



January 2016

BEVERLEY ASSESSMENT AREA, SOUTH AUSTRALIA

Stage 4B Indoor Air Data Report (September 2015)

Submitted to:
Environment Protection Authority
Level 8, 250 Victoria Square
ADELAIDE SA 5000

REPORT



Accredited for compliance with ISO/IEC 17025. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Report Number. 1418522-025-R-Rev0b

Distribution:

Electronic Copy - Environment Protection Authority
Electronic Copy - Golder Associates Pty Ltd





Record of Issue

Company	Client Contact	Version	Date Issued	Method of Delivery
Environment Protection Authority	Mark Hassam	Rev A	December 2015	Mark.hassam@sa.gov.au
Environment Protection Authority	Dale McGill	Rev 0b	January 2016	Dale.McGill@sa.gov.au



Table of Contents

1.0 INTRODUCTION	1
2.0 TEST METHODS	2
2.1 Indoor Air Monitoring	2
2.1.1 SUMMA Canister	2
3.0 MEASUREMENT UNCERTAINTY	3
3.1 SUMMA Canister	3
4.0 DATA	4
5.0 QUALITY CONTROL MEASURES	5
5.1 Field Duplicates	5
5.2 Field Blanks	5
5.3 Ambient Air Sampling	5
5.4 Laboratory Blanks.....	5
5.5 Laboratory Analytical Recoveries	6
6.0 IMPORTANT INFORMATION RELATING TO THIS REPORT	7
TABLES	
Table 1: Indoor Air Monitoring Programme	4
Table 2: QC Measures	5
FIGURES	
Figure 1: Barometric Pressure recorded at Adelaide Airport (28/09/2015 – 29/09/2015).....	4
APPENDICES	
APPENDIX A	
Figure	
APPENDIX B	
Summary Tables of Laboratory Results	
APPENDIX C	
Lab Certificates (including COC)	
APPENDIX D	
Important Information Relating to this Report	



1.0 INTRODUCTION

Golder Associates Pty. Ltd. (Golder) was commissioned by the Environment Protection Authority (EPA; South Australia) to undertake an indoor air monitoring programme at selected residential properties located within the Beverley Assessment Area, South Australia (refer to Appendix A, Figure 1).

The monitoring programme consisted of indoor air sampling at two properties (10 locations) by SUMMA canister on 28-29 September 2015. All samples were analysed for chlorinated volatile organic compounds (VOCs).



2.0 TEST METHODS

Golder holds National Association of Testing Authorities (NATA) accreditation for the sampling methodologies used in this programme (NATA Laboratory Accreditation No. 1910).

2.1 Indoor Air Monitoring

2.1.1 SUMMA Canister

The procedure for sampling VOCs using evacuated canisters, and for the subsequent analysis, is described in USEPA Method TO-15. The method involved the collection of whole air samples in passivated electropolished stainless steel canisters. The VOCs were subsequently separated by gas chromatography (GC), and measured by mass selective (MS) detector or multi-detector techniques.

The sampling train consisted of flow controller and a 6 L SUMMA Canister. Samples were collected over a nominal 24 hr period and positioned at a height estimated to be within the breathing zone of residents. For each property, five samples were collected from separate rooms.

Sample analysis was conducted by Envirolab Services (NATA Accreditation No. 2901) in accordance with modified USEPA Method TO15 (and method USEPA 18 for methylene chloride).



3.0 MEASUREMENT UNCERTAINTY

3.1 SUMMA Canister

USEPA Method TO-15 cites the measurement precision and uncertainty for two ambient air quality studies conducted in the United States of America. The average replicate precision for a range of 16 compounds in both studies was 15%.

The reported measurement uncertainties for these studies ranged between $\pm 4\%$ and $\pm 31\%$. The average measurement uncertainty for both studies for the range of 16 compounds was $\pm 11\%$.¹

¹ United States Environmental Protection Agency (USEPA) *Compendium Method TO-15, Determination Of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS) (January 1999)*



4.0 DATA

Monitoring programme results are provided in Appendix A. A summary of the indoor air concentrations of trichloroethene (TCE) at each location is presented in Table 1. Laboratory reports are provided in Appendix B.

Barometric pressure recorded at Bureau of Meteorology (BOM) station Adelaide Airport (approximately 5 km from the site) during the monitoring programme is provided in Figure 1 below.

Table 1: Indoor Air Monitoring Programme

Location	Sample Description	Sampling Date	TCE Concentration (µg/m ³)*
Property 17	Location 1	28/09//2015 – 29/09/2015	24
	Location 2	28/09//2015 – 29/09/2015	22
	Location 3	28/09//2015 – 29/09/2015	32
	Location 4	28/09//2015 – 29/09/2015	15
	Location 5	28/09//2015 – 29/09/2015	12
Property 18	Location 1	28/09//2015 – 29/09/2015	<2
	Location 2	28/09//2015 – 29/09/2015	<2
	Location 3	28/09//2015 – 29/09/2015	<2
	Location 4	28/09//2015 – 29/09/2015	<2
	Location 5	28/09//2015 – 29/09/2015	2.4

* Results reported at 0°C and 101.3kPa.

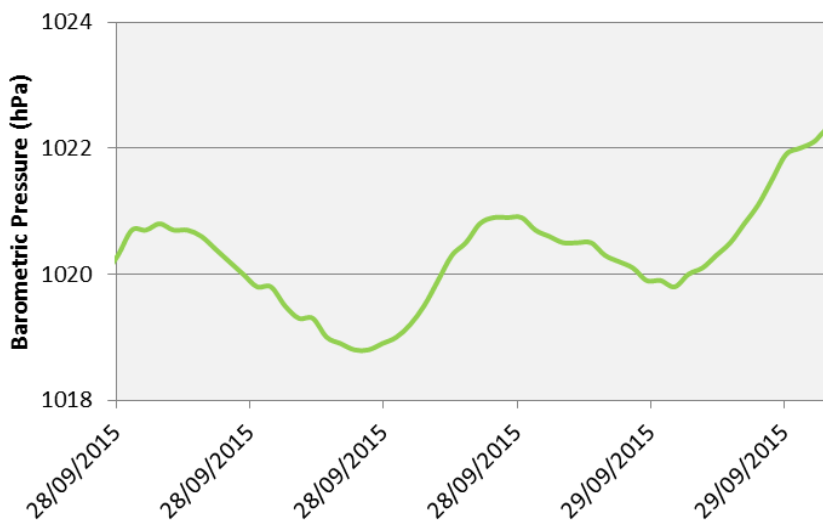


Figure 1: Barometric Pressure recorded at Adelaide Airport (28/09/2015 – 29/09/2015).



5.0 QUALITY CONTROL MEASURES

The quality control (QC) measures taken throughout the monitoring program include replicate sampling, method blanks, ambient air sampling, analytical recoveries and sampling media certification.

Details of the quality control measures taken, together with the data quality objectives (DQO) are listed in Table 2.

Table 2: QC Measures

Measure	Frequency	Quality Objective (limit)
Field duplicates	1 in 20 samples or per event	<100% RPD
Field blanks	1 in 20 samples or per event	NA
Ambient air (background) sampling	1 per event	NA
Canister cleaning	10% canisters to be certified clean	NA
Surrogate Spike	1 in 20 samples	70 – 130%
Laboratory Control Sample (LCS)	1 in 20 samples	70 – 130%
Laboratory Blank	1 in 20 samples	NA
Laboratory Duplicate	1 in 20 samples	Method Specific

A small vacuum is maintained in canisters at the completion of sampling. This is recorded and verified by the laboratory prior to analysis to check that the integrity of the sample has been maintained (the canister has not leaked) during transit.

This check was not performed on Sample no. 15-1185 as the canister was evacuated to atmospheric pressure during sampling.

QA/QC data was assessed and found to be compliant with the programme objectives and therefore the results of the sampling programme are accepted as valid.

5.1 Field Duplicates

A field duplicate was collected in Location 5 of Property 13 (15-1196). All analytes were within the DQO of <100% RPD. Field duplicate results are presented in Appendix B.

5.2 Field Blanks

No field blank was collected at this stage. A field blank was anticipated to be collected concurrently to the sampling of two additional properties for which access was not granted.

5.3 Ambient Air Sampling

Ambient air sample no. 15-1190 was collected on Property 12 to compare to indoor air results. All analytes were reported below the reporting limit. Ambient air results are presented in Appendix B.

5.4 Laboratory Blanks

Laboratory blanks were analysed to assess if contaminants were present within the laboratory instrumentation and sampling media.

Laboratory blanks returned results below the reporting limit for all analytes.



5.5 Laboratory Analytical Recoveries

The laboratory determines analytical recoveries from the sampling media by spiking the samples with surrogate standards, preparing laboratory control standards (LCS) and laboratory control standards duplicates (LCSD).

All LCS and LCSD analytical recoveries met the DQO.



6.0 IMPORTANT INFORMATION RELATING TO THIS REPORT

Your attention is drawn to the document, *Important Information Relating to this Report* (LEG04, RL2), which is attached to this report (Appendix D). The statements presented in this document are intended to advise you of what your realistic expectations of this technical report should be. The document is not intended to reduce the level of responsibility accepted by Golder Associates, but rather to ensure that all parties who may rely on this letter are aware of the responsibilities each assumes in so doing. We would be pleased to answer any questions the reader may have regarding this document.



Report Signature Page

A handwritten signature in black ink, appearing to read 'Mark Peterson'.

Mark Peterson
Senior Environmental Scientist

A handwritten signature in black ink, appearing to read 'Mark Tulau'.

Mark Tulau
Senior Environmental Scientist

JC:MJP/MT/sjm

A.B.N. 64 006 107 857

\\golder.gds\gap\adelaide\jobs-enviro\env\2015\1418522 - epa beverley gw and soil vapour assessment\correspondence out\025 stage 4b nata report\1418522-025-r-rev0b.docx



APPENDIX A

Figure



LOCATION MAP

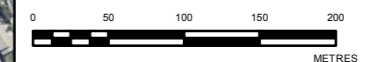


LEGEND

Assessment Area

COPYRIGHT

1. Aerial image sourced from Nearmap Pty. Ltd, aerial dated 30.08.2015, sourced 09.09.2015.
2. Roads data sourced from DPTI, Department for Transport Energy and Infrastructure, South Australian Government, sourced <http://www.dptiapps.com.au/dataportal/Roads.zip>, sourced 19.06.2014.
3. Suburb data sourced from MapInfo StreetPro.



REFERENCE SCALE: 1:5,000 (at A3)

PROJECTION: GDA 1994 MGA Zone 54

CLIENT

ENVIRONMENT PROTECTION AUTHORITY

PROJECT

STAGE 4 INDOOR AIR DATA REPORT (AUGUST-SEPTEMBER 2015)

TITLE

ASSESSMENT AREA LOCATION PLAN

CONSULTANT

YYYY-MM-DD	2015-09-21
PREPARED	KB
DESIGN	-
REVIEW	MP
APPROVED	JC

PROJECT No.
1418522

CONTROL
020-R

Rev.
0

FIGURE
1



APPENDIX B

Summary Tables of Laboratory Results



Sample Location Sample Type Sample Start Sample Finish Sample No.	Property 17 Location 1 Primary 07:53 28/09/2015 07:33 29/09/2015 15-1185	Property 17 Location 2 Primary 07:56 28/09/2015 07:36 29/09/2015 15-1186	Property 17 Location 3 Primary 07:59 28/09/2015 07:39 29/09/2015 15-1187	Property 17 Location 4 Primary 08:02 28/09/2015 07:40 29/09/2015 15-1188	Property 17 Location 5 Primary 08:06 28/09/2015 07:42 29/09/2015 15-1189	Ambient Air Primary 08:10 28/09/2015 07:46 29/09/2015 15-1190	Property 18 Location 1 Primary 09:03 28/09/2015 08:39 29/09/2015 15-1191	Property 18 Location 2 Primary 09:05 28/09/2015 08:40 29/09/2015 15-1192	Property 18 Location 3 Primary 09:07 28/09/2015 08:41 29/09/2015 15-1193	Property 18 Location 4 Primary 09:09 28/09/2015 08:42 29/09/2015 15-1194	Property 18 Location 5 Primary 09:12 28/09/2015 08:44 29/09/2015 15-1195	Property 18 Location 5 Replicate 09:11 28/09/2015 08:43 29/09/2015 15-1196
Compound	Concentration (µg/m ³)											
Chloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl Chloride	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Chloroethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Methylene Chloride	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
trans-1,2-Dichloroethene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
1,1-Dichloroethane	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
cis-1,2-Dichloroethene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Chloroform	5.3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
1,1,1-Trichloroethane	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Carbon Tetrachloride	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
1,2-Dichloroethane	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Trichloroethene	24	22	32	15	12	<2	<2	<2	<2	<2	2.4	<2
1,2-Dichloropropane	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Bromodichloromethane	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
cis-1,3-Dichloropropene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
trans-1,3-Dichloropropene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
1,1,2-Trichloroethane	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Tetrachloroethene	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Dibromochloromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Chlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
1,1,2,2-Tetrachloroethane	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
1,3-Dichlorobenzene	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
1,4-Dichlorobenzene	<4	8.3	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
alpha-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
1,2-Dichlorobenzene	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
1,2,4-Trichlorobenzene	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Hexachlorobutadiene	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6

Concentrations expressed at 0°C and 101.3 kPa



APPENDIX C

Lab Certificates (including COC)

CANISTER CHAIN OF CUSTODY RECORD

Client Name	Golder Associates	Project Contact	Mark Peterson	Quote No	150805A
Client Address	118 Franklin St Adelaide 5000 SA	Contact Phone No	08 3243 2100	Date Results Required	1 day / 2 days / 3 days / Standard
		Contact Mobile No	0405 009 686		
Project Name	1418522 - Beverley	Results Required by	6/10/15	E-mail Report To	mepeterson@golder.com.au
Site Location	Beverley, SA	Sampled by	JC	PO No	

Client sample ID (Field location)	Canister #	Soil gas train / Mass flow controller #	Leak Test Passed	PID Reading (ppmv)	Date of Collection	Collection Time		Canister vacuum (Hg")		Analysis requested						
						Time on	Time off	Initial	Final	TO-15	TPH	5-Sulfides	Ozone precursors	RGA gases	Sec. attached	
1-15-1185	H2841	832	-	-	28-29/09/15			-30	0							✓
2-15-1186	H3344	829	-	-	"			-30	-12							✓
3-15-1187	H2844	821	-	-	"			-30	-10							✓
4-15-1188	H2876	1553	-	-	"			-30	-5							✓
5-15-1189	H3352	393	-	-	"			+5	+10							✓
6-15-1190	H2877	1540	-	-	"			-30	-14							✓
7-15-1191	H2864	818	-	-	"			-30	-30							✓
Relinquished by Print Name			Date & Time			Received by		Lab		Date & Time		Notes:				
Jennifer Catherine			29/09/15			JYH		ELC		11:51 09:30						
[Signature]			[Signature]			[Signature]				[Signature]						

CANISTER CHAIN OF CUSTODY RECORD

Client Name	Golder Associates	Project Contact	Mark Peterson	Quote No	15080 SA
Client Address	118 Franklin St Adelaide 5000 SA	Contact Phone No	08 8213 2100	Date Results Required	1 day / 2 days / <u>3 days</u> / Standard
		Contact Mobile No	0405 009 636		
Project Name	1418522 - Beverley	Results Required by	6/10/15	E-mail Report To	mark.peterson@golder.com.au
Site Location	Beverley, SA	Sampled by	JC	PO No	

135254

Client sample ID (Field location)	Canister #	Soil gas train / Mass flow controller #	Leak Test Passed	PID Reading (ppmv)	Date of Collection	Collection Time		Canister vacuum (Hg")		Analysis requested						
						Time on	Time off	Initial	Final	TO-15	TPH	5-Sulfides	Ozone precursors	RGA gases	See attached list	
8-15-1192	A3624	828	-	-	28-29/09/15			-30	-15							✓
9-15-1193	A2861	397	-	-	"			-30	-20							✓
10-15-1194	A2843	505	-	-	"			-30	-10							✓
11-15-1195	0349	1539	-	-	"			-30	-8							✓
12-15-1196	0337	493	-	-	"			-30	-8							✓

Relinquished by	Jennifer	Date & Time	29/09/15	Received by	Lab	Date & Time	11/10/15 09:30	Notes:
- Print Name	Catherine	Signature		Print Name	ELS	Signature		



CERTIFICATE OF ANALYSIS

135254

Client:

Golder Associates Pty Ltd (Adelaide)

199 Franklin St

Adelaide

SA 5000

Attention: Mark Peterson

Sample log in details:

Your Reference: **1418522-Beverley**
No. of samples: 12 Air Samples
Date samples received / completed instructions received 01/10/15 / 01/10/15
R01: The PQL of TCE has been reduced to 0.3 ppbv and 1.6 ug/m3.

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data. Samples were analysed as received from the client. Results relate specifically to the samples as received. Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date: 7/10/15 / 12/10/15

Date of Preliminary Report: Not Issued

NATA accreditation number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:


Jacinta Hurst
Laboratory Manager

TO15 in Canisters ug/m3 Our Reference: Your Reference Type of sample	UNITS ----- -----	135254-1 15-1185 Air	135254-2 15-1186 Air	135254-3 15-1187 Air	135254-4 15-1188 Air	135254-5 15-1189 Air
Vacuum before Shipment	Hg"	-30	-30	-30	-30	-30
Vacuum before Analysis	Hg"	0	-15	-10	-4	-9
Date prepared	-	2/10/2015	2/10/2015	2/10/2015	2/10/2015	2/10/2015
Date analysed	-	2/10/2015	2/10/2015	2/10/2015	2/10/2015	2/10/2015
Chloromethane	µg/m ³	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	µg/m ³	<1.3	<1.3	<1.3	<1.3	<1.3
Chloroethane	µg/m ³	<1.3	<1.3	<1.3	<1.3	<1.3
1,1-Dichloroethene	µg/m ³	<2.0	<2.0	<2.0	<2.0	<2.0
Methylene chloride (Dichloromethane)	µg/m ³	<20	<20	<20	<20	<20
trans-1,2-dichloroethene	µg/m ³	<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloroethane	µg/m ³	<2.0	<2.0	<2.0	<2.0	<2.0
cis-1,2-Dichloroethene	µg/m ³	<2.0	<2.0	<2.0	<2.0	<2.0
Chloroform	µg/m ³	<2.4	4.9	<2.4	<2.4	<2.4
1,1,1-Trichloroethane	µg/m ³	<2.7	<2.7	<2.7	<2.7	<2.7
1,2-Dichloroethane	µg/m ³	<2.0	<2.0	<2.0	<2.0	<2.0
Carbon tetrachloride	µg/m ³	<3.1	<3.1	<3.1	<3.1	<3.1
Trichloroethene	µg/m ³	22	20	29	14	11
1,2-Dichloropropane	µg/m ³	<2.3	<2.3	<2.3	<2.3	<2.3
Bromodichloromethane	µg/m ³	<3.4	<3.4	<3.4	<3.4	<3.4
cis-1,3-Dichloropropene	µg/m ³	<2.3	<2.3	<2.3	<2.3	<2.3
trans-1,3-Dichloropropene	µg/m ³	<2.3	<2.3	<2.3	<2.3	<2.3
1,1,2-Trichloroethane	µg/m ³	<2.7	<2.7	<2.7	<2.7	<2.7
Dibromochloromethane	µg/m ³	<1.6	<1.6	<1.6	<1.6	<1.6
Tetrachloroethene	µg/m ³	<3.4	<3.4	<3.4	<3.4	<3.4
Chlorobenzene	µg/m ³	<2.3	<2.3	<2.3	<2.3	<2.3
1,1,2,2-Tetrachloroethane	µg/m ³	<3.4	<3.4	<3.4	<3.4	<3.4
1,3-Dichlorobenzene	µg/m ³	<3.0	<3.0	<3.0	<3.0	<3.0
Benzyl chloride	µg/m ³	<2.6	<2.6	<2.6	<2.6	<2.6
1,4-Dichlorobenzene	µg/m ³	<3.0	7.6	<3.0	<3.0	<3.0
1,2-Dichlorobenzene	µg/m ³	<3.0	<3.0	<3.0	<3.0	<3.0
1,2,4-Trichlorobenzene	µg/m ³	<3.7	<3.7	<3.7	<3.7	<3.7
Hexachloro- 1,3-butadiene	µg/m ³	<5.3	<5.3	<5.3	<5.3	<5.3
Surrogate-Bromochloromethane	% rec	101	96	97	92	84
Surrogate-1,4-Difluorobenzene	% rec	92	92	91	84	81
Surrogate-Chlorobenzene-D5	% rec	92	91	89	84	82

TO15 in Canisters ug/m3						
Our Reference:	UNITS	135254-6	135254-7	135254-8	135254-9	135254-10
Your Reference	-----	15-1190	15-1191	15-1192	15-1193	15-1194
Type of sample	-----	Air	Air	Air	Air	Air
Vacuum before Shipment	Hg"	-30	-30	-30	-30	-30
Vacuum before Analysis	Hg"	-13	-15	-14	-1	-8
Date prepared	-	2/10/2015	2/10/2015	2/10/2015	2/10/2015	2/10/2015
Date analysed	-	2/10/2015	2/10/2015	2/10/2015	2/10/2015	2/10/2015
Chloromethane	µg/m ³	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	µg/m ³	<1.3	<1.3	<1.3	<1.3	<1.3
Chloroethane	µg/m ³	<1.3	<1.3	<1.3	<1.3	<1.3
1,1-Dichloroethene	µg/m ³	<2.0	<2.0	<2.0	<2.0	<2.0
Methylene chloride (Dichloromethane)	µg/m ³	<20	<20	<20	<20	<20
trans-1,2-dichloroethene	µg/m ³	<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloroethane	µg/m ³	<2.0	<2.0	<2.0	<2.0	<2.0
cis-1,2-Dichloroethene	µg/m ³	<2.0	<2.0	<2.0	<2.0	<2.0
Chloroform	µg/m ³	<2.4	<2.4	<2.4	<2.4	<2.4
1,1,1-Trichloroethane	µg/m ³	<2.7	<2.7	<2.7	<2.7	<2.7
1,2-Dichloroethane	µg/m ³	<2.0	<2.0	<2.0	<2.0	<2.0
Carbon tetrachloride	µg/m ³	<3.1	<3.1	<3.1	<3.1	<3.1
Trichloroethene	µg/m ³	<1.6	<1.6	<1.6	<1.6	<1.6
1,2-Dichloropropane	µg/m ³	<2.3	<2.3	<2.3	<2.3	<2.3
Bromodichloromethane	µg/m ³	<3.4	<3.4	<3.4	<3.4	<3.4
cis-1,3-Dichloropropene	µg/m ³	<2.3	<2.3	<2.3	<2.3	<2.3
trans-1,3-Dichloropropene	µg/m ³	<2.3	<2.3	<2.3	<2.3	<2.3
1,1,2-Trichloroethane	µg/m ³	<2.7	<2.7	<2.7	<2.7	<2.7
Dibromochloromethane	µg/m ³	<1.6	<1.6	<1.6	<1.6	<1.6
Tetrachloroethene	µg/m ³	<3.4	<3.4	<3.4	<3.4	<3.4
Chlorobenzene	µg/m ³	<2.3	<2.3	<2.3	<2.3	<2.3
1,1,2,2-Tetrachloroethane	µg/m ³	<3.4	<3.4	<3.4	<3.4	<3.4
1,3-Dichlorobenzene	µg/m ³	<3.0	<3.0	<3.0	<3.0	<3.0
Benzyl chloride	µg/m ³	<2.6	<2.6	<2.6	<2.6	<2.6
1,4-Dichlorobenzene	µg/m ³	<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene	µg/m ³	<3.0	<3.0	<3.0	<3.0	<3.0
1,2,4-Trichlorobenzene	µg/m ³	<3.7	<3.7	<3.7	<3.7	<3.7
Hexachloro- 1,3-butadiene	µg/m ³	<5.3	<5.3	<5.3	<5.3	<5.3
Surrogate-Bromochloromethane	% rec	84	81	91	82	76
Surrogate-1,4-Difluorobenzene	% rec	79	77	87	73	70
Surrogate-Chlorobenzene-D5	% rec	80	78	87	74	72

TO15 in Canisters ug/m3	UNITS	135254-11	135254-12
Our Reference:	-----	15-1195	15-1196
Your Reference	-----	Air	Air
Type of sample			
Vacuum before Shipment	Hg"	-30	-30
Vacuum before Analysis	Hg"	-6	-9
Date prepared	-	2/10/2015	2/10/2015
Date analysed	-	2/10/2015	2/10/2015
Chloromethane	µg/m ³	<1.0	<1.0
Vinyl chloride	µg/m ³	<1.3	<1.3
Chloroethane	µg/m ³	<1.3	<1.3
1,1-Dichloroethene	µg/m ³	<2.0	<2.0
Methylene chloride (Dichloromethane)	µg/m ³	<20	<20
trans-1,2-dichloroethene	µg/m ³	<2.0	<2.0
1,1-Dichloroethane	µg/m ³	<2.0	<2.0
cis-1,2-Dichloroethene	µg/m ³	<2.0	<2.0
Chloroform	µg/m ³	<2.4	<2.4
1,1,1-Trichloroethane	µg/m ³	<2.7	<2.7
1,2-Dichloroethane	µg/m ³	<2.0	<2.0
Carbon tetrachloride	µg/m ³	<3.1	<3.1
Trichloroethene	µg/m ³	2.2	<1.6
1,2-Dichloropropane	µg/m ³	<2.3	<2.3
Bromodichloromethane	µg/m ³	<3.4	<3.4
cis-1,3-Dichloropropene	µg/m ³	<2.3	<2.3
trans-1,3-Dichloropropene	µg/m ³	<2.3	<2.3
1,1,2-Trichloroethane	µg/m ³	<2.7	<2.7
Dibromochloromethane	µg/m ³	<1.6	<1.6
Tetrachloroethene	µg/m ³	<3.4	<3.4
Chlorobenzene	µg/m ³	<2.3	<2.3
1,1,2,2-Tetrachloroethane	µg/m ³	<3.4	<3.4
1,3-Dichlorobenzene	µg/m ³	<3.0	<3.0
Benzyl chloride	µg/m ³	<2.6	<2.6
1,4-Dichlorobenzene	µg/m ³	<3.0	<3.0
1,2-Dichlorobenzene	µg/m ³	<3.0	<3.0
1,2,4-Trichlorobenzene	µg/m ³	<3.7	<3.7
Hexachloro- 1,3-butadiene	µg/m ³	<5.3	<5.3
Surrogate-Bromochloromethane	% rec	94	78
Surrogate-1,4-Difluorobenzene	% rec	89	73
Surrogate-Chlorobenzene-D5	% rec	88	73

TO15 in Canisters/Bags Our Reference: Your Reference Type of sample	UNITS ----- -----	135254-1 15-1185 Air	135254-2 15-1186 Air	135254-3 15-1187 Air	135254-4 15-1188 Air	135254-5 15-1189 Air
Vacuum before Shipment	Hg"	-30	-30	-30	-30	-30
Vacuum before Analysis	Hg"	0	-15	-10	-4	-9
Date prepared	-	2/10/2015	2/10/2015	2/10/2015	2/10/2015	2/10/2015
Date analysed	-	2/10/2015	2/10/2015	2/10/2015	2/10/2015	2/10/2015
Chloromethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride (Dichloromethane)	ppbv	<5	<5	<5	<5	<5
trans-1,2-dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroform	ppbv	<0.5	1.0	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	ppbv	4.1	3.8	5.4	2.6	2.1
1,2-Dichloropropane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Benzyl chloride	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ppbv	<0.5	1.3	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Hexachloro-1,3-butadiene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate-Bromochloromethane	% rec	101	96	97	92	84
Surrogate-1,4-Difluorobenzene	% rec	92	92	91	84	81
Surrogate-Chlorobenzene-D5	% rec	92	91	89	84	82

TO15 in Canisters/Bags Our Reference: Your Reference Type of sample	UNITS ----- -----	135254-6 15-1190 Air	135254-7 15-1191 Air	135254-8 15-1192 Air	135254-9 15-1193 Air	135254-10 15-1194 Air
Vacuum before Shipment	Hg"	-30	-30	-30	-30	-30
Vacuum before Analysis	Hg"	-13	-15	-14	-1	-8
Date prepared	-	2/10/2015	2/10/2015	2/10/2015	2/10/2015	2/10/2015
Date analysed	-	2/10/2015	2/10/2015	2/10/2015	2/10/2015	2/10/2015
Chloromethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride (Dichloromethane)	ppbv	<5	<5	<5	<5	<5
trans-1,2-dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroform	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	ppbv	<0.3	<0.3	<0.3	<0.3	<0.3
1,2-Dichloropropane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Benzyl chloride	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Hexachloro- 1,3-butadiene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate-Bromochloromethane	% rec	84	81	91	82	76
Surrogate-1,4-Difluorobenzene	% rec	79	77	87	73	70
Surrogate-Chlorobenzene-D5	% rec	80	78	87	74	72

TO15 in Canisters/Bags Our Reference: Your Reference Type of sample	UNITS ----- -----	135254-11 15-1195 Air	135254-12 15-1196 Air
Vacuum before Shipment	Hg"	-30	-30
Vacuum before Analysis	Hg"	-6	-9
Date prepared	-	2/10/2015	2/10/2015
Date analysed	-	2/10/2015	2/10/2015
Chloromethane	ppbv	<0.5	<0.5
Vinyl chloride	ppbv	<0.5	<0.5
Chloroethane	ppbv	<0.5	<0.5
1,1-Dichloroethene	ppbv	<0.5	<0.5
Methylene chloride (Dichloromethane)	ppbv	<5	<5
trans-1,2-dichloroethene	ppbv	<0.5	<0.5
1,1-Dichloroethane	ppbv	<0.5	<0.5
cis-1,2-Dichloroethene	ppbv	<0.5	<0.5
Chloroform	ppbv	<0.5	<0.5
1,1,1-Trichloroethane	ppbv	<0.5	<0.5
1,2-Dichloroethane	ppbv	<0.5	<0.5
Carbon tetrachloride	ppbv	<0.5	<0.5
Trichloroethene	ppbv	0.4	<0.3
1,2-Dichloropropane	ppbv	<0.5	<0.5
Bromodichloromethane	ppbv	<0.5	<0.5
cis-1,3-Dichloropropene	ppbv	<0.5	<0.5
trans-1,3-Dichloropropene	ppbv	<0.5	<0.5
1,1,2-Trichloroethane	ppbv	<0.5	<0.5
Dibromochloromethane	ppbv	<0.5	<0.5
Tetrachloroethene	ppbv	<0.5	<0.5
Chlorobenzene	ppbv	<0.5	<0.5
1,1,2,2-Tetrachloroethane	ppbv	<0.5	<0.5
1,3-Dichlorobenzene	ppbv	<0.5	<0.5
Benzyl chloride	ppbv	<0.5	<0.5
1,4-Dichlorobenzene	ppbv	<0.5	<0.5
1,2-Dichlorobenzene	ppbv	<0.5	<0.5
1,2,4-Trichlorobenzene	ppbv	<0.5	<0.5
Hexachloro- 1,3-butadiene	ppbv	<0.5	<0.5
Surrogate-Bromochloromethane	% rec	94	78
Surrogate-1,4-Difluorobenzene	% rec	89	73
Surrogate-Chlorobenzene-D5	% rec	88	73

Method ID	Methodology Summary
TO15	USEPA TO15 - Analysis of VOC's in air following USEPA TO15 protocols
USEPA 18	Measurement of Gaseous Organic Compound Emissions by Gas Chromatography using USEPA m18.

Client Reference: 1418522-Beverley

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
TO15 in Canisters ug/m3						Base II Duplicate II %RPD		
Vacuum before Shipment	Hg"			[NT]	135254-1	-30 -30 RPD: 0	[NR]	[NR]
Vacuum before Analysis	Hg"			[NT]	135254-1	0 0	[NR]	[NR]
Date prepared	-			2/10/2015	135254-1	2/10/2015 2/10/2015	LCS-1	2/10/2015
Date analysed	-			2/10/2015	135254-1	2/10/2015 2/10/2015	LCS-1	2/10/2015
Chloromethane	µg/m ³	1.0	TO15	<1.0	135254-1	<1.0 <1.0	[NR]	[NR]
Vinyl chloride	µg/m ³	1.3	TO15	<1.3	135254-1	<1.3 <1.3	[NR]	[NR]
Chloroethane	µg/m ³	1.3	TO15	<1.3	135254-1	<1.3 <1.3	[NR]	[NR]
1,1-Dichloroethene	µg/m ³	2.0	TO15	<2.0	135254-1	<2.0 <2.0	[NR]	[NR]
Methylene chloride (Dichloromethane)	µg/m ³	20	USEPA 18	<20	135254-1	<20 <20	[NR]	[NR]
trans-1,2-dichloroethene	µg/m ³	2.0	TO15	<2.0	135254-1	<2.0 <2.0	[NR]	[NR]
1,1-Dichloroethane	µg/m ³	2.0	TO15	<2.0	135254-1	<2.0 <2.0	[NR]	[NR]
cis-1,2-Dichloroethene	µg/m ³	2.0	TO15	<2.0	135254-1	<2.0 <2.0	[NR]	[NR]
Chloroform	µg/m ³	2.4	TO15	<2.4	135254-1	<2.4 <2.4	[NR]	[NR]
1,1,1-Trichloroethane	µg/m ³	2.7	TO15	<2.7	135254-1	<2.7 <2.7	[NR]	[NR]
1,2-Dichloroethane	µg/m ³	2.0	TO15	<2.0	135254-1	<2.0 <2.0	[NR]	[NR]
Carbon tetrachloride	µg/m ³	3.1	TO15	<3.1	135254-1	<3.1 <3.1	[NR]	[NR]
Trichloroethene	µg/m ³	1.6	TO15	<1.6	135254-1	22 22 RPD: 0	[NR]	[NR]
1,2-Dichloropropane	µg/m ³	2.3	TO15	<2.3	135254-1	<2.3 <2.3	[NR]	[NR]
Bromodichloromethane	µg/m ³	3.4	TO15	<3.4	135254-1	<3.4 <3.4	[NR]	[NR]
cis-1,3-Dichloropropene	µg/m ³	2.3	TO15	<2.3	135254-1	<2.3 <2.3	[NR]	[NR]
trans-1,3-Dichloropropene	µg/m ³	2.3	TO15	<2.3	135254-1	<2.3 <2.3	[NR]	[NR]
1,1,2-Trichloroethane	µg/m ³	2.7	TO15	<2.7	135254-1	<2.7 <2.7	[NR]	[NR]
Dibromochloromethane	µg/m ³	1.6	TO15	<1.6	135254-1	<1.6 <1.6	[NR]	[NR]
Tetrachloroethene	µg/m ³	3.4	TO15	<3.4	135254-1	<3.4 <3.4	[NR]	[NR]
Chlorobenzene	µg/m ³	2.3	TO15	<2.3	135254-1	<2.3 <2.3	[NR]	[NR]
1,1,2,2-Tetrachloroethane	µg/m ³	3.4	TO15	<3.4	135254-1	<3.4 <3.4	[NR]	[NR]
1,3-Dichlorobenzene	µg/m ³	3.0	TO15	<3.0	135254-1	<3.0 <3.0	[NR]	[NR]
Benzyl chloride	µg/m ³	2.6	TO15	<2.6	135254-1	<2.6 <2.6	[NR]	[NR]
1,4-Dichlorobenzene	µg/m ³	3.0	TO15	<3.0	135254-1	<3.0 <3.0	[NR]	[NR]
1,2-Dichlorobenzene	µg/m ³	3.0	TO15	<3.0	135254-1	<3.0 <3.0	[NR]	[NR]
1,2,4-Trichlorobenzene	µg/m ³	3.7	TO15	<3.7	135254-1	<3.7 <3.7	[NR]	[NR]
Hexachloro- 1,3-butadiene	µg/m ³	5.3	TO15	<5.3	135254-1	<5.3 <5.3	[NR]	[NR]
Surrogate-Bromochloromethane	% rec		TO15	97	135254-1	101 101 RPD: 0	LCS-1	91%
Surrogate-1,4-Difluorobenzene	% rec		TO15	98	135254-1	92 92 RPD: 0	LCS-1	91%
Surrogate-Chlorobenzene-D5	% rec		TO15	99	135254-1	92 91 RPD: 1	LCS-1	90%

Client Reference: 1418522-Beverley

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results
TO15 in Canisters/Bags						Base II Duplicate II %RPD
Vacuum before Shipment	Hg"			[NT]	135254-1	-30 -30 RPD: 0
Vacuum before Analysis	Hg"			[NT]	135254-1	0 0
Date prepared	-			2/10/2015	135254-1	2/10/2015 2/10/2015
Date analysed	-			2/10/2015	135254-1	2/10/2015 2/10/2015
Chloromethane	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
Vinyl chloride	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
Chloroethane	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
1,1-Dichloroethene	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
Methylene chloride (Dichloromethane)	ppbv	5	TO15	<5	135254-1	<5 <5
trans-1,2-dichloroethene	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
1,1-Dichloroethane	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
cis-1,2-Dichloroethene	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
Chloroform	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
1,1,1-Trichloroethane	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
1,2-Dichloroethane	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
Carbon tetrachloride	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
Trichloroethene	ppbv	0.3	TO15	<0.3	135254-1	4.1 4.1 RPD: 0
1,2-Dichloropropane	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
Bromodichloromethane	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
cis-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
trans-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
1,1,2-Trichloroethane	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
Dibromochloromethane	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
Tetrachloroethene	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
Chlorobenzene	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
1,1,2,2-Tetrachloroethane	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
1,3-Dichlorobenzene	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
Benzyl chloride	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
1,4-Dichlorobenzene	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
1,2-Dichlorobenzene	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
1,2,4-Trichlorobenzene	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
Hexachloro- 1,3-butadiene	ppbv	0.5	TO15	<0.5	135254-1	<0.5 <0.5
Surrogate-Bromochloromethane	% rec		TO15	97	135254-1	101 101 RPD: 0
Surrogate-1,4-Difluorobenzene	% rec		TO15	98	135254-1	92 92 RPD: 0
Surrogate-Chlorobenzene-D5	% rec		TO15	99	135254-1	92 91 RPD: 1

QUALITY CONTROL TO15 in Canisters ug/m3	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Vacuum before Shipment	Hg"	135254-12	-30 -30 RPD: 0
Vacuum before Analysis	Hg"	135254-12	-9 -9 RPD: 0
Date prepared	-	135254-12	2/10/2015 2/10/2015
Date analysed	-	135254-12	2/10/2015 2/10/2015
Chloromethane	µg/m ³	135254-12	<1.0 <1.0
Vinyl chloride	µg/m ³	135254-12	<1.3 <1.3
Chloroethane	µg/m ³	135254-12	<1.3 <1.3
1,1-Dichloroethene	µg/m ³	135254-12	<2.0 <2.0
Methylene chloride (Dichloromethane)	µg/m ³	135254-12	<20 <20
trans-1,2-dichloroethene	µg/m ³	135254-12	<2.0 <2.0
1,1-Dichloroethane	µg/m ³	135254-12	<2.0 <2.0
cis-1,2-Dichloroethene	µg/m ³	135254-12	<2.0 <2.0
Chloroform	µg/m ³	135254-12	<2.4 <2.4
1,1,1-Trichloroethane	µg/m ³	135254-12	<2.7 <2.7
1,2-Dichloroethane	µg/m ³	135254-12	<2.0 <2.0
Carbon tetrachloride	µg/m ³	135254-12	<3.1 <3.1
Trichloroethene	µg/m ³	135254-12	<1.6 <1.6
1,2-Dichloropropane	µg/m ³	135254-12	<2.3 <2.3
Bromodichloromethane	µg/m ³	135254-12	<3.4 <3.4
cis-1,3-Dichloropropene	µg/m ³	135254-12	<2.3 <2.3
trans-1,3-Dichloropropene	µg/m ³	135254-12	<2.3 <2.3
1,1,2-Trichloroethane	µg/m ³	135254-12	<2.7 <2.7
Dibromochloromethane	µg/m ³	135254-12	<1.6 <1.6
Tetrachloroethene	µg/m ³	135254-12	<3.4 <3.4
Chlorobenzene	µg/m ³	135254-12	<2.3 <2.3
1,1,2,2-Tetrachloroethane	µg/m ³	135254-12	<3.4 <3.4
1,3-Dichlorobenzene	µg/m ³	135254-12	<3.0 <3.0
Benzyl chloride	µg/m ³	135254-12	<2.6 <2.6
1,4-Dichlorobenzene	µg/m ³	135254-12	<3.0 <3.0
1,2-Dichlorobenzene	µg/m ³	135254-12	<3.0 <3.0
1,2,4-Trichlorobenzene	µg/m ³	135254-12	<3.7 <3.7
Hexachloro- 1,3-butadiene	µg/m ³	135254-12	<5.3 <5.3
Surrogate- Bromochloromethane	% rec	135254-12	78 76 RPD: 3
Surrogate-1,4- Difluorobenzene	% rec	135254-12	73 71 RPD: 3
Surrogate-Chlorobenzene- D5	% rec	135254-12	73 71 RPD: 3

QUALITY CONTROL TO15 in Canisters/Bags	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Vacuum before Shipment	Hg"	135254-12	-30 -30 RPD: 0
Vacuum before Analysis	Hg"	135254-12	-9 -9 RPD: 0
Date prepared	-	135254-12	2/10/2015 2/10/2015
Date analysed	-	135254-12	2/10/2015 2/10/2015
Chloromethane	ppbv	135254-12	<0.5 <0.5
Vinyl chloride	ppbv	135254-12	<0.5 <0.5
Chloroethane	ppbv	135254-12	<0.5 <0.5
1,1-Dichloroethene	ppbv	135254-12	<0.5 <0.5
Methylene chloride (Dichloromethane)	ppbv	135254-12	<5 <5
trans-1,2-dichloroethene	ppbv	135254-12	<0.5 <0.5
1,1-Dichloroethane	ppbv	135254-12	<0.5 <0.5
cis-1,2-Dichloroethene	ppbv	135254-12	<0.5 <0.5
Chloroform	ppbv	135254-12	<0.5 <0.5
1,1,1-Trichloroethane	ppbv	135254-12	<0.5 <0.5
1,2-Dichloroethane	ppbv	135254-12	<0.5 <0.5
Carbon tetrachloride	ppbv	135254-12	<0.5 <0.5
Trichloroethene	ppbv	135254-12	<0.3 <0.3
1,2-Dichloropropane	ppbv	135254-12	<0.5 <0.5
Bromodichloromethane	ppbv	135254-12	<0.5 <0.5
cis-1,3-Dichloropropene	ppbv	135254-12	<0.5 <0.5
trans-1,3-Dichloropropene	ppbv	135254-12	<0.5 <0.5
1,1,2-Trichloroethane	ppbv	135254-12	<0.5 <0.5
Dibromochloromethane	ppbv	135254-12	<0.5 <0.5
Tetrachloroethene	ppbv	135254-12	<0.5 <0.5
Chlorobenzene	ppbv	135254-12	<0.5 <0.5
1,1,2,2-Tetrachloroethane	ppbv	135254-12	<0.5 <0.5
1,3-Dichlorobenzene	ppbv	135254-12	<0.5 <0.5
Benzyl chloride	ppbv	135254-12	<0.5 <0.5
1,4-Dichlorobenzene	ppbv	135254-12	<0.5 <0.5
1,2-Dichlorobenzene	ppbv	135254-12	<0.5 <0.5
1,2,4-Trichlorobenzene	ppbv	135254-12	<0.5 <0.5
Hexachloro- 1,3-butadiene	ppbv	135254-12	<0.5 <0.5
Surrogate- Bromochloromethane	% rec	135254-12	78 76 RPD: 3
Surrogate-1,4- Difluorobenzene	% rec	135254-12	73 71 RPD: 3
Surrogate-Chlorobenzene- D5	% rec	135254-12	73 71 RPD: 3

Report Comments:

LCS has been run as Ozone Precursor. The Recovery of LCS can not be reported due to they are not in the list of analytes requested.

Sample #1 received as positive pressure.

Asbestos ID was analysed by Approved Identifier:

Not applicable for this job

Asbestos ID was authorised by Approved Signatory:

Not applicable for this job

INS: Insufficient sample for this test

PQL: Practical Quantitation Limit

NT: Not tested

NA: Test not required

RPD: Relative Percent Difference

NA: Test not required

<: Less than

>: Greater than

LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.



APPENDIX D

Important Information Relating to this Report



IMPORTANT INFORMATION RELATING TO THIS REPORT

The document ("Report") to which this page is attached and which this page forms a part of, has been issued by Golder Associates Pty Ltd ("Golder") subject to the important limitations and other qualifications set out below.

This Report constitutes or is part of services ("Services") provided by Golder to its client ("Client") under and subject to a contract between Golder and its Client ("Contract"). The contents of this page are not intended to and do not alter Golder's obligations (including any limits on those obligations) to its Client under the Contract.

This Report is provided for use solely by Golder's Client and persons acting on the Client's behalf, such as its professional advisers. Golder is responsible only to its Client for this Report. Golder has no responsibility to any other person who relies or makes decisions based upon this Report or who makes any other use of this Report. Golder accepts no responsibility for any loss or damage suffered by any person other than its Client as a result of any reliance upon any part of this Report, decisions made based upon this Report or any other use of it.

This Report has been prepared in the context of the circumstances and purposes referred to in, or derived from, the Contract and Golder accepts no responsibility for use of the Report, in whole or in part, in any other context or circumstance or for any other purpose.

The scope of Golder's Services and the period of time they relate to are determined by the Contract and are subject to restrictions and limitations set out in the Contract. If a service or other work is not expressly referred to in this Report, do not assume that it has been provided or performed. If a matter is not addressed in this Report, do not assume that any determination has been made by Golder in regards to it.

At any location relevant to the Services conditions may exist which were not detected by Golder, in particular due to the specific scope of the investigation Golder has been engaged to undertake. Conditions can only be verified at the exact location of any tests undertaken. Variations in conditions may occur between tested locations and there may be conditions which have not been revealed by the investigation and which have not therefore been taken into account in this Report.

Golder accepts no responsibility for and makes no representation as to the accuracy or completeness of the information provided to it by or on behalf of the Client or sourced from any third party. Golder has assumed that such information is correct unless otherwise stated and no responsibility is accepted by Golder for incomplete or inaccurate data supplied by its Client or any other person for whom Golder is not responsible. Golder has not taken account of matters that may have existed when the Report was prepared but which were only later disclosed to Golder.

Having regard to the matters referred to in the previous paragraphs on this page in particular, carrying out the Services has allowed Golder to form no more than an opinion as to the actual conditions at any relevant location. That opinion is necessarily constrained by the extent of the information collected by Golder or otherwise made available to Golder. Further, the passage of time may affect the accuracy, applicability or usefulness of the opinions, assessments or other information in this Report. This Report is based upon the information and other circumstances that existed and were known to Golder when the Services were performed and this Report was prepared. Golder has not considered the effect of any possible future developments including physical changes to any relevant location or changes to any laws or regulations relevant to such location.

Where permitted by the Contract, Golder may have retained subconsultants affiliated with Golder to provide some or all of the Services. However, it is Golder which remains solely responsible for the Services and there is no legal recourse against any of Golder's affiliated companies or the employees, officers or directors of any of them.

By date, or revision, the Report supersedes any prior report or other document issued by Golder dealing with any matter that is addressed in the Report.

Any uncertainty as to the extent to which this Report can be used or relied upon in any respect should be referred to Golder for clarification.

At Golder Associates we strive to be the most respected global company providing consulting, design, and construction services in earth, environment, and related areas of energy. Employee owned since our formation in 1960, our focus, unique culture and operating environment offer opportunities and the freedom to excel, which attracts the leading specialists in our fields. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees who operate from offices located throughout Africa, Asia, Australasia, Europe, North America, and South America.

Africa	+ 27 11 254 4800
Asia	+ 86 21 6258 5522
Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
North America	+ 1 800 275 3281
South America	+ 55 21 3095 9500

solutions@golder.com
www.golder.com

Golder Associates Pty Ltd
118 Franklin Street
Adelaide, South Australia 5000
Australia
T: +61 8 8213 2100

