

Pat Mcgrath
Cardiff City Council
Waste Mangement, Lamby Way
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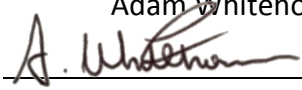
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Certificate of Analysis Number: 3150

Project/Site name:	Lamby Way	Samples Taken:	30-05-2018	
Job Number:	-	Samples Received:	30-05-2018	
Order Number:	-	Date Instructed:	30-05-2018	
Quotation Number	DS170612	Analysis Complete:	20-06-2018	
Sample Matrix:	Surface, Ground and Effluent Water	Report Issued:	20-06-2018	
		Sampled By:	Client	

Amendment Records:

None

Approved by: Adam Whitehouse
Signature: 
Title: Laboratory Manager



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FAO: Pat Mcgrath

CERTIFICATE OF ANALYSIS 3150

Report Date
20th June 2019

Results of analysis of 26 samples received
on the 30/05/19

Code	Determinand	Units	*	Sample Identification			
Laboratory Sample Number:				200619014	200619015	200619016	200619017
Client Sample Reference:				C1	C2	C3	C5
Sample Date:				30/05/19	30/05/19	30/05/19	30/05/19
Sample Matrix:				Groundwater	Groundwater	Groundwater	Groundwater
INORG-L01	pH	pH units	A	7.2	7.4	7.7	7.3
INORG-L02	Conductivity	$\mu\text{S.cm}^{-1}$	A	2,190	977	5,050	8,910
INORG-L12	Ammonical Nitrogen	mg.l^{-1} as N	A	0.52	0.02	4.3	3.4
INORG-L13	Chloride	mg.l^{-1}	A	383	44	1,210	2,060
INORG-L06.1	BOD	mg.l^{-1} as O_2	A	5.4	2.3	1.9	0.9
INORG-L09	Alkalinity	mg.l^{-1} as HCO_3	A	671	495	1030	493
INORG-L11	Nitrate	mg.l^{-1} as N	N	0.1	0.5	0.9	<0.1
INORG-L14	Nitrite	mg.l^{-1} as N	A	0.189	<0.004	1.04	<0.004
METALS-L	Sulphate	mg.l^{-1} as SO_4	A	58	104	123	2.7
INORG-L37	Sulphide	mg.l^{-1} as S	N	<0.1	<0.1	<0.1	<0.1
INORG-L18	TOC	mg.l^{-1} as C	A	12.6	27.9	56.6	54.1
1450	Cadmium	$\mu\text{g.l}^{-1}$	S-A	<0.080	<0.080	<0.080	<0.080
1450	Mercury	$\mu\text{g.l}^{-1}$	S-A	<0.50	<0.50	3.4	0.99
ORG-L17	Mecoprop	$\mu\text{g.l}^{-1}$	A	<0.1	<0.1	<0.1	<0.1
ORG-L05	Xylene	$\mu\text{g.l}^{-1}$	N	<1.0	<1.0	<1.0	<1.0
INORG-L05	COD	mg.l^{-1} as O_2	A	<2	<2	57	26
METALS-L	Iron	$\mu\text{g.l}^{-1}$	A	93.4	12.7	48.7	1,810
METALS-L	Manganese	$\mu\text{g.l}^{-1}$	A	2,290	3.5	404	388
METALS-L	Calcium	mg.l^{-1}	A	132	97.2	137	96.0
METALS-L	Magnesium	mg.l^{-1}	A	102	43.1	87.9	127
METALS-L	Sodium	mg.l^{-1}	A	107	45.0	620	1,140
METALS-L	Potassium	mg.l^{-1}	A	38.0	8.9	90.3	50.1
METALS-L	Nickel	$\mu\text{g.l}^{-1}$	A	<1.5	<1.5	2.8	1.6
METALS-L	Chromium	$\mu\text{g.l}^{-1}$	A	2.4	7.6	4.5	1.1
METALS-L	Copper	$\mu\text{g.l}^{-1}$	A	<0.8	3.4	4.6	<0.8
METALS-L	Lead	$\mu\text{g.l}^{-1}$	A	<4.1	<4.1	<4.1	<4.1
METALS-L	Zinc	$\mu\text{g.l}^{-1}$	A	<1.1	<1.1	6.2	<1.1

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Code	Determinand	Units	*	Sample Identification			
Laboratory Sample Number:				200619018	200619019	200619020	200619021
Client Sample Reference:				C8	C12	C13	C16
Sample Date:				30/05/19	30/05/19	30/05/19	30/05/19
Sample Matrix:				Groundwater	Groundwater	Groundwater	Groundwater
INORG-L01	pH	pH units	A	7.4	7.4	7.4	7.0
INORG-L02	Conductivity	$\mu\text{S.cm}^{-1}$	A	21,630	23,380	12,670	26,890
INORG-L12	Ammonical Nitrogen	mg.l^{-1} as N	A	1.5	17.7	7.4	3.7
INORG-L13	Chloride	mg.l^{-1}	A	2,950	3,030	2,440	3,140
INORG-L06.1	BOD	mg.l^{-1} as O_2	A	2.9	3.4	5.0	5.4
INORG-L09	Alkalinity	mg.l^{-1} as HCO_3	A	1,080	1,160	735	1,170
INORG-L11	Nitrate	mg.l^{-1} as N	N	0.2	<0.1	0.3	<0.1
INORG-L14	Nitrite	mg.l^{-1} as N	A	0.121	0.005	<0.004	0.014
METALS-L	Sulphate	mg.l^{-1} as SO_4	A	445	369	76.6	937
INORG-L37	Sulphide	mg.l^{-1} as S	N	<0.1	<0.1	<0.1	<0.1
INORG-L18	TOC	mg.l^{-1} as C	A	52.6	41.0	45.2	25.6
1450	Cadmium	$\mu\text{g.l}^{-1}$	S-A	<0.080	0.090	<0.080	<0.080
1450	Mercury	$\mu\text{g.l}^{-1}$	S-A	1.5	0.62	<0.50	<0.50
ORG-L17	Mecoprop	$\mu\text{g.l}^{-1}$	A	<0.1	<0.1	<0.1	<0.1
ORG-L05	Xylene	$\mu\text{g.l}^{-1}$	N	<1.0	<1.0	<1.0	<1.0
INORG-L05	COD	mg.l^{-1} as O_2	A	54	80	39	63
METALS-L	Iron	$\mu\text{g.l}^{-1}$	A	79.0	524	429	246
METALS-L	Manganese	$\mu\text{g.l}^{-1}$	A	153	725	1,450	3,420
METALS-L	Calcium	mg.l^{-1}	A	186	130	207	302
METALS-L	Magnesium	mg.l^{-1}	A	273	275	208	339
METALS-L	Sodium	mg.l^{-1}	A	2,220	2,320	1,390	2,450
METALS-L	Potassium	mg.l^{-1}	A	127	124	46.9	134
METALS-L	Nickel	$\mu\text{g.l}^{-1}$	A	4.3	<1.5	<1.5	<1.5
METALS-L	Chromium	$\mu\text{g.l}^{-1}$	A	4.5	2.3	3.1	1.6
METALS-L	Copper	$\mu\text{g.l}^{-1}$	A	1.5	<0.8	<0.8	<0.8
METALS-L	Lead	$\mu\text{g.l}^{-1}$	A	85.1	<4.1	<4.1	5.6
METALS-L	Zinc	$\mu\text{g.l}^{-1}$	A	<1.1	<1.1	<1.1	<1.1

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Code	Determinand	Units	*	Sample Identification			
Laboratory Sample Number:				200619022	200619023	200619024	200619025
Client Sample Reference:				C18	C19	C20	C21
Sample Date:				30/05/19	30/05/19	30/05/19	30/05/19
Sample Matrix:				Groundwater	Groundwater	Groundwater	Groundwater
INORG-L01	pH	pH units	A	7.1	7.6	7.1	7.3
INORG-L02	Conductivity	$\mu\text{S.cm}^{-1}$	A	4,480	6,100	28,030	9,870
INORG-L12	Ammonical Nitrogen	mg.l^{-1} as N	A	0.03	0.01	2.7	0.03
INORG-L13	Chloride	mg.l^{-1}	A	1,150	1,350	3,220	2,010
INORG-L06.1	BOD	mg.l^{-1} as O_2	A	2.6	5.1	2.6	4.5
INORG-L09	Alkalinity	mg.l^{-1} as HCO_3	A	566	851	1,240	987
INORG-L11	Nitrate	mg.l^{-1} as N	N	2.0	2.8	0.1	3.2
INORG-L14	Nitrite	mg.l^{-1} as N	A	<0.004	<0.004	0.112	<0.004
METALS-L	Sulphate	mg.l^{-1} as SO_4	A	209	512	514	466
INORG-L37	Sulphide	mg.l^{-1} as S	N	<0.1	<0.1	<0.1	<0.1
INORG-L18	TOC	mg.l^{-1} as C	A	16.9	46.8	24.6	50.6
1450	Cadmium	$\mu\text{g.l}^{-1}$	S-A	<0.080	<0.080	0.10	<0.080
1450	Mercury	$\mu\text{g.l}^{-1}$	S-A	<0.50	<0.50	<0.50	<0.50
ORG-L17	Mecoprop	$\mu\text{g.l}^{-1}$	A	<0.1	<0.1	<0.1	<0.1
ORG-L05	Xylene	$\mu\text{g.l}^{-1}$	N	<1.0	<1.0	<1.0	<1.0
INORG-L05	COD	mg.l^{-1} as O_2	A	36	15	85	29
METALS-L	Iron	$\mu\text{g.l}^{-1}$	A	59.3	9.8	189	29.7
METALS-L	Manganese	$\mu\text{g.l}^{-1}$	A	2.1	5.2	3,990	131
METALS-L	Calcium	mg.l^{-1}	A	151	143	245	177
METALS-L	Magnesium	mg.l^{-1}	A	83.0	104	303	161
METALS-L	Sodium	mg.l^{-1}	A	517	822	2,520	1,210
METALS-L	Potassium	mg.l^{-1}	A	34.5	43.4	167	73.9
METALS-L	Nickel	$\mu\text{g.l}^{-1}$	A	<1.5	<1.5	2.6	<1.5
METALS-L	Chromium	$\mu\text{g.l}^{-1}$	A	7.2	6.7	1.0	<1.0
METALS-L	Copper	$\mu\text{g.l}^{-1}$	A	5.7	1.6	1.9	1.7
METALS-L	Lead	$\mu\text{g.l}^{-1}$	A	<4.1	<4.1	<4.1	<4.1
METALS-L	Zinc	$\mu\text{g.l}^{-1}$	A	2.4	<1.1	1.4	<1.1

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Code	Determinand	Units	*	Sample Identification			
Laboratory Sample Number:				200619026	200619083	-	-
Client Sample Reference:				C22	C6	-	-
Sample Date:				30/05/19	30/05/19	-	-
Sample Matrix:				Groundwater	Groundwater	-	-
INORG-L01	pH	pH units	A	7.0	7.6	-	-
INORG-L02	Conductivity	$\mu\text{S.cm}^{-1}$	A	26,010	18,390	-	-
INORG-L12	Ammonical Nitrogen	mg.l^{-1} as N	A	3.1	0.48	-	-
INORG-L13	Chloride	mg.l^{-1}	A	3,090	2,720	-	-
INORG-L06.1	BOD	mg.l^{-1} as O_2	A	2.6	4.5	-	-
INORG-L09	Alkalinity	mg.l^{-1} as HCO_3	A	1,290	1,680	-	-
INORG-L11	Nitrate	mg.l^{-1} as N	N	<0.1	0.2	-	-
INORG-L14	Nitrite	mg.l^{-1} as N	A	0.126	0.169	-	-
METALS-L	Sulphate	mg.l^{-1} as SO_4	A	996	311	-	-
INORG-L37	Sulphide	mg.l^{-1} as S	N	<0.1	<0.1	-	-
INORG-L18	TOC	mg.l^{-1} as C	A	66.4	64.1	-	-
1450	Cadmium	$\mu\text{g.l}^{-1}$	S-A	<0.080	<0.080	-	-
1450	Mercury	$\mu\text{g.l}^{-1}$	S-A	<0.50	<0.50	-	-
ORG-L17	Mecoprop	$\mu\text{g.l}^{-1}$	A	<0.1	<0.1	-	-
ORG-L05	Xylene	$\mu\text{g.l}^{-1}$	N	<1.0	<1.0	-	-
INORG-L05	COD	mg.l^{-1} as O_2	A	49	46	-	-
METALS-L	Iron	$\mu\text{g.l}^{-1}$	A	246	99.7	-	-
METALS-L	Manganese	$\mu\text{g.l}^{-1}$	A	5,860	387	-	-
METALS-L	Calcium	mg.l^{-1}	A	295	165	-	-
METALS-L	Magnesium	mg.l^{-1}	A	317	206	-	-
METALS-L	Sodium	mg.l^{-1}	A	2,410	1,980	-	-
METALS-L	Potassium	mg.l^{-1}	A	123	100	-	-
METALS-L	Nickel	$\mu\text{g.l}^{-1}$	A	<1.5	4.6	-	-
METALS-L	Chromium	$\mu\text{g.l}^{-1}$	A	2.2	4.5	-	-
METALS-L	Copper	$\mu\text{g.l}^{-1}$	A	<0.8	<0.8	-	-
METALS-L	Lead	$\mu\text{g.l}^{-1}$	A	9.8	7.9	-	-
METALS-L	Zinc	$\mu\text{g.l}^{-1}$	A	<1.1	<1.1	-	-

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Code	Determinand	Units	*	Sample Identification			
Laboratory Sample Number:				200619027	200619028	200619029	200619030
Client Sample Reference:				L2	L4	L7/LTP	SL4
Sample Date:				30/05/19	30/05/19	30/05/19	30/05/19
Sample Matrix:				Leachate Water	Leachate Water	Leachate Water	Leachate Water
INORG-L12	Ammonia	mg.l ⁻¹ as NH ₄	A	1,350	1,260	279	156
INORG-L13	Chloride	mg.l ⁻¹	A	2,110	2,020	798	936
METALS-L	Nickel	µg.l ⁻¹	A	142	154	44.6	4.6
1450	Cadmium	µg.l ⁻¹	S-A	0.21	<0.080	<0.080	<0.080
ORG-L17	Mecoprop	µg.l ⁻¹	A	7.0	9.2	2.3	12.5
ORG-L05	Xylene	µg.l ⁻¹	N	64.0	68.8	<1.0	<1.0

Code	Determinand	Units	*	Sample Identification			
Laboratory Sample Number:				200619031	200619032	200619033	200619034
Client Sample Reference:				SL5	SL6	SL7	SL8
Sample Date:				30/05/19	30/05/19	30/05/19	30/05/19
Sample Matrix:				Leachate Water	Leachate Water	Leachate Water	Leachate Water
INORG-L12	Ammonia	mg.l ⁻¹ as NH ₄	A	128	249	864	1,220
INORG-L13	Chloride	mg.l ⁻¹	A	538	382	3,170	1,520
METALS-L	Nickel	µg.l ⁻¹	A	2.5	16.1	18.7	83.7
1450	Cadmium	µg.l ⁻¹	S-A	<0.080	<0.080	<0.080	<0.080
ORG-L17	Mecoprop	µg.l ⁻¹	A	3.5	3.9	11.6	12.2
ORG-L05	Xylene	µg.l ⁻¹	N	<1.0	<1.0	48.8	33.0

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Code	Determinand	Units	*	Sample Identification			
Laboratory Sample Number:				200619035	200619036	200619037	200619038
Client Sample Reference:				SW2	SW3	SW4	SW6
Sample Date:				30/05/19	30/05/19	30/05/19	30/05/19
Sample Matrix:				Surface Water	Surface Water	Surface Water	Surface Water
INORG-L01	pH	pH units	A	7.9	7.6	7.4	7.7
INORG-L02	Conductivity	$\mu\text{S.cm}^{-1}$	A	821	717	1,740	496
INORG-L12	Ammonia	mg.l^{-1} as NH_4	A	0.01	0.36	1.0	0.03
INORG-L12	Ammonical Nitrogen	mg.l^{-1} as N	A	0.01	0.28	0.80	0.02
INORG-L06.1	BOD	mg.l^{-1} as O_2	A	2.9	2.5	6.4	6.9
INORG-L06.1	BOD ATU	mg.l^{-1} as O_2	A	2.2	2.1	5.3	5.6
INORG-L05	COD	mg.l^{-1} as O_2	A	<2	<2	3	<2
INORG-L10	Total Suspended Solids	mg.l^{-1}	A	4.0	<1.5	16.0	<1.5
INORG-L13	Chloride	mg.l^{-1}	A	29.4	18.2	121	25.0
-	TON	mg.l^{-1} as N	N	0.2	0.7	0.9	0.1
METALS-L	Nickel	$\mu\text{g.l}^{-1}$	A	<1.5	<1.5	1.9	<1.5

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Analytical Method	Method Code	Accreditation Status
Determination of pH in waters by electrode probe meter (In-house method)	INORG-L01	ISO 17025
Determination of ammonia in waters by colorimetric photometer (In-house method)	INORG-L12	ISO 17025
Determination of chloride by colorimetric photometer (In-house method)	INORG-L13	ISO 17025
Determination of BOD in waters by titration (In-house method)	INORG-L06	ISO 17025
Determination of metals (Cr, Ni, Cu, Zn, SO ₄) in waters by ICP-OES (In-house method)	METALS-L	ISO 17025
Determination of COD in waters by colorimetric photometer (In-house method)	INORG-L05	ISO 17025
Determination of suspended solids in waters by gravimetric (In-house method)	INORG-L10	ISO 17025
Determination of Sulphide in water by Colorimetric analysis (In-house method)	INORG-L37	None
Determination of Cd, Hg) in waters by ICP-MS (Sub-Contracted method)	1450	ISO 17025
Determination of Xylene by GC-MS (In-house method)	ORG-L05	None
Determination of mecoprop by GC-MS (In-house method)	ORG-L17	ISO 17025
Determination of alkalinity by colorimetric photometer (In-house method)	INORG-L07	ISO 17025
Determination of nitrate in waters by colorimetric photometer (In-house method)	INORG-L11	ISO 17025
Determination of nitrite in waters by colorimetric photometer (In-house method)	INORG-L14	ISO 17025
Determination of TON by summation of nitrate and nitrite (In-house method)	-	None
Determination of TOC in waters by colorimetric photometer (In-house method)	INORG-L18	ISO 17025

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Disposal Times:

All water samples will be retained for a period of two weeks and all soil samples retained for a period of one month following the date of the issued certificate.

All results only relate to the samples as received.

This report supersedes any previous versions issued by the laboratory.

A full list of determinants relating to abbreviations such as PAHs, VOCs, SVOCs, PCBs etc. is available upon request.

Where results have been labelled as deviating for any reason, the data may not be representative of the sample at the point of sampling:

[I/S]: Insufficient Sample

[U/S]: Unsuitable Sample

[A]: Date of Sampling not supplied

[B]: Sample age exceeds recommended storage time

[C]: Samples not received in appropriate containers

[D]: Broken Container

< "Less Than"

> "Greater Than"

Where any sub-contracted results have been noted as deviating by the laboratory in question, their deviations codes will be applied and detailed.

Accreditation statements are correct at the time of issue.

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*****END OF REPORT*****

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