

# Appendix A14.2 Baseline Ambient Air Quality Report 2017





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## Attachments

Figure 1 – 6 Maps showing Air Quality Monitoring Locations

Laboratory Analysis Reports

Field Observation Records for Odour Assessments







### 1.0 Scope

This report presents the results of a survey of ambient air quality at various locations in Dublin associated with the Greater Dublin Drainage Orbital Sewer and Wastewater Treatment Plant Project.

### 2.0 Methodology

The survey was conducted by TMS Environment Ltd personnel during the period 13 June – 11 July 2017. The surveys included the following:

- Diffusion tube surveys for determination of ambient levels of nitrogen dioxide (NO<sub>2</sub>) and sulphur dioxide (SO<sub>2</sub>), benzene, toluene, ethylbenzene and xylenes (BTEX);
- Subjective assessments of odour at all monitoring locations where diffusion tube monitoring was undertaken.

Diffusion tubes were used for the determination of ambient levels of nitrogen dioxide (NO<sub>2</sub>) and sulphur dioxide (SO<sub>2</sub>), benzene, toluene, ethylbenzene and xylenes (BTEX) at 12 locations in accordance with standard methodologies including UK DEFRA Technical Guidance LAQM TG(09).

The levels of ambient BTEX, nitrogen dioxide (NO<sub>2</sub>) and sulphur dioxide (SO<sub>2</sub>) were measured by positioning diffusion tubes at strategic locations for a period of approximately 28 days. The selection of sampling point locations was determined by the location of the proposed site taking in to account the surrounding area, with respect to the location of the samplers relative to buildings and other obstructions, height above ground and sample collection and analysis procedures. After the exposure period was complete, the diffusion tubes were removed from the site; the diffusion tubes were analysed using ultraviolet-visible spectrophotometry to determine the levels of NO<sub>2</sub> and SO<sub>2</sub> and gas chromatography (GC) with flame ionisation detection (FID) analysis for BTEX. The locations of the tubes are marked as AQ1 – AQ12 on the attached maps in Figures 1 - 6.

The monitoring personnel also carried out subjective olfactometric assessments at the same locations during the measurement events. The methodology conformed to the general guidance issued by the EPA in the Guidance Note "Air Guidance Note 5 (AG5): Odour Impact Assessment Guidance for EPA Licensed Sites". This Guidance offers a systematic and consistent approach to the assessment of odours on and in the local area of facilities and installations that are licensed by the Agency. While the study is aimed at establishing baseline ambient air quality as opposed to examining the air quality impact of a licenced facility, the use of this best-practice Guidance demonstrates the robust assessment procedures adopted for the study.

#### 3.0 Survey results

The measurement results are presented in Tables 1 - 6. The detailed laboratory analysis results are presented in the attached Laboratory Analysis Reports and the Field Record Sheets for the Odour Assessments.







## Table 14.2.1: Monitoring results for $\mathsf{NO}_2$ and $\mathsf{SO}_2$ for 13 June 2017 to 27 June 2017

Monitoring Location	Monitoring dates	NO₂ µg/m⁻³	SO₂µg/m⁻³
AQ1 St. Francis Hospice, Connolly Hospital. North of proposed pumping station	13/06/2017 to 27/06/2017	14.8	<1.5
AQ2 Elm Green Nursing Home, Southeast of proposed pumping station	13/06/2017 to 27/06/2017	14.1	<1.5
AQ3 St. Michael's House, south of proposed WwTP	13/06/2017 to 27/06/2017	15.2	<1.5
AQ4 In the vicinity of the proposed WwTP site	13/06/2017 to 27/06/2017	13.2	3.7
AG5 In the vicinity of the proposed WwTP site	13/06/2017 to 27/06/2017	10.6	<1.5
AQ6 In the vicinity of the proposed WwTP site	13/06/2017 to 27/06/2017	9.1	<1.5
AQ7 In the vicinity of the proposed WwTP site	13/06/2017 to 27/06/2017	11.6	<1.5
AQ8 In the vicinity of the proposed WwTP site	13/06/2017 to 27/06/2017	14.5	<1.5
AQ9 In the vicinity of the proposed WwTP site	13/06/2017 to 27/06/2017	12.4	<1.5
AQ10 In the vicinity of the proposed WwTP site	13/06/2017 to 27/06/2017	13.8	<1.5
AQ11 Grange	13/06/2017 to 27/06/2017	9.0	<1.5
AQ12 Grange	13/06/2017 to 27/06/2017	14.0	<1.5







#### Table 14.2.2: Monitoring results for NO2 and SO2 for 27 June 2017 to 11 July 2017

Monitoring Location	Monitoring dates	NO <sub>2</sub> µg/m <sup>-3</sup>	<b>SO</b> <sub>2</sub> µg/m <sup>-3</sup>
AQ1 St. Francis Hospice, Connolly Hospital. North of proposed pumping station	27/06/2017 to 11/07/2017	14.1	<2.66
AQ2 Elm Green Nursing Home, Southeast of proposed pumping station	27/06/2017 to 11/07/2017	12.7	<2.65
AQ3 St. Michael's House, south of proposed WwTP	27/06/2017 to 11/07/2017	19.4	<2.65
AQ4 In the vicinity of the proposed WwTP site	27/06/2017 to 11/07/2017	15.3	<2.64
AG5 In the vicinity of the proposed WwTP site	27/06/2017 to 11/07/2017	11.0	<2.64
AQ6 In the vicinity of the proposed WwTP site	27/06/2017 to 11/07/2017	9.3	<2.64
AQ7 In the vicinity of the proposed WwTP site	27/06/2017 to 11/07/2017	10.3	<2.64
AQ8 In the vicinity of the proposed WwTP site	27/06/2017 to 11/07/2017	10.4	<2.64
AQ9 In the vicinity of the proposed WwTP site	27/06/2017 to 11/07/2017	11.9	<2.64
AQ10 In the vicinity of the proposed WwTP site	27/06/2017 to 11/07/2017	13.7	<2.64
AQ11 Grange	27/06/2017 to 11/07/2017	11.6	<2.65
AQ12 Grange	27/06/2017 to 11/07/2017	16.9	<2.65







#### Table 14.2.3: Monitoring results for BTEX, 13 June 2017 to 27 June 2017

Monitoring Location	Benzene µg/m⁻³	Toluene μg/m <sup>-3</sup>	Ethylbenzene m-, p-xylene μg/m <sup>-3</sup> μg/m <sup>-3</sup>		o-Xylene µg/m <sup>-3</sup>
AQ1	<0.38	2.03	<0.51	0.56	<0.51
AQ2	<0.38	1.23	2.75	2.53	1.02
AQ3	<0.38	1.56	1.56	1.55	0.58
AQ4	<0.38	0.72	<0.51	<0.51	<0.51
AG5	<0.38	0.56	0.80	0.94	<0.51
AQ6	0.77	3.98	<0.51	0.67	<0.51
AQ7	<0.38	2.85	2.14	2.02	0.83
AQ8	0.45	4.30	3.78	3.02	1.32
AQ9	<0.38	10.01	1.35	2.69	0.92
AQ10	<0.38	<0.43	<0.51	<0.51	<0.51
AQ11	<0.38	0.81	<0.51	<0.51	<0.51
AQ12	<0.38	4.10	<0.51	0.70	<0.51

#### Table 14.2.4: Monitoring results for BTEX, 27 June 2017 to 11 July 2017

Monitoring Location	Benzene µg/m⁻³	Toluene μg/m <sup>-3</sup>			o-Xylene µg/m <sup>-3</sup>
AQ1	0.60	2.34	2.34 1.36 1.92		0.75
AQ2	<0.39	0.64	0.69	0.67	<0.51
AQ3	<0.39	<0.43	<0.51	<0.51	<0.51
AQ4	0.53	<0.43	<0.51	<0.51	<0.51
AG5	<0.38	0.93	1.23	1.11	<0.51
AQ6	0.59	1.70	<0.51	2.05	0.52
AQ7	<0.38	0.66	<0.51	<0.51	<0.51
AQ8	0.67	1.54	<0.51	<0.51	<0.51
AQ9	<0.38	<0.43	<0.51	<0.51	<0.51
AQ10	<0.38	2.10	3.61	3.27	1.26
AQ11	0.42	0.59	<0.51	<0.51	<0.51
AQ12	<0.39	0.68	<0.51	<0.51	<0.51







#### Table 14.2.5: Baseline Odour assessment – 27 June 2017

Monitoring Location	Odour persistence	Odour intensity	Description
AQ1 St. Francis Hospice, Connolly Hospital. North of proposed pumping station	0	0	None detected
AQ2 Elm Green Nursing Home, Southeast of proposed pumping station	0	0	None detected
AQ3 St. Michael's House, south of proposed WwTP	0	0	None detected
AQ4 In the vicinity of the proposed WwTP site	0	0	None detected
AG5 In the vicinity of the proposed WwTP site	0	0	None detected
AQ6 In the vicinity of the proposed WwTP site	0	0	None detected
AQ7 In the vicinity of the proposed WwTP site	0	0	None detected
AQ8 In the vicinity of the proposed WwTP site	0	0	None detected
AQ9 In the vicinity of the proposed WwTP site	0	0	None detected
AQ10 In the vicinity of the proposed WwTP site	0	0	None detected
AQ11 Grange	0	0	None detected
AQ12 Grange	0	0	None detected

NOTE 1

Odour rating: 0 = No odour, 1 = Faint odour, 2 = Moderate odour, 3 = Strong odour, 4 = Very strong odour







#### Table 14.2.6: Baseline Odour assessment – 11 July 2017

Monitoring Location	Odour peristence	Odour intensity	Description
AQ1 St. Francis Hospice, Connolly Hospital. North of proposed pumping station	0	0	None detected
AQ2 Elm Green Nursing Home, Southeast of proposed pumping station	0	0	None detected
AQ3 St. Michael's House, south of proposed WwTP	0	0	None detected
AQ4 In the vicinity of the proposed WwTP site	0	0	None detected
AG5 In the vicinity of the proposed WwTP site	0	0	None detected
AQ6 In the vicinity of the proposed WwTP site	0	0	None detected
AQ7 In the vicinity of the proposed WwTP site	0	0	None detected
AQ8 In the vicinity of the proposed WwTP site	0	0	None detected
AQ9 In the vicinity of the proposed WwTP site	0	0	None detected
AQ10 In the vicinity of the proposed WwTP site	0	0	None detected
AQ11 Grange	0	0	None detected
AQ12 Grange	1	2	Foul odour from adjacent building site

NOTE Odour rating: 0 = No odour, 1 = Faint odour, 2 = Moderate odour, 3 = Strong odour, 4 = Very strong odour



















#### LABORATORY ANALYSIS REPORT NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTOMETRY REPORT NUMBER L04575R

BOOKING IN REFERENCE L04575 **DESPATCH NOTE** 37616 CUSTOMER TMS Environmental Attn: Graham Adams 53 Broomhill Drive Tallaght Dublin 24

Ireland

#### DATE SAMPLES RECEIVED 30/06/2017

		Sample	Exposure Data					TOTAL
		Sample	Dala		Time		ppb	IUTAL
Locat	ion	Number	Date On	Date Off	(hr.)	μ <b>g/m</b> ³ *	*	µg NO₂
AQ5		925343	13/06/2017	27/06/2017	336.25	10.64	5.55	0.26
AQ4		925345	13/06/2017	27/06/2017	335.83	13.24	6.91	0.32
AQ7		925346	13/06/2017	27/06/2017	335.83	11.60	6.05	0.28
AQ8		925344	13/06/2017	27/06/2017	335.83	14.50	7.57	0.35
AQ9		925348	13/06/2017	27/06/2017	335.92	12.45	6.50	0.30
AQ10		925347	13/06/2017	27/06/2017	335.92	13.81	7.21	0.34
AQ11		925350	13/06/2017	27/06/2017	336.83	8.99	4.69	0.22
AQ12		925351	13/06/2017	27/06/2017	336.67	14.05	7.34	0.34
AQ6		925349	13/06/2017	27/06/2017	334.75	9.15	4.78	0.22
AQ3		925352	13/06/2017	27/06/2017	335.92	15.19	7.93	0.37
AQ2		925353	13/06/2017	27/06/2017	335.67	14.13	7.38	0.34
AQ1		925363	13/06/2017	27/06/2017	335.58	14.80	7.72	0.36
Blank		925354			336.83	1.52	0.79	0.04
	Laboratory Blank				336.83	0.37	0.19	0.009

Comment: Results are not blank subtracted Results have been corrected to a temperature of 293 K (20°)

**Overall M.U.** ±7.8% Limit of Detection 0.010µgNO2 Analysed on UV05 Camspec Tube Preparation : 20% TEA / Water M550

**Analyst Name** 

James Crowley

**Report Checked By** 

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk (\*). Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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**Report Number L045** 

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	Gradko International Ltd
This signat	ture confirms the authenticity of these results
Signed	1 Cales
1.2	L. Gates, Laboratory Manager





St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

# LABORATORY ANALYSIS REPORT

**Date of Analysis** 

12/07/2017

**Date of Report** 

13/07/2017

Analysis carried out in accordance with documented in-house Laboratory Method GLM7

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk (\*). Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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**Report Number L04575R** 





### LABORATORY ANALYSIS REPORT NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTOMETRY

REPORT NUMBER L05087R BOOKING IN REFERENCE L05087 DESPATCH NOTE 37616 CUSTOMER TMS Environmer 53 Broomhill Driv Tallaght

L05087 37616 TMS Environmental Attn: Graham Adams 53 Broomhill Drive Tallaght Dublin 24

# DATE SAMPLES RECEIVED 18/07/2017

Exposure Data TOTAL							
Location	Sample Number	Date On	Date Off	Time (hr.)	µg/m³ ∗	ppb *	µg NO₂
AQ5	925355	27/06/2017	11/07/2017	335.33	11.00	5.74	0.27
AQ4	925357	27/06/2017	11/07/2017	335.33	15.27	7.97	0.37
AQ7	925359	27/06/2017	11/07/2017	335.33	10.28	5.36	0.25
AQ8	925356	27/06/2017	11/07/2017	335.33	10.43	5.44	0.25
AQ9	925360	27/06/2017	11/07/2017	335.33	11.94	6.23	0.29
AQ10	925358	27/06/2017	11/07/2017	335.33	13.72	7.16	0.33
AQ11	925362	27/06/2017	11/07/2017	334.17	11.61	6.06	0.28
AQ12	925364	27/06/2017	11/07/2017	333.92	16.86	8.80	0.41
AQ6	925361	27/06/2017	11/07/2017	335.25	9.33	4.87	0.23
AQ3	925365	27/06/2017	11/07/2017	333.58	19.40	10.12	0.47
AQ2	925366	27/06/2017	11/07/2017	333.33	12.71	6.64	0.31
AQ1	925367	27/06/2017	11/07/2017	332.75	14.13	7.38	0.34
Blank	925368			335.33	0.67	0.35	0.02

Laboratory Blank

335.33

#### Comment: Results are not blank subtracted Results have been corrected to a temperature of 293 K (20°)

Overall M.U.	±7.8%	Limit of Detection	0.010 μgNO₂
Tube Preparation : 20% TEA / Water		Analysed on UV 08 Camspec	M550
Analyst Name	Joanna Kowalewska	Report Checked By	Adam Robinson
Date of Analysis	01/08/2017	Date of Report	01/08/2017

Analysis carried out in accordance with documented in-house Laboratory Method GLM7

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk (\*). Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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0.26

0.012

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Signed	





# LABORATORY ANALYSIS REPORT

#### DETERMINATION OF SULPHUR DIOXIDE IN DIFFUSION TUBES BY ION CHROMATOGRAPHY

REPORT NUMBER	L04576R
BOOKING IN REFERENCE No	L04576
DESPATCH NOTE No	37616
CUSTOMER	TMS Environmental Attn: Graham Adams
	53 Broomhill Drive Tallaght Dublin 24 Ireland

#### DATE SAMPLES RECEIVED 30/06/2017

	Sample	Date	Date	Exposure	μg S	μg S -	SO <sub>2</sub>	SO <sub>2</sub>	
Location	Number	Exposed	Finished	Hours	Total	Blank	μg/m <sup>3</sup> *	ppb*	
AQ5	925315	13/06/2017	27/06/2017	336.25	<0.03	<0.01	<1.50	<0.56	
AQ4	925317	13/06/2017	27/06/2017	335.83	0.05	0.03	3.70	1.39	
AQ7	925318	13/06/2017	27/06/2017	335.83	<0.03	<0.01	<1.50	<0.56	
AQ8	925316	13/06/2017	27/06/2017	335.83	<0.03	<0.01	<1.50	<0.56	
AQ9	925320	13/06/2017	27/06/2017	335.92	<0.03	<0.01	<1.50	<0.56	
AQ10	925319	13/06/2017	27/06/2017	335.92	<0.03	<0.01	<1.50	<0.56	
AQ11	925322	13/06/2017	27/06/2017	336.83	<0.03	<0.01	<1.49	<0.56	
AQ12	925323	13/06/2017	27/06/2017	336.67	<0.03	<0.01	<1.49	<0.56	
AQ6	925321	13/06/2017	27/06/2017	334.75	<0.03	<0.01	<1.50	<0.56	
AQ3	925324	13/06/2017	27/06/2017	335.92	<0.03	<0.01	<1.50	<0.56	
AQ1	925326	13/06/2017	27/06/2017	335.58	<0.03	<0.01	<1.50	<0.56	
AQ2	925325	13/06/2017	27/06/2017	335.67	<0.03	<0.01	<1.50	<0.56	
Blank	925327				0.01				
Laboratory Bla	nk				0.01				
Comment: Results are blank sub Results reported as <0.03µg S ar		ing limit.							
Tube 925315 was wet when rece	ived. Result may b	e compromised							
Overall M.U.	±6.0%			Reporting L	imit	0.03μί	g S		
Analysed on Dionex ICS3000 ICU	5								

Analyst Name	Zoe Munday	Report Checked By	J.Farbiszewska-Szulc
Date of Analysis	06/07/2017	Date of Report	10/07/2017

#### Analysis has been carried out in accordance with in-house method GLM1

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk (\*). Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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This signature confirms the	authenticity of these results
Signed	
L. Gates, Labor	ratory Manager





# LABORATORY ANALYSIS REPORT

#### DETERMINATION OF SULPHUR DIOXIDE IN DIFFUSION TUBES BY ION CHROMATOGRAPHY

REPORT NUMBER	L05086R
BOOKING IN REFERENCE No	L05086
DESPATCH NOTE No	37616
CUSTOMER	TMS Environmental Attn: Graham Adams
	53 Broomhill Drive Tallaght Dublin 24 Ireland
	10/07/0017

#### DATE SAMPLES RECEIVED 18/07/2017

	Sample	Date	Date	Exposure	μg S	μg S -	SO <sub>2</sub>	SO <sub>2</sub>
Location	Number	Exposed	Finished	Hours	Total	Blank	μg/m <sup>3</sup> *	ppb*
AQ5	925328	27/06/2017	11/07/2017	335.33	<0.03	<0.02	<2.64	<0.99
AQ4	925330	27/06/2017	11/07/2017	335.33	<0.03	<0.02	<2.64	<0.99
AQ7	925332	27/06/2017	11/07/2017	335.33	<0.03	<0.02	<2.64	<0.99
AQ8	925329	27/06/2017	11/07/2017	335.33	<0.03	<0.02	<2.64	<0.99
AQ9	925333	27/06/2017	11/07/2017	335.33	<0.03	<0.02	<2.64	<0.99
AQ10	925331	27/06/2017	11/07/2017	335.33	<0.03	<0.02	<2.64	<0.99
AQ11	925335	27/06/2017	11/07/2017	334.17	<0.03	<0.02	<2.65	<0.99
AQ12	925336	27/06/2017	11/07/2017	333.92	<0.03	<0.02	<2.65	<0.99
AQ6	925334	27/06/2017	11/07/2017	335.25	<0.03	<0.02	<2.64	<0.99
AQ3	925337	27/06/2017	11/07/2017	333.58	<0.03	<0.02	<2.65	<0.99
AQ2	925338	27/06/2017	11/07/2017	333.33	<0.03	<0.02	<2.65	<0.99
AQ1	925339	27/06/2017	11/07/2017	332.75	<0.03	<0.02	<2.66	<1.00
Blank	925340				0.002			
Labor	atory Blank				0.01			
	ank subtracted ed without a filter. Result ma 3µg S on tube are below the	•	ed.					
Overall M.U.	±6.0%			Reporting L	imit	0.03µ	ıg S	
Analysed on Dionex ICS30	000 ICU5							
Analyst Name	Zoe Munday			Report Cheo	ked By	K. Pald	amova	
Date of Analysis	27/07/20	17		Date of Rep	ort	31/07/	2017	

#### Analysis has been carried out in accordance with in-house method GLM1

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk (\*). Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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U.4. Pro-	Gradko International Ltd
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Signed	blates
	L. Gates, Laboratory Manager





RTEY

St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

# LABORATORY ANALYSIS REPORT

#### DETERMINATION OF AMBIENT AIR VOLATILE ORGANIC COMPOUNDS IN DIFFUSION TUBES **BY THERMAL DESORPTION / GAS CHROMATOGRAPHY**

Report number	L04675R
Booking in reference no	W0672
Despatch note no	37616
Customer	TMS Environmental
	53 Broomhill Drive, Tallaght
	Dublin 24
	Ireland
Date samples received	30/06/2017

Location	Tube no	Date exposed	Date finished	Exposure hours	Benzene	Toluene	Ethyl Benzene ng on Tube	<i>mp</i> - Xylene	o- Xylene
AQ5	GRA04077	13/06/2017	27/06/2017	336.25	<5.00	6.54	7.84	9.29	<5.00
AQ4	GRA11174	13/06/2017	27/06/2017	335.83	<5.00	8.40	<5.00	<5.00	<5.00
AQ7	GRA11156	13/06/2017	27/06/2017	335.83	<5.00	33.29	21.06	19.87	8.12
AQ8	GRA10873	13/06/2017	27/06/2017	335.83	5.81	50.09	37.20	29.69	12.95
AQ9	GRA08055	13/06/2017	27/06/2017	335.92	<5.00	116.73	13.31	26.48	9.06
AQ10	GRA11506	13/06/2017	27/06/2017	335.92	<5.00	<5.00	<5.00	<5.00	<5.00
AQ11	GRA10985	13/06/2017	27/06/2017	336.83	<5.00	9.42	<5.00	<5.00	<5.00
AQ12	GRA11077	13/06/2017	27/06/2017	336.67	<5.00	47.93	<5.00	6.94	<5.00
AQ6	GRA10991	13/06/2017	27/06/2017	334.75	10.06	46.30	<5.00	6.59	<5.00
AQ3	GRA02587	13/06/2017	27/06/2017	335.92	<5.00	18.21	15.30	15.26	5.68
AQ2	GRA10559	13/06/2017	27/06/2017	335.67	<5.00	14.38	27.07	24.92	10.05
AQ1	GRA11115	13/06/2017	27/06/2017	335.58	<5.00	23.69	<5.00	5.54	<5.00
Blank	GRA11555	13/06/2017	27/06/2017	336.00	<5.00	<5.00	<5.00	<5.00	<5.00
Blank					1.751	1.058	0.412	0.300	0.334

### (RESULTS ARE BLANK CORRECTED) Tube Type Carbograph 1TD

COMMENTS:

#### Results below 5.0ng on tube are below the reporting limit.

Overall M.U.	±13.1%	Reporting Limit	5ng on tube
Analyst name	Katarzyna Kotrych	Report checked by	Gavin Aikman
Date of analysis	11/07/2017	Date of report	12/07/2017

The analysis has been carried out in accordance with in-house method GLM4

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures. Calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS Accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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Signed.
L. Gates, Laboratory Manager





# LABORATORY ANALYSIS REPORT

#### DETERMINATION OF AMBIENT AIR VOLATILE ORGANIC COMPOUNDS IN DIFFUSION TUBES BY THERMAL DESORPTION / GAS CHROMATOGRAPHY

Report number	L04675R1
Booking in reference no	W0672
Despatch note no	37616
Customer	TMS Environmental
	53 Broomhill Drive, Tallaght
	Dublin 24
	Ireland

							BIEX		
Location	Tube no	Date exposed	Date finished	Exposure hours	Benzene	Toluene	Ethyl Benzene	<i>mp</i> - Xylene	o- Xylene
					Values R	eported in F	Parts per Bill	ion (p.p.b.)	) in Air *
AQ5	GRA04077	13/06/2017	27/06/2017	336.25	<0.12	0.15	0.19	0.22	<0.12
AQ4	GRA11174	13/06/2017	27/06/2017	335.83	<0.12	0.20	<0.12	<0.12	<0.12
AQ7	GRA11156	13/06/2017	27/06/2017	335.83	<0.12	0.78	0.50	0.48	0.19
AQ8	GRA10873	13/06/2017	27/06/2017	335.83	0.14	1.17	0.89	0.71	0.31
AQ9	GRA08055	13/06/2017	27/06/2017	335.92	<0.12	2.72	0.32	0.63	0.22
AQ10	GRA11506	13/06/2017	27/06/2017	335.92	<0.12	<0.12	<0.12	<0.12	<0.12
AQ11	GRA10985	13/06/2017	27/06/2017	336.83	<0.12	0.22	<0.12	<0.12	<0.12
AQ12	GRA11077	13/06/2017	27/06/2017	336.67	<0.12	1.11	<0.12	0.17	<0.12
AQ6	GRA10991	13/06/2017	27/06/2017	334.75	0.25	1.08	<0.12	0.16	<0.12
AQ3	GRA02587	13/06/2017	27/06/2017	335.92	<0.12	0.42	0.37	0.37	0.14
AQ2	GRA10559	13/06/2017	27/06/2017	335.67	<0.12	0.34	0.65	0.60	0.24
AQ1	GRA11115	13/06/2017	27/06/2017	335.58	<0.12	0.55	<0.12	0.13	<0.12
Blank	GRA11555	13/06/2017	27/06/2017	336.00	<0.12	<0.12	<0.12	<0.12	<0.12
Blank				336.83	0.04	0.02	0.01	0.01	0.01

#### (RESULTS ARE BLANK CORRECTED) Tube Type Carbograph 1TD COMMENTS:

#### Results indicated with < are below the reporting limit calculated for time exposed.

Weeks exposed	2	Uptake rates (ng.ppm <sup>-1</sup> min <sup>-1</sup> )	2.02	2.13	2.07	2.07	2.07
Overall M.U.	±	13.1%		Reporting	I Limit	5ng or	n tube
Analyst name	Katarz	yna Kotrych		Report ch	ecked by	Gavin A	Aikman
Date of analysis	11/	07/2017		Date of re	port	12/07	/2017

#### The analysis has been carried out in accordance with in-house method GLM4

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures. Calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS Accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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Report Number L046751

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	L. Gates, Laboratory Manager

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#### LABORATORY ANALYSIS REPORT DETERMINATION OF AMBIENT AIR VOLATILE ORGANIC COMPOUNDS IN DIFFUSION TUBES

**BY THERMAL DESORPTION / GAS CHROMATOGRAPHY** 

Report number	L04675R2
Booking in reference no	W0672
Despatch note no	37616
Customer	TMS Environmental
	53 Broomhill Drive, Tallaght
	Dublin 24
	Ireland
Date samples received	30/06/2017

							BTEX		
Location	Tube no	Date exposed	Date finished	Exposure hours	Benzene	Toluene	Ethyl Benzene	<i>mp</i> - Xylene	o- Xylene
		-			Ň	/alues Repo	orted in µgm	<sup>-3</sup> in Air *	
AQ5	GRA04077	13/06/2017	27/06/2017	336.25	<0.38	0.56	0.80	0.94	<0.51
AQ4	GRA11174	13/06/2017	27/06/2017	335.83	<0.38	0.72	<0.51	<0.51	<0.51
AQ7	GRA11156	13/06/2017	27/06/2017	335.83	<0.38	2.85	2.14	2.02	0.83
AQ8	GRA10873	13/06/2017	27/06/2017	335.83	0.45	4.30	3.78	3.02	1.32
AQ9	GRA08055	13/06/2017	27/06/2017	335.92	<0.38	10.01	1.35	2.69	0.92
AQ10	GRA11506	13/06/2017	27/06/2017	335.92	<0.38	<0.43	<0.51	<0.51	<0.51
AQ11	GRA10985	13/06/2017	27/06/2017	336.83	<0.38	0.81	<0.51	<0.51	<0.51
AQ12	GRA11077	13/06/2017	27/06/2017	336.67	<0.38	4.10	<0.51	0.70	<0.51
AQ6	GRA10991	13/06/2017	27/06/2017	334.75	0.77	3.98	<0.51	0.67	<0.51
AQ3	GRA02587	13/06/2017	27/06/2017	335.92	<0.38	1.56	1.56	1.55	0.58
AQ2	GRA10559	13/06/2017	27/06/2017	335.67	<0.38	1.23	2.75	2.53	1.02
AQ1	GRA11115	13/06/2017	27/06/2017	335.58	<0.38	2.03	<0.51	0.56	<0.51
Blank	GRA11555	13/06/2017	27/06/2017	336.00	<0.38	<0.43	<0.51	<0.51	<0.51
Blank				336.83	0.13	0.09	0.04	0.03	0.03

#### (RESULTS ARE BLANK CORRECTED)

Tube Type Carbograph 1TD COMMENTS:

#### Results indicated with < are below the reporting limit calculated for time exposed.

Weeks exposed	2	Uptake rates (ng.ppm <sup>-1</sup> min <sup>-1</sup> )	2.02	2.13	2.07	2.07	2.07
Overall M.U.	±	13.1%		Reporting	Limit	5ng or	n tube
Analyst name	Katarzyna Kotrych			Report ch	ecked by	Gavin A	Aikman
Date of analysis	analysis 11/07/2017 Date of report 12/07/2				/2017		
The analysis has been carried out in accordance with in-house method GLM4							

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures. Calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS Accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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**Report Number** L040

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Signed	1 Gates
L.	Gates, Laboratory Manager

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St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

# LABORATORY ANALYSIS REPORT

#### DETERMINATION OF AMBIENT AIR VOLATILE ORGANIC COMPOUNDS IN DIFFUSION TUBES **BY THERMAL DESORPTION / GAS CHROMATOGRAPHY**

Report number Booking in reference no	L05078R W0751 37616
Despatch note no	
Customer	TMS Environmental
	53 Broomhill Drive, Tallaght
	Dublin 24
	Ireland
Date samples received	18-Jul
Job Reference	D-17-9253

		D. (	<b>D</b> .(	-			DICA			
Location	Tube no	Date exposed	Date finished	Exposure hours	Benzene	Toluene	Ethyl Benzene	<i>mp</i> - Xylene	o- Xylene	
							ng on Tube			
AQ5	GRA11574	27/06/2017	11/07/2017	335.33	<5.00	10.78	12.08	10.93	<5.00	
AQ4	GRA04905	27/06/2017	11/07/2017	335.33	6.96	<5.00	<5.00	<5.00	<5.00	
AQ7	GRA11929	27/06/2017	11/07/2017	335.33	<5.00	7.71	<5.00	<5.00	<5.00	
AQ8	GRA07536	27/06/2017	11/07/2017	335.33	8.73	17.91	<5.00	<5.00	<5.00	
AQ9	GRA11198	27/06/2017	11/07/2017	335.33	<5.00	<5.00	<5.00	<5.00	<5.00	
AQ10	GRA09507	27/06/2017	11/07/2017	335.33	<5.00	24.44	35.44	32.14	12.39	
AQ11	GRA11931	27/06/2017	11/07/2017	334.17	5.49	6.79	<5.00	<5.00	<5.00	
AQ12	GRA11042	27/06/2017	11/07/2017	333.92	<5.00	7.90	<5.00	<5.00	<5.00	
AQ6	GRA10693	27/06/2017	11/07/2017	335.25	7.73	19.79	<5.00	20.11	5.15	
AQ3	GRA11264	27/06/2017	11/07/2017	333.58	<5.00	<5.00	<5.00	<5.00	<5.00	
AQ2	GRA11411	27/06/2017	11/07/2017	333.33	<5.00	7.46	6.74	6.50	<5.00	
AQ1	GRA11609	27/06/2017	11/07/2017	332.75	7.75	27.08	13.29	18.72	7.28	
Blank	Mi028050				1.158	0.942	0.858	1.763	1.218	

#### (RESULTS ARE BLANK CORRECTED) Tube Type Carbograph 1TD COMMENTS:

#### Results below 5.0ng on tube are below the reporting limit.

Overall M.U.	±13.1%	Reporting Limit	5ng on tube
Analyst name	Katarzyna Kotrych	Report checked by	K. Paldamova
Date of analysis	25/07/2017	Date of report	26/07/2017

#### The analysis has been carried out in accordance with in-house method GLM4

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures. Calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS Accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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## LABORATORY ANALYSIS REPORT

#### DETERMINATION OF AMBIENT AIR VOLATILE ORGANIC COMPOUNDS IN DIFFUSION TUBES BY THERMAL DESORPTION / GAS CHROMATOGRAPHY

Report number	L05078R1
Booking in reference no	W0751
Despatch note no	37616
Customer	TMS Environmental
	53 Broomhill Drive, Tallaght
	Dublin 24
	Ireland
Date samples received	18/07/2017
Job Reference	D-17-9253

							BIEX		
Location	Tube no	Date exposed	Date finished	Exposure hours	Benzene	Toluene	Ethyl Benzene	<i>mp</i> - Xylene	o- Xylene
		-			Values R	eported in F	Parts per Bill	ion (p.p.b.)	) in Air *
AQ5	GRA11574	27/06/2017	11/07/2017	335.33	<0.12	0.25	0.29	0.26	<0.12
AQ4	GRA04905	27/06/2017	11/07/2017	335.33	0.17	<0.12	<0.12	<0.12	<0.12
AQ7	GRA11929	27/06/2017	11/07/2017	335.33	<0.12	0.18	<0.12	<0.12	<0.12
AQ8	GRA07536	27/06/2017	11/07/2017	335.33	0.21	0.42	<0.12	<0.12	<0.12
AQ9	GRA11198	27/06/2017	11/07/2017	335.33	<0.12	<0.12	<0.12	<0.12	<0.12
AQ10	GRA09507	27/06/2017	11/07/2017	335.33	<0.12	0.57	0.85	0.77	0.30
AQ11	GRA11931	27/06/2017	11/07/2017	334.17	0.14	0.16	<0.12	<0.12	<0.12
AQ12	GRA11042	27/06/2017	11/07/2017	333.92	<0.12	0.19	<0.12	<0.12	<0.12
AQ6	GRA10693	27/06/2017	11/07/2017	335.25	0.19	0.46	<0.12	0.48	0.12
AQ3	GRA11264	27/06/2017	11/07/2017	333.58	<0.12	<0.12	<0.12	<0.12	<0.12
AQ2	GRA11411	27/06/2017	11/07/2017	333.33	<0.12	0.18	0.16	0.16	<0.12
AQ1	GRA11609	27/06/2017	11/07/2017	332.75	0.19	0.64	0.32	0.45	0.18
Blank	Mi028050			335.33	0.03	0.02	0.02	0.05	0.03
	ANK CORRECT								

#### (RESULTS ARE BLANK CORRECTED) Tube Type Carbograph 1TD COMMENTS:

#### Results indicated with < are below the reporting limit calculated for time exposed.

Weeks exposed	2	Uptake rates (ng.ppm <sup>-1</sup> min <sup>-1</sup> )	2.02	2.13	2.07	2.07	2.07
Overall M.U.	±1	13.1%		Reporting	Limit	5ng or	n tube
Analyst name	Katarzy	/na Kotrych		Report ch	ecked by	K. Pald	amova
Date of analysis	25/0	07/2017		Date of re	port	26/07/	/2017
	The analy	usis has been carried out in accordance w	vith in-house m	ethod GI M	4		

The analysis has been carried out in accordance with in-house method GLM4

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures. Calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS Accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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**Report Number L05078R** 

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L. Gates, Laboratory Manager	
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# LABORATORY ANALYSIS REPORT

#### DETERMINATION OF AMBIENT AIR VOLATILE ORGANIC COMPOUNDS IN DIFFUSION TUBES BY THERMAL DESORPTION / GAS CHROMATOGRAPHY

Report number	L05078R2
Booking in reference no	W0751
Despatch note no	37616
Customer	TMS Environmental
	53 Broomhill Drive, Tallaght
	Dublin 24
	Ireland
Date samples received	18/07/2017
Job Reference	D-17-9253

							DIEA		
Location	Tube no	Date exposed	Date finished	Exposure hours	Benzene	Toluene	Ethyl Benzene	<i>mp</i> - Xylene	o- Xylene
						Values Rep	orted in µgm	<sup>3</sup> in Air *	
AQ5	GRA11574	27/06/2017	11/07/2017	335.33	<0.38	0.93	1.23	1.11	<0.51
AQ4	GRA04905	27/06/2017	11/07/2017	335.33	0.53	<0.43	<0.51	<0.51	<0.51
AQ7	GRA11929	27/06/2017	11/07/2017	335.33	<0.38	0.66	<0.51	<0.51	<0.51
AQ8	GRA07536	27/06/2017	11/07/2017	335.33	0.67	1.54	<0.51	<0.51	<0.51
AQ9	GRA11198	27/06/2017	11/07/2017	335.33	<0.38	<0.43	<0.51	<0.51	<0.51
AQ10	GRA09507	27/06/2017	11/07/2017	335.33	<0.38	2.10	3.61	3.27	1.26
AQ11	GRA11931	27/06/2017	11/07/2017	334.17	0.42	0.59	<0.51	<0.51	<0.51
AQ12	GRA11042	27/06/2017	11/07/2017	333.92	<0.39	0.68	<0.51	<0.51	<0.51
AQ6	GRA10693	27/06/2017	11/07/2017	335.25	0.59	1.70	<0.51	2.05	0.52
AQ3	GRA11264	27/06/2017	11/07/2017	333.58	<0.39	<0.43	<0.51	<0.51	<0.51
AQ2	GRA11411	27/06/2017	11/07/2017	333.33	<0.39	0.64	0.69	0.67	<0.51
AQ1	GRA11609	27/06/2017	11/07/2017	332.75	0.60	2.34	1.36	1.92	0.75
Blank	Mi028050			335.33	0.10	0.08	0.09	0.19	0.13
(RESULTS ARE BL	ANK CORRECTE	D)							

(RESULTS ARE BLANK CORREC Tube Type Carbograph 1TD COMMENTS:

#### Results indicated with < are below the reporting limit calculated for time exposed

neouto matoatea ma		The reporting mint barbarated for this	ie expeded.				
Weeks exposed	2	Uptake rates (ng.ppm <sup>-1</sup> min <sup>-1</sup> )	2.02	2.13	2.07	2.07	2.07
Overall M.U.	<u> </u>	£13.1%		Reporting	g Limit	5ng oi	n tube
Analyst name	Katarz	zyna Kotrych		Report ch	necked by	K. Pald	lamova
Date of analysis	25	/07/2017		Date of re	eport	26/07	/2017
	The evel	ala haa haan aawiad ay tin aaaandanaa y	ulth in house m				

The analysis has been carried out in accordance with in-house method GLM4

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures. Calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS Accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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**Report Number L05078** 

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igned	1 Calis
	L. Gates, Laboratory Manager

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General	Your Refere	nce	Site Licence No.	ord Sheet		Assessme	nt by				Date of Assessment
	24390		NIA			Your nam (other Inv	estigat	or(s) present):	NIA		27 JUN 2017
Preparation	Observer is fi medical cond (cold, sore th sinus trouble)	ree from itions roat,	Observer abstiner min) from smokin flavoured drinks, toiletries and deo	ng, as scented ve	eason for odou sessment – Co prification; rou her (specify).	ur omplaint	Map show	- Has a map ing assessment ons been attacl		Weather Condit (record wind in	fo on page 2):
H (	Yes	No	Yes	No 🅅	ANNING ROPL	icat ion	Yes		No	UK/ & WA	R <sup>T</sup> 1
st be ations	1 Remote (no	housing, com	point Sensitivity (as mercial/industrial premises ng, commercial/industrial p	s or public area within a premises or public area	500m of observatio within 100m of ob	n point) servation point)	I	Note 3: Weath Precipitation – dry, ra Temperature – cold,	ained rece	ntly, drizzle, raining, fog	ggy
se notes mu ield observa f)	3 Moderate se	nsitivity (hou	commercial/industrial commercial/industrial pre ts arising from residents, bu	premises or public area mises or public area wi	a within 100m of o thin area of observa-	ation point)	n (	Note 4: Odour No Odour Intermittent (detect Persistent (detect	ected inter	tence mittently during the peri hout the period of assess	od of assessment) ment)
(the ranking systems in these notes must be used when completing the field observations table overleaf)	Note 2: Win 0 Calm 1 Light air 2 Light Breez 3 Gentle Breez 4 Moderate F 5 Fresh Breez 6 Strong Bree 7 Near Gale 8 Gale 9 Strong Gale	sma Dir Dir ze Lea reeze Rai ze Sm ze Lar Wh Tw Slis	bke rises vertically ection of wind shown by sn dd felt on face; leaves rustle ves and small twigs in con- ses dust and loose paper; sr all trees in leaf begin to sw ge branches in motion; uml ole trees in motion; iconv gs break off trees; progress; ht structural damage occur	e, ordinary vane moved stant motion nall branches are move ay brellas used with diffice enience felt when walk s generally impeded s (chinney pots and sh	by wind d ulty against the win ing against wind ates removed)			2 Moderate Odour possibly offensiv 3 Strong Odour (b	Odour rely detect r (easily de ve) carable bu	able, need to stand still a stectable while walking a at offensive – might mak arable, difficult to remain	te clothes / hair smell?) n in area affected by odour)
Investigation (Post Odour Survey)	Start Time:	Do any of	the odours experienced rded during the off-site	on-site match in cha	tracter List and	eas Inspected:	٥			What relevant activ during the off-site	vities were occurring on-site odour assessment?
Investigation Post Odour Surv	Finish Time:	Potential	on-site odour sources ide	entified:							V / V

## Annex A: Odour Investigation Field Record Sheet

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	Paraméter	Thresholds that stacibni bluos sonsiun			S	noitsy	raser	o blsiš	I		
OUSEI VEI LUCAUUI	Name of household / commercial site (describe so that location can be easily identified again by a third party)	I	ARS	AQ4	T84	AQB	A& 9	AR10	A. B. I	ARIL	AR6
	Sensitivity (1-5) Note 1	33	1	M	5	2	2	2	2	2	M
detectable)	Direction from which wind blows	I	N	M	2	3	3	M	3	3	M
detectable)	Orientation (Observer Vs facility)	Approx DW or not	NA	NIA	NIA	NIA	NIA	NJA	NA	NIA	NIA
	Strength Note 2	I	_	1	[	1			1	)	-
	Start Time (24hr clock)		11.00	01'11	11,20	5211	11.35	07 1	20,51	22.51	02-21
	Period of observation		2	S	S	S	S	S	S	S	5
D	Odour Persistence Vote 4 Vote 4	1 or 2	0	0	0	Û	0	0	0	0	0
9	Odour Intensity (0-4) Note 5	<b>2</b> ≺I	0	0	0	0	0	0	0	0	0
	Description of any odours, other source(s) of odours etc, (Also note variable weather conditions etc)	Guide- A location where the score meets or exceeds all the threshold values may be deemed subject to nuisance/significant impairment, particularly if the observations are supported by public complaints on impact, frequency and duration of odours.		а.							

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General	Your Reference	nce	1   Your Reference   Site Licence No.		Assessment by	at by		Date of Assessment
	24396		AN AN		Your name (other Inve	Your name: NICH OWDA (other Investigator(s) present): NIA		27 SUN LOIP
sessment notion	Observer is free from medical conditions (cold, sore throat, sinus trouble)?	ree from litions uroat, )?	Observer abstinence (30 min) from smoking, flavoured drinks, scented toiletries and deodorisers?	Reason for odour assessment – Complaint verification; routine; other (specify).	nplaint ine;	Map – Has a map showing assessment locations been attached?	Weather Conditions Note 3 (record wind info on page 2):	on page 2): o on page 2):
Prepa	Yes	No	Yes	PLANNING APPLICATION		No	ORY , WARM	Ę
ations ations	Note 1: Obse 1 Remote (no. 2 Low sensitiv	ervation p housing, com	Note 1: Observation point Sensitivity (assuming detectable, if not then 0) Remote (no housing, commercial/industrial premises or public area within 500m of observation point) Low sensitivity (no housing, commercial/industrial premises or public area within 100m of observation point)	ctable, if not the in 500m of observatio area within 100m of ob	en 0) in point) servation point)	Note 3: Weather Conditions Precipitation – dry, rained recently, drizzle, raining, foggy Temperature – cold, cool, warm, hot	<b>ditions</b> ntly, drizzle, raining, fogg n, hot	ñ
lield observ	6 4 W	ansitivity (hous ivity (housing, ive (complaint	Moderate sensitivity (housing commercial/industrial premises or public area within 100m of observation point) High sensitivity (housing, commercial/industrial premises or public area within area of observation point) Extra sensitive (complaints arising from residents, business and users of public areas within area of observation oint)	ic area within 100m of observation point) ea within area of observation point) of public areas within area of observation	observation point) ation point) ca of observation	Note 4: Odour Persistence           0         No Odour           1         Intermittent (detected intermittently during the period of assessment)           2         Persistent (detected throughout the period of assessment)	tence mittently during the period nout the period of assessm	d of assessment) tent)
the t	4	d Strengtl	h			Note 5: Odour Intensity	ity	
i eməteye gui gnitəlqmoə ı vo əldat	0 -1 0 10 4 1		ke drift, but no ordinary vane n nt motion Il branches are	t wind vanes noved by wind moved			able, need to stand still and tectable while walking an	No Detectable Odour Faint Odour (barely detectable, need to stand still and inhale facing into wind) Moderate Odour (easily detectable while walking and breathing normally, possibly offensive)
used when	5 Fresh Breeze 6 Strong Breeze 7 Near Gale 8 Gale 9 Strong Gale	0 8	Small trees in leaf begin to sway Large branches in motion; unbrellas used with difficulty against the wind Whole trees in motion; inconvenience felt when walking against wind Twigs break off trees; progress generally impeded Slight structural damage occurs (chinney pots and slates removed)	fficulty against the win valking against wind 1 d slates removed)	P	<ul> <li>Surving Outour (orearable out outensive - nugati make courses) that sincut i)</li> <li>Very Strong Odour (unbearable, difficult to remain in area affected by odour)</li> </ul>	r oucusive – might make rable, difficult to remain i	croures / near surcus / in area affected by odour)
(A	Start Time:	Do any those r	Do any of the odours experienced on-site match in character those recorded during the off-site survey?		List areas Inspected:		What relevant activities were occurrind during the off-site odour assessment?	What relevant activities were occurring on-site during the off-site odour assessment?
tigation our Surve	NA		NAD		MM		0.00	
ruobO Poot Odd Poot Odd	Finish Time:	Potential or	Potential on-site odour sources identified:		Ņ		lain	

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Field observations     Thresholds that could indicate misance     Parameter       Field observations     Thresholds that field observations     Parameter       Approx DW or not by     Approx DW or not detectable etc     Down-Wind from which wind blows       Approx DW or not from which wind blows     Image: State from which wind blows       Approx DW or not from which wind blows     Image: State from which wind blows       Approx DW or not from which wind blows     Image: State from which wind blows       Approx DW or not from which wind blows     Image: State from which wind blows       Approx DW or not from which wind blows     Image: State from which wind blows       Approx DW or not from which wind blows     Image: State from which wind blows       Approx DW or not from which wind blows     Image: State from which wind blows       Approx DW or not from which wind blows     Image: State from which wind blows       Approx DW or not from which wind blows     Image: State from which wind blows       Approx DW or not from which wind blows     Image: State from which wind blows       Approx DW or not from which wind blows     Image: State from which wind blows       Approx DW or not from which wind blows     Image: State from which wind blows       Approx DW or not from which wind blows     Image: State from which wind blows       Approx DW or not from which wind blows     Image: State from which wind blows       Approx DW or not from which wind blows
Second indicate       could indicate         inisance       inisance         inininisance       inisance <tr< td=""></tr<>
RRZ 4 WA 1 14.0 RRZ 3 W WA 1 14.4 RRZ 3 W WA 1 15.2 RR
AR2 3 W AR2 3 W AR2 3 W MAR 1 14.4 AR2 3 W MAR 1 15.2 AR2 4 MA
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Date of Assessment	11 Jourant	Weather Conditions Note 3 (record wind info on page 2):	DRY , Hat	aining, foggy g the period of assessment) of assessment)	tand still and inhale facing into wind) walking and breathing normally, uight make clothes / hair smell?) to remain in area affected by odour)	What relevant activities were occurring on-site during the off-site odour assessment?		MIN		
by	Your name: MCK CWEN (other Investigator(s) present): NIF	Map – Has a map showing assessment (record ' locations been attached?	Yes No DRY	Note 3: Weather Conditions           Precipitation - dry, rained recently, drizzle, raining, foggy           Temperature - cold, cool, warm, hot           Note 4: Odour Persistence           0         No odour           1         Intermittent (detected intermittenty during the period of assessment)	<ul> <li>Note 5: Odour Intensity</li> <li>0 No Detectable Odour</li> <li>1 Faint Odour (barely detectable, need to stand still and inhale facing into wind)</li> <li>2 Moderate Odour (easily detectable while walking and breathing normally, possibly offensive)</li> <li>3 Strong Odour (bearable but offensive - might make clothes / hair smell?)</li> <li>4 Very Strong Odour (unbearable, difficult to remain in area affected by odour)</li> </ul>	What relev during the				
Assessment by	Your name: (other Invest	Reason for odour assessment – Complaint sh verification; routine; lo other (specify).	PLANN-INL ROPUCADEN	ectable, if not then 0) ithin 500m of observation point) a area within 100m of observation point) ic area within 100m of observation point) ea within area of observation point) of public areas within area of observation	t wind vanes noved by wind moved difficulty against the wind walking against wind	noved) List areas Inspect	SAIN	-		
Site Licence No.	AIN	<ul> <li>Observer abstinence (30 min) from smoking, flavoured drinks, scented toiletries and deodorisers?</li> </ul>	No No	<ul> <li>Note 1: Observation point Sensitivity (assuming detectable, if not then 0)</li> <li>1 Remote (no housing, commercial/industrial premises or public area within 500m of observation point)</li> <li>2 Low sensitivity (no housing, commercial/industrial premises or public area within 100m of observation point)</li> <li>3 Moderate sensitivity (housing commercial/industrial premises or public area within 100m of observation point)</li> <li>4 High sensitivity (housing commercial/industrial premises or public area within area of observation point)</li> <li>5 Extra sensitive (complaints arising from residents, business and users of public areas within area of observation point)</li> </ul>	e rises vertically ion of wind shown by smoke drift, but no felt on face; leaves rustle, ordinary vane n s and small twigs in constant motion e dust and loose paper; small branches are trees in leaf begin to sway branches in motion; umbrellas used with- e trees in motion; inconvenience felt when	Twigs break off trees; progress generally impeded         Slight structural damage occurs (chimney pots and slates removed)         Do any of the odours experienced on-site match in character         Li         those recorded during the off-site survey?	MAA	Potential on-site odour sources identified:		
Your Reference	29396	Observer is free from medical conditions (cold, sore throat, sinus trouble)?	Yes No	Note 1: Observation 1 Remote (no housing, cor 2 Low sensitivity (hon hous 3 Moderate sensitivity (housing 5 Extra sensitive (complaii point)	Note 2: Wind Strength0Calm0Calm1Light air2Light Breeze3Gentle Breeze4Moderate Breeze5Fresh Breeze6Strong Breeze7Near Gale	8 Gale Tw 9 Strong Gale Sli Start Time: phose reco	NA	Finish Time: Potential		
General		sessment uration		ield observations	Notes (the ranking systems in these notes must be used when completing the field observations table overleaf) Z – 0 w 4 w					

Annex A: Odour Investigation Field Record Sheet

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	Observer Location		Wind (nd = detectable)	Wind (nd = if not detectable)		Time	e	Odour Kaung	ing	Odour Description Comments
Parameter	Name of household / commercial site (describe so that location can be easily identified again by a third party)	Sensitivity (1-5) Note 1	Direction from which wind blows	Orientation (Observer Vs facility)	Strength Strength	Start Time (24hr clock)	Period of observation	Odour Persistence Note 4	Odour Intensity Note 5	Description of any odours, other source(s) of odours etc, (Also note variable weather conditions etc)
Thresholds that could indicate nuisance	I	۲۷ ع	1	ton ro WG xorqqA	I	I	1	1 or 2	5	Guide- A location where the score meets or exceeds all the threshold values may be deemed subject to nuisance/significant impairment, particularly if the observations are supported by public complaints on impact, frequency and duration of odours.
	A95	1	NAAN	MIA	2	10.20	S	0	0	
	A84	M	WIRN	ANN	2	10.30	5	0	0	
S	FON	.2	MIRIN	FIRM	2	10.40	S	0	0	
noitsv	ABS	2	New	NIA	2	10.45	5	0	0	
aset	A QY	7	HER	AIA	2	10,55	S	0	0	
o blsif	A 810	2	MAIL	NJA	7	11.00	2	0	0	
I	100	2	Stift	ALM	)	11,15	5	0	0	
	AR12	M	WLX.	NJA	1	11,20	5	-(	20	ODEUR FROM ADJAIENT BUNLOIAL
	ARK	2	WHAN	NA	1	11,35	5	2	)	

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General	Your Reference		Site Licence No.		Assessment by	nt by		Date of Assessment
	19396		ANN		Your name (other Inve	Your name: NICK OWAN (other Investigator(s) present): N/A		t107 722 11
sessment aration	Observer is free from medical conditions (cold, sore throat, sinus trouble)?	ee from tions oat,	Observer abstinence (30 min) from smoking, flavoured drinks, scented toiletries and deodorisers?	Reason for odour assessment – Complaint verification; routine; other (specify).	dour Complaint routine; y).	Map – Has a map showing assessment locations been attached?	Weather Conditions Note 3 (record wind info on page 2):	ons Note 3 îo on page 2):
	Yes	No	Yes	PLANNING APPLICATION	PLICATION	Yes No	DRY , HOT	Joh
field observations	Note 1: Obser 1 Remote (no ho 2 Low sensitivity 3 Moderate sensitivity 4 High sensitivity 5 Extra sensitive point)	rvation p ousing, comm y (no housin sitivity (housing, c ty (housing, c	<ul> <li>Note 1: Observation point Sensitivity (assuming detectable, if not then 0)</li> <li>Remote (no housing, commercial/industrial premises or public area within 100m of observation point)</li> <li>Low sensitivity (no housing, commercial/industrial premises or public area within 100m of observation point)</li> <li>Moderate sensitivity (housing commercial/industrial premises or public area within 100m of observation point)</li> <li>High sensitivity (housing commercial/industrial premises or public area within 100m of observation point)</li> <li>Extra sensitive (complaints arising from residents, business and users of public areas within area of observation point)</li> <li>point)</li> </ul>	the second secon	then () ation point) ( observation point) of observation point) ervation point) area of observation	Note 3: Weather Conditions         Precipitation – dry, rained recently, drizzle, raining, foggy         Temperature – cold, cool, warm, hot         Temperature – cold, cool, warm, hot         Note 4: Odour Persistence         0       No Odour         1       Intermittent (detected intermittently during the period of assessment)         2       Persistent (detected throughout the period of assessment)	ditions nuty, drizzle, raining, fogg n, hot tence mittently during the perio nout the period of assessm	gy d of assessment) nent)
Votes (the ranking system) used when completing the table overle	Note 2: Wind Strength           0         Calm         Smok           1         Light air         Direck           2         Light Breeze         Wind           3         Gentle Breeze         Leave           4         Moderate Breeze         Raise:           5         Fresh Breeze         Small           6         Strong Breeze         Small           7         Near Gale         Whole           8         Gale         Woole	<ul> <li>Strengtl</li> <li>Strong</li> <li>Smol</li> <li>Direc</li> <li>Vind</li> <li>Leave</li> <li>Smail</li> <li>Large</li> <li>Whol</li> <li>Twig</li> <li>Strong</li> </ul>	e rises vertically ion of wind shown by smoke drift, but no felt on face; leaves rustle, ordinary vane n s and small twigs in constant motion s dust and loose paper; small branches are trees in leaf begin to sway branches in motion; umbrellas used with, branches in motion; inconvenience felt when c break off trees; progress generally imped structural damage occurs (chimney roots	t wind vanes noved by wind moved difficulty against the walking against wine dalates removed)	buiwd	<ul> <li>Note 5: Odour Intensity</li> <li>0 No Detectable Odour</li> <li>1 Faint Odour (barely detectable, need to stand still and inhale facing into wind)</li> <li>2 Moderate Odour (easily detectable while walking and breathing normally, possibly offensive)</li> <li>3 Strong Odour (bearable but offensive – might make clothes / hair smell?)</li> <li>4 Very Strong Odour (unbearable, difficult to remain in area affected by odour)</li> </ul>	ifty able, need to stand still an tectable while walking ar t offensive – might make rable, difficult to remain	<b>te 5: Odour Intensity</b> No Detectable Odour Faint Odour (barely detectable, need to stand still and inhale facing into wind) Moderate Odour (barely detectable while walking and breathing normally, possibly offensive) Strong Odour (bearable but offensive – might make clothes / hair smell?) Very Strong Odour (unbearable, difficult to remain in area affected by odour)
our Survey) Bation · Source	the second s	Do any of ti those record	Do any of the odours experienced on-site match in character those recorded during the off-site survey? $W_1 A$		List areas Inspected:		What relevant activities were occurrin during the off-site odour assessment?	What relevant activities were occurring on-site during the off-site odour assessment?
Invest	Finish Time: P	Potential or	Potential on-site odour sources identified: $M/A$	-			KIN	

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	Parameter	Thresholds that stacibni bluoc sance			S	noits	pserv	o bləi	A		
Observer Location	Name of household / commercial site (describe so that location can be easily identified again by a third party)	I	ARJ	204	AQI						
	Sensitivity (1-5) Note 1	3	4	£	S						
detectable)	Direction from which wind blows	I	M	M	Z						
wind (nd = 11 not detectable)	Orientation (Observer Vs facility)	Approx DW or not	NFA	NIA	NIA					_	
	Strength Strength	- I	1	I	-						
TILLE	Start Time (24hr clock)	I	H.45	00'11	12.10			411	11 911		
	Period of observation	1	S	5	3		e		IN IN		
9	Odour Persistence (0-2) Note 4	1 or 2	0	0	0				<b>7</b>		
8	Odour Intensity (0-4) Note 5	×1 2	0	0	Ø						
Odour Description Comments	Description of any odours, other source(s) of odours etc, (Also note variable weather conditions etc)	Guide- A location where the score meets or exceeds all the threshold values may be deemed subject to nuisance/significant impairment, particularly if the observations are supported by public complaints on impact, frequency and duration of odours.									

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