

		EXPLORATORY HOLE PHOTOGRAPHS		Remarks Machine excavated trial pit from GL to 2.40m		Exploratory Hole
						S1-TP114
Project	Global Centre of Rail Excellence	Easting	284975.01	Equipment	21 Tonne Tracked Excavator	Sheet 3 of 3
Client	Walters UK Limited	Northing	210562.92	Method	TP	
Project No	G22069	Level	239.99 mAOD	Termination Reason	Water ingress and instability	



S1-TP114 Face C

		EXPLORATORY HOLE PHOTOGRAPHS		Remarks Machine excavated trial pit from GL to 0.70m		Exploratory Hole
						S1-TP115
Project	Global Centre of Rail Excellence	Easting	284344.59	Equipment	Komatsu PC 210 LC	Sheet 1 of 3
Client	Walters UK Limited	Northing	210556.68	Method	TP	
Project No	G22069	Level	230.63 mAOD	Termination Reason	Terminated due to water ingress	

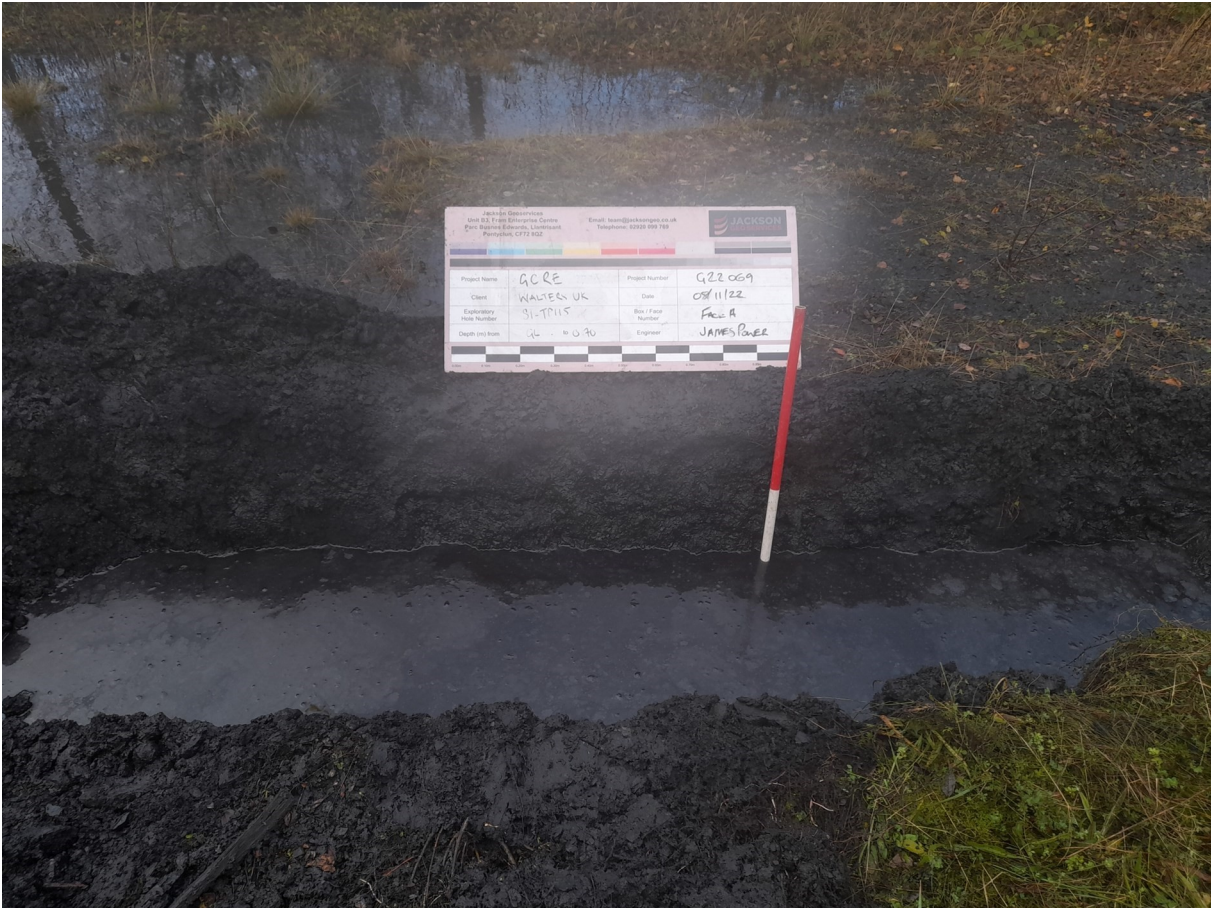


S1-TP115 Face D



S1-TP115 Spoil

		EXPLORATORY HOLE PHOTOGRAPHS		Remarks Machine excavated trial pit from GL to 0.70m		Exploratory Hole
						S1-TP115
Project	Global Centre of Rail Excellence	Easting	284344.59	Equipment	Komatsu PC 210 LC	Sheet 2 of 3
Client	Walters UK Limited	Northing	210556.68	Method	TP	
Project No	G22069	Level	230.63 mAOD	Termination Reason	Terminated due to water ingress	



S1-TP115 Face A

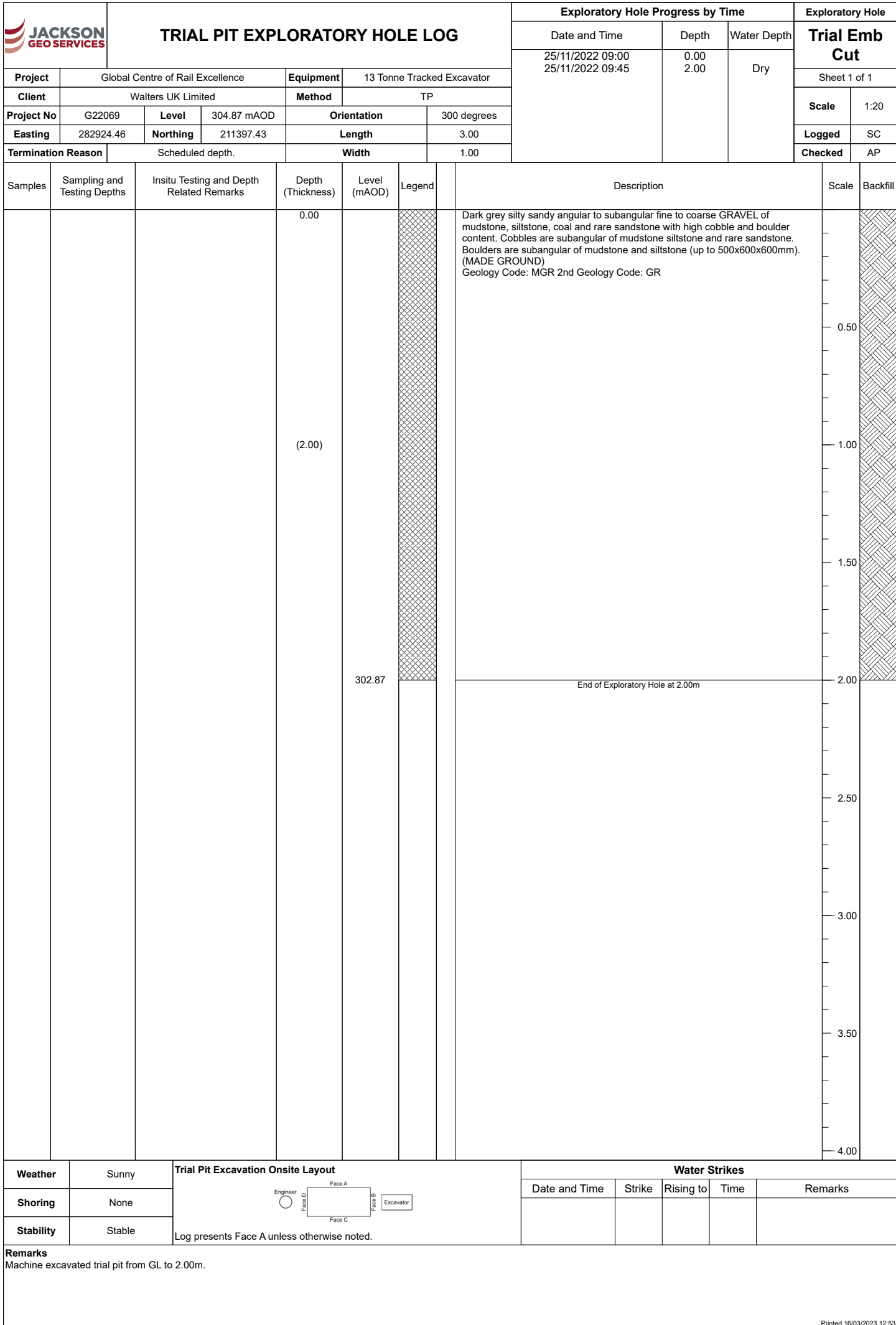


S1-TP115 Face C

		EXPLORATORY HOLE PHOTOGRAPHS		Remarks Machine excavated trial pit from GL to 0.70m		Exploratory Hole
						S1-TP115
Project	Global Centre of Rail Excellence	Easting	284344.59	Equipment	Komatsu PC 210 LC	Sheet 3 of 3
Client	Walters UK Limited	Northing	210556.68	Method	TP	
Project No	G22069	Level	230.63 mAOD	Termination Reason	Terminated due to water ingress	



S1-TP115 Face B





EXPLORATORY HOLE PHOTOGRAPHS

Remarks Machine excavated trial pit from GL to 2.00m.	Exploratory Hole
	Trial Emb Cut

Project	Global Centre of Rail Excellence	Easting	282924.46	Equipment	13 Tonne Tracked Excavator
Client	Walters UK Limited	Northing	211397.43	Method	TP
Project No	G22069	Level	304.87 mAOD	Termination Reason	Scheduled depth.

Sheet 1 of 3



Trial Embankment Cut - Face A



Trial Embankment Cut - Face B

		EXPLORATORY HOLE PHOTOGRAPHS		Remarks Machine excavated trial pit from GL to 2.00m.		Exploratory Hole
						Trial Emb Cut
Project	Global Centre of Rail Excellence	Easting	282924.46	Equipment	13 Tonne Tracked Excavator	Sheet 2 of 3
Client	Walters UK Limited	Northing	211397.43	Method	TP	
Project No	G22069	Level	304.87 mAOD	Termination Reason	Scheduled depth.	



Trial Embankment Cut - Face C



Trial Embankment Cut - Face D

		EXPLORATORY HOLE PHOTOGRAPHS		Remarks Machine excavated trial pit from GL to 2.00m.		Exploratory Hole
						Trial Emb Cut
Project	Global Centre of Rail Excellence	Easting	282924.46	Equipment	13 Tonne Tracked Excavator	Sheet 3 of 3
Client	Walters UK Limited	Northing	211397.43	Method	TP	
Project No	G22069	Level	304.87 mAOD	Termination Reason	Scheduled depth.	



Trial Embankment Cut - Spoil



Figure 10 is a line graph showing the relationship between Time (min) on the x-axis and Depth (m) on the y-axis. The x-axis ranges from 0 to 140 minutes, and the y-axis ranges from 0.00 to 2.50 meters. The graph displays 'Soakaway Data' as a series of black dots connected by a line, showing a rapid decrease in depth over time. Two horizontal red lines represent '25% effective depth' at approximately 1.15m and '75% effective depth' at approximately 1.70m. Vertical dashed red lines indicate the time taken for the data to reach these depths: approximately 5 minutes for 25% and 15 minutes for 75%.

Time (min)	Depth (m)
0	0.85
1	0.90
2	0.95
3	1.00
4	1.05
5	1.10
6	1.15
7	1.20
8	1.25
9	1.30
10	1.35
11	1.40
12	1.45
13	1.50
14	1.55
15	1.60
16	1.65
17	1.70
18	1.75
19	1.80
20	1.85
21	1.90
22	1.95
23	2.00
24	2.05
25	2.10



Figure 10 is a line graph showing the relationship between Time (min) on the x-axis and Depth (m) on the y-axis. The x-axis ranges from 0 to 140 minutes, and the y-axis ranges from 0.00 to 2.00 meters. The graph displays 'Soakaway Data' as a series of black dots connected by a line, showing a rapid decrease in depth over time. Two horizontal red lines represent the '25% effective depth' at approximately 1.15m and the '75% effective depth' at approximately 1.70m. Vertical dashed lines indicate the time taken for the data to reach these depths: approximately 5 minutes for 25% and 15 minutes for 75%.

Time (min)	Depth (m)
0	0.95
1	1.00
2	1.05
3	1.10
4	1.15
5	1.20
6	1.25
7	1.30
8	1.35
9	1.40
10	1.45
11	1.50
12	1.55
13	1.60
14	1.65
15	1.70
16	1.75
17	1.80
18	1.85
19	1.90



The graph plots Depth (m) on the y-axis (0.00 to 2.00) against Time (min) on the x-axis (0 to 140). The 'Soakaway Data' is represented by black dots and a line, showing a decreasing trend. Two horizontal red lines indicate the '25% effective depth' at approximately 1.05m and the '75% effective depth' at approximately 1.65m. Two vertical dashed brown lines are drawn at approximately 5 minutes and 15 minutes.

Time (min)	Depth (m)
0	0.90
2	0.95
4	1.00
6	1.05
8	1.10
10	1.15
12	1.20
14	1.25
16	1.30
18	1.35
20	1.40
22	1.45
24	1.50
26	1.55
28	1.60
30	1.65
32	1.70
34	1.75
36	1.80
38	1.85
40	1.90

		SOIL SOAKAWAY INFILTRATION TEST									
Project		Global Centre of Rail Excellence		Project No		G22069		Client		Walters UK Limited	
Exploratory Hole ID		Test No		Easting		Northing		Ground Level		Depth (m)	
S1-TP111		1		284443.58		210631.42				3.50	
Length (m)		Width (m)									
4.20		0.70									
Test Data				Soakaway Construction		Vertical sides trimmed square. No fill material.					
Time Elapsed (mins)		Water Depth (m bgl)		Date of Test		15/11/2022		Weather		Dry overcast	
0.50		1.45		Fill Porosity				Test Duration (mins)		168	
1.00		1.46		Operative		JJ		Checked by			
1.50		1.46									
2.00		1.46									
2.50		1.46									
3.00		1.47									
3.50		1.47									
4.00		1.47									
4.50		1.47									
5.00		1.475									
6.00		1.475									
7.00		1.475									
8.00		1.475									
9.00		1.48									
10.00		1.48									
15.00		1.48									
20.00		1.48									
30.00		1.48									
60.00		1.48									
120.00		1.48									
168.00		1.48									
Water Depth Test Start (m)				1.45		Base base area (m ²)		2.94			
Water Depth Test End (m)				1.48		Pit sides area (m ²)		14.7			
75% effective depth (m)				1.96		Vp75-25 (m ³)		3.0135			
50% effective depth (m)				2.48		ap50 (m ²)		3.087			
25% effective depth (m)				2.99							
Time water level reaches 75% effective depth (Tp75) (mins)											
Time water level reaches 25% effective depth (Tp25) (mins)											
Soil Infiltration Rate (f) (m/s)						Unable to determine					
Remarks Undertaken in accordance with BRE digest 365 (2016) Soakaway terminated due to lack of infiltration.											

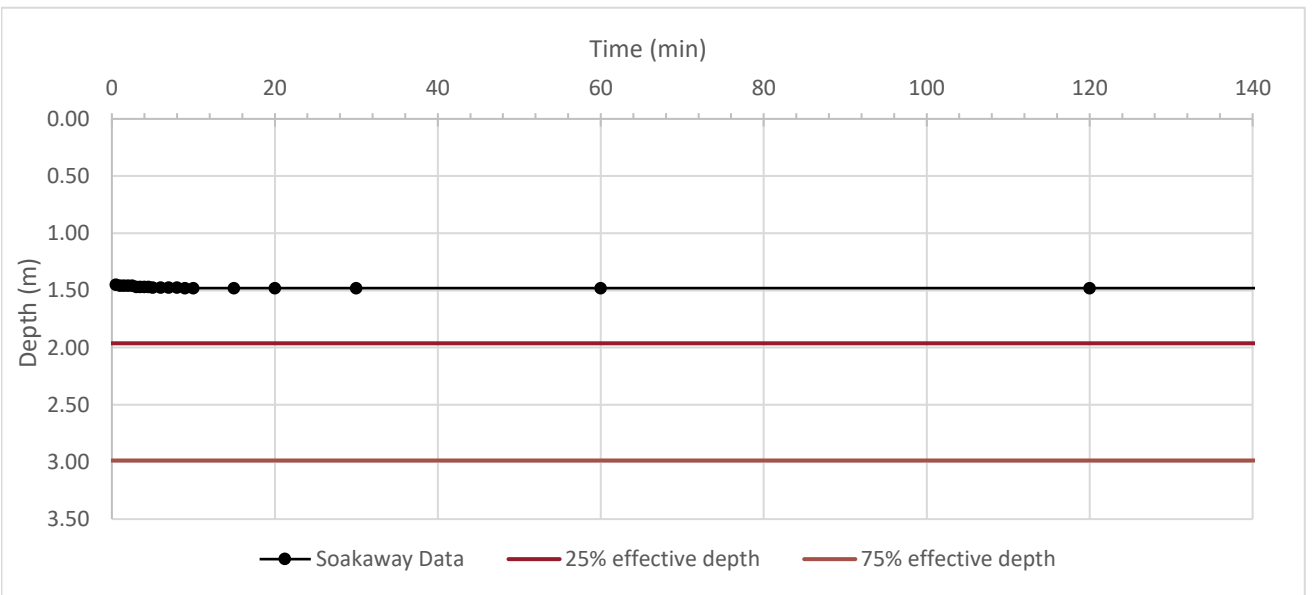
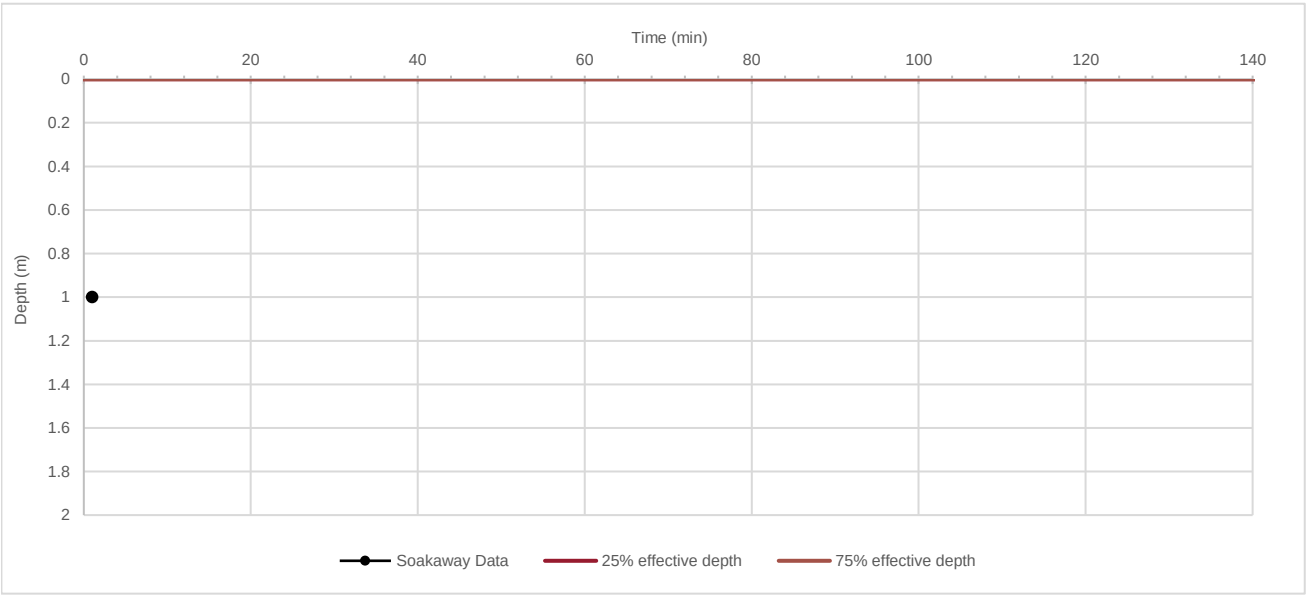






Figure 10 is a graph showing the relationship between Time (min) on the x-axis and Depth (m) on the y-axis. The x-axis ranges from 0 to 140 minutes, and the y-axis ranges from 0 to 2 meters. A single black dot at (0, 1) represents the 'Soakaway Data'. A red line at Depth = 0 represents the '25% effective depth'. A brown line at Depth = 0 represents the '75% effective depth'.

		SOIL SOAKAWAY INFILTRATION TEST									
Project		Global Centre of Rail Excellence		Project No		G22069		Client		Walters UK Limited	
Exploratory Hole ID		Test No		Easting		Northing		Ground Level		Depth (m)	
Trial Emb Cut		3								2.00	
Time Elapsed (mins)		Water Depth (m bgl)		Soakaway Construction		Vertical sides trimmed square. No fill material.					
				Date of Test		25/11/2022		Weather		Sunny	
				Fill Porosity				Test Duration (mins)		1	
				Operative		SC		Checked by			
				Water Depth Test Start (m)		1.41		Base base area (m ²)		3	
				Water Depth Test End (m)		2		Pit sides area (m ²)		6	
				75% effective depth (m)		1.56		Vp75-25 (m ³)		0.885	
				50% effective depth (m)		1.71		ap50 (m ²)		5.36	
				25% effective depth (m)		1.85					
				Time water level reaches 75% effective depth (Tp75) (mins)							
				Time water level reaches 25% effective depth (Tp25) (mins)							
				Soil Infiltration Rate (f) (m/s)		Unable to determine					
				Remarks Undertaken in accordance with BRE digest 365 (2016) Water bowser emptied, 9000L in to pit with fast infiltration. Infiltration too quick to accurately measure rate.							



Appendix III

Monitoring

Gas Monitor Calibration Certificate

Certificate Number:

G504748_1/31650

G508511_2/32102

Barometric Pressure Data

Gas and Groundwater Monitoring

Well Development Records

S1-BH101 to S10BH103,

S1-BH105, S1-BH108,

S1-BH112 Instrument 1 and 2,

S1-BH113, S1-BH121,

S1-BH122 and SOP003.16

Purging and Sampling Records

Visit 1

Visit 2

Visit 3

CERTIFICATION OF CALIBRATION



Date Of Calibration: 21-Nov-2022

Certificate Number: G504748_1/31650

Issued by: QED Environmental Systems Ltd.

Customer: Jackson Drilling Ltd

Jackson Drilling Northwood Farm Coxbridge Road Baltonsborough
GLASTONBURY Somerset BA6 8RA UNITED KINGDOM

Description: Gas Analyser

Model: GA5000

Serial Number: G504748

UKAS Accredited results:

Results after adjustment :

Methane (CH ₄)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	5.1	0.072
15.0	15.2	0.13
60.0	59.9	0.42

Carbon Dioxide (CO ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.8	0.074
15.0	14.8	0.13
40.0	40.3	0.29

Oxygen (O ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
21.2	21.3	0.25

The inwards assessment was carried out 15-Nov-2022.

The maximum adjustment is larger than the specification limit.

Inwards assessment data is available if requested.

All concentrations are molar.

CH₄, CO₂ readings recorded at : 30.7 °C ± 2.5 °C

O₂ readings recorded at : 22.0 °C ± 2.5 °C

Barometric Pressure : 0984 mbar ± 4 mbar

Method of Test : The analyser is calibrated in a temperature controlled chamber using a series of reference gases, in compliance with procedure LP004.

Instrument has passed calibration as the measurement result is within the specification limit. The specification limit takes into account the measurement uncertainty.

The results relate only to the item calibrated

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Calibration Instance:114 IGC Instance:114

Page 1 of 2 | LP015GIUKAS-2.5

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QED Environmental Systems Ltd. Cyan Park - Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM

Registered in England and Wales 1898734

CERTIFICATION OF CALIBRATION



Date Of Calibration: 21-Nov-2022

Certificate Number: G504748_1/31650

Issued by: QED Environmental Systems Ltd.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Calibrations marked 'Non-UKAS Accredited results' on this certificate have been included for completeness.

Non-UKAS accredited results after adjustment:

Barometer (mbar)	
Reference	Instrument Reading
984	985

Additional Gas Cells		
Gas	Certified Gas (ppm)	Instrument Reading (ppm)
CO	505	505
H ₂ S	260	260

Internal Flow	
Applied (l/hr)	Instrument Reading (l/hr)
5.0	5.0
10.0	10.0

Date of Issue : 23-Nov-2022

Approved by Signatory

Laura McBride

Laboratory Inspection

End of Certificate

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Calibration Instance: 114 IGC Instance: 114

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QED Environmental Systems Ltd. Cyan Park - Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM

Registered in England and Wales 1898734

CERTIFICATION OF CALIBRATION



Date Of Calibration: 01-Feb-2023

Certificate Number: G508511_2/32102

Issued by: QED Environmental Systems Ltd.

Customer: Jackson Drilling Ltd

Jackson Drilling Northwood Farm Coxbridge Road Baltonsborough
GLASTONBURY Somerset BA6 8RA UNITED KINGDOM

Description: Gas Analyser

Model: GA5000

Serial Number: G508511

UKAS Accredited results:

Results after adjustment :

Methane (CH ₄)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.9	0.072
15.0	14.9	0.13
60.0	59.6	0.42

Carbon Dioxide (CO ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.9	0.074
15.0	15.0	0.13
40.0	40.1	0.29

Oxygen (O ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
21.5	21.5	0.25

The inwards assessment was carried out 23-Jan-2023.

The maximum adjustment is larger than the specification limit.

Inwards assessment data is available if requested.

All concentrations are molar.

CH₄, CO₂ readings recorded at : 31.3 °C ± 2.5 °C

O₂ readings recorded at : 21.3 °C ± 2.5 °C

Barometric Pressure : 1013 mbar ± 4 mbar

Method of Test : The analyser is calibrated in a temperature controlled chamber using a series of reference gases, in compliance with procedure LP004.

Instrument has passed calibration as the measurement result is within the specification limit. The specification limit takes into account the measurement uncertainty.

The results relate only to the item calibrated

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Calibration Instance:114 IGC Instance:114

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QED Environmental Systems Ltd, Cyan Park - Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM

Registered in England and Wales 1898734

CERTIFICATION OF CALIBRATION



Date Of Calibration: 01-Feb-2023

Certificate Number: G508511_2/32102

Issued by: QED Environmental Systems Ltd.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Calibrations marked 'Non-UKAS Accredited results' on this certificate have been included for completeness.

Non-UKAS accredited results after adjustment:

Barometer (mbar)	
Reference	Instrument Reading
1013	1013

Additional Gas Cells		
Gas	Certified Gas (ppm)	Instrument Reading (ppm)
CO	505	505
H ₂ S	258.8	259

Internal Flow	
Applied (l/hr)	Instrument Reading (l/hr)
5.0	5.1
10.0	10.1

Date of Issue : 02-Feb-2023

Approved by Signatory

Laura McBride

Laboratory Inspection

End of Certificate

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Calibration Instance:114 IGC Instance:114

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Registered in England and Wales 1898734



BAROMETRIC PRESSURE DATA

Project

Global Centre of Rail Excellence

Project No

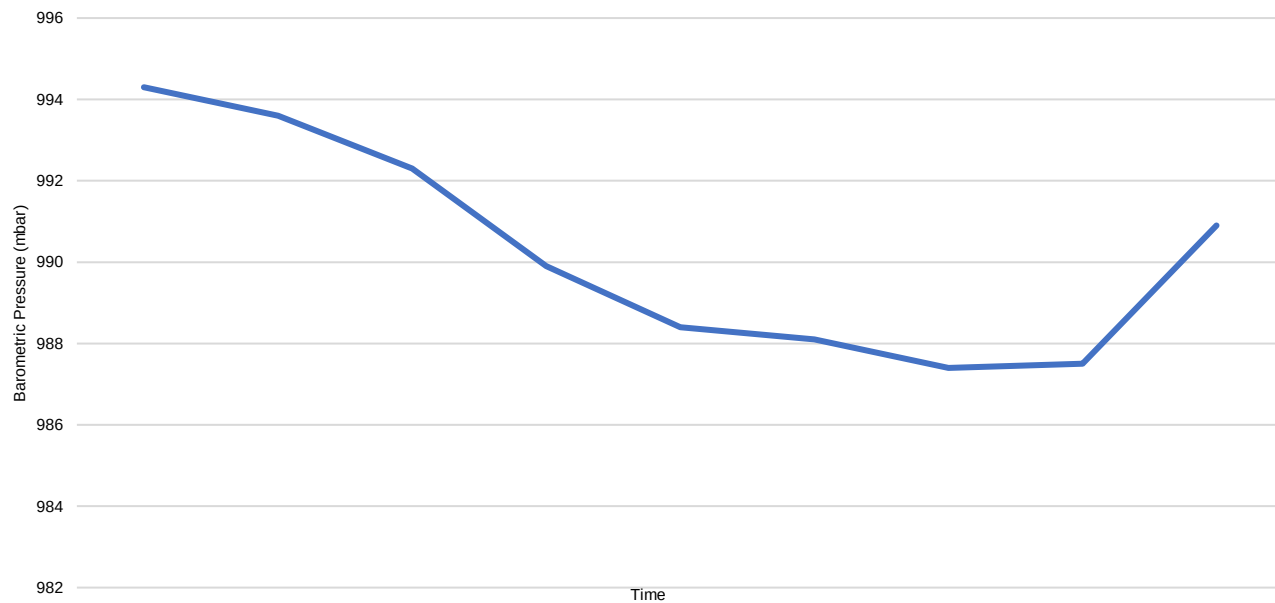
G22069

Client

Walters UK Limited

Date	Time (24hr)	Barometric Pressure (mbar)
08/01/2023	00:00	994.3
	03:00	993.6
	06:00	992.3
	09:00	989.9
	12:00	988.4
	15:00	988.1
	18:00	987.4
	21:00	987.5
	00:00	990.9

Barometric Pressure Vs Time





BAROMETRIC PRESSURE DATA

Project

Global Centre of Rail Excellence

Project No

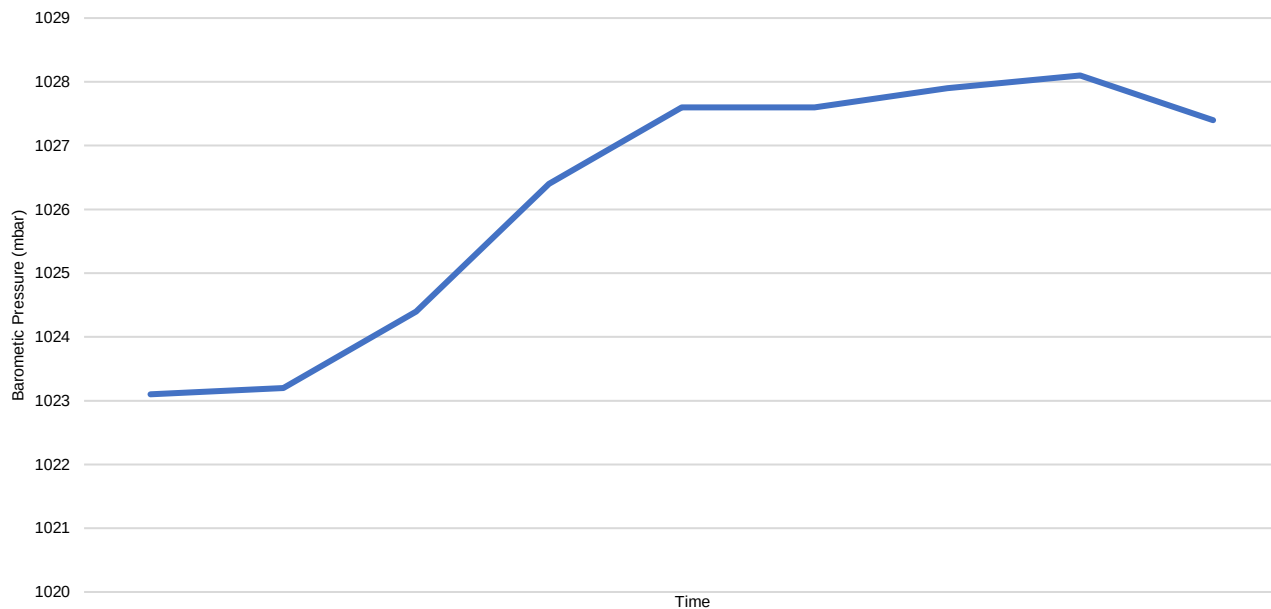
G22069

Client

Walters UK Limited

Date	Time (24hr)	Barometric Pressure (mbar)
30/01/2023	00:00	1023.1
	03:00	1023.2
	06:00	1024.4
	09:00	1026.4
	12:00	1027.6
	15:00	1027.6
	18:00	1027.9
	21:00	1028.1
	00:00	1027.4

Barometric Pressure Vs Time





BAROMETRIC PRESSURE DATA

Project

Global Centre of Rail Excellence

Project No

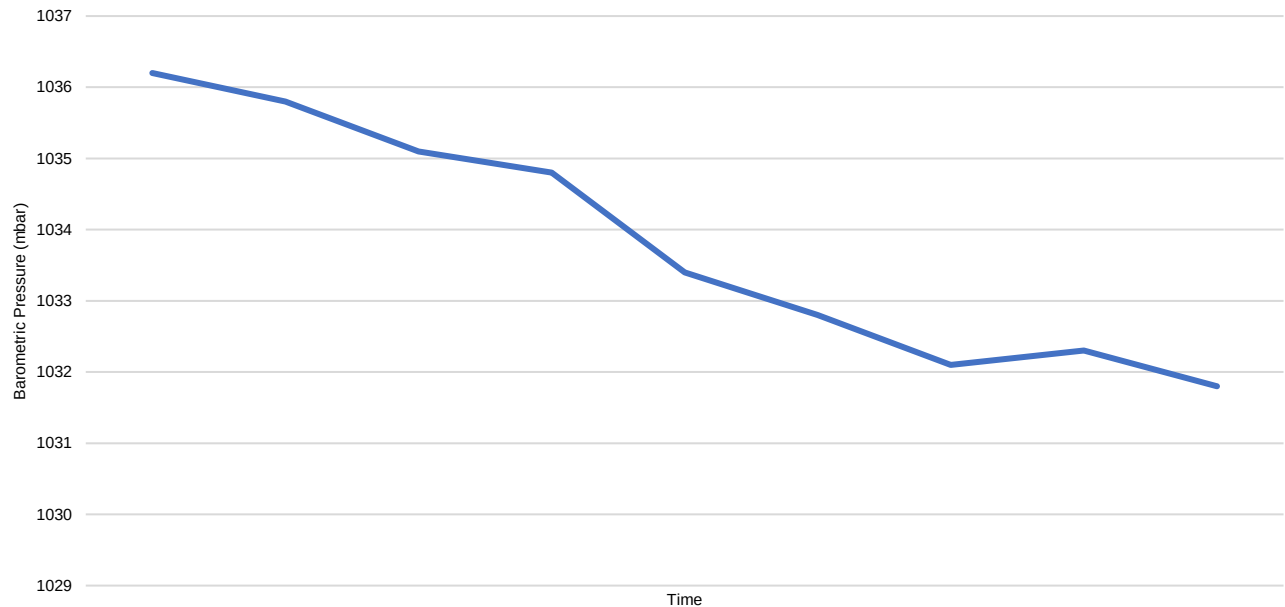
G22069

Client

Walters UK Limited

Date	Time (24hr)	Barometric Pressure (mbar)
12/02/2023	00:00	1036.2
	03:00	1035.8
	06:00	1035.1
	09:00	1034.8
	12:00	1033.4
	15:00	1032.8
	18:00	1032.1
	21:00	1032.3
	00:00	1031.8

Barometric Pressure Vs Time





GAS AND GROUNDWATER MONITORING DATA

Project	Global Centre of Rail Excellence		Project No	G22069	Client	Walters UK Limited		
Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH101	1	20/12/2022 15:54	Water Level	10.56	m	0.01	Dip Meter	Base dipped at 13.49m
S1-BH101	1	21/12/2022 13:59	Water Level	10.54	m	0.01	Dip Meter	Base dipped at 13.48m
S1-BH101	1	22/12/2022 12:31	Water Level	10.52	m	0.01	Dip Meter	Base dipped at 13.48m
S1-BH101	1	09/01/2023 13:49	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Differential Pressure	-0.09	mbar	4	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Steady Carbon Dioxide	1.4	%	0.5	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Barometric Pressure	979	mbar	5	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Peak Oxygen	19.1	%	1	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Steady Oxygen	19.1	%	1	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Carbon Monoxide	23	ppm	2	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Steady Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Peak Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Gas Flow Rate	-7.3	l/hr	0.3	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Peak Carbon Dioxide	1.4	%	0.5	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:51	Water Level	10.44	m	0.01	Dip Meter	Base dipped at 13.74m. No LNAPL detected.
S1-BH101	1	25/01/2023 14:42	Water Level		m	0.01	Dip Meter	Base dipped at 13.74m. Borehole dry
S1-BH101	1	31/01/2023 12:34	Gas Flow Rate	6.5	l/hr	0.3	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Peak Carbon Dioxide	1.5	%	0.5	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Steady Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Differential Pressure	-0.34	mbar	4	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Peak Oxygen	18.9	%	1	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Barometric Pressure	998	mbar	5	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Peak Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Steady Oxygen	18.9	%	1	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Carbon Monoxide	2	ppm	2	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:34	Steady Carbon Dioxide	1.5	%	0.5	GA5000 SN:G504748	
S1-BH101	1	31/01/2023 12:36	Water Level	10.66	m	0.01	Dip Meter	Base dipped at 13.61m
S1-BH101	1	14/02/2023 14:43	Water Level	10.66	m	0.01	Dip Meter	Base dipped at 13.47m
S1-BH101	1	17/02/2023 14:45	Steady Methane	0.1	%	0.5	GA5000 SN:G508511	
S1-BH101	1	17/02/2023 14:45	Peak Methane	0.1	%	0.5	GA5000 SN:G508511	
S1-BH101	1	17/02/2023 14:45	Barometric Pressure	1000	mbar	5	GA5000 SN:G508511	
S1-BH101	1	17/02/2023 14:45	Differential Pressure	-2.94	mbar	4	GA5000 SN:G508511	
S1-BH101	1	17/02/2023 14:45	Carbon Monoxide	3	ppm	2	GA5000 SN:G508511	
S1-BH101	1	17/02/2023 14:45	Peak Carbon Dioxide	1	%	0.5	GA5000 SN:G508511	
S1-BH101	1	17/02/2023 14:45	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G508511	
S1-BH101	1	17/02/2023 14:45	Gas Flow Rate	3	l/hr	0.3	GA5000 SN:G508511	
S1-BH101	1	17/02/2023 14:45	Steady Oxygen	18.9	%	1	GA5000 SN:G508511	
S1-BH101	1	17/02/2023 14:45	Peak Oxygen	18.8	%	1	GA5000 SN:G508511	



GAS AND GROUNDWATER MONITORING DATA

Project	Global Centre of Rail Excellence		Project No	G22069	Client	Walters UK Limited		
Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH101	1	17/02/2023 14:45	Steady Carbon Dioxide	1	%	0.5	GA5000 SN:G508511	
S1-BH102	1	21/11/2022 12:31	Water Level	0.64	m	0.01	Dip Meter	Base dipped at 8.94m
S1-BH102	1	22/11/2022 11:05	Water Level	0.68	m	0.01	Dip Meter	Base dipped at 8.94m
S1-BH102	1	23/11/2022 13:50	Water Level	0.48	m	0.01	Dip Meter	Base dipped at 8.93m
S1-BH102	1	24/11/2022 09:01	Water Level	0.53	m	0.01	Dip Meter	Base dipped at 8.94m
S1-BH102	1	25/11/2022 10:41	Water Level	0.61	m	0.01	Dip Meter	Base dipped at 8.85m
S1-BH102	1	28/11/2022 11:48	Water Level	0.65	m	0.01	Dip Meter	Base dipped at 8.94m
S1-BH102	1	29/11/2022 13:42	LNAPL	0.74	m	0.01	Interface Probe	Base dipped at 8.86m. No LNAPL detected.
S1-BH102	1	30/11/2022 15:51	LNAPL	0.7	m	0.01	Interface Probe	Base dipped at 8.86m.
S1-BH102	1	01/12/2022 11:53	LNAPL	0.72	m	0.01	Interface Probe	Base dipped at 8.85m.
S1-BH102	1	02/12/2022 15:04	Water Level	0.69	m	0.01	Dip Meter	Base dipped at 8.85m.
S1-BH102	1	05/12/2022 12:05	Water Level	0.65	m	0.01	Dip Meter	Base dipped at 8.85m.
S1-BH102	1	06/12/2022 08:48	LNAPL	0.66	m	0.01	Interface Probe	Base dipped at 8.85m.
S1-BH102	1	07/12/2022 12:29	LNAPL	0.65	m	0.01	Interface Probe	Base dipped at 8.85m.
S1-BH102	1	08/12/2022 09:16	LNAPL	0.62	m	0.01	Interface Probe	Depth to base 2.98m
S1-BH102	1	09/12/2022 09:34	LNAPL	0.68	m	0.01	Interface Probe	Depth to base 2.98m
S1-BH102	1	12/12/2022 12:39	Water Level	0.65	m	0.01	Dip Meter	Base dipped at 8.82m
S1-BH102	1	13/12/2022 12:30	Water Level	0.69	m	0.01	Dip Meter	Base dipped at 8.84m
S1-BH102	1	14/12/2022 14:32	Water Level	0.69	m	0.01	Dip Meter	Base dipped at 8.84m
S1-BH102	1	15/12/2022 11:03	Water Level	0.64	m	0.01	Dip Meter	Base dipped at 8.84m
S1-BH102	1	16/12/2022 11:03	Water Level	0.64	m	0.01	Dip Meter	Base dipped at 8.84m
S1-BH102	1	20/12/2022 14:59	Water Level	0.66	m	0.01	Dip Meter	Base dipped at 8.77m
S1-BH102	1	22/12/2022 10:06	Water Level	0.63	m	0.01	Dip Meter	Base dipped at 8.85m
S1-BH102	1	09/01/2023 11:01	Steady Carbon Dioxide	4.5	%	0.5	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Steady Methane	8.5	%	0.5	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Peak Methane	8.2	%	0.5	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Carbon Monoxide	2	ppm	2	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Steady Oxygen	14.4	%	1	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Peak Oxygen	14.4	%	1	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Differential Pressure	0.02	mbar	4	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Gas Flow Rate	-8.8	l/hr	0.3	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Barometric Pressure	978	mbar	5	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Peak Carbon Dioxide	4.5	%	0.5	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:03	Water Level	0.5	m	0.01	Dip Meter	Base dipped at 8.77m. No LNAPL detected.
S1-BH102	1	24/01/2023 11:15	Water Level	0.68	m	0.01	Dip Meter	Base dipped at 8.72m
S1-BH102	1	31/01/2023 10:39	Peak Carbon Dioxide	3.6	%	0.5	GA5000 SN:G504748	
S1-BH102	1	31/01/2023 10:39	Steady Methane	2.7	%	0.5	GA5000 SN:G504748	
S1-BH102	1	31/01/2023 10:39	Steady Carbon Dioxide	3.6	%	0.5	GA5000 SN:G504748	



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Project	Global Centre of Rail Excellence			Project No	G22069		Client	Walters UK Limited	
Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks	
S1-BH102	1	31/01/2023 10:39	Steady Oxygen	18.9	%	1	GA5000 SN:G504748		
S1-BH102	1	31/01/2023 10:39	Peak Methane	2.7	%	0.5	GA5000 SN:G504748		
S1-BH102	1	31/01/2023 10:39	Gas Flow Rate	5.5	l/hr	0.3	GA5000 SN:G504748		
S1-BH102	1	31/01/2023 10:39	Differential Pressure	14.38	mbar	4	GA5000 SN:G504748		
S1-BH102	1	31/01/2023 10:39	Carbon Monoxide	1	ppm	2	GA5000 SN:G504748		
S1-BH102	1	31/01/2023 10:39	Barometric Pressure	1000	mbar	5	GA5000 SN:G504748		
S1-BH102	1	31/01/2023 10:39	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748		
S1-BH102	1	31/01/2023 10:39	Peak Oxygen	18.9	%	1	GA5000 SN:G504748		
S1-BH102	1	31/01/2023 10:40	Water Level	0.64	m	0.01	Dip Meter	Base dipped at 8.85m	
S1-BH102	1	01/02/2023 11:18	Water Level	0.64	m	0.01	Dip Meter	Base dipped at 8.85m	
S1-BH102	1	13/02/2023 11:43	Water Level	0.68	m	0.01	Dip Meter	Base dipped at 8.75m	
S1-BH102	1	13/02/2023 11:45	Carbon Monoxide	1	ppm	2	GA5000 SN:G508511		
S1-BH102	1	13/02/2023 11:45	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G508511		
S1-BH102	1	13/02/2023 11:45	Barometric Pressure	1006	mbar	5	GA5000 SN:G508511		
S1-BH102	1	13/02/2023 11:45	Peak Carbon Dioxide	2	%	0.5	GA5000 SN:G508511		
S1-BH102	1	13/02/2023 11:45	Peak Oxygen	16.6	%	1	GA5000 SN:G508511		
S1-BH102	1	13/02/2023 11:45	Differential Pressure	12.91	mbar	4	GA5000 SN:G508511		
S1-BH102	1	13/02/2023 11:45	Steady Methane	8.9	%	0.5	GA5000 SN:G508511		
S1-BH102	1	13/02/2023 11:45	Steady Oxygen	16.6	%	1	GA5000 SN:G508511		
S1-BH102	1	13/02/2023 11:45	Gas Flow Rate	6.2	l/hr	0.3	GA5000 SN:G508511		
S1-BH102	1	13/02/2023 11:45	Peak Methane	8.9	%	0.5	GA5000 SN:G508511		
S1-BH102	1	13/02/2023 11:45	Steady Carbon Dioxide	2	%	0.5	GA5000 SN:G508511		
S1-BH103	1	02/12/2022 14:11	LNAPL	3.32	m	0.01	Interface Probe	Base dipped at 5.22m.	
S1-BH103	1	05/12/2022 12:13	LNAPL	3.35	m	0.01	Interface Probe	Base dipped at 5.20m.	
S1-BH103	1	06/12/2022 08:58	LNAPL	3.42	m	0.01	Interface Probe	Base dipped at 5.20m.	
S1-BH103	1	07/12/2022 12:32	LNAPL	3.42	m	0.01	Interface Probe	Base dipped at 5.20m.	
S1-BH103	1	08/12/2022 10:05	LNAPL	3.42	m	0.01	Interface Probe	Depth to base 5.67m	
S1-BH103	1	09/12/2022 11:22	LNAPL	3.42	m	0.01	Interface Probe	Depth to base 5.67m	
S1-BH103	1	12/12/2022 12:10	Water Level	3.42	m	0.01	Dip Meter	Base dipped at 12.10m	
S1-BH103	1	13/12/2022 12:40	Water Level	3.42	m	0.01	Dip Meter	Base dipped at 5.67m	
S1-BH103	1	14/12/2022 13:56	Water Level	3.42	m	0.01	Dip Meter	Base dipped at 5.67m	
S1-BH103	1	16/12/2022 12:38	Water Level	3.4	m	0.01	Dip Meter	Base dipped at 5.67m	
S1-BH103	1	20/12/2022 15:13	Water Level	3.14	m	0.01	Dip Meter	Base dipped at 5.51m	
S1-BH103	1	22/12/2022 10:13	Water Level	3.12	m	0.01	Dip Meter	Base dipped at 5.52m	
S1-BH103	1	09/01/2023 11:34	Water Level	2.85	m	0.01	Dip Meter	Base dipped at 5.75m. No LNAPL detected.	
S1-BH103	1	09/01/2023 11:35	Peak Carbon Dioxide	4.7	%	0.5	GA5000 SN:G504748		
S1-BH103	1	09/01/2023 11:35	Peak Oxygen	15.9	%	1	GA5000 SN:G504748		
S1-BH103	1	09/01/2023 11:35	Steady Oxygen	15.9	%	1	GA5000 SN:G504748		
S1-BH103	1	09/01/2023 11:35	Barometric Pressure	978	mbar	5	GA5000 SN:G504748		



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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH103	1	09/01/2023 11:35	Steady Carbon Dioxide	4.7	%	0.5	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Gas Flow Rate	0.2	l/hr	0.3	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Steady Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Differential Pressure	-0.02	mbar	4	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Peak Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH103	1	25/01/2023 10:38	Water Level	3.25	m	0.01	Dip Meter	Base dipped at 5.54m
S1-BH103	1	31/01/2023 11:23	Peak Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Steady Carbon Dioxide	4	%	0.5	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Steady Oxygen	18.9	%	1	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Barometric Pressure	999	mbar	5	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Differential Pressure	-0.12	mbar	4	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Peak Carbon Dioxide	4	%	0.5	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Gas Flow Rate	0	l/hr	0.3	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Steady Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:23	Peak Oxygen	18.9	%	1	GA5000 SN:G504748	
S1-BH103	1	31/01/2023 11:25	Water Level	3.3	m	0.01	Dip Meter	Base dipped at 5.52m
S1-BH103	1	02/02/2023 09:34	Water Level	3.3	m	0.01	Dip Meter	Base dipped at 5.52m
S1-BH103	1	14/02/2023 09:10	Water Level	3.4	m	0.01	Dip Meter	Base dipped at 5.52m
S1-BH103	1	14/02/2023 09:12	Peak Methane	0.2	%	0.5	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Carbon Monoxide	0	ppm	2	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Gas Flow Rate	0.1	l/hr	0.3	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Differential Pressure	0.1	mbar	4	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Peak Oxygen	17.9	%	1	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Peak Carbon Dioxide	4.4	%	0.5	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Steady Oxygen	17.9	%	1	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Steady Carbon Dioxide	4.4	%	0.5	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Barometric Pressure	1003	mbar	5	GA5000 SN:G508511	
S1-BH103	1	14/02/2023 09:12	Steady Methane	0.2	%	0.5	GA5000 SN:G508511	
S1-BH105	1	06/12/2022 08:59	LNAPL	6.47	m	0.01	Interface Probe	Base dipped at 15.50m.
S1-BH105	1	07/12/2022 12:34	LNAPL	6.46	m	0.01	Interface Probe	Base dipped at 15.48m.
S1-BH105	1	08/12/2022 10:25	LNAPL	6.45	m	0.01	Interface Probe	Depth to base 15.63m
S1-BH105	1	09/12/2022 11:29	LNAPL	6.43	m	0.01	Interface Probe	Depth to base 15.63m
S1-BH105	1	12/12/2022 12:00	Water Level	6.45	m	0.01	Dip Meter	Base dipped at 15.64m
S1-BH105	1	13/12/2022 13:15	Water Level	8.84	m	0.01	Dip Meter	Base dipped at 15.61m



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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH105	1	14/12/2022 13:46	Water Level	8.83	m	0.01	Dip Meter	Base dipped at 15.60m
S1-BH105	1	15/12/2022 10:14	Water Level	6.51	m	0.01	Dip Meter	Base dipped at 15.61m
S1-BH105	1	16/12/2022 11:53	Water Level	6.5	m	0.01	Dip Meter	Base dipped at 15.62m
S1-BH105	1	20/12/2022 15:19	Water Level	6.4	m	0.01	Dip Meter	Base dipped at 15.39m
S1-BH105	1	22/12/2022 10:21	Water Level	6.38	m	0.01	Dip Meter	Base dipped at 15.61m
S1-BH105	1	09/01/2023 12:11	Steady Oxygen	5	%	1	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Peak Oxygen	5	%	1	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Peak Carbon Dioxide	3.9	%	0.5	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Barometric Pressure	977	mbar	5	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Peak Methane	25.9	%	0.5	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Steady Methane	25.8	%	0.5	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Carbon Monoxide	1	ppm	2	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Gas Flow Rate	-8.3	l/hr	0.3	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Differential Pressure	0.02	mbar	4	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Steady Carbon Dioxide	3.9	%	0.5	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:14	Water Level	6.3	m	0.01	Dip Meter	Base dipped at 15.50m. No LNAPL detected.
S1-BH105	1	16/01/2023 11:11	Water Level	6.275	m	0.01	Dip Meter	Base dipped at 15.44m
S1-BH105	1	31/01/2023 11:37	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Peak Methane	21	%	0.5	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Differential Pressure	1.26	mbar	4	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Peak Carbon Dioxide	3.6	%	0.5	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Steady Methane	21	%	0.5	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Gas Flow Rate	5.5	l/hr	0.3	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Carbon Monoxide	88	ppm	2	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Peak Oxygen	9.3	%	1	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Steady Carbon Dioxide	3.6	%	0.5	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Steady Oxygen	9.3	%	1	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:37	Barometric Pressure	999	mbar	5	GA5000 SN:G504748	
S1-BH105	1	31/01/2023 11:39	Water Level	6.42	m	0.01	Dip Meter	Base dipped at 15.36m
S1-BH105	1	01/02/2023 14:26	Water Level	6.42	m	0.01	Dip Meter	Base dipped at 15.36m
S1-BH105	1	14/02/2023 10:19	Water Level	6.46	m	0.01	Dip Meter	Base dipped at 15.36m
S1-BH105	1	14/02/2023 10:21	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G508511	
S1-BH105	1	14/02/2023 10:21	Differential Pressure	2.59	mbar	4	GA5000 SN:G508511	
S1-BH105	1	14/02/2023 10:21	Steady Methane	34.1	%	0.5	GA5000 SN:G508511	
S1-BH105	1	14/02/2023 10:21	Peak Carbon Dioxide	3.8	%	0.5	GA5000 SN:G508511	
S1-BH105	1	14/02/2023 10:21	Peak Methane	35.1	%	0.5	GA5000 SN:G508511	
S1-BH105	1	14/02/2023 10:21	Carbon Monoxide	10	ppm	2	GA5000 SN:G508511	
S1-BH105	1	14/02/2023 10:21	Barometric Pressure	1003	mbar	5	GA5000 SN:G508511	



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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks	
S1-BH105	1	14/02/2023 10:21	Steady Carbon Dioxide	3.8	%	0.5	GA5000 SN:G508511		
S1-BH105	1	14/02/2023 10:21	Gas Flow Rate	3.9	l/hr	0.3	GA5000 SN:G508511		
S1-BH105	1	14/02/2023 10:21	Steady Oxygen	6.5	%	1	GA5000 SN:G508511		
S1-BH105	1	14/02/2023 10:21	Peak Oxygen	6.5	%	1	GA5000 SN:G508511		
S1-BH108	1	25/11/2022 10:28	Water Level	1.78	m	0.01	Dip Meter	Base dipped at 15.50m	
S1-BH108	1	28/11/2022 10:20	Water Level	1.4	m	0.01	Dip Meter	Base dipped at 15.50m	
S1-BH108	1	29/11/2022 13:41	LNAPL	1.35	m	0.01	Interface Probe	Base dipped at 15.43m. No LNAPL detected.	
S1-BH108	1	30/11/2022 15:47	LNAPL	1.49	m	0.01	Interface Probe	Base dipped at 15.50m.	
S1-BH108	1	01/12/2022 11:51	LNAPL	1.5	m	0.01	Interface Probe	Base dipped at 15.50m.	
S1-BH108	1	02/12/2022 14:59	LNAPL	1.69	m	0.01	Interface Probe	Base dipped at 15.50m.	
S1-BH108	1	05/12/2022 12:00	Water Level	1.84	m	0.01	Dip Meter	Base dipped at 15.48m.	
S1-BH108	1	06/12/2022 08:44	LNAPL	0	m	0.01	Interface Probe	Heavy damage from machine strike, unable to dip due to bent post.	
S1-BH108	1	07/12/2022 08:46	Water Level	1.79	m	0.01	Dip Meter	Base dipped at 15.47m.	
S1-BH108	1	08/12/2022 09:30	LNAPL	1.8	m	0.01	Interface Probe	Depth to base 15.77m	
S1-BH108	1	09/12/2022 09:17	LNAPL	1.97	m	0.01	Interface Probe	Depth to base 15.77m	
S1-BH108	1	12/12/2022 12:19	Water Level	2.23	m	0.01	Dip Meter	Base dipped at 12.19m	
S1-BH108	1	13/12/2022 10:05	Water Level	2.43	m	0.01	Dip Meter	Base dipped at 15.75m	
S1-BH108	1	14/12/2022 14:10	Water Level	2.44	m	0.01	Dip Meter	Base dipped at 15.75m	
S1-BH108	1	15/12/2022 09:14	Water Level	2.47	m	0.01	Dip Meter	Base dipped at 2.47m	
S1-BH108	1	16/12/2022 12:42	Water Level	2.49	m	0.01	Dip Meter	Base dipped at 15.71m	
S1-BH108	1	20/12/2022 14:48	Water Level	2.23	m	0.01	Dip Meter	Base dipped at 15.45m	
S1-BH108	1	22/12/2022 09:57	Water Level	2.25	m	0.01	Dip Meter	Base dipped at 15.51m	
S1-BH108	1	09/01/2023 10:16	Peak Carbon Dioxide	0.9	%	0.5	GA5000 SN:G504748		
S1-BH108	1	09/01/2023 10:16	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748		
S1-BH108	1	09/01/2023 10:16	Steady Oxygen	20.7	%	1	GA5000 SN:G504748		
S1-BH108	1	09/01/2023 10:16	Peak Methane	0.1	%	0.5	GA5000 SN:G504748		
S1-BH108	1	09/01/2023 10:16	Barometric Pressure	976	mbar	5	GA5000 SN:G504748		
S1-BH108	1	09/01/2023 10:16	Gas Flow Rate	-3.4	l/hr	0.3	GA5000 SN:G504748		
S1-BH108	1	09/01/2023 10:16	Steady Carbon Dioxide	0.6	%	0.5	GA5000 SN:G504748		
S1-BH108	1	09/01/2023 10:16	Differential Pressure	-0.02	mbar	4	GA5000 SN:G504748		
S1-BH108	1	09/01/2023 10:16	Peak Oxygen	20.6	%	1	GA5000 SN:G504748		
S1-BH108	1	09/01/2023 10:16	Steady Methane	0	%	0.5	GA5000 SN:G504748		
S1-BH108	1	09/01/2023 10:16	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748		
S1-BH108	1	09/01/2023 10:21	Water Level	1.19	m	0.01	Dip Meter	Base dipped at 15.60m. No LNAPL detected.	
S1-BH108	1	16/01/2023 13:04	Water Level	1.18	m	0.01	Dip Meter	Base dipped at 15.55m	
S1-BH108	1	31/01/2023 10:04	Steady Methane	0.1	%	0.5	GA5000 SN:G504748		
S1-BH108	1	31/01/2023 10:04	Peak Carbon Dioxide	2.8	%	0.5	GA5000 SN:G504748		
S1-BH108	1	31/01/2023 10:04	Barometric Pressure	999	mbar	5	GA5000 SN:G504748		
S1-BH108	1	31/01/2023 10:04	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748		



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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH108	1	31/01/2023 10:04	Steady Carbon Dioxide	2.8	%	0.5	GA5000 SN:G504748	
S1-BH108	1	31/01/2023 10:04	Peak Oxygen	20.3	%	1	GA5000 SN:G504748	
S1-BH108	1	31/01/2023 10:04	Gas Flow Rate	6.3	l/hr	0.3	GA5000 SN:G504748	
S1-BH108	1	31/01/2023 10:04	Differential Pressure	0.03	mbar	4	GA5000 SN:G504748	
S1-BH108	1	31/01/2023 10:04	Carbon Monoxide	10	ppm	2	GA5000 SN:G504748	
S1-BH108	1	31/01/2023 10:04	Peak Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH108	1	31/01/2023 10:04	Steady Oxygen	20.3	%	1	GA5000 SN:G504748	
S1-BH108	1	31/01/2023 10:07	Water Level	2.13	m	0.01	Dip Meter	Base dipped at 15.46m
S1-BH112	1	20/12/2022 15:32	Water Level	2.09	m	0.01	Dip Meter	Base dipped at 3.34m
S1-BH112	2	20/12/2022 15:47	Water Level	9.74	m	0.01	Dip Meter	Base dipped at 15.23m
S1-BH112	1	21/12/2022 12:22	Water Level	2.25	m	0.01	Dip Meter	Base dipped at 3.31m
S1-BH112	2	21/12/2022 12:24	Water Level	9.62	m	0.01	Dip Meter	Base dipped at 15.00m
S1-BH112	1	22/12/2022 10:33	Water Level	2.08	m	0.01	Dip Meter	Base dipped at 3.3m
S1-BH112	2	23/12/2022 10:35	Water Level	9.62	m	0.01	Dip Meter	Base dipped at 14.99m
S1-BH112	1	09/01/2023 12:46	Steady Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Steady Oxygen	9	%	1	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Differential Pressure	0.1	mbar	4	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Steady Carbon Dioxide	1.4	%	0.5	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Peak Oxygen	9	%	1	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Steady Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Peak Carbon Dioxide	1.4	%	0.5	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Gas Flow Rate	0.2	l/hr	0.3	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Barometric Pressure	978	mbar	5	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:53	Water Level	2.41	m	0.01	Dip Meter	Base dipped at 3.37m. No LNAPL detected.
S1-BH112	2	09/01/2023 13:06	Steady Oxygen	8.5	%	1	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Peak Methane	0.2	%	0.5	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Peak Carbon Dioxide	2.3	%	0.5	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Differential Pressure	0.03	mbar	4	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Gas Flow Rate	-3	l/hr	0.3	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Carbon Monoxide	1	ppm	2	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Peak Oxygen	8.5	%	1	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Steady Carbon Dioxide	2.3	%	0.5	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Steady Methane	0.2	%	0.5	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Barometric Pressure	978	mbar	5	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:09	Water Level	8.87	m	0.01	Dip Meter	Base dipped at 15.12m. No LNAPL detected.
S1-BH112	1	02/02/2023 10:49	Water Level		m	0.01	Dip Meter	Water dipped at 3.15m. Base dipped at 3.36m



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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH112	2	02/02/2023 10:58	Water Level	9.98	m	0.01	Dip Meter	Base dipped at 15.00m
S1-BH112	1	14/02/2023 13:58	Steady Methane	0.2	%	0.5	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Peak Oxygen	14.8	%	1	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Steady Oxygen	14.8	%	1	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Differential Pressure	0.14	mbar	4	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Carbon Monoxide	1	ppm	2	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Steady Carbon Dioxide	2	%	0.5	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Peak Methane	0.2	%	0.5	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Gas Flow Rate	0.2	l/hr	0.3	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Water Level		m	0.01	Dip Meter	Water dipped at 3.20m. Base dipped at 3.41m
S1-BH112	1	14/02/2023 13:58	Barometric Pressure	1001	mbar	5	GA5000 SN:G508511	
S1-BH112	1	14/02/2023 13:58	Peak Carbon Dioxide	2	%	0.5	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Differential Pressure	0.66	mbar	4	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Gas Flow Rate	0.3	l/hr	0.3	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Peak Carbon Dioxide	0.9	%	0.5	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Steady Carbon Dioxide	0.9	%	0.5	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Peak Oxygen	17.1	%	1	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Steady Methane	0.1	%	0.5	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Water Level	10.13	m	0.01	Dip Meter	Base dipped at 15.17m
S1-BH112	2	14/02/2023 14:05	Steady Oxygen	17.2	%	1	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Peak Methane	0.2	%	0.5	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Carbon Monoxide	2	ppm	2	GA5000 SN:G508511	
S1-BH112	2	14/02/2023 14:05	Barometric Pressure	1001	mbar	5	GA5000 SN:G508511	
S1-BH113	1	25/11/2022 11:00	Water Level	4.17	m	0.01	Dip Meter	Base dipped at 5.50m
S1-BH113	1	28/11/2022 12:42	Water Level	4.1	m	0.01	Dip Meter	Base dipped at 5.50m
S1-BH113	1	29/11/2022 13:44	LNAPL	4.09	m	0.01	Interface Probe	Base dipped at 5.50m. No LNAPL detected.
S1-BH113	1	30/11/2022 15:52	LNAPL	4.29	m	0.01	Interface Probe	Base dipped at 5.50m.
S1-BH113	1	01/12/2022 11:55	LNAPL	4.33	m	0.01	Interface Probe	Base dipped at 5.50m.
S1-BH113	1	02/12/2022 12:08	Water Level	4.37	m	0.01	Dip Meter	Base dipped at 5.50m.
S1-BH113	1	05/12/2022 14:08	Water Level	4.55	m	0.01	Dip Meter	Base dipped at 5.50m.
S1-BH113	1	06/12/2022 08:51	LNAPL	4.5	m	0.01	Interface Probe	Base dipped at 5.50m.
S1-BH113	1	07/12/2022 12:35	LNAPL	4.52	m	0.01	Interface Probe	Base dipped at 5.49m.
S1-BH113	1	08/12/2022 10:40	LNAPL	4.52	m	0.01	Interface Probe	Depth to base 5.85m
S1-BH113	1	09/12/2022 11:34	LNAPL	4.55	m	0.01	Interface Probe	Depth to base 5.85m
S1-BH113	1	12/12/2022 11:51	Water Level	4.52	m	0.01	Dip Meter	Base dipped at 5.58m
S1-BH113	1	13/12/2022 13:18	Water Level	4.7	m	0.01	Dip Meter	Base dipped at 5.58m
S1-BH113	1	14/12/2022 13:31	Water Level	4.7	m	0.01	Dip Meter	Base dipped at 5.58m



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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH113	1	15/12/2022 10:03	Water Level	4.71	m	0.01	Dip Meter	Base dipped at 5.58m
S1-BH113	1	16/12/2022 11:48	Water Level	4.8	m	0.01	Dip Meter	Base dipped at 5.58m
S1-BH113	1	20/12/2022 15:25	Water Level	4.13	m	0.01	Dip Meter	Base dipped at 5.50m
S1-BH113	1	22/12/2022 10:26	Water Level	4.11	m	0.01	Dip Meter	Base dipped at 5.52m
S1-BH113	1	09/01/2023 12:30	Gas Flow Rate	0.3	l/hr	0.3	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:30	Steady Carbon Dioxide	4.5	%	0.5	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:30	Carbon Monoxide	6	ppm	2	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:30	Peak Carbon Dioxide	4.5	%	0.5	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:30	Barometric Pressure	978	mbar	5	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:30	Water Level	3.69	m	0.01	Dip Meter	Base dipped at 5.53m. No LNAPL detected.
S1-BH113	1	09/01/2023 12:30	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:32	Steady Methane	4.5	%	0.5	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:32	Peak Methane	0.2	%	0.5	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:33	Peak Oxygen	4.5	%	1	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:33	Steady Oxygen	1.8	%	1	GA5000 SN:G504748	
S1-BH113	1	16/01/2023 08:40	Water Level	3.86	m	0.01	Dip Meter	Base dipped at 5.53m
S1-BH113	1	31/01/2023 11:49	Peak Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Steady Carbon Dioxide	4	%	0.5	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Gas Flow Rate	0.2	l/hr	0.3	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Peak Carbon Dioxide	4	%	0.5	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Carbon Monoxide	2	ppm	2	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Steady Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Barometric Pressure	999	mbar	5	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Steady Oxygen	7	%	1	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Peak Oxygen	7	%	1	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:49	Differential Pressure	0.14	mbar	4	GA5000 SN:G504748	
S1-BH113	1	31/01/2023 11:51	Water Level	4.66	m	0.01	Dip Meter	Base dipped at 5.54m
S1-BH113	1	01/02/2023 15:15	Water Level	4.66	m	0.01	Dip Meter	Base dipped at 5.54m
S1-BH113	1	14/02/2023 11:03	Water Level		m	0.01	Dip Meter	Borehole dry. Base dipped at 5.49m
S1-BH113	1	14/02/2023 11:05	Peak Oxygen	9.5	%	1	GA5000 SN:G508511	
S1-BH113	1	14/02/2023 11:05	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G508511	
S1-BH113	1	14/02/2023 11:05	Steady Methane	0.2	%	0.5	GA5000 SN:G508511	
S1-BH113	1	14/02/2023 11:05	Gas Flow Rate	0.2	l/hr	0.3	GA5000 SN:G508511	
S1-BH113	1	14/02/2023 11:05	Peak Methane	0.4	%	0.5	GA5000 SN:G508511	
S1-BH113	1	14/02/2023 11:05	Carbon Monoxide	1	ppm	2	GA5000 SN:G508511	
S1-BH113	1	14/02/2023 11:05	Peak Carbon Dioxide	5.4	%	0.5	GA5000 SN:G508511	
S1-BH113	1	14/02/2023 11:05	Barometric Pressure	1003	mbar	5	GA5000 SN:G508511	
S1-BH113	1	14/02/2023 11:05	Differential Pressure	0.14	mbar	4	GA5000 SN:G508511	



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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH113	1	14/02/2023 11:05	Steady Oxygen	9.6	%	1	GA5000 SN:G508511	
S1-BH113	1	14/02/2023 11:05	Steady Carbon Dioxide	5.4	%	0.5	GA5000 SN:G508511	
S1-BH121	1	15/11/2022 15:00	Water Level	0.52	m	0.01	Dip Meter	Base dipped at 3.37m
S1-BH121	1	16/11/2022 10:00	Water Level	0.43	m	0.01	Dip Meter	Base dipped at 3.37m
S1-BH121	1	17/11/2022 09:50	Water Level	0.53	m	0.01	Dip Meter	Base dipped at 3.37m
S1-BH121	1	21/11/2022 12:30	Water Level	0.44	m	0.01	Dip Meter	Base dipped at 3.36m
S1-BH121	1	22/11/2022 11:00	Water Level	0.46	m	0.01	Dip Meter	Base dipped at 3.37m
S1-BH121	1	23/11/2022 13:49	Water Level	0.44	m	0.01	Dip Meter	Base dipped at 3.36m
S1-BH121	1	24/11/2022 08:56	Water Level	0.47	m	0.01	Dip Meter	Base dipped at 3.36m
S1-BH121	1	25/11/2022 10:36	Water Level	0.48	m	0.01	Dip Meter	Base dipped at 3.35m
S1-BH121	1	28/11/2022 11:08	Water Level	0.43	m	0.01	Dip Meter	Base dipped at 3.38m
S1-BH121	1	29/11/2022 13:41	LNAPL	0.6	m	0.01	Interface Probe	Base dipped at 3.40m. No LNAPL detected.
S1-BH121	1	30/11/2022 15:49	LNAPL	0.62	m	0.01	Interface Probe	Base dipped at 3.39m.
S1-BH121	1	01/12/2022 11:52	LNAPL	0.64	m	0.01	Interface Probe	Base dipped at 3.40m.
S1-BH121	1	02/12/2022 14:02	Water Level	0.65	m	0.01	Dip Meter	Base dipped at 3.40m.
S1-BH121	1	05/12/2022 12:02	Water Level	0.71	m	0.01	Dip Meter	Base dipped at 3.40m.
S1-BH121	1	06/12/2022 08:47	LNAPL	0.71	m	0.01	Interface Probe	Base dipped at 3.41m.
S1-BH121	1	07/12/2022 12:27	LNAPL	0.7	m	0.01	Interface Probe	Base dipped at 3.40m.
S1-BH121	1	08/12/2022 09:45	LNAPL	0.77	m	0.01	Interface Probe	Depth to base 3.41m
S1-BH121	1	09/12/2022 09:34	LNAPL	0.7	m	0.01	Interface Probe	Depth to base 3.41m
S1-BH121	1	12/12/2022 12:48	Water Level	0.7	m	0.01	Dip Meter	Base dipped at 12.48m
S1-BH121	1	13/12/2022 12:16	Water Level	0.75	m	0.01	Dip Meter	Base dipped at 3.33m
S1-BH121	1	14/12/2022 14:19	Water Level	0.75	m	0.01	Dip Meter	Base dipped at 3.33m
S1-BH121	1	15/12/2022 10:34	Water Level	0.72	m	0.01	Dip Meter	Base dipped at 3.33m
S1-BH121	1	16/12/2022 12:06	Water Level	0.76	m	0.01	Dip Meter	Base dipped at 3.32m
S1-BH121	1	20/12/2022 14:55	Water Level	0.46	m	0.01	Dip Meter	Base dipped at 3.28m
S1-BH121	1	23/12/2022 10:03	Water Level	0.46	m	0.01	Dip Meter	Base dipped at 3.40m
S1-BH121	1	09/01/2023 10:36	Water Level	0.45	m	0.01	Dip Meter	Base dipped at 3.31m. No LNAPL detected
S1-BH121	1	09/01/2023 10:37	Peak Carbon Dioxide	2	%	0.5	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Barometric Pressure	977	mbar	5	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Gas Flow Rate	-12	l/hr	0.3	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Steady Methane	0.3	%	0.5	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Peak Methane	0.3	%	0.5	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Steady Carbon Dioxide	2	%	0.5	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Peak Oxygen	20.1	%	1	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Steady Oxygen	20.1	%	1	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Differential Pressure	-0.02	mbar	4	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	



GAS AND GROUNDWATER MONITORING DATA

Project	Global Centre of Rail Excellence		Project No	G22069	Client	Walters UK Limited		
Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH121	1	17/01/2023 08:27	Water Level	0.645	m	0.01	Dip Meter	Base dipped at 3.33m
S1-BH121	1	24/01/2023 14:15	Water Level	0.63	m	0.01	Dip Meter	Base dipped at 3.30m
S1-BH121	1	31/01/2023 10:25	Steady Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Steady Oxygen	21.2	%	1	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Differential Pressure	-0.14	mbar	4	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Peak Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Gas Flow Rate	3.9	l/hr	0.3	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Steady Carbon Dioxide	0.5	%	0.5	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Peak Carbon Dioxide	1.2	%	0.5	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Peak Oxygen	21.2	%	1	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:25	Barometric Pressure	1000	mbar	5	GA5000 SN:G504748	
S1-BH121	1	31/01/2023 10:27	Water Level	0.61	m	0.01	Dip Meter	Base dipped at 3.22m
S1-BH121	1	01/02/2023 10:37	Water Level	0.61	m	0.01	Dip Meter	Base dipped at 3.32m
S1-BH121	1	13/02/2023 10:44	Water Level	0.67	m	0.01	Dip Meter	Base dipped at 3.28m
S1-BH121	1	13/02/2023 10:46	Barometric Pressure	1006	mbar	5	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Carbon Monoxide	0	ppm	2	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Steady Carbon Dioxide	1.9	%	0.5	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Gas Flow Rate	5.6	l/hr	0.3	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Peak Carbon Dioxide	1.9	%	0.5	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Peak Oxygen	19.5	%	1	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Steady Oxygen	19.5	%	1	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Peak Methane	0.4	%	0.5	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Differential Pressure	12.27	mbar	4	GA5000 SN:G508511	
S1-BH121	1	13/02/2023 10:46	Steady Methane	0.2	%	0.5	GA5000 SN:G508511	
S1-BH122	1	15/11/2022 15:05	Water Level	0.205	m	0.01	Dip Meter	Base dipped at 1.84m
S1-BH122	1	16/11/2022 10:05	Water Level	0.17	m	0.01	Dip Meter	Base dipped at 1.84m
S1-BH122	1	17/11/2022 09:53	Water Level	0.19	m	0.01	Dip Meter	Base dipped at 1.84m
S1-BH122	1	21/11/2022 12:31	Water Level	0.19	m	0.01	Dip Meter	Base dipped at 1.83m
S1-BH122	1	22/11/2022 11:10	Water Level	0.21	m	0.01	Dip Meter	Base dipped at 1.83m
S1-BH122	1	23/11/2022 13:51	Water Level	0.19	m	0.01	Dip Meter	Base dipped at 1.82m
S1-BH122	1	24/11/2022 09:04	Water Level	0.18	m	0.01	Dip Meter	Base dipped at 1.83m.
S1-BH122	1	25/11/2022 10:45	Water Level	0.2	m	0.01	Dip Meter	Base dipped at 1.82m
S1-BH122	1	28/11/2022 07:32	Water Level	0.19	m	0.01	Dip Meter	Base dipped at 1.84m
S1-BH122	1	29/11/2022 13:43	LNAPL	0.43	m	0.01	Interface Probe	Base dipped at 1.85m. No LNAPL detected.
S1-BH122	1	30/11/2022 15:51	LNAPL	0.29	m	0.01	Interface Probe	Base dipped at 1.85m.
S1-BH122	1	01/12/2022 11:54	LNAPL	0.28	m	0.01	Interface Probe	Base dipped at 1.85m.



GAS AND GROUNDWATER MONITORING DATA

Project	Global Centre of Rail Excellence		Project No	G22069	Client	Walters UK Limited		
Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH122	1	02/12/2022 14:06	Water Level	0.28	m	0.01	Dip Meter	Base dipped at 1.85m.
S1-BH122	1	05/12/2022 12:06	Water Level	0.26	m	0.01	Dip Meter	Base dipped at 1.85m.
S1-BH122	1	06/12/2022 08:49	LNAPL	0.24	m	0.01	Interface Probe	Base dipped at 1.85m.
S1-BH122	1	07/12/2022 12:30	LNAPL	0.25	m	0.01	Interface Probe	Base dipped at 1.85m.
S1-BH122	1	08/12/2022 09:50	LNAPL	0.4	m	0.01	Interface Probe	Depth to base 2.00m
S1-BH122	1	09/12/2022 09:43	LNAPL	0.33	m	0.01	Interface Probe	Depth to base 2.00m
S1-BH122	1	12/12/2022 12:30	Water Level	0.36	m	0.01	Dip Meter	Base dipped at 1.80m
S1-BH122	1	13/12/2022 12:42	Water Level	0.42	m	0.01	Dip Meter	Base dipped at 2.45m
S1-BH122	1	14/12/2022 14:46	Water Level	0.36	m	0.01	Dip Meter	Base dipped at 2.46m
S1-BH122	1	15/12/2022 10:52	Water Level	0.32	m	0.01	Dip Meter	Base dipped at 1.79m
S1-BH122	1	16/12/2022 12:25	Water Level	0.36	m	0.01	Dip Meter	Base dipped at 1.79m
S1-BH122	1	20/12/2022 15:03	Water Level	0.17	m	0.01	Dip Meter	Base dipped at 1.80m
S1-BH122	1	23/12/2022 10:09	Water Level	0.21	m	0.01	Dip Meter	Base dipped at 1.79m
S1-BH122	1	09/01/2023 11:16	Steady Carbon Dioxide	2.2	%	0.5	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Steady Oxygen	19.4	%	1	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Peak Methane	0.3	%	0.5	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Steady Methane	0.3	%	0.5	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Barometric Pressure	978	mbar	5	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Differential Pressure	0.02	mbar	4	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Peak Carbon Dioxide	2.2	%	0.5	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Peak Oxygen	19.4	%	1	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Gas Flow Rate	-2.1	l/hr	0.3	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:19	Water Level	0.15	m	0.01	Dip Meter	Base dipped at 1.77m. No LNAPL detected.
S1-BH122	1	24/01/2023 12:04	Water Level	0.28	m	0.01	Dip Meter	Base dipped at 1.76m
S1-BH122	1	31/01/2023 10:51	Peak Carbon Dioxide	1.7	%	0.5	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Steady Carbon Dioxide	1.7	%	0.5	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Peak Oxygen	19.9	%	1	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Gas Flow Rate	11	l/hr	0.3	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Steady Oxygen	19.9	%	1	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Steady Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Barometric Pressure	1000	mbar	5	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Differential Pressure	-0.05	mbar	4	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:51	Peak Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH122	1	31/01/2023 10:53	Water Level	0.25	m	0.01	Dip Meter	Base dipped at 1.76m
S1-BH122	1	01/02/2023 12:07	Water Level	0.25	m	0.01	Dip Meter	Base dipped at 1.76m



GAS AND GROUNDWATER MONITORING DATA

Project	Global Centre of Rail Excellence		Project No	G22069	Client	Walters UK Limited		
Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH122	1	13/02/2023 14:16	Water Level	0.34	m	0.01	Dip Meter	Base dipped at 1.76m
S1-BH122	1	13/02/2023 14:18	Hydrogen Sulphide	1	ppm	1.5	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Steady Carbon Dioxide	1.8	%	0.5	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Peak Oxygen	18.9	%	1	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Carbon Monoxide	2	ppm	2	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Peak Methane	0.2	%	0.5	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Gas Flow Rate	7.5	l/hr	0.3	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Steady Oxygen	18.9	%	1	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Differential Pressure	-2.78	mbar	4	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Peak Carbon Dioxide	1.8	%	0.5	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Steady Methane	0.2	%	0.5	GA5000 SN:G508511	
S1-BH122	1	13/02/2023 14:18	Barometric Pressure	1005	mbar	5	GA5000 SN:G508511	
SOP003.16	1	09/12/2022 13:33	Water Level		m	0.01	Dip Meter	Dry. Base dipped at 13.88m
SOP003.16	1	12/12/2022 11:30	Water Level	11.3	m	0.01	Dip Meter	Base dipped at 13.86m
SOP003.16	1	13/12/2022 13:53	Water Level	11.34	m	0.01	Dip Meter	Base dipped at 13.37m
SOP003.16	1	14/12/2022 13:05	Water Level	11.36	m	0.01	Dip Meter	Base dipped at 13.34m
SOP003.16	1	15/12/2022 09:54	Water Level	11.35	m	0.01	Dip Meter	Base dipped at 13.86m
SOP003.16	1	16/12/2022 11:40	Water Level	11.35	m	0.01	Dip Meter	Base dipped at 13.90m
SOP003.16	1	20/12/2022 13:45	Water Level	11.35	m	0.01	Dip Meter	Base dipped at 13.88m
SOP003.16	1	21/12/2022 08:35	Water Level	11.34	m	0.01	Dip Meter	Base dipped at 13.88m
SOP003.16	1	22/12/2022 10:15	Water Level	12.35	m	0.01	Dip Meter	Base dipped at 13.88m
SOP003.16	1	09/01/2023 13:21	Peak Oxygen	15.8	%	1	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Steady Methane	0.2	%	0.5	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Gas Flow Rate	-6.8	l/hr	0.3	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Steady Oxygen	15.8	%	1	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Barometric Pressure	979	mbar	5	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Peak Carbon Dioxide	3.7	%	0.5	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Carbon Monoxide	2	ppm	2	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Peak Methane	0.3	%	0.5	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Steady Carbon Dioxide	3.6	%	0.5	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Differential Pressure	0.02	mbar	4	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:24	Water Level	10.2	m	0.01	Dip Meter	Base dipped at 13.75m. No LNAPL detected.
SOP003.16	1	25/01/2023 14:02	Water Level	11.04	m	0.01	Dip Meter	Base dipped at 13.60m
SOP003.16	1	31/01/2023 12:17	Gas Flow Rate	7	l/hr	0.3	GA5000 SN:G504748	
SOP003.16	1	31/01/2023 12:17	Differential Pressure	-6.67	mbar	4	GA5000 SN:G504748	
SOP003.16	1	31/01/2023 12:17	Steady Carbon Dioxide	2.2	%	0.5	GA5000 SN:G504748	
SOP003.16	1	31/01/2023 12:17	Steady Oxygen	17.8	%	1	GA5000 SN:G504748	
SOP003.16	1	31/01/2023 12:17	Peak Carbon Dioxide	2.2	%	0.5	GA5000 SN:G504748	



GAS AND GROUNDWATER MONITORING DATA

Project	Global Centre of Rail Excellence			Project No	G22069		Client	Walters UK Limited	
Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks	
SOP003.16	1	31/01/2023 12:17	Peak Methane	0.2	%	0.5	GA5000 SN:G504748		
SOP003.16	1	31/01/2023 12:17	Steady Methane	0.2	%	0.5	GA5000 SN:G504748		
SOP003.16	1	31/01/2023 12:17	Barometric Pressure	998	mbar	5	GA5000 SN:G504748		
SOP003.16	1	31/01/2023 12:17	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748		
SOP003.16	1	31/01/2023 12:17	Peak Oxygen	17.8	%	1	GA5000 SN:G504748		
SOP003.16	1	31/01/2023 12:17	Carbon Monoxide	2	ppm	2	GA5000 SN:G504748		
SOP003.16	1	31/01/2023 12:18	Water Level	11.28	m	0.01	Dip Meter	Base dipped at 13.65m	
SOP003.16	1	02/02/2023 10:21	Water Level	11.3	m	0.01	Dip Meter	Base dipped at 13.56m	
SOP003.16	1	14/02/2023 12:22	Peak Methane	0.3	%	0.5	GA5000 SN:G508511		
SOP003.16	1	14/02/2023 12:22	Differential Pressure	-3.3	mbar	4	GA5000 SN:G508511		
SOP003.16	1	14/02/2023 12:22	Water Level	11.38	m	0.01	Dip Meter	Base dipped at 13.66m	
SOP003.16	1	14/02/2023 12:22	Steady Carbon Dioxide	1.7	%	0.5	GA5000 SN:G508511		
SOP003.16	1	14/02/2023 12:22	Carbon Monoxide	2	ppm	2	GA5000 SN:G508511		
SOP003.16	1	14/02/2023 12:22	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G508511		
SOP003.16	1	14/02/2023 12:22	Steady Methane	0.2	%	0.5	GA5000 SN:G508511		
SOP003.16	1	14/02/2023 12:22	Barometric Pressure	1002	mbar	5	GA5000 SN:G508511		
SOP003.16	1	14/02/2023 12:22	Gas Flow Rate	3.4	l/hr	0.3	GA5000 SN:G508511		
SOP003.16	1	14/02/2023 12:22	Steady Oxygen	17.4	%	1	GA5000 SN:G508511		
SOP003.16	1	14/02/2023 12:22	Peak Carbon Dioxide	1.7	%	0.5	GA5000 SN:G508511		
SOP003.16	1	14/02/2023 12:22	Peak Oxygen	17.4	%	1	GA5000 SN:G508511		



INSTALLATION INSPECTION AND WELL DEVELOPMENT RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
S1-BH101	1	50	14.00	21/12/2214:00	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Plug	11.00	14.00	Clear	
Installation Inspection					
Surface Conditions	Wet	Damage to Headworks?	No		
Check Dip of Base (m bgl)	13.48	Pipe Cover/Bung Present?	Yes		
Remedial actions undertaken to well:					
N/A					
Purging and Well Development					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	3.00
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	140
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)/((\pi df^2/4)-(\pi dp^2/4))$	13.3
Groundwater Prior to Well Development				Volume of the Standpipe	
Groundwater Level (m bgl)	10.54	LNAPL/ DNAPL (m bgl)	0.00	Diameter of Standpipe (mm) (dp)	50
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)	
Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	6.5	3.46	
Time to Purge (mins)	10	Number of Well Volumes Purged	3.2	Volume of the Standpipe (litres) $(\pi dp^2/4)*10^{-3}$	6.8
Total Volume Purged (litres)	65.0	Operative	JP	Total Well Volume	
				Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe	20.1
t				Additional Notes and Observations	
In-situ Parameter Device Model	N/A	Groundwater Odour	No	In-situ parameters not required during development.	
In-situ Parameter Device SN	N/A	Visual Turbidity	Yes		
Confirm Field Calibration Completed	N/A	Groundwater Colour	Dark grey/black		

INSTALLATION INSPECTION, PURGING AND WATER SAMPLING RECORD

Installation Inspection							
Weather Conditions	Overcast			Surface Conditions	Wet		
Installation Base Depth (m bgl)	9.00			Damage to headworks?	No		
Remedial Actions undertaken to well:							
Purging and Well Development							
Guidance Notes				Well Volume Calculation			
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack			
				Saturated length of Filter Pack (dip depth to base of installation) (L) (m)		3.00	
				Porosity of Filter Pack (ø)		0.33	
Approx. Guidance Volumes for Field Calculation of Wet Well Volume							
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	150		
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of the Filter Pack (litres) $(Lø)/((\pi df^2/4)-((\pi dp^2/4)))$	15.5		
Groundwater Prior to Well Development				Volume of the Standpipe			
Groundwater Level (m bgl)	0.65	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50		
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)			
Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	10.00	Volume of the Standpipe (litres) $(\pi dp^2/4)*10-3$		16.4	
Time to Purge (mins)	21	Number of Well Volumes Purged	3.00	Total Well Volume			
Total Volume Purged (litres)	96	Operative	JJ	Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	31.9		
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations			
In-situ Parameter Device Model		Groundwater Odour	No	In-situ parameters not required during well development.			
In-situ Parameter Device SN		Visual Turbidity	Yes				
Confirm Field Calibration Completed		Groundwater Colour	Grey/Black running clear				
Exploratory Hole Number	S1-BH102		Installation No	1	Date and Time	28.11.22 11:48	
Project Number	G22069		Client	Walters UK			
Project Name	GCRE						



INSTALLATION INSPECTION AND WELL DEVELOPMENT RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
S1-BH103	1	50	5.50	08.12.2022	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Plug	2.00	5.50	Dry and cold	
Installation Inspection					
Surface Conditions	Dry	Damage to Headworks?	No		
Check Dip of Base (m bgl)	5.2	Pipe Cover/Bung Present?	Yes		
Remedial actions undertaken to well:					
N/A					
Purging and Well Development					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	2.05
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	146
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)/((\pi df^2/4)-(\pi dp^2/4))$	9.4
Groundwater Prior to Well Development				Volume of the Standpipe	
Groundwater Level (m bgl)	3.45	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)	
Purge Method/ Device	WASP PUMP	Average Flow Rate (litres/min)	1.9	1.75	
Time to Purge (mins)	15	Number of Well Volumes Purged	3.0	Volume of the Standpipe (litres) $(\pi dp^2/4)*10^{-3}$	8.0
Total Volume Purged (litres)	29.0	Operative	JJ	Total Well Volume	
				Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	9.6
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations	
In-situ Parameter Device Model	N/A	Groundwater Odour	None	In-situ parameters not required during development.	
In-situ Parameter Device SN	N/A	Visual Turbidity	No		
Confirm Field Calibration Completed	N/A	Groundwater Colour	Clear		



INSTALLATION INSPECTION AND WELL DEVELOPMENT RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
S1-BH105	1	50	15.00	08.12.22	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Plug	11.00	15.00	Cold/Dry	
Installation Inspection					
Surface Conditions	Dry	Damage to Headworks?	No		
Check Dip of Base (m bgl)	15.63	Pipe Cover/Bung Present?	Yes		
Remedial actions undertaken to well:					
N/A					
Purging and Well Development					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	4.00
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	146
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)/((\pi df^2/4)-(\pi dp^2/4))$	20.1
Groundwater Prior to Well Development				Volume of the Standpipe	
Groundwater Level (m bgl)	6.45	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)	
Purge Method/ Device	Wasp pump.	Average Flow Rate (litres/min)	6.9	8.55	
Time to Purge (mins)	16	Number of Well Volumes Purged	3.0	Volume of the Standpipe (litres) $(\pi dp^2/4)*10^{-3}$	16.8
Total Volume Purged (litres)	110.0	Operative	JJ	Total Well Volume	
				Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	36.9
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations	
In-situ Parameter Device Model	N/A	Groundwater Odour	None	In-situ parameters not required during development.	
In-situ Parameter Device SN	N/A	Visual Turbidity	No		
Confirm Field Calibration Completed	N/A	Groundwater Colour	Clear		

INSTALLATION INSPECTION, PURGING AND WATER SAMPLING RECORD

Installation Inspection							
Weather Conditions	Rain			Surface Conditions	Wet		
Installation Base Depth (m bgl)	15.50			Damage to headworks?	No		
Remedial Actions undertaken to well:							
Purging and Well Development							
Guidance Notes				Well Volume Calculation			
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack			
				Saturated length of Filter Pack (dip depth to base of installation) (L) (m)		2.50	
				Porosity of Filter Pack (ø)		0.33	
Approx. Guidance Volumes for Field Calculation of Wet Well Volume							
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	150		
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of the Filter Pack (litres) $(Lø)/((\pi df^2/4)-(\pi dp^2/4))$	12.6		
Groundwater Prior to Well Development				Volume of the Standpipe			
Groundwater Level (m bgl)	1.40	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50		
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)		14.10	
Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	10.00	Volume of the Standpipe (litres) $(\pi dp^2/4)*10-3$		27.7	
Time to Purge (mins)	14.5	Number of Well Volumes Purged	3.00	Total Well Volume			
Total Volume Purged (litres)	121	Operative	JJ	Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)		40.3	
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations			
In-situ Parameter Device Model		Groundwater Odour	No	In-situ parameters not required during well development.			
In-situ Parameter Device SN		Visual Turbidity	Yes				
Confirm Field Calibration Completed		Groundwater Colour	Grey/Black running clear				
Exploratory Hole Number	S1-BH108		Installation No	1	Date and Time	28.11.22 10:20	
Project Number	G22069		Client	Walters UK			
Project Name	GCRE						



INSTALLATION INSPECTION AND WELL DEVELOPMENT RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
S1-BH112	1	50	2.50	21/12/2022 12:26	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Plug	1.00	2.50	Clear	
Installation Inspection					
Surface Conditions	Wet	Damage to Headworks?	No		
Check Dip of Base (m bgl)	3.31	Pipe Cover/Bung Present?	Yes		
Remedial actions undertaken to well:					
N/A					
Purging and Well Development					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	0.25
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	146
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)/((\pi df^2/4)-(\pi dp^2/4))$	1.2
Groundwater Prior to Well Development				Volume of the Standpipe	
Groundwater Level (m bgl)	2.25	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)	
Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	10.0	0.25	
Time to Purge (mins)	2	Number of Well Volumes Purged	8.8	Volume of the Standpipe (litres) $(\pi dp^2/4)*10^{-3}$	0.5
Total Volume Purged (litres)	15.0	Operative	JP	Total Well Volume	
				Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	1.7
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations	
In-situ Parameter Device Model	N/A	Groundwater Odour	No	In-situ parameters not required during development.	
In-situ Parameter Device SN	N/A	Visual Turbidity	Yes		
Confirm Field Calibration Completed	N/A	Groundwater Colour	Grey		



INSTALLATION INSPECTION AND WELL DEVELOPMENT RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
S1-BH112	2	50	15.00	21/12/2022 13:03	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Plug	8.00	15.00	Clear	
Installation Inspection					
Surface Conditions	Wet	Damage to Headworks?	No		
Check Dip of Base (m bgl)	15	Pipe Cover/Bung Present?	Yes		
Remedial actions undertaken to well:					
N/A					
Purging and Well Development					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	5.38
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	146
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)/((\pi df^2/4)-(\pi dp^2/4))$	26.2
Groundwater Prior to Well Development				Volume of the Standpipe	
Groundwater Level (m bgl)	9.62	LNAPL/ DNAPL (m bgl)	0.00	Diameter of Standpipe (mm) (dp)	50
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)	
Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	6.1	5.38	
Time to Purge (mins)	20	Number of Well Volumes Purged	3.3	Volume of the Standpipe (litres) $(\pi dp^2/4)*10^{-3}$	10.6
Total Volume Purged (litres)	120.0	Operative	JP	Total Well Volume	
				Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	36.8
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations	
In-situ Parameter Device Model	N/A	Groundwater Odour	No	In-situ parameters not required during development.	
In-situ Parameter Device SN	N/A	Visual Turbidity	Yes		
Confirm Field Calibration Completed	N/A	Groundwater Colour	Greyish brown running clear.		

INSTALLATION INSPECTION, PURGING AND WATER SAMPLING RECORD

Installation Inspection							
Weather Conditions	Clear skies			Surface Conditions	Wet		
Installation Base Depth (m bgl)	5.50			Damage to headworks?	No		
Remedial Actions undertaken to well:							
Purging and Well Development							
Guidance Notes				Well Volume Calculation			
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack			
				Saturated length of Filter Pack (dip depth to base of installation) (L) (m)		2.50	
				Porosity of Filter Pack (ϕ)		0.33	
Approx. Guidance Volumes for Field Calculation of Wet Well Volume							
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	150		
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of the Filter Pack (litres) ($L\phi/((\pi df^2/4)-(\pi dp^2/4))$)	12.6		
Groundwater Prior to Well Development				Volume of the Standpipe			
Groundwater Level (m bgl)	0.93	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50		
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)			
Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	10.00	Volume of the Standpipe (litres) ($\pi dp^2/4 \times 10^{-3}$)		9.0	
Time to Purge (mins)	12	Number of Well Volumes Purged	5.75	Total Well Volume			
Total Volume Purged (litres)	124	Operative	JJ	Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)		21.6	
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations			
In-situ Parameter Device Model		Groundwater Odour	No	In-situ parameters not required during well development.			
In-situ Parameter Device SN		Visual Turbidity	Yes				
Confirm Field Calibration Completed		Groundwater Colour	Grey/Black running clear				
Exploratory Hole Number	S1-BH113		Installation No	1	Date and Time	28.11.22 12:42	
Project Number	G22069		Client	Walters UK			
Project Name	GCRE						

INSTALLATION INSPECTION, PURGING AND WATER SAMPLING RECORD

Installation Inspection							
Weather Conditions	Rajn			Surface Conditions	Wet		
Installation Base Depth (m bgl)	3.50			Damage to headworks?	No		
Remedial Actions undertaken to well:							
Purging and Well Development							
Guidance Notes				Well Volume Calculation			
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack			
				Saturated length of Filter Pack (dip depth to base of installation) (L) (m)		1.50	
				Porosity of Filter Pack (ø)		0.33	
Approx. Guidance Volumes for Field Calculation of Wet Well Volume							
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	150		
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of the Filter Pack (litres) $(Lø)/((\pi df^2/4)-((\pi dp^2/4)))$	6.8		
Groundwater Prior to Well Development				Volume of the Standpipe			
Groundwater Level (m bgl)	0.43	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50		
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)			
Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	10.00	Volume of the Standpipe (litres) $(\pi dp^2/4)*10-3$		6.0	
Time to Purge (mins)	15	Number of Well Volumes Purged	3.05	Total Well Volume			
Total Volume Purged (litres)	39	Operative	JJ	Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	12.8		
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations			
In-situ Parameter Device Model		Groundwater Odour	No	In-situ parameters not required during well development.			
In-situ Parameter Device SN		Visual Turbidity	Yes				
Confirm Field Calibration Completed		Groundwater Colour	Dark brown and black with a slight sheen, not a typical oil sheen though.				
Exploratory Hole Number	S1-BH121		Installation No	1	Date and Time	28.11.22 11:08	
Project Number	G22069		Client	Walters UK			
Project Name	GCRE						

INSTALLATION INSPECTION, PURGING AND WATER SAMPLING RECORD

Installation Inspection							
Weather Conditions	Overcast			Surface Conditions	Wet		
Installation Base Depth (m bgl)	1.90			Damage to headworks?	No		
Remedial Actions undertaken to well:							
Purging and Well Development							
Guidance Notes				Well Volume Calculation			
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack			
				Saturated length of Filter Pack (dip depth to base of installation) (L) (m)		0.90	
				Porosity of Filter Pack (ϕ)		0.33	
Approx. Guidance Volumes for Field Calculation of Wet Well Volume							
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	150		
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of the Filter Pack (litres) ($L\phi$)/(($\pi df^2/4$)-(($\pi dp^2/4$)))	3.3		
Groundwater Prior to Well Development				Volume of the Standpipe			
Groundwater Level (m bgl)	0.19	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50		
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)		1.71	
Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	10.00	Volume of the Standpipe (litres) ($\pi dp^2/4$)*10-3		3.4	
Time to Purge (mins)	5	Number of Well Volumes Purged	2.71	Total Well Volume			
Total Volume Purged (litres)	18	Operative	JJ	Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)		6.6	
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations			
In-situ Parameter Device Model		Groundwater Odour	No	In-situ parameters not required during well development.			
In-situ Parameter Device SN		Visual Turbidity	Yes				
Confirm Field Calibration Completed		Groundwater Colour	Grey/Black running clear				
Exploratory Hole Number	S1-BH122		Installation No	1	Date and Time	28.11.22 12:08	
Project Number	G22069		Client	Walters UK			
Project Name	GCRE						



INSTALLATION INSPECTION AND WELL DEVELOPMENT RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
SOP003.16	1	50	13.00	14/12/2022 13:07	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Plug	10.00	13.00	Cold and clear	
Installation Inspection					
Surface Conditions	Frozen	Damage to Headworks?	Not concreted in		
Check Dip of Base (m bgl)	13.61	Pipe Cover/Bung Present?	Yes		
Remedial actions undertaken to well:					
Well head concreted in.					
Purging and Well Development					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	1.66
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	115
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)/((\pi df^2/4)-(\pi dp^2/4))$	3.7
Groundwater Prior to Well Development				Volume of the Standpipe	
Groundwater Level (m bgl)	11.34	LNAPL/ DNAPL (m bgl)	0.00	Diameter of Standpipe (mm) (dp)	50
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)	
Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	7.0	1.66	
Time to Purge (mins)	1	Number of Well Volumes Purged	1.0	Volume of the Standpipe (litres) $(\pi dp^2/4)*10^{-3}$	3.3
Total Volume Purged (litres)	7.0	Operative	JP	Total Well Volume	
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations	
In-situ Parameter Device Model	N/A	Groundwater Odour	No	In-situ parameters not required during development. Well purged dry with no recharge.	
In-situ Parameter Device SN	N/A	Visual Turbidity	No		
Confirm Field Calibration Completed	N/A	Groundwater Colour	Clear		



INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
S1-BH101	1	50	14.00	25/01/2023 14:42	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Plug	11.00	14.00	Foggy	
Installation Inspection					
Surface Conditions	Frozen	Damage to Headworks?	No		
Check Dip of Base (m bgl)	13.74	Pipe Cover/Bung Present?	Yes		
Remedial actions undertaken to well:					
N/A					
Purging and Sampling					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	121
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)/(\pi df^2/4) - (\pi dp^2/4)$	
Groundwater Prior to Purging and Sampling				Volume of the Standpipe	
Groundwater Level (m bgl)	Dry	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)	
Purge Method/ Device	N/A	Average Flow Rate (litres/min)		Volume of the Standpipe (litres) $(\pi dp^2/4) \times 10^{-3}$	0.0
Time to Purge (mins)	N/A	Number of Well Volumes Purged		Total Well Volume	
Total Volume Purged (litres)	N/A	Operative	JP	Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	0.0
Observations During Purging (see Vu-situ output for insitu parameter readings)				Sampling Information	
In-situ Parameter Device Model	N/A	Groundwater Odour	N/A	Sample Depth (m bgl)	N/A
				Sample Type	N/A
				Sample Reference Number	N/A
In-situ Parameter Device SN	N/A	Visual Turbidity	N/A	Date and Time Obtained	N/A
				Additional Notes and Observations	
Confirm Field Calibration Completed	N/A	Groundwater Colour	N/A	Borehole dry unable to purge and sample.	



INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
S1-BH102	1	50	9.00	24/01/2023 10:59	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Cover	6.00	9.00	Cold and clear	
Installation Inspection					
Surface Conditions	Snow	Damage to Headworks?	No		
Check Dip of Base (m bgl)	8.72	Pipe Cover/Bung Present?	Yes		
Remedial actions undertaken to well:					
N/A					
Purging and Sampling					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	3.00
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	104
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)/(\pi df^2/4) - (\pi dp^2/4)$	6.5
Groundwater Prior to Purging and Sampling				Volume of the Standpipe	
Groundwater Level (m bgl)	0.60	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)	
Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	2.0	8.40	
Time to Purge (mins)	12	Number of Well Volumes Purged	1.0	Volume of the Standpipe (litres) $(\pi dp^2/4) \times 10^{-3}$	16.5
Total Volume Purged (litres)	24.0	Operative	JP	Total Well Volume	
				Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	22.9
Observations During Purging (see Vu-situ output for insitu parameter readings)				Sampling Information	
In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No	Sample Depth (m bgl)	8.72
				Sample Type	EW
				Sample Reference Number	28
In-situ Parameter Device SN	877732	Visual Turbidity	Yes	Date and Time Obtained	24/01/2023 11:39
				Additional Notes and Observations	
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey becoming light grey then opaque.	N/A	

Low-Flow Test Report:

Test Date / Time: 1/24/2023 11:27:28 AM
Project: GCRE
Operator Name: JP

Location Name: S1-BH102 Well Diameter: 5 cm Casing Type: Plastic Screen Length: 2.72 m Top of Screen: 6 m Total Depth: 8.72 m Initial Depth to Water: 0.6 m	Pump Type: Wasp pump Estimated Total Volume Pumped: 24000 ml Flow Cell Volume: 90 ml Final Flow Rate: 2000 ml/min Final Draw Down: 0 m	Instrument Used: Aqua TROLL 400 Serial Number: 877732
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Test Notes:

Weather Conditions:
Cold and clear

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
1/24/2023 11:27 AM	00:00	8.22 pH	8.76 °C	706.08 µS/cm	5.79 mg/L		723.4 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:27 AM	00:30	7.98 pH	8.57 °C	820.19 µS/cm	4.81 mg/L		1,021.9 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:28 AM	01:00	7.79 pH	9.23 °C	791.63 µS/cm	7.07 mg/L		1,039.5 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:28 AM	01:30	7.66 pH	9.66 °C	846.68 µS/cm	3.41 mg/L		1,035.7 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:29 AM	02:00	7.60 pH	10.47 °C	862.04 µS/cm	1.28 mg/L		1,031.6 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:29 AM	02:30	7.53 pH	10.69 °C	852.78 µS/cm	0.75 mg/L		1,036.8 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:30 AM	03:00	7.50 pH	10.71 °C	865.61 µS/cm	0.52 mg/L		1,041.0 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:30 AM	03:30	7.42 pH	10.75 °C	865.44 µS/cm	0.36 mg/L		1,029.6 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:31 AM	04:00	7.38 pH	10.78 °C	867.66 µS/cm	0.27 mg/L		1,025.5 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:31 AM	04:30	7.36 pH	10.82 °C	878.89 µS/cm	0.21 mg/L		1,021.7 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:32 AM	05:00	7.33 pH	10.83 °C	872.22 µS/cm	0.24 mg/L		1,015.8 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:32 AM	05:30	7.32 pH	10.85 °C	878.87 µS/cm	0.20 mg/L		1,012.1 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:33 AM	06:00	7.29 pH	10.86 °C	876.68 µS/cm	0.17 mg/L		1,004.7 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:33 AM	06:30	7.24 pH	10.87 °C	879.91 µS/cm	0.15 mg/L		995.0 mV	60.00 cm	2,000.00 ml/min

1/24/2023 11:34 AM	07:00	7.25 pH	10.88 °C	869.03 µS/cm	0.14 mg/L		985.4 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:34 AM	07:30	7.20 pH	10.91 °C	867.33 µS/cm	0.14 mg/L		967.5 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:35 AM	08:00	7.17 pH	10.92 °C	866.86 µS/cm	0.13 mg/L		965.5 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:35 AM	08:30	7.16 pH	10.92 °C	870.46 µS/cm	0.12 mg/L		956.7 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:36 AM	09:00	7.13 pH	10.94 °C	872.52 µS/cm	0.12 mg/L		954.0 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:36 AM	09:30	7.11 pH	10.96 °C	868.69 µS/cm	0.12 mg/L		947.1 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:37 AM	10:00	7.08 pH	10.97 °C	870.62 µS/cm	0.11 mg/L		936.2 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:37 AM	10:30	7.08 pH	11.00 °C	870.96 µS/cm	0.11 mg/L		935.6 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:38 AM	11:00	7.06 pH	11.00 °C	870.03 µS/cm	0.16 mg/L		937.7 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:38 AM	11:30	7.06 pH	11.01 °C	871.01 µS/cm	0.20 mg/L		944.0 mV	60.00 cm	2,000.00 ml/min
1/24/2023 11:39 AM	12:00	7.04 pH	11.01 °C	871.01 µS/cm	0.17 mg/L		942.5 mV	60.00 cm	2,000.00 ml/min

Samples

Sample ID:	Description:
EW1	Ground water



INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
S1-BH103	1	50	5.50	25/01/2023 10:37	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Plug	2.00	5.50	Foggy	
Installation Inspection					
Surface Conditions	Wet/thawing	Damage to Headworks?	No		
Check Dip of Base (m bgl)	5.54	Pipe Cover/Bung Present?	Yes		
Remedial actions undertaken to well:					
N/A					
Purging and Sampling					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	2.25
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	146
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)/((\pi df^2/4)-(\pi dp^2/4))$	11.0
Groundwater Prior to Purging and Sampling				Volume of the Standpipe	
Groundwater Level (m bgl)	3.25	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)	
Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	2.0	2.25	
Time to Purge (mins)	8	Number of Well Volumes Purged	1.0	Volume of the Standpipe (litres) $(\pi dp^2/4)*10^{-3}$	4.4
Total Volume Purged (litres)	16.0	Operative	JP	Total Well Volume	
				Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	15.4
Observations During Purging (see Vu-situ output for insitu parameter readings)				Sampling Information	
In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	No	Sample Depth (m bgl)	5.54
				Sample Type	EW
				Sample Reference Number	36
In-situ Parameter Device SN	877732	Visual Turbidity	No	Date and Time Obtained	25/01/2023 13:32
				Additional Notes and Observations	
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey running clear	N/A	

Low-Flow Test Report:

Test Date / Time: 1/25/2023 1:27:57 PM
Project: GCRE
Operator Name: JP

Location Name: S1-BH103 Well Diameter: 5 cm Casing Type: Plastic Screen Length: 3.54 m Top of Screen: 2 m Total Depth: 5.54 m Initial Depth to Water: 3.25 m	Pump Type: Wasp pump Estimated Total Volume Pumped: 16000 ml Flow Cell Volume: 90 ml Final Flow Rate: 2000 ml/min Final Draw Down: 0 m	Instrument Used: Aqua TROLL 400 Serial Number: 877732
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Test Notes:

Weather Conditions:
Foggy

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
1/25/2023 1:27 PM	00:00	6.17 pH	8.16 °C	959.69 µS/cm	7.86 mg/L		1,064.4 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:28 PM	00:30	6.29 pH	9.33 °C	934.40 µS/cm	1.84 mg/L		1,168.9 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:28 PM	01:00	6.41 pH	9.80 °C	932.32 µS/cm	0.52 mg/L		1,170.2 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:29 PM	01:30	6.46 pH	10.14 °C	932.15 µS/cm	0.27 mg/L		1,168.6 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:29 PM	02:00	6.47 pH	10.38 °C	926.11 µS/cm	0.22 mg/L		1,167.0 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:30 PM	02:30	6.48 pH	10.59 °C	922.65 µS/cm	0.17 mg/L		1,166.8 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:30 PM	03:00	6.50 pH	10.69 °C	921.95 µS/cm	0.14 mg/L		1,167.7 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:31 PM	03:30	6.50 pH	10.76 °C	920.08 µS/cm	0.13 mg/L		1,167.6 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:31 PM	04:00	6.53 pH	10.83 °C	919.62 µS/cm	0.12 mg/L		1,167.5 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:32 PM	04:30	6.54 pH	10.87 °C	918.08 µS/cm	0.10 mg/L		1,166.5 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:32 PM	05:00	6.55 pH	10.92 °C	919.87 µS/cm	0.10 mg/L		1,166.3 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:33 PM	05:30	6.59 pH	10.95 °C	918.96 µS/cm	0.09 mg/L		1,166.5 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:33 PM	06:00	6.59 pH	10.98 °C	918.85 µS/cm	0.08 mg/L		1,166.1 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:34 PM	06:30	6.62 pH	11.01 °C	918.87 µS/cm	0.07 mg/L		1,165.8 mV	325.00 cm	2,000.0 ml/min

1/25/2023 1:34 PM	07:00	6.64 pH	11.01 °C	918.26 µS/cm	0.07 mg/L		1,166.3 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:35 PM	07:30	6.66 pH	11.06 °C	927.09 µS/cm	0.05 mg/L		1,164.8 mV	325.00 cm	2,000.0 ml/min
1/25/2023 1:35 PM	08:00	6.70 pH	11.13 °C	927.89 µS/cm	0.04 mg/L		1,165.4 mV	325.00 cm	2,000.0 ml/min

Samples

Sample ID:	Description:
EW1	Groundwater



INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
S1-BH105	1	50	15.00	16/1/23 12:08	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Plug	11.00	15.00	clear	
Installation Inspection					
Surface Conditions	made ground	Damage to Headworks?	none		
Check Dip of Base (m bgl)	15.44	Pipe Cover/Bung Present?	yes		
Remedial actions undertaken to well:					
N/A					
Purging and Sampling					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	4.00
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	146
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)/((\pi df^2/4)-(\pi dp^2/4))$	19.5
Groundwater Prior to Purging and Sampling				Volume of the Standpipe	
Groundwater Level (m bgl)	6.28	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50
Purging Details				Sampling Information	
Purge Method/ Device	wasp pump	Average Flow Rate (litres/min)	1.2	Saturated depth (m) (sd) (installation base - groundwater level)	8.72
Time to Purge (mins)	25	Number of Well Volumes Purged	0.8	Volume of the Standpipe (litres) $(\pi dp^2/4)*10^{-3}$	17.1
Total Volume Purged (litres)	30.0	Operative	Sse	Total Well Volume	
				Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	36.6
Observations During Purging (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations	
In-situ Parameter Device Model	Aqua Troll 400	Groundwater Odour	None	Sample Depth (m bgl)	6.28
				Sample Type	EW
				Sample Reference Number	GW1
In-situ Parameter Device SN	877732	Visual Turbidity	Med-High	Date and Time Obtained	16/01/2022 12:22
Confirm Field Calibration Completed	Yes	Groundwater Colour	Dark grey running opaque	N/A	

Low-Flow Test Report:

Test Date / Time: 12/7/2020 9:03:49 AM
Project: Gcre
Operator Name:

Location Name: Device Location	Flow Cell Volume: 90 ml	Instrument Used: Aqua TROLL 400 Serial Number: 877732
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Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5
16/1/2023 9:03 AM	00:00	8.06 pH	8.57 °C	831.97 µS/cm	1.03 mg/L		385.1 mV	
16/1/2023 9:04 AM	00:38	7.93 pH	9.27 °C	813.88 µS/cm	2.44 mg/L		537.5 mV	
16/1/2023 9:05 AM	01:16	7.83 pH	9.45 °C	804.16 µS/cm	0.67 mg/L		636.4 mV	
16/1/2023 9:05 AM	01:47	7.74 pH	9.53 °C	796.81 µS/cm	0.40 mg/L		721.2 mV	
16/1/2023 9:06 AM	02:17	7.68 pH	9.53 °C	789.98 µS/cm	0.31 mg/L		767.2 mV	
16/1/2023 9:06 AM	02:47	7.72 pH	9.43 °C	784.98 µS/cm	0.29 mg/L		743.1 mV	
16/1/2023 9:07 AM	03:17	7.58 pH	9.27 °C	784.89 µS/cm	0.28 mg/L		715.2 mV	
16/1/2023 9:07 AM	03:47	7.52 pH	9.14 °C	779.83 µS/cm	0.26 mg/L		711.9 mV	
16/1/2023 9:08 AM	04:17	7.50 pH	8.95 °C	782.59 µS/cm	0.86 mg/L		705.5 mV	
16/1/2023 9:08 AM	04:47	7.98 pH	8.95 °C	3.54 µS/cm	8.46 mg/L		706.8 mV	
16/1/2023 9:09 AM	05:17	8.02 pH	8.95 °C	3.61 µS/cm	10.77 mg/L		709.6 mV	
16/1/2023 9:09 AM	05:47	7.56 pH	8.63 °C	775.32 µS/cm	5.06 mg/L		726.0 mV	
16/1/2023 9:10 AM	06:17	7.47 pH	8.71 °C	780.98 µS/cm	1.33 mg/L		719.9 mV	
16/1/2023 9:10 AM	06:47	7.42 pH	9.09 °C	787.99 µS/cm	0.54 mg/L		716.5 mV	
16/1/2023 9:11 AM	07:17	7.39 pH	9.56 °C	800.16 µS/cm	0.21 mg/L		716.2 mV	
16/1/2023 9:11 AM	07:47	7.35 pH	9.78 °C	796.09 µS/cm	0.12 mg/L		715.4 mV	
16/1/2023 9:12 AM	08:17	7.33 pH	9.89 °C	788.67 µS/cm	0.08 mg/L		715.0 mV	
16/1/2023 9:12 AM	08:47	7.31 pH	9.89 °C	784.36 µS/cm	0.06 mg/L		716.1 mV	
16/1/2023 9:13 AM	09:17	7.30 pH	9.89 °C	781.40 µS/cm	0.06 mg/L		718.8 mV	

12/7/2020 9:13 AM	09:47	7.28 pH	9.81 °C	780.66 µS/cm	0.05 mg/L		719.8 mV	
12/7/2020 9:14 AM	10:17	7.27 pH	9.61 °C	783.96 µS/cm	0.06 mg/L		722.0 mV	
12/7/2020 9:14 AM	10:47	7.24 pH	9.52 °C	782.53 µS/cm	0.03 mg/L		723.5 mV	
12/7/2020 9:15 AM	11:17	7.25 pH	9.43 °C	782.22 µS/cm	0.02 mg/L		713.5 mV	
12/7/2020 9:15 AM	11:47	7.23 pH	9.42 °C	783.08 µS/cm	0.02 mg/L		712.8 mV	
12/7/2020 9:16 AM	12:17	7.23 pH	9.42 °C	782.88 µS/cm	0.01 mg/L		712.3 mV	
12/7/2020 9:16 AM	12:47	7.22 pH	9.42 °C	780.57 µS/cm	0.01 mg/L		712.4 mV	
12/7/2020 9:17 AM	13:17	7.21 pH	9.40 °C	779.33 µS/cm	0.01 mg/L		714.0 mV	
12/7/2020 9:17 AM	13:47	7.20 pH	9.36 °C	778.37 µS/cm	0.01 mg/L		713.8 mV	
12/7/2020 9:18 AM	14:17	7.19 pH	9.33 °C	777.89 µS/cm	0.01 mg/L		715.4 mV	
12/7/2020 9:18 AM	14:47	7.16 pH	9.28 °C	777.51 µS/cm	0.01 mg/L		715.9 mV	
12/7/2020 9:19 AM	15:17	7.17 pH	9.24 °C	778.31 µS/cm	0.01 mg/L		716.5 mV	
12/7/2020 9:19 AM	15:56	7.19 pH	9.23 °C	778.40 µS/cm	0.00 mg/L		593.9 mV	
12/7/2020 9:20 AM	16:20	7.36 pH	9.25 °C	779.73 µS/cm	0.00 mg/L		675.8 mV	

Samples

Sample ID:	Description:
Gw1	



INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
S1-BH108	1	50	15.50	16/01/13:05	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Cover	13.00	15.50	Clear	
Installation Inspection					
Surface Conditions	Made Ground	Damage to Headworks?	Previous damage		
Check Dip of Base (m bgl)	15.55	Pipe Cover/Bung Present?	Yes		
Remedial actions undertaken to well:					
None at this time. There is evidence of the headworks previously being damaged as it is surrounded by concrete that formally surrounded the cover's base.					
Purging and Sampling					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	2.50
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	145
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)((\pi df^2/4)-(\pi dp^2/4))$	12.0
Groundwater Prior to Purging and Sampling				Volume of the Standpipe	
Groundwater Level (m bgl)	1.18	LNAPL/ DNAPL (m bgl)	None	Diameter of Standpipe (mm) (dp)	50
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)	
Purge Method/ Device	N/A	Average Flow Rate (litres/min)	#VALUE!	14.32	
Time to Purge (mins)	N/A	Number of Well Volumes Purged	#VALUE!	Volume of the Standpipe (litres) $(\pi dp^2/4)*10^{-3}$	28.1
Total Volume Purged (litres)	N/A	Operative	Sse	Total Well Volume	
				Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	40.1
Observations During Purging (see Vu-situ output for insitu parameter readings)				Sampling Information	
In-situ Parameter Device Model	N/A	Groundwater Odour	N/A	Sample Depth (m bgl)	N/A
				Sample Type	N/A
				Sample Reference Number	N/A
In-situ Parameter Device SN	N/A	Visual Turbidity	N/A	Date and Time Obtained	N/A
				Additional Notes and Observations	
Confirm Field Calibration Completed	N/A	Groundwater Colour	N/A	Unable to sample as pipe damaged around 0.5m below top of standpipe. Pipe is bent so allows dip tape to pass but no sampling device.	



INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
S1-BH112	1	50	2.50	25/01/2023 13@58	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Plug	1.00	2.50	Foggy	
Installation Inspection					
Surface Conditions	Wet	Damage to Headworks?	No		
Check Dip of Base (m bgl)	Unknown	Pipe Cover/Bung Present?	Unknown		
Remedial actions undertaken to well:					
N/A					
Purging and Sampling					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	146
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)((\pi df^2/4)-(\pi dp^2/4))$	
Groundwater Prior to Purging and Sampling				Volume of the Standpipe	
Groundwater Level (m bgl)	N/A	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)	
Purge Method/ Device	N/A	Average Flow Rate (litres/min)	N/A	Volume of the Standpipe (litres) $(\pi dp^2/4)*10^{-3}$	
Time to Purge (mins)	N/A	Number of Well Volumes Purged	N/A	Total Well Volume	
Total Volume Purged (litres)	N/A	Operative	JP	Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	0.0
Observations During Purging (see Vu-situ output for insitu parameter readings)				Sampling Information	
In-situ Parameter Device Model	N/A	Groundwater Odour	N/A	Sample Depth (m bgl)	N/A
				Sample Type	N/A
				Sample Reference Number	N/A
In-situ Parameter Device SN	N/A	Visual Turbidity	N/A	Date and Time Obtained	N/A
				Additional Notes and Observations	
Confirm Field Calibration Completed	N/A	Groundwater Colour	N/A	Unable to carry out monitoring and sampling due to proximity of unguarded deep excavation.	



INSTALLATION INSPECTION, PURGING AND SAMPLING RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
S1-BH112	2	50	15.00	25/01/2023 13:58	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Plug	8.00	15.00	Foggy	
Installation Inspection					
Surface Conditions	Wet	Damage to Headworks?	No		
Check Dip of Base (m bgl)	Unknown	Pipe Cover/Bung Present?	Unknown		
Remedial actions undertaken to well:					
N/A					
Purging and Sampling					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	146
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)((\pi df^2/4)-(\pi dp^2/4))$	
Groundwater Prior to Purging and Sampling				Volume of the Standpipe	
Groundwater Level (m bgl)	N/A	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)	
Purge Method/ Device	N/A	Average Flow Rate (litres/min)	N/A	Volume of the Standpipe (litres) $(\pi dp^2/4) \times 10^{-3}$	
Time to Purge (mins)	N/A	Number of Well Volumes Purged	N/A	Total Well Volume	
Total Volume Purged (litres)	N/A	Operative	JP	Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	0.0
Observations During Purging (see Vu-situ output for insitu parameter readings)				Sampling Information	
In-situ Parameter Device Model	N/A	Groundwater Odour	N/A	Sample Depth (m bgl)	N/A
				Sample Type	N/A
				Sample Reference Number	N/A
In-situ Parameter Device SN	N/A	Visual Turbidity	N/A	Date and Time Obtained	N/A
				Additional Notes and Observations	
Confirm Field Calibration Completed	N/A	Groundwater Colour	N/A	Unable to carry out monitoring and sampling due to proximity of unguarded deep excavation.	