

# 1 Executive Summary

- 1.1.1 Monitoring was undertaken across C1 throughout November 2022 in response to site construction activities. Graphs showing the monitoring data for the month are attached in Appendix A.
- 1.1.2 Monitoring at Chalfont St Peter (CSP) ventilation shaft remained at a quarterly monitoring frequency, whilst monitoring at Chalfont St Giles (CSG), Amersham (AMS), and Little Missenden (LMI) vent shaft sites continued monthly in line with the SSMP's. Chesham Road (CHR) and North Portal (NPTL) both continue to be monitored weekly in response to construction works.
- 1.1.3 Monitoring at Colne Valley Viaduct (CVV) module 1 continued at a weekly frequency in response to rotary bored piling (RBP) at piers 2-5. Monitoring at Modules 4, 3, and 2 remained at a monthly monitoring frequency.
- 1.1.4 Monitoring across the South Portal and Western Valley Slopes areas continued at a monthly monitoring frequency, with continued surface water monitoring of the drainage systems. Pynesfield monitoring remains at a fortnightly monitoring schedule.
- 1.1.5 The priority monitoring round was completed, with all locations visited where possible. ML035-CR004 (RTD) was reported as dry and could not be monitored.
- 1.1.6 Two trigger level exceedances were observed in November, both for turbidity at the two surface water monitoring locations (ML035-SW001 and ML035-SW002) in the River Misbourne at Chalfont St Giles Village. As river levels were still fluctuating between low flow and no flow through November, and no corresponding rises in pH or EC was observed, rainfall is the likely cause.
- 1.1.7 One reading of elevated pH (9.1) was observed at ML026-SW002 on 11 November, at the northern end of Harefield No. 2 Lake. No corresponding EC or turbidity spike was observed. This was a short-lived event and the cause of the elevated reading is unclear.
- 1.1.8 On the 21<sup>st</sup> November a further loss of water from the Chalfont St Peter attenuation pond was observed to have occurred over the weekend prior. A leak test of the pumping transfer and attenuation pond was conducted. On 25<sup>th</sup> November a gap was observed in a joint of the outlet pipe. This was sealed by mastic on 29<sup>th</sup> November with no further loss reported.

- 1.1.9 Rain was observed throughout the month, with 20 days of rainfall recorded across the South Portal site.

## Colne Valley Viaduct (CVV)

1.4.29 Rotary piling activities continued with the following locations worked on during the month:

- A1
- P2
- P12
- P14
- P15

1.4.30 Approximately 62 m<sup>3</sup> of support fluid was lost between Pier 15 to Pier12, and Pier 2 to Pier A1 was reported during November. Most of the total volume of losses were at Pier 2 and Pier A1. No impact on groundwater quality was detected as a result of these losses. Table 11 displays the reported losses.

Table 11 Support fluid loss in November >1m<sup>3</sup>

Pier	Loss (m <sup>3</sup> )
P2	17
P15	5
A1	39

## CVV Module 4 (North Embankment to Pier 43)

### Groundwater

- 1.4.31 There were no trigger limit breaches during the month in Module 4.
- 1.4.32 Table 12 compares typical priority borehole ranges for the area with trigger levels and any trigger level exceedances.

Table 12 CVV Module 4 borehole in-field parameter data

	pH	SPC ( $\mu\text{S}/\text{cm}$ )	Turb (NTU)	REDOX (mV)	DO (mg/L)
<b>Typical Range</b>	6.5 – 8	700 - 875	1 – 25	50 - 300	8 – 11
<b>Trigger limit</b>	5 – 9	1000	100 <sup>1</sup> /250 <sup>2</sup> /500 <sup>3</sup>	-	-
<b>Trigger Level Exceedances</b>	-		-	-	-
<b>Exceeding borehole</b>	-		-	-	-

- 1.4.33 Groundwater levels displayed an increase of approximately 0.4m across the month.

### Surface water

- 1.4.34 Surface water monitoring was completed during the month with chemical sampling and gauge board readings collected where possible. Monitoring continued both weekly and monthly. Surface water bodies within Module 4 include ML029-SW001, Denham Water-Ski Lake (ML028-SW004 and SW003) and the River Colne (ML028-SW002).
- 1.4.35 Table 13 compares typical surface water ranges for the area with trigger levels and any trigger level exceedances.

<sup>1</sup> ML029-CR010, ML029-RO431

<sup>2</sup> ML028-CR018, ML028-CR009

<sup>3</sup> ML028-CR006

Table 13 CVV Module 4 surface water in-field parameter data

	pH	SPC ( $\mu\text{S}/\text{cm}$ )	Turb (NTU)	REDOX (mV)	DO (mg/L)
<b>Typical Range</b>	7.8 – 8.5	500 – 650	1 – 25	100 – 225	9 – 13
<b>Exceedances</b>	-	-	-	-	-
<b>Exceeding location</b>	-	-	-	-	-

## CVV Module 3 (Pier 42 – P29)

### Groundwater

- 1.4.36 Table 14 compares typical priority borehole ranges for the area with trigger levels and any trigger level exceedances.
- 1.4.37 No trigger limit breaches were observed during the month in Module 3.

Table 14 CVV Module 3 borehole in-field parameter data

	pH	SPC ( $\mu\text{S}/\text{cm}$ )	Turb (NTU)	REDOX (mV)	DO (mg/L)
<b>Typical Range</b>	7.1 – 7.9	600 – 775	1 – 25	100 – 300	3 – 9
<b>Trigger limit</b>	5 – 9	1000	250	-	-
<b>Trigger Level Exceedances</b>	-	-	-	-	-
<b>Exceeding borehole</b>	-	-	-	-	-

- 1.4.38 Groundwater levels displayed an increase of approximately 0.15 m across the month.

### Surface water

- 1.4.39 Surface water bodies within Module 3 include the River Colne, Long Pond (ML028-SW001 and ML027-SW003), and Korda Lake (ML027-SW002 and ML027-SW001).
- 1.4.40 Table 15 compares typical surface water ranges for the area with trigger levels and any trigger level exceedances.

Table 15 CVV Module 3 surface water in-field parameter data

	pH	SPC (µS/cm)	Turb (NTU)	REDOX (mV)	DO (mg/L)
<b>Typical Range</b>	7 –8.5	550 - 900	1 – 25	50 - 250	7- 13
<b>Exceedances</b>	-	-	-	-	-
<b>Exceeding location</b>	-	-	-	-	-

## CVV Module 2 (Pier 28 - Pier 13)

### Groundwater

- 1.4.41 Table 16 compares typical priority borehole ranges for the area with trigger levels and any trigger level exceedances.
- 1.4.42 There were no trigger limit breaches in Module 2 during the month.

Table 16 CVV Module 2 borehole in-field parameter data

	pH	SPC (µS/cm)	Turb (NTU)	REDOX (mV)	DO (mg/L)
<b>Typical Range</b>	7 – 8	600 - 850	1 – 25	50 - 300	7 – 11
<b>Trigger limit</b>	5 – 9	1000	250	-	-
<b>Trigger Level Exceedances</b>	-	-	-	-	-
<b>Exceeding borehole</b>	-	-	-	-	-

- 1.4.43 Groundwater levels displayed variability across the month with increases and decreases of <0.1 m.

### Surface water

- 1.4.44 Surface water bodies within Module 2 include Savay Lake (ML027-SW006), and Small Pond (ML027-SW004 and SW005), as well as the Grand Union Canal (ML026-SW001).
- 1.4.45 Table 17 compares typical surface water ranges for the area with trigger levels and any trigger level exceedances.

Table 17 CVV Module 2 surface water in-field parameter data

	pH	SPC (µS/cm)	Turb (NTU)	REDOX (mV)	DO (mg/L)
Typical Range	7 – 7.7	700-850	1 – 25	0 - 250	6 – 13
Exceedances	-	-	-	-	-
Exceeding location	-	-	-	-	-

1.4.46 A new sampling point for ML027-SW004, named ML027-SW004a, has been established in a area where the sample will be more representative of the rest of the lake.

## CVV Module 1 (Pier 13 to South Embankment)

### Groundwater

1.4.47 There were no trigger limit breaches in Module 1 during the month.

1.4.48 Table 18 compares typical borehole ranges for the area with trigger levels and any trigger level exceedances.

Table 18 CVV Module 1 borehole in-field parameter data

	pH	SPC (µS/cm)	Turb (NTU)	REDOX (mV)	DO (mg/L)
Typical Range	6.7 – 7.7	620 - 1300	1 – 25	-50 - 300	1 – 11
Trigger limit	5 – 9	1500 <sup>4</sup>	500	-	-
Trigger Level Exceedances	-	-	-	-	-
Exceeding borehole	-	-	-	-	-

1.4.49 Groundwater levels remained relatively stable across the month.

<sup>4</sup> Due to pre-existing contamination in the Module 1 area, EC values are generally higher than anywhere else in Section C1.

### Surface water

- 1.4.50 Surface water bodies within Module 1 include Harefield lake No. 2 (ML026-SW002 and ML026-SW003) and New Years Green Bourne (ML026-SW005 and ML026-SW006).
- 1.4.51 A pH observation of 9.1pH was recorded by the monitoring contractor at ML026-SW002 on 11 November, the northern end of Harefield No. 2 Lake. No corresponding EC or turbidity spike is observed. This was a short-lived event and the cause of the elevated reading is unclear.
- 1.4.52 Table 19 compares typical surface water ranges for the area with trigger levels and any trigger level exceedances.

Table 19 CVV Module 1 surface water in-field parameter data

	pH	SPC (µS/cm)	Turb (NTU)	REDOX (mV)	DO (mg/L)
<b>Typical Range</b>	7.7 – 8.5	600 - 1200	1 – 20	0 - 300	7.5 – 13
<b>Exceedances</b>	9.1	-	-	-	-
<b>Exceeding location</b>	ML026-SW002		-	-	-

- 1.4.53 The variability in EC at ML026-SW002 during September reported last month was attributable to incorrect data (typos). As such the data has been corrected for this month’s report.

## South Portal and Western Valley Slopes

- 1.4.54 Activity on South Portal is focused on the continued operations of the Tunnel Boring Machine (TBM) and the Slurry Treatment Plant (STP). Chalk cake placement on the WVS is ongoing.

### Western Valley Slopes

- 1.4.55 Table 20 compares typical priority borehole ranges for the area with any abnormal in-situ readings in the area.

Table 20 WVS borehole in-field parameter data