

Mark Tanner,
The Longley Group,
Unit 4 Brook Court,
Blakeney Road,
Beckenham,
Kent,
BR3 1HG

10th November 2022

Our Ref: 4551 22 07 11 Ltr Rpt 01 Rev B AS SP

Dear Mark,

SITE: Armoury Drive, Gravesend, DA12 1NB
SERVICE: Updated Ground Gas Risk Assessment Addendum Letter Report

Introduction

The work covered in this report was undertaken on behalf of The Longley Group, in accordance with Sevenoaks Environmental Consultancy Ltd's (SEC) proposal dated January 2022 (Ref: 4551 22 01 05 Ltr 01 FPA 01 REV A LB CW). This addendum provides comment on the environmental ground gas monitoring carried out as part of the previous site investigation and should be read in conjunction with the Preliminary Geo-Environmental Site Investigation Report (Ref: 4551 22 04 21 Rpt 06 Rev B EH CW) previously provided. The previous version of this document has been updated further to additional information coming to light and the conduct of some further gas monitoring.

The site was noted to form an approximately 'L' shaped plot previously occupied by a former St John's Ambulance Garage and a Water Tower Structure with associated tarmac hardstanding (See attached Figures 1 & 2 – Site Location Plan and Existing Site layout Plan). The approved proposed development associated with the planning application (Ref: 2020/0561) is understood to involve the construction of 1 No. 2-storey block of flats to the western end of the site and 2No. detached bungalows to the eastern end with gardens and areas of soft landscaping (see appended Proposed Development Plan).

As part of the Geo-Environmental Site Investigation referred to above, SEC were instructed to carry out 9no. environmental ground gasses and groundwater monitoring visits. Details of the standpipes installed and their response zone backfill / materials have been provided in the relevant attached Exploratory Hole Records. Also see attached the Exploratory Hole Location Plan.

Assessment

9 No. rounds of environmental ground gas monitoring was carried out between 9th March 2022 and 7th July 2022 and included 2no. rounds of monitoring undertaken at periods of low atmospheric pressure to help inform a preliminary ground gas risk assessment given consideration of the potential on site sources of ground gas that have been identified which include the following:

- Made Ground associated with the sites former use as a garage and its potential use for storage and leaks of oils/paints/fuels and identified to contain elevated concentrations of PAHs;
- Former site use as a garage with an above ground tank and as part of a barracks;

Off-site sources of potential contamination identified primarily included an infilled chalk pit ~167m north east (1954 – 1981), tanks 76m north east (1954 – 1993) and 49m south east (1954 – 1978)

Based on the rounds of monitoring conducted, concentrations of carbon dioxide were recorded to be typically below 5% although the highest concentration recorded was 7.3% by Vol (WS05). Methane concentrations were generally low although elevated spikes of up to ~45% (WS05 monitoring round No. 5) were recorded. This spike in methane was identified for the first few seconds of monitoring at WS05 and then the methane concentration reduced back down to 0% by Vol. During the other visits concentrations of Methane were not recorded to be elevated, except for visit No. 6 where another methane spike was recorded for a few seconds before returning to 0% by Vol. No elevated concentrations of VOCs were recorded and flow rates were recorded up to a maximum of 0.4l/hr (WS01 and WS05) (see attached Environmental Monitoring data).

It is also known that a gas main leak occurred nearby to the north of the site, which was reportedly repaired in the early part of 2022. However, during the environmental ground gas monitoring visits and also prior to the conduct of the previous Site Investigation (which was after the reported repair was made) a strong mercaptan odour has been observed within the manhole located adjacent to the north of the site in Albert Murray Close which is also incidentally close by to WS05. The Client liaised with SGN who confirmed that there was an ongoing gas leak. This was then repaired and is documented within an SGN Leak Repair Report (see attached).

Further to the findings of the previous investigation and the ongoing gas leak that was repaired, it was agreed with the EHO that 2 No. additional confirmatory environmental ground gas monitoring visits would be conducted following the re-repair of the gas leak. These visits were to confirm an absence of persistent ground gases or methane spikes greater than previously recorded, considered likely to be caused by the nearby gas leak.

Confirmation was provided to the Client by SGN that the gas main leak identified had been repaired on 17th August 2022 (see appended Southern Gas Networks Remedial Report). SEC then conducted 3 No. confirmatory environmental ground gas monitoring visits were conducted between 6th October 2022 and 3rd November 2022, which included 1 No. round of monitoring undertaken at a period of low atmospheric pressure. During the monitoring visits the manhole adjacent to site which was identified to exhibit a mercaptan odour previously was also inspected. No olfactory observations of mercaptan were identified within the manhole during any of the confirmatory monitoring visits.

Based on the 3 No. rounds of additional confirmatory ground gas monitoring conducted, concentrations of methane were not identified to be elevated, carbon dioxide was recorded up to



5.8% by Vol (WS05) and oxygen was identified to be depleted to 14.1% (WS05). No methane spikes were recorded, VOCs were recorded to be slightly elevated up to 1.1ppm (WS05) and flow rates were recorded up to a maximum of -0.3l/hr (WS01).

Discussion and Recommendations

The results of the environmental ground gas monitoring indicate that a ground gas screening value of 0.0292 l/hr remains applicable to the site. This corresponds with Characteristic Situation 1 of the current CIRIA C665 guidance. However, given that carbon dioxide concentrations have been recorded in excess of 5%, it is recommended that a precautionary approach be adopted with respect to potential ground gas risks on site. Accordingly it is recommended that Characteristic Situation 2 of CIRIA C665 Guidance should be adopted for the site.

Based upon the assumption that the proposed building will comprise a Type A Building as described in the BS 8485:2015 guidance i.e. private housing with small sized rooms, it is recommended that at least 2 No. different design measures be employed within the design of the proposed building in order to reach a minimum gas protection score of 3.5 points. Inclusion of a passively vented sub-floor void and low permeability hydrocarbon resistant gas protection membrane within the design would achieve the required points (however please refer to Tables 5, 6 and 7 of the BS 8485:2015 guidance for further details). Please note that all joints and penetrations should be appropriately sealed and that protective measures should be fitted appropriately in accordance with the manufacturer's specification and current guidance including BRE414 and BS8485.

The updated RMS for the site includes a Ground Gas / Vapour Mitigation Design and third-party independent inspection, testing and verification plan, which should be approved by the LPA prior to construction and then incorporated during the redevelopment of the site. A suitably qualified independent specialist should also produce a Validation Report in accordance with C735 for the membrane installation to certify the installation of the protective measures complies with the requirements of the Verification Plan.

It is recommended that the existing monitoring boreholes should be retained until the ground gas risk assessment has been approved by the Regulators.

It is also noted that the recommendations made in the previous Geo-Environmental Site Investigation report remain applicable.

Please refer to the attached General Limitations and Exceptions

Kind Regards

Damian Jones
Managing Director
d.jones@sevenoaksenvironmental.co.uk

Enc.

Site Location Plan
Existing Site Layout Plan
Proposed Site Layout
Exploratory Hole Location Plan

Sevenoaks Environmental Consultancy Ltd. – Registered in England 5330038 - VAT Registration No. 851 0732 49



Exploratory Hole Records
Environmental Monitoring
Southern Gas Networks Remedial Report
General Limitations and Exceptions

Gravesham Borough Council



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SITE: Armoury Drive, Gravesend

SCALE: NTS

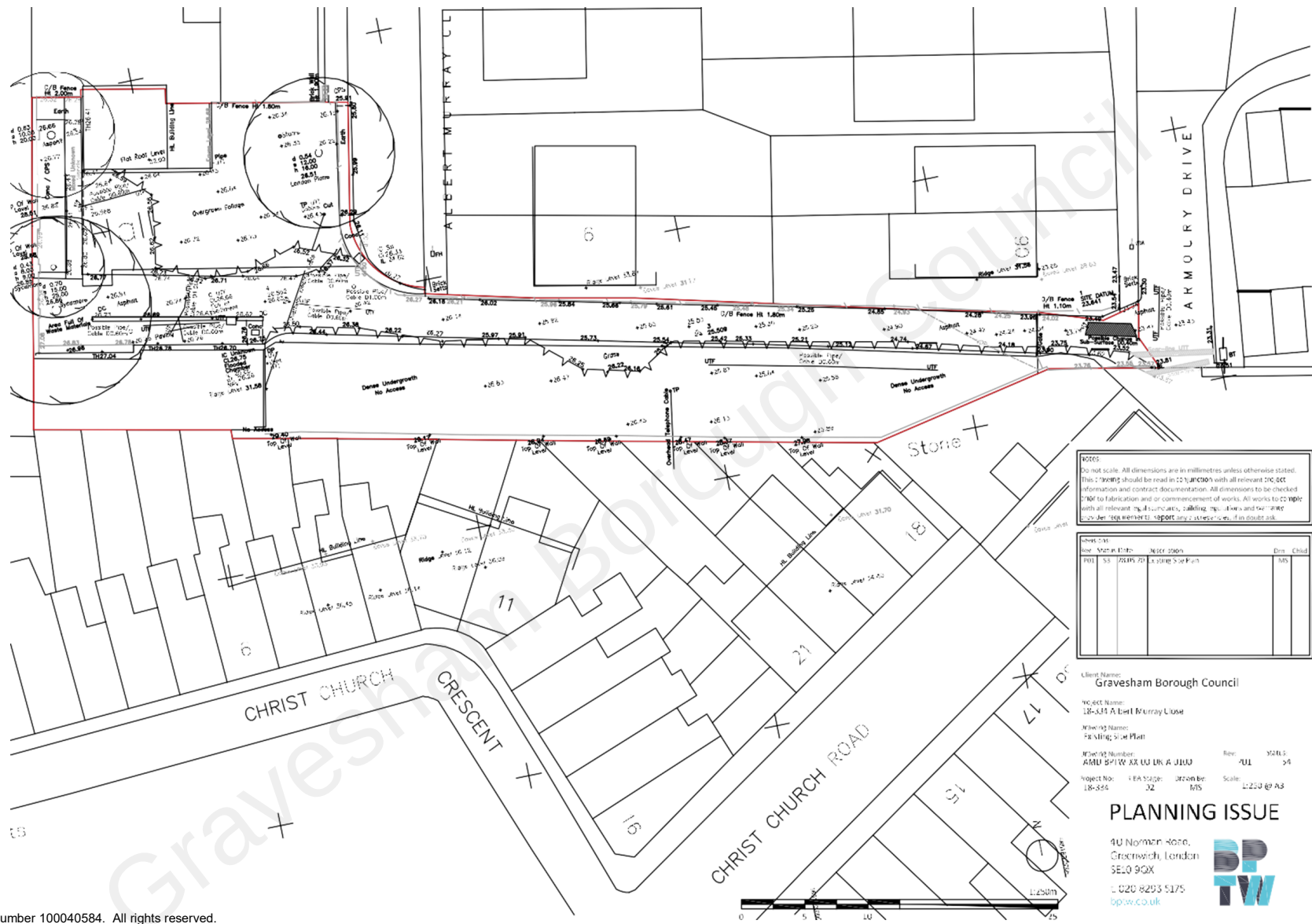
JOB NO: 4551

FIGURE TITLE: Site Location Plan

REV: 01

FIGURE NO: 01

 **SEVENOAKS
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SITE: Armoury Drive, Gravesend	SCALE: NTS	JOB NO: 4551	
FIGURE TITLE: Existing Layout Plan	REV: 01	FIGURE NO: 02	



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SITE: Armory Drive, Gravesend

SCALE: NTS

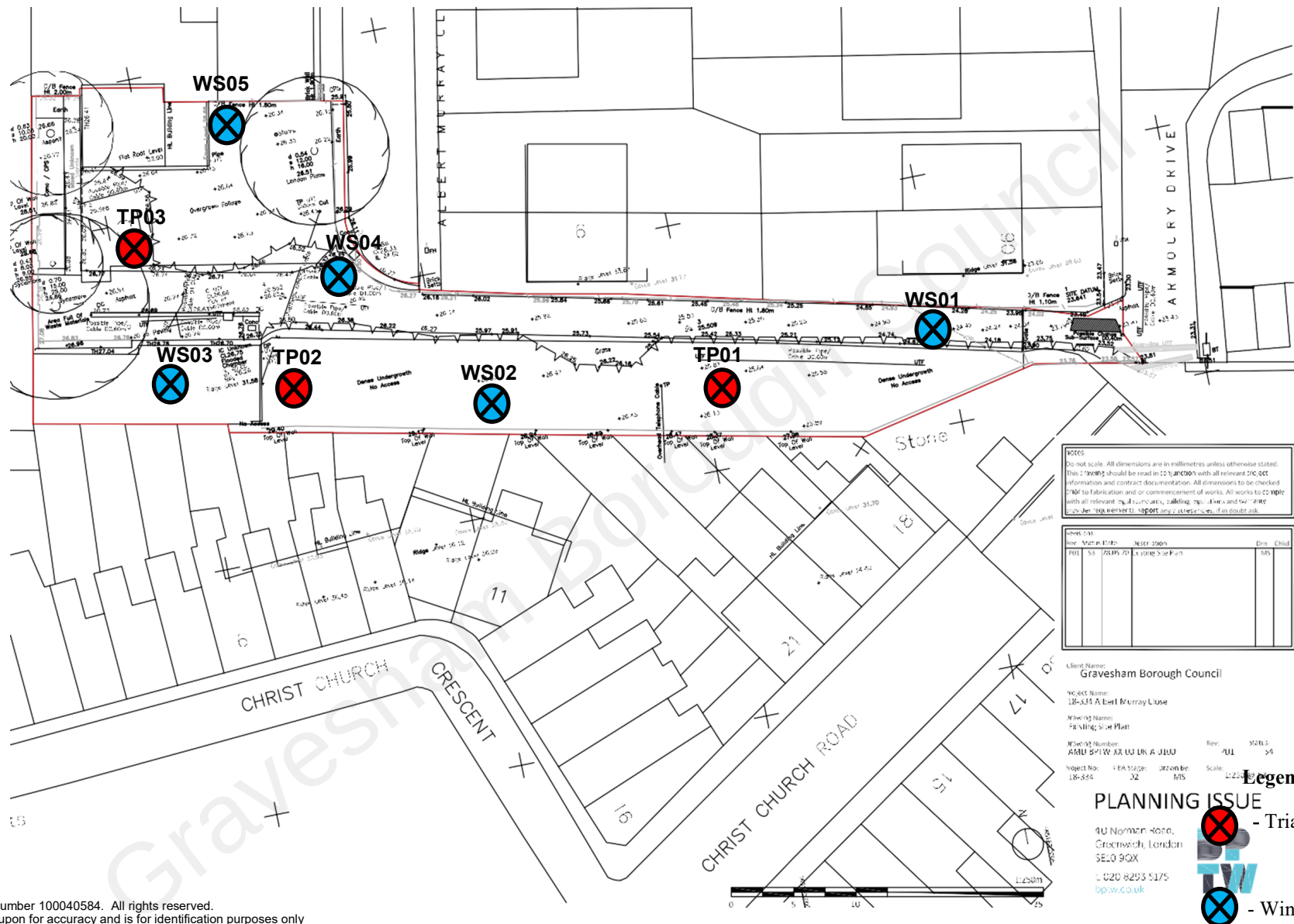
JOB NO: 4551

FIGURE TITLE: Site Location Plan

REV: 01

FIGURE NO: 03

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SITE: Armoury Drive, Gravesend	SCALE: NTS	JOB NO: 4551	 SEVENOAKS ENVIRONMENTAL CONSULTANCY
FIGURE TITLE: Exploratory Hole Location Plan	REV: 01	FIGURE NO: 04	

WINDOW SAMPLE LOG

Project Combined Site Investigation - Former St Johns Ambulance HQ, Armoury Drive, DA12 1NB				Window Sample No WS01
Job No 4551	Date 25-02-22	Ground Level (m)	Co-Ordinates ()	
Contractor Sevenoaks Environmental Consultancy Ltd				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.05	D	PID: 0.0ppm				0.15	MADE GROUND: Bituminous surfacing with hydrocarbon smell noted throughout.		
0.50	D	PID: 0.4ppm				(0.50) 0.65	MADE GROUND: Soft dark orange mottled black slightly sandy Clay with rare gravels. Gravels are fine to medium sub-rounded to sub-angular bituminous surfacing and tile fragments.		
1.00	D	PID: 0.4ppm				(1.45)	Medium dense orange mottled yellow slightly clayey Sand. Sand is fine.		
1.00-1.45	SPTN	= 11 blows							
1.50	D	PID: 4.1ppm				2.10			
2.00	D	PID: 4.1ppm							
2.00-2.45	SPTN	= 10 blows				(1.35)	Loose to medium dense grey mottled orange slightly gravelly slightly silty fine SAND. Gravel is fine subrounded flint fragments.		
2.50	D	PID: 18.1ppm							
3.00	D	PID: 18.9ppm				3.45			
3.00-3.45	SPTN	= 14 blows							
3.50	D	PID: 5.9ppm				(1.00)	Medium dense grey mottled orange slightly clayey SAND, with rare medium sub-rounded flint gravel.		
4.00	D	PID: 11.5ppm				4.45			
4.00-4.45	SPTN	= 16 blows							

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Dia. mm	Water Dpt	From	To	Hours	From	To	
											No groundwater encountered.
All dimensions in metres Scale 1:50			Client The Longley Group			Method/ Plant Used CDS Rig			Logged By EH		

WINDOW SAMPLE LOG

Project Combined Site Investigation - Former St Johns Ambulance HQ, Armoury Drive, DA12 1NB				Window Sample No WS02
Job No 4551	Date 25-02-22	Ground Level (m)	Co-Ordinates ()	
Contractor Sevenoaks Environmental Consultancy Ltd				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.05	D	PID: 4.6ppm				(0.70)	MADE GROUND: Loose to medium dense dark brown very clayey gravelly Sand with rootlets. Gravels are fine to medium sub-angular to sub-rounded flint glass and tile fragments.		
0.50	D	PID: 7.5ppm				0.70			
1.00	D	PID: 5.1ppm					Medium dense grey mottled orange slightly silty fine SAND.		
1.00-1.45	SPTN	= 12 blows							
1.50	D	PID: 6.6ppm							
2.00	D	PID: 0.6ppm							
2.00-2.45	SPTN	= 21 blows							
2.50	D	PID: 5.7ppm				(3.75)			
3.00	D	PID: 9.5ppm							
3.00-3.45	SPTN	= 24 blows							
3.50	D	PID: 40.8ppm							
4.00	D	PID: 5.3ppm				4.45			
4.00-4.45	SPTN	= 20 blows							

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Dia. mm	Water Dpt	From	To	Hours	From	To	
											No groundwater encountered.
All dimensions in metres Scale 1:50			Client The Longley Group			Method/ Plant Used CDS Rig			Logged By EH		

WINDOW SAMPLE LOG 4551 ARMOURY DRIVE GPJ AGS3 ALL GDT 5/4/22

WINDOW SAMPLE LOG

Project Combined Site Investigation - Former St Johns Ambulance HQ, Armoury Drive, DA12 1NB				Window Sample No WS03
Job No 4551	Date 25-02-22	Ground Level (m)	Co-Ordinates ()	
Contractor Sevenoaks Environmental Consultancy Ltd				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.05	D	PID: 0.5ppm				0.30	MADE GROUND: Soft to firm dark brown mottled white slightly sandy very gravelly Clay with cobbles. Sand is fine. Gravel is fine to coarse angular to subrounded flint, brick, concrete and tile fragments. Cobbles are up to 10cm in diameter.		
0.50	D	PID: 0.4ppm				(0.80)	MADE GROUND: Soft to firm dark brown slightly sandy gravelly Clay. Sand is fine. Gravels are fine to coarse rounded to sub-angular flint, cement and brick fragments.		
1.00	D	PID: 0.7ppm				1.10			
1.00-1.45	SPTN	= 12 blows				1.25	MADE GROUND: Loose to medium dense brown mottled orange slightly clayey gravelly Sand, with rare rootlets. Sand is fine. Gravels are fine to coarse rounded to sub-angular flint, concrete and brick fragments.		
2.00	D	PID: 11.4ppm					Medium dense grey mottled orange slightly silty fine Sand.		
2.00-2.45	SPTN	= 16 blows				(3.20)			
3.00	D	PID: 24.6ppm							
3.00-3.45	SPTN	= 21 blows							
4.00	D	PID: 1.1ppm				4.45			
4.00-4.45	SPTN	= 21 blows							

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Dia. mm	Water Dpt	From	To	Hours	From	To	
											No groundwater encountered.
All dimensions in metres Scale 1:50			Client The Longley Group			Method/ Plant Used CDS Rig			Logged By EH		

WINDOW SAMPLE LOG 4551 ARMOURY DRIVE GPJ AGS3 ALL GDT 5/4/22

WINDOW SAMPLE LOG

Project Combined Site Investigation - Former St Johns Ambulance HQ, Armoury Drive, DA12 1NB				Window Sample No WS04
Job No 4551	Date 25-02-22	Ground Level (m)	Co-Ordinates ()	
Contractor Sevenoaks Environmental Consultancy Ltd				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.05	D	PID: 0.0ppm				0.25	MADE GROUND: Soft dark brown slightly sandy gravelly Clay. Sand is fine. Gravels are fine to medium sub-angular to rounded flint, brick and concrete fragments.		
0.50	D	PID: 0.0ppm				(0.90)	Medium dense grey mottled orange slightly silty gravelly SAND. Sand fine to medium. Gravels are fine to medium sub-angular to rounded flint fragments.		
1.00	D	PID: 0.3ppm				1.15			
1.00-1.45	SPT	16 blows					Medium dense grey mottled orange slightly silty fine SAND.		
1.50	D	PID: 0.3ppm							
2.00	D	PID: 0.9ppm							
2.00-2.45	SPT	11 blows							
2.50	D	PID: 1.5ppm							
3.00	D	PID: 1.3ppm							
3.00-3.45	SPT	25 blows							
3.50	D	PID: 0.2ppm							
4.00	D	PID: 0.9ppm							
4.00-4.45	SPT	15 blows				4.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Dia. mm	Water Dpt	From	To	Hours	From	To	
											No groundwater encountered.
All dimensions in metres Scale 1:50			Client The Longley Group			Method/ Plant Used CDS Rig			Logged By EH		

WINDOW SAMPLE LOG 4551 ARMOURY DRIVE GPJ AGS3 ALL GDT 5/4/22

WINDOW SAMPLE LOG

Project Combined Site Investigation - Former St Johns Ambulance HQ, Armoury Drive, DA12 1NB				Window Sample No WS05
Job No 4551	Date 25-02-22	Ground Level (m)	Co-Ordinates ()	
Contractor Sevenoaks Environmental Consultancy Ltd				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.05	D	PID: 0.0ppm					MADE GROUND: Soft to firm dark brown mottled yellow slightly sandy gravelly Clay, with occasional rootlets to 0.15m bgl. Sand is fine. Gravels are fine to coarse sub-angular to sub-rounded brick, flint and tile fragments.		
0.50	D	PID: 0.0ppm				(1.35)			
1.00	D	PID: 0.1ppm				1.35			
1.00-1.45	SPT N = 8 blows						Loose to medium dense grey mottled orange slightly silty slightly gravelly SAND. Sand is fine to medium. Gravel is fine to medium rounded flints. ...@between 3.20m and 3.30m bgl gravelly lense noted. Gravel is coarse, subrounded of flint.		
1.20	D	PID: 3.3ppm							
1.50	D	PID: 25.7ppm							
2.00	D	PID: 11.9ppm							
2.00-2.45	SPT N = 8 blows								
2.50	D	PID: 8.8ppm							
3.00	D	PID: 2.1ppm				(3.10)			
3.00-3.45	SPT N = 19 blows								
3.50	D	PID: 4.7ppm							
4.00	D	PID: 1.3ppm							
4.00-4.45	SPT N = 15 blows					4.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											No groundwater encountered.
All dimensions in metres Scale 1:50			Client The Longley Group			Method/ Plant Used CDS Rig			Logged By EH		

WINDOW SAMPLE LOG 4551 ARMOURY DRIVE GPJ AGS3 ALL GDT 5/4/22



Date: 18/03/2022
Site: Armoury Drive
Job Ref: 4551
Monitoring Round: 1

Borehole Ref:	Methane %	Carbon Dioxide %	Oxygen %	Carbon Monoxide (ppm)	H2S %	VOCs (ppm)	Flow l/hr	Dip [m]	Plumb [m]	Comments
WS01	0.0	2.1	19.4	0.0	0.0	0.0	0.3	Dry	4.02	
WS02	0.0	2.6	17.1	0.0	0.0	0.0	0.1	Dry	3.85	
WS03	0.0	1.5	19.9	0.0	0.0	0.0	0.4	Dry	3.98	
WS04	0.0	1.7	18.6	0.0	0.0	0.0	0.1	Dry	4.06	
WS05	0.0	2.9	17.5	0.0	0.0	0.0	0.1	Dry	3.98	

Atmospheric pressure start:	1030mb
Atmospheric pressure finish:	1030mb
Weather:	Sunny



Date: 31/03/2022
Site: Armoury Drive
Job Ref: 4551
Monitoring Round: 2

Borehole Ref:	Methane %	Carbon Dioxide %	Oxygen %	Carbon Monoxide (ppm)	H2S %	VOCs (ppm)	Flow l/hr	Dip [m]	Plumb [m]	Comments
WS01	0.0	0.1	20.7	0.0	0.0	0.0	0.1	Dry	3.93	
WS02	0.0	0.1	20.6	0.0	0.0	0.0	0.1	Dry	3.75	
WS03	0.0	1.8	19.5	0.0	0.0	0.0	0.1	Dry	3.90	
WS04	0.0	2.2	17.7	0.0	0.0	0.0	0.1	Dry	3.97	
WS05	0.0	3.3	17.8	0.0	0.0	0.0	0.1	Dry	3.87	

Atmospheric pressure start:	987mb
Atmospheric pressure finish:	985mb
Weather:	Snowing



Date: 21/04/2022
Site: Armoury Drive
Job Ref: 4551
Monitoring Round: 3

Borehole Ref:	Methane %	Carbon Dioxide %	Oxygen %	Carbon Monoxide (ppm)	H2S %	VOCs (ppm)	Flow l/hr	Dip [m]	Plumb [m]	Comments
WS01	0.0	2.2	19.4	0.0	0.0	0.0	0.1	Dry	4.03	
WS02	0.0	3.3	17.0	0.0	0.0	0.0	0.1	Dry	3.85	
WS03	0.0	1.8	19.7	0.0	0.0	0.0	0.3	Dry	3.98	
WS04	0.0	2.4	17.8	0.0	0.0	0.0	0.1	Dry	4.05	
WS05	0.0	3.6	17.7	0.0	0.0	0.0	0.1	Dry	3.95	

Atmospheric pressure start:	1001mb
Atmospheric pressure finish:	1004mb
Weather:	Sunny



Date: 29/04/2022
Site: Armoury Drive
Job Ref: 4551
Monitoring Round: 4

Borehole Ref:	Methane %	Carbon Dioxide %	Oxygen %	Carbon Monoxide (ppm)	H2S %	VOCs (ppm)	Flow l/hr	Dip [m]	Plumb [m]	Comments
WS01	0.0	2.3	19.5	0.0	0.0	0.0	0.4	Dry	4.03	
WS02	0.0	3.4	17.5	0.0	0.0	0.0	0.0	Dry	3.87	
WS03	0.0	1.5	20.2	0.0	0.0	0.0	0.2	Dry	3.99	
WS04	0.0	2.6	18.3	0.0	0.0	0.0	0.0	Dry	4.05	
WS05	0.0	3.2	18.3	0.0	0.0	0.0	0.1	Dry	3.97	

Atmospheric pressure start:	1016mb
Atmospheric pressure finish:	1015mb
Weather:	Sunny



Date: 12/05/2022
Site: Armoury Drive
Job Ref: 4551
Monitoring Round: 5

Borehole Ref:	Methane %	Carbon Dioxide %	Oxygen %	Carbon Monoxide (ppm)	H2S %	VOCs (ppm)	Flow l/hr	Dip [m]	Plumb [m]	Comments
WS01	0.0	2.4	19.1	0.0	0.0	0.0	0.1	Dry	4.04	CH4 and LEL was at around 5% and dropped to 0 after ~3 seconds
WS02	0.0	3.4	18.4	0.0	0.0	0.0	0.0	Dry	3.77	
WS03	0.0	1.5	19.7	0.0	0.0	0.0	0.1	Dry	3.97	
WS04	0.0	2.8	18.1	0.0	0.0	0.0	0.0	Dry	4.06	
WS05	0.0	3.4	18.2	0.0	0.0	0.0	0.1	Dry	3.97	CH4 started at ~45% and dropped to 0 after ~3 seconds

Atmospheric pressure start:	1005mb
Atmospheric pressure finish:	1010mb
Weather:	Sunny



Date: 25/05/2022
Site: Armoury Drive
Job Ref: 4551
Monitoring Round: 6

Borehole Ref:	Methane %	Carbon Dioxide %	Oxygen %	Carbon Monoxide (ppm)	H2S %	VOCs (ppm)	Flow l/hr	Dip [m]	Plumb [m]	Comments
WS01	0.0	2.5	18.9	0.0	0.0	0.0	0.3	Dry	3.92	CH4 was at around 0.8% and dropped to 0 after ~4 seconds
WS02	0.0	2.4	18.4	0.0	0.0	0.0	0.1	Dry	3.66	
WS03	0.0	1.5	19.5	0.0	0.0	0.0	0.1	Dry	3.87	
WS04	0.0	2.9	17.3	0.0	0.0	0.0	0.1	Dry	3.95	
WS05	0.0	3.7	17.2	0.0	0.0	0.0	0.4	Dry	3.87	

Atmospheric pressure start:	998mb
Atmospheric pressure finish:	1001mb
Weather:	Sunny



Date: 10/06/2022
Site: Armoury Drive
Job Ref: 4551
Monitoring Round: 7

Borehole Ref:	Methane %	Carbon Dioxide %	Oxygen %	Carbon Monoxide (ppm)	H2S %	VOCs (ppm)	Flow l/hr	Dip [m]	Plumb [m]	Comments
WS01	0.0	2.5	18.4	0.0	0.0	0.0	1.9	Dry	4.05	
WS02	0.0	2.3	18.8	0.0	0.0	0.0	1.9	Dry	3.78	
WS03	0.0	1.5	19.4	0.0	0.0	0.0	1.5	Dry	3.98	
WS04	0.0	3.9	16.7	0.0	0.0	0.0	1.5	Dry	3.98	
WS05	0.0	3.2	17.3	0.0	0.0	0.0	1.6	Dry	4.06	

Atmospheric pressure start:	1004mb
Atmospheric pressure finish:	1010mb
Weather:	Overcast



Date: 23/06/2022
Site: Armoury Drive
Job Ref: 4551
Monitoring Round: 8

Borehole Ref:	Methane %	Carbon Dioxide %	Oxygen %	Carbon Monoxide (ppm)	H2S %	VOCs (ppm)	Flow l/hr	Dip [m]	Plumb [m]	Comments
WS01	0.0	2.4	18.9	0.0	0.0	0.0	0.3	Dry	4.03	
WS02	0.0	2.0	19.6	0.0	0.0	0.0	0.1	Dry	3.77	
WS03	0.0	1.6	20.1	0.0	0.0	0.0	0.1	Dry	3.97	
WS04	0.0	2.9	17.7	0.0	0.0	0.0	0.1	Dry	4.05	
WS05	0.0	4.6	13.3	0.0	0.0	0.0	0.4	Dry	3.95	

Atmospheric pressure start:	1018mb
Atmospheric pressure finish:	1017mb
Weather:	Sunny



Date: 07/07/2022
Site: Armoury Drive
Job Ref: 4551
Monitoring Round: 9

Borehole Ref:	Methane %	Carbon Dioxide %	Oxygen %	Carbon Monoxide (ppm)	H2S %	VOCs (ppm)	Flow l/hr	Dip [m]	Plumb [m]	Comments
WS01	0.0	0.8	20.3	0.0	0.0	0.3	0.0	Dry	4.03	
WS02	0.0	1.4	19.9	0.0	0.0	0.0	0.0	Dry	3.77	
WS03	0.0	1.4	19.7	0.0	0.0	0.0	0.0	Dry	3.98	
WS04	0.0	2.4	18.2	0.0	0.0	0.0	0.0	Dry	4.06	
WS05	0.0	7.3	11.8	0.0	0.0	0.0	0.4	Dry	3.96	

Atmospheric pressure start:	1025mb
Atmospheric pressure finish:	1023mb
Weather:	Sunny



Date: 06/10/2022
Site: Armoury Drive
Job Ref: 4551
Monitoring Round: 10

Borehole Ref:	Methane %	Carbon Dioxide %	Oxygen %	Carbon Monoxide (ppm)	H2S %	VOCs (ppm)	Flow l/hr	Dip [m]	Plumb [m]	Comments
WS01	0.0	2.8	17.9	0.0	0.0	0.3	0.0	Dry	3.93	
WS02	0.0	1.6	19.1	0.0	0.0	0.4	0.0	Dry	3.66	
WS03	0.0	2.2	18.1	0.0	0.0	0.0	0.0	Dry	3.88	
WS04	0.0	3.8	16.7	0.0	0.0	1.0	0.0	Dry	3.95	
WS05	0.0	5.3	16.1	0.0	0.0	1.1	0.0	Dry	3.97	
Manhole 01	-	-	-	-	-	-	-	-	-	Manhole lifted no olfactory observation of mercaptan was noted

Atmospheric pressure start:	1025mb
Atmospheric pressure finish:	1024mb
Weather:	Sunny



Date: 31/10/2022
Site: Armoury Drive
Job Ref: 4551
Monitoring Round: 11

Borehole Ref:	Methane %	Carbon Dioxide %	Oxygen %	Carbon Monoxide (ppm)	H2S %	VOCs (ppm)	Flow l/hr	Dip [m]	Plumb [m]	Comments
WS01	0.0	2.6	17.8	0.0	0.0	1.0	-0.3	Dry	4.03	
WS02	0.0	2.1	18.3	0.0	0.0	1.0	0.0	Dry	3.77	
WS03	0.0	3.0	17.0	0.0	0.0	1.0	0.0	Dry	3.97	
WS04	0.0	4.1	15.5	0.0	0.0	1.0	0.0	Dry	4.05	
WS05	0.0	5.8	14.1	0.0	0.0	1.0	0.0	Dry	3.99	
Manhole 01	-	-	-	-	-	-	-	-	-	Manhole lifted no olfactory observation of metercaptan was noted

Atmospheric pressure start:	1003mb
Atmospheric pressure finish:	1003mb
Weather:	Overcast

Date: 03/11/2022
Site: Armoury Drive
Job Ref: 4551
Monitoring Round: 12

Borehole Ref:	Methane %	Carbon Dioxide %	Oxygen %	Carbon Monoxide (ppm)	H2S %	VOCs (ppm)	Flow l/hr	Dip [m]	Plumb [m]	Comments
WS01	0.0	2.5	18.2	0.0	0.0	0.0	0.0	Dry	4.04	
WS02	0.0	2.1	18.3	0.0	0.0	0.0	0.0	Dry	3.77	
WS03	0.0	3.3	16.5	0.0	0.0	0.0	0.0	Dry	3.98	
WS04	0.0	3.8	15.5	0.0	0.0	0.1	0.0	Dry	4.04	
WS05	0.0	5.6	14.3	0.0	0.0	0.1	0.0	Dry	4.00	
Manhole 01	-	-	-	-	-	-	-	-	-	No olfactory observations of Mercaptan

Atmospheric pressure start:	996mb
Atmospheric pressure finish:	995mb
Weather:	Raining



2 Leasons Hill
Orpington
Kent
BR5 2TN
Telephone 01689 881305

Mr Mark Tanner
Dead End Side of Road
Albert Murray Close
Gravesend, Kent
DA12-1LT

16 November 2022

Ref: CRM 2343970

Dear Mr. Tanner

Thank you for your enquiry requesting an update of a recent gas leak repair.

I can confirm that we attended Albert Murray Close, Gravesend DA12-1LT on 17th August 2022 where a repair job was completed; this was monitored with no outstanding reading found.

Should you require any further explanation, please do not hesitate to contact us.

Many thanks

Dean Newell Repair Team Manager

T: 07887825365

E: dean.newell@sgn.co.uk

SGN, 2 Leasons Hill Orpington Kent BR5 2TN

sgn.co.uk

Follow us on Twitter: [@SGNgas](https://twitter.com/SGNgas)



Smell gas? Call 0800 111 999

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General Limitations and Exceptions

1. The advice given in this report with respect to contaminated land / pollution is based on the guidelines available at the time of writing.
2. The Client is advised that the conditions observed on site by SEC at the time of the investigation or assessment are subject to change. Certain indicators of the presence of hazardous substances may have been latent at the time of the most recent site reconnaissance or investigation and they may subsequently have become observable.
3. Comments made relating to land gas or groundwater conditions are based on observations made at the time of an investigation unless otherwise stated. However, land gas or groundwater conditions may vary as a result of seasonal or other effects.
4. Ground contamination often exists as small discrete areas of contamination and there can be no certainty that any or all such areas have been located, sampled and / or identified.
5. Whilst commonly regarded as one of the most reliable drilling techniques, cable percussive drilling may result in a certain amount of soil mixing.
6. This assessment may be subject to amendment in light of additional information becoming available.
7. The findings and opinions conveyed in this report are based on information obtained from a variety of sources, including that from 1) previous site investigations and 2) chemical testing laboratories, and which SEC has assumed are correct. Nevertheless, SEC cannot and does not guarantee the authenticity or reliability of the information it has relied upon. SEC can accept no responsibility for inaccuracies within the data supplied by other parties.
8. This report is written in the context of an agreed scope of work between SEC and the Client and should not be used in a different context. In light of additional information becoming available, improved practices and changes in legislation amendment or re-interpretation of the assessment or report in whole or part may be necessary after its original submission.
9. This report is provided for sole use by the Client and is confidential to them. No responsibility whatsoever for the contents of the report will be accepted to anyone other than the Client.
10. SEC believes that providing information about limitations is essential to help the Client identify and thereby manage risks.
11. The copyright of written materials supplied shall remain the property of SEC but with a royalty free perpetual licence, granted to the Client on payment in full of any outstanding monies.
12. SEC does not provide legal advice and the advice of the Clients legal advisors may also be required.
13. The use of data generated by this site investigation for the design of foundations or geo-technical assessment was outside the scope of this report.
14. An ecological, topographical or asbestos survey was outside of the scope of this report.

15. SEC notes that all recommendations made within our report are subject to regulatory approval and should be agreed with them prior to the conduct of any further site investigation, remediation or development works.
16. This report represents a stage in an iterative process of investigation and assessment and as such it is possible that further work may be recommended.
17. The report is issued on the condition that SEC will under no circumstances be liable for any loss arising directly or indirectly from ground conditions between the boreholes or trial pits which have not been shown by the borehole, trial pits or other tests carried out during the investigation.
18. In addition, SEC will not be liable for any loss whatsoever arising directly or indirectly from any opinion given on the possible configuration of strata both between the borehole and/or trial pit positions and/or below the maximum depth of the investigation. Such opinions, where given, are for guidance only.
19. No allowance has been made in this report for testing which may be required for waste categorisation prior to the removal of any material from site for disposal.
20. No person other than the client to whom this report is addressed, shall rely on it in any respect and no duty of care shall be owed to any such third party.
21. That this investigation has relied on information from a discrete number of exploratory hole locations and allowances should be made for the variation in ground conditions between these locations and within the site boundary.
22. The opinions expressed in this report are based on the ground conditions revealed by the site works, together with an assessment of the site and of laboratory test results. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated, for example between or beyond borehole positions, these are only for guidance only and no liability can be accepted for their accuracy.
23. It should be noted that the Made Ground depth recorded above is that encountered within the exploratory holes undertaken during the phase of work to which this report pertains. Owing to the variable nature and unknown deposition criteria of Made Ground it is possible that deeper or more extensive areas of Made Ground may exist at this site which has not been revealed by the current work. SEC can only comment on the findings within the exploratory holes conducted and cannot be held liable for variation of ground conditions between exploratory hole.
24. The above should take into account any LPA requirements with regard to the sites archaeological sensitivity (e.g. Watching Brief on excavation works)