
Appendix 17.1
Water Quality Monitoring
Data

EPA Sampling

Monitoring data was extracted from two EPA monitoring stations located within the vicinity of the Study Area, one on the River Boyne upstream of the proposed corridor and one on the River Mattock immediately upstream of the confluence with the River Boyne. The sampling locations for Boyne_160 and Mattock_030 are shown in **Figure A17.1**.

The mean, 95th percentile and maximum results for key parameters are presented in **Table A17-1** for the period January 2020 to December 2022 inclusive. Statutory Environmental Quality Standard (EQS) limits are presented for comparison, and exceedances of the limits are shown in red.

The EQS limits shown in relation to Surface Water Regulations 2009 (S.I. No. 272 of 2009), as amended, are for water bodies with Good WFD ecological status. The EQS limits shown in relation to Salmonid Regulations 1988 (S.I. No. 293 of 1988) apply to the River Boyne only.

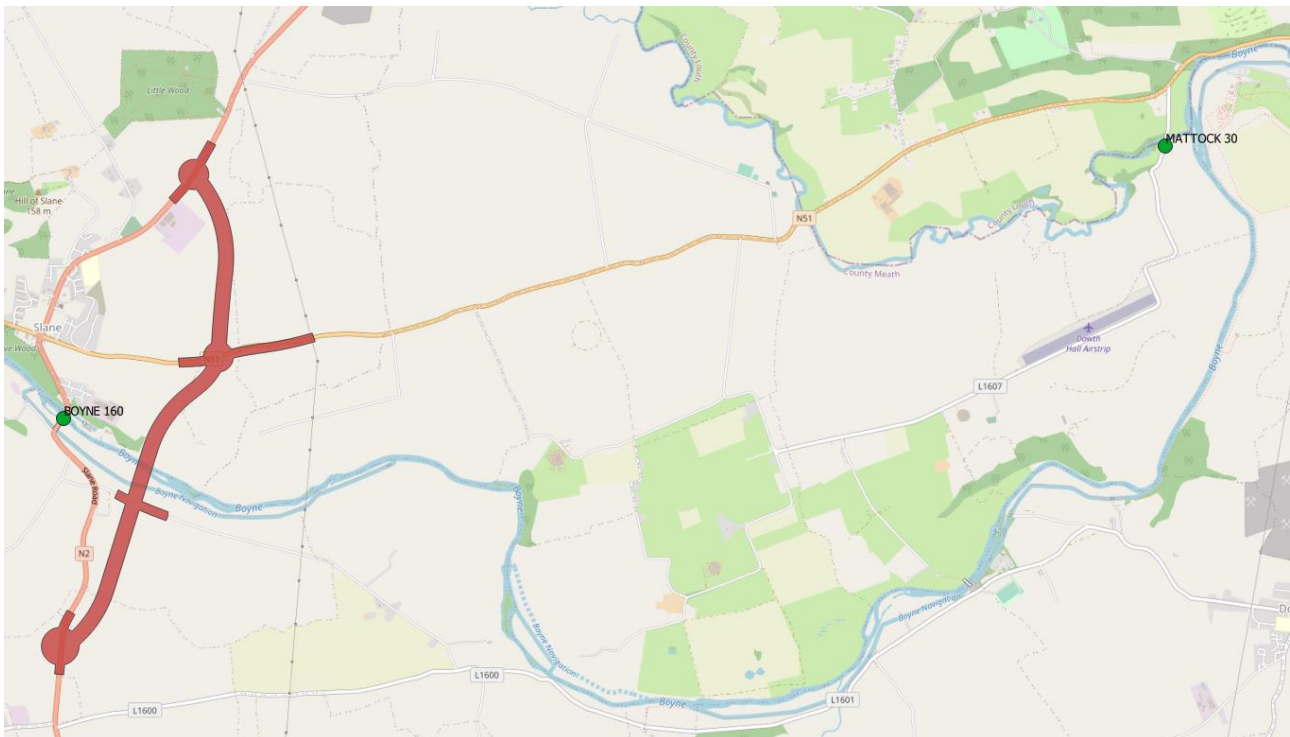


Figure A17.1: EPA Monitoring Locations

VOL. 4 APPENDIX 17

Table A17-1: EPA Monitoring Data

Parameter	Units	Value	EPA 2019-2021						Surface Water Regulations (Good WFD Status River)	Salmonid Regulations (for Boyne only)
			Boyne_160			Mattock_030				
			2020	2021	2022	2020	2021	2022		
Alkalinity (as CaCO ₃)	mg/l	N	12	12	12	5	5	5	-	-
		Mean	254	242	249	165	197	190	-	-
		95th Percentile	301	295	308	203	290	208	-	-
		Maximum	304	299	314	206	309	209	-	-
Total Ammonia (as N)	mg/l	N	20	20	22	5	5	5	0.065	-
		Mean	0.026	0.022	0.019	0.041	0.037	0.013	0.140	-
		95th Percentile	0.043	0.076	0.034	0.103	0.072	0.021	-	-
		Maximum	0.052	0.077	0.061	0.120	0.075	0.024	-	-
Biological Oxygen Demand	mg/l	N	20	20	20	5	5	5	1.5	-
		Mean	1.0	1.1	1.0	1.2	1.9	0.5	2.6	5
		95th Percentile	1.7	1.6	1.4	1.8	2.6	0.5	-	-
		Maximum	1.8	1.7	1.8	1.9	2.6	0.5	-	-
Dissolved Oxygen	%	N	20	20	22	5	5	5	-	-
		Mean	99	101	100	102	96	104	80≤ % ≤120	-
		95th Percentile	102	109	108	113	104	112	-	-
		Maximum	111	110	110	116	106	113	-	-
Dissolved Oxygen	mg/l	N	20	20	22	5	5	5	-	50% >9
		Mean	11	11	11	12	11	12	-	-
		95th Percentile	12	13	13	13	13	12	-	-
		Maximum	12	13	13	13	13	12	-	-
Nitrite (as NO ₂ -N)	µg/L	N	11	12	12	5	5	5	-	-
		Mean	11	10	10	25	15	15	-	50
		95th Percentile	17	20	18	53	20	27	-	-
		Maximum	18	23	19	53	21	27	-	-
	mg/l	N	20	20	22	5	5	5		

VOL. 4 APPENDIX 17

Parameter	Units	Value
Orthophosphate (as P)		Mean
		95th Percentile
		Maximum
pH	pH Units	N
		Mean
		95th Percentile
		Maximum
Total Oxidised Nitrogen (as N)	mg/l	N
		Mean
		95th Percentile
		Maximum
Total Suspended Solids	mg/l	N
		Mean
		95th Percentile
		Maximum

EPA 2019-2021					
Boyne_160			Mattock_030		
2020	2021	2022	2020	2021	2022
0.029	0.024	0.023	0.019	0.042	0.023
0.054	0.045	0.045	0.041	0.090	0.043
0.069	0.048	0.055	0.041	0.100	0.044
20	20	22	5	5	4
8.2	8.2	8.2	8.1	8.0	8.2
8.3	8.4	8.4	8.2	8.2	8.3
8.4	8.4	8.4	8.2	8.2	8.3
12	12	12	5	5	5
2.5	2.3	2.7	5.1	4.8	4.8
3.2	3.0	3.9	6.9	5.4	5.4
3.4	3.2	4.1	7.2	5.4	5.5
12	12	12	0	0	0
5	12	4	n/a	n/a	n/a
12	42	12	n/a	n/a	n/a
17	57	19	n/a	n/a	n/a

Surface Water Regulations (Good WFD Status River)	Salmonid Regulations (for Boyne only)
0.035	-
0.075	-
-	-
6 < pH < 9	-
-	6.5 ≤ pH ≤ 9.5
-	-
-	-
-	-
-	25
-	-
-	-

Note: N = Number of samples

EIA Sampling

A water sampling and monitoring programme was commissioned by MCC to inform the baseline water quality in the watercourses within the Study Area. The programme included sampling at eight locations within the Study Area, sampled twice monthly for a period of 12 months. The sampling locations A, B, C, D, E1, E2, E4, and E5 are shown in **Figure A17.2**.

The mean, 95th percentile and maximum concentrations for key parameters are presented in **Table A17-2** for the period August 2021 to July 2022 inclusive. Statutory EQS limits are presented for comparison, and exceedances of the limits are shown in red.

The EQS limits shown in relation to Surface Water Regulations are for waterbodies with Good ecological status. The EQS limits shown in relation to Salmonid Regulations apply to the River Boyne only.

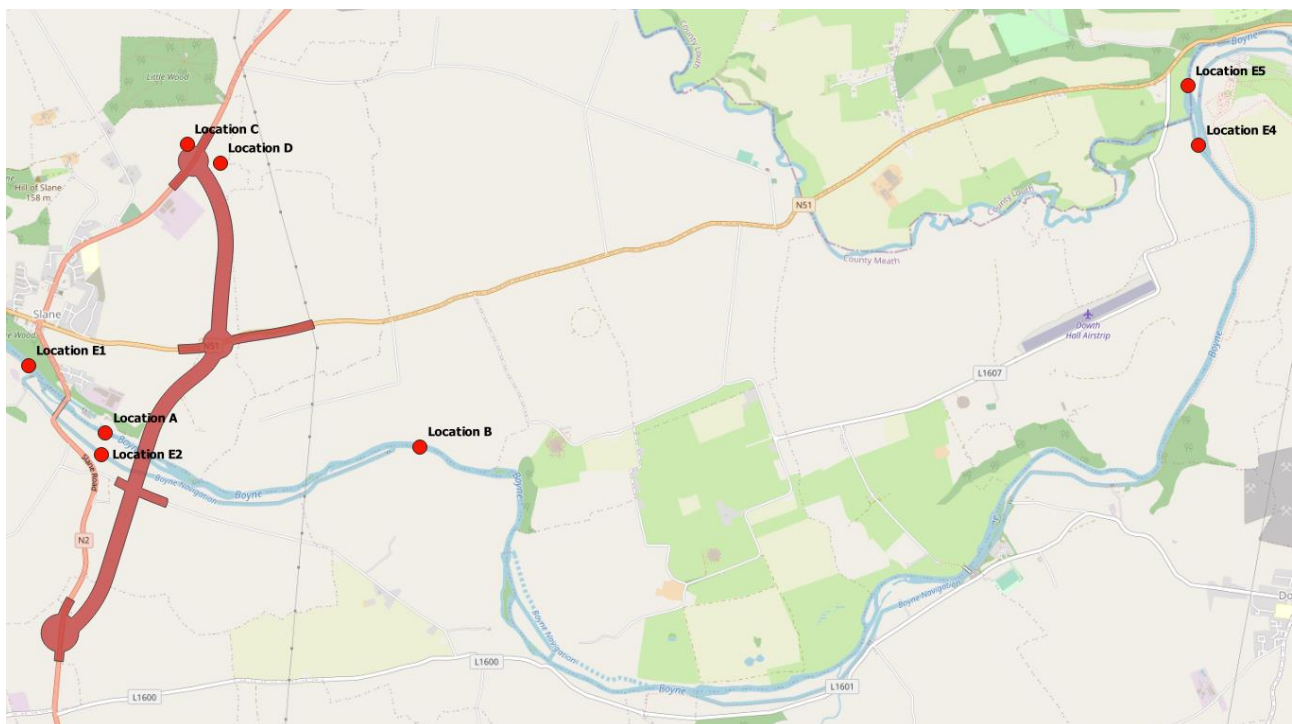


Figure A17.2: EIA Sampling Locations

VOL. 4 APPENDIX 17

Table A17-2: EIA Sampling Data

Parameter	Units	N ¹	Value	EIA Sampling Site (2021-2022)								Surface Water Regulations (for Good Status River)	Salmonid Regulations (for Boyne only)
				A	B	C	D	E1	E2	E4	E5		
Alkalinity (as CaCO ₃)	mg/L	16	Mean	243	248	219	217	236	242	236	203	-	-
			95th Percentile	308	287	291	295	304	297	297	275	-	-
			Maximum	319	328	321	318	313	316	307	277	-	-
Total Ammonia (as N)	mg/L	16	Mean	0.105	0.113	0.263	0.141	0.101	0.103	0.104	0.105	0.065	-
			95th Percentile	0.140	0.150	0.665	0.185	0.100	0.117	0.129	0.129	0.140	-
			Maximum	0.150	0.240	2.800	0.810	0.120	0.160	0.130	0.140	-	-
Biological Oxygen Demand	mg/L	16	Mean	0.9	3.3	1.9	2.2	0.9	3.4	1.1	0.9	1.5	-
			95th Percentile	2.1	7.4	4.5	9.5	1.6	7.5	2.2	2.0	2.6	5
			Maximum	2.5	7.5	11.0	15.0	2.5	27.0	2.6	3.5	-	-
Dissolved Oxygen	%	12	Mean	99	92	95	95	97	85	98	97	-	-
			95th Percentile	121	119	117	114	114	109	114	112	80 ≤ % ≤ 120	-
			Maximum	134	119	124	116	120	120	118	119	-	-
Dissolved Oxygen	mg/L	12	Mean	11	10	10	10	11	9	11	10	-	50% >9
			95th Percentile	12	13	13	13	12	12	13	12	-	-
			Maximum	13	14	15	13	13	14	14	13	-	-
Nitrite (as NO ₂ -N)	µg/L	16	Mean	16	17	19	34	16	17	16	16	-	-
			95th Percentile	19	18	33	144	17	20	16	16	-	50
			Maximum	20	24	38	160	18	23	16	18	-	-
Orthophosphate (as P)	mg/L	16	Mean	0.060	0.061	0.113	0.117	0.059	0.062	0.062	0.071	0.035	-
			95th Percentile	0.065	0.065	0.238	0.301	0.065	0.065	0.065	0.110	0.075	-
			Maximum	0.073	0.072	0.250	0.330	0.065	0.065	0.130	0.200	-	-
pH	pH Units	16	Mean	7.99	7.95	7.90	7.90	7.98	7.66	7.99	7.98	6 < pH < 9	-
			95th Percentile	8.30	8.22	8.20	8.22	8.20	8.12	8.24	8.31	-	-
			Maximum	8.99	9.06	8.80	8.79	8.92	8.72	8.73	8.75	-	-
	mg/L	16	Mean	2.3	2.8	2.3	2.9	2.2	2.3	2.9	4.3	-	-

¹ N = Number of samples. The number of samples taken at sites C and D is one less than indicated in the table (the watercourse was dry for one of the sampling events in July 2022).

VOL. 4 APPENDIX 17

Parameter	Units	N ¹	Value	EIA Sampling Site (2021-2022)								Surface Water Regulations (for Good Status River)	Salmonid Regulations (for Boyne only)
				A	B	C	D	E1	E2	E4	E5		
Total Oxidised Nitrogen (as N)			95th Percentile Maximum	3.5	4.7	4.8	4.3	3.6	3.6	7.6	8.1	-	-
Total Suspended Solids	mg/L	16	Mean 95th Percentile Maximum	3.6	19.0	6.5	4.5	3.7	3.7	11.0	9.9	-	-
				15	21	71	78	10	22	12	16	-	25
				39	64	366	412	19	69	38	36	-	-
				71	72	457	791	56	190	66	162	-	-
Cadmium (Dissolved as Cd)	µg/L	11	Mean 95th Percentile Maximum	<5	<5	7	<5	<5	<5	<5	<5	0.25	-
				<5	<5	9	<5	<5	<5	<5	<5	-	-
				<5	<5	35	<5	<5	<5	<5	<5	1.50	-
Copper (Dissolved as Cu)	µg/L	16	Mean 95th Percentile Maximum	25	<25	38	<25	<25	<25	<25	<25	30	-
				25	<25	25	<25	<25	<25	<25	<25	-	112
				25	<25	330	<25	<25	<25	<25	<25	-	-
Zinc (Dissolved as Zn)	µg/L	16	Mean 95th Percentile Maximum	27	26	32	<25	26	26	25	26	100	-
				41	28	25	<25	25	25	25	25	-	-
				54	35	190	<25	43	40	30	38	-	-
Zinc (Total as Zn)	µg/L	16	Mean 95th Percentile Maximum	47	46	49	50	44	46	41	40	-	-
				93	81	66	84	85	93	91	83	-	300
				120	110	240	150	100	100	140	110	-	-
Benzo-[a]-anthracene	µg/L	16	Mean 95th Percentile Maximum	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.00017	-
				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-
				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.27000	-

Q-Values

The historic Q-value biotic index at the Boyne and Mattock station locations within the Study area are shown in **Figure A17.3** and are presented in **Table A17-3** below.

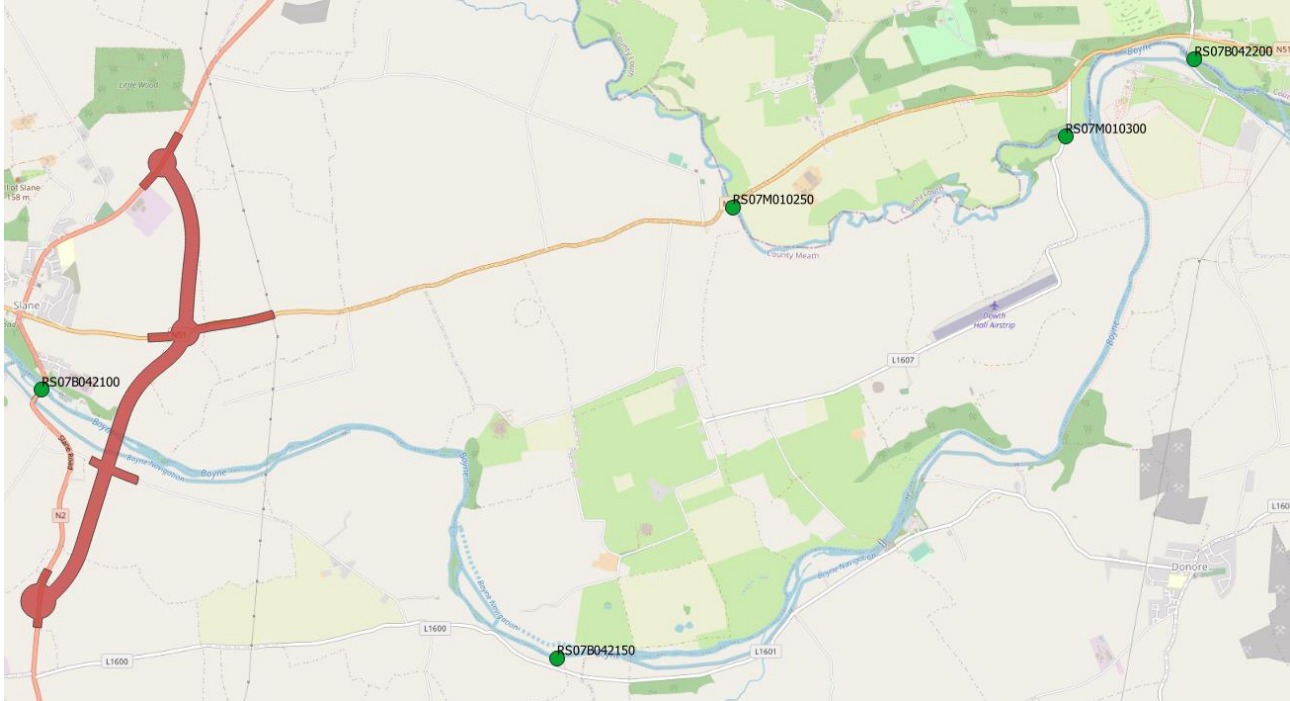


Figure A17.3: Q-Value Locations

VOL. 4 APPENDIX 17

Table A17-3: Boyne and Mattock EPA Historical Q-Values

EPA River Station Code	Station Location	WFD Water Body Code	X (ING)	Y (ING)	1973	1974	1975	1977	1979	1981	1985	1986	1990	1994	1997	2000	2003	2004	2005	2006	2007	2008	2009	2012	2014	2015	2018	2020
RS07B042100	Slane Br	IE_EA_07B042100	296399	273644	4-5		4	4	4	4-5		4	4	3-4	3	3-4	3-4	3-4	3-4	3-4	3-4	3-4	4	4		3-4	4	4
RS07B042150	Ford S of Broc Ho	IE_EA_07B042150	300127	271817									4-5	3-4	3-4	4	3-4			3-4			4	4				
RS07B042200	Oldbridge (Obelisk Br)	IE_EA_07B042200	304595	276163	4-5		3-4	4	4	4		4			3-4	3-4	3-4			3-4			3-4	3-4		4	4	4
RS07M010250	MATTOCK - Mattock Br	IE_EA_07M010300	301305	275070						4	4		3															
RS07M010300	New Br u/s Boyne R confluent.	IE_EA_07M010300	303683	275638						5	4-5			3-4	4	3				4								4

Source: EPA river Quality Surveys: Biological. Available at: <https://epawebapp.epa.ie/qvalue/webusers/>