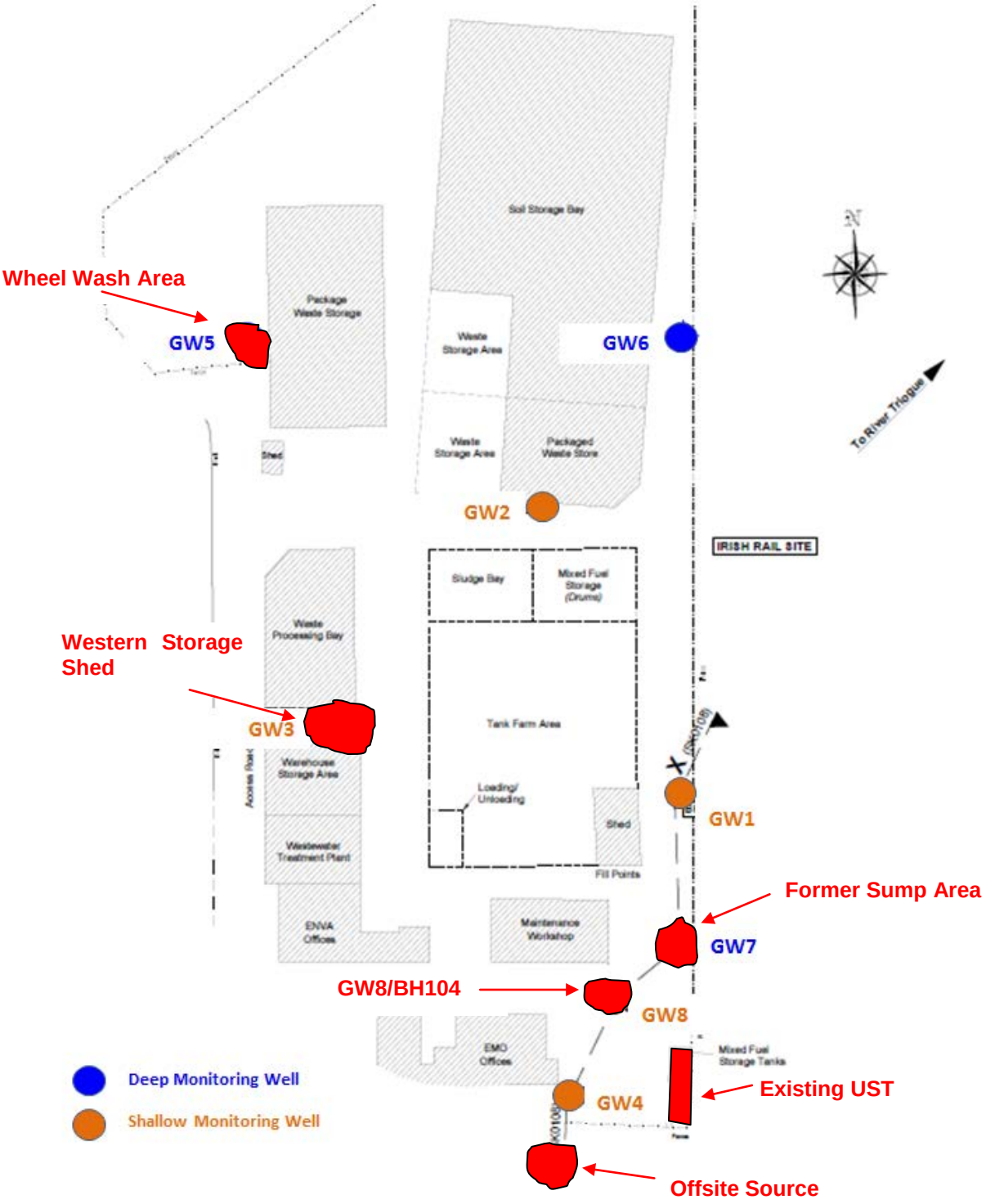


Figure 8.1 Potential Source Zones

Linkage No.	Source	Pathway	Receptor	Risk
1	**Mixed Fuel Container Storage Area located in the centre of the site**	**Vertical Migration from Surface To Groundwater** The mixed fuel storage container area is bunded and the bund was integrity tested in 2015. The site is covered in hardstanding and all surface water run-off is directed to the surface water drainage system. The surface water drainage pipework was integrity tested in 2013 and a CCTV camera survey undertaken in June 2016 with no breakages or leaks detected. New groundwater well covers were installed in 2012 and well head improvements were made to protect groundwater wells from surface water ingress.	Locally Important Limestone (Ll) Aquifer located directly beneath the site and high to moderate vulnerability. Regionally Important Karstified (Rk) Aquifer Located 0.5 km east of the site and moderate vulnerability. River Triogue - Located 1.5 km east of the site and has a moderate to poor quality status.	**Low Risk** There is no pathway for accidental surface spillages to any receptor

Linkage No.	Source	Pathway	Receptor	Risk
2	**Tank Farm** No leaks have been reported from the tank farm to-date	**Vertical Migration from Surface To Groundwater** The tank farm is bunded and the bund was integrity tested in 2015. The site is covered in hardstanding and all surface water run-off is directed to the surface water drainage system. The surface water drainage pipework was integrity tested in 2013 and a CCTV camera survey undertaken in June 2016 with no breakages or leaks detected. New groundwater well covers were installed in 2012 and well head improvements were made to protect groundwater wells from surface water ingress.	Locally Important Limestone (Ll) Aquifer located directly beneath the site and high to moderate vulnerability. Regionally Important Karstified (Rk) Aquifer Located 0.5 km east of the site and moderate vulnerability.	**Low Risk** There is no pathway for accidental surface spillages to any receptor
3	**Underground Waste Petrol/Kerosene Tank** Leaks or spills associated with the tank may be contributing to the hydrocarbons detected in GW8/MW04.	**Horizontal migration from tank to shallow Groundwater** The migration of hydrocarbon contaminants from this 30,000 litre UST may impact on proximate monitoring wells. The tank is integrity tested every 3 years		**Low to Moderate Risk** Given the proximity of GW8/MW04 to this tank, the tank is considered a potential source of contamination.
4	**Former Oil Reception Sump** The detections of hydrocarbons and chlorinated solvents within GW7/MW03 located adjacent to the former oil reception sump suggest that some residual contamination is present within the subsoils.	**Vertical Migration from Subsurface to Groundwater** The migration of residual hydrocarbon and solvent contamination in the vicinity of the former oil reception sump to groundwater appears to be persisting.	River Triogue - Located 1.5 km east of the site and has a moderate to poor quality status. Meelick Groundwater Supply Source Protection Zone	**Low to Moderate Risk** The persistency and recent increase in trends warrants further consideration at this location. In addition, recent analysis suggests a slightly more mobile contaminant than previously identified.
5	**Maintenance Workshop** No accidental spillages have been reported from the maintenance workshop to-date	The workshop is covered in hardstanding and all surface water run-off is directed to the surface water drainage system. The surface water drainage pipework was integrity tested		**Low Risk** There is no pathway for accidental surface spillages to any receptor

Linkage No.	Source	Pathway	Receptor	Risk
		in 2016.		
6	**Unloading Gantries** No accidental spillages or leaks have been reported from the refuelling gantry	Operators at the three unloading gantries are fully trained. The site is covered in hardstanding and all surface water run-off is directed to the surface water drainage system. The surface water drainage pipework was survey via CCTV in 2016 with no leaks or damage detected. New groundwater well covers were installed in 2012 and well head improvements were made to protect groundwater wells from surface water ingress.	Locally Important Limestone (Ll) Aquifer located directly beneath the site and high to moderate vulnerability. Regionally Important Karstified (Rk) Aquifer Located 0.5 km east of the site and moderate vulnerability.	**Low Risk** There is no pathway for accidental surface spillages to any receptor
7	**Made Ground to the South of the Site at GW4/BH104b** Quarterly groundwater monitoring from GW4/BH104b indicates that since 2015 hydrocarbon levels occasionally exceeded the respective solubility levels for the individual carbon bands and suggests a possible presence of NAPL in the general area when detected. The non-detections subsequently recorded (including the most recent two		River Triogue - Located 1.5 km east of the site and has a moderate to poor quality status. Meelick Groundwater Supply Source Protection Zone	**Low Risk** Quarterly groundwater monitoring indicates that the made ground in the vicinity of the well in addition to an upgradient diesel source is a potential source of contamination on occasion with both low mobility NAPL and moderate mobility dissolved phase aromatics present. However, the source of the contamination is predominantly attributed to an

Linkage No.	Source	Pathway	Receptor	Risk
	rounds of monitoring) suggest that a source in the general vicinity of the well may only be intermittently contaminating groundwater in the area. The levels detected in 2017 suggest a reducing trend over time since 2015.	**Vertical Groundwater Flow** The sand and gravel beneath the made ground will provide a pathway for vertical migration of contaminants to the Ll aquifer.		off-site source and therefore this made ground risk linkage is considered to be low.
8	**Off-site Source to the South of the Enva facility** Refurbishment works were undertaken to the south of and upgradient of the Enva facility in 2014/2015 are attributed to the sudden detections of hydrocarbons in well GW4/BH104 at this time. Diesel storage was historically undertaken at this site.	**Lateral Groundwater Flow** Fractures in the Ll aquifer will allow contaminants to move towards the downgradient Rk aquifer. Dilution and dispersion will act on contaminants as they move away from the source reducing concentrations at the downgradient receptor.	Locally Important Limestone (Ll) Aquifer located directly beneath the site and high to moderate vulnerability. Regionally Important Karstified (Rk) Aquifer Located 0.5 km east of the site and moderate vulnerability. River Triogue - Located 1.5 km east of the site and has a moderate quality status. Meelick Groundwater Supply Source Protection Zone	**Low Risk** The sudden and high levels of hydrocarbons detected in GW4/BH104b in Dec 2015 are attributed to the off-site source. However the levels have dramatically reduced since this period with the most recent data recording low levels.
9	**Wheel Wash in the north of the site** Recent detections of hydrocarbons within GW5/MW01 during 3 sampling events in 2017 suggest a recent impact to groundwater in this area. The source is potentially attributed to the proximate wheel wash facility and its associated drainage system.			**Low Risk** Groundwater quality in the vicinity of the wheel wash has been of a good quality prior to 2017. The hydrocarbon levels detected in 2017 warrant further consideration to determine the persistency of these detections in this area. The levels recorded to-date you suggest a recent source although the levels recorded and the type of hydrocarbon present does not suggest an increased risk to sensitive receptors at this time.

Table 8.1 2017 CSM SPR Linkages

9 CONCLUSIONS

- BlueRock Environmental Ltd was requested to undertake an update of the previous 2014 Conceptual Site Model and Hydrogeological Risk Assessment previous undertaken at the Enva Ireland (Eva) facility at Clonminam Industrial Estate, Portlaoise, Co. Laois.
- This updated hydrogeological CSM report has been undertaken in accordance with Condition 6.15 of the recently issued revised EPA licence No. W0184-02 issued on the 15th June 2017 and in accordance with recent correspondence from the EPA, Ref: RI008474.
- While the activities above were undertaken in accordance with the EPA Guidance on Authorisation of Discharges to Groundwater, there are no discharges to ground or groundwater associated with the Enva facility. The entire site, with the exception of a small area to the north-east, is covered in hardstanding and bunding and drainage pipelines have passed the most recent integrity testing required by the Waste Licence. As Enva does not have any intentional discharges to ground or groundwater the source-pathway-receptor risk factors outlined in the EPA guidance were applied to contaminants identified by trend analysis of quarterly groundwater monitoring data.
- An updated hydrogeological assessment was carried out to assess the potential risk the Enva facility may pose to the sensitive receptors. Source-pathway-receptor risk factors were used to assess risk and feed into the updating of the Conceptual Site Model (CSM). The assessment and the CSM were updated from the 2014 Updated CSM report. Quarterly groundwater monitoring data from 2014 to 2017 and groundwater flow direction mapping from 2015 to 2017 were used to update the hydrogeological assessment of the site. The updated hydrogeological assessment made the following conclusions:

    - In general, shallow groundwater appears to be consistently flowing in a northeasterly direction in the southern region of the site and possibly in a southeasterly/southwesterly direction in the northern region of the site. A shallow groundwater divide has been suggested across the centre of the site based on groundwater levels; however this requires further assessment to conclusively determine its presence. There is no regular seasonal trend to the fluctuation in groundwater flow direction and it is likely to be due to preferential recharge in particular areas and may also be influenced by upward flow of groundwater with the deeper bedrock.

    - A review of bedrock groundwater levels determined bedrock groundwater to be predominantly flowing in a southeasterly direction since 2014. Prior to 2014 groundwater levels vary significantly with the downgradient well GW7/MW03 on occasion representing an upgradient location and groundwater within bedrock flowing in a northerly direction. The recorded significant variations in groundwater flow direction over time are likely to be due to the fact that the monitoring boreholes are screened within three different fracture zones with a vertical separation of up to 15 m between screened horizons. A vertical connection between these fracture zones is likely but has not been proven and as such the assumption of a linear variation in groundwater level between these holes (such as assumed when drawing contour plots) is questionable as the water is potentially being transmitted on three different planes. Any connection between these fracture zones will be greatly influenced by the nature and orientation of fracturing within the bedrock and external factors such as changes to recharge patterns (influenced by changes in land use and geological morphology) and abstraction of water.

    - The River Triogue, the Locally Important Limestone Aquifer (Ll) beneath the site and the Regionally Important Karstified Aquifer (Rk) east of the site and have been identified as sensitive receptors of the site. Meelick Source Protection Zone is also considered a sensitive receptor.

    - An analysis of contaminant trends and levels from 2014 to 2017 was undertaken. Manganese, iron, chloride and nickel are inorganic parameters that have been detected above the relevant water quality standards, predominately at monitoring

locations GW7/MW03 and GW8/MW04 and to a lesser extent GW1/BH01 and GW3/BH03. Manganese and iron are naturally occurring metals; however detected levels of both parameters may increase in anoxic environments where contamination may be naturally attenuating and therefore may be indicative of a contaminative source at these locations. Chloride and nickel may be related to a contamination source however no known sources of either chloride or nickel have been identified on-site. Elevated levels of lead are consistently detected within GW3/MW03.

- Levels of PAHs and TPHs were previously intermittent or non-detected across the site between 2008 and 2014; however in more recent times consistently elevated levels of TPH have been detected within 3 no. locations i.e. GW3/MW03 , GW7/MW03 and GW8/MW04 and slightly elevated and more recent detections within GW5/MW01. Although hydrocarbons were previously detected in GW4/BH104b, no detections have been recorded in the most recent rounds of monitoring in August and November 2017. The hydrocarbon signature at each location varies across the site suggesting separate sources of contamination at each location.
- The main sources of contamination identified at the site relate to the following:
  - Residual contamination from a Former Oil Reception Sump in the vicinity of GW7/MW03 impacting on groundwater quality within the well.
  - Contamination in the west of the site at the Warehouse Storage Area in vicinity of GW3/BH103 potentially attributed to underground interceptor and collection sumps in the area.
  - Contamination in the vicinity of GW8/MW04 potentially impacted by a UST in the southeastern corner of the site although he UST was integrity tested and deemed fit for purpose.
  - Made Ground and groundwater in the south of the site in the vicinity of GW4/BH104b that has been potentially impacted by an off-site and upgradient diesel source to the south of the site. It is noted however the contaminant levels recorded recently are considered to be low.
  - Recent detections of hydrocarbons in the north of the site at GW5/MW01 potentially attributed to the proximate wheel wash and associated collection sumps/drainage system.

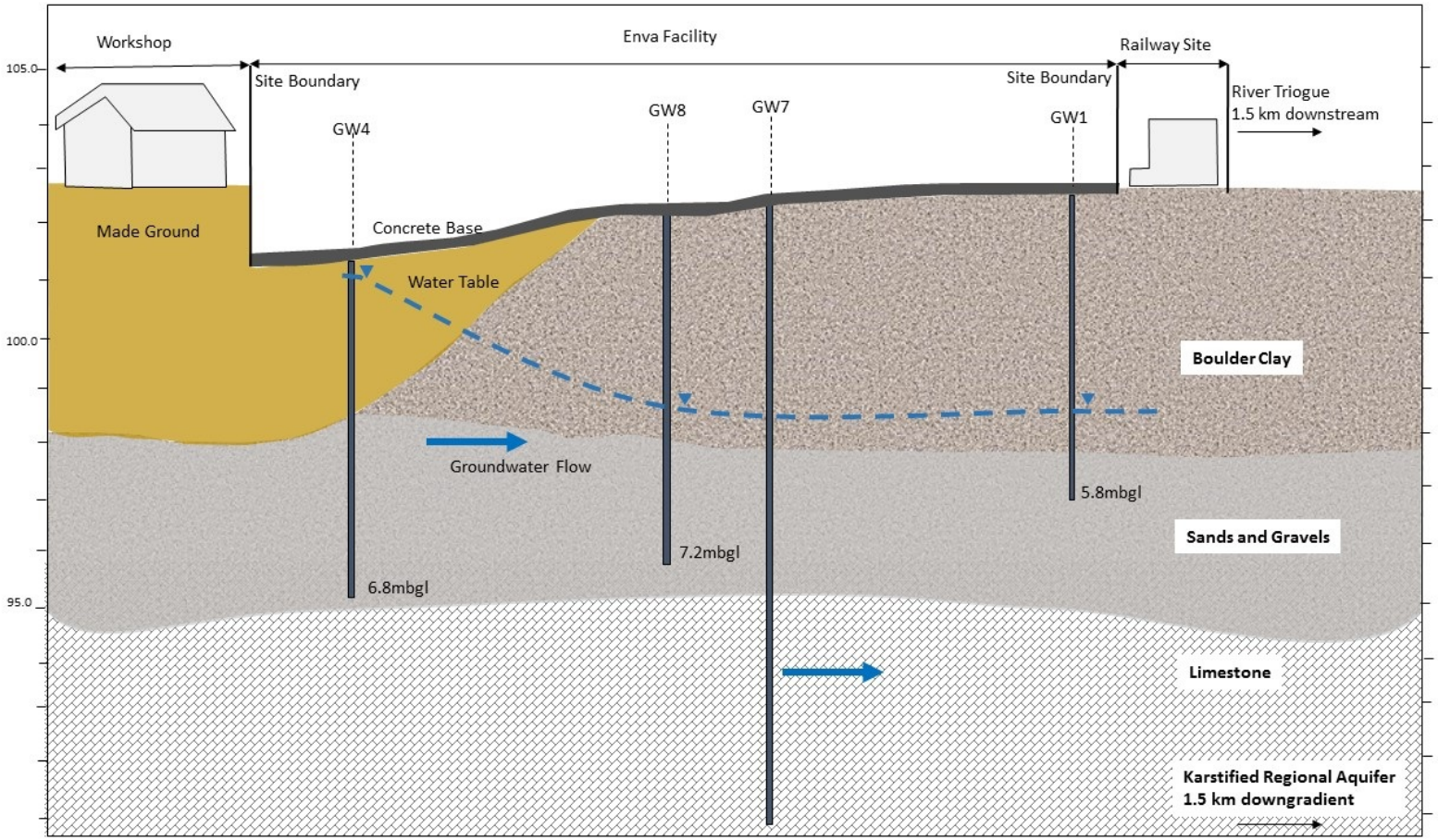
- The 2017 Updated CSM concludes that based on the most up-to-date laboratory and monitoring data, all risk linkages identified were considered to pose a low risk to the downgradient sensitive receptors with the exception of contaminant levels recorded within GW8/MW04 and GW7/MW03. Recent laboratory testing of the contaminant material at these locations suggests a slightly more mobile contaminant than previously interpreted and the risk posed has been increased slightly to Low to Moderate as a conservative approach. More detailed information is required to confirm otherwise as detailed in Section 10.

10 RECOMMENDATIONS

The following recommendations have been made to ensure compliance with the 2010 Groundwater Regulations and on the findings of this 2017 CSM report:

1. Resurvey all groundwater monitoring well heads including well GW8/MBH104 which has not been previously surveyed in addition to installation dataloggers within a select number of shallow monitoring wells. The objective is to confirm the previously interpreted groundwater flow directions across the site to minimise any uncertainty in this regard. In particular the presence of a possible shallow groundwater divide across the centre of the site requires definitive confirmation.
2. Assess the seal on all Fibrolite well heads installed across the site to determine how water is entering a number of well heads and reseal where appropriate.
3. Undertake integrity testing on all underground interceptors and selected sumps
4. During 1 round of groundwater sampling in 2018, collect additional water samples for chemical testing from the UST in the southeastern corner of the site, from each interceptor and from the BH104 sump.
5. During 1 round of groundwater sampling in 2018, arrange for the laboratory to undertake product identification where appropriate and provide chromatographs for relevant samples to determine linkages between identified sources and impacted monitoring wells.
6. Given the uncertainty relating to recent detections (in particular hydrocarbons) within a number of wells, undertake duplicate sampling from selected wells and have them independently tested for comparison purposes.
7. Ensure all laboratory limits of detection are below their respectively IGV and GTV guideline levels in particular Vinyl Chloride and Total Hydrocarbons.
8. Request from the laboratory that all further hydrocarbon analysis is the TPHCWG testing method which provides a more representative range of carbon bands for risk assessment purposes.
9. Given the recent detections of hydrocarbons in particular wells, a review of sampling methodologies undertaken to-date at the site should be undertaken to ensure representative groundwater samples are being tested for chemical analysis going forward.
10. Depending on the outcome of the above works, additional boreholes should be considered to provide a better understanding of groundwater flow direction, the presence of a groundwater divide, to identify possible residual sources of contamination at the facility and to provide a more representative downgradient compliance well, if appropriate.
11. Continue quarterly groundwater monitoring as per the EPA licence requirements. On completion of the 2018 monitoring events and subject to completion of the above recommendations, an updated CSM report should be provided at the end of 2018. An interim monitoring report should be considered in June/July 2018 on completion of 2 rounds of quarterly monitoring to assess the persistency of the recent hydrocarbon detections recorded. Depending on the results recorded, a predictive groundwater risk assessment/model may be required similar to that completed in 2008; however a more accurate understanding of groundwater flow directions across the site is required to facilitate this model.

FIGURES



Legend

Project

2017 CSM Update

Client

Enva Ireland Ltd

Drawing

Figure A

Title

Section X - X'

BlueRock Environmental

The Hydrogeological and Contaminated Land Consultancy

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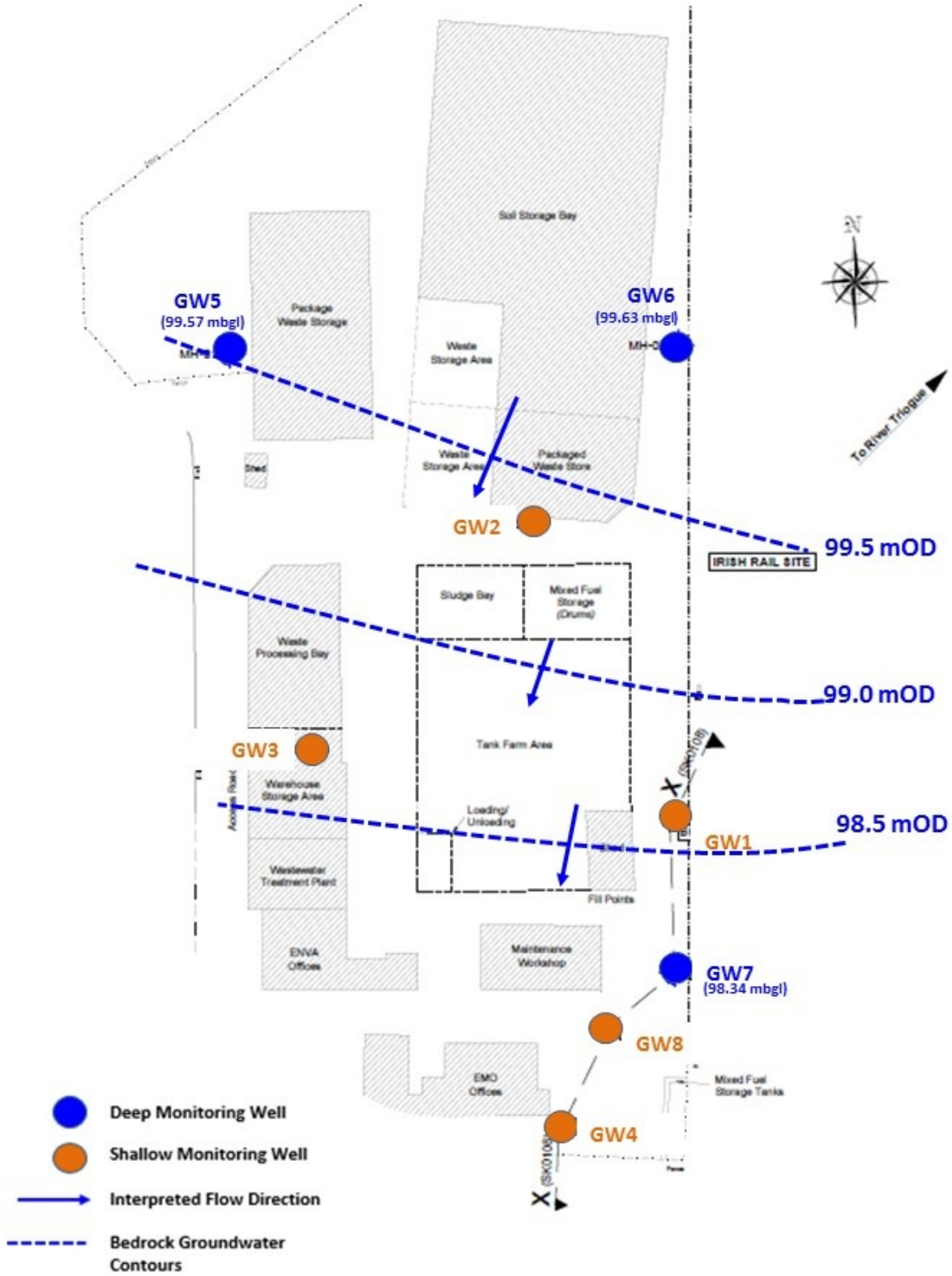
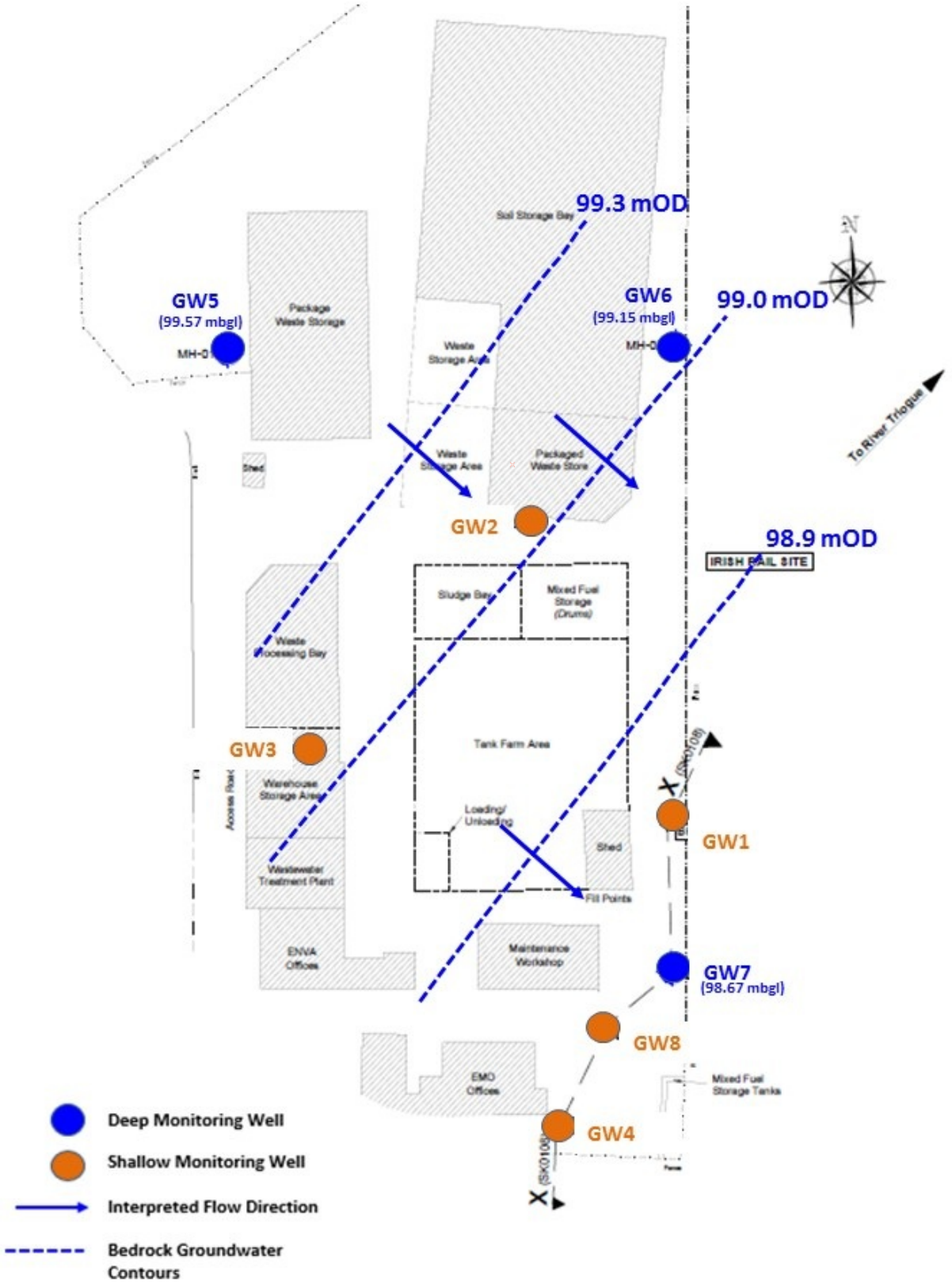
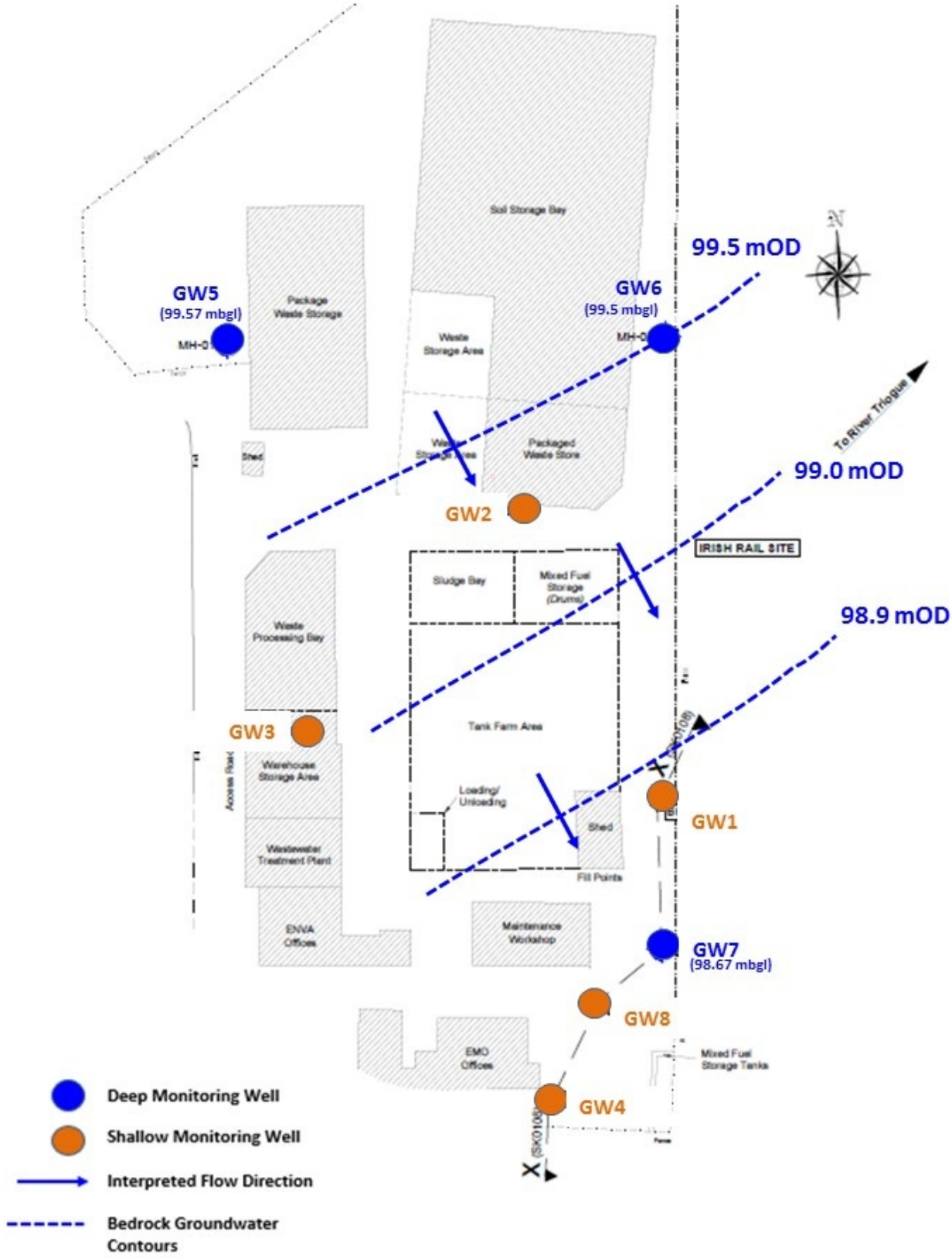
File Ref : BRE17017
Drawing Ref : BRE17017DG01
Revision : V01
Date : 15/12/2017
Scale: NTS
Drawn by: GB



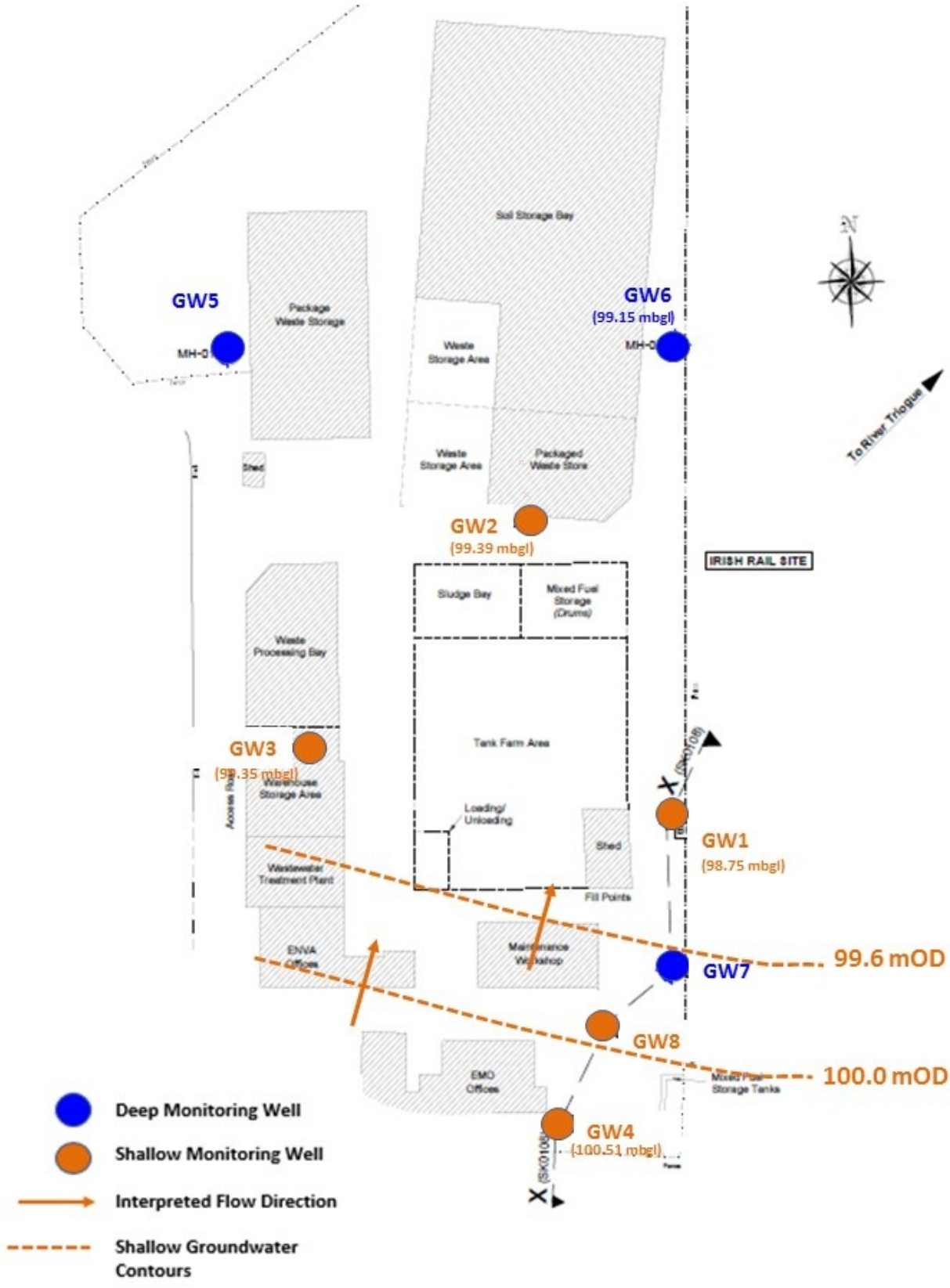
Project	Title		
2017 CSM Update	**Bedrock Groundwater Flow February 2017**	File Ref: BRE17017 Drawing Ref: BRE17017DG02 Revision: V01 Date: 15/12/2017 Scale: NTS Drawn by: GB Copyright: BlueRock Env Ltd	BlueRock Environmental The Hydrogeological and Contaminated Land Consultancy
Client **Enva Ireland Ltd**	**Drawing** **Figure B**		T 00353 863856884 E admin@bluerockenv.ie W www.bluerockenvironmental.ie



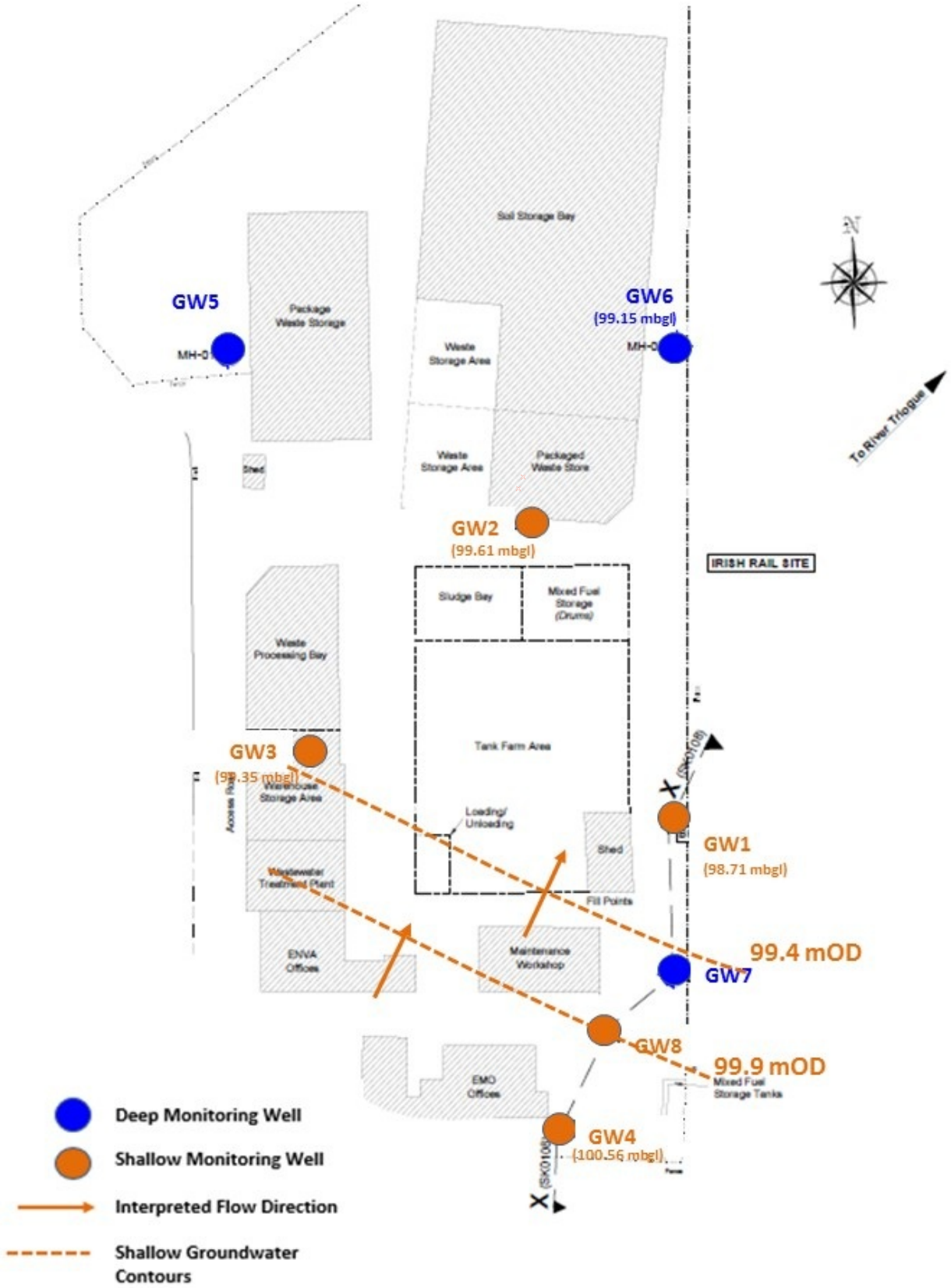
Project **2017 CSM Update**	**Title** **Bedrock Groundwater Flow May 2017**	File Ref: BRE17017 Drawing Ref: BRE17017DG03 Revision: V01 Date: 15/12/2017 Scale: NTS Drawn by: GB Copyright: BlueRock Env Ltd	BlueRock Environmental The Hydrogeological and Contaminated Land Consultancy T 00353 863856884 E admin@bluerockenv.ie W www.bluerockenvironmental.ie
Client **Enva Ireland Ltd**	**Drawing** **Figure C**		



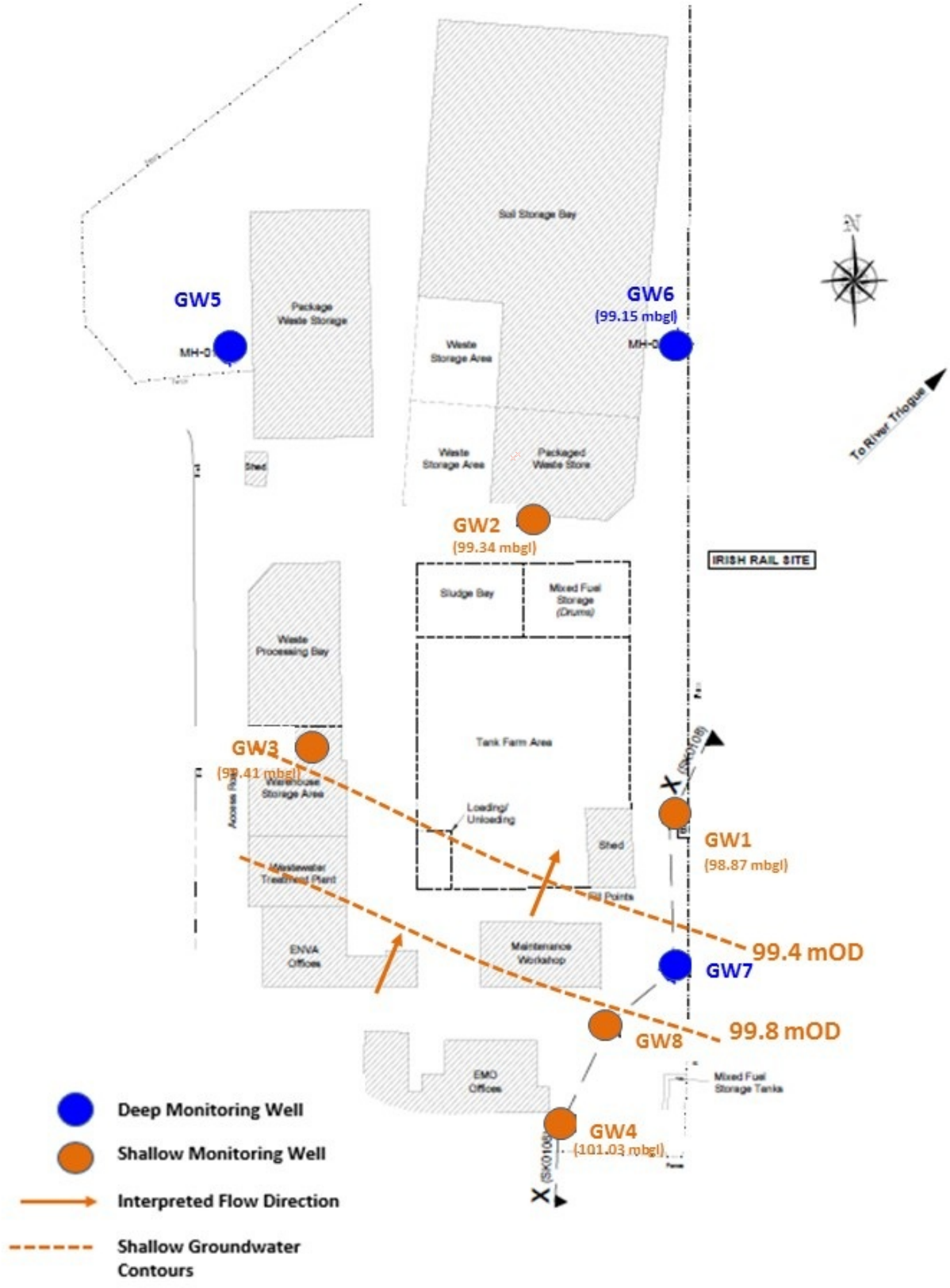
Project **2017 CSM Update**	**Title** **Bedrock Groundwater Flow August 2017**	File Ref: BRE17017 Drawing Ref: BRE17017DG04 Revision: V01 Date: 15/12/2017 Scale: NTS Drawn by: GB Copyright: BlueRock Env Ltd	BlueRock Environmental The Hydrogeological and Contaminated Land Consultancy T 00353 863856884 E admin@bluerockenv.ie W www.bluerockenvironmental.ie
Client **Enva Ireland Ltd**	**Drawing** **Figure D**		



Project **2017 CSM Update**	**Title** **Shallow Groundwater Flow February 2017**	File Ref: BRE17017 Drawing Ref: BRE17017DG05 Revision: V01 Date: 15/12/2017 Scale: NTS Drawn by: GB Copyright: BlueRock Env Ltd	BlueRock Environmental The Hydrogeological and Contaminated Land Consultancy
Client **Enva Ireland Ltd**	**Drawing** **Figure E**		T 00353 863856884 E admin@bluerockenv.ie W www.bluerockenvironmental.ie



Project **2017 CSM Update**	**Title** **Shallow Groundwater Flow May 2017**	File Ref: BRE17017 Drawing Ref: BRE17017DG06 Revision: V01 Date: 15/12/2017 Scale: NTS Drawn by: GB Copyright: BlueRock Env Ltd	BlueRock Environmental The Hydrogeological and Contaminated Land Consultancy T 00353 863856884 E admin@bluerockenv.ie W www.bluerockenvironmental.ie
Client **Enva Ireland Ltd**	**Drawing** **Figure F**		



Project **2017 CSM Update**	**Title** **Shallow Groundwater Flow August 2017**	File Ref: BRE17017 Drawing Ref: BRE17017DG07 Revision: V01 Date: 15/12/2017 Scale: NTS Drawn by: GB Copyright: BlueRock Env Ltd	BlueRock Environmental The Hydrogeological and Contaminated Land Consultancy T 00353 863856884 E admin@bluerockenv.ie W www.bluerockenvironmental.ie
Client **Enva Ireland Ltd**	**Drawing** **Figure G**		

APPENDIX A

EPA Correspondence

Reference
RI008474
ParentSubject
LR027854
Question

Dear Mr Coll,

The Agency has reviewed your submission LR027854, "RPS Reports on Groundwater" in relation to ENVA Ireland Limited (Portlaoise) Licence Reg. No. W0184-02.

It is noted in this submission that:

- The measurement range of concentration on the graphs do not enable interrogation of recent monitoring results and trends, or enable comparison with applicable limits/guideline values e.g. Total PAHs, TPH>C5-C44;
- The discussion of results is not succinct and does not provide a comprehensive overview of results. A significant amount of the discussion provided is spent on historical data rather than recent current data and does not clearly focus on what wells exceeded the limit/guideline value, what is the source of this exceedance, and what is the significance and the impact of this exceedance. Discussions of results should focus primarily on the previous 12 months, and if relevant, historical data could be placed in an Appendix for reference purposes;
- The discussion is broken up into results by parameter, rather than a summary comparison between recent upgradient results compared with downgradient results, and between recent results and historical results;
- The Licensee is comparing results with the highest historical concentration, but is not comparing results with the target (pre-contamination) quality concentrations;
- The last update to the conceptual site model and hydrogeological risk assessment on the effectiveness of time to manage the groundwater contamination was undertaken in 2014, based on data up to the end of 2013 (ref. LR010225).

The Licensee is referred to Condition 6.15 of Licence Reg. No. W0184-02 and shall update the conceptual site model for the site.

The Licensee shall refer to the EPA *Guidance On The Management Of Contaminated Land And Groundwater At EPA Licensed Sites* (available on the EPA website at http://www.epa.ie/pubs/advice/waste/contaminatedland/contaminatedland/Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites FINAL.pdf), and shall submit an updated hydrogeological risk assessment to the EPA no later than 15/12/2017.

Furthermore, the Licensee shall ensure the format and content of future groundwater monitoring reports submitted to the EPA take account of the above points.

You are reminded of the requirement to comply with the Conditions of Licence Reg. No. W0184-01 at all times.

The Licensee shall note that a direct response to this correspondence is not required.

Yours sincerely,

Joan Fogarty,

Office of Environmental Enforcement, Southeast Region.

APPENDIX B

Borehole Logs

URS

Dames & Moore
O'Brien Kreitzberg
Thorburn Colquhoun

Dames & Moore
Iveagh Court, 4th Floor
6-8 Harcourt Road
Dublin 2
Ireland

BOREHOLE LOG

BOREHOLE NO.: BH 101

TOTAL DEPTH: 6.8m bgl

PROJECT INFORMATION

CLIENT:	Atlas Oil
SITE NAME:	Portlaois
SITE LOCATION:	Portlaois, Co Laois
JOB NO.:	46605-002
LOGGED BY:	Nicola O'Hara
CHECKED BY:	
DATES DRILLED:	05/03/01-08/03/01

DRILLING INFORMATION

DRILLING CO.:	Glovers
DRILLER:	John Sheppard
DRILLING METHOD/DIAMETER:	Shell and Auger
SCREEN TYPE/DIAMETER:	HDPE/ 50mm
SCREEN SLOT SIZE:	1mm
SAMPLING METHODS:	Grab

NOTES:

▽ Water level during drilling

▼ Water level in completed well

BOREHOLE COMPLETION	SAMP. #	PID ppm	WATER LEVEL	DEPTH m	GEOLOGY	DESCRIPTION	COMMENTS	DEPTH m
				0		CONCRETE		0
	BH101.1					CLAY: light-medium brown/grey, sandy, gravelly, significant cobbles and boulders,	no odour	
				-1		CLAY: light brown, dry, sandy gravelly, significant angular and subangular cobbles,		-1
				-2		CLAY: very stiff, light brown, boulder clay, gravelly, sandy,	no odour	-2
				-3			moist, no sheen, no odour	-3
			▼	-4		CLAY: very stiff, compacted, sandy, dry, some subangular, medium-coarse gravel,		-4
				-5				-5
	BH101.2		▽			CLAY: very stiff, compacted, sandy, dry, some subangular, medium-coarse gravel,		
				-6		GRAVEL: subangular and subrounded, cobbles and boulders, some sand,	no sheen, no odour	-6

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O'Brien Kreitzberg
Thornburn Colquhoun

Dames & Moore
Iveagh Court, 4th Floor
6-8 Harcourt Road
Dublin 2
Ireland

BOREHOLE LOG

BOREHOLE NO.: BH 102

TOTAL DEPTH: 6.8m bgl

PROJECT INFORMATION

CLIENT:	Atlas Oil
SITE NAME:	Portlaois
SITE LOCATION:	Portlaois, Co Laois
JOB NO.:	46605-002
LOGGED BY:	Caroline Enright
CHECKED BY:	
DATES DRILLED:	01/03/01-03/03/01

NOTES:

DRILLING INFORMATION

DRILLING CO.:	Glovers
DRILLER:	John Sheppard
DRILLING METHOD/DIAMETER:	Shell and Auger
SCREEN TYPE/DIAMETER:	HDPE/ 50mm
SCREEN SLOT SIZE:	1mm
SAMPLING METHODS:	Grab

▽ Water level during drilling

▼ Water level in completed well

BOREHOLE COMPLETION	SAMP. #	PID ppm	WATER LEVEL	DEPTH m	GEOLOGY	DESCRIPTION	COMMENTS	DEPTH m
				0		CONCRETE		0
				-1		CLAY: soft-firm, mid-brown, friable, some peat, some small-medium subangular gravel,	slightly damp	-1
	BH102.1	1		-2		CLAY: soft-firm, mid-brown with grey/green mottling, friable, some peat, some small-medium subangular and subrounded gravel,		-2
			▽	-3		CLAY: soft, green grey, slightly plastic, some large cobbles,	slightly damp, no odour	-3
						CLAY: firm to stiff, light grey with green mottling, plastic, large gravel and cobbles	slightly damp, no odour	
				-4		CLAY: soft, brown, plastic, marley, large gravel and cobbles		-4
						CLAY: soft, light brown, plastic, marley, fine-coarse gravel, some cobbles	slightly damp, no odour	
						CLAY: soft, light brown, plastic, marley, fine-coarse gravel, some cobbles		
	BH102.2	1	▽	-5		BOULDERS: very hard ground		-5
						BOULDERS: large cobles gravel and boulders, some clay		
				-6		BOULDERS: some firm clay with fine-coarse gravel, large cobbles		-6

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Thorburn Colquhoun

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Iveagh Court, 4th Floor
6-8 Harcourt Road
Dublin 2
Ireland

BOREHOLE LOG

BOREHOLE NO.: BH 103

TOTAL DEPTH: 5.7m bgl

PROJECT INFORMATION

CLIENT:	Atlas Oil
SITE NAME:	Portlaois
SITE LOCATION:	Portlaois, Co Laois
JOB NO.:	46605-002
LOGGED BY:	Caroline Enright
CHECKED BY:	
DATES DRILLED:	01/03/01-03/03/01

DRILLING INFORMATION

DRILLING CO.:	Glovers
DRILLER:	John Sheppard
DRILLING METHOD/DIAMETER:	Shell and Auger
SCREEN TYPE/DIAMETER:	HDPE/ 50mm
SCREEN SLOT SIZE:	1mm
SAMPLING METHODS:	Grab

NOTES:

▽ Water level during drilling

▽ Water level in completed well

BOREHOLE COMPLETION	SAMP. #	PID ppm	WATER LEVEL	DEPTH m	GEOLOGY	DESCRIPTION	COMMENTS	DEPTH m
				0		CONCRETE		0
						GRAVEL: dense, grey, clayey, some sand, fine-medium subangular gravel,	slightly damp, slight HC odour	
						GRAVEL: firm, light grey, sandy, clayey, cobbles,	damp, slight HC odour	
				-1		CLAY: firm, light-medium grey, some brown and yellow mottling, sandy gravelly, fine-medium gravel, sub angular and sub rounded, large cobbles	slightly damp, slight HC odour	-1
						CLAY: soft, medium grey, plastic, some gravel fine-coarse, some sand, cobbles	damp, no odour	
				-2				-2
	BH103.1	4				CLAY: firm, brown/grey, slightly plastic, some sand, some gravel fine-coarse, cobbles	damp, no odour	
				-3				-3
	BH103.2	1	▽	-4		CLAY: soft-firm, brown-grey, gravelly fine-coarse, slightly plastic	damp, no odour	-4
						CLAY: soft, brown-grey, gravelly fine-coarse, slightly plastic, some cobbles		
				-5				-5
						BOULDERS: black/grey, very hard ground		

URS

Dames & Moore
O'Brien Kreitzberg
Thornburn Colquhoun

Dames & Moore
Iveagh Court, 4th Floor
6-8 Harcourt Road
Dublin 2
Ireland

BOREHOLE LOG

BOREHOLE NO.: BH 104

TOTAL DEPTH: 6.8m bgl

PROJECT INFORMATION

CLIENT:	Atlas Oil
SITE NAME:	Portlaois
SITE LOCATION:	Portlaois, Co Laois
JOB NO.:	46605-002
LOGGED BY:	Nicola O'Hara
CHECKED BY:	
DATES DRILLED:	05/03/01-08/03/01

DRILLING INFORMATION

DRILLING CO.:	Glovers
DRILLER:	John Sheppard
DRILLING METHOD/DIAMETER:	Shell and Auger
SCREEN TYPE/DIAMETER:	HDPE/ 50mm
SCREEN SLOT SIZE:	1mm
SAMPLING METHODS:	Grab

NOTES:

▽ Water level during drilling

▼ Water level in completed well

BOREHOLE COMPLETION	SAMP. #	PID ppm	WATER LEVEL	DEPTH m	GEOLOGY	DESCRIPTION	COMMENTS	DEPTH m
	BH104.1		▽	0		CONCRETE		0
				-1		FILL: dense, hardcore some clay,	HC odour, sheen	-1
				-2				-2
			▽	-3			no odour, no sheen	-3
				-4		GRAVEL & SAND: medium grained gravel,	no odour, wet	-4
	BH104.2			-5		SAND: medium-coarse grained, medium to coarse gravel angular and subangular, angular and subangular cobbles,	no odour	-5
				-6		SAND: as above, except more gravel content		-6

BOREHOLE NUMBER: MW01		PAGE 1 of 1
DRILLING DATES: 14 April 2003	DRILLING METHODS : Air Rotary	
DRILLER : Glover Site Investigations	BOREHOLE DIAMETER :	
LOGGED BY : SES	SCREEN TYPE & DIAM:	
CHECKED BY : CG	SCREEN SLOT SIZE:	

BOREHOLE CONSTRUCTION	SAMPLE ANALYTES	SAMPLE TYPE	PID READING (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	DESCRIPTION	COMMENTS
				Water table	0.0		Grey brown, **Sandy Boulder Clay** with abundant fine to medium rounded gravels. Moist.	NEC
					9.0		**Limestone**, light grey, unweathered. Dry to 21m.	NEC
				Water Strike	24.0		End of Borehole	

LOCATION / NOTES:
NEC= No Evidence of Contamination

LEGEND
- Disturbed Sample
- Undisturbed Sample
- PID Headspace Analysis
- Down Borehole Analysis
- Groundwater Table
- Perched Water Table

BOREHOLE LOG

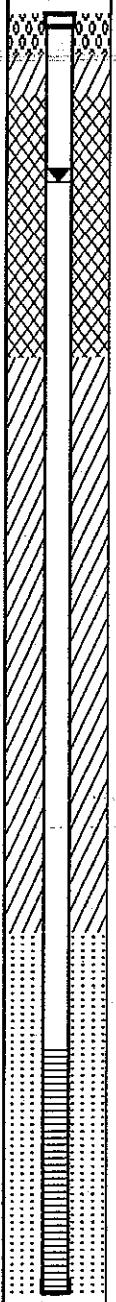
Job Title: Groundwater Investigation
Location: Portlaoise, Co Laois
Client: Atlas Ireland Ltd

URS

App'd:	Date: 14-4-04
Drawn : SES	Ref: SS/CG/GW
Scale:	Job No: 46605-009-447
Drg. Size: A4	BOREHOLE LOG

BOREHOLE NUMBER: MW02 | PAGE 1 of 1

DRILLING DATES: 14-15 April 2003	DRILLING METHODS : Air Rotary
DRILLER : Glover Site Investigations	BOREHOLE DIAMETER :
LOGGED BY : SES	SCREEN TYPE & DIAM:
CHECKED BY : CG	SCREEN SLOT SIZE:



DEPTH (m)	DESCRIPTION	COMMENTS
0.0 – 1.0	Made Ground: Loose **Sand and Gravel** hardcore with some silt. Dry.	NEC
1.0 – 9.0	Light brown, **Sandy Boulder Clay**, with abundant fine to medium rounded gravels. Dry.	NEC
9.0 – 29.0	**Limestone**, pale grey, fine grained, unweathered. Dry to 29m.	NEC
29.0 – 33.0	End of Borehole	

Water table

Water strike

LOCATION / NOTES:
NEC= No Evidence of Contamination

LEGEND
- Disturbed Sample
- Undisturbed Sample
- PID Headspace Analysis
- Down Borehole Analysis
- Groundwater Table
- Perched Water Table

BOREHOLE LOG

Job Title: Groundwater Investigation
Location: Portlaoise, Co Laois
Client: Atlas Ireland Ltd

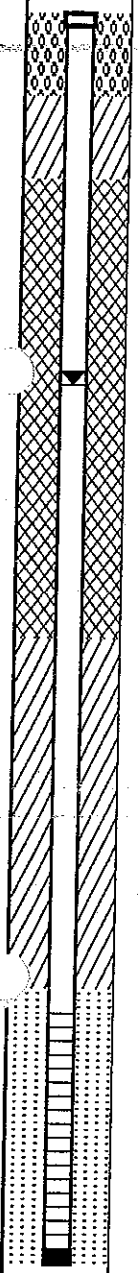
URS

App'd:	Date: 15-4-04
Drawn : SES	Ref: SS/CG/GW
Scale:	Job No: 46605-009-447
Drg. Size: A4	BOREHOLE LOG

BOREHOLE NUMBER: MW03

PAGE 1 of 1

DRILLING DATES: 14 April 2003	DRILLING METHODS : Air Rotary
DRILLER : Glover Site Investigations	BOREHOLE DIAMETER :
LOGGED BY : SES	SCREEN TYPE & DIAM:
CHECKED BY : CG	SCREEN SLOT SIZE:



DEPTH (m)	DESCRIPTION	COMMENTS
0.0	Light brown, **Sandy Boulder Clay** with abundant fine to medium rounded gravels. Moist.	
1.0		Slight Hydrocarbon Odour
2.0		
3.0		
4.0		
5.0	Slightly loose, light brown **Clayey Sand**, with fine to medium grained gravel, slightly moist.	Slight Hydrocarbon Odour
6.0		
7.0	Grey brown **Sand** with fine to medium subrounded to rounded gravels. Moist, becoming wet at 7.5m.	Slight Hydrocarbon Odour
8.0	**Limestone**, pale grey, unweathered. Wet.	NEC
9.0		
10.0		
11.0		
12.0		
13.0		
14.0		
15.0	End of Borehole	
16.0		

Water table

Water strike

LOCATION / NOTES:
NEC= No Evidence of Contamination

LEGEND
- Disturbed Sample
- Undisturbed Sample
- PID Headspace Analysis
- Down Borehole Analysis
- Groundwater Table
- Perched Water Table

BOREHOLE LOG

Job Title: Groundwater Investigation

Location: Portlaoise, Co Laois

Client: Atlas Ireland Ltd

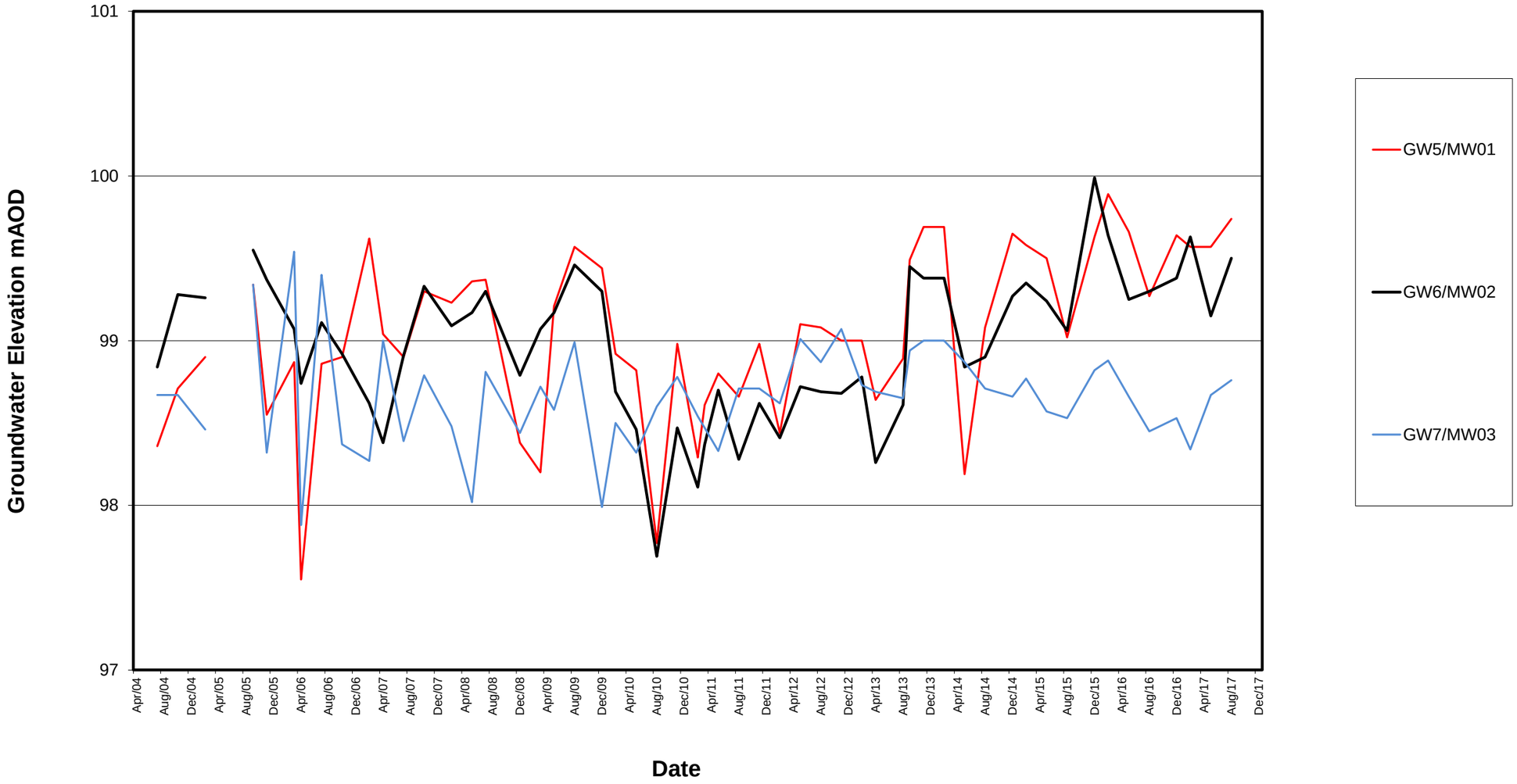
URS

App'd:	Date: 14-4-04
Drawn : SES	Ref: SS/CG/GW
Scale:	Job No: 46605-009-447
Drg. Size: A4	BOREHOLE LOG

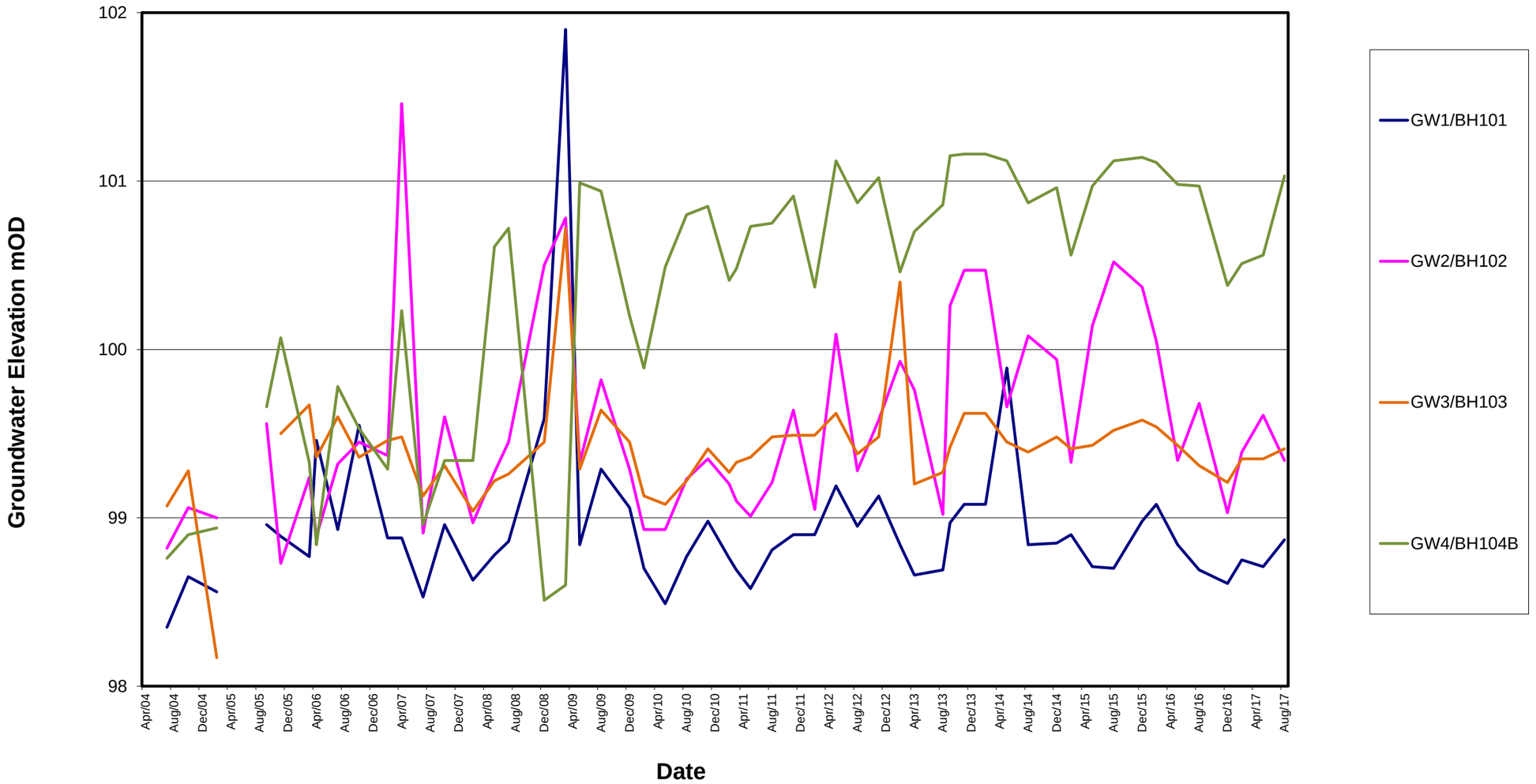
APPENDIX C

Groundwater Levels

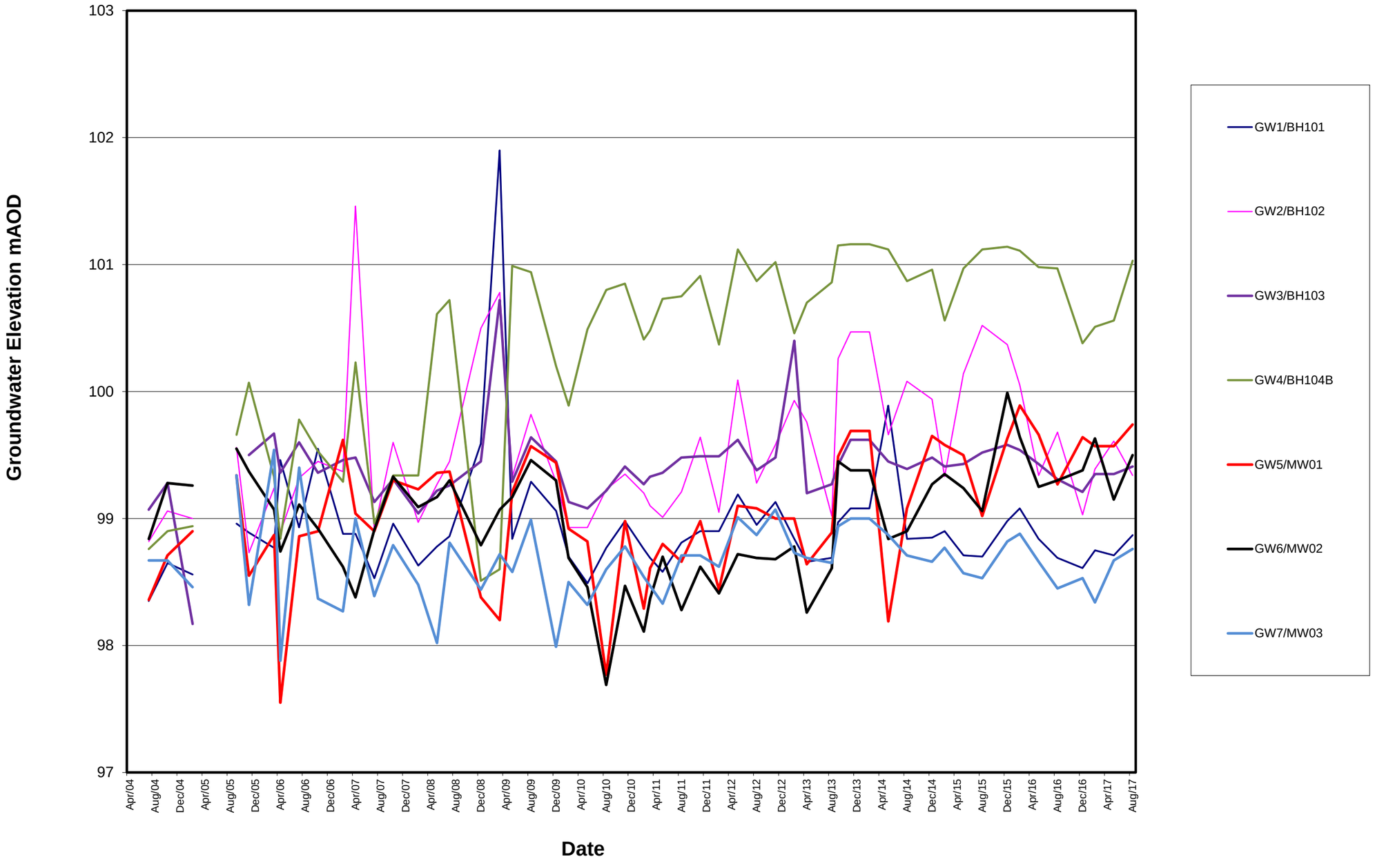
Manual Groundwater Dips - Deep Boreholes



Manual Groundwater Dips - Shallow Boreholes



Manual Groundwater Dips - All Boreholes



APPENDIX D

Summary Laboratory data

Total Hydrocarbons

TPH >C5 - C44	GW1/BH 101	GW2/BH102	GW3/BH103	GW4/BH 104B	GW5/MW01	GW6/MW02	GW7/MW03	GW8/MW04	EPA IGV (ug/l)
02-Mar-06									
19-Apr-06									
27-Jul-06									
17-Oct-06									
19-Feb-07									
27-Apr-07									
26-Jul-07									
22-Oct-07									
13-Feb-08									
07-May-08									
16-Jul-08									
15-Dec-08									
05-Mar-09	**2103**	**462**	**3294**	**16711**	**118**	**25**	**2568**		10
27-May-09	**516**	<10	**2937**	**386**	**63**	<10	**34700**		10
06-Aug-09	**40**	<10	**12**	**511**	<10	<10	**1800**		10
04-Dec-09	**66**	**141**	**2670**	**193**	**2020**	<10	**10300**		10
18-Feb-10	<10	<10	<10	<10	<10	<10	**4700**		10
27-May-10	<10	<10	<10	**270**	<10	<10	<10		10
12-Aug-10	<10	<10	<10	**31**	<10	<10	**98**		10
24 Nov 2010	<10	<10	<10	<10	<10	<10	<10		10
10-Mar-2011	<10	<10	<10	<10	<10	<10	<10		10
24 May 2011	<10	<10	**760**	**120**	<10	<10	**210**		10
03 Aug 2011	<10	<10	<10	<10	<10	<10	**370**		10
06 Nov 2011	<10	<10	<10	<10	<10	<10	**270**		10
23 Feb 2012	<10	<10	**2000**	<10	<10	<10	<10		10
28 May 2012	<10	<10	**500**	<10	<10	<10	<10	<10	10
14 Aug 2012	<10	<10	<10	<10	<10	<10	<10	<10	10
07 Nov 2012	<10	<10	<10	<10	<10	<10	<10	<10	10
19 Feb 2013	<10	<10	<10	<10	<10	<10	<10	<10	10
17 Apr 2013	<10	<10	<10	<10	<10	<10	<10	<10	10
23 Sep 2013	<10	<10	<10	<10	<10	<10	**390**	<10	10
05 Nov 2013	<10	<10	<10	<10	<10	<10	<10	<10	10
25 Feb 2014	<10	<10	<10	<10	<10	<10	<10	<10	10
22 May 2014	<10	<10	<10	<10	<10	<10	<10	<10	10
22 Aug 2014	<10	<10	<10	**410**	<10	<10	<10	<10	10
03 Dec 2014	<10		<10	<10	<10	<10	<10	<10	10
12 Feb 2015	<10	<10	**68**	**53**	<10	<10	**72**	**15**	10
20-May-15	<10	<10	**2269**	**557**	<10	<10	<20	<40	10
26-Aug-15	<10	<10	**89**	**219**	<10	<10	**14**	**47**	10
08-Dec-15	<10	<10	**304**	**9890**	<10	<10	<10	**35**	10
24-Feb-16	<10	<10	**132**	<10	<10	<10	<10	**15**	10
25 May 2016	<10	<10	**207**	<10	<10	<10	<10	**20**	10
31 Aug 2016	<10	<10	**56**	**37**	<10	<10	<10	**23**	10
06 Dec 2016	<10	<10	**47**	**12**	<10	<10	<10	**35**	10
16 Feb 2017	<10	**11**	**15**	<10	**23**	<10	**53**	**32**	10
30 May 2017	<10	<10	**50**	**85**	<10	**12**	**18**	**29**	10
28/08/2017	<40	<10	**247**	<10	**120**	<10	**102**	**41**	10
14/11/2017	<10	**98**	**351**	<10	**60**	<10	<40	<40	10

Benzo (a) pyrene

	GW1/BH 101	GW2/BH102	GW3/BH103	GW4/BH 104B	GW5/MW01	GW6/MW02	GW7/MW03	GW8/MW04	EPA IGV (ug/l)
11 Apr 2004	-	-	-	-	-	-	-		0.01
19 Jul 2004	<0.01	<0.01	0.041	-	<0.01	<0.01	<0.01		0.01
04 Oct 2004	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
07 Feb 2005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
13 Jun 2005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
21 Sep 2005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
10 Nov 2005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
02 Mar 2006	<0.01	**0.115**	<0.01	**0.18**	**0.012**	**0.017**	**2.751**		0.01
19 Apr 2006	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
27 Jul 2006	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.249**		0.01
17 Oct 2006	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.337**		0.01
19 Feb 2007	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
27 Apr 2007	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.024**		0.01
26 Jul 2007	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
22 Oct 2007	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.05**		0.01
13 Feb 2008	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010		0.01
07 May 2008	<10	<10	<10	<10	<10	<10	0.01		0.01
16 Jul 2008	<10	<10	<10	<10	<10	<10	**0.023**		0.01
15 Dec 2008	<10	<10	<10	<10	<10	<10	<10		0.01
05 Mar 2009	<0.01	<0.01	**0.34**	<0.01	<0.01	<0.01	<0.01		0.01
27 May 2009	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**0.18**		0.01
06 Aug 2009	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.02**		0.01
04 Dec 2009	**0.04**	<0.01	**0.01**	<0.01	**0.03**	<0.01	**0.27**		0.01
18 Feb 2010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
27 May 2010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
12 Aug 2010	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01		0.01
24 Nov 2010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
10 Mar 2011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
24 May 2011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
03 Aug 2011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
16 Nov 2011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
23 Feb 2012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01
28 May 2012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
14 Aug 2012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
07 Nov 2012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
19 Feb 2013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
17 Apr 2013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
23 Sep 2013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
05 Nov 2013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
25 Feb 2014	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
22 May 2014	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
28 Aug 2014	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
03 Dec 2014	<0.01	<0.01	<0.0.1	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
12 Feb 2015	<0.01	<0.01	<0.0.1	<0.01	**0.011**	<0.01	<0.01	<0.01	0.01
20 May 2015	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
26-Aug-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.052**	<0.10	0.01
08 Dec 2015	<0.01	<0.01	<0.01	<0.10	<0.01	<0.01	**0.108**	<0.01	0.01
24 Feb 2016	<0.10	<0.01	<0.04	<0.01	<0.01	<0.01	<0.01	<0.10	0.01
25 May 2016	<0.01	<0.01	<0.05	<0.10	<0.01	0.01	<0.10	<0.01	0.01
31 Aug 2016	<0.01	<0.01	**0.04**	<0.01	<0.01	<0.01	**0.037**	<0.01	0.01
06-Dec-16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.032**	<0.01	0.01
16-Feb-17	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.033**	<0.01	0.01
30-May-17	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.02	<0.01	0.01
28-Aug-17	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	0.01
14-Nov-17	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.036**	<0.01	0.01

Benzo (g,h,i) perylene

	GW1/BH 101	GW2/BH102	GW3/BH103	GW4/BH 104B	GW5/MW01	GW6/MW02	GW7/MW03	GW8/MW04	EPA IGV (ug/l)
11 Apr 2004	-	-	-	-	-	-	-		0.05
19 Jul 2004	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01		0.05
04 Oct 2004	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
07 Feb 2005	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01		0.05
13 Jun 2005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
21 Sep 2005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
10 Nov 2005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
02 Mar 2006	<0.01	<0.01	<0.01	**0.087**	<0.01	<0.01	**1.283**		0.05
19 Apr 2006	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
27 Jul 2006	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.232**		0.05
17 Oct 2006	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.1**		0.05
19 Feb 2007	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
27 Apr 2007	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.012		0.05
26 Jul 2007	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
22 Oct 2007	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
13 Feb 2008	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
07 May 2008	<10	<10	<10	<10	<10	<10	<10		0.05
16 Jul 2008	<10	<10	<10	<10	<10	<10	0.022		0.05
15 Dec 2008	<10	<10	<10	<10	<10	<10	<10		0.05
05 Mar 2009	<0.01*	<0.01*	**0.42***	<0.01*	<0.01*	<0.01*	<0.01*		0.05
27 May 2009	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	**0.08**		0.05
06 Aug 2009	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03		0.05
04 Dec 2009	0.05	<0.01	0.02	<0.01	**0.05**	<0.01	**0.26**		0.05
18 Feb 2010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
27 May 2010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
12 Aug 2010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
24 Nov 2010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
10 Mar 2011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
24 May 2011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
3 Aug 2011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
16 Nov 2011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
23 Feb 2012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
28 May 2012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
14 Aug 2012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
07 Nov 2012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
19 Feb 2013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
17 Apr 2013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
23 Sep 2013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
05 Nov 2013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
25 Feb 2014	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
22 May 2014	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
28 Aug 2014	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
03 Dec 2014	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
12 Feb 2015	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
20 May 2015	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
26-Aug-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.053**	<0.10	0.05
08 Dec 2015	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.131**	<0.01	0.05
24 Feb 2016	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
25 May 2016	<0.01	<0.01	<0.01	<0.10	<0.01	0.011	<0.10	<0.01	0.05
31 Aug 2016	<0.01	<0.01	**0.015**	<0.01	<0.01	<0.01	**0.035**	<0.01	0.05
06-Dec-16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.036**	<0.01	0.05
16-Feb-17	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.037**	<0.01	0.05
30-May-17	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.02	<0.01	0.05
28-Aug-17	<0.01	<0.01	<0.01	<0.01	0.013	<0.01	<0.10	<0.10	0.05
14-Nov-17	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.041**	<0.01	0.05

PAH Total

	GW1/BH 101	GW2/BH102	GW3/BH103	GW4/BH 104B	GW5/MW01	GW6/MW02	GW7/MW03	GW8/MW04	EPA IGV (ug/l)
11 Apr 2004	-	-	-		-	-	-		0.1
19 Jul 2004	**0.879**	**0.324**	**1.829**		**1.151**	**0.791**	**1.08**		0.1
04 Oct 2004	**0.031**	**0.087**	**0.034**	**1.006**	**0.103**	**0.037**	**0.099**		0.1
07 Feb 2005	**0.334**	**0.386**	**0.874**	**2.881**	**0.34**	**0.143**	**7.77**		0.1
13 Jun 2005	-	-	-	-	-	-	-		0.1
21 Sep 2005	-	-	-	-	-	-	-		0.1
10 Nov 2005	-	-	-	-	-	-	-		0.1
02 Mar 2006	<0.01	**1.499**	**0.14**	**4.775**	**1.122**	**0.553**	**107.35**		0.1
19 Apr 2006	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.1
27 Jul 2006	<0.01	<0.01	<0.01	**1.988**	<0.01	<0.01	**21.439**		0.1
17 Oct 2006	<0.01	<0.01	<0.01	**0.235**	<0.01	<0.01	**17.325**		0.1
19 Feb 2007	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**4.186**		0.1
27 Apr 2007	<0.01	<0.01	<0.01	**0.702**	<0.01	<0.01	**0.839**		0.1
26 Jul 2007	<0.01	<0.01	<0.01	**0.702**	<0.01	<0.01	**2.262**		0.1
22 Oct 2007	**0.15**	<0.01	<0.01	**19.72**	<0.01	<0.01	**3.86**		0.1
13 Feb 2008	<0.01	<0.01	<0.01	**1.701**	<0.01	<0.01	**1.146**		0.1
07 May 2008	<10	<10	<10	**1.501**	<10	<10	**1.003**		0.1
16 Jul 2008	<10	<10	<10	**0.963**	<10	<10	**1.564**		0.1
15 Dec 2008	<10	<10	<10	**0.2865**	<10	<10	**0.184**		0.1
05 Mar 2009	*<0.01* *	*<0.01* *	***8.40*** *	*<0.03* *	*0.02* *	*0.01* *	*0.01* *		0.1
27 May 2009	<0.01	<0.01	<0.01	**0.09**	0.07	**0.28**	**2.51**		0.1
06 Aug 2009	<0.01	0.02	0.02	**0.85**	<0.01	0.01	**0.45**		0.1
04 Dec 2009	**0.57**	0.03	**0.12**	**0.85**	**0.92**	<0.01	**4.58**		0.1
18 Feb 2010	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**0.3**		0.1
27 May 2010	<0.1	<0.1	<0.1	**1.2**	<0.1	<0.1	<0.1		0.1
12 Aug 2010	<0.2	<0.2	<0.2	**0.2**	<0.2	**2.0**	<0.2		0.1
24 Nov 2010	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		0.1
10 Mar 2011	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		0.1
03 Aug 2011	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		0.1
16 Nov 2011	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		0.1
23 Feb 2012	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		0.1
28 May 2012	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	2.6	<0.2	0.1
14 Aug 2012	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.1
07 Nov 2012	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.1
19 Feb 2013	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.1
17 Apr 2013	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.1
23 Sep 2013	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	2.62	<0.2	0.1
05 Nov 2013	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.1
25 Feb 2014	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.1
22 May 2014	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.1
28 Aug 2014	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.1
03 Dec 2014	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.1
12 Feb 2015	< 0.01	< 0.01	< 0.22	0.096	**0.106**	< 0.10	<0.10	< 0.01	0.1
20 May 2015	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.015	< 0.01	0.1
26-Aug-15	0.011	< 0.01	0.093	0.159	<0.01	< 0.01	**0.586**	< 0.10	0.1
08-Dec-15	0.011	< 0.01	**0.21**	<0.10	<0.01	< 0.01	**0.986**	0.079	0.1
24-Feb-16	<0.10	<0.01	**0.123**	**0.159**	<0.01	<0.01	<0.01	**0.153**	0.1
25 May 2016	<0.01	<0.01	**0.111**	<0.10	0.011	0.069	<0.10	0.023	0.1
31 Aug 2016	0.011	0.033	**0.181**	**0.158**	0.011	<0.01	**0.562**	**0.151**	0.1
06-Dec-16	<0.01	**0.124**	0.027	0.037	0.024	<0.01	**0.596**	0.015	0.1
16-Feb-17	<0.01	0.014	0.05	0.021	**0.121**	<0.01	**0.47**	**0.148**	0.1
30-May-17	<0.10	0.01	**0.127**	0.049	0.024	<0.01	**0.11**	**0.194**	0.1
28-Aug-17	<0.01	<0.01	**0.108**	**0.139**	**0.145**	<0.01	<0.10	**0.161**	0.1
14-Nov-17	<0.01	<0.01	0.031	<0.01	<0.01	<0.01	**0.243**	**0.147**	0.1

Naphthalene

	GW1/BH 101	GW2/BH102	GW3/BH103	GW4/BH 104B	GW5/MW01	GW6/MW02	GW7/MW03	GW8/MW04	EPA IGV (ug/l)
11 Apr 2004	-	-	-	-	-	-	-		1.0
19 Jul 2004	0.747	0.213	0.374	-	0.8	0.628	0.81		1.0
04 Oct 2004	<0.01	0.019	0.012	0.044	0.024	0.011	0.02		1.0
07 Feb 2005	0.187	0.07	0.51	0.147	0.048	0.028	**4.883**		1.0
13 Jun 2005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		1.0
21 Sep 2005	<0.01	<0.01	<0.01	**39**	<0.01	<0.01	<0.01		1.0
10 Nov 2005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		1.0
02 Mar 2006	<0.01	0.046	0.032	**1.069**	0.034	0.043	**19.986**		1.0
19 Apr 2006	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		1.0
27 Jul 2006	<0.01	<0.01	<0.01	**1.594**	<0.01	<0.01	**6.641**		1.0
17 Oct 2006	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**1.64**		1.0
19 Feb 2007	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**1.2**		1.0
27 Apr 2007	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.085		1.0
26 Jul 2007	<0.01	<0.01	<0.01	0.314	<0.01	<0.01	0.628		1.0
22 Oct 2007	0.07	<0.01	<0.01	**16.31**	<0.01	<0.01	0.26		1.0
13 Feb 2008	<0.01	<0.01	<0.01	0.639	<0.01	<0.01	0.067		1.0
07 May 2008	<10	<10	<10	0.681	<10	<10	0.075		1.0
16 Jul 2008	<10	<10	<10	0.134	<10	<10	0.084		1.0
15 Dec 2008	<10	<10	<10	0.038	<10	<10	0.0116		1.0
05 Mar 2009	<0.01	<0.01	0.13	<0.01	<0.01	<0.01	0.04		1.0
27 May 2009	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06		1.0
06 Aug 2009	<0.01	0.02	0.02	0.61	<0.01	0.01	0.04		1.0
04 Dec 2009	0.03	<0.01	<0.01	0.24	<0.01	<0.01	0.06		1.0
18 Feb 2010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		1.0
27 May 2010	<0.01	<0.01	<0.01	*0.24*	<0.01	<0.01	<0.01		1.0
12 Aug 2010	<0.01	<0.01	<0.01	*0.08*	<0.01	<0.01	*0.05*		1.0
24 Nov 2010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		1.0
10 Mar 2011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		1.0
24 May 2011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		1.0
03 Aug 2011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		1.0
16 Nov 2011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		1.0
23 Feb 2012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		1.0
28 May 2012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	2.4	<0.01	1
14 Aug 2012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1
07 Nov 2012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1
19 Feb 2013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1
17 Apr 2013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1
23 Sep 2013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1
05 Nov 2013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1
25 Feb 2014	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1
22 May 2014	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1
28 Aug 2014	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1
03 Dec 2014	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1
12 Feb 2015	<0.01	<0.01	<0.04	< 0.05	<0.01	<0.01	<0.10	< 0.18	1
20 May 2015	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1
26-Aug-15	0.011	<0.01	<0.14	<0.07	<0.01	<0.01	**0.031**	<0.10	1
08-Dec-15	<0.01	<0.01	**0.095**	<0.10	<0.01	<0.01	<0.01	**0.067**	1
24-Feb-16	<0.10	<0.01	<0.12	0.034	<0.01	<0.01	<0.01	**0.153**	1
25-May-16	<0.01	<0.01	<0.12	<0.10	<0.01	<0.01	<0.01	<0.16	1
31-Aug-16	<0.01	<0.01	<0.13	**0.039**	<0.01	<0.01	**0.028**	**0.12**	1
06-Dec-16	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	**0.036**	<0.17	1
16-Feb-17	<0.01	<0.01	**0.018**	<0.01	**0.041**	<0.01	<0.01	**0.12**	1
30-May-17	<0.10	<0.01	**0.066**	<0.04	<0.01	<0.01	**0.11**	**0.157**	1
28/08/2017	<0.01	<0.01	**0.04**	**0.024**	<0.01	<0.01	<0.10	**0.161**	1
14/11/2017	<0.01	<0.01	<0.03	<0.01	<0.01	<0.01	<0.01	**0.107**	1

Vinyl Chloride

	GW1/BH 101	GW2/BH102	GW3/BH103	GW4/BH 104B	GW5/MW01	GW6/MW02	GW7/MW03	GW8/MW04	2010 GTV ug/l
12-Feb-15	<0.5	<0.5	0.8	<0.5	**0.9**	<0.5	<0.5	<0.5	0.375
20-May-15	<0.5	<1.0	<5.0	<0.5	<0.5	<0.5	<1.0	<0.5	0.375
01-Aug-15	<0.5	<0.5	<0.5	<5.0	<0.5	<0.5	<5.0	<5.0	0.375
08-Dec-15	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	0.375
24-Feb-16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**1.1**	0.375
25-May-16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**0.9**	0.375
31-Aug-16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	0.375
06-Dec-16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.375
16-Feb-17	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**0.5**	0.375
30-May-17									0.375
28-Aug-17	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.375
14-Nov-17	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.375

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APPENDIX E

Laboratory Certificates 2017

ALS Environmental Ltd
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www.alsenvironmental.co.uk

Miss Reilly
RPS Consultants
West Pier Business Campus
Dun Laoghaire
Dublin

06 March 2017

Test Report: COV/1363169/2017

Dear Miss Reilly

Analysis of your sample(s) submitted on 16 February 2017 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed:

Name: P. Johal

Title: Microbiology Manager

Report Summary

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ALS Environmental

Miss Catriona Reilly
RPS Consultants
West Pier Business Campus
Dun Laoghaire
Dublin

Date of Issue: **06 March 2017**

Report Number: **COV/1363169/2017** Issue **1**

This issue replaces all previous issues

Job Description: Portlaoise Groundwater

Job Location: Portlaoise

Number of Samples included in this report **8**

Job Received: **16 February 2017**

Number of Test Results included in this report **1416**

Analysis Commenced: **20 February 2017**

Signed:

Name: **P. Johal** Date: **06 March 2017**

Title: **Microbiology Manager**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

Certificate of Analysis

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ALS Environmental

Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887316** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH101**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	11000	ug/l	25/02/2017	Y	Cov	WAS049
Potassium, Total as K	4570	ug/l	25/02/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	<1.0	ug/l	27/02/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	25/02/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	25/02/2017	Y	Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	25/02/2017	Y	Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	25/02/2017	Y	Cov	WAS049
Iron, Total as Fe	538	ug/l	25/02/2017	Y	Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	25/02/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.10	ug/l	20/02/2017	N	Cov	WAS013
Nickel , Total as Ni	5.80	ug/l	25/02/2017	Y	Cov	WAS049
Selenium, trace Total as Se	<0.80	ug/l	27/02/2017	Y	Cov	WAS060
Zinc , Total as Zn	<18.0	ug/l	25/02/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	02/03/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	28/02/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46

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Report Number: **COV/1363169/2017** Issue **1**
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Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH101**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aromatic EPH >C10 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
EPH >C10 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
Acenaphthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Fluorene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Naphthalene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
PAH, Total	<0.01	ug/l	21/02/2017	N	Cov	GEO19
VOC	Y	ug/l	27/02/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dichloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1-Dichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	27/02/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887316** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH101**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,1-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	27/02/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,2,2-Tetrachloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32

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Report Number: **COV/1363169/2017** Issue **1**
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Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH101**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
tert-Butylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2,4-Trimethylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
n-Butylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Naphthalene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
MTBE	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromofluoromethane	99.1	%Recovery	27/02/2017	N	Cov	GEO32
Toluene-d8	99.0	%Recovery	27/02/2017	N	Cov	GEO32
4-Bromofluorobenzene	96.1	%Recovery	27/02/2017	N	Cov	GEO32
SVOC	Y	ug/l	24/02/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	24/02/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	24/02/2017	N	Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40

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Report Number: **COV/1363169/2017** Issue **1**
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Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH101**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
2-Nitrophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	24/02/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	24/02/2017	Y	Cov	GEO40

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887316** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH101**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Di-n-octylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Fluorophenol	98.7	%Recovery	24/02/2017	N	Cov	GEO40
Phenol-d6	82.0	%Recovery	24/02/2017	N	Cov	GEO40
Nitrobenzene-d5	94.4	%Recovery	24/02/2017	N	Cov	GEO40
2-Fluorobiphenyl	86.5	%Recovery	24/02/2017	N	Cov	GEO40
2,4,6-Tribromophenol	88.3	%Recovery	24/02/2017	N	Cov	GEO40
Terphenyl-d14	94.9	%Recovery	24/02/2017	N	Cov	GEO40

Analyst Comments for 15887316: This sample has been analysed for Phenols in Water method GEO18, Boron Total as B outside recommended stability times. It is therefore possible that the results provided may be compromised. This sample has been re-analysed for 2,4-dimethylphenol outside recommended stability times due to quality failure on original extraction. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: 

Name: **P. Johal** Date: **06 March 2017**

Title: **Microbiology Manager**

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887317** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH102**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	5360	ug/l	25/02/2017	Y	Cov	WAS049
Potassium, Total as K	2730	ug/l	25/02/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	<1.0	ug/l	27/02/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	25/02/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	25/02/2017	Y	Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	25/02/2017	Y	Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	25/02/2017	Y	Cov	WAS049
Iron, Total as Fe	<230	ug/l	25/02/2017	Y	Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	25/02/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.10	ug/l	20/02/2017	N	Cov	WAS013
Nickel , Total as Ni	7.60	ug/l	25/02/2017	Y	Cov	WAS049
Selenium, trace Total as Se	<0.80	ug/l	27/02/2017	Y	Cov	WAS060
Zinc , Total as Zn	18.1	ug/l	25/02/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	02/03/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	28/02/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	11	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	11	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887317** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH102**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aromatic EPH >C10 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
EPH >C10 - C44	11	ug/l	23/02/2017	N	Cov	GEO46
Acenaphthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Fluorene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Naphthalene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Pyrene	0.014	ug/l	21/02/2017	Y	Cov	GEO19
PAH, Total	0.014	ug/l	21/02/2017	N	Cov	GEO19
VOC	Y	ug/l	27/02/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dichloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1-Dichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	27/02/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887317** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH102**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,1-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	27/02/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,2,2-Tetrachloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887317** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH102**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
tert-Butylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2,4-Trimethylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
n-Butylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Naphthalene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
MTBE	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromofluoromethane	98.4	%Recovery	27/02/2017	N	Cov	GEO32
Toluene-d8	98.8	%Recovery	27/02/2017	N	Cov	GEO32
4-Bromofluorobenzene	98.6	%Recovery	27/02/2017	N	Cov	GEO32
SVOC	Y	ug/l	24/02/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	24/02/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	24/02/2017	N	Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887317** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH102**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
2-Nitrophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	24/02/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	24/02/2017	Y	Cov	GEO40

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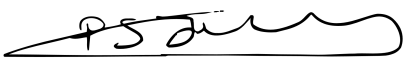
Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887317** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH102**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Di-n-octylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Fluorophenol	101.8	%Recovery	24/02/2017	N	Cov	GEO40
Phenol-d6	83.7	%Recovery	24/02/2017	N	Cov	GEO40
Nitrobenzene-d5	95.6	%Recovery	24/02/2017	N	Cov	GEO40
2-Fluorobiphenyl	87.4	%Recovery	24/02/2017	N	Cov	GEO40
2,4,6-Tribromophenol	97.9	%Recovery	24/02/2017	N	Cov	GEO40
Terphenyl-d14	92.5	%Recovery	24/02/2017	N	Cov	GEO40

Analyst Comments for 15887317: This sample has been analysed for Phenols in Water method GEO18, Boron Total as B outside recommended stability times. It is therefore possible that the results provided may be compromised. This sample has been re-analysed for 2,4-dimethylphenol outside recommended stability times due to quality failure on original extraction. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: 

Name: **P. Johal** Date: **06 March 2017**

Title: **Microbiology Manager**

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887318** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH103**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	12800	ug/l	25/02/2017	Y	Cov	WAS049
Potassium, Total as K	2550	ug/l	25/02/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	7.6	ug/l	27/02/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	25/02/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	25/02/2017	Y	Cov	WAS049
Chromium , Total as Cr	2.10	ug/l	25/02/2017	Y	Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	25/02/2017	Y	Cov	WAS049
Iron, Total as Fe	5500	ug/l	25/02/2017	Y	Cov	WAS049
Lead , Total as Pb	24.3	ug/l	25/02/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.10	ug/l	20/02/2017	N	Cov	WAS013
Nickel , Total as Ni	7.90	ug/l	25/02/2017	Y	Cov	WAS049
Selenium, trace Total as Se	<0.80	ug/l	27/02/2017	Y	Cov	WAS060
Zinc , Total as Zn	30.5	ug/l	25/02/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	02/03/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	28/02/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	15	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	15	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887318** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH103**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aromatic EPH >C10 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
EPH >C10 - C44	15	ug/l	23/02/2017	N	Cov	GEO46
Acenaphthene	0.032	ug/l	21/02/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Fluorene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Naphthalene	0.018	ug/l	21/02/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
PAH, Total	0.050	ug/l	21/02/2017	N	Cov	GEO19
VOC	Y	ug/l	27/02/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dichloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1-Dichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	27/02/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887318** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH103**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,1-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	27/02/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,2,2-Tetrachloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887318** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH103**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
tert-Butylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2,4-Trimethylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
n-Butylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Naphthalene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
MTBE	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromofluoromethane	101.6	%Recovery	27/02/2017	N	Cov	GEO32
Toluene-d8	99.9	%Recovery	27/02/2017	N	Cov	GEO32
4-Bromofluorobenzene	97.6	%Recovery	27/02/2017	N	Cov	GEO32
SVOC	Y	ug/l	24/02/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	24/02/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	24/02/2017	N	Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887318** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH103**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
2-Nitrophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	24/02/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	24/02/2017	Y	Cov	GEO40

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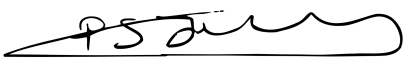
Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887318** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH103**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Di-n-octylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Fluorophenol	89.6	%Recovery	24/02/2017	N	Cov	GEO40
Phenol-d6	74.7	%Recovery	24/02/2017	N	Cov	GEO40
Nitrobenzene-d5	85.4	%Recovery	24/02/2017	N	Cov	GEO40
2-Fluorobiphenyl	83.2	%Recovery	24/02/2017	N	Cov	GEO40
2,4,6-Tribromophenol	97.2	%Recovery	24/02/2017	N	Cov	GEO40
Terphenyl-d14	97.5	%Recovery	24/02/2017	N	Cov	GEO40

Analyst Comments for 15887318: This sample has been analysed for Phenols in Water method GEO18, Boron Total as B outside recommended stability times. It is therefore possible that the results provided may be compromised. This sample has been re-analysed for 2,4-dimethylphenol outside recommended stability times due to quality failure on original extraction. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: 

Name: **P. Johal** Date: **06 March 2017**

Title: **Microbiology Manager**

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ALS Environmental

Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887319** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH104**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	4260	ug/l	25/02/2017	Y	Cov	WAS049
Potassium, Total as K	7130	ug/l	25/02/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	<1.0	ug/l	27/02/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	25/02/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	25/02/2017	Y	Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	25/02/2017	Y	Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	25/02/2017	Y	Cov	WAS049
Iron, Total as Fe	410	ug/l	25/02/2017	Y	Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	25/02/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.10	ug/l	22/02/2017	N	Cov	WAS013
Nickel , Total as Ni	5.30	ug/l	25/02/2017	Y	Cov	WAS049
Selenium, trace Total as Se	<0.80	ug/l	27/02/2017	Y	Cov	WAS060
Zinc , Total as Zn	<18.0	ug/l	25/02/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	02/03/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	28/02/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887319** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH104**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aromatic EPH >C10 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
EPH >C10 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
Acenaphthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Fluorene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Naphthalene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Pyrene	0.021	ug/l	21/02/2017	Y	Cov	GEO19
PAH, Total	0.021	ug/l	21/02/2017	N	Cov	GEO19
VOC	Y	ug/l	27/02/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dichloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1-Dichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	27/02/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887319** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH104**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,1-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	27/02/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,2,2-Tetrachloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887319** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH104**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation	Method
tert-Butylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2,4-Trimethylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
n-Butylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	27/02/2017	Y Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
Naphthalene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
MTBE	<1.0	ug/l	27/02/2017	Y Cov	GEO32
Dibromofluoromethane	99.6	%Recovery	27/02/2017	N Cov	GEO32
Toluene-d8	99.7	%Recovery	27/02/2017	N Cov	GEO32
4-Bromofluorobenzene	97.3	%Recovery	27/02/2017	N Cov	GEO32
SVOC	Y	ug/l	24/02/2017	N Cov	GEO40
Phenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	24/02/2017	Y Cov	GEO40
2-Chlorophenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
2-Methylphenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	24/02/2017	N Cov	GEO40
Dibenzofuran	<1.0	ug/l	24/02/2017	N Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	24/02/2017	Y Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Hexachloroethane	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Nitrobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Isophorone	<1.0	ug/l	24/02/2017	Y Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887319** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH104**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
2-Nitrophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	24/02/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	24/02/2017	Y	Cov	GEO40

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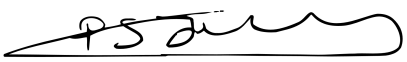
Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887319** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH104**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Di-n-octylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Fluorophenol	102.2	%Recovery	24/02/2017	N	Cov	GEO40
Phenol-d6	88.5	%Recovery	24/02/2017	N	Cov	GEO40
Nitrobenzene-d5	96.3	%Recovery	24/02/2017	N	Cov	GEO40
2-Fluorobiphenyl	87.3	%Recovery	24/02/2017	N	Cov	GEO40
2,4,6-Tribromophenol	95.7	%Recovery	24/02/2017	N	Cov	GEO40
Terphenyl-d14	93.7	%Recovery	24/02/2017	N	Cov	GEO40

Analyst Comments for 15887319: This sample has been analysed for Phenols in Water method GEO18, Boron Total as B outside recommended stability times. It is therefore possible that the results provided may be compromised. This sample has been re-analysed for 2,4-dimethylphenol outside recommended stability times due to quality failure on original extraction. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: 

Name: **P. Johal** Date: **06 March 2017**
Title: **Microbiology Manager**

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887320** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	17300	ug/l	25/02/2017	Y	Cov	WAS049
Potassium, Total as K	2380	ug/l	25/02/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	9.3	ug/l	27/02/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	25/02/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	25/02/2017	Y	Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	25/02/2017	Y	Cov	WAS049
Copper , Total as Cu	24.8	ug/l	25/02/2017	Y	Cov	WAS049
Iron, Total as Fe	4800	ug/l	25/02/2017	Y	Cov	WAS049
Lead , Total as Pb	190	ug/l	25/02/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.10	ug/l	22/02/2017	N	Cov	WAS013
Nickel , Total as Ni	9.60	ug/l	25/02/2017	Y	Cov	WAS049
Selenium, trace Total as Se	<0.80	ug/l	27/02/2017	Y	Cov	WAS060
Zinc , Total as Zn	74.3	ug/l	25/02/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	02/03/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	28/02/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	23	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	23	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887320** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aromatic EPH >C10 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
EPH >C10 - C44	23	ug/l	23/02/2017	N	Cov	GEO46
Acenaphthene	0.061	ug/l	21/02/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Fluorene	0.018	ug/l	21/02/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Naphthalene	0.041	ug/l	21/02/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
PAH, Total	0.121	ug/l	21/02/2017	N	Cov	GEO19
VOC	Y	ug/l	27/02/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dichloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1-Dichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	27/02/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887320** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,1-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	27/02/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,2,2-Tetrachloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887320** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation	Method
tert-Butylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2,4-Trimethylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
n-Butylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	27/02/2017	Y Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
Naphthalene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
MTBE	<1.0	ug/l	27/02/2017	Y Cov	GEO32
Dibromofluoromethane	100.0	%Recovery	27/02/2017	N Cov	GEO32
Toluene-d8	98.8	%Recovery	27/02/2017	N Cov	GEO32
4-Bromofluorobenzene	97.4	%Recovery	27/02/2017	N Cov	GEO32
SVOC	Y	ug/l	24/02/2017	N Cov	GEO40
Phenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	24/02/2017	Y Cov	GEO40
2-Chlorophenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
2-Methylphenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	24/02/2017	N Cov	GEO40
Dibenzofuran	<1.0	ug/l	24/02/2017	N Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	24/02/2017	Y Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Hexachloroethane	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Nitrobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Isophorone	<1.0	ug/l	24/02/2017	Y Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887320** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
2-Nitrophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	24/02/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	24/02/2017	Y	Cov	GEO40

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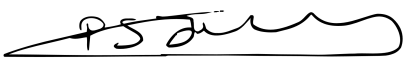
Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887320** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Di-n-octylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Fluorophenol	100.1	%Recovery	24/02/2017	N	Cov	GEO40
Phenol-d6	86.0	%Recovery	24/02/2017	N	Cov	GEO40
Nitrobenzene-d5	96.9	%Recovery	24/02/2017	N	Cov	GEO40
2-Fluorobiphenyl	87.7	%Recovery	24/02/2017	N	Cov	GEO40
2,4,6-Tribromophenol	101.4	%Recovery	24/02/2017	N	Cov	GEO40
Terphenyl-d14	96.0	%Recovery	24/02/2017	N	Cov	GEO40

Analyst Comments for 15887320: This sample has been analysed for Phenols in Water method GEO18, Boron Total as B outside recommended stability times. It is therefore possible that the results provided may be compromised. This sample has been re-analysed for 2,4-dimethylphenol outside recommended stability times due to quality failure on original extraction. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: 

Name: **P. Johal** Date: **06 March 2017**

Title: **Microbiology Manager**

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887321** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	31900	ug/l	25/02/2017	Y	Cov	WAS049
Potassium, Total as K	1570	ug/l	25/02/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	<1.0	ug/l	27/02/2017	Y	Cov	WAS060
Boron , Total as B	237	ug/l	25/02/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	25/02/2017	Y	Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	25/02/2017	Y	Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	25/02/2017	Y	Cov	WAS049
Iron, Total as Fe	<230	ug/l	25/02/2017	Y	Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	25/02/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.10	ug/l	22/02/2017	N	Cov	WAS013
Nickel , Total as Ni	<3.00	ug/l	25/02/2017	Y	Cov	WAS049
Selenium, trace Total as Se	<0.80	ug/l	27/02/2017	Y	Cov	WAS060
Zinc , Total as Zn	23.7	ug/l	25/02/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	02/03/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	28/02/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887321** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aromatic EPH >C10 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
EPH >C10 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
Acenaphthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Fluorene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Naphthalene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
PAH, Total	<0.01	ug/l	21/02/2017	N	Cov	GEO19
VOC	Y	ug/l	27/02/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dichloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1-Dichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	27/02/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887321** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,1-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	27/02/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,2,2-Tetrachloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887321** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation	Method
tert-Butylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2,4-Trimethylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
n-Butylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	27/02/2017	Y Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
Naphthalene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
MTBE	<1.0	ug/l	27/02/2017	Y Cov	GEO32
Dibromofluoromethane	100.1	%Recovery	27/02/2017	N Cov	GEO32
Toluene-d8	98.8	%Recovery	27/02/2017	N Cov	GEO32
4-Bromofluorobenzene	96.4	%Recovery	27/02/2017	N Cov	GEO32
SVOC	Y	ug/l	24/02/2017	N Cov	GEO40
Phenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	24/02/2017	Y Cov	GEO40
2-Chlorophenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
2-Methylphenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	24/02/2017	N Cov	GEO40
Dibenzofuran	<1.0	ug/l	24/02/2017	N Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	24/02/2017	Y Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Hexachloroethane	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Nitrobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Isophorone	<1.0	ug/l	24/02/2017	Y Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887321** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
2-Nitrophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	24/02/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	24/02/2017	Y	Cov	GEO40

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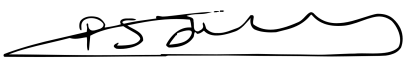
Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887321** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Di-n-octylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Fluorophenol	99.1	%Recovery	24/02/2017	N	Cov	GEO40
Phenol-d6	84.4	%Recovery	24/02/2017	N	Cov	GEO40
Nitrobenzene-d5	97.5	%Recovery	24/02/2017	N	Cov	GEO40
2-Fluorobiphenyl	87.2	%Recovery	24/02/2017	N	Cov	GEO40
2,4,6-Tribromophenol	98.4	%Recovery	24/02/2017	N	Cov	GEO40
Terphenyl-d14	93.4	%Recovery	24/02/2017	N	Cov	GEO40

Analyst Comments for 15887321: This sample has been analysed for Phenols in Water method GEO18, Boron Total as B outside recommended stability times. It is therefore possible that the results provided may be compromised. This sample has been re-analysed for 2,4-dimethylphenol outside recommended stability times due to quality failure on original extraction. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: 

Name: **P. Johal** Date: **06 March 2017**

Title: **Microbiology Manager**

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887322** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW03**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	14800	ug/l	25/02/2017	Y	Cov	WAS049
Potassium, Total as K	2420	ug/l	25/02/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	1.4	ug/l	27/02/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	25/02/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	25/02/2017	Y	Cov	WAS049
Chromium , Total as Cr	6.00	ug/l	25/02/2017	Y	Cov	WAS049
Copper , Total as Cu	40.7	ug/l	25/02/2017	Y	Cov	WAS049
Iron, Total as Fe	5500	ug/l	25/02/2017	Y	Cov	WAS049
Lead , Total as Pb	7.80	ug/l	25/02/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.10	ug/l	22/02/2017	N	Cov	WAS013
Nickel , Total as Ni	106	ug/l	25/02/2017	Y	Cov	WAS049
Selenium, trace Total as Se	<0.80	ug/l	27/02/2017	Y	Cov	WAS060
Zinc , Total as Zn	93.3	ug/l	25/02/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
2 - Methylphenol	3.48	ug/l	28/02/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	02/03/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
3+4-Methylphenol	2.19	ug/l	28/02/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	28/02/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	40	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	40	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	13	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887322** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW03**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aromatic EPH >C10 - C44	13	ug/l	23/02/2017	N	Cov	GEO46
EPH >C10 - C44	53	ug/l	23/02/2017	N	Cov	GEO46
Acenaphthene	0.093	ug/l	21/02/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (a) anthracene	0.025	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	0.037	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (a) pyrene	0.033	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	0.019	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Chrysene	0.060	ug/l	21/02/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Fluoranthene	0.021	ug/l	21/02/2017	Y	Cov	GEO19
Fluorene	0.103	ug/l	21/02/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Naphthalene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Pyrene	0.081	ug/l	21/02/2017	Y	Cov	GEO19
PAH, Total	0.470	ug/l	21/02/2017	N	Cov	GEO19
VOC	Y	ug/l	27/02/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dichloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1-Dichloroethane	1.8	ug/l	27/02/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	27/02/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887322** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW03**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,1-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Vinyl Chloride	0.6	ug/l	27/02/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,2,2-Tetrachloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32

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ALS Environmental

Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887322** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW03**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation	Method
tert-Butylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2,4-Trimethylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
n-Butylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	27/02/2017	Y Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
Naphthalene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
MTBE	2.4	ug/l	27/02/2017	Y Cov	GEO32
Dibromofluoromethane	99.1	%Recovery	27/02/2017	N Cov	GEO32
Toluene-d8	99.8	%Recovery	27/02/2017	N Cov	GEO32
4-Bromofluorobenzene	98.4	%Recovery	27/02/2017	N Cov	GEO32
SVOC	Y	ug/l	24/02/2017	N Cov	GEO40
Phenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	24/02/2017	Y Cov	GEO40
2-Chlorophenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
2-Methylphenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	24/02/2017	N Cov	GEO40
Dibenzofuran	<1.0	ug/l	24/02/2017	N Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	24/02/2017	Y Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Hexachloroethane	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Nitrobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Isophorone	<1.0	ug/l	24/02/2017	Y Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887322** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW03**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
2-Nitrophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	24/02/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	24/02/2017	Y	Cov	GEO40

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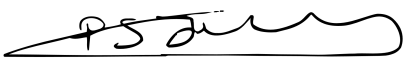
Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887322** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW03**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Di-n-octylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Fluorophenol	89.9	%Recovery	24/02/2017	N	Cov	GEO40
Phenol-d6	85.3	%Recovery	24/02/2017	N	Cov	GEO40
Nitrobenzene-d5	93.7	%Recovery	24/02/2017	N	Cov	GEO40
2-Fluorobiphenyl	95.0	%Recovery	24/02/2017	N	Cov	GEO40
2,4,6-Tribromophenol	104.6	%Recovery	24/02/2017	N	Cov	GEO40
Terphenyl-d14	98.8	%Recovery	24/02/2017	N	Cov	GEO40

Analyst Comments for 15887322: This sample has been analysed for Phenols in Water method GEO18, Boron Total as B outside recommended stability times. It is therefore possible that the results provided may be compromised. This sample has been re-analysed for 2,4-dimethylphenol outside recommended stability times due to quality failure on original extraction. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: 

Name: **P. Johal** Date: **06 March 2017**

Title: **Microbiology Manager**

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887323** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW04**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	25300	ug/l	25/02/2017	Y	Cov	WAS049
Potassium, Total as K	2410	ug/l	25/02/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	2.8	ug/l	27/02/2017	Y	Cov	WAS060
Boron , Total as B	341	ug/l	25/02/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	25/02/2017	Y	Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	25/02/2017	Y	Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	25/02/2017	Y	Cov	WAS049
Iron, Total as Fe	2600	ug/l	25/02/2017	Y	Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	25/02/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.10	ug/l	22/02/2017	N	Cov	WAS013
Nickel , Total as Ni	50.4	ug/l	25/02/2017	Y	Cov	WAS049
Selenium, trace Total as Se	<0.80	ug/l	27/02/2017	Y	Cov	WAS060
Zinc , Total as Zn	32.1	ug/l	25/02/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	02/03/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	28/02/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	28/02/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	28/02/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	11	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	21	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	23/02/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	23/02/2017	N	Cov	GEO46

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887323** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW04**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aromatic EPH >C10 - C44	32	ug/l	23/02/2017	N	Cov	GEO46
EPH >C10 - C44	32	ug/l	23/02/2017	N	Cov	GEO46
Acenaphthene	0.014	ug/l	21/02/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Fluorene	0.014	ug/l	21/02/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Naphthalene	0.120	ug/l	21/02/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	21/02/2017	Y	Cov	GEO19
PAH, Total	0.148	ug/l	21/02/2017	N	Cov	GEO19
VOC	Y	ug/l	27/02/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chloroethane	5.8	ug/l	27/02/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dichloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1-Dichloroethane	2.2	ug/l	27/02/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	27/02/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887323** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW04**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,1-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Vinyl Chloride	0.5	ug/l	27/02/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,1,2,2-Tetrachloroethane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	27/02/2017	Y	Cov	GEO32

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Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887323** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW04**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation	Method
tert-Butylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2,4-Trimethylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
n-Butylbenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	27/02/2017	Y Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
Naphthalene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	27/02/2017	Y Cov	GEO32
MTBE	1.2	ug/l	27/02/2017	Y Cov	GEO32
Dibromofluoromethane	99.0	%Recovery	27/02/2017	N Cov	GEO32
Toluene-d8	100.8	%Recovery	27/02/2017	N Cov	GEO32
4-Bromofluorobenzene	98.1	%Recovery	27/02/2017	N Cov	GEO32
SVOC	Y	ug/l	24/02/2017	N Cov	GEO40
Phenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	24/02/2017	Y Cov	GEO40
2-Chlorophenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
2-Methylphenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	24/02/2017	N Cov	GEO40
Dibenzofuran	<1.0	ug/l	24/02/2017	N Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	24/02/2017	Y Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Hexachloroethane	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Nitrobenzene	<1.0	ug/l	24/02/2017	Y Cov	GEO40
Isophorone	<1.0	ug/l	24/02/2017	Y Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	24/02/2017	Y Cov	GEO40

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ALS Environmental

Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887323** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW04**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
2-Nitrophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	24/02/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	24/02/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	24/02/2017	Y	Cov	GEO40

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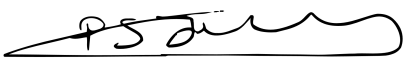
Report Number: **COV/1363169/2017** Issue **1**
Laboratory Number: **15887323** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW04**
Sample Matrix: **Ground Water**
Sample Date/Time: **16 February 2017**
Sample Received: **16 February 2017**
Analysis Complete: **02 March 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Di-n-octylphthalate	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	24/02/2017	Y	Cov	GEO40
2-Fluorophenol	89.8	%Recovery	24/02/2017	N	Cov	GEO40
Phenol-d6	85.1	%Recovery	24/02/2017	N	Cov	GEO40
Nitrobenzene-d5	90.4	%Recovery	24/02/2017	N	Cov	GEO40
2-Fluorobiphenyl	87.0	%Recovery	24/02/2017	N	Cov	GEO40
2,4,6-Tribromophenol	99.0	%Recovery	24/02/2017	N	Cov	GEO40
Terphenyl-d14	99.7	%Recovery	24/02/2017	N	Cov	GEO40

Analyst Comments for 15887323: This sample has been analysed for Phenols in Water method GEO18, Boron Total as B outside recommended stability times. It is therefore possible that the results provided may be compromised. This sample has been re-analysed for 2,4-dimethylphenol outside recommended stability times due to quality failure on original extraction. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: 

Name: **P. Johal** Date: **06 March 2017**

Title: **Microbiology Manager**

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Miss Reilly
RPS Consultants
West Pier Business Campus
Dun Laoghaire
Dublin

31 July 2017

Test Report: COV/1394345/2017

Dear Miss Reilly

Analysis of your sample(s) submitted on 31 May 2017 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed:

Name: P. Patel

Title: Inorganic Team Leader

Report Summary

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Miss Catriona Reilly
RPS Consultants
West Pier Business Campus
Dun Laoghaire
Dublin

Date of Issue: **31 July 2017**

Report Number: **COV/1394345/2017** Issue **2**

This issue replaces all previous issues

Job Description: Portlaoise Groundwater

Job Location: Portlaoise

Number of Samples included in this report **8**

Job Received: **31 May 2017**

Number of Test Results included in this report **1384**

Analysis Commenced: **02 June 2017**

Signed:

Name: **P. Patel** Date: **31 July 2017**

Title: **Inorganic Team Leader**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119369** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH01**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	10600	ug/l	12/06/2017	Y	Cov	WAS049
Potassium, Total as K	4300	ug/l	12/06/2017	Y	Cov	WAS049
Bromomethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Chloroethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Methyl tert-Butyl Ether	<0.20	ug/l	22/06/2017	N	S	SUBCON
Arsenic, Ultra-low Total as As	3.9	ug/l	13/06/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	12/06/2017	Y	Cov	WAS049
Cadmium , Total as Cd	1.90	ug/l	12/06/2017	Y	Cov	WAS049
Chromium , Total as Cr	6.20	ug/l	12/06/2017	Y	Cov	WAS049
Copper , Total as Cu	20.9	ug/l	12/06/2017	Y	Cov	WAS049
Iron, Total as Fe	5900	ug/l	12/06/2017	Y	Cov	WAS049
Lead , Total as Pb	41.3	ug/l	12/06/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.05	ug/l	15/06/2017	Y	Cov	WAS013
Nickel , Total as Ni	16.0	ug/l	12/06/2017	Y	Cov	WAS049
Selenium, trace Total as Se	2.08	ug/l	13/06/2017	Y	Cov	WAS060
Zinc , Total as Zn	127	ug/l	12/06/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	06/06/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	12/06/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	12/06/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<10	ug/l	12/06/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	12/06/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<10	ug/l	12/06/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	12/06/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	12/06/2017	N	Cov	GEO46

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119369** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH01**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aromatic EPH >C16 - C21	<10	ug/l	12/06/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	12/06/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	12/06/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	<10	ug/l	12/06/2017	N	Cov	GEO46
EPH >C10 - C44	<10	ug/l	12/06/2017	N	Cov	GEO46
Acenaphthene	<0.10	ug/l	08/06/2017	Y	Cov	GEO19
Acenaphthylene	<0.10	ug/l	08/06/2017	Y	Cov	GEO19
Anthracene	<0.10	ug/l	08/06/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.10	ug/l	08/06/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.10	ug/l	08/06/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.10	ug/l	08/06/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.10	ug/l	08/06/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.10	ug/l	08/06/2017	Y	Cov	GEO19
Chrysene	<0.10	ug/l	08/06/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.10	ug/l	08/06/2017	Y	Cov	GEO19
Fluoranthene	<0.10	ug/l	08/06/2017	Y	Cov	GEO19
Fluorene	<0.10	ug/l	08/06/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.10	ug/l	08/06/2017	Y	Cov	GEO19
Naphthalene	<0.10	ug/l	08/06/2017	Y	Cov	GEO19
Phenanthrene	<0.10	ug/l	08/06/2017	Y	Cov	GEO19
Pyrene	<0.10	ug/l	08/06/2017	Y	Cov	GEO19
PAH, Total	<0.10	ug/l	08/06/2017	N	Cov	GEO19
SVOC	Y	ug/l	05/06/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	05/06/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	05/06/2017	N	Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119369** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH01**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
n-Nitrosodi-n-propylamine	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	05/06/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119369** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH01**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	05/06/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Fluorophenol	113.6	%Recovery	05/06/2017	N	Cov	GEO40
Phenol-d6	92.4	%Recovery	05/06/2017	N	Cov	GEO40
Nitrobenzene-d5	100.1	%Recovery	05/06/2017	N	Cov	GEO40
2-Fluorobiphenyl	99.4	%Recovery	05/06/2017	N	Cov	GEO40
2,4,6-Tribromophenol	90.1	%Recovery	05/06/2017	N	Cov	GEO40
Terphenyl-d14	100.0	%Recovery	05/06/2017	N	Cov	GEO40
1,1,1,2-Tetrachloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1,1-Trichloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1,2,2-Tetrachloroethane	<0.20	ug/l	22/06/2017	Y	S	SUBCON
1,1,2-Trichloroethane	<0.20	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2,3-Trichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2,3-Trichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2,4-Trichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2,4-Trimethylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dibromo-3-chloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dibromoethane	<0.50	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dichloroethane	<0.50	ug/l	22/06/2017	Y	S	SUBCON

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119369** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH01**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,3,5-Trimethylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,3-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,3-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,4-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
2,2-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
2-Chlorotoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
4-Chlorotoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Benzene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Bromobenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Bromochloromethane	<2.0	ug/l	22/06/2017	Y	S	SUBCON
Bromodichloromethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Bromoform	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Carbon Tetrachloride	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chloroform	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chloromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
cis-1,2-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
cis-1,3-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dibromochloromethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Dibromomethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dichlorodifluoromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dichloromethane	<6.0	ug/l	22/06/2017	Y	S	SUBCON
Ethyl Benzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Hexachlorobutadiene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Isopropylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
m&p-Xylene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Naphthalene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
n-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
n-Propylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
o-Xylene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
p-Isopropyltoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
sec-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119369** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH01**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Styrene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
tert-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Tetrachloroethene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Toluene	<0.50	ug/l	22/06/2017	Y	S	SUBCON
trans-1,2-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
trans-1,3-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Trichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Trichlorofluoromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Vinyl Chloride	<0.10	ug/l	22/06/2017	Y	S	SUBCON

Analyst Comments for 16119369: This sample has been analysed for Boron Total as B, Magnesium, Total as Mg outside recommended stability times. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: P. Patel

Name: **P. Patel** Date: **31 July 2017**
Title: **Inorganic Team Leader**

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119370** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH02**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	4330	ug/l	12/06/2017	Y	Cov	WAS049
Potassium, Total as K	1560	ug/l	12/06/2017	Y	Cov	WAS049
Bromomethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Chloroethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Methyl tert-Butyl Ether	<0.20	ug/l	22/06/2017	N	S	SUBCON
Arsenic, Ultra-low Total as As	<1.0	ug/l	13/06/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	12/06/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	12/06/2017	Y	Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	12/06/2017	Y	Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	12/06/2017	Y	Cov	WAS049
Iron, Total as Fe	529	ug/l	12/06/2017	Y	Cov	WAS049
Lead , Total as Pb	17.6	ug/l	12/06/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.05	ug/l	15/06/2017	Y	Cov	WAS013
Nickel , Total as Ni	4.50	ug/l	12/06/2017	Y	Cov	WAS049
Selenium, trace Total as Se	<0.80	ug/l	13/06/2017	Y	Cov	WAS060
Zinc , Total as Zn	38.9	ug/l	12/06/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	06/06/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	08/06/2017	N	Cov	GEO46

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119370** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH02**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aromatic EPH >C16 - C21	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
EPH >C10 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Acenaphthene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Fluorene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Naphthalene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Phenanthrene	0.010	ug/l	05/06/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
PAH, Total	0.010	ug/l	05/06/2017	N	Cov	GEO19
SVOC	Y	ug/l	05/06/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	05/06/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	05/06/2017	N	Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119370** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH02**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
n-Nitrosodi-n-propylamine	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	05/06/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119370** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH02**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	05/06/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Fluorophenol	111.6	%Recovery	05/06/2017	N	Cov	GEO40
Phenol-d6	95.6	%Recovery	05/06/2017	N	Cov	GEO40
Nitrobenzene-d5	98.2	%Recovery	05/06/2017	N	Cov	GEO40
2-Fluorobiphenyl	96.5	%Recovery	05/06/2017	N	Cov	GEO40
2,4,6-Tribromophenol	94.4	%Recovery	05/06/2017	N	Cov	GEO40
Terphenyl-d14	92.9	%Recovery	05/06/2017	N	Cov	GEO40
1,1,1,2-Tetrachloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1,1-Trichloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1,2,2-Tetrachloroethane	<0.20	ug/l	22/06/2017	Y	S	SUBCON
1,1,2-Trichloroethane	<0.20	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2,3-Trichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2,3-Trichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2,4-Trichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2,4-Trimethylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dibromo-3-chloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dibromoethane	<0.50	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dichloroethane	<0.50	ug/l	22/06/2017	Y	S	SUBCON

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119370** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH02**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,3,5-Trimethylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,3-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,3-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,4-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
2,2-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
2-Chlorotoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
4-Chlorotoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Benzene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Bromobenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Bromochloromethane	<2.0	ug/l	22/06/2017	Y	S	SUBCON
Bromodichloromethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Bromoform	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Carbon Tetrachloride	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chloroform	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chloromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
cis-1,2-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
cis-1,3-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dibromochloromethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Dibromomethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dichlorodifluoromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dichloromethane	<6.0	ug/l	22/06/2017	Y	S	SUBCON
Ethyl Benzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Hexachlorobutadiene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Isopropylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
m&p-Xylene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Naphthalene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
n-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
n-Propylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
o-Xylene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
p-Isopropyltoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
sec-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119370** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH02**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Styrene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
tert-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Tetrachloroethene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Toluene	<0.50	ug/l	22/06/2017	Y	S	SUBCON
trans-1,2-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
trans-1,3-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Trichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Trichlorofluoromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Vinyl Chloride	<0.10	ug/l	22/06/2017	Y	S	SUBCON

Analyst Comments for 16119370: This sample has been analysed for Boron Total as B, Magnesium, Total as Mg outside recommended stability times. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: P. Patel

Name: **P. Patel** Date: **31 July 2017**
Title: **Inorganic Team Leader**

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119371** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH03**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	20300	ug/l	13/06/2017	Y	Cov	WAS049
Potassium, Total as K	2350	ug/l	13/06/2017	Y	Cov	WAS049
Bromomethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Chloroethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Methyl tert-Butyl Ether	0.81	ug/l	22/06/2017	N	S	SUBCON
Arsenic, Ultra-low Total as As	29	ug/l	13/06/2017	Y	Cov	WAS060
Boron , Total as B	<2300	ug/l	13/06/2017	Y	Cov	WAS049
Cadmium , Total as Cd	6.20	ug/l	13/06/2017	Y	Cov	WAS049
Chromium , Total as Cr	<20.0	ug/l	13/06/2017	Y	Cov	WAS049
Copper , Total as Cu	159	ug/l	13/06/2017	Y	Cov	WAS049
Iron, Total as Fe	16400	ug/l	13/06/2017	Y	Cov	WAS049
Lead , Total as Pb	679	ug/l	13/06/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.05	ug/l	15/06/2017	Y	Cov	WAS013
Nickel , Total as Ni	30.7	ug/l	13/06/2017	Y	Cov	WAS049
Selenium, trace Total as Se	2.06	ug/l	13/06/2017	Y	Cov	WAS060
Zinc , Total as Zn	802	ug/l	13/06/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	06/06/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	50	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	50	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	08/06/2017	N	Cov	GEO46

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119371** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH03**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aromatic EPH >C16 - C21	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
EPH >C10 - C44	50	ug/l	08/06/2017	N	Cov	GEO46
Acenaphthene	0.051	ug/l	05/06/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Fluorene	0.010	ug/l	05/06/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Naphthalene	0.066	ug/l	05/06/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
PAH, Total	0.127	ug/l	05/06/2017	N	Cov	GEO19
SVOC	Y	ug/l	05/06/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	05/06/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	05/06/2017	N	Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119371** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH03**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
n-Nitrosodi-n-propylamine	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	05/06/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119371** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH03**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	05/06/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Fluorophenol	122.1	%Recovery	05/06/2017	N	Cov	GEO40
Phenol-d6	100.4	%Recovery	05/06/2017	N	Cov	GEO40
Nitrobenzene-d5	101.3	%Recovery	05/06/2017	N	Cov	GEO40
2-Fluorobiphenyl	98.1	%Recovery	05/06/2017	N	Cov	GEO40
2,4,6-Tribromophenol	100.5	%Recovery	05/06/2017	N	Cov	GEO40
Terphenyl-d14	104.6	%Recovery	05/06/2017	N	Cov	GEO40
1,1,1,2-Tetrachloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1,1-Trichloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1,2,2-Tetrachloroethane	<0.20	ug/l	22/06/2017	Y	S	SUBCON
1,1,2-Trichloroethane	<0.20	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2,3-Trichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2,3-Trichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2,4-Trichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2,4-Trimethylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dibromo-3-chloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dibromoethane	<0.50	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dichloroethane	<0.50	ug/l	22/06/2017	Y	S	SUBCON

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119371** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH03**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,3,5-Trimethylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,3-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,3-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,4-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
2,2-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
2-Chlorotoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
4-Chlorotoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Benzene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Bromobenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Bromochloromethane	<2.0	ug/l	22/06/2017	Y	S	SUBCON
Bromodichloromethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Bromoform	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Carbon Tetrachloride	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chloroform	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chloromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
cis-1,2-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
cis-1,3-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dibromochloromethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Dibromomethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dichlorodifluoromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dichloromethane	<6.0	ug/l	22/06/2017	Y	S	SUBCON
Ethyl Benzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Hexachlorobutadiene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Isopropylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
m&p-Xylene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Naphthalene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
n-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
n-Propylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
o-Xylene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
p-Isopropyltoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
sec-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119371** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH03**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Styrene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
tert-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Tetrachloroethene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Toluene	<0.50	ug/l	22/06/2017	Y	S	SUBCON
trans-1,2-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
trans-1,3-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Trichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Trichlorofluoromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Vinyl Chloride	<0.10	ug/l	22/06/2017	Y	S	SUBCON

Analyst Comments for 16119371: This sample has been analysed for Boron Total as B, Magnesium, Total as Mg outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}Reporting limit raised for metals due to interference with the internal standard.{*/}

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: P. Patel

Name: **P. Patel** Date: **31 July 2017**
Title: **Inorganic Team Leader**

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119372** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH04B**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	3690	ug/l	12/06/2017	Y	Cov	WAS049
Potassium, Total as K	6100	ug/l	12/06/2017	Y	Cov	WAS049
Bromomethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Chloroethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Methyl tert-Butyl Ether	<0.20	ug/l	22/06/2017	N	S	SUBCON
Arsenic, Ultra-low Total as As	1.0	ug/l	13/06/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	12/06/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	12/06/2017	Y	Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	12/06/2017	Y	Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	12/06/2017	Y	Cov	WAS049
Iron, Total as Fe	577	ug/l	12/06/2017	Y	Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	12/06/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.05	ug/l	15/06/2017	Y	Cov	WAS013
Nickel , Total as Ni	3.40	ug/l	12/06/2017	Y	Cov	WAS049
Selenium, trace Total as Se	<0.80	ug/l	13/06/2017	Y	Cov	WAS060
Zinc , Total as Zn	<18.0	ug/l	12/06/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	06/06/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	13	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	37	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	50	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	15	ug/l	08/06/2017	N	Cov	GEO46

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119372** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH04B**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aromatic EPH >C16 - C21	20	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	35	ug/l	08/06/2017	N	Cov	GEO46
EPH >C10 - C44	85	ug/l	08/06/2017	N	Cov	GEO46
Acenaphthene	<0.04	ug/l	05/06/2017	Y	Cov	GEO19
Acenaphthylene	<0.04	ug/l	05/06/2017	Y	Cov	GEO19
Anthracene	<0.04	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.04	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.04	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.04	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.04	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.04	ug/l	05/06/2017	Y	Cov	GEO19
Chrysene	<0.04	ug/l	05/06/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.04	ug/l	05/06/2017	Y	Cov	GEO19
Fluoranthene	<0.04	ug/l	05/06/2017	Y	Cov	GEO19
Fluorene	<0.04	ug/l	05/06/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.04	ug/l	05/06/2017	Y	Cov	GEO19
Naphthalene	<0.04	ug/l	05/06/2017	Y	Cov	GEO19
Phenanthrene	<0.04	ug/l	05/06/2017	Y	Cov	GEO19
Pyrene	0.049	ug/l	05/06/2017	Y	Cov	GEO19
PAH, Total	0.049	ug/l	05/06/2017	N	Cov	GEO19
SVOC	Y	ug/l	05/06/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	05/06/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	05/06/2017	N	Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119372** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH04B**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
n-Nitrosodi-n-propylamine	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	05/06/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119372** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH04B**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	05/06/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Fluorophenol	114.7	%Recovery	05/06/2017	N	Cov	GEO40
Phenol-d6	97.8	%Recovery	05/06/2017	N	Cov	GEO40
Nitrobenzene-d5	101.5	%Recovery	05/06/2017	N	Cov	GEO40
2-Fluorobiphenyl	101.2	%Recovery	05/06/2017	N	Cov	GEO40
2,4,6-Tribromophenol	100.7	%Recovery	05/06/2017	N	Cov	GEO40
Terphenyl-d14	90.6	%Recovery	05/06/2017	N	Cov	GEO40
1,1,1,2-Tetrachloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1,1-Trichloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1,2,2-Tetrachloroethane	<0.20	ug/l	22/06/2017	Y	S	SUBCON
1,1,2-Trichloroethane	<0.20	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2,3-Trichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2,3-Trichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2,4-Trichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2,4-Trimethylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dibromo-3-chloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dibromoethane	<0.50	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dichloroethane	<0.50	ug/l	22/06/2017	Y	S	SUBCON

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119372** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH04B**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,3,5-Trimethylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,3-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,3-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,4-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
2,2-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
2-Chlorotoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
4-Chlorotoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Benzene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Bromobenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Bromochloromethane	<2.0	ug/l	22/06/2017	Y	S	SUBCON
Bromodichloromethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Bromoform	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Carbon Tetrachloride	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chloroform	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chloromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
cis-1,2-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
cis-1,3-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dibromochloromethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Dibromomethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dichlorodifluoromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dichloromethane	<6.0	ug/l	22/06/2017	Y	S	SUBCON
Ethyl Benzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Hexachlorobutadiene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Isopropylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
m&p-Xylene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Naphthalene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
n-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
n-Propylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
o-Xylene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
p-Isopropyltoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
sec-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119372** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH04B**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Styrene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
tert-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Tetrachloroethene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Toluene	<0.50	ug/l	22/06/2017	Y	S	SUBCON
trans-1,2-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
trans-1,3-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Trichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Trichlorofluoromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Vinyl Chloride	<0.10	ug/l	22/06/2017	Y	S	SUBCON

Analyst Comments for 16119372: This sample has been analysed for Boron Total as B, Magnesium, Total as Mg outside recommended stability times. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: P. Patel

Name: **P. Patel** Date: **31 July 2017**
Title: **Inorganic Team Leader**

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119373** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	35800	ug/l	12/06/2017	Y	Cov	WAS049
Potassium, Total as K	1810	ug/l	12/06/2017	Y	Cov	WAS049
Bromomethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Chloroethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Methyl tert-Butyl Ether	<0.20	ug/l	22/06/2017	N	S	SUBCON
Arsenic, Ultra-low Total as As	<1.0	ug/l	13/06/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	12/06/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	12/06/2017	Y	Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	12/06/2017	Y	Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	12/06/2017	Y	Cov	WAS049
Iron, Total as Fe	513	ug/l	12/06/2017	Y	Cov	WAS049
Lead , Total as Pb	9.60	ug/l	12/06/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.05	ug/l	15/06/2017	Y	Cov	WAS013
Nickel , Total as Ni	<3.00	ug/l	12/06/2017	Y	Cov	WAS049
Selenium, trace Total as Se	<0.80	ug/l	13/06/2017	Y	Cov	WAS060
Zinc , Total as Zn	52.9	ug/l	12/06/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	06/06/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	08/06/2017	N	Cov	GEO46

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119373** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aromatic EPH >C16 - C21	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
EPH >C10 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Acenaphthene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Fluoranthene	0.012	ug/l	05/06/2017	Y	Cov	GEO19
Fluorene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Naphthalene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Pyrene	0.012	ug/l	05/06/2017	Y	Cov	GEO19
PAH, Total	0.024	ug/l	05/06/2017	N	Cov	GEO19
SVOC	Y	ug/l	05/06/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	05/06/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	05/06/2017	N	Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119373** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
n-Nitrosodi-n-propylamine	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Diethylphthalate	1.3	ug/l	05/06/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	05/06/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119373** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	05/06/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Fluorophenol	114.8	%Recovery	05/06/2017	N	Cov	GEO40
Phenol-d6	95.0	%Recovery	05/06/2017	N	Cov	GEO40
Nitrobenzene-d5	102.3	%Recovery	05/06/2017	N	Cov	GEO40
2-Fluorobiphenyl	99.5	%Recovery	05/06/2017	N	Cov	GEO40
2,4,6-Tribromophenol	92.8	%Recovery	05/06/2017	N	Cov	GEO40
Terphenyl-d14	92.6	%Recovery	05/06/2017	N	Cov	GEO40
1,1,1,2-Tetrachloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1,1-Trichloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1,2,2-Tetrachloroethane	<0.20	ug/l	22/06/2017	Y	S	SUBCON
1,1,2-Trichloroethane	<0.20	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2,3-Trichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2,3-Trichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2,4-Trichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2,4-Trimethylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dibromo-3-chloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dibromoethane	<0.50	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dichloroethane	<0.50	ug/l	22/06/2017	Y	S	SUBCON

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119373** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,3,5-Trimethylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,3-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,3-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,4-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
2,2-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
2-Chlorotoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
4-Chlorotoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Benzene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Bromobenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Bromochloromethane	<2.0	ug/l	22/06/2017	Y	S	SUBCON
Bromodichloromethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Bromoform	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Carbon Tetrachloride	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chloroform	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chloromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
cis-1,2-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
cis-1,3-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dibromochloromethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Dibromomethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dichlorodifluoromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dichloromethane	<6.0	ug/l	22/06/2017	Y	S	SUBCON
Ethyl Benzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Hexachlorobutadiene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Isopropylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
m&p-Xylene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Naphthalene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
n-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
n-Propylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
o-Xylene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
p-Isopropyltoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
sec-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119373** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Styrene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
tert-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Tetrachloroethene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Toluene	<0.50	ug/l	22/06/2017	Y	S	SUBCON
trans-1,2-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
trans-1,3-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Trichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Trichlorofluoromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Vinyl Chloride	<0.10	ug/l	22/06/2017	Y	S	SUBCON

Analyst Comments for 16119373: This sample has been analysed for Boron Total as B, Magnesium, Total as Mg outside recommended stability times. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: P. Patel

Name: **P. Patel** Date: **31 July 2017**
Title: **Inorganic Team Leader**

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119374** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	32100	ug/l	12/06/2017	Y	Cov	WAS049
Potassium, Total as K	1650	ug/l	12/06/2017	Y	Cov	WAS049
Bromomethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Chloroethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Methyl tert-Butyl Ether	<0.20	ug/l	22/06/2017	N	S	SUBCON
Arsenic, Ultra-low Total as As	1.0	ug/l	13/06/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	12/06/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	12/06/2017	Y	Cov	WAS049
Chromium , Total as Cr	2.70	ug/l	12/06/2017	Y	Cov	WAS049
Copper , Total as Cu	15.9	ug/l	12/06/2017	Y	Cov	WAS049
Iron, Total as Fe	1000	ug/l	12/06/2017	Y	Cov	WAS049
Lead , Total as Pb	38.6	ug/l	12/06/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.05	ug/l	15/06/2017	Y	Cov	WAS013
Nickel , Total as Ni	<3.00	ug/l	12/06/2017	Y	Cov	WAS049
Selenium, trace Total as Se	<0.80	ug/l	13/06/2017	Y	Cov	WAS060
Zinc , Total as Zn	92.2	ug/l	12/06/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	06/06/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	12	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	12	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	08/06/2017	N	Cov	GEO46

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119374** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aromatic EPH >C16 - C21	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
EPH >C10 - C44	12	ug/l	08/06/2017	N	Cov	GEO46
Acenaphthene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Fluorene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Naphthalene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
PAH, Total	<0.01	ug/l	05/06/2017	N	Cov	GEO19
SVOC	Y	ug/l	05/06/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	05/06/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	05/06/2017	N	Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119374** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
n-Nitrosodi-n-propylamine	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	05/06/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119374** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	05/06/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Fluorophenol	127.8	%Recovery	05/06/2017	N	Cov	GEO40
Phenol-d6	106.8	%Recovery	05/06/2017	N	Cov	GEO40
Nitrobenzene-d5	111.2	%Recovery	05/06/2017	N	Cov	GEO40
2-Fluorobiphenyl	106.8	%Recovery	05/06/2017	N	Cov	GEO40
2,4,6-Tribromophenol	96.1	%Recovery	05/06/2017	N	Cov	GEO40
Terphenyl-d14	94.3	%Recovery	05/06/2017	N	Cov	GEO40
1,1,1,2-Tetrachloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1,1-Trichloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1,2,2-Tetrachloroethane	<0.20	ug/l	22/06/2017	Y	S	SUBCON
1,1,2-Trichloroethane	<0.20	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2,3-Trichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2,3-Trichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2,4-Trichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2,4-Trimethylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dibromo-3-chloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dibromoethane	<0.50	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dichloroethane	<0.50	ug/l	22/06/2017	Y	S	SUBCON

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119374** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,3,5-Trimethylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,3-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,3-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,4-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
2,2-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
2-Chlorotoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
4-Chlorotoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Benzene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Bromobenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Bromochloromethane	<2.0	ug/l	22/06/2017	Y	S	SUBCON
Bromodichloromethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Bromoform	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Carbon Tetrachloride	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chloroform	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chloromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
cis-1,2-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
cis-1,3-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dibromochloromethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Dibromomethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dichlorodifluoromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dichloromethane	<6.0	ug/l	22/06/2017	Y	S	SUBCON
Ethyl Benzene	0.15	ug/l	22/06/2017	Y	S	SUBCON
Hexachlorobutadiene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Isopropylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
m&p-Xylene	0.47	ug/l	22/06/2017	Y	S	SUBCON
Naphthalene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
n-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
n-Propylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
o-Xylene	0.16	ug/l	22/06/2017	Y	S	SUBCON
p-Isopropyltoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
sec-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119374** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Styrene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
tert-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Tetrachloroethene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Toluene	<0.50	ug/l	22/06/2017	Y	S	SUBCON
trans-1,2-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
trans-1,3-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Trichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Trichlorofluoromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Vinyl Chloride	<0.10	ug/l	22/06/2017	Y	S	SUBCON

Analyst Comments for 16119374: This sample has been analysed for Boron Total as B, Magnesium, Total as Mg outside recommended stability times. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: P. Patel

Name: **P. Patel** Date: **31 July 2017**
Title: **Inorganic Team Leader**

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119375** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW03**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	17200	ug/l	12/06/2017	Y	Cov	WAS049
Potassium, Total as K	2160	ug/l	12/06/2017	Y	Cov	WAS049
Bromomethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Chloroethane	6.3	ug/l	22/06/2017	Y	S	SUBCON
Methyl tert-Butyl Ether	1.73	ug/l	22/06/2017	N	S	SUBCON
Arsenic, Ultra-low Total as As	4.5	ug/l	13/06/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	12/06/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	12/06/2017	Y	Cov	WAS049
Chromium , Total as Cr	3.50	ug/l	12/06/2017	Y	Cov	WAS049
Copper , Total as Cu	39.5	ug/l	12/06/2017	Y	Cov	WAS049
Iron, Total as Fe	8100	ug/l	12/06/2017	Y	Cov	WAS049
Lead , Total as Pb	22.0	ug/l	12/06/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.05	ug/l	15/06/2017	Y	Cov	WAS013
Nickel , Total as Ni	69.5	ug/l	12/06/2017	Y	Cov	WAS049
Selenium, trace Total as Se	2.25	ug/l	13/06/2017	Y	Cov	WAS060
Zinc , Total as Zn	44.2	ug/l	12/06/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	06/06/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	18	ug/l	08/06/2017	N	Cov	GEO46

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119375** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW03**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aromatic EPH >C16 - C21	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	18	ug/l	08/06/2017	N	Cov	GEO46
EPH >C10 - C44	18	ug/l	08/06/2017	N	Cov	GEO46
Acenaphthene	<0.02	ug/l	05/06/2017	Y	Cov	GEO19
Acenaphthylene	<0.02	ug/l	05/06/2017	Y	Cov	GEO19
Anthracene	<0.02	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.02	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.02	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.02	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.02	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.02	ug/l	05/06/2017	Y	Cov	GEO19
Chrysene	<0.02	ug/l	05/06/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.02	ug/l	05/06/2017	Y	Cov	GEO19
Fluoranthene	<0.02	ug/l	05/06/2017	Y	Cov	GEO19
Fluorene	<0.02	ug/l	05/06/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.02	ug/l	05/06/2017	Y	Cov	GEO19
Naphthalene	0.110	ug/l	05/06/2017	Y	Cov	GEO19
Phenanthrene	<0.02	ug/l	05/06/2017	Y	Cov	GEO19
Pyrene	<0.02	ug/l	05/06/2017	Y	Cov	GEO19
PAH, Total	0.110	ug/l	05/06/2017	N	Cov	GEO19
SVOC	Y	ug/l	05/06/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	05/06/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	05/06/2017	N	Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119375** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW03**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
n-Nitrosodi-n-propylamine	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	05/06/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119375** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW03**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	05/06/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Fluorophenol	105.3	%Recovery	05/06/2017	N	Cov	GEO40
Phenol-d6	92.5	%Recovery	05/06/2017	N	Cov	GEO40
Nitrobenzene-d5	92.3	%Recovery	05/06/2017	N	Cov	GEO40
2-Fluorobiphenyl	91.1	%Recovery	05/06/2017	N	Cov	GEO40
2,4,6-Tribromophenol	100.3	%Recovery	05/06/2017	N	Cov	GEO40
Terphenyl-d14	91.3	%Recovery	05/06/2017	N	Cov	GEO40
1,1,1,2-Tetrachloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1,1-Trichloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1,2,2-Tetrachloroethane	<0.20	ug/l	22/06/2017	Y	S	SUBCON
1,1,2-Trichloroethane	<0.20	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloroethane	2.80	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2,3-Trichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2,3-Trichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2,4-Trichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2,4-Trimethylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dibromo-3-chloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dibromoethane	<0.50	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dichloroethane	<0.50	ug/l	22/06/2017	Y	S	SUBCON

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119375** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW03**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,3,5-Trimethylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,3-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,3-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,4-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
2,2-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
2-Chlorotoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
4-Chlorotoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Benzene	0.39	ug/l	22/06/2017	Y	S	SUBCON
Bromobenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Bromochloromethane	<2.0	ug/l	22/06/2017	Y	S	SUBCON
Bromodichloromethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Bromoform	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Carbon Tetrachloride	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chloroform	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chloromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
cis-1,2-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
cis-1,3-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dibromochloromethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Dibromomethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dichlorodifluoromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dichloromethane	<6.0	ug/l	22/06/2017	Y	S	SUBCON
Ethyl Benzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Hexachlorobutadiene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Isopropylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
m&p-Xylene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Naphthalene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
n-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
n-Propylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
o-Xylene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
p-Isopropyltoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
sec-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119375** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW03**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Styrene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
tert-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Tetrachloroethene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Toluene	<0.50	ug/l	22/06/2017	Y	S	SUBCON
trans-1,2-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
trans-1,3-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Trichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Trichlorofluoromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Vinyl Chloride	0.40	ug/l	22/06/2017	Y	S	SUBCON

Analyst Comments for 16119375: This sample has been analysed for Boron Total as B, Magnesium, Total as Mg outside recommended stability times. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: P. Patel

Name: **P. Patel** Date: **31 July 2017**
Title: **Inorganic Team Leader**

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119376** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW04**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	22500	ug/l	13/06/2017	Y	Cov	WAS049
Potassium, Total as K	<1800	ug/l	13/06/2017	Y	Cov	WAS049
Bromomethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Chloroethane	7.4	ug/l	22/06/2017	Y	S	SUBCON
Methyl tert-Butyl Ether	1.73	ug/l	22/06/2017	N	S	SUBCON
Arsenic, Ultra-low Total as As	5.1	ug/l	13/06/2017	Y	Cov	WAS060
Boron , Total as B	<2300	ug/l	13/06/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<6.00	ug/l	13/06/2017	Y	Cov	WAS049
Chromium , Total as Cr	<20.0	ug/l	13/06/2017	Y	Cov	WAS049
Copper , Total as Cu	<90.0	ug/l	13/06/2017	Y	Cov	WAS049
Iron, Total as Fe	12300	ug/l	13/06/2017	Y	Cov	WAS049
Lead , Total as Pb	<60.0	ug/l	13/06/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.05	ug/l	15/06/2017	Y	Cov	WAS013
Nickel , Total as Ni	106	ug/l	13/06/2017	Y	Cov	WAS049
Selenium, trace Total as Se	2.93	ug/l	13/06/2017	Y	Cov	WAS060
Zinc , Total as Zn	<180	ug/l	13/06/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	06/06/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	06/06/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	06/06/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	29	ug/l	08/06/2017	N	Cov	GEO46

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119376** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW04**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aromatic EPH >C16 - C21	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	08/06/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	29	ug/l	08/06/2017	N	Cov	GEO46
EPH >C10 - C44	29	ug/l	08/06/2017	N	Cov	GEO46
Acenaphthene	0.019	ug/l	05/06/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Fluorene	0.019	ug/l	05/06/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Naphthalene	0.157	ug/l	05/06/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	05/06/2017	Y	Cov	GEO19
PAH, Total	0.194	ug/l	05/06/2017	N	Cov	GEO19
SVOC	Y	ug/l	05/06/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	05/06/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	05/06/2017	N	Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119376** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW04**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
n-Nitrosodi-n-propylamine	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	05/06/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	05/06/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119376** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW04**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	05/06/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	05/06/2017	Y	Cov	GEO40
2-Fluorophenol	113.0	%Recovery	05/06/2017	N	Cov	GEO40
Phenol-d6	97.3	%Recovery	05/06/2017	N	Cov	GEO40
Nitrobenzene-d5	101.4	%Recovery	05/06/2017	N	Cov	GEO40
2-Fluorobiphenyl	97.3	%Recovery	05/06/2017	N	Cov	GEO40
2,4,6-Tribromophenol	105.5	%Recovery	05/06/2017	N	Cov	GEO40
Terphenyl-d14	95.9	%Recovery	05/06/2017	N	Cov	GEO40
1,1,1,2-Tetrachloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1,1-Trichloroethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1,2,2-Tetrachloroethane	<0.20	ug/l	22/06/2017	Y	S	SUBCON
1,1,2-Trichloroethane	<0.20	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloroethane	3.58	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,1-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2,3-Trichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2,3-Trichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2,4-Trichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2,4-Trimethylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dibromo-3-chloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dibromoethane	<0.50	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,2-Dichloroethane	<0.50	ug/l	22/06/2017	Y	S	SUBCON

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119376** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW04**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,3,5-Trimethylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,3-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
1,3-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
1,4-Dichlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
2,2-Dichloropropane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
2-Chlorotoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
4-Chlorotoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Benzene	0.49	ug/l	22/06/2017	Y	S	SUBCON
Bromobenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Bromochloromethane	<2.0	ug/l	22/06/2017	Y	S	SUBCON
Bromodichloromethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Bromoform	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Carbon Tetrachloride	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chlorobenzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chloroform	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Chloromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
cis-1,2-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
cis-1,3-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dibromochloromethane	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Dibromomethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dichlorodifluoromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Dichloromethane	<6.0	ug/l	22/06/2017	Y	S	SUBCON
Ethyl Benzene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Hexachlorobutadiene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Isopropylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
m&p-Xylene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Naphthalene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
n-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
n-Propylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
o-Xylene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
p-Isopropyltoluene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
sec-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON

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Report Number: **COV/1394345/2017** Issue **2**
Laboratory Number: **16119376** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW04**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 May 2017**
Sample Received: **31 May 2017**
Analysis Complete: **22 June 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Styrene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
tert-Butylbenzene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Tetrachloroethene	<0.20	ug/l	22/06/2017	Y	S	SUBCON
Toluene	<0.50	ug/l	22/06/2017	Y	S	SUBCON
trans-1,2-Dichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
trans-1,3-Dichloropropene	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Trichloroethene	<0.10	ug/l	22/06/2017	Y	S	SUBCON
Trichlorofluoromethane	<1.0	ug/l	22/06/2017	Y	S	SUBCON
Vinyl Chloride	0.49	ug/l	22/06/2017	Y	S	SUBCON

Analyst Comments for 16119376: This sample has been analysed for Boron Total as B, Magnesium, Total as Mg outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}Reporting limit raised for metals due to interference with the internal standard.{*/}

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: Name: **P. Patel** Date: **31 July 2017**
Title: **Inorganic Team Leader**

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Miss Reilly
RPS Consultants
West Pier Business Campus
Dun Laoghaire
Dublin

19 September 2017

Test Report: COV/1430113/2017

Dear Miss Reilly

Analysis of your sample(s) submitted on 29 August 2017 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed: A I Horobin

Name: A. Horobin

Title: Organic Operations Manager

Report Summary

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Miss Catriona Reilly
RPS Consultants
West Pier Business Campus
Dun Laoghaire
Dublin

Date of Issue: **19 September 2017**

Report Number: **COV/1430113/2017** Issue **1**

This issue replaces all previous issues

Job Description: Portlaoise Groundwater

Job Location: Portlaoise

Number of Samples included in this report **8**

Job Received: **29 August 2017**

Number of Test Results included in this report **1408**

Analysis Commenced: **31 August 2017**

Signed: A I Horobin

Name: **A. Horobin** Date: **19 September 2017**

Title: **Organic Operations Manager**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358230** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	31600	ug/l	11/09/2017	Y	Cov	WAS049
Potassium, Total as K	1520	ug/l	11/09/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	<1.0	ug/l	12/09/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	11/09/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	11/09/2017	Y	Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	11/09/2017	Y	Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	11/09/2017	Y	Cov	WAS049
Iron, Total as Fe	<230	ug/l	11/09/2017	Y	Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	11/09/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.05	ug/l	05/09/2017	Y	Cov	WAS013
Nickel , Total as Ni	<3.00	ug/l	11/09/2017	Y	Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	11/09/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	12/09/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	07/09/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	07/09/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<10	ug/l	07/09/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	07/09/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<10	ug/l	07/09/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	07/09/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	07/09/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<10	ug/l	07/09/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	07/09/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	07/09/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	<10	ug/l	07/09/2017	N	Cov	GEO46

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ALS Environmental

Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358230** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
EPH >C10 - C44	<10	ug/l	07/09/2017	N	Cov	GEO46
Acenaphthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Fluorene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Naphthalene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
PAH, Total	<0.01	ug/l	04/09/2017	N	Cov	GEO19
VOC	Y	ug/l	12/09/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	12/09/2017	N	Cov	GEO32
Chloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dichloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	12/09/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358230** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	12/09/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,2,2-Tetrachloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
tert-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358230** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2,4-Trimethylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
n-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Naphthalene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
MTBE	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromofluoromethane	100.2	%Recovery	12/09/2017	N	Cov	GEO32
Toluene-d8	101.7	%Recovery	12/09/2017	N	Cov	GEO32
4-Bromofluorobenzene	91.7	%Recovery	12/09/2017	N	Cov	GEO32
SVOC	Y	ug/l	04/09/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	04/09/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	04/09/2017	N	Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358230** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Bis(2-chloroethoxy)methane	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	04/09/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	04/09/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	04/09/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	04/09/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	04/09/2017	Y	Cov	GEO40

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358230** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Benzo(b)fluoranthene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2-Fluorophenol	87.0	%Recovery	04/09/2017	N	Cov	GEO40
Phenol-d6	72.4	%Recovery	04/09/2017	N	Cov	GEO40
Nitrobenzene-d5	81.3	%Recovery	04/09/2017	N	Cov	GEO40
2-Fluorobiphenyl	81.6	%Recovery	04/09/2017	N	Cov	GEO40
2,4,6-Tribromophenol	81.8	%Recovery	04/09/2017	N	Cov	GEO40
Terphenyl-d14	93.0	%Recovery	04/09/2017	N	Cov	GEO40

Analyst Comments for 16358230: This sample has been analysed for Phenols in Water method GEO18, Boron Total as B, Magnesium, Total as Mg outside recommended stability times. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: A I Horobin

Name: **A. Horobin** Date: **19 September 2017**

Title: **Organic Operations Manager**

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358231** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH102**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	4260	ug/l	11/09/2017	Y	Cov	WAS049
Potassium, Total as K	2000	ug/l	11/09/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	<1.0	ug/l	12/09/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	11/09/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	11/09/2017	Y	Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	11/09/2017	Y	Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	11/09/2017	Y	Cov	WAS049
Iron, Total as Fe	334	ug/l	11/09/2017	Y	Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	11/09/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.05	ug/l	05/09/2017	Y	Cov	WAS013
Nickel , Total as Ni	<3.00	ug/l	11/09/2017	Y	Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	11/09/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	12/09/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<10	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<10	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<10	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	<10	ug/l	15/09/2017	N	Cov	GEO46

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358231** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH102**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
EPH >C10 - C44	<10	ug/l	15/09/2017	N	Cov	GEO46
Acenaphthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Fluorene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Naphthalene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
PAH, Total	<0.01	ug/l	04/09/2017	N	Cov	GEO19
VOC	Y	ug/l	12/09/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	12/09/2017	N	Cov	GEO32
Chloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dichloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	12/09/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358231** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH102**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	12/09/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,2,2-Tetrachloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
tert-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358231** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH102**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2,4-Trimethylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
n-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Naphthalene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
MTBE	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromofluoromethane	102.5	%Recovery	12/09/2017	N	Cov	GEO32
Toluene-d8	100.9	%Recovery	12/09/2017	N	Cov	GEO32
4-Bromofluorobenzene	91.1	%Recovery	12/09/2017	N	Cov	GEO32
SVOC	Y	ug/l	04/09/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	04/09/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	04/09/2017	N	Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358231** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH102**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Bis(2-chloroethoxy)methane	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	04/09/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	04/09/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	04/09/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	04/09/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	04/09/2017	Y	Cov	GEO40

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358231** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH102**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Benzo(b)fluoranthene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2-Fluorophenol	90.4	%Recovery	04/09/2017	N	Cov	GEO40
Phenol-d6	83.1	%Recovery	04/09/2017	N	Cov	GEO40
Nitrobenzene-d5	82.9	%Recovery	04/09/2017	N	Cov	GEO40
2-Fluorobiphenyl	82.5	%Recovery	04/09/2017	N	Cov	GEO40
2,4,6-Tribromophenol	78.4	%Recovery	04/09/2017	N	Cov	GEO40
Terphenyl-d14	89.7	%Recovery	04/09/2017	N	Cov	GEO40

Analyst Comments for 16358231: This sample has been analysed for Phenols in Water method GEO18, Boron Total as B, Magnesium, Total as Mg outside recommended stability times. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: A I Horobin

Name: **A. Horobin** Date: **19 September 2017**

Title: **Organic Operations Manager**

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358232** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Magnesium, Total as Mg	33700	ug/l	11/09/2017	Y Cov	WAS049
Potassium, Total as K	1780	ug/l	11/09/2017	Y Cov	WAS049
Arsenic, Ultra-low Total as As	<1.0	ug/l	12/09/2017	Y Cov	WAS060
Boron , Total as B	<230	ug/l	11/09/2017	Y Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	11/09/2017	Y Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	11/09/2017	Y Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	11/09/2017	Y Cov	WAS049
Iron, Total as Fe	411	ug/l	11/09/2017	Y Cov	WAS049
Lead , Total as Pb	27.3	ug/l	11/09/2017	Y Cov	WAS049
Mercury, Total as Hg	<0.05	ug/l	05/09/2017	Y Cov	WAS013
Nickel , Total as Ni	<3.00	ug/l	11/09/2017	Y Cov	WAS049
Zinc , Total as Zn	48.8	ug/l	11/09/2017	Y Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	12/09/2017	Y Cov	GEO18
2 - Methylphenol	<1.00	ug/l	12/09/2017	N Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	12/09/2017	Y Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	12/09/2017	Y Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	12/09/2017	N Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	12/09/2017	Y Cov	GEO18
4-Chlorophenol	<1.00	ug/l	12/09/2017	Y Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	12/09/2017	N Cov	GEO18
Phenol	<5.00	ug/l	12/09/2017	Y Cov	GEO18
Aliphatic EPH >C10 - C12	<40	ug/l	15/09/2017	N Cov	GEO46
Aliphatic EPH >C12 - C16	<40	ug/l	15/09/2017	N Cov	GEO46
Aliphatic EPH >C16 - C35	120	ug/l	15/09/2017	N Cov	GEO46
Aliphatic EPH >C35 - C44	<40	ug/l	15/09/2017	N Cov	GEO46
Aliphatic EPH >C10 - C44	120	ug/l	15/09/2017	N Cov	GEO46
Aromatic EPH >C10 - C12	<40	ug/l	15/09/2017	N Cov	GEO46
Aromatic EPH >C12 - C16	<40	ug/l	15/09/2017	N Cov	GEO46
Aromatic EPH >C16 - C21	<40	ug/l	15/09/2017	N Cov	GEO46
Aromatic EPH >C21 - C35	<40	ug/l	15/09/2017	N Cov	GEO46
Aromatic EPH >C35 - C44	<40	ug/l	15/09/2017	N Cov	GEO46
Aromatic EPH >C10 - C44	<40	ug/l	15/09/2017	N Cov	GEO46

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ALS Environmental

Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358232** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
EPH >C10 - C44	120	ug/l	15/09/2017	N	Cov	GEO46
Acenaphthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	0.013	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	0.012	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Chrysene	0.014	ug/l	04/09/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Fluoranthene	0.052	ug/l	04/09/2017	Y	Cov	GEO19
Fluorene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Naphthalene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Phenanthrene	0.017	ug/l	04/09/2017	Y	Cov	GEO19
Pyrene	0.038	ug/l	04/09/2017	Y	Cov	GEO19
PAH, Total	0.145	ug/l	04/09/2017	N	Cov	GEO19
VOC	Y	ug/l	12/09/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	12/09/2017	N	Cov	GEO32
Chloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dichloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	12/09/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358232** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	12/09/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,2,2-Tetrachloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
tert-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358232** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2,4-Trimethylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
n-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Naphthalene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
MTBE	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromofluoromethane	98.9	%Recovery	12/09/2017	N	Cov	GEO32
Toluene-d8	101.0	%Recovery	12/09/2017	N	Cov	GEO32
4-Bromofluorobenzene	91.6	%Recovery	12/09/2017	N	Cov	GEO32
SVOC	Y	ug/l	14/09/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	14/09/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	14/09/2017	N	Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358232** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Bis(2-chloroethoxy)methane	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	14/09/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Diethylphthalate	1.4	ug/l	14/09/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	14/09/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	14/09/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	14/09/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358232** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Benzo(b)fluoranthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Fluorophenol	96.3	%Recovery	14/09/2017	N	Cov	GEO40
Phenol-d6	79.6	%Recovery	14/09/2017	N	Cov	GEO40
Nitrobenzene-d5	124.3	%Recovery	14/09/2017	N	Cov	GEO40
2-Fluorobiphenyl	140.4	%Recovery	14/09/2017	N	Cov	GEO40
2,4,6-Tribromophenol	115.7	%Recovery	14/09/2017	N	Cov	GEO40
Terphenyl-d14	132.9	%Recovery	14/09/2017	N	Cov	GEO40

Analyst Comments for 16358232: This sample has been analysed for Phenols in Water method GEO18, SVOC Waters method GEO40, Boron Total as B, Magnesium, Total as Mg outside recommended stability times. It is therefore possible that the results provided may be compromised.
Raised reporting limits for GEO46 EPH Waters due to the nature of the sample matrix.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: A I Horobin

Name: **A. Horobin** Date: **19 September 2017**

Title: **Organic Operations Manager**

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358233** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH104B**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	3530	ug/l	11/09/2017	Y	Cov	WAS049
Potassium, Total as K	5710	ug/l	11/09/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	<1.0	ug/l	12/09/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	11/09/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	11/09/2017	Y	Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	11/09/2017	Y	Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	11/09/2017	Y	Cov	WAS049
Iron, Total as Fe	<230	ug/l	11/09/2017	Y	Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	11/09/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.05	ug/l	05/09/2017	Y	Cov	WAS013
Nickel , Total as Ni	<3.00	ug/l	11/09/2017	Y	Cov	WAS049
Zinc , Total as Zn	<18.0	ug/l	11/09/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	12/09/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<10	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<10	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<10	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	<10	ug/l	15/09/2017	N	Cov	GEO46

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358233** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH104B**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
EPH >C10 - C44	<10	ug/l	15/09/2017	N	Cov	GEO46
Acenaphthene	0.030	ug/l	04/09/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Fluorene	0.053	ug/l	04/09/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Naphthalene	0.024	ug/l	04/09/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Pyrene	0.032	ug/l	04/09/2017	Y	Cov	GEO19
PAH, Total	0.139	ug/l	04/09/2017	N	Cov	GEO19
VOC	Y	ug/l	12/09/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	12/09/2017	N	Cov	GEO32
Chloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dichloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	12/09/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358233** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH104B**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	12/09/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,2,2-Tetrachloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
tert-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358233** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH104B**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation	Method
1,2,4-Trimethylbenzene	<1.0	ug/l	12/09/2017	Y Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	12/09/2017	Y Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	12/09/2017	Y Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y Cov	GEO32
n-Butylbenzene	<1.0	ug/l	12/09/2017	Y Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	12/09/2017	Y Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	12/09/2017	Y Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	12/09/2017	Y Cov	GEO32
Naphthalene	<1.0	ug/l	12/09/2017	Y Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	12/09/2017	Y Cov	GEO32
MTBE	<1.0	ug/l	12/09/2017	Y Cov	GEO32
Dibromofluoromethane	100.5	%Recovery	12/09/2017	N Cov	GEO32
Toluene-d8	101.8	%Recovery	12/09/2017	N Cov	GEO32
4-Bromofluorobenzene	90.5	%Recovery	12/09/2017	N Cov	GEO32
SVOC	Y	ug/l	04/09/2017	N Cov	GEO40
Phenol	<1.0	ug/l	04/09/2017	Y Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	04/09/2017	Y Cov	GEO40
2-Chlorophenol	<1.0	ug/l	04/09/2017	Y Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	04/09/2017	Y Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	04/09/2017	Y Cov	GEO40
2-Methylphenol	<1.0	ug/l	04/09/2017	Y Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	04/09/2017	N Cov	GEO40
Dibenzofuran	<1.0	ug/l	04/09/2017	N Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	04/09/2017	Y Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	04/09/2017	Y Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	04/09/2017	Y Cov	GEO40
Hexachloroethane	<1.0	ug/l	04/09/2017	Y Cov	GEO40
Nitrobenzene	<1.0	ug/l	04/09/2017	Y Cov	GEO40
Isophorone	<1.0	ug/l	04/09/2017	Y Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	04/09/2017	Y Cov	GEO40
2-Nitrophenol	<1.0	ug/l	04/09/2017	Y Cov	GEO40

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358233** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH104B**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Bis(2-chloroethoxy)methane	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	04/09/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	04/09/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	04/09/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	04/09/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	04/09/2017	Y	Cov	GEO40

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358233** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH104B**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Benzo(b)fluoranthene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	04/09/2017	Y	Cov	GEO40
2-Fluorophenol	87.8	%Recovery	04/09/2017	N	Cov	GEO40
Phenol-d6	75.1	%Recovery	04/09/2017	N	Cov	GEO40
Nitrobenzene-d5	81.6	%Recovery	04/09/2017	N	Cov	GEO40
2-Fluorobiphenyl	83.0	%Recovery	04/09/2017	N	Cov	GEO40
2,4,6-Tribromophenol	82.2	%Recovery	04/09/2017	N	Cov	GEO40
Terphenyl-d14	78.6	%Recovery	04/09/2017	N	Cov	GEO40

Analyst Comments for 16358233: This sample has been analysed for Phenols in Water method GEO18, Boron Total as B, Magnesium, Total as Mg outside recommended stability times. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: A I Horobin

Name: **A. Horobin** Date: **19 September 2017**

Title: **Organic Operations Manager**

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358234** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW04**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	16000	ug/l	11/09/2017	Y	Cov	WAS049
Potassium, Total as K	2390	ug/l	11/09/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	4.5	ug/l	12/09/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	11/09/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	11/09/2017	Y	Cov	WAS049
Chromium , Total as Cr	5.10	ug/l	11/09/2017	Y	Cov	WAS049
Copper , Total as Cu	29.4	ug/l	11/09/2017	Y	Cov	WAS049
Iron, Total as Fe	8000	ug/l	11/09/2017	Y	Cov	WAS049
Lead , Total as Pb	15.2	ug/l	11/09/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.05	ug/l	05/09/2017	Y	Cov	WAS013
Nickel , Total as Ni	74.9	ug/l	11/09/2017	Y	Cov	WAS049
Zinc , Total as Zn	49.0	ug/l	11/09/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	12/09/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	19/09/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	19/09/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<10	ug/l	19/09/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<10	ug/l	19/09/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<10	ug/l	19/09/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	17	ug/l	19/09/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	24	ug/l	19/09/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<10	ug/l	19/09/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	19/09/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	19/09/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	41	ug/l	19/09/2017	N	Cov	GEO46

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358234** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW04**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
EPH >C10 - C44	41	ug/l	19/09/2017	N	Cov	GEO46
Acenaphthene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Acenaphthylene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Anthracene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Chrysene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Fluoranthene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Fluorene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Naphthalene	0.161	ug/l	13/09/2017	Y	Cov	GEO19
Phenanthrene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Pyrene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
PAH, Total	0.161	ug/l	13/09/2017	N	Cov	GEO19
VOC	Y	ug/l	12/09/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	12/09/2017	N	Cov	GEO32
Chloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Chloroethane	10.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dichloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloroethane	3.3	ug/l	12/09/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	12/09/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358234** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW04**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	12/09/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,2,2-Tetrachloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
tert-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358234** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW04**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2,4-Trimethylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
n-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Naphthalene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
MTBE	2.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromofluoromethane	98.4	%Recovery	12/09/2017	N	Cov	GEO32
Toluene-d8	98.8	%Recovery	12/09/2017	N	Cov	GEO32
4-Bromofluorobenzene	91.5	%Recovery	12/09/2017	N	Cov	GEO32
SVOC	Y	ug/l	14/09/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	14/09/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	14/09/2017	N	Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358234** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW04**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Bis(2-chloroethoxy)methane	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	14/09/2017	Y	Cov	GEO40
Hexachlorobutadiene	<4.0	ug/l	14/09/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
4-Nitrophenol	<20.0	ug/l	14/09/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	14/09/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	14/09/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358234** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW04**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Benzo(b)fluoranthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Fluorophenol	92.3	%Recovery	14/09/2017	N	Cov	GEO40
Phenol-d6	83.2	%Recovery	14/09/2017	N	Cov	GEO40
Nitrobenzene-d5	90.6	%Recovery	14/09/2017	N	Cov	GEO40
2-Fluorobiphenyl	92.5	%Recovery	14/09/2017	N	Cov	GEO40
2,4,6-Tribromophenol	105.8	%Recovery	14/09/2017	N	Cov	GEO40
Terphenyl-d14	96.2	%Recovery	14/09/2017	N	Cov	GEO40

Analyst Comments for 16358234:

This sample has been analysed for Phenols in Water method GEO18, SVOC Waters method GEO40, Boron Total as B, Magnesium, Total as Mg outside recommended stability times. It is therefore possible that the results provided may be compromised. Reporting limits raised for PAH due to nature of sample matrix. Sub sample taken from PET bottle for PAH due to quality failure on the original sample taken from the glass container and re-analysed outside recommended stability times. It is therefore possible that the results provided could be compromised.GEO40 SVOC Waters: Raised reporting limits for Hexachlorobutadiene & 4-Nitrophenol part of the SVOC suite due to insufficient sample as repeat extraction performed due to a quality control failure therefore extraction performed on reduced volumes.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: A I Horobin

Name: **A. Horobin** Date: **19 September 2017**

Title: **Organic Operations Manager**

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358235** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW03**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	17800	ug/l	11/09/2017	Y	Cov	WAS049
Potassium, Total as K	2840	ug/l	11/09/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	2.1	ug/l	12/09/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	11/09/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	11/09/2017	Y	Cov	WAS049
Chromium , Total as Cr	3.60	ug/l	11/09/2017	Y	Cov	WAS049
Copper , Total as Cu	10.3	ug/l	11/09/2017	Y	Cov	WAS049
Iron, Total as Fe	3600	ug/l	11/09/2017	Y	Cov	WAS049
Lead , Total as Pb	8.30	ug/l	11/09/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.05	ug/l	05/09/2017	Y	Cov	WAS013
Nickel , Total as Ni	51.2	ug/l	11/09/2017	Y	Cov	WAS049
Zinc , Total as Zn	38.3	ug/l	11/09/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	12/09/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<40	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<40	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	61	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<40	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	61	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<40	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<40	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<40	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	40	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<40	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	40	ug/l	15/09/2017	N	Cov	GEO46

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358235** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW03**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
EPH >C10 - C44	102	ug/l	15/09/2017	N	Cov	GEO46
Acenaphthene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Acenaphthylene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Anthracene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Chrysene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Fluoranthene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Fluorene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Naphthalene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Phenanthrene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
Pyrene	<0.10	ug/l	13/09/2017	Y	Cov	GEO19
PAH, Total	<0.10	ug/l	13/09/2017	N	Cov	GEO19
VOC	Y	ug/l	12/09/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	12/09/2017	N	Cov	GEO32
Chloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dichloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloroethane	1.7	ug/l	12/09/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	12/09/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358235** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW03**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	12/09/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,2,2-Tetrachloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
tert-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358235** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW03**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2,4-Trimethylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
n-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Naphthalene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
MTBE	2.7	ug/l	12/09/2017	Y	Cov	GEO32
Dibromofluoromethane	99.8	%Recovery	12/09/2017	N	Cov	GEO32
Toluene-d8	99.3	%Recovery	12/09/2017	N	Cov	GEO32
4-Bromofluorobenzene	95.1	%Recovery	12/09/2017	N	Cov	GEO32
SVOC	Y	ug/l	14/09/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	14/09/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	14/09/2017	N	Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358235** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW03**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Bis(2-chloroethoxy)methane	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	14/09/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	14/09/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	14/09/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	14/09/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358235** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **MW03**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Benzo(b)fluoranthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Fluorophenol	92.6	%Recovery	14/09/2017	N	Cov	GEO40
Phenol-d6	82.5	%Recovery	14/09/2017	N	Cov	GEO40
Nitrobenzene-d5	91.2	%Recovery	14/09/2017	N	Cov	GEO40
2-Fluorobiphenyl	90.0	%Recovery	14/09/2017	N	Cov	GEO40
2,4,6-Tribromophenol	102.9	%Recovery	14/09/2017	N	Cov	GEO40
Terphenyl-d14	91.2	%Recovery	14/09/2017	N	Cov	GEO40

Analyst Comments for 16358235:

This sample has been analysed for Phenols in Water method GEO18, SVOC Waters method GEO40, Boron Total as B, Magnesium, Total as Mg outside recommended stability times. It is therefore possible that the results provided may be compromised. Reporting limits raised for PAH due to nature of sample matrix. Sub sample taken from PET bottle for PAH due to quality failure on the original sample taken from the glass container and re-analysed outside recommended stability times. It is therefore possible that the results provided could be compromised.GEO40 SVOC Waters:This sample For Hexachlorobutadiene & 4-Nitrophenol as part of the SVOC suite, has been analysed outside recommended stability times due to quality control failures. It is therefore possible that the results provided may be compromised.
Raised reporting limits for GEO46 EPH Waters due to the nature of the sample matrix.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: A I Horobin

Name: **A. Horobin** Date: **19 September 2017**

Title: **Organic Operations Manager**

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358236** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH103**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	14500	ug/l	11/09/2017	Y	Cov	WAS049
Potassium, Total as K	4070	ug/l	11/09/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	23	ug/l	12/09/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	11/09/2017	Y	Cov	WAS049
Cadmium , Total as Cd	2.80	ug/l	11/09/2017	Y	Cov	WAS049
Chromium , Total as Cr	8.80	ug/l	11/09/2017	Y	Cov	WAS049
Copper , Total as Cu	45.4	ug/l	11/09/2017	Y	Cov	WAS049
Iron, Total as Fe	10700	ug/l	11/09/2017	Y	Cov	WAS049
Lead , Total as Pb	194	ug/l	11/09/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.05	ug/l	05/09/2017	Y	Cov	WAS013
Nickel , Total as Ni	28.6	ug/l	11/09/2017	Y	Cov	WAS049
Zinc , Total as Zn	387	ug/l	11/09/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	12/09/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<40	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<40	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	177	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<40	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	177	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<40	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<40	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<40	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	71	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<40	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	71	ug/l	15/09/2017	N	Cov	GEO46

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358236** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH103**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
EPH >C10 - C44	247	ug/l	15/09/2017	N	Cov	GEO46
Acenaphthene	0.054	ug/l	04/09/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Fluorene	0.013	ug/l	04/09/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Naphthalene	0.040	ug/l	04/09/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
PAH, Total	0.108	ug/l	04/09/2017	N	Cov	GEO19
VOC	Y	ug/l	12/09/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	12/09/2017	N	Cov	GEO32
Chloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dichloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	12/09/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358236** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH103**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	12/09/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,2,2-Tetrachloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
tert-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358236** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH103**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2,4-Trimethylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
n-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Naphthalene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
MTBE	1.2	ug/l	12/09/2017	Y	Cov	GEO32
Dibromofluoromethane	100.8	%Recovery	12/09/2017	N	Cov	GEO32
Toluene-d8	99.2	%Recovery	12/09/2017	N	Cov	GEO32
4-Bromofluorobenzene	90.1	%Recovery	12/09/2017	N	Cov	GEO32
SVOC	Y	ug/l	14/09/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	14/09/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	14/09/2017	N	Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358236** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH103**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Bis(2-chloroethoxy)methane	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	14/09/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	14/09/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	14/09/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	14/09/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358236** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH103**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Benzo(b)fluoranthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Fluorophenol	90.9	%Recovery	14/09/2017	N	Cov	GEO40
Phenol-d6	76.3	%Recovery	14/09/2017	N	Cov	GEO40
Nitrobenzene-d5	88.1	%Recovery	14/09/2017	N	Cov	GEO40
2-Fluorobiphenyl	86.6	%Recovery	14/09/2017	N	Cov	GEO40
2,4,6-Tribromophenol	99.6	%Recovery	14/09/2017	N	Cov	GEO40
Terphenyl-d14	101.0	%Recovery	14/09/2017	N	Cov	GEO40

Analyst Comments for 16358236:

This sample has been analysed for Phenols in Water method GEO18, SVOC Waters method GEO40, Boron Total as B, Magnesium, Total as Mg outside recommended stability times. It is therefore possible that the results provided may be compromised. GEO40 SVOC Waters:This sample For Hexachlorobutadiene & 4-Nitrophenol as part of the SVOC suite, has been analysed outside recommended stability times due to quality control failures. It is therefore possible that the results provided may be compromised.
Raised reporting limits for GEO46 EPH Waters due to the nature of the sample matrix.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: A I Horobin

Name: **A. Horobin** Date: **19 September 2017**

Title: **Organic Operations Manager**

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358237** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH101**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Magnesium, Total as Mg	11600	ug/l	11/09/2017	Y	Cov	WAS049
Potassium, Total as K	5320	ug/l	11/09/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	3.8	ug/l	12/09/2017	Y	Cov	WAS060
Boron , Total as B	<230	ug/l	11/09/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	11/09/2017	Y	Cov	WAS049
Chromium , Total as Cr	8.20	ug/l	11/09/2017	Y	Cov	WAS049
Copper , Total as Cu	14.5	ug/l	11/09/2017	Y	Cov	WAS049
Iron, Total as Fe	5400	ug/l	11/09/2017	Y	Cov	WAS049
Lead , Total as Pb	20.3	ug/l	11/09/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.05	ug/l	05/09/2017	Y	Cov	WAS013
Nickel , Total as Ni	23.2	ug/l	11/09/2017	Y	Cov	WAS049
Zinc , Total as Zn	98.1	ug/l	11/09/2017	Y	Cov	WAS049
2 - Chlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	12/09/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	12/09/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	12/09/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<40	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<40	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<40	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C35 - C44	<40	ug/l	15/09/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<40	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<40	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<40	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<40	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<40	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<40	ug/l	15/09/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	<40	ug/l	15/09/2017	N	Cov	GEO46

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358237** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH101**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
EPH >C10 - C44	<40	ug/l	15/09/2017	N	Cov	GEO46
Acenaphthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Fluorene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Naphthalene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	04/09/2017	Y	Cov	GEO19
PAH, Total	<0.01	ug/l	04/09/2017	N	Cov	GEO19
VOC	Y	ug/l	12/09/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	12/09/2017	N	Cov	GEO32
Chloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dichloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	12/09/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358237** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH101**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	12/09/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,1,2,2-Tetrachloroethane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
tert-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358237** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH101**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2,4-Trimethylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
n-Butylbenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Naphthalene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
MTBE	<1.0	ug/l	12/09/2017	Y	Cov	GEO32
Dibromofluoromethane	100.1	%Recovery	12/09/2017	N	Cov	GEO32
Toluene-d8	100.6	%Recovery	12/09/2017	N	Cov	GEO32
4-Bromofluorobenzene	93.8	%Recovery	12/09/2017	N	Cov	GEO32
SVOC	Y	ug/l	14/09/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	14/09/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	14/09/2017	N	Cov	GEO40
1,2-Dichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358237** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH101**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Bis(2-chloroethoxy)methane	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	14/09/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	14/09/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	14/09/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
di-n-Butylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	14/09/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	14/09/2017	Y	Cov	GEO40

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Report Number: **COV/1430113/2017** Issue **1**
Laboratory Number: **16358237** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **BH101**
Sample Matrix: **Ground Water**
Sample Date/Time: **28 August 2017**
Sample Received: **29 August 2017**
Analysis Complete: **19 September 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Benzo(b)fluoranthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	14/09/2017	Y	Cov	GEO40
2-Fluorophenol	94.0	%Recovery	14/09/2017	N	Cov	GEO40
Phenol-d6	80.1	%Recovery	14/09/2017	N	Cov	GEO40
Nitrobenzene-d5	92.0	%Recovery	14/09/2017	N	Cov	GEO40
2-Fluorobiphenyl	90.6	%Recovery	14/09/2017	N	Cov	GEO40
2,4,6-Tribromophenol	96.8	%Recovery	14/09/2017	N	Cov	GEO40
Terphenyl-d14	97.1	%Recovery	14/09/2017	N	Cov	GEO40

Analyst Comments for 16358237:

This sample has been analysed for Phenols in Water method GEO18, SVOC Waters method GEO40, Boron Total as B, Magnesium, Total as Mg outside recommended stability times. It is therefore possible that the results provided may be compromised. GEO40 SVOC Waters:This sample For Hexachlorobutadiene & 4-Nitrophenol as part of the SVOC suite, has been analysed outside recommended stability times due to quality control failures. It is therefore possible that the results provided may be compromised.
Raised reporting limits for GEO46 EPH Waters due to the nature of the sample matrix.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: A I Horobin

Name: **A. Horobin** Date: **19 September 2017**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue
Coventry
CV4 9GU

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www.alsenvironmental.co.uk

Miss Reilly
RPS Consultants
West Pier Business Campus
Dun Laoghaire
Dublin

28 November 2017

Test Report: COV/1464510/2017

Dear Miss Reilly

Analysis of your sample(s) submitted on 14 November 2017 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed: A I Horobin

Name: A. Horobin

Title: Organic Operations Manager

Report Summary

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Miss Catriona Reilly
RPS Consultants
West Pier Business Campus
Dun Laoghaire
Dublin

Date of Issue: **28 November 2017**

Report Number: **COV/1464510/2017** Issue **1**

This issue replaces all previous issues

Job Description: Portlaoise Groundwater

Job Location: Portlaoise

Number of Samples included in this report **8**

Job Received: **14 November 2017**

Number of Test Results included in this report **1472**

Analysis Commenced: **15 November 2017**

Signed: A I Horobin

Name: **A. Horobin** Date: **28 November 2017**

Title: **Organic Operations Manager**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

Certificate of Analysis

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ALS Environmental

Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581460** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW1**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Sodium, Total as Na	76500	ug/l	21/11/2017	Y	Cov	WAS049
Calcium, Total as Ca	138000	ug/l	21/11/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	<1.0	ug/l	22/11/2017	Y	Cov	WAS060
Boron, Total as B	<0.23	mg/l	21/11/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	21/11/2017	Y	Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	21/11/2017	Y	Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	21/11/2017	Y	Cov	WAS049
Iron, Total as Fe	283	ug/l	21/11/2017	Y	Cov	WAS049
Lead , Total as Pb	8.70	ug/l	21/11/2017	Y	Cov	WAS049
Magnesium, Total as Mg	9.5	mg/l	21/11/2017	Y	Cov	WAS049
Manganese , Total as Mn	25.8	ug/l	21/11/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.10	ug/l	20/11/2017	Y	Cov	WAS013
Nickel , Total as Ni	<3.00	ug/l	21/11/2017	Y	Cov	WAS049
Potassium , Total as K	5.05	mg/l	21/11/2017	Y	Cov	WAS049
Selenium, trace Total as Se	<0.80	ug/l	22/11/2017	Y	Cov	WAS060
Zinc , Total as Zn	<18.0	ug/l	21/11/2017	Y	Cov	WAS049
Alkalinity as CaCO3	358	mg/l	26/11/2017	Y	Cov	WAS025
Chloride as Cl	122	mg/l	15/11/2017	N	Cov	WAS036
Sulphate as SO4	38.9	mg/l	15/11/2017	N	Cov	WAS036
Cyanide, Total as CN	<9	ug/l	17/11/2017	Y	Cov	WAS018
2 - Chlorophenol	<1.00	ug/l	22/11/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	22/11/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	22/11/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	22/11/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	22/11/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	22/11/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	22/11/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	22/11/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	22/11/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	21/11/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	21/11/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<10	ug/l	21/11/2017	N	Cov	GEO46

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ALS Environmental

Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581460** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW1**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aliphatic EPH >C35 - C44	<10	ug/l	21/11/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<10	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<10	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	<10	ug/l	21/11/2017	N	Cov	GEO46
EPH >C10 - C44	<10	ug/l	21/11/2017	N	Cov	GEO46
Acenaphthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Fluorene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Naphthalene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
PAH, Total	<0.01	ug/l	21/11/2017	N	Cov	GEO19
VOC	Y	ug/l	22/11/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	22/11/2017	N	Cov	GEO32
Chloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581460** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW1**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Dichloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	22/11/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	22/11/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581460** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW1**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation	Method
1,1,2,2-Tetrachloroethane	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	22/11/2017	Y Cov	GEO32
n-Propylbenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
Bromobenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
tert-Butylbenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,2,4-Trimethylbenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
n-Butylbenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	22/11/2017	Y Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
Naphthalene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
MTBE	<1.0	ug/l	22/11/2017	Y Cov	GEO32
Dibromofluoromethane	101.1	%Recovery	22/11/2017	N Cov	GEO32
Toluene-d8	99.5	%Recovery	22/11/2017	N Cov	GEO32
4-Bromofluorobenzene	100.6	%Recovery	22/11/2017	N Cov	GEO32
SVOC	Y	ug/l	17/11/2017	N Cov	GEO40
Phenol	<1.0	ug/l	17/11/2017	Y Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	17/11/2017	Y Cov	GEO40
2-Chlorophenol	<1.0	ug/l	17/11/2017	Y Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y Cov	GEO40
2-Methylphenol	<1.0	ug/l	17/11/2017	Y Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	17/11/2017	N Cov	GEO40
Dibenzofuran	<1.0	ug/l	17/11/2017	N Cov	GEO40

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581460** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW1**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	17/11/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40

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ALS Environmental

Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581460** Sample **1** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW1**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
di-n-Butylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	17/11/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Fluorophenol	79.9	%Recovery	17/11/2017	N	Cov	GEO40
Phenol-d6	65.8	%Recovery	17/11/2017	N	Cov	GEO40
Nitrobenzene-d5	80.9	%Recovery	17/11/2017	N	Cov	GEO40
2-Fluorobiphenyl	84.9	%Recovery	17/11/2017	N	Cov	GEO40
2,4,6-Tribromophenol	74.8	%Recovery	17/11/2017	N	Cov	GEO40
Terphenyl-d14	101.0	%Recovery	17/11/2017	N	Cov	GEO40

Analyst Comments for 16581460: No Analyst Comment

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Che = Chester(CH4 9EP), Ctd = Coatbridge(ML5 4FR), Cov = Coventry(CV4 9GU), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: A I Horobin

Name: **A. Horobin** Date: **28 November 2017**

Title: **Organic Operations Manager**

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581461** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW2**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Sodium, Total as Na	3720	ug/l	17/11/2017	Y	Cov	WAS049
Calcium, Total as Ca	79300	ug/l	17/11/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	<1.0	ug/l	17/11/2017	Y	Cov	WAS060
Boron, Total as B	<0.23	mg/l	17/11/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	17/11/2017	Y	Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	17/11/2017	Y	Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	17/11/2017	Y	Cov	WAS049
Iron, Total as Fe	245	ug/l	17/11/2017	Y	Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	17/11/2017	Y	Cov	WAS049
Magnesium, Total as Mg	2.8	mg/l	17/11/2017	Y	Cov	WAS049
Manganese , Total as Mn	83.0	ug/l	17/11/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.10	ug/l	20/11/2017	Y	Cov	WAS013
Nickel , Total as Ni	3.50	ug/l	17/11/2017	Y	Cov	WAS049
Potassium , Total as K	1.18	mg/l	17/11/2017	Y	Cov	WAS049
Selenium, trace Total as Se	<0.80	ug/l	17/11/2017	Y	Cov	WAS060
Zinc , Total as Zn	<18.0	ug/l	17/11/2017	Y	Cov	WAS049
Alkalinity as CaCO3	198	mg/l	26/11/2017	Y	Cov	WAS025
Chloride as Cl	6.1	mg/l	15/11/2017	N	Cov	WAS036
Sulphate as SO4	5.6	mg/l	15/11/2017	N	Cov	WAS036
Cyanide, Total as CN	<9	ug/l	17/11/2017	Y	Cov	WAS018
2 - Chlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	27/11/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	21/11/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	15	ug/l	21/11/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	70	ug/l	21/11/2017	N	Cov	GEO46

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581461** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW2**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aliphatic EPH >C35 - C44	13	ug/l	21/11/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	98	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<10	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	<10	ug/l	21/11/2017	N	Cov	GEO46
EPH >C10 - C44	98	ug/l	21/11/2017	N	Cov	GEO46
Acenaphthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Fluorene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Naphthalene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
PAH, Total	<0.01	ug/l	21/11/2017	N	Cov	GEO19
VOC	Y	ug/l	22/11/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	22/11/2017	N	Cov	GEO32
Chloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581461** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW2**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Dichloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	22/11/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	22/11/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581461** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW2**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,1,2,2-Tetrachloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
tert-Butylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,4-Trimethylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
n-Butylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Naphthalene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
MTBE	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromofluoromethane	100.3	%Recovery	22/11/2017	N	Cov	GEO32
Toluene-d8	99.3	%Recovery	22/11/2017	N	Cov	GEO32
4-Bromofluorobenzene	96.8	%Recovery	22/11/2017	N	Cov	GEO32
SVOC	Y	ug/l	17/11/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	17/11/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	17/11/2017	N	Cov	GEO40

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581461** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW2**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	17/11/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581461** Sample **2** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW2**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
di-n-Butylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	17/11/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Fluorophenol	82.4	%Recovery	17/11/2017	N	Cov	GEO40
Phenol-d6	78.7	%Recovery	17/11/2017	N	Cov	GEO40
Nitrobenzene-d5	83.2	%Recovery	17/11/2017	N	Cov	GEO40
2-Fluorobiphenyl	87.5	%Recovery	17/11/2017	N	Cov	GEO40
2,4,6-Tribromophenol	73.4	%Recovery	17/11/2017	N	Cov	GEO40
Terphenyl-d14	91.6	%Recovery	17/11/2017	N	Cov	GEO40

Analyst Comments for 16581461: This sample has been analysed for Phenols in Water method GEO18 outside recommended stability times. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Che = Chester(CH4 9EP), Ctd = Coatbridge(ML5 4FR), Cov = Coventry(CV4 9GU), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: A I Horobin

Name: **A. Horobin** Date: **28 November 2017**

Title: **Organic Operations Manager**

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581462** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW3**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Sodium, Total as Na	10300	ug/l	21/11/2017	Y	Cov	WAS049
Calcium, Total as Ca	200000	ug/l	21/11/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	15	ug/l	22/11/2017	Y	Cov	WAS060
Boron, Total as B	<0.23	mg/l	21/11/2017	Y	Cov	WAS049
Cadmium , Total as Cd	1.50	ug/l	21/11/2017	Y	Cov	WAS049
Chromium , Total as Cr	9.90	ug/l	21/11/2017	Y	Cov	WAS049
Copper , Total as Cu	42.9	ug/l	21/11/2017	Y	Cov	WAS049
Iron, Total as Fe	10800	ug/l	21/11/2017	Y	Cov	WAS049
Lead , Total as Pb	207	ug/l	21/11/2017	Y	Cov	WAS049
Magnesium, Total as Mg	13.3	mg/l	21/11/2017	Y	Cov	WAS049
Manganese , Total as Mn	1280	ug/l	21/11/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.10	ug/l	20/11/2017	Y	Cov	WAS013
Nickel , Total as Ni	25.6	ug/l	21/11/2017	Y	Cov	WAS049
Potassium , Total as K	4.94	mg/l	21/11/2017	Y	Cov	WAS049
Selenium, trace Total as Se	1.23	ug/l	22/11/2017	Y	Cov	WAS060
Zinc , Total as Zn	251	ug/l	21/11/2017	Y	Cov	WAS049
Alkalinity as CaCO3	506	mg/l	26/11/2017	Y	Cov	WAS025
Chloride as Cl	33.5	mg/l	15/11/2017	N	Cov	WAS036
Sulphate, total as SO4 by I.C.	25.57	mg/l	21/11/2017	Y	Cov	CON27
Cyanide, Total as CN	<9	ug/l	17/11/2017	Y	Cov	WAS018
2 - Chlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	27/11/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<40	ug/l	21/11/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<40	ug/l	21/11/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	263	ug/l	21/11/2017	N	Cov	GEO46

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581462** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW3**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aliphatic EPH >C35 - C44	<40	ug/l	21/11/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	263	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<40	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<40	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<40	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	89	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<40	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	89	ug/l	21/11/2017	N	Cov	GEO46
EPH >C10 - C44	351	ug/l	21/11/2017	N	Cov	GEO46
Acenaphthene	0.031	ug/l	21/11/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Fluorene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Naphthalene	<0.03	ug/l	21/11/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
PAH, Total	0.031	ug/l	21/11/2017	N	Cov	GEO19
VOC	Y	ug/l	22/11/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	22/11/2017	N	Cov	GEO32
Chloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581462** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW3**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Dichloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	22/11/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	22/11/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581462** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW3**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation	Method
1,1,2,2-Tetrachloroethane	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	22/11/2017	Y Cov	GEO32
n-Propylbenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
Bromobenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
tert-Butylbenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,2,4-Trimethylbenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
n-Butylbenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	22/11/2017	Y Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
Naphthalene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
MTBE	<1.0	ug/l	22/11/2017	Y Cov	GEO32
Dibromofluoromethane	99.3	%Recovery	22/11/2017	N Cov	GEO32
Toluene-d8	100.4	%Recovery	22/11/2017	N Cov	GEO32
4-Bromofluorobenzene	94.9	%Recovery	22/11/2017	N Cov	GEO32
SVOC	Y	ug/l	17/11/2017	N Cov	GEO40
Phenol	<1.0	ug/l	17/11/2017	Y Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	17/11/2017	Y Cov	GEO40
2-Chlorophenol	<1.0	ug/l	17/11/2017	Y Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y Cov	GEO40
2-Methylphenol	<1.0	ug/l	17/11/2017	Y Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	17/11/2017	N Cov	GEO40
Dibenzofuran	<1.0	ug/l	17/11/2017	N Cov	GEO40

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581462** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW3**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	17/11/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581462** Sample **3** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW3**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
di-n-Butylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	17/11/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Fluorophenol	83.4	%Recovery	17/11/2017	N	Cov	GEO40
Phenol-d6	78.5	%Recovery	17/11/2017	N	Cov	GEO40
Nitrobenzene-d5	87.0	%Recovery	17/11/2017	N	Cov	GEO40
2-Fluorobiphenyl	94.2	%Recovery	17/11/2017	N	Cov	GEO40
2,4,6-Tribromophenol	89.8	%Recovery	17/11/2017	N	Cov	GEO40
Terphenyl-d14	108.9	%Recovery	17/11/2017	N	Cov	GEO40

Analyst Comments for 16581462: This sample has been analysed for Phenols in Water method GEO18 outside recommended stability times. It is therefore possible that the results provided may be compromised. The reporting limit for Naphthalene for PAH analysis has been raised due to interference from sample matrix. {/*}Sulphate analysed by ion chromatography due to interference with turbidmetric determination{*/}

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Che = Chester(CH4 9EP), Ctd = Coatbridge(ML5 4FR), Cov = Coventry(CV4 9GU), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: A I Horobin
Name: **A. Horobin** Date: **28 November 2017**
Title: **Organic Operations Manager**

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581463** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW4**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Sodium, Total as Na	11400	ug/l	17/11/2017	Y	Cov	WAS049
Calcium, Total as Ca	57500	ug/l	17/11/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	1.1	ug/l	17/11/2017	Y	Cov	WAS060
Boron, Total as B	<0.23	mg/l	17/11/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	17/11/2017	Y	Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	17/11/2017	Y	Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	17/11/2017	Y	Cov	WAS049
Iron, Total as Fe	347	ug/l	17/11/2017	Y	Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	17/11/2017	Y	Cov	WAS049
Magnesium, Total as Mg	3.2	mg/l	17/11/2017	Y	Cov	WAS049
Manganese , Total as Mn	42.8	ug/l	17/11/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.10	ug/l	20/11/2017	Y	Cov	WAS013
Nickel , Total as Ni	4.70	ug/l	17/11/2017	Y	Cov	WAS049
Potassium , Total as K	4.77	mg/l	17/11/2017	Y	Cov	WAS049
Selenium, trace Total as Se	<0.80	ug/l	17/11/2017	Y	Cov	WAS060
Zinc , Total as Zn	<18.0	ug/l	17/11/2017	Y	Cov	WAS049
Alkalinity as CaCO3	157	mg/l	26/11/2017	Y	Cov	WAS025
Chloride as Cl	13.8	mg/l	15/11/2017	N	Cov	WAS036
Sulphate as SO4	12.1	mg/l	15/11/2017	N	Cov	WAS036
Cyanide, Total as CN	<9	ug/l	17/11/2017	Y	Cov	WAS018
2 - Chlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	27/11/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	24/11/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	24/11/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<10	ug/l	24/11/2017	N	Cov	GEO46

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581463** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW4**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aliphatic EPH >C35 - C44	<10	ug/l	24/11/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<10	ug/l	24/11/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	24/11/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	24/11/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<10	ug/l	24/11/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	24/11/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	24/11/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	<10	ug/l	24/11/2017	N	Cov	GEO46
EPH >C10 - C44	<10	ug/l	24/11/2017	N	Cov	GEO46
Acenaphthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Fluorene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Naphthalene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
PAH, Total	<0.01	ug/l	21/11/2017	N	Cov	GEO19
VOC	Y	ug/l	22/11/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	22/11/2017	N	Cov	GEO32
Chloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581463** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW4**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Dichloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	22/11/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	22/11/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581463** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW4**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,1,2,2-Tetrachloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
tert-Butylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,4-Trimethylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
n-Butylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Naphthalene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
MTBE	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromofluoromethane	100.9	%Recovery	22/11/2017	N	Cov	GEO32
Toluene-d8	100.0	%Recovery	22/11/2017	N	Cov	GEO32
4-Bromofluorobenzene	97.2	%Recovery	22/11/2017	N	Cov	GEO32
SVOC	Y	ug/l	17/11/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	17/11/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	17/11/2017	N	Cov	GEO40

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581463** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW4**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	17/11/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581463** Sample **4** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW4**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
di-n-Butylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	17/11/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Fluorophenol	83.7	%Recovery	17/11/2017	N	Cov	GEO40
Phenol-d6	72.4	%Recovery	17/11/2017	N	Cov	GEO40
Nitrobenzene-d5	85.3	%Recovery	17/11/2017	N	Cov	GEO40
2-Fluorobiphenyl	88.4	%Recovery	17/11/2017	N	Cov	GEO40
2,4,6-Tribromophenol	73.5	%Recovery	17/11/2017	N	Cov	GEO40
Terphenyl-d14	89.9	%Recovery	17/11/2017	N	Cov	GEO40

Analyst Comments for 16581463: This sample has been analysed for Phenols in Water method GEO18 outside recommended stability times. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Che = Chester(CH4 9EP), Ctd = Coatbridge(ML5 4FR), Cov = Coventry(CV4 9GU), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: A I Horobin

Name: **A. Horobin** Date: **28 November 2017**

Title: **Organic Operations Manager**

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581464** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW5**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Sodium, Total as Na	21000	ug/l	17/11/2017	Y	Cov	WAS049
Calcium, Total as Ca	62800	ug/l	17/11/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	<1.0	ug/l	17/11/2017	Y	Cov	WAS060
Boron, Total as B	<0.23	mg/l	17/11/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	17/11/2017	Y	Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	17/11/2017	Y	Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	17/11/2017	Y	Cov	WAS049
Iron, Total as Fe	521	ug/l	17/11/2017	Y	Cov	WAS049
Lead , Total as Pb	27.9	ug/l	17/11/2017	Y	Cov	WAS049
Magnesium, Total as Mg	38.0	mg/l	17/11/2017	Y	Cov	WAS049
Manganese , Total as Mn	45.4	ug/l	17/11/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.10	ug/l	20/11/2017	Y	Cov	WAS013
Nickel , Total as Ni	4.20	ug/l	17/11/2017	Y	Cov	WAS049
Potassium , Total as K	2.09	mg/l	17/11/2017	Y	Cov	WAS049
Selenium, trace Total as Se	<0.80	ug/l	17/11/2017	Y	Cov	WAS060
Zinc , Total as Zn	31.1	ug/l	17/11/2017	Y	Cov	WAS049
Alkalinity as CaCO3	324	mg/l	26/11/2017	Y	Cov	WAS025
Chloride as Cl	12.4	mg/l	15/11/2017	N	Cov	WAS036
Sulphate as SO4	13.0	mg/l	15/11/2017	N	Cov	WAS036
Cyanide, Total as CN	<9	ug/l	17/11/2017	Y	Cov	WAS018
2 - Chlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	27/11/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	21/11/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	21/11/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	49	ug/l	21/11/2017	N	Cov	GEO46

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581464** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW5**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aliphatic EPH >C35 - C44	<10	ug/l	21/11/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	49	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<10	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	11	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	11	ug/l	21/11/2017	N	Cov	GEO46
EPH >C10 - C44	60	ug/l	21/11/2017	N	Cov	GEO46
Acenaphthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Fluorene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Naphthalene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
PAH, Total	<0.01	ug/l	21/11/2017	N	Cov	GEO19
VOC	Y	ug/l	22/11/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	22/11/2017	N	Cov	GEO32
Chloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581464** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW5**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Dichloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	22/11/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	22/11/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581464** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW5**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation	Method
1,1,2,2-Tetrachloroethane	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	22/11/2017	Y Cov	GEO32
n-Propylbenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
Bromobenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
tert-Butylbenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,2,4-Trimethylbenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
n-Butylbenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	22/11/2017	Y Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
Naphthalene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	22/11/2017	Y Cov	GEO32
MTBE	<1.0	ug/l	22/11/2017	Y Cov	GEO32
Dibromofluoromethane	99.8	%Recovery	22/11/2017	N Cov	GEO32
Toluene-d8	99.4	%Recovery	22/11/2017	N Cov	GEO32
4-Bromofluorobenzene	95.6	%Recovery	22/11/2017	N Cov	GEO32
SVOC	Y	ug/l	17/11/2017	N Cov	GEO40
Phenol	<1.0	ug/l	17/11/2017	Y Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	17/11/2017	Y Cov	GEO40
2-Chlorophenol	<1.0	ug/l	17/11/2017	Y Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y Cov	GEO40
2-Methylphenol	<1.0	ug/l	17/11/2017	Y Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	17/11/2017	N Cov	GEO40
Dibenzofuran	<1.0	ug/l	17/11/2017	N Cov	GEO40

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581464** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW5**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	17/11/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581464** Sample **5** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW5**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
di-n-Butylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	17/11/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Fluorophenol	84.2	%Recovery	17/11/2017	N	Cov	GEO40
Phenol-d6	78.6	%Recovery	17/11/2017	N	Cov	GEO40
Nitrobenzene-d5	91.9	%Recovery	17/11/2017	N	Cov	GEO40
2-Fluorobiphenyl	96.9	%Recovery	17/11/2017	N	Cov	GEO40
2,4,6-Tribromophenol	77.2	%Recovery	17/11/2017	N	Cov	GEO40
Terphenyl-d14	105.5	%Recovery	17/11/2017	N	Cov	GEO40

Analyst Comments for 16581464: This sample has been analysed for Phenols in Water method GEO18 outside recommended stability times. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Che = Chester(CH4 9EP), Ctd = Coatbridge(ML5 4FR), Cov = Coventry(CV4 9GU), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: A I Horobin

Name: **A. Horobin** Date: **28 November 2017**

Title: **Organic Operations Manager**

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581465** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW6**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Sodium, Total as Na	19300	ug/l	17/11/2017	Y	Cov	WAS049
Calcium, Total as Ca	58200	ug/l	17/11/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	<1.0	ug/l	17/11/2017	Y	Cov	WAS060
Boron, Total as B	<0.23	mg/l	17/11/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	17/11/2017	Y	Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	17/11/2017	Y	Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	17/11/2017	Y	Cov	WAS049
Iron, Total as Fe	<230	ug/l	17/11/2017	Y	Cov	WAS049
Lead , Total as Pb	<6.00	ug/l	17/11/2017	Y	Cov	WAS049
Magnesium, Total as Mg	34.2	mg/l	17/11/2017	Y	Cov	WAS049
Manganese , Total as Mn	13.5	ug/l	17/11/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.10	ug/l	20/11/2017	Y	Cov	WAS013
Nickel , Total as Ni	<3.00	ug/l	17/11/2017	Y	Cov	WAS049
Potassium , Total as K	1.60	mg/l	17/11/2017	Y	Cov	WAS049
Selenium, trace Total as Se	<0.80	ug/l	17/11/2017	Y	Cov	WAS060
Zinc , Total as Zn	<18.0	ug/l	17/11/2017	Y	Cov	WAS049
Alkalinity as CaCO3	294	mg/l	26/11/2017	Y	Cov	WAS025
Chloride as Cl	13.4	mg/l	15/11/2017	N	Cov	WAS036
Sulphate as SO4	17.8	mg/l	15/11/2017	N	Cov	WAS036
Cyanide, Total as CN	<9	ug/l	17/11/2017	Y	Cov	WAS018
2 - Chlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	1.12	ug/l	27/11/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	27/11/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<10	ug/l	24/11/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<10	ug/l	24/11/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<10	ug/l	24/11/2017	N	Cov	GEO46

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581465** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW6**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aliphatic EPH >C35 - C44	<10	ug/l	24/11/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<10	ug/l	24/11/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<10	ug/l	24/11/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<10	ug/l	24/11/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<10	ug/l	24/11/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<10	ug/l	24/11/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<10	ug/l	24/11/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	<10	ug/l	24/11/2017	N	Cov	GEO46
EPH >C10 - C44	<10	ug/l	24/11/2017	N	Cov	GEO46
Acenaphthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Fluorene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Naphthalene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
PAH, Total	<0.01	ug/l	21/11/2017	N	Cov	GEO19
VOC	Y	ug/l	22/11/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	22/11/2017	N	Cov	GEO32
Chloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Chloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581465** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW6**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Dichloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	22/11/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	22/11/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581465** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW6**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,1,2,2-Tetrachloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
tert-Butylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,4-Trimethylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
n-Butylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Naphthalene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
MTBE	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromofluoromethane	98.4	%Recovery	22/11/2017	N	Cov	GEO32
Toluene-d8	99.7	%Recovery	22/11/2017	N	Cov	GEO32
4-Bromofluorobenzene	96.5	%Recovery	22/11/2017	N	Cov	GEO32
SVOC	Y	ug/l	17/11/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	17/11/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	17/11/2017	N	Cov	GEO40

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581465** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW6**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	17/11/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581465** Sample **6** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW6**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
di-n-Butylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	17/11/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Fluorophenol	78.8	%Recovery	17/11/2017	N	Cov	GEO40
Phenol-d6	65.7	%Recovery	17/11/2017	N	Cov	GEO40
Nitrobenzene-d5	89.9	%Recovery	17/11/2017	N	Cov	GEO40
2-Fluorobiphenyl	97.7	%Recovery	17/11/2017	N	Cov	GEO40
2,4,6-Tribromophenol	75.2	%Recovery	17/11/2017	N	Cov	GEO40
Terphenyl-d14	109.1	%Recovery	17/11/2017	N	Cov	GEO40

Analyst Comments for 16581465: This sample has been analysed for Phenols in Water method GEO18 outside recommended stability times. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Che = Chester(CH4 9EP), Ctd = Coatbridge(ML5 4FR), Cov = Coventry(CV4 9GU), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: A I Horobin

Name: **A. Horobin** Date: **28 November 2017**

Title: **Organic Operations Manager**

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581466** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW7**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Sodium, Total as Na	84100	ug/l	21/11/2017	Y	Cov	WAS049
Calcium, Total as Ca	112000	ug/l	21/11/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	3.6	ug/l	22/11/2017	Y	Cov	WAS060
Boron, Total as B	0.28	mg/l	21/11/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<0.600	ug/l	21/11/2017	Y	Cov	WAS049
Chromium , Total as Cr	<2.00	ug/l	21/11/2017	Y	Cov	WAS049
Copper , Total as Cu	<9.00	ug/l	21/11/2017	Y	Cov	WAS049
Iron, Total as Fe	3100	ug/l	21/11/2017	Y	Cov	WAS049
Lead , Total as Pb	13.3	ug/l	21/11/2017	Y	Cov	WAS049
Magnesium, Total as Mg	20.8	mg/l	21/11/2017	Y	Cov	WAS049
Manganese , Total as Mn	555	ug/l	21/11/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.10	ug/l	20/11/2017	Y	Cov	WAS013
Nickel , Total as Ni	36.8	ug/l	21/11/2017	Y	Cov	WAS049
Potassium , Total as K	3.29	mg/l	21/11/2017	Y	Cov	WAS049
Selenium, trace Total as Se	<0.80	ug/l	22/11/2017	Y	Cov	WAS060
Zinc , Total as Zn	30.7	ug/l	21/11/2017	Y	Cov	WAS049
Alkalinity as CaCO3	356	mg/l	26/11/2017	Y	Cov	WAS025
Chloride as Cl	141	mg/l	15/11/2017	N	Cov	WAS036
Sulphate as SO4	8.8	mg/l	15/11/2017	N	Cov	WAS036
Cyanide, Total as CN	<9	ug/l	17/11/2017	Y	Cov	WAS018
2 - Chlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	27/11/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<40	ug/l	24/11/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<40	ug/l	24/11/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<40	ug/l	24/11/2017	N	Cov	GEO46

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581466** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW7**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aliphatic EPH >C35 - C44	<40	ug/l	24/11/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<40	ug/l	24/11/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<40	ug/l	24/11/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<40	ug/l	24/11/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<40	ug/l	24/11/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<40	ug/l	24/11/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<40	ug/l	24/11/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	<40	ug/l	24/11/2017	N	Cov	GEO46
EPH >C10 - C44	<40	ug/l	24/11/2017	N	Cov	GEO46
Acenaphthene	0.020	ug/l	21/11/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (a) anthracene	0.021	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	0.041	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (a) pyrene	0.036	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	0.020	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Chrysene	<0.03	ug/l	21/11/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Fluoranthene	0.011	ug/l	21/11/2017	Y	Cov	GEO19
Fluorene	0.016	ug/l	21/11/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Naphthalene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Pyrene	0.078	ug/l	21/11/2017	Y	Cov	GEO19
PAH, Total	0.243	ug/l	21/11/2017	N	Cov	GEO19
VOC	Y	ug/l	22/11/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	22/11/2017	N	Cov	GEO32
Chloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Chloroethane	1.1	ug/l	22/11/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581466** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW7**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Dichloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloroethane	2.3	ug/l	22/11/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	22/11/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	22/11/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581466** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW7**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,1,2,2-Tetrachloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
tert-Butylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,4-Trimethylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
n-Butylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Naphthalene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
MTBE	8.7	ug/l	22/11/2017	Y	Cov	GEO32
Dibromofluoromethane	99.3	%Recovery	22/11/2017	N	Cov	GEO32
Toluene-d8	101.1	%Recovery	22/11/2017	N	Cov	GEO32
4-Bromofluorobenzene	97.1	%Recovery	22/11/2017	N	Cov	GEO32
SVOC	Y	ug/l	17/11/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	17/11/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	17/11/2017	N	Cov	GEO40

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581466** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW7**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	17/11/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581466** Sample **7** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW7**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
di-n-Butylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	17/11/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Fluorophenol	84.0	%Recovery	17/11/2017	N	Cov	GEO40
Phenol-d6	83.5	%Recovery	17/11/2017	N	Cov	GEO40
Nitrobenzene-d5	84.9	%Recovery	17/11/2017	N	Cov	GEO40
2-Fluorobiphenyl	90.3	%Recovery	17/11/2017	N	Cov	GEO40
2,4,6-Tribromophenol	91.5	%Recovery	17/11/2017	N	Cov	GEO40
Terphenyl-d14	101.4	%Recovery	17/11/2017	N	Cov	GEO40

Analyst Comments for 16581466: This sample has been analysed for Phenols in Water method GEO18 outside recommended stability times. It is therefore possible that the results provided may be compromised. Raised reporting limits for GEO46 EPH Waters due to the nature of the sample matrix.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Che = Chester(CH4 9EP), Ctd = Coatbridge(ML5 4FR), Cov = Coventry(CV4 9GU), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: A I Horobin Name: **A. Horobin** Date: **28 November 2017**
Title: **Organic Operations Manager**

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581467** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW8**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Sodium, Total as Na	124000	ug/l	24/11/2017	Y	Cov	WAS049
Calcium, Total as Ca	430000	ug/l	24/11/2017	Y	Cov	WAS049
Arsenic, Ultra-low Total as As	11	ug/l	22/11/2017	Y	Cov	WAS060
Boron, Total as B	<2.30	mg/l	24/11/2017	Y	Cov	WAS049
Cadmium , Total as Cd	<6.00	ug/l	24/11/2017	Y	Cov	WAS049
Chromium , Total as Cr	<20.0	ug/l	24/11/2017	Y	Cov	WAS049
Copper , Total as Cu	108	ug/l	24/11/2017	Y	Cov	WAS049
Iron, Total as Fe	16000	ug/l	24/11/2017	Y	Cov	WAS049
Lead , Total as Pb	<60.0	ug/l	24/11/2017	Y	Cov	WAS049
Magnesium, Total as Mg	29.7	mg/l	24/11/2017	Y	Cov	WAS049
Manganese , Total as Mn	4960	ug/l	24/11/2017	Y	Cov	WAS049
Mercury, Total as Hg	<0.10	ug/l	20/11/2017	Y	Cov	WAS013
Nickel , Total as Ni	176	ug/l	24/11/2017	Y	Cov	WAS049
Potassium , Total as K	4.96	mg/l	24/11/2017	Y	Cov	WAS049
Selenium, trace Total as Se	5.78	ug/l	23/11/2017	Y	Cov	WAS060
Zinc , Total as Zn	704	ug/l	24/11/2017	Y	Cov	WAS049
Alkalinity as CaCO3	1020	mg/l	26/11/2017	Y	Cov	WAS025
Chloride as Cl	269	mg/l	15/11/2017	N	Cov	WAS036
Sulphate as SO4	<4.4	mg/l	15/11/2017	N	Cov	WAS036
Cyanide, Total as CN	<9	ug/l	17/11/2017	Y	Cov	WAS018
2 - Chlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2 - Methylphenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
2,4 - Dichlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2,4 - Dimethylphenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
2,4,6 - Trichlorophenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
3,5-Dimethylphenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
4-Chlorophenol	<1.00	ug/l	27/11/2017	Y	Cov	GEO18
3+4-Methylphenol	<1.00	ug/l	27/11/2017	N	Cov	GEO18
Phenol	<5.00	ug/l	27/11/2017	Y	Cov	GEO18
Aliphatic EPH >C10 - C12	<40	ug/l	21/11/2017	N	Cov	GEO46
Aliphatic EPH >C12 - C16	<40	ug/l	21/11/2017	N	Cov	GEO46
Aliphatic EPH >C16 - C35	<40	ug/l	21/11/2017	N	Cov	GEO46

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581467** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW8**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Aliphatic EPH >C35 - C44	<40	ug/l	21/11/2017	N	Cov	GEO46
Aliphatic EPH >C10 - C44	<40	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C10 - C12	<40	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C12 - C16	<40	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C16 - C21	<40	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C21 - C35	<40	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C35 - C44	<40	ug/l	21/11/2017	N	Cov	GEO46
Aromatic EPH >C10 - C44	<40	ug/l	21/11/2017	N	Cov	GEO46
EPH >C10 - C44	<40	ug/l	21/11/2017	N	Cov	GEO46
Acenaphthene	0.012	ug/l	21/11/2017	Y	Cov	GEO19
Acenaphthylene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (a) anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (g,h,i) perylene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (a) pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (b) fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Benzo (k) fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Chrysene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Dibenz (a,h) anthracene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Fluoranthene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Fluorene	0.028	ug/l	21/11/2017	Y	Cov	GEO19
Indeno (1,2,3) cd pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Naphthalene	0.107	ug/l	21/11/2017	Y	Cov	GEO19
Phenanthrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
Pyrene	<0.01	ug/l	21/11/2017	Y	Cov	GEO19
PAH, Total	0.147	ug/l	21/11/2017	N	Cov	GEO19
VOC	Y	ug/l	22/11/2017	N	Cov	GEO32
Dichlorodifluoromethane	<1.0	ug/l	22/11/2017	N	Cov	GEO32
Chloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Chloroethane	8.9	ug/l	22/11/2017	Y	Cov	GEO32
Bromomethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Trichlorofluoromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581467** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW8**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Dichloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloroethane	3.1	ug/l	22/11/2017	Y	Cov	GEO32
cis-1,2-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
2,2-Dichloropropane	<1.0	ug/l	22/11/2017	N	Cov	GEO32
Chloroform	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromochloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,1-Trichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Benzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Trichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromodichloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromomethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
cis-1,3-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Toluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
trans-1,3-Dichloropropene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,2-Trichloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Carbon Tetrachloride	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Vinyl Chloride	<0.5	ug/l	22/11/2017	Y	Cov	GEO32
1,3-Dichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Tetrachloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Dibromochloromethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dibromoethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Chlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,1,1,2-Tetrachloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Ethyl Benzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
m&p-Xylene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
o-Xylene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Styrene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromoform	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
trans-1,2-Dichloroethene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Isopropylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32

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Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581467** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW8**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,1,2,2-Tetrachloroethane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,3-Trichloropropane	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
n-Propylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Bromobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
2-Chlorotoluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,3,5-Trimethylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
4-Chlorotoluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
tert-Butylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,4-Trimethylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
sec-Butylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
p-Isopropyltoluene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,3-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,4-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
n-Butylbenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2-Dibromo-3-chloropropane	<2.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,4-Trichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Hexachlorobutadiene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
Naphthalene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
1,2,3-Trichlorobenzene	<1.0	ug/l	22/11/2017	Y	Cov	GEO32
MTBE	1.8	ug/l	22/11/2017	Y	Cov	GEO32
Dibromofluoromethane	99.0	%Recovery	22/11/2017	N	Cov	GEO32
Toluene-d8	100.6	%Recovery	22/11/2017	N	Cov	GEO32
4-Bromofluorobenzene	98.6	%Recovery	22/11/2017	N	Cov	GEO32
SVOC	Y	ug/l	17/11/2017	N	Cov	GEO40
Phenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroethyl)ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Chlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
1,3-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
1,4-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Methylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
3&4-Methylphenol	<1.0	ug/l	17/11/2017	N	Cov	GEO40
Dibenzofuran	<1.0	ug/l	17/11/2017	N	Cov	GEO40

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ALS Environmental

Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581467** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW8**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
1,2-Dichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroisopropyl)ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
n-Nitrosodi-n-propylamine	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachloroethane	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Nitrobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Isophorone	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dimethylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Nitrophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-chloroethoxy)methane	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
1,2,4-Trichlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Naphthalene	<2.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachlorobutadiene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Chloro-3-methylphenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Methylnaphthalene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4,6-Trichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4,5-Trichlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Chloronaphthalene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Dimethylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,6-Dinitrotoluene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Acenaphthylene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Acenaphthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2,4-Dinitrotoluene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Diethylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Nitrophenol	<5.0	ug/l	17/11/2017	Y	Cov	GEO40
4-Chlorophenyl phenyl ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Fluorene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Diphenylamine	<1.0	ug/l	17/11/2017	N	Cov	GEO40
4-Bromophenyl Phenyl Ether	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Hexachlorobenzene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Pentachlorophenol	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Phenanthrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40

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ALS Environmental

Report Number: **COV/1464510/2017** Issue **1**
Laboratory Number: **16581467** Sample **8** of **8**

Sample Source: **RPS Consultants**
Sample Point Description: **RPS**
Sample Description: **GW8**
Sample Matrix: **Ground Water**
Sample Date/Time: **14 November 2017**
Sample Received: **14 November 2017**
Analysis Complete: **28 November 2017**

Test Description	Result	Units	Analysis Date	Accreditation		Method
di-n-Butylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzyl Butyl Phthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(a)anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Chrysene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Bis(2-ethylhexyl)phthalate	<5.0	ug/l	17/11/2017	Y	Cov	GEO40
Di-n-octylphthalate	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(b)fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(k)fluoranthene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(a)pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Indeno(1,2,3-c,d)pyrene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Dibenz(a,h)anthracene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
Benzo(g,h,i)perylene	<1.0	ug/l	17/11/2017	Y	Cov	GEO40
2-Fluorophenol	82.4	%Recovery	17/11/2017	N	Cov	GEO40
Phenol-d6	79.5	%Recovery	17/11/2017	N	Cov	GEO40
Nitrobenzene-d5	81.6	%Recovery	17/11/2017	N	Cov	GEO40
2-Fluorobiphenyl	82.6	%Recovery	17/11/2017	N	Cov	GEO40
2,4,6-Tribromophenol	96.2	%Recovery	17/11/2017	N	Cov	GEO40
Terphenyl-d14	93.6	%Recovery	17/11/2017	N	Cov	GEO40

Analyst Comments for 16581467: This sample has been analysed for Phenols in Water method GEO18, Boron, Total as B, Sodium, Total as Na outside recommended stability times. It is therefore possible that the results provided may be compromised. Raised reporting limits for GEO46 EPH Waters due to the nature of the sample matrix. {/*} Reporting limit raised for metals due to interference with the sample matrix.{*/}

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Che = Chester(CH4 9EP), Ctd = Coatbridge(ML5 4FR), Cov = Coventry(CV4 9GU), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).

Signed: A I Horobin

Name: **A. Horobin** Date: **28 November 2017**

Title: **Organic Operations Manager**

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Appendix 6

4.0 Summary of Results

Bund Identity	Pass / Fail	Comments
Bund 1 Section A	Pass	This storage area is too large to complete a hydrostatic test. The building was split into 3 sections to allow for movement of material in order to complete visual assessments thoroughly. The bund was deemed to pass the visual inspection.
Bund 2		This bund passed the Hydrostatic Integrity test and had sufficient storage volume to meet the licence requirements
Bund 5 Section 1		This bund passed the Hydrostatic Integrity test and had sufficient storage volume to meet the licence requirements
Bund 6		This bund passed the Hydrostatic Integrity test and had sufficient storage volume to meet the licence requirements
Bund 8		This bund passed the Hydrostatic Integrity test and had sufficient storage volume to meet the licence requirements

Project Manager	.....	Date of Report	07-07-2015
Client	Enva Ireland Limited	Contact	Kevin Coll

Bund Number 5 Section 1

Company	ENVA Ireland	**Waste Reference No**	W0184-01
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Bund Reference No	Bund 5 (Section 1)	**Bund Type: Local/ Remote / Combined**	Local
Bund Location	Storage Area	**Bund Risk Classification: 0, 1, 2, 3**	2
Bund Dimensions	4210 x 8280 x 220mm	**Primary Vessel Material**	Steel Tanks
Bund Materials of Construction	Reinforced Concrete	**Primary Vessel Storage Volume**	c. 13m^3 full
Bund Lining materials	N.a	**Primary Vessel 110% Largest Vessel**	14.3 m^3
Bund Retention Volume (local/ Remote)	76 m^3 (Local)	**Primary Vessel 25% Total Volume**	-
Practical to Conduct Hydrostatic Test	Yes	**Date of Visual Inspection**	11-06-2015

Visual Description:

Visual inspection was carried out on the walls, joints and floor both internally and externally. The walls and floors were deemed acceptable and therefore the bund passed through to the hydrostatic test. Water was filled to a height of 125mm from the floor of the bund – this bund could not be filled much higher due to the risk of damage to in line equipment and damage to the storage vessel controls. A visual inspection was completed on the remainder of the bund walls which has not been submerged for the test. There were no cracks, fissures or weak spots identified above the water line with the exception of a pipe connected through the wall. The seals around the pipe are finished and deemed appropriate to retain water. This pipe is above the level of water in the tank and therefore did not form part of the hydrostatic test but has been deemed to pass the visual inspection.

Date Bunds Filled	11-06-2015	**Date of Hydrostatic Test**	12 to 15-06-15
Start Time	10:00	**End Time**	11:00
Start Level of Water	125 mm	**End of Test Level of Water**	124 mm

Status & Recommendations:

- Bund Passes Hydrostatic Test to the level of water filled.
- Hydrostatic retest required in 2018 unless bund is damaged or repaired in the meantime.

Notes:

Low Risk - WGK 0 or 1
High Risk – WGK 2 or 3 R45, R46, R50, R51, R52, R53, R54, R55, R56, R58, R61, R63

Signed:	**Date: 07-07-2015**	**Title: Project Manager**
Signed: *Noel Harrington*	**Date: 07-07-2015**	**Title: Chartered Engineer**

Bund Number 6

Company	ENVA Ireland	**Waste Reference No**	W0184-01
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Bund Reference No	Bund 6	**Bund Type: Local/ Remote / Combined**	Local
Bund Location	Effluent Discharge Tank	**Bund Risk Classification: 0, 1, 2, 3**	1
Bund Dimensions	1200 x 410 x 144mm	**Primary Vessel Material**	Steel Tanks
Bund Materials of Construction	Reinforced Concrete	**Primary Vessel Storage Volume**	c. 130 m^3 full
Bund Lining materials	N.a	**Primary Vessel 110% Largest Vessel**	55 m^3
Bund Retention Volume (local/ Remote)	71 m^3 (Local)	**Primary Vessel 25% Total Volume**	32.5 m^3
Practical to Conduct Hydrostatic Test	Yes	**Date of Visual Inspection**	11-06-2015

Visual Description:

Visual inspection was carried out on the walls, joints and floor both internally and externally. The walls, joints and floors were deemed acceptable and therefore the bund passed through to the hydrostatic test. Water was filled to a height of 92 mm from the floor of the bund – this bund could not be filled higher due to the risk of damage to electrical equipment.

A visual inspection was completed on the remainder of the bund walls which has not been submerged for the test. There were no cracks, fissures or weak spots identified above the water line with the exception of a pipe connected through the wall. The seals around the pipe are finished and deemed appropriate to retain water. This pipe is above the level of water in the tank and therefore did not form part of the hydrostatic test but has been deemed to pass the visual inspection.

The bund is fitted with a screw cork to allow for emptying purpose – this connection was included in the hydrostatic test.

Date Bunds Filled	11-06-2015	**Date of Hydrostatic Test**	12 to 15-06-15
Start Time	10:35	**End Time**	11:05
Start Level of Water	92 mm	**End of Test Level of Water**	91 mm

Status & Recommendations:

- Bund Passes Hydrostatic Test to the level of water filled.
- Hydrostatic retest required in 2018 unless bund is damaged or repaired in the meantime.

Notes:

Low Risk - WGK 0 or 1
High Risk – WGK 2 or 3 R45, R46, R50, R51, R52, R53, R54, R55, R56, R58, R61, R63

Signed:	**Date: 07-07-2015**	**Title: Project Manager**
Signed: *Noel Harrington*	**Date: 07-07-2015**	**Title: Chartered Engineer**

Bund Number 1 Section 1 of 3

Note: This store was sectioned into 3 parts for this visual inspection. The reason for only completing 1/3rd of the building was to allow for stored materials to be moved into the other sections leaving one completely free for visual observation. There were no materials in this section for the visual observation therefore allowing a complete and comprehensive assessment of the section. This store is far too large of floor area to be deemed suitable for a hydrostatic test.

Company	ENVA Ireland	**Waste Reference No**	W0184-01
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Bund Reference No	Bund 1 Section 1	**Bund Type: Local/ Remote / Combined**	Local
Bund Location	Export Storage	**Bund Risk Classification: 0, 1, 2, 3**	2
Bund Dimensions	c. 322 m^2 for Section 1	**Primary Vessel Material**	IBC's, Plastic and Metal Barrells
Bund Materials of Construction	Reinforced Concrete	**Primary Vessel Storage Volume**	Variable – max 100 m^3
Bund Lining materials	N.a	**Primary Vessel 110% Largest Vessel**	1.1 m^3
Bund Retention Volume (local/ Remote)	Total c. 57 m^3 (Local)	**Primary Vessel 25% Total Volume**	25 m^3
Practical to Conduct Hydrostatic Test	No	**Date of Visual Inspection**	11-06-2015

Visual Description:

Visual inspection was carried out on the walls and floor both internally and externally. The maximum retention height with this section would be 22mm. Above this level liquid would overflow the bund lip. Therefore the total retention volume of this export store was calculated at c. 40 m^3.

A visual inspection was completed on section 1 of the store floor, joints and walls. There were no significant cracks, fissures or weak spots identified. There was evidence of weak surface concrete in places however this did not constitute a failure of visual inspection as they were very minor.

Date Bunds Filled	N/a	**Date of Hydrostatic Test**	N/a
Start Time	N/a	**End Time**	N/a
Start Level of Water	N/a	**End of Test Level of Water**	N/a

Status & Recommendations:

- Bund Section 1 passed the visual inspection.
- This should be inspected every three years or in the event of damage caused as per the licence requirement.

Notes:

Low Risk - WGK 0 or 1
High Risk – WGK 2 or 3 R45, R46, R50, R51, R52, R53, R54, R55, R56, R58, R61, R63

Signed:	**Date: 07-07-2015**	**Title: Project Manager**
Signed: *Noel Harrington*	**Date: 07-07-2015**	**Title: Chartered Engineer**

Bund Number 2

Company	ENVA Ireland	**Waste Reference No**	W0184-01
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Bund Reference No	Bund 2	**Bund Type: Local/ Remote / Combined**	Local & Remote
Bund Location	Mixed Fuels Bay	**Bund Risk Classification: 0, 1, 2, 3**	3
Bund Dimensions	8680 x 8260 x avg 220mm	**Primary Vessel Material**	IBC, Plastic and Steel Barrels
Bund Materials of Construction	Reinforced Concrete	**Primary Vessel Storage Volume**	Variable max 50 m^3 full
Bund Lining materials	N.a	**Primary Vessel 110% Largest Vessel**	1.1 m^3
Bund Retention Volume (local/ Remote)	15 m^3 (Local)	**Primary Vessel 25% Total Volume**	12 m^3
Practical to Conduct Hydrostatic Test	Yes	**Date of Visual Inspection**	11-06-2015

Visual Description:

Visual inspection was carried out on the walls and floor both internally and externally of the bund. The walls, joints and floors were deemed acceptable and therefore the bund passed through to the hydrostatic test. Water was filled to a height of 161 mm from the floor of the bund.

A visual inspection was completed on the remainder of the bund walls which has not been submerged for the test. There were no cracks, fissures or weak spots identified above the water line with the exception of a bung connected through the wall to another bund. This bung was below the level of water in the bund and therefore did form part of the hydrostatic test.

Date Bunds Filled	11-06-2015	**Date of Hydrostatic Test**	12 to 15-06-15
Start Time	10:55	**End Time**	11:10
Start Level of Water	161 mm	**End of Test Level of Water**	159 mm

Status & Recommendations:

- Bund Passes Hydrostatic Test to the level of water filled.
- Hydrostatic retest required in 2018 unless bund is damaged or repaired in the meantime.

Notes:

Low Risk - WGK 0 or 1
High Risk – WGK 2 or 3 R45, R46, R50, R51, R52, R53, R54, R55, R56, R58, R61, R63

Signed:	**Date: 07-07-2015**	**Title: Project Manager**
Signed: *Noel Harrington*	**Date: 07-07-2015**	**Title: Chartered Engineer**

Bund Number 8

Company	ENVA Ireland	**Waste Reference No**	W0184-01
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Bund Reference No	Bund 8	**Bund Type: Local/ Remote / Combined**	Local
Bund Location	Chemical Dosing Area	**Bund Risk Classification: 0, 1, 2, 3**	2
Bund Dimensions	6260 x 5190 x 1020mm	**Primary Vessel Material**	Steel Tanks
Bund Materials of Construction	Reinforced Concrete	**Primary Vessel Storage Volume**	20 m^3 full
Bund Lining materials	N.a	**Primary Vessel 110% Largest Vessel**	11 m^3
Bund Retention Volume (local/ Remote)	33 m^3 (Local)	**Primary Vessel 25% Total Volume**	5 m^3
Practical to Conduct Hydrostatic Test	Yes	**Date of Visual Inspection**	11-06-2015

Visual Description:

Visual inspection was carried out on the walls, joints and floor both internally and externally of the bund. The walls, joints and floors were deemed acceptable and therefore the bund passed through to the hydrostatic test. Water was filled to a height of 64 mm from the floor of the bund. There was electrical equipment in the bund restricting the height of the hydrostatic test to this level.

A visual inspection was completed on the reminder or the wall which was not submerged. There were no cracks, fissures or weak spots identified above the water line. The hydrostatic test was completed and passed.

Date Bunds Filled	11-06-2015	**Date of Hydrostatic Test**	12 to 15-06-15
Start Time	11:20	**End Time**	11:20
Start Level of Water	64 mm	**End of Test Level of Water**	64 mm

Status & Recommendations:

- Bund Passes Hydrostatic Test to the level of water filled.
- Hydrostatic retest required in 2018 unless bund is damaged or repaired in the meantime.

Notes:

Low Risk - WGK 0 or 1
High Risk – WGK 2 or 3 R45, R46, R50, R51, R52, R53, R54, R55, R56, R58, R61, R63

Signed:	**Date: 07-07-2015**	**Title: Project Manager**
Signed: *Noel Harrington*	**Date: 07-07-2015**	**Title: Chartered Engineer**

4.0 Summary of Results

Bund Identity	Pass / Fail	Comments
Stores Area Section 2 (Bund No 5)	Pass	This bund passed the visual inspection. This bund also passed the Hydrostatic Integrity test and had sufficient storage volume to meet the licence requirements
Export Section 2 (Bund No 1)	Pass	This bund passed the visual inspection. It was not deemed practical to complete a hydrostatic test in this bund due to the size of floor area that needed to be covered and large volumes of water required.
Export Section 3 (Bund No 1)	Pass	This bund passed the visual inspection. It was not deemed practical to complete a hydrostatic test in this bund due to the size of floor area that needed to be covered and large volumes of water required.
Main Tank Farm (Bund No 3)	Pass	This bund passed the visual inspection. It was not deemed practical to complete a hydrostatic test in this bund due to the size of floor area that needed to be covered and large volumes of water required.

Project Manager		Date of Report	02-10-2015
Client	Enva Ireland Limited	Contact	Kevin Coll

Stores Area Section 2 – Bund No. 5

Company	ENVA Ireland	**Waste Reference No**	W0184-01
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Bund Reference No	Bund No 5	**Bund Type: Local/ Remote / Combined**	Local
Bund Location	Stores Area	**Bund Risk Classification: 0, 1, 2, 3**	2
Bund Dimensions	1600 x 700 x 170mm	**Primary Vessel Material**	IBC / 200 L steel barrels
Bund Materials of Construction	Reinforced Concrete walls, concrete floor	**Primary Vessel Storage Volume**	Total storage c. 64m^3
Bund Lining materials	N.a	**Primary Vessel 110% Largest Vessel**	1.1 m^3 IBC's
Bund Retention Volume (local/ Remote)	19 m^3 (Local)	**25% Total Volume**	c. 12 m^3
Practical to Conduct Hydrostatic Test	Yes	**Date of Visual Inspection**	20-09-2015

Visual Description:

Visual inspection was carried out on the walls, joints and floor both internally and externally. The walls and floors were deemed acceptable and therefore the bund passed through to the hydrostatic test. Water was filled to a height of 35 and 47mm from the floor of the bund at 2 separate locations – this bund could not be filled much higher due to the room being used by employees for access to the stores. A visual inspection was completed on the remainder of the bund floor and walls which had not been submerged for the test. There were no cracks, fissures or weak spots identified above the water line. The bund floor is sloped and raised in the middle – numerous measurements were made across the bund to get an overview of the entire structure.

Date Bunds Filled	20-09-2015	**Date of Hydrostatic Test**	21/22-09-2015
Start Time	14:20	**End Time**	15:00
Start Level of Water	Side 1 35 mm Side 2 47 mm	**End of Test Level of Water**	Side 1 35 mm Side 2 47 mm

Status & Recommendations:

- Bund Passes Hydrostatic Test to the level of water filled.
- Hydrostatic retest required in 2018 unless bund is damaged or repaired in the meantime.

Notes:

Low Risk - WGK 0 or 1
High Risk – WGK 2 or 3 R45, R46, R50, R51, R52, R53, R54, R55, R56, R58, R61, R63

Signed:	**Date: 02-10-2015**	**Title: Project Manager**
Signed: *Noel Harrington*	**Date: 02-10-2015**	**Title: Chartered Engineer**

Export Storage – Bund No. 1 Section 2

Note: This store was sectioned into 3 parts for this visual inspection. The reason for only completing 1/3rd of the building was to allow for stored materials to be moved into the other sections leaving one completely free for visual observation. There were no materials in this section for the visual observation therefore allowing a complete and comprehensive assessment of the section. This store is far too large of floor area to be deemed suitable for a hydrostatic test.

Company	ENVA Ireland	**Waste Reference No**	W0184-01
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Bund Reference No	Bund 1 Section 2	**Bund Type: Local/ Remote / Combined**	Local
Bund Location	Export Storage	**Bund Risk Classification: 0, 1, 2, 3**	2
Bund Dimensions	c. 320 m^2 for Section 2	**Primary Vessel Material**	IBC's, Plastic and Metal Barrels
Bund Materials of Construction	Reinforced Concrete walls and concrete floors	**Primary Vessel Storage Volume**	1.0 m^3 IBC
Bund Lining materials	N.a	**Primary Vessel 110% Largest Vessel**	1.1 m^3
Bund Retention Volume (local/ Remote)	Total c. 57 m^3 (Local)	**25% Total Volume**	25 m^3
Practical to Conduct Hydrostatic Test	No	**Date of Visual Inspection**	21-09-2015

Visual Description:

Visual inspection was carried out on the walls and floor both internally and externally. The maximum retention height with this section would be 22mm. Above this level liquid would overflow the bund lip. Therefore the total retention volume of this export store was calculated at c. 57 m^3.

A visual inspection was completed on section 2 of the store floor, joints and walls. There were no significant cracks, fissures or weak spots identified. There was evidence of weak surface concrete in places however this did not constitute a failure of visual inspection as they were very minor. There were 2 sumps in this bay which have been previously tested and passed hydrostatically by Kavanagh Ryan & Associates.

Date Bunds Filled	N/a	**Date of Hydrostatic Test**	N/a
Start Time	N/a	**End Time**	N/a
Start Level of Water	N/a	**End of Test Level of Water**	N/a

Status & Recommendations:

- Bund Section 2 passed the visual inspection.
- This should be inspected every three years or in the event of damage caused as per the licence requirement.

Notes:

Low Risk - WGK 0 or 1
High Risk – WGK 2 or 3 R45, R46, R50, R51, R52, R53, R54, R55, R56, R58, R61, R63

Signed:	**Date: 02-10-2015**	**Title: Project Manager**
Signed: *Noel Harrington*	**Date: 02-10-2015**	**Title: Chartered Engineer**

Export Storage – Bund No. 1 Section 3

Note: This store was sectioned into 3 parts for this visual inspection. The reason for only completing 1/3rd of the building was to allow for stored materials to be moved into the other sections leaving one completely free for visual observation. There were no materials in this section for the visual observation therefore allowing a complete and comprehensive assessment of the section. This store is far too large of floor area to be deemed suitable for a hydrostatic test.

Company	ENVA Ireland	**Waste Reference No**	W0184-01
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Bund Reference No	Bund 1 Section 3	**Bund Type: Local/ Remote / Combined**	Local
Bund Location	Export Storage	**Bund Risk Classification: 0, 1, 2, 3**	2
Bund Dimensions	c. 280 m^2 for Section 3	**Primary Vessel Material**	IBC's, Plastic and Metal Barrels
Bund Materials of Construction	Reinforced Concrete walls and concrete floors	**Primary Vessel Storage Volume**	1.0 m^3
Bund Lining materials	N.a	**Primary Vessel 110% Largest Vessel**	1.1 m^3
Bund Retention Volume (local/ Remote)	Total c. 57 m^3 (Local)	**25% Total Volume**	25 m^3
Practical to Conduct Hydrostatic Test	No	**Date of Visual Inspection**	02-10-2015

Visual Description:

Visual inspection was carried out on the walls and floor both internally and externally. The maximum retention height with this section would be 22mm. Above this level liquid would overflow the bund lip. Therefore the total retention volume of this export store was calculated at c. 57 m^3.

A visual inspection was completed on section 3 of the store floor, joints and walls. There were no significant cracks, fissures or weak spots identified. There was evidence of weak surface concrete in places however this did not constitute a failure of visual inspection as they were very minor. There was 1 sump in this bay which have been previously tested and passed hydrostatically by Kavanagh Ryan & Associates.

Date Bunds Filled	N/a	**Date of Hydrostatic Test**	N/a
Start Time	N/a	**End Time**	N/a
Start Level of Water	N/a	**End of Test Level of Water**	N/a

Status & Recommendations:

- Bund Section 3 passed the visual inspection.
- This should be inspected every three years or in the event of damage caused as per the licence requirement.

Notes:

Low Risk - WGK 0 or 1
High Risk – WGK 2 or 3 R45, R46, R50, R51, R52, R53, R54, R55, R56, R58, R61, R63

Signed:	**Date: 02-10-2015**	**Title: Project Manager**
Signed: *Noel Harrington*	**Date: 02-10-2015**	**Title: Chartered Engineer**

Tank Farm – Bund No. 3

Company	ENVA Ireland	**Waste Reference No**	W0184-01
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Bund Reference No	Bund 3	**Bund Type: Local/ Remote / Combined**	Local
Bund Location	Tank Farm	**Bund Risk Classification: 0, 1, 2, 3**	2
Bund Dimensions	c. 1880 m^2 x 2 m high	**Primary Vessel Material**	Large Steel Tanks
Bund Materials of Construction	Reinforced Concrete walls and concrete floors	**Primary Vessel Storage Volume**	180 m^3
Bund Lining materials	N.a	**Primary Vessel 110% Largest Vessel**	200 m^3
Bund Retention Volume (local/ Remote)	Total c. 4066 m^3 (Local)	**25% Total Volume**	1,850 m^3
Practical to Conduct Hydrostatic Test	No	**Date of Visual Inspection**	21-09-2015

Visual Description:

Visual inspection was carried out on the walls and floor both internally and externally. The maximum retention height with this section would be 2000mm. Above this level liquid would overflow the bund at its lowest point. A visual inspection was completed on floor, joints and walls. There were no significant cracks, fissures or weak spots identified. There was evidence of weak surface concrete in places however this did not constitute a failure of visual inspection as they were very minor. The bund consists of 45 tanks totalling 7,400 m^3. Boiler condensate is discharged into the bund through permanent pipes which could not be ceased without shutting down production. This fact rendered a hydrostatic test impractical to complete on top of the excessive volumes of water that would be required to cover the base of the bund.

Date Bunds Filled	N/a	**Date of Hydrostatic Test**	N/a
Start Time	N/a	**End Time**	N/a
Start Level of Water	N/a	**End of Test Level of Water**	N/a

Status & Recommendations:

- Bund 3 passed the visual inspection.
- This should be inspected every three years or in the event of damage caused as per the licence requirement.

Notes:

Low Risk - WGK 0 or 1
High Risk – WGK 2 or 3 R45, R46, R50, R51, R52, R53, R54, R55, R56, R58, R61, R63

Signed:	**Date: 02-10-2015**	**Title: Project Manager**
Signed: *Noel Harrington*	**Date: 02-10-2015**	**Title: Chartered Engineer**

4.0 Summary of Results

Bund Identity	Pass / Fail	Comments
Area 7 – Water Treatment	Pass	This bund passed the Hydrostatic Integrity test and had sufficient storage volume to meet the licence requirements
Bund 4 Sump	Pass	This sump passed the Hydrostatic Integrity test.
Bund 4	Pass	This bund passed the visual inspection. It was not deemed practical to complete a hydrostatic test in this bund due to the size of floor area that needed to be covered and large volumes of water required.

Project Manager		Date of Report	12-08-2015
Client	Enva Ireland Limited	Contact	Kevin Coll

Water Treatment Area 7

Company	ENVA Ireland	**Waste Reference No**	W0184-01
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Bund Reference No	Area 7	**Bund Type: Local/ Remote / Combined**	Local
Bund Location	Wastewater treatment area	**Bund Risk Classification: 0, 1, 2, 3**	2
Bund Dimensions	1112 x 1153 x 220mm	**Primary Vessel Material**	Steel Tanks
Bund Materials of Construction	Reinforced Concrete	**Primary Vessel Storage Volume**	c. 20m³ full
Bund Lining materials	N.a	**Primary Vessel 110% Largest Vessel**	22 m³
Bund Retention Volume (local/ Remote)	28 m³ (Local)	**Primary Vessel 25% Total Volume**	5 m³
Practical to Conduct Hydrostatic Test	Yes	**Date of Visual Inspection**	20-07-2015

Visual Description:

Visual inspection was carried out on the walls, joints and floor both internally and externally. The walls and floors were deemed acceptable and therefore the bund passed through to the hydrostatic test. Water was filled to a height of 99mm from the floor of the bund – this bund could not be filled much higher due to the risk of damage to in line equipment and damage to the storage vessel controls. A visual inspection was completed on the remainder of the bund floor and walls which has not been submerged for the test. There were no cracks, fissures or weak spots identified above the water line with the exception of a pipe connected through the wall. The seals around the pipe are finished and deemed appropriate to retain water. This pipe is above the level of water in the tank and therefore did not form part of the hydrostatic test but has been deemed to pass the visual inspection. The bund floor is sloped and raised in the middle – numerous measurements were made across the bund to get an overview of the entire structure.

Date Bunds Filled	17-07-2015	**Date of Hydrostatic Test**	20 - 21-07-15
Start Time	10:30	**End Time**	11:00
Start Level of Water	Side 1 99 mm Side 2 104 mm	**End of Test Level of Water**	Side 1 98 mm Side 2 104 mm

Status & Recommendations:

- Bund Passes Hydrostatic Test to the level of water filled.
- Hydrostatic retest required in 2018 unless bund is damaged or repaired in the meantime.

Notes:

Low Risk - WGK 0 or 1
High Risk – WGK 2 or 3 R45, R46, R50, R51, R52, R53, R54, R55, R56, R58, R61, R63

Signed:	**Date: 12-08-2015**	**Title: Project Manager**
Signed: *Noel Harrington*	**Date: 12-08-2015**	**Title: Chartered Engineer**

Bund Number 4 – Sump under Filter Press

Company	ENVA Ireland	**Waste Reference No**	W0184-01
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Bund Reference No	Bund 4 – Sump under Filter Press	**Bund Type: Local/ Remote / Combined**	Local
Bund Location	Filter Press	**Bund Risk Classification: 0, 1, 2, 3**	1
Bund Dimensions	1840 x 6060 x 1790mm	**Primary Vessel Material**	Filter Press
Bund Materials of Construction	Reinforced Concrete	**Primary Vessel Storage Volume**	-
Bund Lining materials	N.a	**Primary Vessel 110% Largest Vessel**	-
Bund Retention Volume (local/ Remote)	20 m^3 (Local)	**Primary Vessel 25% Total Volume**	-
Practical to Conduct Hydrostatic Test	Yes	**Date of Visual Inspection**	20-07-2015

Visual Description:

Visual inspection was carried out on the walls where possible – the sump is located below the filter press so there is limited visual inspection that could be carried out. The sump passed through to the hydrostatic test. Water was filled to a height of 1570 mm from the floor of the sump.

Date Bunds Filled	17-07-2015	**Date of Hydrostatic Test**	20 - 21-07-15
Start Time	10:00	**End Time**	11:10
Start Level of Water	1570 mm	**End of Test Level of Water**	1569 mm

Status & Recommendations:

- Sump Passes Hydrostatic Test to the level of water filled.
- Hydrostatic retest required in 2018 unless bund is damaged or repaired in the meantime.

Notes:

Low Risk - WGK 0 or 1
High Risk – WGK 2 or 3 R45, R46, R50, R51, R52, R53, R54, R55, R56, R58, R61, R63

Signed:	**Date: 12-08-2015**	**Title: Project Manager**
Signed: *Noel Harrington*	**Date: 12-08-2015**	**Title: Chartered Engineer**

Bund Number 4 – Filter Press

Company	ENVA Ireland	**Waste Reference No**	W0184-01
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Bund Reference No	Bund 4 – Bund Surrounding Filter Press	**Bund Type: Local/ Remote / Combined**	Local
Bund Location	Filter Press	**Bund Risk Classification: 0, 1, 2, 3**	2
Bund Dimensions	18180 x 8540 x 250mm	**Primary Vessel Material**	Filter Press
Bund Materials of Construction	Reinforced Concrete	**Primary Vessel Storage Volume**	-
Bund Lining materials	N.a	**Primary Vessel 110% Largest Vessel**	-
Bund Retention Volume (local/ Remote)	38.8 m^3 (Local)	**Primary Vessel 25% Total Volume**	-
Practical to Conduct Hydrostatic Test	No	**Date of Visual Inspection**	20-07-2015

Visual Description:

Visual inspection was carried out on the walls and floor both internally and externally. The maximum retention height with this section would be 250mm. Above this level liquid would overflow the bund lip. The bund was so large (c. 155m^2) that is was not deemed practical to conduct a hydrostatic test due to the volumes of water required, the limited means of emptying and disposal of this liquid afterwards and the size of floor space that would need to be covered and put out of commission while the test was underway.

A visual inspection was completed on of the bund floor, joints and walls. There were no significant cracks, fissures or weak spots identified. There was a hole in one wall which was plugged and deemed watertight.

Date Bunds Filled	-	**Date of Hydrostatic Test**	-
Start Time	-	**End Time**	-
Start Level of Water	-	**End of Test Level of Water**	-

Status & Recommendations:

- Bund passed the visual inspection.
- This should be inspected every three years or in the event of damage caused as per the licence requirement.

Notes:

Low Risk - WGK 0 or 1
High Risk – WGK 2 or 3 R45, R46, R50, R51, R52, R53, R54, R55, R56, R58, R61, R63

Signed:	**Date: 12-08-2015**	**Title: Project Manager**
Signed: *Noel Harrington*	**Date: 12-08-2015**	**Title: Chartered Engineer**

4.0 Summary of Results

Sump Identity	Pass / Fail	Comments
1	Pass	This sump passed the Hydrostatic Integrity test and visual inspection
3	Pass	This sump passed the Hydrostatic Integrity test and visual inspection
4	Pass	This sump passed the Hydrostatic Integrity test and visual inspection
6	Pass	This sump passed the Hydrostatic Integrity test and visual inspection
7	Pass	This sump passed the Hydrostatic Integrity test and visual inspection
8	Pass	This sump passed the Hydrostatic Integrity test and visual inspection
9	-	This bund passed the visual inspection however it was emptied before Hydrostatic test was completed
11	Pass	This sump passed the Hydrostatic Integrity test and visual inspection
12	Pass	This sump passed the Hydrostatic Integrity test and visual inspection

Project Manager	.....	Date of Report	27-09-2017
Client	Enva Ireland Limited	Contact	Kevin Coll

Sump 1

Company	ENVA Ireland	**Waste Reference No**	W0184-02
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Sump Reference No	1	**Sump Type: Local/ Remote / Combined**	Local
Sump Location	Filter/Paint Processing Shed	**Sump Risk Classification: 0, 1, 2, 3**	-
Sump Dimensions	1060 X 1400 X 1440	**Sump Vessel Material**	-
Sump Materials of Construction	Concrete	**Primary Vessel Storage Volume**	-
Sump Lining materials	None	**Primary Vessel 110% Largest Vessel**	-
Sump Retention Volume (local/ Remote)	m^3 (Local)	**Primary Vessel 25% Total Volume**	-
Practical to Conduct Hydrostatic Test	No	**Date of Visual Inspection**	08-07-2017

Visual Description:

Visual inspection was carried out sump. There were no cracks, fissures or weak spots identified.

The sump was deemed visually to be appropriate for storage of materials.

No picture available

Date Bunds Filled	07-07-2017	**Date of Hydrostatic Test**	10-07-2017
Start Time	09:10	**End Time**	10:37
Start Level of Water	956mm	**End of Test Level of Water**	956mm

Status & Recommendations:

- Sump passes Hydrostatic and visual inspections

Sump 3

Company	ENVA Ireland	**Waste Reference No**	W0184-02
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Sump Reference No	3	**Sump Type: Local/ Remote / Combined**	Local
Sump Location	Filter/Paint Processing Shed	**Sump Risk Classification: 0, 1, 2, 3**	-
Sump Dimensions	1290 X 1270 X 1710	**Sump Vessel Material**	-
Sump Materials of Construction	Concrete	**Primary Vessel Storage Volume**	-
Sump Lining materials	None	**Primary Vessel 110% Largest Vessel**	-
Sump Retention Volume (local/ Remote)	m^3 (Local)	**Primary Vessel 25% Total Volume**	-
Practical to Conduct Hydrostatic Test	No	**Date of Visual Inspection**	08-07-2017

Visual Description:

Visual inspection was carried out sump. There were no cracks, fissures or weak spots identified.

The sump was deemed visually to be appropriate for storage of materials.

Date Bunds Filled	07-07-2017	**Date of Hydrostatic Test**	10-07-2017
Start Time	09:35	**End Time**	10:52
Start Level of Water	956mm	**End of Test Level of Water**	956mm

Status & Recommendations:

- Sump passes Hydrostatic and visual inspections

Sump 4

Company	ENVA Ireland	**Waste Reference No**	W0184-02
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Sump Reference No	4	**Sump Type: Local/ Remote / Combined**	Local
Sump Location	-	**Sump Risk Classification: 0, 1, 2, 3**	-
Sump Dimensions	1300 X 1270 X 1820	**Sump Vessel Material**	-
Sump Materials of Construction	Concrete	**Primary Vessel Storage Volume**	-
Sump Lining materials	None	**Primary Vessel 110% Largest Vessel**	-
Sump Retention Volume (local/ Remote)	m^3 (Local)	**Primary Vessel 25% Total Volume**	-
Practical to Conduct Hydrostatic Test	No	**Date of Visual Inspection**	08-07-2017

Visual Description:

Visual inspection was carried out sump. There were no cracks, fissures or weak spots identified.

The sump was deemed visually to be appropriate for storage of materials.

Date Bunds Filled	07-07-2017	**Date of Hydrostatic Test**	10-07-2017
Start Time	09:47	**End Time**	11:00
Start Level of Water	635mm	**End of Test Level of Water**	635mm

Status & Recommendations:

- Sump passes Hydrostatic and visual inspections

Sump 6

Company	ENVA Ireland	**Waste Reference No**	W0184-02
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Sump Reference No	6	**Sump Type: Local/ Remote / Combined**	Local
Sump Location	Soil Processing/Storage Shed	**Sump Risk Classification: 0, 1, 2, 3**	-
Sump Dimensions	760 X 1880 X 680	**Sump Vessel Material**	-
Sump Materials of Construction	Concrete	**Primary Vessel Storage Volume**	-
Sump Lining materials	None	**Primary Vessel 110% Largest Vessel**	-
Sump Retention Volume (local/ Remote)	m^3 (Local)	**Primary Vessel 25% Total Volume**	-
Practical to Conduct Hydrostatic Test	No	**Date of Visual Inspection**	08-07-2017

Visual Description:

Visual inspection was carried out sump. There were no cracks, fissures or weak spots identified.

The sump was deemed visually to be appropriate for storage of materials.

Date Bunds Filled	07-07-2017	**Date of Hydrostatic Test**	10-07-2017
Start Time	09:53	**End Time**	11:06
Start Level of Water	445mm	**End of Test Level of Water**	442mm

Status & Recommendations:

- Sump passes Hydrostatic and visual inspections

Sump 7

Company	ENVA Ireland	**Waste Reference No**	W0184-02
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Sump Reference No	7	**Sump Type: Local/ Remote / Combined**	Local
Sump Location	Water Storage Area	**Sump Risk Classification: 0, 1, 2, 3**	-
Sump Dimensions	670 X 1430 X 555	**Sump Vessel Material**	-
Sump Materials of Construction	Concrete	**Primary Vessel Storage Volume**	-
Sump Lining materials	None	**Primary Vessel 110% Largest Vessel**	-
Sump Retention Volume (local/ Remote)	m^3 (Local)	**Primary Vessel 25% Total Volume**	-
Practical to Conduct Hydrostatic Test	No	**Date of Visual Inspection**	08-07-2017

Visual Description:

Visual inspection was carried out sump. There were no cracks, fissures or weak spots identified.

The sump was deemed visually to be appropriate for storage of materials.

Date Bunds Filled	07-07-2017	**Date of Hydrostatic Test**	10-07-2017
Start Time	09:11	**End Time**	10:16
Start Level of Water	382mm	**End of Test Level of Water**	378mm

Status & Recommendations:

- Sump passes Hydrostatic and visual inspections

Sump 8

Company	ENVA Ireland	**Waste Reference No**	W0184-02
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Sump Reference No	8	**Sump Type: Local/ Remote / Combined**	Local
Sump Location	Between tanker dig out area and waste storage area	**Sump Risk Classification: 0, 1, 2, 3**	-
Sump Dimensions	650 X 1470 X 875	**Sump Vessel Material**	-
Sump Materials of Construction	Concrete	**Primary Vessel Storage Volume**	-
Sump Lining materials	None	**Primary Vessel 110% Largest Vessel**	-
Sump Retention Volume (local/ Remote)	m^3 (Local)	**Primary Vessel 25% Total Volume**	-
Practical to Conduct Hydrostatic Test	No	**Date of Visual Inspection**	08-07-2017

Visual Description:

Visual inspection was carried out sump. There were no cracks, fissures or weak spots identified.

The sump was deemed visually to be appropriate for storage of materials.

Date Bunds Filled	07-07-2017	**Date of Hydrostatic Test**	10-07-2017
Start Time	09:13	**End Time**	10:14
Start Level of Water	650mm	**End of Test Level of Water**	650mm

Status & Recommendations:

- Sump passes Hydrostatic and visual inspections

Sump 9

Company	ENVA Ireland	**Waste Reference No**	W0184-02
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Sump Reference No	9	**Sump Type: Local/ Remote / Combined**	Local
Sump Location	Waste Storage Area	**Sump Risk Classification: 0, 1, 2, 3**	-
Sump Dimensions	640 X 1500 X 735	**Sump Vessel Material**	-
Sump Materials of Construction	Concrete	**Primary Vessel Storage Volume**	-
Sump Lining materials	None	**Primary Vessel 110% Largest Vessel**	-
Sump Retention Volume (local/ Remote)	m^3 (Local)	**Primary Vessel 25% Total Volume**	-
Practical to Conduct Hydrostatic Test	No	**Date of Visual Inspection**	08-07-2017

Visual Description:

Visual inspection was carried out sump. There were no cracks, fissures or weak spots identified.

The sump was deemed visually to be appropriate for storage of materials. Sump was accidentally emptied during Hydrostatic test

Date Bunds Filled	07-07-2017	**Date of Hydrostatic Test**	10-07-2017
Start Time	09:15	**End Time**	-
Start Level of Water	665mm	**End of Test Level of Water**	Sump emptied

Status & Recommendations:

- Sump passes visual inspections but requires an hydrostatic test

Sump 11

Company	ENVA Ireland	**Waste Reference No**	W0184-02
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Sump Reference No	11	**Sump Type: Local/ Remote / Combined**	Local
Sump Location	Water Treatment	**Sump Risk Classification: 0, 1, 2, 3**	-
Sump Dimensions	660 X 660 X 460	**Sump Vessel Material**	-
Sump Materials of Construction	Concrete	**Primary Vessel Storage Volume**	-
Sump Lining materials	None	**Primary Vessel 110% Largest Vessel**	-
Sump Retention Volume (local/ Remote)	m^3 (Local)	**Primary Vessel 25% Total Volume**	-
Practical to Conduct Hydrostatic Test	No	**Date of Visual Inspection**	08-07-2017

Visual Description:

Visual inspection was carried out sump. There were no cracks, fissures or weak spots identified.

The sump was deemed visually to be appropriate for storage of materials.

Date Bunds Filled	07-07-2017	**Date of Hydrostatic Test**	10-07-2017
Start Time	09:08	**End Time**	10:13
Start Level of Water	74mm	**End of Test Level of Water**	74mm

Status & Recommendations:

- Sump passes Hydrostatic and visual inspections

Sump 12

Company	ENVA Ireland	**Waste Reference No**	W0184-02
Site	Clonminam Industrial Estate Portlaoise	**Waste Category**	Hazardous Waste Facility
Sump Reference No	12	**Sump Type: Local/ Remote / Combined**	Local
Sump Location	Water Treatment	**Sump Risk Classification: 0, 1, 2, 3**	-
Sump Dimensions	560 X 570 X 440	**Sump Vessel Material**	-
Sump Materials of Construction	Concrete	**Primary Vessel Storage Volume**	-
Sump Lining materials	None	**Primary Vessel 110% Largest Vessel**	-
Sump Retention Volume (local/ Remote)	m^3 (Local)	**Primary Vessel 25% Total Volume**	-
Practical to Conduct Hydrostatic Test	No	**Date of Visual Inspection**	08-07-2017

Visual Description:

Visual inspection was carried out sump. There were no cracks, fissures or weak spots identified.

The sump was deemed visually to be appropriate for storage of materials.

Date Bunds Filled	07-07-2017	**Date of Hydrostatic Test**	10-07-2017
Start Time	09:06	**End Time**	10:12
Start Level of Water	19mm	**End of Test Level of Water**	19mm

Status & Recommendations:

- Sump passes Hydrostatic and visual inspections

3.0 Summary of Results

Table 1 below outlines the bunds tested at the Enva Ireland Portlaoise facility. All tested bunds passed the bund integrity assessment.

Bund Description	Test Date	Pass/Fail	Recommendations/ Comments
Stores Waste Storage Bund	27/09/2017	Pass	N/A
Fire Foam Container Bund	19/09/2017	Pass	N/A
Export Warehouse – Sump 2	12/09/2017	Pass	N/A
Soil Remediation Waste Storage Area Sump 10	19/12/2017	Pass	N/A
Tanker Digout Washarea	19/12/2017	Pass	N/A
Gantry Sump	19/12/2017	Pass	N/A
Collection Sump 5	19/12/2017	Pass	N/A

Table 1: Summary of Results

5.0 Bund Test Record Sheets

5.1 Stores Waste Storage Bund

Company:	**Enva Ireland**	**Date of Inspection:**	27-28th September, 2017.
Site:	Clonminam Industrial Park, Portlaoise	**License Reg. No.:**	**W0184-01**
Bund Ref. No.:	Stores Waste Storage bund	**Bund Type (Local/Remote/Combined/Portable):**	Local
Bund Dimensions:	6.87 x 28.73 x 0.225 m + 11.16 x 5.01 x 0.225 m	**Primary Vessel(s) – Materials of Construction:**	Plastic IBC (1000L)
Bund Construction Material:	In Situ Concrete	**Primary Vessel(s) – Total Storage Volume:**	IBC– 28.38 m³ 1000 ltr
Bund Lining Material:	No Liner	**Primary Vessel(s) – 110% Volume of Largest Vessel:**	1.1 m³ 1100 ltr
Bund Retention Volume:	56.9 m³ (56900 ltr)	**Primary Vessel(s) – 25% of Total Storage Volume:**	N/A
Deemed Practicable / Safe to Conduct Hydrostatic Test? Yes/No		**YES**	
If no give reasons:			
Visual Inspection:	Visual Inspection around internal and external of bund walls reveals no signs of breaches or leaks. Bund newly constructed. Bund is roofed. Bund filled 156 mm due to volume of water required. Bund located under roofed area		
Photographs	APPENDIX A		

HYDROSTATIC TEST DETAILS:

BS 8007:1987 (Yes/No)?	YES
Fill Rate	N/A
Stabilisation Period	Acceptable (24hrs)
Duration of the Test	24 hrs
Acceptance Criteria (Total permissible drop in water level)	During the test period, the total permissible drop in level after allowing for evaporation and rainfall should not exceed 1/500th of the average water depth, 10 mm or another specified amount.
Water Level Change in Reference Vessel	0 mm

Date and Time	Water Level in Bund	Water Level in Reference Vessel	Bund Level (+/-) (mm)	Reference vessel Level (+/-) (mm)
Day 1 27/09/17 13:00	**156 mm**	**176 mm**		
Day 2 28/09/2017 13:15	**156 mm**	**176 mm**	**0 mm**	**0 mm**

Description / Comments of Hydrostatic Test:
Test completed successfully, depth of water in bund measured and photographed day 1 and day 2. Based on the survey and hydrostatic test carried out ENVA deem the Stores waste storage bund to be of sound integrity and therefore Passed.

VISUAL TEST DETAILS: INSPECTION DESCRIPTION & RESULTS:		
Result (Pass/Fail)	**PASS**	
Recommendation(s): Retest October 2020 as per the conditions outlined in license		
Signed: John Cassell	**Title : BE, M.Sc, MIEI**	**Date: 29/09/2017**
Signed:	**Title: BE, C Eng, MIEI**	**Date:29/09/2017**
	ENGINEERS IRELAND Mr. William Stack Chartered Engineer Registrant 059577 of The Institution of Engineers of Ireland	

5.2 Fire Foam Container Bund

Company:	**Enva Ireland Portlaoise**	**Date of Inspection:**	19-20th September, 2017.
Site:	Clonminam Industrial Park, Portlaoise	**License Reg. No.:**	**W0184-01**
Bund Ref. No.:	Fire Foam Container Bund	**Bund Type (Local/Remote/Combined/Portable):**	Local
Bund Dimensions:	2.2 x 5.7 x 0.13 m	**Primary Vessel(s) – Materials of Construction:**	Plastic IBC (1000L)
Bund Construction Material:	Steel	**Primary Vessel(s) – Total Storage Volume:**	IBC– 1m³ 1000 ltr
Bund Lining Material:	No Lining	**Primary Vessel(s) – 110% Volume of Largest Vessel:**	1.10 m³ 1100 ltr
Bund Retention Volume:	1.63 m³ (1630ltr)	**Primary Vessel(s) – 25% of Total Storage Volume:**	N/A
Deemed Practicable / Safe to Conduct Hydrostatic Test? Yes/No		**YES**	
If no give reasons:			
Visual Inspection:	Visual Inspection around internal and external of bund walls reveals no signs of breaches or leaks. The bund floor to wall joint appears to be in good condition. Bund filled 54 mm.		
Photographs	APPENDIX A		

HYDROSTATIC TEST DETAILS:

BS 8007:1987 (Yes/No)?	YES
Fill Rate	N/A
Stabilisation Period	Acceptable (24hrs)
Duration of the Test	24 hrs
Acceptance Criteria (Total permissible drop in water level)	During the test period, the total permissible drop in level after allowing for evaporation and rainfall should not exceed 1/500th of the average water depth, 10 mm or another specified amount.
Water Level Change in Reference Vessel	0 mm drop when the reference vessel is taken into account

Date and Time	Water Level in Bund	Water Level in Reference Vessel	Bund Level (+/-) (mm)	Reference vessel Level (+/-) (mm)
Day 1 19/09/17 15:15	54 mm	131 mm		
Day 2 20/09/2017 15:25	74 mm	151 mm	20 mm	20 mm

Description / Comments of Hydrostatic Test:
Test completed successfully, depth of water in bund measured and photographed day 1 and day 2. Weather was wet and showery over the 24hr test period resulting in the reference vessel level and bund increasing by 20 mm. Based on the survey and hydrostatic test carried out ENVA deem the Fire foam container bund to be of sound integrity and therefore Passed.

VISUAL TEST DETAILS: INSPECTION DESCRIPTION & RESULTS:

Result (Pass/Fail)	**PASS**	
Recommendation(s): Retest October 2020 as per the conditions outlined in license		
Signed: John Cassell	**Title : BE, M.Sc, MIEI**	**Date: 20/09/2017**
Signed:	**Title: BE, C Eng, MIEI**	**Date:20/09/2017**
	ENGINEERS IRELAND Mr. William Stack Chartered Engineer Registrant 059577 of The Institution of Engineers of Ireland	

5.3 Export Warehouse – Sump 2

Company:	**Enva ireland Portlaoise**	**Date of Inspection:**	12-13th September, 2017.
Site:	Clonminam Industrial Park, Portlaoise	**License Reg. No.:**	**W0184-01**
Bund Ref. No.:	Export Warehouse – Sump 2	**Bund Type (Local/Remote/Combined/Portable):**	Local
Bund Dimensions:	1.05 x 1.4 x 1.41 m	**Primary Vessel(s) – Materials of Construction:**	Plastic IBC (1000L)
Bund Construction Material:	InSitu concrete sump	**Primary Vessel(s) – Total Storage Volume:**	IBC– 1m³ 1000 ltr
Bund Lining Material:	No Liner	**Primary Vessel(s) – 110% Volume of Largest Vessel:**	1.10 m³ 1100 ltr
Bund Retention Volume:	2.07 m³ (2072 ltr)	**Primary Vessel(s) – 25% of Total Storage Volume:**	N/A
Deemed Practicable / Safe to Conduct Hydrostatic Test? Yes/No		**YES**	
If no give reasons:			

Visual Inspection:	Visual Inspection around internal of sump walls reveals no signs of breaches or leaks. Bund sump is located inside building and is protected by a heavy duty cover. Level of water measured 559mm from floor level to water level
Photographs	APPENDIX A

HYDROSTATIC TEST DETAILS:

BS 8007:1987 (Yes/No)?	YES
Fill Rate	N/A
Stabilisation Period	Acceptable (24hrs)
Duration of the Test	24 hrs
Acceptance Criteria (Total permissible drop in water level)	During the test period, the total permissible drop in level after allowing for evaporation and rainfall should not exceed 1/500th of the average water depth, 10 mm or another specified amount.
Water Level Change in Reference Vessel	0 mm

Date and Time	Water Level in Bund	Water Level in Reference Vessel	Bund Level (+/-) (mm)	Reference vessel Level (+/-) (mm)
Day 1 12/09/17 16:00	559 mm	154 mm		
Day 2 13/09/2017 16:05	559 mm	154 mm	0 mm	0 mm

Description / Comments of Hydrostatic Test:
Test completed successfully, depth of water in bund measured and photographed day 1 and day 2. Weather was dry and cold over the 24hr test period. Based on the survey and hydrostatic test carried out ENVA deem the bund sump 2 to be of sound integrity and therefore Passed.

VISUAL TEST DETAILS: INSPECTION DESCRIPTION & RESULTS:

Result (Pass/Fail)	**PASS**	
Recommendation(s): Retest October 2020 as per the conditions outlined in license		
Signed: John Carroll	**Title : BE, M.Sc, MIEI**	**Date: 20/09/2017**
Signed:	**Title: BE, C Eng, MIEI**	**Date:20/09/2017**
	ENGINEERS IRELAND **Mr. William Stack** Chartered Engineer Registrant 059577 of The Institution of Engineers of Ireland	

5.4 Soil Remediation Waste Storage Area – Sump 10

Company:	**Enva ireland Portlaoise**	**Date of Inspection:**	18-19th December, 2017.
Site:	Clonminam Industrial Park, Portlaoise	**License Reg. No.:**	**W0184-01**
Bund Ref. No.:	Soil Remediation Waste Storage Area – Sump 10	**Bund Type (Local/Remote/Combined/Portable):**	Local
Bund Dimensions:	0.9m x 2.7m x 1.04m	**Primary Vessel(s) – Materials of Construction:**	Plastic IBC (1000L)
Bund Construction Material:	In Situ Concrete	**Primary Vessel(s) – Total Storage Volume:**	IBC– 1m³ 1000 ltr
Bund Lining Material:	None	**Primary Vessel(s) – 110% Volume of Largest Vessel:**	1.10 m³ 1100 ltr
Bund Retention Volume:	2.52m³ (2527 ltr)	**Primary Vessel(s) – 25% of Total Storage Volume:**	N/A
Deemed Practicable / Safe to Conduct Hydrostatic Test? Yes/No			**YES**
If no give reasons:			
Visual Inspection:	Visual Inspection around internal and external of bund walls reveals no signs of breaches or leaks. The bund floor to wall joint appears to be in good condition. Bund filled 1050 mm.		
Photographs	APPENDIX A		

HYDROSTATIC TEST DETAILS:

BS 8007:1987 (Yes/No)?	YES
Fill Rate	N/A
Stabilisation Period	Acceptable (24hrs)
Duration of the Test	24 hrs
Acceptance Criteria (Total permissible drop in water level)	During the test period, the total permissible drop in level after allowing for evaporation and rainfall should not exceed 1/500th of the average water depth, 10 mm or another specified amount.
Water Level Change in Reference Vessel	Zero drop when the reference vessel is taken into account

Date and Time	Water Level in Bund	Water Level in Reference Vessel	Bund Level (+/-) (mm)	Reference vessel Level (+/-) (mm)
Day 1 18/12/2018 13:00	**1050 mm**	**159 mm**		
Day 2 19/12/2018 13:10	**1048 mm**	**159 mm**		

Description / Comments of Hydrostatic Test:
Test completed successfully, depth of water in bund measured and photographed day 1 and day 2. Weather was dry and cold over the 24hr test period. Based on the survey and hydrostatic test carried out ENVA deem bund sump 10 to be of sound integrity and therefore Passed.

VISUAL TEST DETAILS: INSPECTION DESCRIPTION & RESULTS:

Result (Pass/Fail)	**PASS**	
Recommendation(s): Retest October 2020 as per the conditions outlined in license		
Signed: John Carroll	**Title : BE, C Eng, MIEI**	**Date: 19/12/2017**
Signed:	**Title: BE, C Eng, MIEI**	**Date:19/12/2017**
	ENGINEERS IRELAND **Mr. William Stack** Chartered Engineer Registrant 059577 of The Institution of Engineers of Ireland	

5.5 Tanker Digout WashArea

Company:	**Enva ireland Portlaoise**	**Date of Inspection:**	18-19th December, 2017.
Site:	Clonminam Industrial Park, Portlaoise	**License Reg. No.:**	**W0184-01**
Bund Ref. No.:	Tanker Digout Wash Area Sump	**Bund Type (Local/Remote/Combined/Portable):**	Local
Bund Area	135 m²	**Primary Vessel(s) – Materials of Construction:**	Wash Down Area
Bund Construction Material:	In Situ Concrete	**Primary Vessel(s) – Total Storage Volume:**	N/A
Bund Lining Material:	None	**Primary Vessel(s) – 110% Volume of Largest Vessel:**	N/A
Bund Retention Volume:	33.8m³ (3380 ltr)	**Primary Vessel(s) – 25% of Total Storage Volume:**	N/A
Deemed Practicable / Safe to Conduct Hydrostatic Test? Yes/No		**YES**	
If no give reasons:			
Visual Inspection:	Visual Inspection around internal and external of bund walls reveals no signs of breaches or leaks. The bund floor to wall joint appears to be in good condition. Bund filled 550 mm at deep end of digout bay. Bund is roofed and protected from any rainfall.		
Photographs	APPENDIX A		

HYDROSTATIC TEST DETAILS:

BS 8007:1987 (Yes/No)?	YES
Fill Rate	N/A
Stabilisation Period	Acceptable (24hrs)
Duration of the Test	24 hrs
Acceptance Criteria (Total permissible drop in water level)	During the test period, the total permissible drop in level after allowing for evaporation and rainfall should not exceed 1/500th of the average water depth, 10 mm or another specified amount.
Water Level Change in Reference Vessel	Zero drop when the reference vessel is taken into account

Date and Time	Water Level in Bund	Water Level in Reference Vessel	Bund Level (+/-) (mm)	Reference vessel Level (+/-) (mm)
Day 1 18/12/2018 13:15	550 mm	159 mm		
Day 2 19/12/2018 13:20	548 mm	159 mm	-2 mm	0 mm

Description / Comments of Hydrostatic Test:
Test completed successfully, depth of water in bund measured and photographed day 1 and day 2. Weather was dry, warm and breezy over the 24hr test period.. Based on the survey and hydrostatic test carried out ENVA deem the Tanker digout wash area sump to be of sound integrity and therefore Passed.

VISUAL TEST DETAILS: INSPECTION DESCRIPTION & RESULTS:

Result (Pass/Fail)	**PASS**	
Recommendation(s): Retest October 2020 as per the conditions outlined in license		
Signed: John Carroll	**Title : BE, C Eng, MIEI**	**Date: 19/12/2017**
Signed:	**Title: BE, C Eng, MIEI**	**Date:19/12/2017**
	ENGINEERS IRELAND **Mr. William Stack** Chartered Engineer Registrant 059577 of The Institution of Engineers of Ireland	

5.6 Gantry Sump

Company:	**Enva ireland Portlaoise**	**Date of Inspection:**	18-19th December, 2017.
Site:	Clonminam Industrial Park, Portlaoise	**License Reg. No.:**	**W0184-01**
Bund Ref. No.:	Gantry Sump	**Bund Type (Local/Remote/Combined/Portable):**	Local
Bund Dimensions	3.0m x 9.75m x 2.21 m	**Primary Vessel(s) – Materials of Construction:**	Wash Down Area
Bund Construction Material:	In Situ Concrete	**Primary Vessel(s) – Total Storage Volume:**	N/A
Bund Lining Material:	None	**Primary Vessel(s) – 110% Volume of Largest Vessel:**	N/A
Bund Retention Volume:	64.64m³ (64642 ltr)	**Primary Vessel(s) – 25% of Total Storage Volume:**	N/A
Deemed Practicable / Safe to Conduct Hydrostatic Test? Yes/No		**YES**	
If no give reasons:			
Visual Inspection:	Visual Inspection around internal and external of bund walls reveals no signs of breaches or leaks. The bund floor to wall joint appears to be in good condition. Bund filled 1510 mm		
Photographs	APPENDIX A		

HYDROSTATIC TEST DETAILS:

BS 8007:1987 (Yes/No)?	YES
Fill Rate	N/A
Stabilisation Period	Acceptable (24hrs)
Duration of the Test	24 hrs
Acceptance Criteria (Total permissible drop in water level)	During the test period, the total permissible drop in level after allowing for evaporation and rainfall should not exceed 1/500th of the average water depth, 10 mm or another specified amount.
Water Level Change in Reference Vessel	Zero drop when the reference vessel is taken into account

Date and Time	Water Level in Bund	Water Level in Reference Vessel	Bund Level (+/-) (mm)	Reference vessel Level (+/-) (mm)
Day 1 18/12/2018 13:20	**1510 mm**	**159 mm**		
Day 2 19/12/2018 13:30	**1048 mm**	**159 mm**	**-2 mm**	**0 mm**

Description / Comments of Hydrostatic Test:
Test completed successfully, depth of water in bund measured and photographed day 1 and day 2. Weather was cold and breezy over the 24hr test period. Based on the survey and hydrostatic test carried out ENVA deem bund Gantry sump to be of sound integrity and therefore Passed.

VISUAL TEST DETAILS: INSPECTION DESCRIPTION & RESULTS:

Result (Pass/Fail)	**PASS**

Recommendation(s): Retest October 2020 as per the conditions outlined in license		
Signed: John Cassell	**Title : BE, C Eng, MIEI**	**Date: 19/12/2017**
Signed:	**Title: BE, C Eng, MIEI**	**Date:19/12/2017**
	ENGINEERS IRELAND **Mr. William Stack** Chartered Engineer Registrant 059577 of The Institution of Engineers of Ireland	

5.7 Collection Sump 5

enva	**Enva Ireland Ltd** Clonminam Business Park, Portlaoise, Co. Laois +353 57 8678600 John.Carroll@Enva.com www.enva.com **Sump Exfiltration Test**	**Date of test:** 19/12/2018
Client: Enva Ireland Ltd.		**By:** J. Carroll
Site: Clonminam Industrial Park, Portlaoise, Co. Laois		**Licence:** W0184-1

Sump Ref.	Sump Dimensions (mm)	Inspection 1		Inspection 2		Difference		Comments
		Time	Depth of water (mm)	Time	Depth of water (mm)	Time (mins)	Depth of water (mm)	
No. 5	4900 x 1200 x 845	09:30	547	10:15	547	45	0	Passed

Result (Pass/Fail)	**PASS**	
Signed: John Carroll	**Title : BE, M.Sc, MIEI**	**Date: 19/12/2017**
Signed:	**Title: BE, C Eng, MIEI**	**Date:19/12/2017**
	ENGINEERS IRELAND **Mr. William Stack** Chartered Engineer Registrant 059577 of The Institution of Engineers of Ireland	

Appendix 7

Quarterly Effluent Metal Screen for Q1 2017 is shown in the table below.

	Detection Method		ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES
	Method Detection Limit		<0.2	<0.1	<0.5	<1.5	<7	<20	<2	<2	<3	<1	<5
	ISO 17025 Accredited		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Jones Environmental Reference No	Sample Identity	Other ID	Dissolved Calcium	Dissolved Magnesium	Dissolved Cadmium	Total Dissolved Chromium	Dissolved Copper	Total Dissolved Iron	Dissolved Manganese	Dissolved Nickel	Dissolved Zinc	Dissolved Mercury	Dissolved Lead
			mg/l	mg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Report No: 17/2391 Batch1-1	Quarterly Effluent	Effluent Screen 12/01/2017	341.4	229.8	<0.5	8.1	<7	875	488	24	9	<1	<5

Quarterly Effluent Metal Screen for Q2 2017 is shown in the table below.

	Detection Method		ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES
	Method Detection Limit		<0.2	<0.1	<0.5	<1.5	<7	<20	<2	<2	<3	<1	<5
	ISO 17025 Accredited		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Jones Environmental Reference No	Sample Identity	Other ID	Dissolved Calcium	Dissolved Magnesium	Dissolved Cadmium	Total Dissolved Chromium	Dissolved Copper	Total Dissolved Iron	Dissolved Manganese	Dissolved Nickel	Dissolved Zinc	Dissolved Mercury	Dissolved Lead
			mg/l	mg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Report No: 17/10896	Quarterly Effluent	Effluent Screen 21/06/2017	404.7	62.0	<0.5	16	<7	1238	343	31	21	<1	<5

Quarterly Effluent Metal Screen for Q3 2017 is shown in the table below.

	Detection Method		ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES
	Method Detection Limit		<0.2	<0.1	<0.5	<1.5	<7	<20	<2	<2	<3	<1	<5
	ISO 17025 Accredited		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Jones Environmental Reference No	Sample Identity	Date	Dissolved Calcium	Dissolved Magnesium	Dissolved Cadmium	Total Dissolved Chromium	Dissolved Copper	Total Dissolved Iron	Dissolved Manganese	Dissolved Nickel	Dissolved Zinc	Dissolved Mercury	Dissolved Lead
			mg/l	mg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
17/16242	Quarterly Effluent	Effluent Screen 27/09/2017	323.5	58.3	<0.5	7.5	<7	2035	454	33	<3	<1	<5

Quarterly Effluent Metal Screen for Q4 2017 is shown in the table below.

	Detection Method		ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES	ICP OES
	Method Detection Limit		<0.2	<0.1	<0.5	<1.5	<7	<20	<2	<2	<3	<1	<5
	ISO 17025 Accredited		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Jones Environmental Reference No	Sample Identity	Date	Dissolved Calcium	Dissolved Magnesium	Dissolved Cadmium	Total Dissolved Chromium	Dissolved Copper	Total Dissolved Iron	Dissolved Manganese	Dissolved Nickel	Dissolved Zinc	Dissolved Mercury	Dissolved Lead
			mg/l	mg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
17/19151	Quarterly Effluent	Effluent Screen 15/11/2017	384.4	66.0	<0.5	7.1	<7	1054	671	17	<3	<1	<5