



Appendix 9.6

Lake Bed Sediment Sampling



 Survey Areas

CLIENT London Borough of Hillingdon

PROJECT Broadwater Lake

TITLE Survey Areas

SCALE @ A3 1:1,112	CREATED BY AE	CHECKED BY MJ
REFERENCE J01596-001	ISSUE/REVISION	DATE 27/1/2025

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Determinants	Units	Broadwater Lake 1	Broadwater Lake 2	Broadwater Lake 3	Broadwater Lake 4	Broadwater Lake 5	Broadwater Lake 6	Broadwater Lake 7	Broadwater Lake 8
pH	pH units	8	7	8.1	8.3	8.1	8	8	8
Phosphorus	mg/l	22.4	30.8	18.8	21.8	20.2	14.8	16.4	31.8
Potassium	mg/l	170	247	122	72	111	77	82	111
Magnesium	mg/l	70	97	47	38	77	42	41	55
Copper	mg/kg	23	29.9	18.5	16.2	20.5	17.7	20.4	23.9
Zinc	mg/kg	77.4	104	64.9	57.6	64.5	54.2	63.2	85.7
Nickel	mg/kg	37.6	38.7	29.7	26.1	32.4	31.1	34	34.5
Cadmium	mg/kg	0.52	0.65	0.37	0.32	0.47	0.48	0.61	0.7
Lead	mg/kg	29.6	39.2	21.2	16.1	26	21.1	23.8	25.5
Chromium	mg/kg	21.6	56.3	37.8	31.3	40.8	32.9	37.5	42.9
Mercury	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Molybdenum	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1
Selenium	mg/kg	3.69	2.81	1.96	1.55	1.95	1.62	1.64	1.56
Arsenic	mg/kg	15.4	26	17.7	23.9	19.3	12.8	18	39.7
Fluoride	mg/kg	68.4	3.3	3.8	5.1	4.2	5.7	4	3.9
Conductivity	uS/cm	2248	2147	2090	2144	2169	2186	2177	2132
Organic Matter	% w/w	4.6	6.8	3.3	2.5	4.9	4.6	5.2	3.8
Total Nitrogen	% w/w	0.127	0.219	0.097	0.071	0.155	0.157	0.184	0.116
Total phosphorus	mg/kg	999	1435	902	815	891	761	851	1289
Total Potassium	mg/kg	1778	2371	1623	1435	1761	1513	1786	1882
Total Magnesium	mg/kg	2434	3277	2168	1944	2311	1996	2219	2367
Total Calcium	mg/kg	39913	82839	91670	74280	62983	71156	71128	62089
Stotal Sodium	mg/kg	174	230	173	147	175	152	175	182
Total Carbon	% w/w	2.71	4.34	3.6	3.28	3.93	4.06	4.36	3.11
Total Sulphur	mg/kg	2003	2044	1161	562	1633	1981	2429	1354

All lab results have been screened against the following criteria:

Suitable 4 Use Levels (S4ULs) – Human health screening criteria produced using the CLEA model, used to assess the risk posed to human health by the deposited sediment. These values determine the suitability of materials kept as bank-side
Environment Agency Ecological Soils Screening Values (SSVs) – Produced by the EA in 2017, the SSVs are used for screening waste and waste derived materials to be used as soil improvers on agricultural land. The values assess the hazard posed
Sewage Sludge on Farmland – Potentially Toxic Elements (PTEs) – the sediment has also been screened using the same values which are applied to sewage sludge spreading on agricultural land.

Exceedance of Suitable 4 Use Levels (S4ULs) - Commercial

Exceedance of Environment Agency Ecological Soils Screening Values (SSVs)

Exceedance of potentially Toxic Elements (PTE) - Sewage sludge on farmland

Broadwater Lake 9	Broadwater Lake 10	Broadwater Lake 11	Broadwater Lake 12	Broadwater Lake 13	Broadwater Lake 14	Broadwater Lake 15	Broadwater Lake 16	Broadwater Lake 17
8	7.9	7.8	7.9	7.8	7.8	7.9	7.8	7.8
16.4	41.6	12.4	10.6	18.2	22.6	18.2	18.4	19
86	136	64	106	147	173	108	125	140
46	52	33	45	53	72	46	47	61
20.7	24.8	26.5	30.3	30.1	33.1	20.4	22.3	23.4
60.7	95.3	57.5	55.9	80.7	89.9	59.3	59.6	69
26.5	37.5	25.6	22.8	38.6	39.2	27	27.4	30.6
0.47	0.51	0.49	0.42	0.72	0.73	0.48	0.49	0.61
20.4	26.6	52.9	71.6	45.2	56.6	31.4	31.6	30.9
35.5	56.4	28.4	28	52.1	55.2	42	37	45.2
<0.2	<0.2	0.37	0.52	0.27	0.36	<0.2	0.21	<0.2
<1	<1	<1	<1	<1	<1	<1	<1	<1
1.56	1.98	1.84	1.59	2.47	2.63	1.91	2.15	2.22
18.8	26.4	17.9	11.6	24.8	26.6	19.1	20.3	21.6
69.8	5.3	49.3	56.5	3	3	9.2	3.2	3
2173	2241	2183	2167	2265	2295	2248	2275	2270
5.8	4.1	8.6	7.9	8.4	10.3	6.8	8.4	8.6
0.186	0.144	0.295	0.304	0.311	0.359	0.296	0.382	0.366
753	1499	730	573	1252	1355	921	869	983
1606	2521	1120	1138	1913	2214	1407	1529	1787
2148	3263	1636	2016	2451	2679	1720	1974	2456
34813	50962	35370	29251	65755	66043	46636	72259	60733
156	174	129	143	218	227	154	215	192
3.53	2.75	4.82	4.27	5.8	6.23	4.2	6.47	5.93
1344	2367	2056	1121	2546	3445	2607	3895	3561

retention. 'Commercial' values have been selected as they provide the most conservative screening criteria.

sed by 19 substances to soil fauna, flora and ecosystems. These values asses the suitability of the materials for agricultural spreading, taking into account background concentrations which have been sourced from the NSIV survey.

Broadwater Lake 18	Broadwater Lake 19	Broadwater Lake 20
7.7	7.8	7.8
15.4	21	21
123	143	182
680	78	97
29.7	31.5	33.9
69.1	87.5	101
33.7	40.6	43.3
0.57	0.66	0.69
45	40	43.7
41.4	49.4	58.5
0.31	0.21	0.2
<1	<1	<1
3.08	3.27	3.2
22.1	28.1	30.4
2.5	2.4	2.5
2339	2267	2328
14.4	12	10
0.602	0.488	0.377
840	1074	1222
1791	2192	2590
2462	3071	3520
70175	70782	60303
238	228	265
10.3	7.82	5.74
5405	3159	1756

ANALYTICAL REPORT															
Report Number GREEN TREE HOUSE Date Reported Project Reference Order Number		77341-25 UB9 6AH 17-MAR-2025 SEDMIENT BROADWATER LAKE 1437		W492 JOHNS ASSOCIATES LTD 11 ST MARGARETS STREET BRADFORD ON AVON BA15 1DA		Client BROADWATER LAKE Date Received					06-FEB-2025				
Laboratory Reference		SLUR162208	SLUR162209	SLUR162210	SLUR162211	SLUR162212	SLUR162213	SLUR162214	SLUR162215	SLUR162216	SLUR162217	SLUR162218	SLUR162219	SLUR162220	SLUR162221
Sample Reference		SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6	SITE 7	SITE 8	SITE 9	SITE 10	SITE 11	SITE 12	SITE 13	SITE 14
Determinand	Unit	SEDMIENT	SEDMIENT	SEDMIENT	SEDMIENT	SEDMIENT	SEDMIENT	SEDMIENT	SEDMIENT	SEDMIENT	SEDMIENT	SEDMIENT	SEDMIENT	SEDMIENT	SEDMIENT
Oven Dry Solids	%	15.9	10.6	7.47	22.7	15.8	25.0	4.40	19.4	27.3	40.8	17.6	34.7	29.5	15.1
Asbestos Screen		None Detected	None Detected	None Detected	None Detected	None Detected	None Detected	None Detected	None Detected	None Detected	None Detected	None detected	None detected	None detected	None detected
Hexavalent Chromium	mg/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Total PAH	ug/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
TPH [C5-C35]	mg/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Aliphatic TPH C5-C6	mg/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Aliphatic TPH C6-C8	mg/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Aliphatic TPH C8-C10	mg/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Aliphatic TPH C10-C12	mg/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Aliphatic TPH C12-C16	mg/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Aliphatic TPH C16-C21	mg/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Aliphatic TPH C21-C35	mg/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Aromatic TPH C5-C7	mg/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Aromatic TPH C7-C8	mg/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Aromatic TPH C8-C10	mg/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Aromatic TPH C10-C12	mg/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Aromatic TPH C12-C16	mg/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Aromatic TPH C16-C21	mg/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Aromatic TPH C21-C35	mg/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Conductivity 1:6	uS/cm	140	179	140	162	164	191	161	166	162	169	181.0	163.0	161.0	173.0
Total Kjeldahl Nitrogen	% w/w	0.12	0.13	0.12	0.13	0.14	0.13	0.12	0.13	0.11	0.11	0.1	0.1	0.1	0.1
Nitrate Nitrogen	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Ammonium Nitrogen	mg/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
Total Phosphorus (P)	mg/kg	147	132	139	140	130	182	133	91.7	146	175	145.0	128.0	66.3	154.0
Total Potassium (K)	mg/kg	491	450	412	431	366	963	339	221	399	415	272.0	254.0	174.0	376.0
Total Magnesium (Mg)	mg/kg	638	579	527	551	421	1170	419	263	468	508	383	345	198	514
Total Copper (Cu)	mg/kg	8.33	7.65	5.59	5.53	4.57	1.13	2.86	2.59	4.49	4.67	2.99	2.81	2.06	4.76
Total Zinc (Zn)	mg/kg	22.4	20.7	20.6	20.9	16.7	7.73	9.50	9.28	16.9	18.3	11.1	10.2	7.51	16.8
Total Sulphur (S)	mg/kg	1714	1559	1738	1897	1303	1420	1199	939	934	1087	1196	1166	523	1841
Total Calcium (Ca)	mg/kg	22702	20821	30855	33391	22383	42804	32918	21402	19825	27895	47681	41641	12062	46186
Total Molybdenum (Mo)	mg/kg	0.69	0.63	0.19	0.22	0.16	0.12	0.10	0.08	0.12	0.12	0.10	0.11	<0.05	0.17
Total Lead (Pb)	mg/kg	11.6	10.4	9.96	8.29	6.45	7.14	6.21	3.63	6.84	6.89	3.96	4.00	3.26	6.30
Total Cadmium (Cd)	mg/kg	0.12	0.12	0.13	0.14	0.11	0.16	0.09	0.07	0.11	0.11	0.07	0.07	0.05	0.12
Total Mercury (Hg)	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Nickel (Ni)	mg/kg	7.72	6.93	6.44	6.52	6.02	12.6	5.72	3.32	6.08	6.88	4.62	3.95	2.92	6.57
Total Chromium (Cr)	mg/kg	9.85	8.88	8.29	8.18	6.76	18.3	7.16	4.01	8.07	8.80	5.43	4.81	2.92	7.51
Total Sodium (Na)	mg/kg	69.0	66.5	68.0	71.7	64.6	86.6	64.1	59.0	64.0	67.4	70.3	66.7	51.6	71.0
pH 1:6 [Fresh]		8.16	7.99	8.15	8.11	8.07	7.82	7.96	8.02	8.09	8.03	7.85	8.00	7.88	7.93
Organic Matter LOI	% w/w	1.64	1.52	0.92	2.69	2.39	2.65	0.53	2.31	2.87	2.23	1.58	2.46	2.64	1.84
Fluoride [100:1 H2SO4 Soluble]	mg/kg	22.9	12.7	22.4	17.5	16.1	18.9	17.0	13.8	23.3	25.9	15.3	15.0	<10	16.9
Total Arsenic (As)	mg/kg	4.18	3.78	4.11	3.98	2.92	4.13	2.96	1.80	2.35	2.73	3.23	2.74	1.25	4.31
Total Selenium (Se)	mg/kg	0.56	0.51	0.53	0.57	0.52	0.63	0.74	0.37	0.55	0.60	0.52	0.42	0.34	0.69
Naphthalene	ug/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Acenaphthylene	ug/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Acenaphthene	ug/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Fluorene	ug/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Phenanthrene	ug/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Anthracene	ug/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Fluoranthene	ug/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Pyrene	ug/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Benzo[a]anthracene	ug/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Chrysene	ug/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Benzo[b]fluoranthene	ug/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Benzo[k]fluoranthene	ug/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Benzo[a]pyrene	ug/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Indeno[1,2,3-cd]pyrene	ug/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Dibenzo[a,h]anthracene	ug/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Benzo[g,h,i]perylene	ug/l	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable

