

A black and white photograph of an industrial facility. In the foreground, a metal walkway with a grid pattern leads into the distance. To the right of the walkway is a railing made of vertical posts and horizontal bars. In the background, numerous large, white, curved pipes are visible, some running horizontally and others vertically. The sky is visible in the upper left corner. A dark, semi-transparent vertical bar is on the right side of the image, containing the text.

**Clyde
Shanks**

Chapter 8

Land Quality

8. Land Quality

Introduction

- 8.1 The principal aim of this chapter is to identify any additional information on Land Quality that requires consideration since the original EIA submission (March 2014) and the previous ES addendums (September 2014, March 2019 and September 2023).
- 8.2 The original EIA submission (March 2014), assessed the land quality associated with the site and the wider area. As part of the original assessment, desk studies, site walkovers, and a targeted intrusive ground contamination assessment were undertaken followed by the completion of a Preliminary Risk Assessment (PRA) and a Generic Quantitative Risk Assessment (GQRA).
- 8.3 The key findings from the original 2014 assessment are as follows;
- Through the PRA a Conceptual Site Model (CSM) was created which identified areas of potential contamination on site. A number of potential issues were highlighted but the principal source of contamination for the site was due to historic activities on the quarry site and particularly the presence of fuel and other holding tanks within the site. A full GQRA was recommended which incorporated an intrusive ground contamination assessment; and
 - Samples (soil, water and gas) taken during the ground investigation were analysed for a range of determinants using appropriate Generic Assessment Criteria's (GACs). Following the completion of the GQRA, no significant pollutant linkages were identified. However, a number of appropriate mitigation measures were highlighted to further reduce the potential risks for contamination.
- 8.4 The 2014 addendum included further information in respect of land quality. This information was requested by NIEA and included;
- Copies of the original laboratory analysis sheets for soil and water samples; and
 - Justification for the locations of the trial pits during the targeted soil sampling, along with photographic evidence of these being undertaken in lieu of trial pit logs.
- 8.5 The 2019 addendum included:
- Details of an updated site walkover, undertaken in November 2018, which highlighted that blasting activity had occurred on two occasions since the 2014 site visit;
 - Assessment of risk of disturbing erionite - Site surveys and sample analysis did not detect the presence of erionite; and
 - An update of the screening Generic Assessment Criteria (GAC) values in line with updated screening values, for both soil and water samples and the rescreening of laboratory results. All samples remained below the GAC and the conclusions made in the original risk assessment remained valid.

- 8.6 The principal aim of this chapter is to revisit the methodologies and to identify any additional land uses or events (since the March 2014 assessment and subsequent addendums) which might lead to unacceptable risk to health and the environment (including controlled waters).
- 8.7 Any land quality issues identified (in addition to those examined in the 2014 and 2019 assessments) within or near the site, are described alongside the potential environmental impacts that may occur during construction and operational phase.
- 8.8 This addendum chapter should be considered along with the original 2014 assessment chapter and previous addendums.

Methodology

- 8.9 Since 2019 the guidance supporting Contaminated Land assessments has been updated, although the key principles remain, i.e. Preliminary Risk Assessments (PRA), Conceptual Site Model (CSM) and Generic Quantitative Risk Assessment (GQRA). The assessment has been reviewed and is presented in keeping with the Land Contamination Risk Management (LCRM) guidance produced by the Environment Agency (EA) in October 2020, which supersedes the DEFRA and EA publication CLR 11 Model Procedures for the Management of Contaminated Land.
- 8.10 A review of baseline information related to land quality has been undertaken which has informed updates to the PRA and GQRA. This includes reviews of published information and updates to screening values for ground investigation results. A site verification walkover was also carried out on the 9th February 2023 to reaffirm the conditions of the application site. This verification exercise included discussions with a site representative to confirm what activities had occurred on site since previous assessments and site surveys.
- 8.11 A review has also taken place of the approved (14/03/2023) planning application (LA03/2022/0649/F) at the site for the “Erection of a replacement Coated Roadstone Plant and associated ancillary development to include bitumen storage tanks; aggregate and recycled asphalt pavement storage bays; hoppers; storage silos and conveyors” to determine awareness of potential future baseline at the site.
- 8.12 The information gathered has been used to update the existing CSM, to reassess any potential risks resulting from land quality on or surrounding the application site and to confirm if the findings of the 2014 and 2019 assessments remain valid.

Assessment

Preliminary Risk Assessment

Baseline Information

- 8.13 During the site walkover (09/02/2023) it was noted that little had changed at the site since the 2018 site visit. Fly tipping was noted to have occurred along the access road entering the site and in the northern area of the main development as evidenced in Figure 8.1.

Figure 8.1 Evidence of Fly Tipping



8.14 Within the centre of the site road planings have been stored as evidenced in Figure 8.2 and a derelict building contained evidence of chemical spills as evidenced in Figure 8.3. The road planings are for use in highway aggregate and have been classified as recycled material for this use. These road planings are therefore not considered to be a contamination risk.

Figure 8.2 Storage of Road Planings



Figure 8.3 Derelict Building Containing Potential Chemical Spills



8.15 A review of the planning permission LA03/2022/0649/F at the site did not identify any additional information that would change the content of the CSM.

8.16 Based on this information, additional land quality concerns have been identified and are presented in Table 8.1. The CSM, Preliminary Assessment and Mitigation or Risk has also been updated and presented in Table 8.2.

Table 8.1 Additional Land Quality Concerns within the Site and in the Surrounding Area

Description	Reason(s) for Concern	Potential Pollutants
Application Site		
Fly Tipping	Waste materials	General household waste material.
Derelict Building Containing potential chemical spills	Potential chemicals exiting building and infiltrating ground.	Industrial Lubricants and hydraulic oils. (Metals, petroleum hydrocarbons, semi-volatile organic compounds including polyaromatic hydrocarbons)

Table 8.2 Conceptual Site Model, Preliminary Assessment and Mitigation of Risk

Potential Source and Reason for Concern	Potential Pathway(s) to Receptor	Potential Receptor	Preliminary Risk Assessment and Mitigation of Relevant Source-Pathway-Linkage	Is further investigation required?
Application Site				
Fly Tipping	Physical Risk	Road users, site construction workers, site users, site visitors.	Nil to Tolerable risk – no obvious evidence of ground contamination but represents a physical hazard	No further investigation is recommended, however material should be removed and disposed of at earliest convenience to minimise any physical hazards.
Derelict Building Containing potential chemical spills	Contact with, inhalation or ingestion of materials	Road users, site construction workers, site users, site visitors.	Nil to Tolerable risk – Site management aware of this and in process of remedying.	No further investigation is recommended, however material should be removed and disposed of at earliest convenience to minimise any potential hazards.
	Fissure in Rock.	Groundwater	Nil to Tolerable risk – No spillages were observed outside building. Concrete slab/ floor is intact.	No further investigation is recommended, however material should be removed and disposed of at earliest convenience to minimise any potential hazards.

Review of Assessment Screening Values

Rock / Soil / Overburden Contamination

8.17 Generic Assessment Criteria (GAC) used during the original GQRA and March 2019 addendum included UK Soil Guideline Values (SGV's), the at risk Soil Screening Values (SSV's) and the CL:AIRE soil GAC. As part of this assessment the screening values have been updated to reflect changes in guideline values that have occurred since the initial screening process took place.

8.18 Since the March 2019 addendum, Atkins SSVs have been revised using the updated Contaminated Land Exposure Assessment tool (CLEA v1.071). The update includes the library data sets from the Defra research project SP1010 (Development of Category 4 Screening Levels (C4SLs) for assessment of land affected by contamination). The C4SLs consist of cautious estimates of contaminant concentrations in soil that are still considered to present an acceptable level of risk.

8.19 Laboratory results for the soil samples all remained below the relevant updated GAC's (Appendix 8.1). Therefore, the conclusion drawn in the original GQRA and 2019 addendum remain valid.

Groundwater / Surface Water Contamination

8.20 Water samples obtained from the site were originally analysed against:

- At-risk' Water Screening Values (WSV);
- Freshwater Environmental Quality Standards (EQS);
- Drinking Water Standards (UK and World Health Organisation);
- Private Water Supply Regulations (NI) 2009;
- Freshwater Fisheries Directive (FFD) standards.

8.21 The March 2019 addendum was updated to reflect changes in guideline values that have occurred since the initial screening process took place. Changes included updates to the Private Water Supply Regulations (2017) and updates to the EQS criteria.

8.22 Updated screening tables are located in Appendix 8.2 and include updates to the World Health Organisation Drinking Water Supply (DWS) values, UK DWS, Freshwater EQS (Annual Average) and Freshwater EQS (Maximum) . Laboratory results all remained below GAC for human health and controlled waters.

Conclusions

- 8.23 As part of this re-assessment the CSM has been updated to account for additional land concerns. Additional risks have been classified as “Nil to Tolerable” in terms of fly tipping and materials contained within the derelict building.
- 8.24 Screening (generic assessment criteria) values for both the soil and water laboratory results have been reviewed and updated where applicable. All samples remain below relevant GAC protective of human health and controlled waters. The conclusions made in the original assessment and addendums remain valid ('Nil to Tolerable' risk).

A black and white photograph of an industrial facility. In the foreground, a metal walkway with a grid pattern leads into the distance. To the right, there are large white pipes and metal structures. The background shows more of the facility under a cloudy sky.

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Appendix 8.1

Soil Results

Test	Atrisk(1% SOM - 6%SOM)	C4SL	LQM / /S4UL	Units	TP1	TP7	TP15	TP17	TP18	TP2	TP3	TP4	TP5	TP6	TP8	TP9	TP10	TP11	TP12	TP13	TP14	TP16
Asbestos				-	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not
Amosite (Brown) Asbestos				-	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not
Chrysotile (White) Asbestos				-	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not
Crocidolite (Blue) Asbestos				-	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not
Fibrous Actinolite				-	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not
Fibrous Anthrophyllite				-	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not
Fibrous Tremolite				-	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not
Non-Asbestos Fibre *				-	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Not	Detected
Organic Carbon, Total				%	0.203	0.469	<0.2	0.783	1.14	<0.2	<0.2	0.86	<0.2	0.295	1.37	0.454	<0.2	<0.2	<0.2	<0.2	2.12	<0.2
ANC @ pH 4				mol/kg	0.0489	0.101	0.0498	0.109	0.102													
ANC @ pH 6				mol/kg	<0.03	0.064	<0.03	0.0448	<0.03													
Cyanide, Free	373-373			mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cyanide, Total				mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Loss on Ignition				%	12	2.32	6.58	7.4	15.4													
pH				pH Units	7.2	9.19	8.56	8.29	6.9	8.53	9.3	7.86	9.09	8.69	9.15	8.85	9.11	8.97	9.24	8.97	7	8.89
Phosphate (ortho) as PO4				mg/kg	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sulphide, Easily liberated				mg/kg	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15
Sulphur, Total				%	<0.02	0.171	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.106	<0.02	0.0227	<0.02	<0.02	<0.02	0.0359	<0.02
Thiocyanate				mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Arsenic		635-635		mg/kg	1.21	7.42	0.766	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	1.26	<0.6	<0.6	0.835	<0.6	<0.6	3.15	0.714
Boron, water soluble				mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cadmium		410-410		mg/kg	0.355	0.38	0.692	0.569	0.36	0.274	0.525	0.454	0.327	0.373	0.398	0.329	0.276	0.358	0.377	0.308	0.553	0.645
Chromium	208000-208000			mg/kg	113	51.8	5.39	42.9	61.3	11.5	19.1	15.4	46	35.4	35.1	33.4	39.2	36.1	43.4	44.6	102	15.7
Copper	106000-106000			mg/kg	54.4	44	35.2	64.5	60.4	45.5	53.6	44.5	99.4	59.8	54.2	70.1	71.2	65.6	72.8	72.8	271	42.6
Lead		2310-2310		mg/kg	7.29	9.43	8.57	9.99	7.86	5.34	6.73	6.35	4.74	7.86	4.6	8.73	5.1	6.74	5.93	5.53	28.1	7.62
Mercury				mg/kg	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.214	<0.14
Nickel	1770-1770			mg/kg	138	98.5	24	145	122	56.9	77.5	66.8	259	109	195	151	106	157	128	123	112	65.9
Selenium	13000-13000			mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Zinc	1100000-1100000			mg/kg	53.3	65.2	96.9	73.5	66.6	61.2	62.8	55.2	55.1	60.4	45.4	60.2	59.2	58.3	66.9	57	125	81.9
Phenols, Total Detected monohydric	685-3170			mg/kg	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035
TPH Criteria Working Group (TPH CWG)																						
Aliphatics >C10-C12	7900000-69500000			µg/kg	<10	<10	17.5	1520	<10	<10	<10	1630	<10	<10	15.7	<10	<10	27	<10	<10	<10	<10
Aliphatics >C12-C16	34000000-139000000			µg/kg	2380	<100	11300	36400	2930	2200	<100	459000	<100	<100	12200	1400	1740	<100	2580	1780	2160	1560
Aliphatics >C16-C21	3620000000-3620000000			µg/kg	1970	5750	44500	101000	2470	2010	<100	1230000	2450	3340	44900	3720	1460	1360	2000	1310	1560	3490
Aliphatics >C21-C35	3620000000-3620000000			µg/kg	4810	86200	50700	135000	11200	7840	<100	685000	12300	31600	250000	32600	10600	7190	5660	4880	17400	13400
Aliphatics >C35-C44				µg/kg	<100	15100	3860	40500	<100	1090	<100	22000	1450	22800	359000	33800	2090	4790	<100	<100	3520	3070
Aliphatics >C5-C6	4490000-29400000			µg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Aliphatics >C6-C8	10400000-98200000			µg/kg	<10	<10	11	12.8	<10	<10	<10	41.5	<10	<10	<10	<10	<10	16.2	<10	<10	<10	<10
Aliphatics >C8-C10	1370000-14800000			µg/kg	<10	<10	15.3	65	<10	<10	<10	772	<10	<10	10.4	<10	<10	22.6	<10	<10	<10	<10
Aromatics >EC10-EC12	12300000-53800000			µg/kg	<10	<10	12.1	1010	<10	<10	<10	1080	<10	<10	10.4	<10	<10	18.3	<10	<10	<10	<10
Aromatics >EC12-EC16	41300000-65400000			µg/kg	1950	2080	3660	13100	1110	1150	<100	107000	1890	1970	25900	3500	1930	1610	<100	1400	2370	2870
Aromatics >EC16-EC21	28400000-28400000			µg/kg	<100	2430	12100	45400	<100	<100	<100	531000	1250	1660	52300	13600	<100	1080	<100	<100	3470	1660
Aromatics >EC21-EC35	28400000-28400000			µg/kg	<100	25900	24900	66200	8540	467	<100	455000	4910	32600	403000	74500	1310	5790	2400	1600	22600	7720
Aromatics >EC35-EC44				µg/kg	<100	13600	5940	22400	2970	<100	<100	24400	5800	45200	650000	96100	<100	13700	1150	<100	14400	5440
Aromatics >EC40-EC44				µg/kg	<100	6010	2280	8140	<100	<100	<100	8550	2910	21100	334000	47500	<100	7150	<100	<100	6940	2120
Aromatics >EC5-EC7	12500-98000			µg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Aromatics >EC7-EC8	27900000-183000000			µg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Aromatics >EC8-EC10	12210000-20800000			µg/kg	<10	<10	18.6	48.7	<10	<10	<10	514	<10	<10	<10	<10	<10	32.3	<10	15.1	<10	<10
Benzene		12500-98000		µg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Ethylbenzene	7660000-63100000			µg/kg	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
m,p-Xylene	2720000-29700000			µg/kg	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	9.7	<6	<6	<6	<6
Methyl tertiary butyl ether (MTBE)	3140000-22400000			µg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
o-Xylene	3030000-32700000			µg/kg	<3	<3	3.29	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	5.39	<3	3.23	<3	<3
sum of detected BTEX by GC				µg/kg	<24	<24	<24	<24	<24	<24	<24	<24	<24	<24	<24	<24	<24	<24	<24	<24	<24	<24
sum of detected mpo xylene by GC	2720000-29700000			µg/kg	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	15.1	<9	<9	<9	<9
Toluene	27900000-183000000			µg/kg	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	3.23	<2	2.15	<2	<2
Polyaromatic Hydrocarbons (PAHs)																						
Acenaphthene	83600000-106000000			µg/kg	<8	<8	<8	18.4	<8	<8	<8	352	<8	<8	<8	13.3	<8	<8	<8	<8	<8	<8
Acenaphthylene				µg/kg	<12	<12	<12	<12	<12	<12	<12	61.9	<12	<12	<12	21.3	<12	<12	<12	<12	<12	<12
Anthracene	535000000-540000000			µg/kg	<16	<16	<16	<16	<16	<16	<16	244	<16	<16	20.8	58	<16	<16	<16	<16	<16	<16
Benz(a)anthracene	BaP surrogate			µg/kg	<14	<14	<14	<14	<14	<14	<14	23.8	<14	<14	21.2	298	<14	<14	<14	<14	<14	<14
Benzo(a)pyrene		76300-76300		µg/kg	<15	<15	<15	18.8	<15	<15	<15	18	<15	22.7	39.9	410	<15	<15	<15	<15	<15	<15
Benzo(b)fluoranthene	BaP surrogate			µg/kg	<15	<15	<15	19.8	<15	<15	<15	18.2	<15	17.3	35.2	370	<15	<15	<15	<15	<15	<15
Benzo(g,h,i)perylene	BaP surrogate			µg/kg	<24	<24	<24	<24														

[illegible]



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Appendix 8.2

Water Results

[illegible]

GRO Surrogate %	105	108	110	107	107	107	107	107	103									
m,p-Xylene	<8	<8	<8	<8	<8	<8	<8	<8	<8		µg/l	413000/432000	500			30		
Methyl tertiary butyl ether	<3	<3	<3	<3	<3	<3	<3	<3	<3		µg/l	33800000						
o-Xylene	<3	<3	<3	<3	<3	<3	<3	<3	<3		µg/l	503000	500			30		
Sum of detected BTEX	<28	<28	<28	<28	<28	<28	<28	<28	<28									
Sum of detected Xylenes	<11	<11	<11	<11	<11	<11	<11	<11	<11		µg/l		500					
Toluene	<4	<4	<4	<4	<4	<4	<4	<4	<4		µg/l	9090000	700			74		
Total Aliphatics & Aromatics >C5-35 (aq)	<10	<10	205	<10	<10	<10	<10	<10	<10									
Total Aliphatics >C12-C35 (aq)	<10	<10	205	<10	<10	<10	<10	<10	<10									
Total Aromatics >EC12- EC35 (aq)	<10	<10	<10	<10	<10	<10	<10	<10	<10									
Acenaphthene (aq)	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015		µg/l	no wsv						
Acenaphthylene (aq)	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011		µg/l							
Anthracene (aq)	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015		µg/l	no wsv				0.1	0.1	
Benzo(a)anthracene (aq)	<0.017	<0.017	0.0596	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	0.0596	µg/l	no wsv						
Benzo(a)pyrene (aq)	<0.009	<0.009	0.126	0.0217	0.0426	<0.009	<0.009	<0.009	<0.009	0.126	µg/l	no wsv	0.7		0.01	0.00017		
Benzo(b)fluoranthene (aq)	<0.023	<0.023	0.0818	<0.023	0.0352	<0.023	<0.023	<0.023	<0.023	0.0818	µg/l	no wsv		*	*			
Benzo(g,h,i)perylene (aq)	<0.016	<0.016	0.0888	<0.016	0.033	<0.016	<0.016	<0.016	<0.016	0.0888	µg/l	no wsv		*	*			
Benzo(k)fluoranthene (aq)	<0.027	<0.027	0.0898	<0.027	0.0319	<0.027	<0.027	<0.027	<0.027	0.0898	µg/l	no wsv		*	*			
Chrysene (aq)	<0.013	<0.013	0.1	0.0187	0.0316	<0.013	<0.013	<0.013	<0.013	0.1	µg/l	no wsv						
Dibenzo(a,h)anthracene (aq)	<0.016	<0.016	0.0172	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	0.0172	µg/l	no wsv						
Fluoranthene (aq)	<0.017	<0.017	0.141	0.0217	0.0491	<0.017	<0.017	<0.017	<0.017	0.141	µg/l	no wsv				0.0063	1	
Fluorene (aq)	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014		µg/l	no wsv						
Indeno(1,2,3-cd)pyrene (aq)	<0.014	<0.014	0.0443	<0.014	0.0274	<0.014	<0.014	<0.014	<0.014		µg/l	no wsv		*	*			
Naphthalene (aq)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.158	<0.1	<0.1		µg/l	99800				2	130	
PAH, Total Detected USEPA 16 (aq)	<0.247	<0.247	0.968	<0.247	0.326	<0.247	<0.247	<0.247	<0.247									
Phenanthrene (aq)	<0.022	<0.022	0.0554	<0.022	0.0283	<0.022	<0.022	<0.022	<0.022		µg/l							
Pyrene (aq)	<0.015	<0.015	0.163	0.0448	0.0463	<0.015	<0.015	<0.015	<0.015		µg/l	no wsv						
PCB congener 101	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015		µg/l				0.1			
PCB congener 118	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015		µg/l				0.1			
PCB congener 138	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015		µg/l				0.1			
PCB congener 153	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015		µg/l				0.1			
PCB congener 180	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015		µg/l				0.1			
PCB congener 28	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015		µg/l				0.1			
PCB congener 52	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015		µg/l				0.1			
Sum of detected EC7 PCB's	<0.105	<0.105	<0.105	<0.105	<0.105	<0.105	<0.105	<0.105	<0.105		µg/l				0.1			
1,2,4-Trichlorobenzene (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1									
1,2-Dichlorobenzene (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l		1000					
1,3-Dichlorobenzene (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1									
1,4-Dichlorobenzene (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l		300					
2,4,5-Trichlorophenol (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1									
2,4,6-Trichlorophenol (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l		200					
2,4-Dichlorophenol (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l					4.2	140	
2,4-Dimethylphenol (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	30900000						
2,4-Dinitrotoluene (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	no wsv						
2,6-Dinitrotoluene (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	no wsv						
2-Chloronaphthalene (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	62700						
2-Chlorophenol (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l		30			50		

2-Methylnaphthalene (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
2-Methylphenol (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
2-Nitroaniline (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
2-Nitrophenol (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
3-Nitroaniline (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
4-Bromophenylphenylether	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
4-Chloro-3-methylphenol	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l					40		
4-Chloroaniline (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
4-Chlorophenylphenylether	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
4-Methylphenol (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
4-Nitroaniline (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
4-Nitrophenol (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
Azobenzene (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
bis(2-Chloroethoxy)methane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
bis(2-Chloroethyl)ether (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
bis(2-Ethylhexyl) phthalate	<2	2.14	<2	<2	<2	<2	<2	<2	<2		µg/l	no wsv	8			1.3		
Butylbenzyl phthalate (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l					7.5	51	
Carbazole (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
Dibenzofuran (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
Diethyl phthalate (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	no wsv				200	1000	
Dimethyl phthalate (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l					800	4000	
Hexachlorobenzene (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l		0.05				0.05	
Hexachlorobutadiene (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l		0.6				0.6	
Hexachlorocyclopentadiene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
Hexachloroethane (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	<50000						
Indeno(1,2,3-cd)pyrene (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
Isophorone (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
n-Dibutyl phthalate (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	no wsv				8	40	
n-Dioctyl phthalate (aq)	<5	<5	<5	<5	<5	<5	<5	<5	<5		µg/l	no wsv				20	40	
Nitrobenzene (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
n-Nitroso-n-dipropylamine	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
Pentachlorophenol (aq)	<1	<1	<10	<1	<1	<1	<1	<1	<10		µg/l		9			0.4	1	
Phenol (aq)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	269000000						
1,1,1,2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	96700						
1,1,1-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	1270000				100		
1,1,2,2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	650000						
1,1,2-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	208000				400		
1,1-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	1110000						
1,1-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	65600						
1,1-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
1,2,3-Trichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
1,2,3-Trichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
1,2,4-Trichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
1,2,4-Trimethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	9830						
1,2-Dibromo-3- chloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l		1					
1,2-Dibromoethane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l		0.4					
1,2-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l		1000					
1,2-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	3540	30		3	10		

1,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	11100	40					
1,3,5-Trichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
1,3,5-Trimethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
1,3-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
1,3-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l		20					
1,4-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l		300					
2,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
2-Chlorotoluene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
4-Bromofluorobenzene**	94.3	95.7	95.8	94.5	95.3	93.5	94.5	94.7	96.2		%							
4-Chlorotoluene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
4-iso-Propyltoluene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
Benzene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	8460	10		1	10	50	
Bromobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	87700						
Bromochloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
Bromodichloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	6820	60					
Bromoform	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	1770000	100					
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
Carbon disulphide	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
Carbontetrachloride	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	3310	4			12		
Chlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	1300000						
Chloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
Chloroform	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	369000	300			2.5		
Chloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	5500						
cis-1,2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	54600						
cis-1,3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
Dibromochloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	38700	100					
Dibromofluoromethane**	113	113	113	113	115	111	114	112	110		%							
Dibromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
Dichlorodifluoromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
Dichloromethane	<3	<3	<3	<3	<3	<3	<3	<3	<3		µg/l	1500000	20			20		
Ethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	1250000	300					
Hexachlorobutadiene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l		0.6				0.6	
Isopropylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	38900						
m,p-Xylene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	413000/432000	500			30		
Methyl tertiary butyl ether (MTBE)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	33800000						
Naphthalene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	99800				2	130	
n-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
o-Xylene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	503000	500			30		
Propylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	1100000						
sec-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
Styrene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	3530000	20			50	500	
tert-Amyl methyl ether (TAME)	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
tert-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
Tetrachloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	174000	40	10	10			
Toluene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	9090000	700			74	380	
Toluene-d8**	99.4	99.7	99.4	98.4	99.4	97.9	99.7	99.4	98.7		%							
trans-1,2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	65700						
trans-1,3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							
Trichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l		20	10	10	10		
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l							

Vinyl Chloride	<1	<1	<1	<1	<1	<1	<1	<1	<1		µg/l	249	0.3	0.5	0.5			
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Sources of Information / Notes

UK DWS - The Water Supply (Water Quality) Regulations 2018.
DEFRA: Proposed Aquatic Environmental Quality Standards.
WHO Guidelines for Drinking Water Quality. Fourth edition (2017)
WHO Petroleum Products in Drinking Water 2008
*Limit within Private Water Supply Regs NI 2017 is 0.1µg/l for sum of 4 specified compounds
** - There are no WHO guideline values for aliphatic fractions C16 - C21 and C21-35, therefore the guideline values of C8-C1
Sample Date 15/01/13