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PROJECT	Chilmington Green Ashford, Kent		CLIENT	Hodson Developments			
TITLE	River Beult Monitoring June 2024		REFERENCE	22074-SVY-TN-09		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. Site 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. It must be noted that site 1 has been excluded from the monitoring plan as it has been deemed unsuitable for monitoring or as a point of discharge for the proposed Chilmington Green WwTW. Therefore, Site 2 is considered the next suitable point of discharge.
- 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 June.

2 Monitoring and Sampling Methodology

- 2.1 Water Environment undertook water quality and flow monitoring 11th and the 25th of June 2024.
- 2.2 General weather conditions during the visit on the 11th and the 25th were warm and sunny, with scattered clouds. Ground conditions were dry.
- 2.3 All sites (excluding 1) had flowing water present, and the following measurements and samples were taken for sites 2, 3, 4 and 5.
- 2.4 Pictures of the sites and conditions can be found in Appendix B.

Flow Monitoring

- 2.5 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.
- 2.6 Schematics and river profiles at each monitoring point, with flow recordings at each position are attached in Appendix C.

Water quality Monitoring

- 2.7 In-situ monitoring was conducted using a Hanna Multiparameter probe. The multiparameter probe was placed directly into the river at the sample site location where parameters measured include conductivity, pH, temperature, dissolved oxygen and salinity.
- 2.8 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

- 2.9 Water samples were collected at all sites. 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. Discharge rates did not vary significantly between the two monitoring visits.
- 3.2 The discharge rate across the sites for both site visits was generally low, this was because there had not been as much heavy rainfall beforehand as seen in previous site visits, combined with abundant vegetation in channel at sites 2 and 3.
- 3.3 No flow was recorded at site 5 on the 11th, and very minimal flow on the 25th. However, there was a considerable amount of water present, which was either still or the flow too low to be detected by the flowmeter.
- 3.4 The table below summarises the flow and discharge recorded at each site, however, further data can be found in Appendix C.
- 3.5 Using the flow profiles from onsite monitoring, the discharge (m³/s) has been calculated and displayed in Table 1. It must be noted that the whilst the total discharge values are very low and in some cases 0 m³/s, there was water present in the channel at all sites. The lack of flow could be attributed to the lack of rainfall and channels choked with plants (site 2 & 3).

Table 1: Discharge Analysis for both site visits in June

Site	Discharge (11/06/2024)	Discharge (25/06/2024)
1	NA	NA
2	0.0002 m ³ /s	0.000015 m ³ /s
3	0.0009 m ³ /s	0.001 m ³ /s
4	0.004 m ³ /s	0.003 m ³ /s
5	0 m ³ /s	0.0002 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 reliability, the below examples consist of 2 spot samples taken after the multiparameter probe had been correctly calibrated and 'settled'. Samples were taken for sites 2, 3, 4 and 5.

Temperature

- 4.2 The temperature ranged from 9.87°C to 11.49°C (11/06/2024) and from 13.18°C to 16.09°C (25/06/2024).

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

- 4.3 The dissolved oxygen concentrations varied considerably. On the 11/06/2024 values ranged from 3.33 ppm to 6.77 ppm, and 29.40% to 61.25%. On the 25/06/2024 values ranged from 0.63 ppm to 3.48 ppm and 5.99% to 35%. Values across all sites were much lower for the site visit on the 25/06/2024.

Conductivity

- 4.4 Specific conductivity was recorded between 768 $\mu\text{S}/\text{cm}$ and 1012 $\mu\text{S}/\text{cm}$. The general trend was that conductivity decreased from sites 2 to 5 for both site visits. There was no notable trend between sites. The highest value was recorded at site 4 for both site visits.

pH

- 4.5 The pH had a noticeably small range from 8.05 to 8.57.

Salinity

- 4.6 Salinity was relatively consistent along the river, as expected. Measurements ranged from 0.38 psu to 0.50 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 and 4 were relatively clear, and site 5 appeared siltier. 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 (11/06/24)	Time	Temperature (°C)	pH	ORP (mV)	EC ($\mu\text{S}/\text{cm}$)	Sal (psu)	DO (%)	DO (ppm)
2	10:45:06	9.87	8.29	-121.80	867	0.43	29.40	3.33
3	11:26:35	10.77	8.46	-104.40	972	0.48	61.25	6.77
4	12:01:36	11.54	8.20	-91.15	1012	0.50	57.05	6.18
5	12:34:58	11.49	8.07	-87.60	890	0.44	42.20	4.58
Site (25/06/24)	Time	Temperature (°C)	pH	ORP (mV)	EC ($\mu\text{S}/\text{cm}$)	Sal (psu)	DO (%)	DO (ppm)
2	10:28:12	13.18	8.06	-116.16	797.15	0.39	5.99	0.63
3	11:20:13	14.21	8.57	-94.10	768	0.38	31.96	3.28
4	12:00:49	15.89	8.29	-89.60	934.50	0.46	35	3.48
5	12:34:06	16.09	8.05	-87.95	909	0.45	12.65	1.25

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 11/06/2024	Site 1	Site 2	Site 3	Site 4	Site 5
Biological Oxygen Demand BOD (mg/l)	NA	<1	<1	1	2
Alkalinity as CaCO ₃ (mg/l)	NA	301	272	196	156
Total Suspended Solids (mg/l)	NA	<10	<10	<10	20
Ammoniacal Nitrogen as N (mg/l)	NA	0.12	<0.05	0.07	0.63
Nitrite (mg/l)	NA	<0.1	<0.1	<0.1	0.3
Nitrite as N (mg/l)	NA	<0.03	<0.03	<0.03	0.10
Nitrate (mg/l)	NA	31.7	17.9	8.7	5.1
Nitrate as N (mg/l)	NA	7.161	4.030	1.971	1.142
Nitrogen, Oxidised Nitrogen (mg/l)	NA	7.2	4.0	2.0	1.2
Total Nitrogen (mg/l)	NA	8.0	4.7	2.8	2.8
Orthophosphate PO ₄ (mg/l)	NA	0.15	0.08	0.14	0.20
Total Phosphorus (µg/l)	NA	112	35	46	170
Iron (dissolved)	NA	21	28	52	60
Parameter 25/06/2024	Site 1	Site 2	Site 3	Site 4	Site 5
Biological Oxygen Demand BOD (mg/l)	NA	<1	<1	<1	<1
Alkalinity as CaCO ₃ (mg/l)	NA	367	429	237	259
Total Suspended Solids (mg/l)	NA	44	13	<10	<10
Ammoniacal Nitrogen as N (mg/l)	NA	0.30	0.32	0.26	0.18
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	13.0	3.6	2.2	0.1
Nitrate as N (mg/l)	NA	2.940	0.805	0.497	0.032
Nitrogen, Oxidised Nitrogen (mg/l)	NA	3.0	0.8	0.4	<0.1
Total Nitrogen (mg/l)	NA	4.2	2.0	1.4	0.1

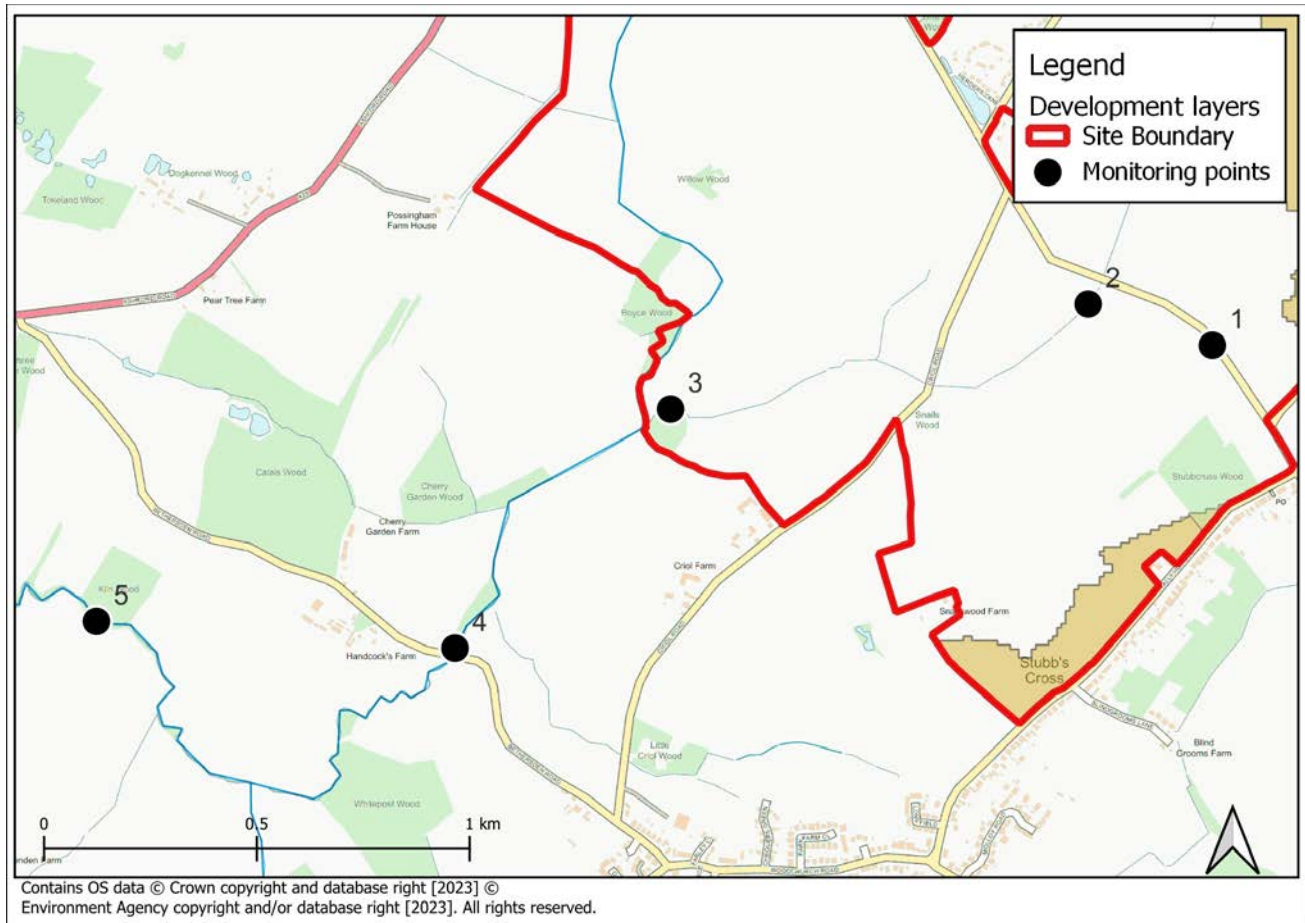
Orthophosphate PO4 (mg/l)	NA	0.26	0.27	0.28	0.32
Total Phosphorus (µg/l)	NA	153	94	93	97
Iron (µg/l)	NA	36	26	63	72

- 5.2 Total Nitrogen decreased from site 2 to site 5, and was generally higher across sites on the 11/06/2024.
- 5.3 Total Phosphorus varied but was considerably higher at sites 2 and 5.
- 5.4 Iron (dissolved) appears to increase from site 2-5 (upstream to further downstream).

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.
- 6.2 Variation in water levels and flow quantity are evident during wet and dry periods.

Appendix A: Figures



Appendix B: Photographs



Site 2: Stream next to field hedge row (11/06/24)



Site 2: Stream next to field hedge row (25/06/24)



Site 3: Stream prior to joining adjacent River Beult tributary. (11/06/24)



Site 3: Stream prior to joining adjacent River Beult tributary. (25/06/24)



Site 4: Upper River Beult near Bethersdon Road (11/06/24)



Site 4: Upper River Beult near Bethersdon Road (25/06/24)



Site 5: Near Kiln Wood Public Right of Way (11/06/24)



Site 5: Near Kiln Wood Public Right of Way (25/06/24)

Appendix C: River Cross section profiles

