

Your ref: EAWML30058

Our ref: 14739/075H/CBH/RHT/VKR/AREA 1GW

06 December 2019

PPC Team  
Natural Resources Wales  
Rivers House  
Fortran Road  
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Cardiff  
CF3 0EY

**Attn: David Willey**

Dear David,

**RE: EAWML30058 - DOCKSWAY DISPOSAL SITE. AREA 1 GROUNDWATER & LEACHATE MONITORING REPORT, ANNUAL SCREEN – SEPTEMBER 2019**

Please find enclosed a summary of the results for the groundwater and leachate quality annual screen 2019, carried out at Area 1 of Docksway Disposal Site, in accordance with the aftercare plan, following definitive closure of Area 1 in October 2014. The monitoring was undertaken during September 2019.

We enclose with this letter report, a plan showing the locations of the primary groundwater monitoring points, (Figure A) and the results of the laboratory testing carried out on the three groundwater compliance wells (GW03\_05, GW07\_07 and GW03\_02), and the four leachate sampling locations.

**Field Observations**

Details of the field testing results obtained during the 2019 annual screen are presented in Table 1.

Table 1 – Field Testing and Observations

Monitoring Point	Groundwater/Leachate Level (mbgl)	pH	Electrical Conductivity (µS/cm)	Temperature (°C)	Dissolved Oxygen (%)
GW07_07	5.98	8.30	2484.00	15.71	37.00
GW03_02	9.41	7.93	2277.00	13.45	0.30
GW03_05	5.66	7.96	2643.00	14.30	48.70
LF11_02	1.25	7.97	7227.00	15.66	30.20
LF11_04	1.53	8.56	25170.00	20.98	21.20
LF11_05	1.10	8.47	23450.00	31.60	26.40
LF11_07	1.49	8.38	19040.00	29.94	75.40

The monitoring undertaken was an annual screen which comprises the following determinands (\* is groundwater only);

Table 2 – Testing Determinands

Total Alkalinity*	Chromium*	Total Oxidised Nitrogen*	Total Organic Carbon*
Ammoniacal Nitrogen	Copper*	Calcium*	VOCs
COD*	Lead*	Magnesium*	SVOCs
Conductivity*	Manganese*	Potassium	Organochlorine and Organophosphorous Pesticides
EPH	Nickel	Sodium*	
Mercury	Zinc*	pH*	Cyanide Total
Arsenic	Chloride*	Organotins*	Cyanide Free
Cadmium*	Sulphate*	Phenols	

## Groundwater

### Control Levels and Compliance Limits

The Hydrogeological Risk Assessment (HRA) for Area 1 was revised and issued in October 2011, and contains the Control Levels and Compliance Limits that were set and used to assess the groundwater quality across the Area 1 site, prior to formal closure. The annual screen results for the Area 1 groundwater have been assessed against the well specific Compliance Limits contained in the HRA.

The current laboratory limit of detection (LDL) has been used as the Control level and Compliance limit for Benzene, Naphthalene, Xylene, Phenols and Mercury. This may however be subject to change as the laboratory limit of detection changes.

### Hazardous Substances (formerly List I substances)

All the Priority Contaminants specified as ‘hazardous substances’ in the Area 1 Hydrogeological Risk Assessment (EPH, Arsenic, Benzene, Naphthalene, Xylene and Mercury) were monitored at the compliance wells in September 2019 and all were recorded below the well specific Compliance Limits with the exception of EPH at GW03\_05 where the recorded concentration of 163ug/l marginally exceeds the Compliance Limit for this location (161.3ug/l).

### Other Hazardous Substances

The results of the testing for hazardous substances other than the priority contaminants undertaken during September 2019 are presented in the enclosed analytical certificates and are summarised below.

In general, volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs), pesticides and organotins were not detected above the LDL in the majority of the Area 1 groundwater samples tested with the exception of the following.

Monitoring Point	Contaminant	Lab Detection Limit	Recorded Value
GW03_02	Dichlobenil (pesticide/herbicide)	<0.001 ug/l	0.0649 ug/l
GW07-07	Dichlobenil (pesticide/herbicide)	<0.001 ug/l	0.0744 ug/l

Dichlobenil was also recorded marginally above the LDL at GW03\_02 during the previous four annual monitoring rounds. Given the general groundwater flow direction at the site (towards the south / south east), it is considered that the presence of these parameters in GW03\_02 (up hydraulic gradient of the landfills) indicates that the source of these specific parameters is off site.

The SVOC testing also identified additional compounds in the sample from GW07\_07 that the laboratory have tentatively identified as follows.

Contaminant	Recorded Value
Hexadecanoic acid	33.4 ug/l
Mixed Hydrocarbons	13.8 ug/l
Octadecanoic acid	28.2 ug/l

### Non-Hazardous Substances

All of the “priority contaminants” specified as non-hazardous substances in the Area 1 Hydrogeological Risk Assessment (Ammoniacal Nitrogen, Nickel, Potassium and Phenols) were monitored at the compliance wells as part of the annual screen and were recorded below the well specific Compliance limits.

#### *Chloride and Chemical Oxygen Demand (COD)*

Chloride concentrations at GW03\_02, GW03\_05 and GW07\_07 were recorded at 118mg/l, 194mg/l and 657mg/l respectively during this round and these are within the range of data recorded for these monitoring wells.

COD concentrations of 37.5mg/l, 60.6mg/l and 100mg/l were recorded at GW03\_02, GW03\_05 and GW07\_07 respectively during this round. The concentrations recorded are within the range of results that have been recorded at these locations.

### **Leachate Dip Measurements and Laboratory Test Results**

The level of leachate across Area 1 was monitored in LF03\_01 and LF11\_01 to LF11\_07 in September 2019 and was recorded at levels of between about 6.0m AOD and 13.6 m AOD.

An annual hazardous substance screen was carried out during September 2019 in accordance with the aftercare plan (EAWML 30058). Samples of leachate were obtained and submitted for laboratory testing, from LF11\_02, LF11\_04, LF11\_05 and LF11\_07. There are no Compliance Limits for the leachate at Area 1, and the results of the testing undertaken during September 2019 are presented in the enclosed analytical certificates and are summarised below.

Free Cyanide was not detected at concentrations above the LDL in the leachate wells sampled during this round. However, Phenols were detected in all locations above the LDL with a maximum concentration detected at LF11\_05 of 0.5 mg/l.

Pesticides were not detected above the laboratory method detection limit (MDL) in any of the Area 1 leachate samples tested, with the exception of 1,2,4-Trichlorobenzene at LF11\_02 (0.0416 ug/l) and Terbutryn at LF11\_04 (0.138 ug/l) and LF11\_07 (0.0417 ug/l).

A number of results were recorded above the lab limit of detection for volatile organic compounds (VOCs) and semi volatile organic compounds (SVOCs) at each of the monitoring locations, as shown in the table below.

Table 3 – Summary of Parameters Recorded Above the Lab Method Detection Limit.

Parameter (MDL <1ug/l)	Concentrations (ug/l)			
	LF11_02	LF11_04	LF11_07	LF11_05
Bis(2-Ethylhexyl)phthalate (SVOC)	<4	<80	105	1830
Methyl Tertiary Butyl Ether (VOC)	<1	1.26	1.44	<1
Cis-1,2-Dichloroethene (VOC)	<1	<1	1.59	1.11
Benzene (VOC)	5.15	5.93	6.63	11.2
Toluene (VOC)	1.06	6.6	2.02	12.5
Chlorobenzene (VOC)	4.17	<1	1.2	2.2
Ethylbenzene (VOC)	<1	10.4	10.2	31.1
m,p-xylene (VOC)	27.3	14.7	7.83	45.4
o-xylene (VOC)	3.78	9.51	10.4	27

Isopropylbenzene (VOC)	2.56	<1	<1	4.88
Propylbenzene	1.7	<1	<1	2.88
1,3,5-Trimethylbenzene (VOC)	<1	2.5	2.8	6.62
1,2,4-Trimethylbenzene (VOC)	6.62	9.32	9.09	21.6
4-iso-Propyltoluene (VOC)	<1	9.97	1.02	18.3
1,4-Dichlorobenzene (VOC)	1.88	<1	<1	<1
Naphthalene (VOC)	2.05	2.1	7.13	8.07

In previous reports (Sept 2017, Sept 2016 and Sept 2015), we have reported an increasing trend in EPH concentrations in LF11\_05. In 2018 the sample indicated a reduced concentration of EPH and LF11\_05 was sampled during September 2019. The laboratory result indicates a significant reduction in concentration of EPH from previous years. The table below shows the concentrations of EPH within LF11\_05 during the last 5 years.

Table 4 – Summary of EPH Concentrations in LF11\_05

Monitoring Date	EPH Concentration ug/l
Sept 2015	460,000
Sept 2016	45,700,000
Sept 2017	1,160,000,000
Sept 2018	3,700,000
Sept 2019	137,000

### Concluding Remarks

NCC will continue to monitor the Area 1 groundwater quality in accordance with the aftercare plan and PBA will comment on the general water quality within subsequent reports.

If you have any questions regarding the data, then please do not hesitate to contact us.

Yours sincerely



Kate Riley  
**Associate**  
 For and on behalf of  
**PETER BRETT ASSOCIATES LLP**

CC Robert Hughes – NCC (Docksway Disposal Site)  
 Silvia Gonzalez Lopez - NCC