1 Executive Summary

1.1.1 Monitoring was undertaken across C1 throughout April 2023 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 and monthly monitoring frequency, whilst monitoring at Chalfont St Giles (CSG), Amersham (AMS), Little Missenden (LMI), and Chesham Road (CHR) ventilation shafts, along with the North Portal (NPTL) continued monthly in line with the SSMP's.

1.1.3 Monitoring at Colne Valley Viaduct (CVV) continued at a monthly frequency for modules 1, 2 and 4. Monitoring at Module 3 was not undertaken following the completion of the RBP works within the area in November.

1.1.4 Following the trigger limit exceedance recorded at CVV module 1 on the 21st March at borehole ML026-RO426, the location has been closely monitored in April, and no further exceedances have been recorded, with all parameters within limits.

1.1.5 Following the TPH detection in CVV Module 1 borehole ML026-RO426 on 21st March, no further presence of TPH has been recorded in April, suggesting that this was related to the landfill contamination in the area

1.1.6 Following the hexavalent chromium detection in CVV Module 1 borehole ML026-CR032 on 21st March, this month's results showed no presence of hexavalent chromium.

1.1.7 Decking activities advanced to P43, with surface water monitoring ongoing on a weekly basis for ML028-SW004, ML028-SW003 and ML028-SW002.

1.1.8 Additional monitoring was conducted within the CVV in response to remedial works, piling cap pours, and concrete plug pours. No impacts have been observed.

1.1.9 Tunnel monitoring continued at a mixed frequency of monthly, weekly, and daily. The highest frequency of monitoring is in a 150 m area upgradient and 300 m downgradient of each tunnel boring machine (TBM) as defined by the SSMP.

1.1.10 Cross passage (CP) monitoring continued at CP10, CP11, CP12, CP15 and CSG adit.

1.1.11 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.

1.1.12 Following the pH peak (above 9) recorded in February and again in March within the Pynesfield drainage ditch, pH has remained below 9 in BH2 throughout April. However, it is still higher than the other Pynesfield boreholes which typically range between 7-7.5. The Pynesfield ditch re-lining has been planned and the contractor appointed, in the meantime, the ditch is not being utilised.

1.1.13 The priority monitoring round was completed, with all locations visited where possible.

1.1.14 Rain was observed during the month at Chenies rain gauge on 17 days with a total of 69.4 mm recorded. 16days of rainfall were recorded across the South Portal site with 69 mm recorded.

1. Site Specific Monitoring

Overview

1.2 A high-level overview of the water monitoring activities and occurrences at each site is provided below for the month. The graphs showing the in-field monitoring data are attached in the appendix.

Colne Valley Viaduct (CVV)

1.2.1 Pile caps have been poured at piers 19, 15 and 14, while piers 22 and 25 have been poured.

1.2.2 Pile cropping has been undertaken at piers 13, 12, 2 and 3.

1.2.3 Earthworks have been undertaken at South Embankment, with further lime cement stabilisation has been carried out on the haul road in Module 1 (between piers 9 and 14) on 8th and 9th April.

1.2.4 Decking works advanced from Pier 45 to Pier 43 in April, with 42 segments installed during the month. To date, a total of 291 segments have been installed.

CVV Module 1 (Pier 12 to South Embankment)

Groundwater

1.2.5 Following to the turbidity trigger limit exceedance at ML026-RO426 (1067 NTU recorded on 21st March), levels at this location have remained below the trigger limit throughout April, with the highest value recorded being 74 NTU on 05th April. All other parameters have stayed within limits.

1.2.6 Table 1 compares typical borehole ranges for the area with trigger levels and any trigger level exceedances.

Table 1 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

	pH	SPC (µS/cm)	Turb (NTU)	REDOX (mV)	DO (mg/L)
Trigger limit	5 – 9	1500[1]	500	-	-
Trigger Level Exceedances	-	-		-	-
Exceeding borehole	-	-		-	-

1.2.7 Following the fluctuations observed in the groundwater levels in Module 1 over last 4 months, in April an extensive monitoring round was carried out, with boreholes visited twice a week. Levels have shown more regular trends across the month. Water levels have displayed an increase of approximately 0.2 m in the first week of the month, a decrease of approximately 0.1 m and have remained stable until the middle of April. In the second half of the month a different response was observed, with ML026-RO426, ML026-CR032 and ML026-RO431 showing a decrease of approximately 0.5 m, while ML026-RO428 and ML026-RO430 remained stable. A further investigation is being conducted to understand the reason behind the water level variations. However, it is not believed that these changes are associated with any Align construction activities. Further assessment will be included in May report.

1.2.8 We believe that the fluctuating trends observed in the previous months were due to measuring errors on site with different reference levels being used by the monitoring subcontractor.

1.2.9 Following the detection of TPH in ML026-RO426 on 21st March (Lab re-test confirmed presence of 160 µg/l in the C12-C16 aliphatic range), further sampling was undertaken in April, with no TPH detected. It is likely that the isolated spike was related to historic landfill contamination.

1.2.10 Subsequent to the hexavalent chromium detection in the borehole ML026-CR032 on 21st March (5.3 µg/l, re-tested at 4.1 µg/l), no further presence has been recorded in April, with result below level of detection (< 0.1 µg/l).

Surface water

1.2.11 Surface water bodies within Module 1 include Harefield Lake No. 2 (ML026-SW002 and ML026-SW003) and New Years Green Bourne (ML026-SW005 and

[1] Due to pre-existing contamination in the Module 1 area, EC values are generally higher than anywhere else in Section C1.

ML026-SW006), as well as the new monitoring location at the outlet of NYGB into the Harefield Lake No 2 (ML026-SW007).

1.2.12 The contamination observed in the New years Green Bourne over the past few months continued into April, although lower concentrations of major ions were observed than those seen in March and electrical conductivity peaking at 1392 uS/cm on the 20th April.

1.2.13 The NYGB is known to be affected by contamination from the New Years Green landfillBoth upstream and downstream locations show similar levels of contamination, indicating that it does not originate within Align's compound.

Table 2 New Years Green Bourne elevated determinand table

Location ID	Sampling date	Ammoniacal Nitrogen (µg/l)	Calcium (mg/l)	Sodium (mg/l)	Potassium (mg/l)	Chloride (mg/l)
Typical Range	03/21 – 01/23	0-500	100-500	30-200	10-50	20-100
ML026-SW005	04/04/23	650	628	59	18.0	23.5
	20/04/23	1090	977	110	29.0	30.0
ML026-SW006	04/04/23	490	388	52.5	14.0	30.0
	10/04/23	4270	793	103.0	31.0	32.0

1.2.14 Table 3 compares typical surface water ranges for the area with any exceedances.

Table 3 CVV Module 1 surface water in-field parameter data

	pH	SPC (µS/cm)	Turb (NTU)	REDOX (mV)	DO (mg/L)
Typical Range	7.7 – 8.5	600 – 1200	1 – 20	0 – 300	7.5 – 13
Exceedances	-	1400	-	-	-
Exceeding location	-	ML026-SW005,	-	-	-

CVV Module 2 (Pier 28 – Pier 13)

Groundwater

1.2.15 Table 4 compares typical priority borehole ranges for the area with trigger levels and any trigger level exceedances.

1.2.16 There were no trigger limit breaches in Module 2 during the month.

Table 4 CVV Module 2 borehole in-field parameter data

	pH	SPC (µS/cm)	Turb (NTU)	REDOX (mV)	DO (mg/L)
Typical Range	7 – 8	600 – 850	1 – 25	50 – 300	2 – 8
Trigger limit	5 – 9	1000	250	-	-
Trigger Level Exceedances	-	-	-	-	-
Exceeding borehole	-	-	-	-	-

1.2.17 Groundwater levels decreased of approximately 0.1 m across the month in ML026-RO062a and ML026-RC070, while ML027-RO400 has remained stable for the first half of April and then increased byapproximately 0.1 m in the last week of the month.

Surface water

1.2.18 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).

1.2.19 Table 5 compares typical surface water ranges for the area with any exceedances.

Table 5 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	-	-	-	-	-

CVV Module 3 (Pier 42 – P29)

Groundwater

1.2.20 Monitoring for groundwater impacts ceased in December at module 3 in line with the SSMP following completion of intrusive piling activities.

Surface water

1.2.21 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).

1.2.22 Table 6 compares typical surface water ranges for the area with any exceedances.

Table 6 CVV Module 3 surface water in-field parameter data

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

CVV Module 4 (North Embankment to Pier 43)

Groundwater

1.2.23 Table 7 compares typical priority borehole ranges for the area with trigger levels and any trigger level exceedances.

1.2.24 There were no trigger limit breaches during the month in Module 4.

Table 7 CVV Module 4 borehole in-field parameter data

	pH	SPC (µS/cm)	Turb (NTU)	REDOX (mV)	DO (mg/L)
Typical Range	6.5 – 8	700 – 875	1 – 10	50 – 300	8 – 11

	pH	SPC (µS/cm)	Turb (NTU)	REDOX (mV)	DO (mg/L)
Trigger limit	5 – 9	1000	100[2]/250[3]/500[4]	-	-
Trigger Level Exceedances	-		-	-	-
Exceeding borehole	-		-	-	-

1.2.25 Groundwater levels displayed a decreased of approximately 0.2-0.3 m across the month.

Surface water

1.2.26 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).

1.2.27 Decking activities advanced from P45 to P43 in April, with the decking girder due to cross the River Colne at the end of May and early June.

1.2.28 Table 8 compares typical surface water ranges for the area with any exceedances.

Table 8 CVV Module 4 surface water in-field parameter data

	pH	SPC (µS/cm)	Turb (NTU)	REDOX (mV)	DO (mg/L)
Typical Range	7.8 – 8.5	500 – 850	1 – 25	100 – 225	9 – 13
Exceedances	-	-	-	-	-
Exceeding location	-	-	-	-	-

[2] ML029-CR010, ML029-RO431
[3] ML028-CR018, ML028-CR009
[4] ML028-CR006