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PROJECT	Chilmington Green Ashford, Kent		CLIENT	Hodson Developments			
TITLE	River Beult Monitoring January 2024		REFERENCE	22074-SVY-TN-04		C01	
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1 Introduction

- 1.1 Water Environment was commissioned by Hodson Developments Ltd to undertake surface water baseline monitoring at five locations along the River Beult and tributaries to the southwest of Ashford in Kent.
- 1.2 Monitoring included the collection of water samples for laboratory chemical analysis, the recording of in field physico-chemical parameters and the flow profiles of the watercourse. General observations of visual pollution, lack of flow and other environmental factors were also recorded.
- 1.3 The monitoring schedule is set out over twelve months and occurs approximately fortnightly at five different locations, identified during a preliminary walkover survey. Sites descriptions have been included below:
 - 1- Chilmington Green Road Discharge Point (Grid Ref. TQ 98335 39335)
 - 2- Chilmington Green Road 2 (Grid Ref. TQ 98064 39400)
 - 3- Boyce Wood (Grid Ref. TQ 97043 39153)
 - 4- Bethersden Road (Grid Ref. TQ 96573 38580)
 - 5- Kiln Wood (Grid Ref. TQ 95736 38649)
- 1.4 A detailed site location plan can be found in Appendix A.
- 1.5 Monitoring results are presented in a monthly report, with a final report issued on the completion of the monitoring study.
- 1.6 This report will summarise two rounds of sampling as two site visits were undertaken in January.

2 Monitoring and Sampling Methodology

- 2.1 Water Environment attended site on the 11th and the 24th of January 2024.
- 2.2 General weather conditions during the visit on the 11th were dry, cold and sunny, with frost covering the ground. During the visit on the 24th conditions were dry and sunny, with mild temperatures. On both occasions, water was not present at site 1, and therefore no measurements or samples were taken. All other sites had flowing water present and the following measurements and samples were taken for sites 2, 3, 4 and 5.
- 2.3 Pictures of the sites and conditions can be found in Appendix B.

Flow Monitoring

- 2.4 A Valeport Model 801 Electromagnetic Flowmeter was inserted into the river at multiple locations across the width of the river to give a range of flow across the river profile. Flow and depth were determined at each transect point to calculate an overall stream profile and discharge rate. The number of transects and measurements taken at each site vary depending on river width, but a minimum of 5 was taken for each site.
- 2.5 Schematics and river profiles at each monitoring point, with flow recordings at each position are attached in Appendix C.

Water quality Monitoring

- 2.6 In-situ monitoring was conducted using a Hanna Multiparameter probe. The multiparameter probe was inserted directly into the river at the sample site location where parameters measured include conductivity, pH, temperature, dissolved oxygen and salinity.
- 2.7 To prevent cross contamination, the multiparameter probe was rinsed thoroughly at each location using water from downstream at the next sampling point and stored in a calibration fluid.

Water quality Sampling

- 2.8 Water samples were collected for site: 2, 3, 4 and 5. Samples were stored in a suitable container whilst on and off site, and sent to an accredited laboratory for further analysis.

3 **River Profile and Flow rates**

- 3.1 Whilst recording flow, the depth of the river channel was recorded. Site 1 was recorded as dry for both site visits. A general observation is that the river channel gradually got wider and deeper from site 1 to 5 which was expected.
- 3.2 The discharge rate was only marginally higher during the site visit on the 11th compared with the 24th.
- 3.3 The discharge rate increased through the sites for site 2 to 5, for both site visits on the 11th and the 24th.
- 3.4 The table below summarises the discharge recorded at each site, however, further data can be found in Appendix C.

Using the flow profiles from onsite monitoring, the discharge (m³/s) has been calculated and displayed in Table 1. Table 1: Discharge Analysis for both site visits in January

Site	(11/01/2024)	(24/01/2024)
1	NA	NA
2	0.003 m ³ /s	0.007 m ³ /s
3	0.02 m ³ /s	0.03 m ³ /s
4	0.04 m ³ /s	0.08 m ³ /s
5	0.08 m ³ /s	0.15 m ³ /s

4 **Water Quality- In-Situ monitoring**

- 4.1 The following section summarises the in-situ water quality parameters that were recorded on site. For robustness, the samples consist of 2 spot samples taken after the multiparameter probe had been correctly calibrated and 'settled'.

Temperature

- 4.2 The temperature at each site 2, 3, 4 and 5 was consistent for both site visits, however the average temperature was considerably lower for the site visit on the 11th compared with the 24th.

Dissolved Oxygen (DO) (mg/l and % saturation)

- 4.3 The dissolved oxygen concentrations ranged between 5.82 ppm and 7.9 ppm, and 34.45% and 64.6%, across both site visits. The lowest concentrations were found at Site 5 and the highest at Site 2, for both site visits.

Conductivity

- 4.4 Specific conductivity was recorded between 415 $\mu\text{S}/\text{cm}$ and 830.5 $\mu\text{S}/\text{cm}$. The lowest and highest consistent readings were at Site 5 and 2 respectively. The decrease in conductivity from site 2 to site 5 may be a direct correlation with the decrease in temperature and salinity from site 2 to 5, for both site visits.

pH

- 4.5 The pH had a noticeably small range from 7.52 to 8.39. The lower ranges were recorded at site 5 and the higher at site 2.

Salinity

- 4.6 Salinity was very consistent along the river, as expected. Measurements ranged from 0.20 psu to 0.49 psu.

Visual and Odour observations

- 4.7 There were no odours recorded at any of the sampling locations. The channel beds at sites 2, 3, 4 and 5 were extremely silty. Therefore, visually the water can appear to be a silted colour when walking in the channel to record flow measurements. It was ensured that any water quality samples (in-situ or laboratory) were collected upstream of the flow monitoring transect.
- 4.8 Please see table below for a summarised view of the in-situ water quality measurements.

Table 2: In-Situ Monitoring results

Site (11/01/24)	Time	Temperature (°C)	pH	ORP (mV)	EC (µS/cm)	Sal (psu)	DO (%)	DO (ppm)
2	12:39:16	3.59	8.39	81.4	693.5	0.34	53.35	7.1
3	13:33:41	3.17	8.44	20.5	830.5	0.41	54.80	7.38
4	14:20:28	2.49	7.89	94.85	576	0.28	47.3	6.49
5	15:14:42	2.11	7.83	101.79	435	0.21	45.97	6.38
Site (24/01/24)	Time	Temperature (°C)	pH	ORP (mV)	EC (µS/cm)	Sal (psu)	DO (%)	DO (ppm)
2	12:38:35	6.72	8.06	131.6	639	0.31	64.6	7.9
3	13:15:54	7.09	8.02	145.4	613	0.30	64.45	7.81
4	14:11:56	7.96	7.52	40.55	479	0.23	34.45	4.09
5	14:58:06	7.89	7.60	133.55	415	0.20	48.8	5.82

5 Water Quality- Laboratory Chemical Analysis

- 5.1 The surface water chemical analysis results are summarised below. Please note that no water quality samples were taken at site 1 (point of discharge) as this was recorded as dry.

Table 3: Analytical Test Results

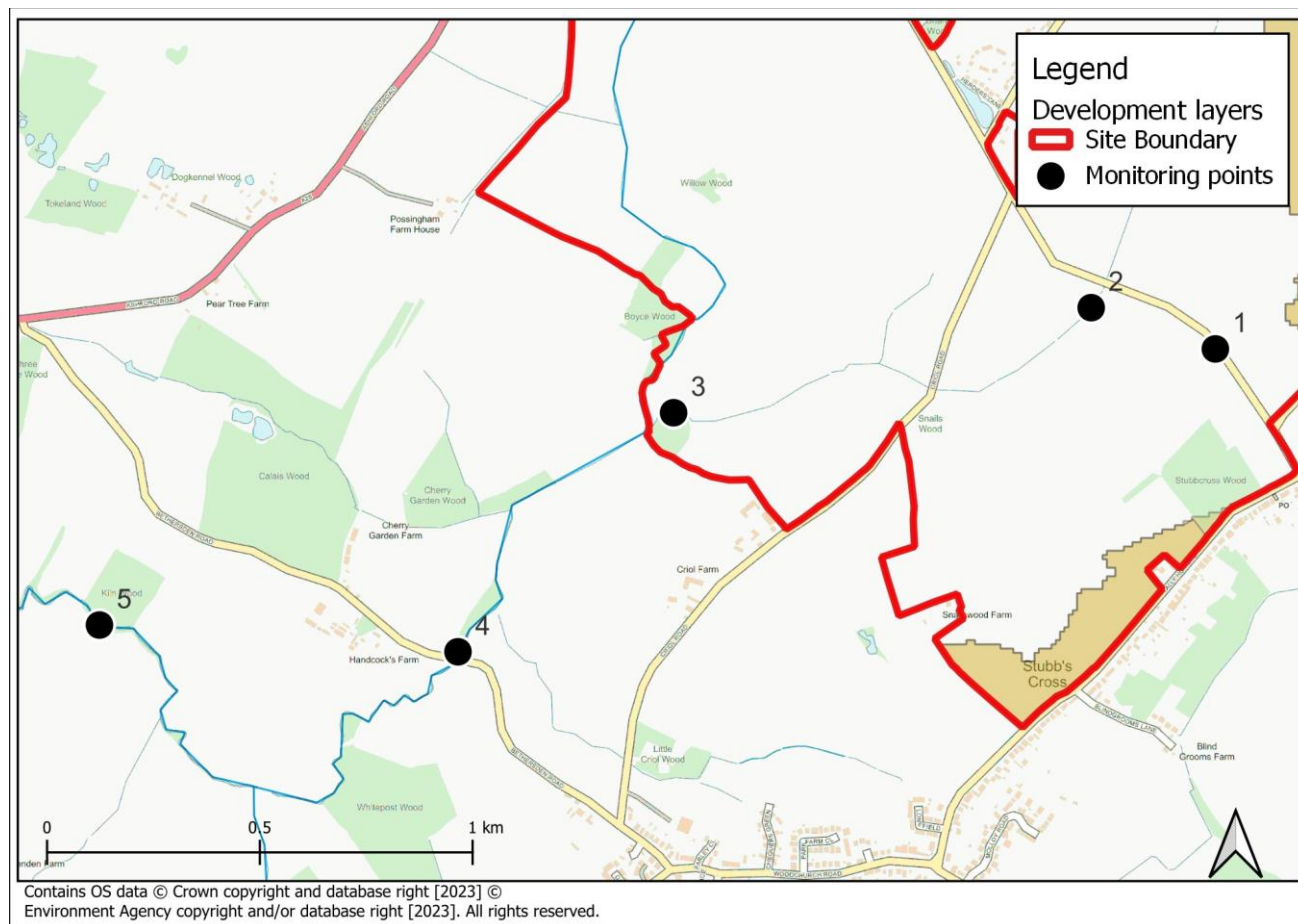
Parameter (11/01/2024)	Site 1	Site 2	Site 3	Site 4	Site 5
Biological Oxygen Demand BOD (mg/l)	NA	<1	<1	<1	<1
Alkalinity as CaCO3 (mg/l)	NA	250	287	165	121
Total Suspended Solids (mg/l)	NA	<10	15	10	17
Ammoniacal Nitrogen as N (mg/l)	NA	0.09	0.05	0.15	0.09
Nitrite (mg/l)	NA	<0.1	<0.1	<0.1	<0.1
Nitrite as N (mg/l)	NA	<0.03	<0.03	<0.03	<0.03
Nitrate (mg/l)	NA	41	34.5	17.2	9.4
Nitrate as N (mg/l)	NA	9.24	7.797	3.875	2.111
Nitrogen, Oxidised Nitrogen (mg/l)	NA	9.3	7.8	3.9	2.1
Total Nitrogen (mg/l)	NA	12.6	8.5	4.5	3
Orthophosphate PO4 (mg/l)	NA	0.32	0.2	0.15	0.14
Total Phosphorus (µg/l)	NA	115	82	48	53
Parameter (24/01/2024)	Site 1	Site 2	Site 3	Site 4	Site 5
Biological Oxygen Demand BOD (mg/l)	NA	1	<1	<1	<1
Alkalinity as CaCO3 (mg/l)	NA	212	198	120	98
Total Suspended Solids (mg/l)	NA	49	90	63	63
Ammoniacal Nitrogen as N (mg/l)	NA	0.08	0.16	0.09	0.12
Nitrite (mg/l)	NA	0.2	0.2	0.1	0.2
Nitrite as N (mg/l)	NA	0.06	0.06	0.04	0.05
Nitrate (mg/l)	NA	38	23.2	15.4	11.4
Nitrate as N (mg/l)	NA	8.582	5.243	3.483	2.576
Nitrogen, Oxidised Nitrogen (mg/l)	NA	8.6	5.3	3.5	2.6
Total Nitrogen (mg/l)	NA	10.8	6.8	4.8	3.9
Orthophosphate PO4 (mg/l)	NA	0.15	0.04	<0.02	<0.02
Total Phosphorus (µg/l)	NA	117	73	47	80

- 5.2 Total Nitrogen decreased considerably from site 2 to site 5 for both site visits, and the values were consistent for both site visits.
- 5.3 The results for Total Phosphorus showed a decrease from site 2 to site 5 for the site visit on the 11th, but no notable pattern between sites for the site visit on the 24th. The Total Phosphorus values were similar for each site when comparing the two separate site visits.
- 5.4 The Total Suspended Solids were much higher for the site visit on the 24th compared with the 11th. Values ranged from <10 mg/l to 17 mg/l (11/01/24), and 49 mg/l to 90 mg/l (24/01/24). The river was considerably siltier during the second site visit.

6 Summary of Monitoring

- 6.1 This report is one of a series of monitoring reports on the River Beult. This will assist in forming baselines that will be compared to future monitoring at the respective sites.

Appendix A: Figures



Appendix B: Photographs



Site 2: Stream next to field hedge row (11/01/24)



Site 2: Stream next to field hedge row (24/01/24)



Site 3: Stream prior to joining adjacent River Beult tributary. (11/01/24)



Site 3: Stream prior to joining adjacent River Beult tributary. (24/01/24)



Site 4: Upper River Beult near Bethersdon Road (11/01/24)



Site 5: Near Kiln Wood Public Right of Way (11/01/24)



Site 5: Near Kiln Wood Public Right of Way (24/01/24)

Appendix C: River Cross section profiles

