

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

VOLUME III APPENDICES

Appendix 11-1 Surface Water Analysis Results



Project Ref: 10117216

Project Title: Cleeves Riverside Quarter EIAR

Project site: Cleeves, Limerick

Client: Limerick City and County Council, in partnership with Limerick Twenty Thirty DAC

Appendix 11-1 Surface Water Quality Monitoring results

		Sample Type	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
		Sampled Date	20/05/2025	20/05/2025	20/05/2025	20/05/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025
		Sample ID	1977768	1977770	1977771	1977769	1999302	1999310	1999309	1999311	1999312	1999313	1999314
		Sample Location	Surface Water	Upstream	Downstream	Outfall	Surface Water	Upstream	Downstream	Outfall	Upstream	Downstream	Outfall
		Sample condition						Low Tide	Low Tide	Low Tide	High Tide	High Tide	High Tide
Parameter	Units	Generic Assessment Criteria*											
pH at 20C		6.0 < pH < 9.0	8.4	8.5	8.5	8.4	8.5	8.4	8.3	8.4	8.4	8.4	8.5
Electrical Conductivity at 25C	µS/cm	-	410	440	430	430	320	420	440	420	440	430	440
Suspended Solids At 105C	mg/l		6.0	28	41	49	130	56	1500	610	15	5.0	9.0
Total Dissolved Solids	mg/l		260	290	280	280	210	280	280	270	280	280	290
Biochemical Oxygen Demand Low Level	mg O2/l	≤ 4.0 (95%ile)	2.0	1.0	< 1.0	2.0	3.0	6.0	6.0	7.0	6.0	5.0	4.0
Chemical Oxygen Demand Low Level	mg O2/l		24	28	21	23	28	24	24	28	26	27	28
Dissolved Oxygen	mg O2/l		8.4	8.5	8.7	8.2	8.6	8.3	8.7	8.9	9.1	9.6	8.6
Redox Potential	mV		210	180	200	200	190	210	210	210	210	210	220
Alkalinity (Total)	mg/l	-	230	240	220	240	100	220	220	220	200	200	200
Chloride	mg/l	-	22	21	22	21	25	22	22	22	23	22	22
Ammoniacal Nitrogen	mg/l	-	0.67	0.54	0.58	0.58	0.58	0.32	0.37	0.37	0.36	0.36	0.16
Nitrate as NO3	mg/l	-	2.6	4.3	3.8	3.8	< 0.50	2.6	3.0	2.5	3.0	3.0	3.1
Phosphate	mg/l	≤ 0.060 (median)	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Sulphate	mg/l	-	18	17	17	17	15	16	17	16	17	16	16
Calcium (Dissolved)	mg/l		67	72	70	72	30	63	65	61	66	66	64
Potassium (Dissolved)	mg/l		2.3	2.1	2.1	2.2	1.6	2.3	2.5	2.3	2.3	2.3	2.6
Magnesium (Dissolved)	mg/l		5.6	5.6	6.0	5.8	4.9	5.6	5.9	5.4	5.7	5.5	5.5
Sodium (Dissolved)	mg/l		9.9	9.3	9.9	9.5	12	11	11	11	12	11	11
Arsenic (Dissolved)	µg/l	20 ^A	0.74	0.51	0.97	0.63	1.1	0.76	1.0	1.2	0.66	0.70	0.61
Barium (Dissolved)	µg/l		41	45	51	49	16	40	37	31	39	40	39
Cadmium (Dissolved)	µg/l	0.45 ^B	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11
Copper (Dissolved)	µg/l	5 ^A	3.1	1.7	1.2	1.4	1.8	1.4	2.3	1.4	1.2	1.6	2.5
Iron (Dissolved)	µg/l		12	17	21	20	13	19	13	13	17	18	15

		Sample Type	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
		Sampled Date	20/05/2025	20/05/2025	20/05/2025	20/05/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025
		Sample ID	1977768	1977770	1977771	1977769	1999302	1999310	1999309	1999311	1999312	1999313	1999314
		Sample Location	Surface Water	Upstream	Downstream	Outfall	Surface Water	Upstream	Downstream	Outfall	Upstream	Downstream	Outfall
		Sample condition							Low Tide	Low Tide	Low Tide	High Tide	High Tide
Parameter	Units	Generic Assessment Criteria*											
Manganese (Dissolved)	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	1.6	1.4	11	2.0	3.1	7.4	4.7
Molybdenum (Dissolved)	µg/l		0.46	0.33	0.35	0.33	0.38	0.40	0.42	0.38	0.38	0.34	0.30
Nickel (Dissolved)	µg/l	34	1.5	1.1	3.6	1.1	2.0	1.2	1.5	1.3	1.3	1.7	1.5
Lead (Dissolved)	µg/l	14	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Antimony (Dissolved)	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	0.59	0.72	1.3	0.85	0.68	0.87	0.57
Zinc (Dissolved)	µg/l	40 ^A	9.0	< 2.5	< 2.5	3.8	39	13	8.1	7.5	19	21	4.2
Mercury Low Level	µg/l	0.07 ^B	< 0.010	< 0.010	< 0.010	< 0.010	0.12	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Chromium (Trivalent)	µg/l	-	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Low-Level Chromium (Hexavalent)	µg/l	0.6 ^A	< 0.10	0.43	0.24	0.28	< 0.10	< 0.10	< 0.10	1.2	< 0.10	< 0.10	0.69
Aliphatic TPH >C5-C6	µg/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	µg/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	µg/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	µg/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	µg/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	µg/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	µg/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	µg/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	µg/l		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	µg/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	µg/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C8-C10	µg/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	µg/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	µg/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	µg/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	µg/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	µg/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	µg/l		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

		Sample Type	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
		Sampled Date	20/05/2025	20/05/2025	20/05/2025	20/05/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025
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		Sample Location	Surface Water	Upstream	Downstream	Outfall	Surface Water	Upstream	Downstream	Outfall	Upstream	Downstream	Outfall
		Sample condition						Low Tide	Low Tide	Low Tide	High Tide	High Tide	High Tide
Parameter	Units	Generic Assessment Criteria*											
Total Petroleum Hydrocarbons	µg/l		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dichlorodifluoromethane	µg/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	µg/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane	µg/l		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	µg/l		< 1.0	< 1.0	< 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	< 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	< 1.0	< 1.0
1,1-Dichloroethane	µg/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	µg/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	µg/l		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloromethane	µg/l		< 1.0	< 1.0	< 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	< 1.0	< 1.0
Tetrachloromethane	µg/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l		< 1.0	< 1.0	< 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	< 1.0
1,2-Dichloroethane	µg/l		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	µg/l		< 1.0	< 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	< 1.0	< 1.0
Dibromomethane	µg/l		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Bromodichloromethane	µg/l		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene	µg/l		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Toluene	µg/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	µg/l		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane	µg/l		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene	µg/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane	µg/l		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane	µg/l		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5

		Sample Type	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
		Sampled Date	20/05/2025	20/05/2025	20/05/2025	20/05/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025
		Sample ID	1977768	1977770	1977771	1977769	1999302	1999310	1999309	1999311	1999312	1999313	1999314
		Sample Location	Surface Water	Upstream	Downstream	Outfall	Surface Water	Upstream	Downstream	Outfall	Upstream	Downstream	Outfall
		Sample condition						Low Tide	Low Tide	Low Tide	High Tide	High Tide	High Tide
Parameter	Units	Generic Assessment Criteria*											
Chlorobenzene	µg/l		< 1.0	< 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		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	µg/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	µg/l		< 1.0	< 1.0	< 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	< 1.0	< 1.0
Styrene	µg/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l		< 1.0	< 1.0	< 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	< 1.0	< 1.0
1,2,3-Trichloropropane	µg/l		< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene	µg/l		< 1.0	< 1.0	< 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	< 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	< 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	< 1.0	< 1.0
Tert-Butylbenzene	µg/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 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	< 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	< 1.0	< 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	< 1.0	< 1.0
4-Isopropyltoluene	µg/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/l		< 1.0	< 1.0	< 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	< 1.0	< 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	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	µg/l		< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	µg/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	0.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/l		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	µg/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

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		Sampled Date	20/05/2025	20/05/2025	20/05/2025	20/05/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025
		Sample ID	1977768	1977770	1977771	1977769	1999302	1999310	1999309	1999311	1999312	1999313	1999314
		Sample Location	Surface Water	Upstream	Downstream	Outfall	Surface Water	Upstream	Downstream	Outfall	Upstream	Downstream	Outfall
		Sample condition						Low Tide	Low Tide	Low Tide	High Tide	High Tide	High Tide
Parameter	Units	Generic Assessment Criteria*											
Bis-(2-Chloroethyl)Ether	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

		Sample Type	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
		Sampled Date	20/05/2025	20/05/2025	20/05/2025	20/05/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025
		Sample ID	1977768	1977770	1977771	1977769	1999302	1999310	1999309	1999311	1999312	1999313	1999314
		Sample Location	Surface Water	Upstream	Downstream	Outfall	Surface Water	Upstream	Downstream	Outfall	Upstream	Downstream	Outfall
		Sample condition						Low Tide	Low Tide	Low Tide	High Tide	High Tide	High Tide
Parameter	Units	Generic Assessment Criteria*											
Dibenzofuran	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene	µg/l	0.05 ^C	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Anthracene	µg/l	0.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbazole	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pyrene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chrysene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	µg/l	0.017 ^C	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene	µg/l	0.017 ^C	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene	µg/l	0.027 ^C	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene	µg/l	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol	µg/l		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
PCB 28	µg/l		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 52	µg/l		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 101	µg/l		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010

		Sample Type	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
		Sampled Date	20/05/2025	20/05/2025	20/05/2025	20/05/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025
		Sample ID	1977768	1977770	1977771	1977769	1999302	1999310	1999309	1999311	1999312	1999313	1999314
		Sample Location	Surface Water	Upstream	Downstream	Outfall	Surface Water	Upstream	Downstream	Outfall	Upstream	Downstream	Outfall
		Sample condition						Low Tide	Low Tide	Low Tide	High Tide	High Tide	High Tide
Parameter	Units	Generic Assessment Criteria*											
PCB 118	µg/l		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 153	µg/l		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 138	µg/l		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 180	µg/l		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total PCBs (7 congeners)	µg/l		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010

Shaded values denote exceedance of relevant surface water regulation value

*Surface Water Regulation Value (S.I. No. 272 of 2009 as amended - SI No. 327 of 2012 and SI No.386 of 2015) - S.I. No. 77/2019 - European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019)

^A AA-EQS value used in the absence of available MAC-EQS

^B MAC-EQS (Class 1)

^C LOD exceeds MAC

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

VOLUME III APPENDICES

Appendix 11-2 Groundwater Analysis Results



Project Ref: 10117216

Project Title: Cleeves Riverside Quarter EIAR

Project site: Cleeves, Limerick

Client: Limerick City and County Council, in partnership with Limerick Twenty Thirty DAC

Appendix 11-2 Groundwater Quality Monitoring results

		Sample Type		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	
		Sampled Date		20/05/2025	20/05/2025	20/05/2025	20/05/2025	20/05/2025	20/05/2025	20/05/2025	20/05/2025	20/05/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025
		Sample ID		1977763	1977764	1977765	1977766	1977767	1977772	1977773	1977774	1999294	1999298	1999299	1999300	1999301	
		Sample Location		BH311	BH312	BH314	BH302	BH310	BH306	BH309	BH308	BH302	BH311	BH312	BH313	BH314	
		Sample condition															
Parameter	Units	Groundwater Regulation Value (Sl. No. 9 of 2010 as amended - Sl. No. 366 of 2016)	Interim Guidelines Value (EPA 2003)														
pH at 20C		≥ 6.5 and ≤ 9.5	7.7	8.0	7.8	8.0	8.1	8.1	9.9	8.4	8.3	8.2	8.1	8.2	8.0		
Electrical Conductivity at 25C	µS/cm	1000	570	530	750	590	680	630	640	760	500	500	500	590	730		
Suspended Solids At 105C	mg/l		480	110000	570	780	30000	5400	12000	I/S	820	87	9000	13000	2200		
Total Dissolved Solids	mg/l	1000	370	340	480	380	440	410	420	490	330	320	330	380	470		
Biochemical Oxygen Demand Low Level	mg O2/l		1.0	< 1.0	1.0	1.0	< 1.0	< 1.0	< 1.0	< 1.0	4.0	4.0	4.0	5.0	2.0		
Chemical Oxygen Demand Low Level	mg O2/l		15	13	2.3	8.3	22	20	64	19	16	17	17	20	11		
Dissolved Oxygen	mg O2/l		8.5	8.4	8.5	7.9	9.5	8.9	8.8	8.9	9.1	8.9	8.9	8.8	8.7		
Redox Potential	mV		200	200	210	190	210	200	190	200	190	200	200	200	210		
Alkalinity (Total)	mg/l		550	210	630	200	580	640	110	I/S	180	250	210	180	190		
Chloride	mg/l	240 - 187.5	30	22	38	31	31	33	23	39	I/S	19	18	23	32	31	
Ammoniacal Nitrogen	mg/l		0.15	0.20	0.20	0.21	0.23	0.29	1.0	1.6	I/S	0.35	0.30	0.37	0.40	0.36	
Nitrate as NO3	mg/l	37.5	25	3.2	< 0.50	22	11	15	11	< 0.50	I/S	6.8	4.9	2.5	< 0.50	17	
Phosphate	mg/l	106.4	0.03	< 0.20	< 0.20	< 0.20	< 0.20	0.46	< 0.20	< 0.20	I/S	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	
Sulphate	mg/l	187.5	200	29	46	61	78	88	55	210	I/S	81	31	24	24	61	
Calcium (Dissolved)	mg/l		200	91	61	120	83	94	99	71	I/S	72	76	77	60	110	
Potassium (Dissolved)	mg/l		5	4.0	11	2.6	3.8	2.9	0.98	26	I/S	4.4	3.8	4.1	2.6	2.8	
Magnesium (Dissolved)	mg/l		50	7.2	16	19	9.3	6.5	7.5	0.39	I/S	8.2	6.4	7.4	13	17	
Sodium (Dissolved)	mg/l		150	11	15	19	16	43	37	48	I/S	15	12	14	44	21	
Arsenic (Dissolved)	µg/l	7.5	10	1.2	0.90	< 0.20	0.33	1.5	0.41	5.8	I/S	0.53	0.71	0.84	4.8	0.34	
Barium (Dissolved)	µg/l		100	64	36	40	76	35	24	48	I/S	56	44	26	55	49	
Cadmium (Dissolved)	µg/l	3.75	5	0.30	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	I/S	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	
Copper (Dissolved)	µg/l	1500	30	10	0.94	< 0.50	4.2	5.4	3.3	32	I/S	4.4	7.4	1.9	1.5	0.64	
Iron (Dissolved)	µg/l		200	< 5.0	20	< 5.0	< 5.0	< 5.0	< 5.0	23	I/S	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	
Manganese (Dissolved)	µg/l		50	29	99	< 0.50	< 0.50	24	37	0.52	I/S	< 0.50	24	120	550	6.5	
Molybdenum (Dissolved)	µg/l			2.0	69	0.59	8.0	8.3	1.3	87	I/S	5.6	1.5	9.3	10	0.64	
Nickel (Dissolved)	µg/l	15	20	6.2	4.1	0.51	0.63	1.7	0.74	11	I/S	1.1	2.6	2.5	3.0	0.93	
Lead (Dissolved)	µg/l	7.5	10	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.84	I/S	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Antimony (Dissolved)	µg/l			1.2	0.75	< 0.50	< 0.50	0.94	< 0.50	2.9	I/S	0.78	0.75	< 0.50	0.77	< 0.50	
Selenium (Dissolved)	µg/l			< 0.50	< 0.50	1.8	1.0	2.8	6.8	1.2	I/S	2.5	1.1	1.1	1.6	2.4	
Zinc (Dissolved)	µg/l	75	100	19	3.4	6.4	8.0	7.3	9.7	< 2.5	I/S	22	23	4.0	4.2	8.3	
Mercury Low Level	µg/l	0.75	1	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	I/S	I/S	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	
Chromium (Trivalent)	µg/l			< 20	< 20	< 20	< 20	< 20	< 20	< 20	I/S	< 20	< 20	< 20	< 20	< 20	
Low-Level Chromium (Hexavalent)	µg/l	7.5		0.33	< 0.10	0.75	0.44	0.25	0.14	1.4	I/S	< 0.10	< 0.10	< 0.10	< 0.10	0.74	
Aliphatic TPH >C5-C6	µg/l			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Aliphatic TPH >C6-C8	µg/l			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Aliphatic TPH >C8-C10	µg/l			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Aliphatic TPH >C10-C12	µg/l			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Aliphatic TPH >C12-C16	µg/l			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Aliphatic TPH >C16-C21	µg/l			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Aliphatic TPH >C21-C35	µg/l			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Aliphatic TPH >C35-C44	µg/l			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Total Aliphatic Hydrocarbons	µg/l			< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	
Aromatic TPH >C5-C7	µg/l			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Aromatic TPH >C7-C8	µg/l			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Aromatic TPH >C8-C10	µg/l			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Aromatic TPH >C10-C12	µg/l			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Aromatic TPH >C12-C16	µg/l			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Aromatic TPH >C16-C21	µg/l			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Aromatic TPH >C21-C35	µg/l			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Aromatic TPH >C35-C44	µg/l			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Total Aromatic Hydrocarbons	µg/l			< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	
Total Petroleum Hydrocarbons	µg/l			< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	
Dichlorodifluoromethane	µg/l			< 1.0	< 1.0	< 1.0	< 1.0	I/S	I/S	I/S	I/S	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Chloromethane	µg/l			< 1.0	< 1.0	< 1.0	< 1.0	I/S	I/S	I/S	I/S	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Vinyl Chloride	µg/l	0.375		< 1.0	< 1.0	< 1.0	< 1.0	I/S	I/S	I/S	I/S	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Bromomethane	µg/l			< 5	< 5	< 5	< 5	I/S	I/S	I/S	I/S	< 5	< 5	< 5	< 5	< 5	
Chloroethane	µg/l			< 2.0	< 2.0	< 2.0	< 2.0	I/S	I/S	I/S	I/S	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	
Trichlorofluoromethane	µg/l			< 1.0	< 1.0	< 1.0	< 1.0										

		Sample Type			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
		Sampled Date			20/05/2025	20/05/2025	20/05/2025	20/05/2025	20/05/2025	20/05/2025	20/05/2025	20/05/2025	20/05/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025
		Sample ID			1977763	1977764	1977765	1977766	1977767	1977772	1977773	1977774	1999294	1999298	1999299	1999300	1999301
		Sample Location			BH311	BH312	BH314	BH302	BH310	BH306	BH309	BH308	BH302	BH311	BH312	BH313	BH314
		Sample condition															
Parameter	Units	Groundwater Regulation Value (Sl. No. 9 of 2010 as amended - Sl. No. 366 of 2016)	Interim Guidelines Value (EPA 2003)														
	µg/l		0.05 ^A	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
	µg/l	0.0075 ^A	0.01 ^A	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
	µg/l		0.05 ^A	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
	µg/l			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
	µg/l		0.05 ^A	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
	µg/l			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
	µg/l			< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
	µg/l			< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
	µg/l			< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
	µg/l			< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
	µg/l			< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
	µg/l			< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010

Shaded values denote exceedance of relevant regulation value

^A LOD exceeds GAC

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

VOLUME III APPENDICES

Appendix 11-3 PFAS Analysis Results



Eurofins Chemtest Ltd
Attn. Mr. J. King
Depot Road 11
GB-CB8 0AL NEWMARKET
GROOT BRITTANIE

Your reference : 25-17339
Our reference : Project 1935760
Validation Ref. : 1935760_certificaat_v1
Verificationcode : KGNT-DWAQ-TAAB-KTNA

Amsterdam, 12 June 2025

I hereby enclose the results of the laboratory tests that have been carried out on your request on the samples that you supplied to us.

I would like to point out to you that the results apply only to the samples supplied, such as these were presented for testing.

The research, with the exception of any outsourced research, was carried out by Eurofins Omegam. Information about the used analysis method(s) can be found in our customer portal My Lab under "Info and Docs".

Do also note that the enclosed report may not be copied or reproduced in any way except in its entirety. I trust that we have completed your order as agreed and to your full satisfaction. If you have any questions reading this report, then please don't hesitate to contact our Customer Service.

Yours sincerely,
On behalf of Eurofins Omegam,



BSc J. Tukker
Production manager

Conditions of delivery of Eurofins Omegam have been registered.
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Eurofins Omegam B.V.
H.J.E. Wenckebachweg 120
NL-1114 AD Amsterdam-Duivendrecht
Netherlands

T +31-(0)20-597 66 80
CSOmegam@etbnl.eurofins.com
www.eurofins.nl/en

IBAN NL 16 BNPA 0227667980
Swiftaddress BNPANL2A
VAT: NL8139.67.132.B01
Trade register No. 34215654

CERTIFICATE

Project code : 1935760
 Your Project Description : 25-17339
 Client : Eurofins Chemtest Ltd

Your Sample identification

8819443 = 1977920 BH312

8819464 = 1977921 BH302

8819465 = 1977922 BH309

Client sampling date	:	20/05/2025	20/05/2025	20/05/2025
Date of receipt	:	28/05/2025	28/05/2025	28/05/2025
Startdate	:	28/05/2025	28/05/2025	28/05/2025
Reference number	:	8819443	8819464	8819465
Your Matrix	:	Water	Water	Water

Organic compounds - per- and polyfluoroalkylsubstances (PFAS) HPLC-MS/MS

Perfluorinated carboxylic acids:

PFBA	µg/l	< 0,02	0,07	< 0,02
PFPeA	µg/l	< 0,02	0,29	< 0,02
PFHxA	µg/l	< 0,02	0,14	< 0,02
PFHpA	µg/l	< 0,02	0,04	< 0,02
PFOA linear	µg/l	< 0,02	< 0,02	< 0,02
PFOA branched	µg/l	< 0,02	< 0,02	< 0,02
PFNA	µg/l	< 0,02	< 0,02	< 0,02
PFDA	µg/l	< 0,02	< 0,02	< 0,02
PFUnDA	µg/l	< 0,02	< 0,02	< 0,02
PFDoDA	µg/l	< 0,02	< 0,02	< 0,02
PFTTrDA	µg/l	< 0,02	< 0,02	< 0,02
PFTeDA	µg/l	< 0,02	< 0,02	< 0,02
PFHxDA	µg/l	< 0,02	< 0,02	< 0,02
PFODA	µg/l	< 0,02	< 0,02	< 0,02

Perfluorinated sulfonic acids:

PFBS	µg/l	< 0,02	< 0,02	< 0,02
PFPeS	µg/l	< 0,02	< 0,02	< 0,02
PFHxS	µg/l	< 0,02	< 0,02	< 0,02
PFHpS	µg/l	< 0,02	< 0,02	< 0,02
PFOS linear	µg/l	< 0,02	< 0,02	< 0,02
PFOS branched	µg/l	< 0,02	< 0,02	< 0,02
PFDS	µg/l	< 0,02	< 0,02	< 0,02

Perfluorinated alkyl substances - precursors:

4:2 FTS	µg/l	< 0,05	< 0,05	< 0,05
6:2 FTS	µg/l	< 0,05	< 0,05	< 0,05
8:2 FTS	µg/l	< 0,1	< 0,1	< 0,1
10:2 FTS	µg/l	< 0,05	< 0,05	< 0,05
PFOSA	µg/l	< 0,02	< 0,02	< 0,02

Perfluorinated alkyl substances - remainder:

HPFHpA	µg/l	< 0,5	< 0,5	< 0,5
4H-PFUnDA	µg/l	< 0,05	< 0,05	< 0,05
8:2 FTUCA	µg/l	< 0,05	< 0,05	< 0,05
9CI-PF3ONS (F53-B)	µg/l	< 0,02	< 0,02	< 0,02
ADONA	µg/l	< 0,02	< 0,02	< 0,02
EtFOSA	µg/l	< 0,05	< 0,05	< 0,05
EtFOSAA	µg/l	< 0,02	< 0,02	< 0,02
MeFBSA	µg/l	< 0,02	< 0,02	< 0,02
MeFOSAA	µg/l	< 0,1	< 0,1	< 0,1
P37DMOA	µg/l	< 0,5	< 0,5	< 0,5
PFBSA	µg/l	< 0,02	< 0,02	< 0,02
MeFOSA	µg/l	< 0,05	< 0,05	< 0,05
MeFBSAA	µg/l	< 0,02	< 0,02	< 0,02
8:2 DiPAP	µg/l	< 0,1	< 0,1	< 0,1
HFPO-DA (GenX)	µg/l	< 0,02	< 0,02	< 0,02

CERTIFICATE

Project code : 1935760
Your Project Description : 25-17339
Client : Eurofins Chemtest Ltd

Your Sample identification

8819443 = 1977920 BH312

8819464 = 1977921 BH302

8819465 = 1977922 BH309

Client sampling date	:	20/05/2025	20/05/2025	20/05/2025
Date of receipt	:	28/05/2025	28/05/2025	28/05/2025
Startdate	:	28/05/2025	28/05/2025	28/05/2025
Reference number	:	8819443	8819464	8819465
Your Matrix	:	Water	Water	Water

som PFOA	µg/l	0,03	0,03	0,03
sum PFOS	µg/l	0,03	0,03	0,03

CERTIFICATE

Project code : 1935760
 Your Project Description : 25-17339
 Client : Eurofins Chemtest Ltd

Your Sample identification

8819467 = 1977923 TRIP BLANK
 8819469 = 1977924 FIELD BLANK
 8819470 = 1977925 EQUIPMENT BLANK

Client sampling date	:	20/05/2025	20/05/2025	20/05/2025
Date of receipt	:	28/05/2025	28/05/2025	28/05/2025
Startdate	:	28/05/2025	28/05/2025	28/05/2025
Reference number	:	8819467	8819469	8819470
Your Matrix	:	Water	Water	Water

Organic compounds - per- and polyfluoroalkylsubstances (PFAS) HPLC-MS/MS

Perfluorinated carboxylic acids:

PFBA	µg/l	< 0,02	< 0,02	< 0,02
PFPeA	µg/l	< 0,02	< 0,02	< 0,02
PFHxA	µg/l	< 0,02	< 0,02	< 0,02
PFHpA	µg/l	< 0,02	< 0,02	< 0,02
PFOA linear	µg/l	< 0,02	< 0,02	< 0,02
PFOA branched	µg/l	< 0,02	< 0,02	< 0,02
PFNA	µg/l	< 0,02	< 0,02	< 0,02
PFDA	µg/l	< 0,02	< 0,02	< 0,02
PFUnDA	µg/l	< 0,02	< 0,02	< 0,02
PFDoDA	µg/l	< 0,02	< 0,02	< 0,02
PFTTrDA	µg/l	< 0,02	< 0,02	< 0,02
PFTeDA	µg/l	< 0,02	< 0,02	< 0,02
PFHxDA	µg/l	< 0,02	< 0,02	< 0,02
PFODA	µg/l	< 0,02	< 0,02	< 0,02

Perfluorinated sulfonic acids:

PFBS	µg/l	< 0,02	< 0,02	< 0,02
PFPeS	µg/l	< 0,02	< 0,02	< 0,02
PFHxS	µg/l	< 0,02	< 0,02	< 0,02
PFHpS	µg/l	< 0,02	< 0,02	< 0,02
PFOS linear	µg/l	< 0,02	< 0,02	< 0,02
PFOS branched	µg/l	< 0,02	< 0,02	< 0,02
PFDS	µg/l	< 0,02	< 0,02	< 0,02

Perfluorinated alkyl substances - precursors:

4:2 FTS	µg/l	< 0,05	< 0,05	< 0,05
6:2 FTS	µg/l	< 0,05	< 0,05	< 0,05
8:2 FTS	µg/l	< 0,1	< 0,1	< 0,1
10:2 FTS	µg/l	< 0,05	< 0,05	< 0,05
PFOSA	µg/l	< 0,02	< 0,02	< 0,02

Perfluorinated alkyl substances - remainder:

HPFHpA	µg/l	< 0,5	< 0,5	< 0,5
4H-PFUnDA	µg/l	< 0,05	< 0,05	< 0,05
8:2 FTUCA	µg/l	< 0,05	< 0,05	< 0,05
9CI-PF3ONS (F53-B)	µg/l	< 0,02	< 0,02	< 0,02
ADONA	µg/l	< 0,02	< 0,02	< 0,02
EtFOSA	µg/l	< 0,05	< 0,05	< 0,05
EtFOSAA	µg/l	< 0,02	< 0,02	< 0,02
MeFBSA	µg/l	< 0,02	< 0,02	< 0,02
MeFOSAA	µg/l	< 0,1	< 0,1	< 0,1
P37DMOA	µg/l	< 0,5	< 0,5	< 0,5
PFBSA	µg/l	< 0,02	< 0,02	< 0,02
MeFOSA	µg/l	< 0,05	< 0,05	< 0,05
MeFBSAA	µg/l	< 0,02	< 0,02	< 0,02
8:2 DiPAP	µg/l	< 0,1	< 0,1	< 0,1
HFPO-DA (GenX)	µg/l	< 0,02	< 0,02	< 0,02

C E R T I F I C A T E

Project code : 1935760
Your Project Description : 25-17339
Client : Eurofins Chemtest Ltd

Your Sample identification
8819467 = 1977923 TRIP BLANK
8819469 = 1977924 FIELD BLANK
8819470 = 1977925 EQUIPMENT BLANK

Client sampling date	:	20/05/2025	20/05/2025	20/05/2025
Date of receipt	:	28/05/2025	28/05/2025	28/05/2025
Startdate	:	28/05/2025	28/05/2025	28/05/2025
Reference number	:	8819467	8819469	8819470
Your Matrix	:	Water	Water	Water

som PFOA	µg/l	0,03	0,03	0,03
sum PFOS	µg/l	0,03	0,03	0,03

C E R T I F I C A T E

Project code	:	1935760
Your Project Description	:	25-17339
Client	:	Eurofins Chemtest Ltd

Notes related to analyses

General comments

The following information has been provided by the client if applicable:

Project description, Sample identificaton, Client sampling date, Client Matrix, Sample depth, Pot number (Barcode), Field data, Field observations and sampling data. The client sampling date can affect the validity of the results.

Quantification of branched PFOS/POA is based on DIN 38414-14.

Summation of concentrations for group parameters

Summation is calculated according to AS3000 protocol, paragraph 2.5.2 and appendix 3.

C E R T I F I C A T E

Project code : 1935760
Your Project Description : 25-17339
Client : Eurofins Chemtest Ltd

Appendix Index PFAS

PFAS component	Full name PFAS component
10:2 FTS	10:2 FTS (10:2 Fluorotelomer sulfonic acid)
4:2 FTS	4:2 FTS (4:2 Fluorotelomer sulfonic acid)
4H-PFUnDA	4H-PFUnDA (2H,2H,3H,3H-Perfluoroundecanoic acid)
6:2 FTS	6:2 FTS (6:2 Fluorotelomer sulfonic acid)
8:2 DiPAP	8:2 DiPAP (8:2 Fluorotelomer phosphate diester)
8:2 FTS	8:2 FTS (8:2 Fluorotelomer sulfonic acid)
8:2 FTUCA	8:2 FTUCA (8:2 Fluorotelomer unsaturated carboxylic acid)
9Cl-PF3ONS (F53-B)	9Cl-PF3ONS (F53-B) (9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid)
ADONA	ADONA (ammonium 4,8-dioxa-3H-perfluorononanoate)
EtFOSA	EtFOSA (N-ethyl perfluorooctanesulfonamide)
EtFOSAA	EtFOSAA (perfluorooctanesulfonylamide(N-ethyl)acetate)
HPFHpA	HPFHpA (7H-perfluoroheptanoic acid)
MeFBSA	MeFBSA (N-methylperfluorobutanesulfonylamide)
MeFBSAA	MeFBSAA (perfluorobutanesulfonylamide(N-methyl)acetate)
MeFOSA	MeFOSA (N-methyl perfluorooctanesulfonamide)
MeFOSAA	MeFOSAA (N-methyl perfluorooctanesulfonamidoacetic acid)
P37DMOA	P37DMOA (perfluoro-3,7-dimethyloctanoic acid)
PFBA	PFBA (perfluorobutanoic acid)
PFBS	PFBS (perfluorobutanesulfonic acid)
PFBSA	PFBSA (perfluorobutanesulfonamide)
PFDA	PFDA (perfluorodecanoic acid)
PFDoDA	PFDoDA (perfluorododecanoic acid)
PFDS	PFDS (perfluorodecanesulfonic acid)
PFHhA	PFHhA (perfluoroheptanoic acid)
PFHhS	PFHhS (perfluoroheptanesulfonic acid)
PFHxA	PFHxA (perfluorohexanoic acid)
PFHxDA	PFHxDA (perfluorohexadecanoic acid)
PFHxS	PFHxS (perfluorohexanesulfonic acid)
PFNA	PFNA (perfluorononanoic acid)
PFOA branched	PFOA branched (perfluorooctanoic acid)
PFOA linear	PFOA linear (perfluorooctanoic acid)
PFODA	PFODA (perfluorooctadecanoic acid)
PFOS branched	PFOS branched (perfluorooctanesulfonic acid)
PFOS linear	PFOS linear (perfluorooctanesulfonic acid)
PFOSA	PFOSA (perfluorooctanesulfonamide)
PFPeA	PFPeA (perfluoropentanoic acid)
PFPeS	PFPeS (perfluoropentanesulfonic acid)
PFTeDA	PFTeDA (perfluorotetradecanoic acid)
PFTTrDA	PFTTrDA (perfluorotridecanoic acid)
PFUnDA	PFUnDA (perfluoroundecanoic acid)
