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NAS CORPUS CHRISTI
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INDOOR AIR QUALITY SCREENING LEVEL SURVEY BUILDING 8 NAS CORPUS CHRISTI TX

1/22/2003

ENSAFE, INC

Indoor Air Quality Screening Level Survey
Naval Air Station
Corpus Christi, TX
Building 8
January 22, 2003

EnSafe Project No.
0163-001-08-400-00

Prepared by:

EnSafe Inc.
5724 Summer Trees Drive
Memphis, TN 38134
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Table of Contents

EXECUTIVE SUMMARY i

1.0 INTRODUCTION 1

2.0 SAMPLING METHODOLOGY 1

3.0 ASSESSMENT RESULTS 3

4.0 SUMMARY AND RECOMMENDATIONS 4

List of Attachments

Attachment A - Air Monitoring Results

Attachment B – Laboratory Reports

Attachment C – Room Evaluation Checklists

EXECUTIVE SUMMARY

On January 22nd, EnSafe, Inc. conducted an indoor air quality screening level survey of Building 8 at the Naval Air Station in Corpus Christi, TX. The assessment included air monitoring for chlorinated solvents in 10 locations using summa canisters. The compounds of concern (COCs) were those identified in ground water near Building 8.

Analysis of samples indicated average concentrations of contaminants significantly below OSHA occupational exposure limits. It should be noted that some target compounds were detected in air samples at part per billion level concentrations. The detection of chlorinated compounds in indoor and outdoor air in industrialized areas is not uncommon. The detection of these compounds does not necessarily indicate that vapor intrusion from groundwater is occurring.

Based on the results, recommendations to control exposure to the contaminants of concern are not warranted at this time (based on similar environmental and operating conditions).

1.0 INTRODUCTION

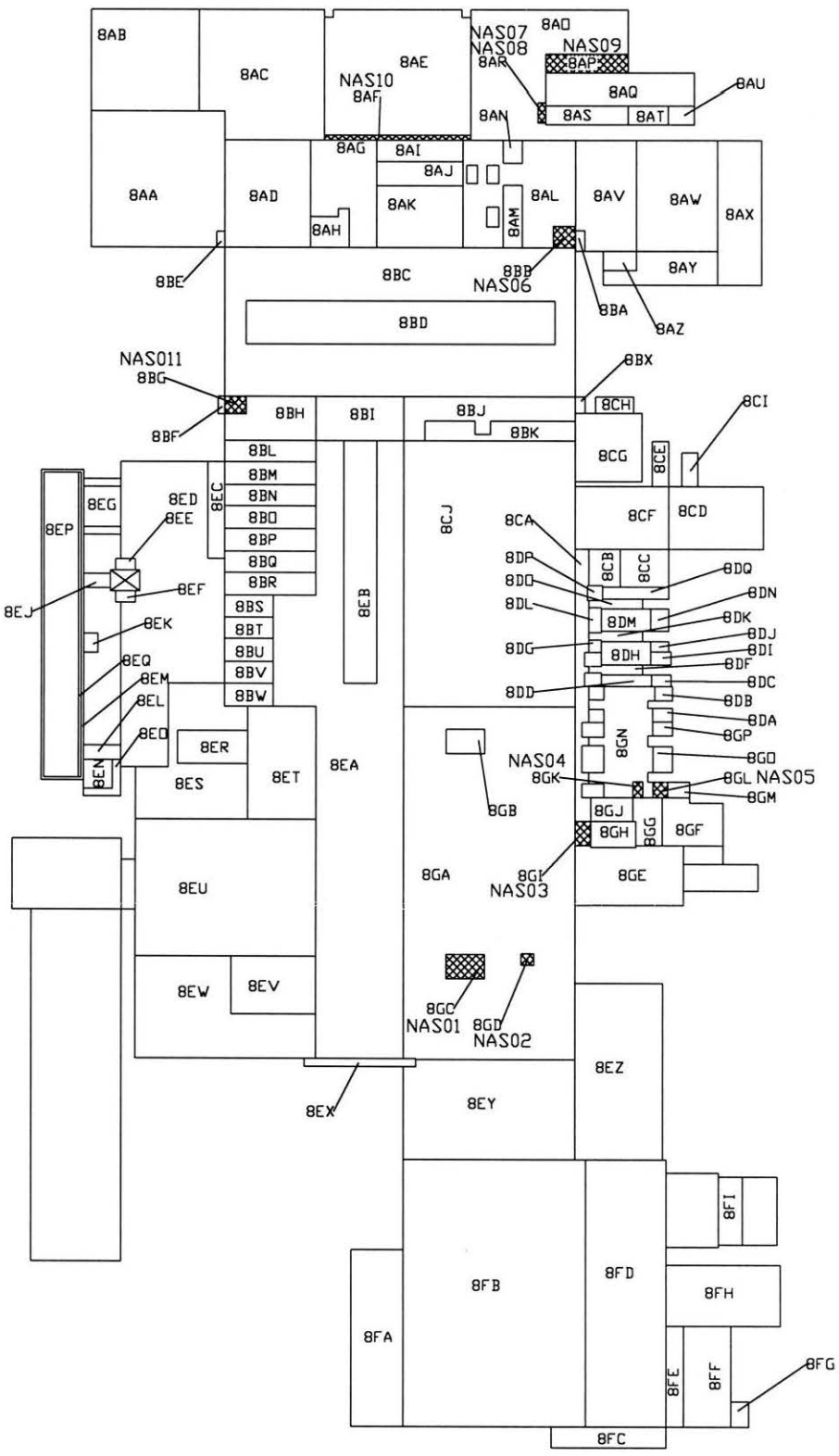
On January 22nd, EnSafe, Inc. conducted an indoor air quality screening level survey of Building 8 at the Naval Air Station in Corpus Christi, TX. The assessment included air monitoring for volatile organic compounds (VOCs) in 10 rooms of the facility. These areas were selected based on their proximity to locations identified as having elevated levels of vinyl chloride in groundwater. The Johnson/Ettinger Vapor Intrusion Model was also used to assist with identifying sample locations. The contaminants of concern (COCs) that have been identified in groundwater beneath Building 8 include: benzene, chlorobenzene, 1,3-dichlorobenzene, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, methylene chloride, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, trichloroethene, and vinyl chloride.

The Johnson/Ettinger model was not used to determine safe levels of contaminants of concern (COCs) to remain in groundwater but as a tool to determine, on a relative basis, which rooms are more likely to be impacted by vapor intrusion from groundwater.

The assessment was conducted Mr. Michael Self (a Certified Safety Professional) of EnSafe.

2.0 SAMPLING METHODOLOGY

The Johnson/Ettinger modeling results were compared with known locations of COC concentrations in groundwater. Summa evacuated canisters were used to collect air samples from each selected location over a two to four hour period. Six-liter canisters were used with a flow rate of 20 cubic centimeters per minute. Canisters were positioned to sample within the breathing zone (if possible) and minimize the potential for disturbance by local activities. Figure 2-1 shows the sample locations within Building 8.



SELECTED SAMPLE LOCATIONS

8GD ROOM IDENTIFICATION

NAS02 SAMPLE ID

SCALE FEET

0 50 100 200 400

NORTH

Naval Facilities Engineering Command • Southern Division •

FILE NAME: 0152A02

FIGURE 2-1
INDOOR AIR
SAMPLING LOCATIONS

BUILDING 8
NAS CORPUS CHRISTI

At the conclusion of the sampling event, the canisters were shipped to Severn Trent Laboratories of Austin, Texas for analysis. Analysis was completed following the guidelines of Environmental Protection Agency Method TO-15.

3.0 ASSESSMENT RESULTS

All 10 samples indicated average concentrations of the target compounds significantly below the Permissible Exposure Limits (PELs) promulgated by the Occupational Safety and health Administration (OSHA). It should be noted that the OSHA PELs are based on 8-hour time weighted average exposures. The average concentrations found in the samples are assumed to be present over the entire 8-hour, typical work shift.

The target compound results for each sample are listed in Attachment A. It should be noted that 1,3-dichlorobenzene, 1,2-dichloroethane, 1,1-dichbroethene, 1,1,2-trichloroethe and vinyl chloride were not detected in any of the samples. The remaining target compounds were detected in one or more samples at levels significantly below OSHA limits.

It should be noted that the TO-15 method includes analysis of additional volatile organics not of concern on this project. The additional analysis results can be referenced in the laboratory report (Attachment B).

Information regarding each sample location can be found on the Room Evaluation Checklists in Attachment C.

4.0 SUMMARY AND RECOMMENDATIONS

The monitoring results indicated average concentrations of the target compounds significantly below OSHA exposure limits. Based on this, recommendations to control exposure to these contaminant areas are not warranted at this time (based on similar environmental and operating conditions).

It should be noted that some target compounds were detected in air samples at part per billion level concentrations. The detection of chlorinated compounds in indoor and outdoor air in industrialized areas is not uncommon. The detection of these compounds does not necessarily indicate that vapor intrusion from groundwater is occurring.

ATTACHMENT A

Air Monitoring Results

Attachment A
Air Monitoring Results - Volatile Organic Compounds
Building 8 – NAS Corpus Christi
January 22, 2003

Canister	Location	Minutes	Result (ppbv)	Result (ppm)	OSHA PEL (ppm)	Compound
NAS01	Rm. 8GC	161	0.446	0.000446	1	Benzene
			ND	ND	75	Chlorobenzene
			ND	ND	Not established	1,3-Dichlorobenzene
			ND	ND	50	1,2-Dichloroethane
			ND	ND	1	1,1-Dichloroethene
			0.0718	0.0000718	200	cis-1,2-Dichloroethene
			2.42	0.00242	25	Methylene Chloride
			0.178	0.000178	5	1,1,2,2,-Tetrachloroethane
			ND	ND	10	1,1,2-Ttrichoroethane
			1.21	0.00121	100	Trichloroethene
			ND	ND	1	Vinyl Chloride
NAS02	Rm. 8GD	360	0.527	0.000527	1	Benzene
			ND	ND	75	Chlorobenzene
			ND	ND	Not established	1,3-Dichlorobenzene
			ND	ND	50	1,2-Dichloroethane
			ND	ND	1	1,1-Dichloroethene
			0.065	0.000065	200	cis-1,2-Dichloroethene
			1.98	0.00198	25	Methylene Chloride
			0.135	0.000135	5	1,1,2,2,-Tetrachloroethane
			ND	ND	10	1,1,2-Ttrichoroethane
			1.02	0.00102	100	Trichloroethene
			ND	ND	1	Vinyl Chloride
NAS03	Rm. 8GI	165	0.36	0.00036	1	Benzene
			ND	ND	75	Chlorobenzene
			ND	ND	Not established	1,3-Dichlorobenzene
			ND	ND	50	1,2-Dichloroethane
			ND	ND	1	1,1-Dichloroethene
			ND	ND	200	cis-1,2-Dichloroethene
			2.06	0.00206	25	Methylene Chloride
			ND	ND	5	1,1,2,2,-Tetrachloroethane
			ND	ND	10	1,1,2-Ttrichoroethane
			ND	ND	100	Trichloroethene
			ND	ND	1	Vinyl Chloride

Notes:

ppb = parts per billion by volume
ppm = parts per million
OSHA PEL = The Occupational Safety and Health Administration Permissible Exposure Limit

Attachment A
Air Monitoring Results - Volatile Organic Compounds
Building 8 – NAS Corpus Christi
January 22, 2003

Canister	Location	Minutes	Result (ppbv)	Result (ppm)	OSHA PEL (ppm)	Compound
NAS04	Rm. 8GK	169	0.402	0.000402	1	Benzene
			ND	ND	75	Chlorobenzene
			ND	ND	Not established	1,3-Dichlorobenzene
			ND	ND	50	1,2-Dichloroethane
			ND	ND	1	1,1-Dichloroethene
			ND	ND	200	cis-1,2-Dichloroethene
			0.342	0.000342	25	Methylene Chloride
			ND	ND	5	1,1,2,2,-Tetrachloroethane
			ND	ND	10	1,1,2-Ttrichoroethane
			ND	ND	100	Trichloroethene
			ND	ND	1	Vinyl Chloride
NAS05	Rm. 8GL	170	0.434	0.000434	1	Benzene
			ND	ND	75	Chlorobenzene
			ND	ND	Not established	1,3-Dichlorobenzene
			ND	ND	50	1,2-Dichloroethane
			ND	ND	1	1,1-Dichloroethene
			ND	ND	200	cis-1,2-Dichloroethene
			2.62	0.00262	25	Methylene Chloride
			ND	ND	5	1,1,2,2,-Tetrachloroethane
			ND	ND	10	1,1,2-Ttrichoroethane
			ND	ND	100	Trichloroethene
			ND	ND	1	Vinyl Chloride
NAS05	Rm. 8BB	197	0.341	0.000341	1	Benzene
			ND	ND	75	Chlorobenzene
			ND	ND	Not established	1,3-Dichlorobenzene
			ND	ND	50	1,2-Dichloroethane
			ND	ND	1	1,1-Dichloroethene
			ND	ND	200	cis-1,2-Dichloroethene
			0.719	0.000719	25	Methylene Chloride
			ND	ND	5	1,1,2,2,-Tetrachloroethane
			ND	ND	10	1,1,2-Ttrichoroethane
			1.15	0.00115	100	Trichloroethene
			ND	ND	1	Vinyl Chloride

Notes:

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Attachment A
Air Monitoring Results - Volatile Organic Compounds
Building 8 – NAS Corpus Christi
January 22, 2003

Canister	Location	Minutes	Result (ppbv)	Result (ppm)	OSHA PEL (ppm)	Compound
NAS07	Rm. 8AP	197	0.308	0.000308	1	Benzene
			ND	ND	75	Chlorobenzene
			ND	ND	Not established	1,3-Dichlorobenzene
			ND	ND	50	1,2-Dichloroethane
			ND	ND	1	1,1-Dichloroethene
			ND	ND	200	cis-1,2-Dichloroethene
			0.351	0.000351	25	Methylene Chloride
			ND	ND	5	1,1,2,2,-Tetrachloroethane
			ND	ND	10	1,1,2-Ttrichoroethane
			ND	ND	100	Trichloroethene
			ND	ND	1	Vinyl Chloride
NAS08	Rm. 8AP	197	0.286	0.000286	1	Benzene
			ND	ND	75	Chlorobenzene
			ND	ND	Not established	1,3-Dichlorobenzene
			ND	ND	50	1,2-Dichloroethane
			ND	ND	1	1,1-Dichloroethene
			ND	ND	200	cis-1,2-Dichloroethene
			3.02	0.00302	25	Methylene Chloride
			ND	ND	5	1,1,2,2,-Tetrachloroethane
			ND	ND	10	1,1,2-Ttrichoroethane
			ND	ND	100	Trichloroethene
			ND	ND	1	Vinyl Chloride
NAS09	Rm. 8AR	204	0.32	0.00032	1	Benzene
			0.24	0.00024	75	Chlorobenzene
			ND	ND	Not established	1,3-Dichlorobenzene
			ND	ND	50	1,2-Dichloroethane
			ND	ND	1	1,1-Dichloroethene
			ND	ND	200	cis-1,2-Dichloroethene
			5.25	0.00525	25	Methylene Chloride
			ND	ND	5	1,1,2,2,-Tetrachloroethane
			ND	ND	10	1,1,2-Ttrichoroethane
			0.202	0.000202	100	Trichloroethene
			ND	ND	1	Vinyl Chloride

Notes:

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Attachment A
Air Monitoring Results - Volatile Organic Compounds
Building 8 – NAS Corpus Christi
January 22, 2003

Canister	Location	Minutes	Result (ppbv)	Result (ppm)	OSHA PEL (ppm)	Compound
NAS10	Rm.8AW	204	0.338	0.000338	1	Benzene
			ND	ND	75	Chlorobenzene
			ND	ND	Not established	1,3-Dichlorobenzene
			ND	ND	50	1,2-Dichloroethane
			ND	ND	1	1,1-Dichloroethene
			ND	ND	200	cis-1,2-Dichloroethene
			7.46	0.00746	25	Methylene Chloride
			0.15	0.00015	5	1,1,2,2,-Tetrachloroethane
			ND	ND	10	1,1,2-Ttrichoroethane
			0.0664	0.0000664	100	Trichloroethene
			ND	ND	1	Vinyl Chloride
NAS11	Rm. 8GB	206	0.333	0.000333	1	Benzene
			ND	ND	75	Chlorobenzene
			ND	ND	Not established	1,3-Dichlorobenzene
			ND	ND	50	1,2-Dichloroethane
			ND	ND	1	1,1-Dichloroethene
			ND	ND	200	cis-1,2-Dichloroethene
			1.9	0.0019	25	Methylene Chloride
			ND	ND	5	1,1,2,2,-Tetrachloroethane
			ND	ND	10	1,1,2-Ttrichoroethane
			0.202	0.000202	100	Trichloroethene
			ND	ND	1	Vinyl Chloride

Notes:

ppb = parts per billion by volume
ppm = parts per million
OSHA PEL = The Occupational Safety and Health Administration Permissible Exposure Limit

ATTACHMENT B

LABORATORY REPORTS

STL Austin

Laboratory Analysis Report

February 04, 2003

Mike Self
ENSELF Inc.
4545 Fuller Drive
Suite 230
Irving, TX 75038

972-791-3222 (Business)

RE: Laboratory Reference: Indoor Air Samples for TO15 An [20301114] Ensafe

Dear Mike Self:

STL Austin received samples with a request for the analytical fractions listed below. Except as noted in the QCER(s) all laboratory quality control parameters were met. These data have been reviewed and released by the person below. Results for the indicated analytical fractions and associated quality control data are enclosed in this report.

Fraction	Status	Reported	Approval Signature - Title
VOC	ENCLOSED	02/04/2003	Carlie Shelley 2/5/03

The report is provided as indicated in the Table of Contents (Page i) and it is followed by Appendix A which includes any additional information associated with the report. This report must not be reproduced, except in full, without the written approval of the laboratory.

STL Austin appreciates your business and looks forward to serving you again. If you have any questions about your report or need any additional information, please call me at (512)310-5202 or fax inquiries to (512)244-0160.

Sincerely,

Linda Voigt
Client Services/Project Manager

SECTION I
Table of Contents

Section	Form	Page
	Cover Page - Laboratory Analytical Report	
I.	Table of Contents	i
VOC		1
II.	Report Summaries	1
	Workorder Summary	1
	Protocol Summary	1
III.	Comments and Flag Definitions	3
	Standard Flag Definitions	3
	Analyst Comments	3
	Sample Condition Comments	3
IV.	Analytical Results	4
	TO15	4
V.	Calibration and Quality Control Results	16
	TO15	16
	Calibration Verification Results	16
	Mass Spectrometer Tune	17
	Method Blank Results	18
	Duplicate Analysis Results	21
	Control Sample Results	22
VI.	Batch Summaries	24
	TO15	24
	Extraction/Digestion Batch Summary	24
	Analysis Batch Summary	25
VII.	Certifications	26

SECTION II
Report Summaries

VOC

Client Name: Ensafe
Client Code: ENSAFE

Project Name: Indoor Air Samples for TO15 An [20301114] Ensafe
Facility Name: TX

Workorder Summary

Client Sample ID	Lab Sample ID	Sample Matrix	Method Citation	Method Description
NAS01	2030111401	Air	TO15	VOC Ambient GC/MS
NAS02	2030111402	Air	TO15	VOC Ambient GC/MS
NAS03	2030111403	Air	TO15	VOC Ambient GC/MS
NAS04	2030111404	Air	TO15	VOC Ambient GC/MS
NAS05	2030111405	Air	TO15	VOC Ambient GC/MS
NAS06	2030111406	Air	TO15	VOC Ambient GC/MS
NAS07	2030111407	Air	TO15	VOC Ambient GC/MS
NAS08	2030111408	Air	TO15	VOC Ambient GC/MS
NAS09	2030111409	Air	TO15	VOC Ambient GC/MS
NAS10	2030111410	Air	TO15	VOC Ambient GC/MS
NAS11	2030111411	Air	TO15	VOC Ambient GC/MS

Protocol Summary

Client Sample ID	Lab Sample ID	Date & Time Collected	Date & Time Received	Prep Batch ID	Date & Time Prepared	Analysis Batch ID	Date & Time Analyzed	Hold Time Spec Prep Spec	Prep Actual	Analysis Spec	Analysis Actua
Method: TO15											
NAS01	2030111401	01/22/03 00:00	01/23/03 08:30	40091	02/03/03 14:55	40091	02/03/03 14:55	30D	12D	30D	12D
NAS02	2030111402	01/22/03 00:00	01/23/03 08:30	40091	02/03/03 15:54	40091	02/03/03 15:54	30D	12D	30D	12D
NAS03	2030111403	01/22/03 00:00	01/23/03 08:30	40091	02/03/03 16:53	40091	02/03/03 16:53	30D	12D	30D	12D

VOC

Protocol Summary continued -

Client Sample ID	Lab Sample ID	Date & Time Collected	Date & Time Received	Prep Batch ID	Date & Time Prepared	Analysis Batch ID	Date & Time Analyzed	Hold Time Spec Prep Spec	Prep Actual	Analysis Spec	Analysis Actua
Method: TO15 continued -											
NAS04	2030111404	01/22/03 00:00	01/23/03 08:30	40091	02/03/03 18:51	40091	02/03/03 18:51	30D	12D	30D	12D
NAS05	2030111405	01/22/03 00:00	01/23/03 08:30	40091	02/03/03 19:50	40091	02/03/03 19:50	30D	12D	30D	12D
NAS06	2030111406	01/22/03 00:00	01/23/03 08:30	40091	02/03/03 20:49	40091	02/03/03 20:49	30D	12D	30D	12D
NAS07	2030111407	01/22/03 00:00	01/23/03 08:30	40091	02/03/03 21:47	40091	02/03/03 21:47	30D	12D	30D	12D
NAS08	2030111408	01/22/03 00:00	01/23/03 08:30	40091	02/03/03 22:46	40091	02/03/03 22:46	30D	12D	30D	12D
NAS09	2030111409	01/22/03 00:00	01/23/03 08:30	40091	02/03/03 23:44	40091	02/03/03 23:44	30D	12D	30D	12D
NAS10	2030111410	01/22/03 00:00	01/23/03 08:30	40091	02/04/03 00:43	40091	02/04/03 00:43	30D	13D	30D	13D
NAS11	2030111411	01/22/03 00:00	01/23/03 08:30	40091	02/04/03 01:41	40091	02/04/03 01:41	30D	13D	30D	13D

SECTION III
Comments and Flag Definitions

VOC

Standard Data Qualifiers

Flag	Definition
B	Analyte detected in method blank and concentration > MDL
F	Interference or coelution suspected.
J	Result > or = MDL and <PQL
NA	Not analyzed/Not available
ND	Not detected at the specified reporting limit
Q	Result does not meet tolerance in Protocol Specification
U	Result less than sample specific method detection limit

Analyst Comments

Flag	Affected Sample	Method	Comment

Sample Condition Comments

Affected Sample	Comment

SECTION IV
Analytical Results

VOC
TO15

Client Sample ID	NAS01	NAS02	NAS03
Lab Sample ID	2030111401	2030111402	2030111403
Matrix	Air	Air	Air
Reported As	RECEIVED	RECEIVED	RECEIVED
% Moisture	NA	NA	NA
Date/Time Collected	01/22/2003 00:00	01/22/2003 00:00	01/22/2003 00:00
Date/Time Prepared	02/03/2003 14:55	02/03/2003 15:54	02/03/2003 16:53
Date/Time Analyzed	02/03/2003 14:55	02/03/2003 15:54	02/03/2003 16:53
Dilution Factor	2.0410	2.0697	10.4089
Instrument	VMSA	VMSA	VMSA
Units	ppbv	ppbv	ppbv

Parameter	CAS	Conc	Flag	DL	RL	Conc	Flag	DL	RL	Conc	Flag	DL	RL
Benzene	71-43-2	0.446	J	0.0396	0.00	0.527	J	0.0401	0.00	0.360	J	0.202	0.00
Chlorobenzene	108-90-7	ND		0.0400	0.00	ND		0.0405	0.00	ND		0.204	0.00
1,3-Dichlorobenzene	541-73-1	ND		0.0392	0.00	ND		0.0397	0.00	ND		0.200	0.00
1,2-Dichloroethane	107-06-2	ND		0.0396	0.00	ND		0.0401	0.00	ND		0.202	0.00
1,1-Dichloroethene	75-35-4	ND		0.0435	0.00	ND		0.0441	0.00	ND		0.222	0.00
cis-1,2-Dichloroethene	156-59-2	0.0718	J	0.0396	0.00	0.0650	J	0.0401	0.00	ND		0.202	0.00
Methylene chloride	75-09-2	2.42	J	0.0400	0.00	1.98	J	0.0405	0.00	2.06	J	0.204	0.00
1,1,2,2-Tetrachloroethane	79-34-5	0.178	J	0.0396	0.00	0.135	J	0.0401	0.00	ND		0.202	0.00
1,1,2-Trichloroethane	79-00-5	ND		0.0392	0.00	ND		0.0397	0.00	ND		0.200	0.00
Trichloroethene	79-01-6	1.21	J	0.0406	0.00	1.02	J	0.0412	0.00	ND		0.207	0.00
Vinyl chloride	75-01-4	ND		0.0392	0.00	ND		0.0397	0.00	ND		0.200	0.00

SECTION IV
Analytical Results
Surrogates

VOC
TO15

Client Sample ID	NAS01	NAS02	NAS03
Lab Sample ID	2030111401	2030111402	2030111403
Matrix	Air	Air	Air
Reported As	RECEIVED	RECEIVED	RECEIVED
% Moisture	NA	NA	NA
Date/Time Collected	01/22/2003 00:00	01/22/2003 00:00	01/22/2003 00:00
Date/Time Prepared	02/03/2003 14:55	02/03/2003 15:54	02/03/2003 16:53
Date/Time Analyzed	02/03/2003 14:55	02/03/2003 15:54	02/03/2003 16:53
Dilution Factor	2.0410	2.0697	10.4089
Instrument	VMSA	VMSA	VMSA
Units	ppbv	ppbv	ppbv

Surrogate Compound	% Recovery	Limits	F	% Recovery	Limits	F	% Recovery	Limits	F
2-Bromo-1,1,1-trifluoroethane	86	77-111		92	77-111		95	77-111	
1-Bromo-4-fluorobenzene	114	55-131		108	55-131		102	55-131	
1,4-Dichlorobutane	106	41-137		102	41-137		98	41-137	
Fluorobenzene	83	49-115		90	49-115		87	49-115	
Toluene-d8	106	87-114		110	87-114		111	87-114	

SECTION IV
Analytical Results
TICS

VOC
TO15

Client Sample ID	NAS01			
Lab Sample ID	2030111401			
Units	ppbv			
	TICs	CAS	Conc	RT
	Tetrafluoroethene	116-14-3	ND	

Client Sample ID	NAS02			
Lab Sample ID	2030111402			
Units	ppbv			
	TICs	CAS	Conc	RT
	Tetrafluoroethene	116-14-3	ND	

Client Sample ID	NAS03			
Lab Sample ID	2030111403			
Units	ppbv			
	TICs	CAS	Conc	RT
	Tetrafluoroethene	116-14-3	ND	

SECTION IV
Analytical Results

VOC
TO15

Client Sample ID	NAS04	NAS05	NAS06
Lab Sample ID	2030111404	2030111405	2030111406
Matrix	Air	Air	Air
Reported As	RECEIVED	RECEIVED	RECEIVED
% Moisture	NA	NA	NA
Date/Time Collected	01/22/2003 00:00	01/22/2003 00:00	01/22/2003 00:00
Date/Time Prepared	02/03/2003 18:51	02/03/2003 19:50	02/03/2003 20:49
Date/Time Analyzed	02/03/2003 18:51	02/03/2003 19:50	02/03/2003 20:49
Dilution Factor	16.7533	10.0541	9.6911
Instrument	VMSA	VMSA	VMSA
Units	ppbv	ppbv	ppbv

Parameter	CAS	Conc	Flag	DL	RL	Conc	Flag	DL	RL	Conc	Flag	DL	RL
Benzene	71-43-2	0.402	J	0.325	0.00	0.434	J	0.195	0.00	0.341	J	0.188	0.00
Chlorobenzene	108-90-7	ND		0.328	0.00	ND		0.197	0.00	ND		0.190	0.00
1,3-Dichlorobenzene	541-73-1	ND		0.322	0.00	ND		0.193	0.00	ND		0.186	0.00
1,2-Dichloroethane	107-06-2	ND		0.325	0.00	ND		0.195	0.00	ND		0.188	0.00
1,1-Dichloroethene	75-35-4	ND		0.357	0.00	ND		0.214	0.00	ND		0.206	0.00
cis-1,2-Dichloroethene	156-59-2	ND		0.325	0.00	ND		0.195	0.00	ND		0.188	0.00
Methylene chloride	75-09-2	0.342	J	0.328	0.00	2.62	J	0.197	0.00	0.719	J	0.190	0.00
1,1,2,2-Tetrachloroethane	79-34-5	ND		0.325	0.00	ND		0.195	0.00	ND		0.188	0.00
1,1,2-Trichloroethane	79-00-5	ND		0.322	0.00	ND		0.193	0.00	ND		0.186	0.00
Trichloroethene	79-01-6	ND		0.333	0.00	ND		0.200	0.00	1.15	J	0.193	0.00
Vinyl chloride	75-01-4	ND		0.322	0.00	ND		0.193	0.00	ND		0.186	0.00

SECTION IV
Analytical Results
Surrogates

VOC
TO15

Client Sample ID	NAS04	NAS05	NAS06
Lab Sample ID	2030111404	2030111405	2030111406
Matrix	Air	Air	Air
Reported As	RECEIVED	RECEIVED	RECEIVED
% Moisture	NA	NA	NA
Date/Time Collected	01/22/2003 00:00	01/22/2003 00:00	01/22/2003 00:00
Date/Time Prepared	02/03/2003 18:51	02/03/2003 19:50	02/03/2003 20:49
Date/Time Analyzed	02/03/2003 18:51	02/03/2003 19:50	02/03/2003 20:49
Dilution Factor	16.7533	10.0541	9.6911
Instrument	VMSA	VMSA	VMSA
Units	ppbv	ppbv	ppbv

Surrogate Compound	% Recovery	Limits	F	% Recovery	Limits	F	% Recovery	Limits	F
2-Bromo-1,1,1-trifluoroethane	92	77-111		90	77-111		90	77-111	
1-Bromo-4-fluorobenzene	102	55-131		102	55-131		101	55-131	
1,4-Dichlorobutane	99	41-137		101	41-137		100	41-137	
Fluorobenzene	82	49-115		81	49-115		81	49-115	
Toluene-d8	114	87-114		113	87-114		112	87-114	

SECTION IV
Analytical Results
TICS

VOC
TO15

Client Sample ID	NAS04			
Lab Sample ID	2030111404			
Units	ppbv			
	TICs	CAS	Conc	RT
	Tetrafluoroethene	116-14-3	ND	

Client Sample ID	NAS05			
Lab Sample ID	2030111405			
Units	ppbv			
	TICs	CAS	Conc	RT
	Tetrafluoroethene	116-14-3	ND	

Client Sample ID	NAS06			
Lab Sample ID	2030111406			
Units	ppbv			
	TICs	CAS	Conc	RT
	Tetrafluoroethene	116-14-3	ND	

SECTION IV
Analytical Results

VOC
TO15

Client Sample ID	NAS07	NAS08	NAS09
Lab Sample ID	2030111407	2030111408	2030111409
Matrix	Air	Air	Air
Reported As	RECEIVED	RECEIVED	RECEIVED
% Moisture	NA	NA	NA
Date/Time Collected	01/22/2003 00:00	01/22/2003 00:00	01/22/2003 00:00
Date/Time Prepared	02/03/2003 21:47	02/03/2003 22:46	02/03/2003 23:44
Date/Time Analyzed	02/03/2003 21:47	02/03/2003 22:46	02/03/2003 23:44
Dilution Factor	4.1786	11.0144	9.5327
Instrument	VMSA	VMSA	VMSA
Units	ppbv	ppbv	ppbv

Parameter	CAS	Conc	Flag	DL	RL	Conc	Flag	DL	RL	Conc	Flag	DL	RL
Benzene	71-43-2	0.308	J	0.0810	0.00	0.286	J	0.213	0.00	0.320	J	0.185	0.00
Chlorobenzene	108-90-7	ND		0.0818	0.00	ND		0.216	0.00	0.240	J	0.187	0.00
1,3-Dichlorobenzene	541-73-1	ND		0.0802	0.00	ND		0.211	0.00	ND		0.183	0.00
1,2-Dichloroethane	107-06-2	ND		0.0810	0.00	ND		0.213	0.00	ND		0.185	0.00
1,1-Dichloroethene	75-35-4	ND		0.0890	0.00	ND		0.235	0.00	ND		0.203	0.00
cis-1,2-Dichloroethene	156-59-2	ND		0.0810	0.00	ND		0.213	0.00	ND		0.185	0.00
Methylene chloride	75-09-2	0.351	J	0.0818	0.00	3.02	J	0.216	0.00	5.25	J	0.187	0.00
1,1,2,2-Tetrachloroethane	79-34-5	ND		0.0810	0.00	ND		0.213	0.00	ND		0.185	0.00
1,1,2-Trichloroethane	79-00-5	ND		0.0802	0.00	ND		0.211	0.00	ND		0.183	0.00
Trichloroethene	79-01-6	ND		0.0832	0.00	ND		0.219	0.00	0.202	J	0.190	0.00
Vinyl chloride	75-01-4	ND		0.0802	0.00	ND		0.211	0.00	ND		0.183	0.00

SECTION IV
Analytical Results
Surrogates

VOC
TO15

Client Sample ID	NAS07	NAS08	NAS09
Lab Sample ID	2030111407	2030111408	2030111409
Matrix	Air	Air	Air
Reported As	RECEIVED	RECEIVED	RECEIVED
% Moisture	NA	NA	NA
Date/Time Collected	01/22/2003 00:00	01/22/2003 00:00	01/22/2003 00:00
Date/Time Prepared	02/03/2003 21:47	02/03/2003 22:46	02/03/2003 23:44
Date/Time Analyzed	02/03/2003 21:47	02/03/2003 22:46	02/03/2003 23:44
Dilution Factor	4.1786	11.0144	9.5327
Instrument	VMSA	VMSA	VMSA
Units	ppbv	ppbv	ppbv

Surrogate Compound	% Recovery	Limits	F	% Recovery	Limits	F	% Recovery	Limits	F
2-Bromo-1,1,1-trifluoroethane	88	77-111		88	77-111		87	77-111	
1-Bromo-4-fluorobenzene	102	55-131		102	55-131		101	55-131	
1,4-Dichlorobutane	100	41-137		99	41-137		100	41-137	
Fluorobenzene	81	49-115		77	49-115		78	49-115	
Toluene-d8	111	87-114		112	87-114		109	87-114	

SECTION IV
Analytical Results
TICS

VOC
TO15

Client Sample ID	NAS07			
Lab Sample ID	2030111407			
Units	ppbv			
	TICs	CAS	Conc	RT
	Tetrafluoroethene	116-14-3	ND	

Client Sample ID	NAS08			
Lab Sample ID	2030111408			
Units	ppbv			
	TICs	CAS	Conc	RT
	Tetrafluoroethene	116-14-3	ND	

Client Sample ID	NAS09			
Lab Sample ID	2030111409			
Units	ppbv			
	TICs	CAS	Conc	RT
	Tetrafluoroethene	116-14-3	ND	

SECTION IV
Analytical Results

VOC
TO15

Client Sample ID	NAS10	NAS11	
Lab Sample ID	2030111410	2030111411	
Matrix	Air	Air	
Reported As	RECEIVED	RECEIVED	
% Moisture	NA	NA	
Date/Time Collected	01/22/2003 00:00	01/22/2003 00:00	
Date/Time Prepared	02/04/2003 00:43	02/04/2003 01:41	
Date/Time Analyzed	02/04/2003 00:43	02/04/2003 01:41	
Dilution Factor	6.0338	11.7265	
Instrument	VMSA	VMSA	
Units	ppbv	ppbv	

Parameter	CAS	Conc	Flag	DL	RL	Conc	Flag	DL	RL	Conc	Flag	DL	RL
Benzene	71-43-2	0.338	J	0.117	0.00	0.333	J	0.227	0.00				
Chlorobenzene	108-90-7	ND		0.118	0.00	ND		0.230	0.00				
1,3-Dichlorobenzene	541-73-1	ND		0.116	0.00	ND		0.225	0.00				
1,2-Dichloroethane	107-06-2	ND		0.117	0.00	ND		0.227	0.00				
1,1-Dichloroethene	75-35-4	ND		0.128	0.00	ND		0.250	0.00				
cis-1,2-Dichloroethene	156-59-2	ND		0.117	0.00	ND		0.227	0.00				
Methylene chloride	75-09-2	7.46	J	0.118	0.00	1.90	J	0.230	0.00				
1,1,2,2-Tetrachloroethane	79-34-5	0.150	J	0.117	0.00	ND		0.227	0.00				
1,1,2-Trichloroethane	79-00-5	ND		0.116	0.00	ND		0.225	0.00				
Trichloroethene	79-01-6	0.0664	U	0.120	0.00	0.202	U	0.233	0.00				
Vinyl chloride	75-01-4	ND		0.116	0.00	ND		0.225	0.00				

SECTION IV
Analytical Results
Surrogates

VOC
TO15

Client Sample ID	NAS10	NAS11	
Lab Sample ID	2030111410	2030111411	
Matrix	Air	Air	
Reported As	RECEIVED	RECEIVED	
% Moisture	NA	NA	
Date/Time Collected	01/22/2003 00:00	01/22/2003 00:00	
Date/Time Prepared	02/04/2003 00:43	02/04/2003 01:41	
Date/Time Analyzed	02/04/2003 00:43	02/04/2003 01:41	
Dilution Factor	6.0338	11.7265	
Instrument	VMSA	VMSA	
Units	ppbv	ppbv	

Surrogate Compound	% Recovery	Limits	F	% Recovery	Limits	F	% Recovery	Limits	F
2-Bromo-1,1,1-trifluoroethane	87	77-111		88	77-111				
1-Bromo-4-fluorobenzene	102	55-131		103	55-131				
1,4-Dichlorobutane	99	41-137		99	41-137				
Fluorobenzene	84	49-115		76	49-115				
Toluene-d8	104	87-114		111	87-114				

SECTION IV
Analytical Results
TICS

VOC
TO15

Client Sample ID	NAS10			
Lab Sample ID	2030111410			
Units	ppbv			
	TICs	CAS	Conc	RT
	Tetrafluoroethene	116-14-3	ND	

Client Sample ID	NAS11			
Lab Sample ID	2030111411			
Units	ppbv			
	TICs	CAS	Conc	RT
	Tetrafluoroethene	116-14-3	ND	

Client Sample ID				
Lab Sample ID				
Units				
	TICs	CAS	Conc	RT

TIC search not performed

SECTION V
Calibration and QC Information
Calibration Verification Results

VOC
TO15

Sample Type: Continuing Calibration Check
Analysis Batch ID: 40091 **Instrument Data File:** MA020302.D **Date/Time Analyzed:** 02/03/2003 10:33
Instrument ID: VMSA **Analyst:** GBC **Units:** ppbv

Parameter	Reference Value	Measured Conc	Flag	%Recovery	Flag	QC Limits %Recovery
Benzene	10.6	10.9		103		70-130
Chlorobenzene	10.8	10.8		100		70-130
1,3-Dichlorobenzene	10.6	10.0		95		70-130
1,2-Dichloroethane	10.6	11.4		107		70-130
1,1-Dichloroethene	10.6	10.2		96		70-130
cis-1,2-Dichloroethene	10.6	10.7		101		70-130
Methylene chloride	10.8	10.6		98		70-130
1,1,2,2-Tetrachloroethane	10.6	10.6		100		70-130
1,1,2-Trichloroethane	10.6	11.1		105		70-130
Trichloroethene	10.6	10.6		99		70-130
Vinyl chloride	10.6	9.31		88		70-130

SECTION V
Calibration and QC Information
Mass Spectrometer Tune

VOC
TO15
BFB

Analysis Batch ID: 40091
Instrument ID: VMSA

Instrument Data File: MA020302.D
Injection Time: 02/03/2003 10:33

Date Analyzed: 02/03/2003 10:33
Analyst: GBC

Mass/Energy	Ion Abundance Criteria		% Relative Abundance
	Lower Limit	Upper Limit	
50	15	40	22.7
75	30	60	47.9
95	100	100	100
96	5	9	6.5
173	0	2	0
174	50		88
175	5	9	7.5
176	95	101	97
177	5	9	6.5

SECTION V
Calibration and QC Information
Method Blank Results

VOC
TO15

Method Blank ID	1047954		
Sample Type	Method Blank		
Matrix	Air		
Date/Time Prepared	02/03/2003 13:30		
Date/Time Analyzed	02/03/2003 13:30		
Instrument	VMSA		
Units	ppbv		

Parameter	CAS	Conc	Flag	DL	RL	Conc	Flag	DL	RL	Conc	Flag	DL	RL
Benzene	71-43-2	ND		0.0194	0.00								
Chlorobenzene	108-90-7	ND		0.0196	0.00								
1,3-Dichlorobenzene	541-73-1	ND		0.0192	0.00								
1,2-Dichloroethane	107-06-2	ND		0.0194	0.00								
1,1-Dichloroethene	75-35-4	ND		0.0213	0.00								
cis-1,2-Dichloroethene	156-59-2	ND		0.0194	0.00								
Methylene chloride	75-09-2	ND		0.0196	0.00								
1,1,2,2-Tetrachloroethane	79-34-5	ND		0.0194	0.00								
1,1,2-Trichloroethane	79-00-5	ND		0.0192	0.00								
Trichloroethene	79-01-6	ND		0.0199	0.00								
Vinyl chloride	75-01-4	ND		0.0192	0.00								

SECTION V
Calibration and QC Information
Method Blank Results

VOC
TO15

Method Blank ID	1047954		
Sample Type	Method Blank		
Matrix	Air		
Date/Time Prepared	02/03/2003 13:30		
Date/Time Analyzed	02/03/2003 13:30		
Instrument	VMSA		
Units	ppbv		

Surrogate Compound	% Recovery	Limits	F	% Recovery	Limits	F	% Recovery	Limits	F
2-Bromo-1,1,1-trifluoroethane	93	77-111							
1-Bromo-4-fluorobenzene	103	55-131							
1,4-Dichlorobutane	100	41-137							
Fluorobenzene	80	49-115							
Toluene-d8	110	87-114							

SECTION V
Calibration and QC Information
Method Blank Results

VOC
TO15

Client Sample ID	MB for HBN 40091 [VOC/4236]			
Lab Sample ID	1047954			
Units	ppbv			
	TICs	CAS	Conc	RT
	Top 20 TICs		ND	
	Tetrafluoroethene	116-14-3	ND	

Client Sample ID				
Lab Sample ID				
Units				
	TICs	CAS	Conc	RT

TIC search not performed

Client Sample ID				
Lab Sample ID				
Units				
	TICs	CAS	Conc	RT

TIC search not performed

SECTION V
Calibration and QC Information
Duplicate Analysis Results

VOC
TO15

Client Sample ID:	NAS03	**Instrument ID:**	VMSA		
Prep Batch ID:	40091	**Units:**	ppbv	**% Moisture:**	NA
Analysis Batch ID:	40091	**Matrix:**	Air	**Analyst:**	GBC

	Sample Result			Duplicate Result					
	Sample ID: 2030111403 **Dilution Factor:** 10.4089 **File ID:** MA020308.D			**Sample ID:** 1047960 **Dilution Factor:** 10.4089 **File ID:** MA020309.D					
Parameter	**Conc**	**Flag**	**Det Limit**	**Conc**	**Flag**	**Det Limit**	**RPD**	**Flag**	**QC Limit**
Benzene	0.360	J	0.202	0.325	J	0.202	10		
Chlorobenzene	ND		0.204	ND		0.204	0		
1,3-Dichlorobenzene	ND		0.200	ND		0.200	0		
1,2-Dichloroethane	ND		0.202	ND		0.202	0		
1,1-Dichloroethene	ND		0.222	ND		0.222	0		
cis-1,2-Dichloroethene	ND		0.202	ND		0.202	0		
Methylene chloride	2.06	J	0.204	2.02	J	0.204	1.7		
1,1,2,2-Tetrachloroethane	ND		0.202	ND		0.202	0		
1,1,2-Trichloroethane	ND		0.200	ND		0.200	0		
Trichloroethene	ND		0.207	ND		0.207	0		
Vinyl chloride	ND		0.200	ND		0.200	0		

SECTION V
Calibration and QC Information
Control Sample Results

VOC
TO15

Client Sample ID:	LCS1 for HBN 40091 [VOC/4236]	**Instrument ID:**	VMSA	**% Moisture:**	NA
Prep Batch ID:	40091	**Units:**	ppbv	**Analyst:**	GBC
Analysis Batch ID:	40091	**Matrix:**	Air		

	Control Sample			Control Sample Duplicate					
	Lab ID: 1047952			Lab ID: 1047953				QC Limits	
	File ID: MA020303.D			File ID: MA020304.D					
Parameter	**Spk Amt**	**Conc**	**%Rec Flg**	**Spk Amt**	**Conc**	**%Rec Flg**	**RPD Flg**	**%Rec**	**RPD**
Benzene	14.3	15.1	106	14.3	15.6	110	3.7	69-146	10
Chlorobenzene	10.6	8.32	78	10.6	8.59	81	3.8	61-127	32
1,3-Dichlorobenzene	9.39	7.24	77	9.39	7.56	80	3.8	34-148	33
1,2-Dichloroethane	8.87	8.53	96	8.87	8.81	99	3.1	65-127	11
1,1-Dichloroethene	9	7.57	84	9	7.78	86	2.4	48-154	7
cis-1,2-Dichloroethene	8.7	7.56	87	8.7	7.86	90	3.4	58-130	12
Methylene chloride	8.92	7.91	89	8.92	8.07	90	1.1	41-159	20
1,1,2,2-Tetrachloroethane	8.92	8.04	90	8.92	8.39	94	4.3	41-158	34
1,1,2-Trichloroethane	8.83	8.46	96	8.83	8.72	99	3.1	61-131	34
Trichloroethene	9.04	8.60	95	9.04	8.87	98	3.1	72-128	31
Vinyl chloride	8.74	7.36	84	8.74	7.43	85	1.2	42-148	17

SECTION V
Calibration and QC Information
Control Sample Results

VOC
TO15

	Lab ID: 1047952		Lab ID: 1047953		
Surrogate Compounds	%Recovery	Flags	%Recovery	Flags	QC Recovery Limits
2-Bromo-1,1,1-trifluoroethane	93		92		77-111
1-Bromo-4-fluorobenzene	104		103		55-131
1,4-Dichlorobutane	104		104		41-137
Fluorobenzene	88		87		49-115
Toluene-d8	110		109		87-114

Extraction/Digestion Batch Summary
VOC
TO15

Extraction Batch ID: 40091

Start Date/Time: 02/03/2003 10:33
Stop Date/Time: 02/05/2003 13:30

Analyst: GBC

Client Sample ID	Lab Sample ID	Sample Type	Matrix	Sample Size Initial	Sample Size Final	Preparation Method
INSTRUMENT QC	1000	GC/MS Tune	Air	0.5 L	1 L	TO15
INSTRUMENT QC	1423	Continuing Calibration Check	Air	0.5 L	1 L	TO15
LCS1 for HBN 40091 [VOC/4236]	1047952	Lab Control Sample	Air	0.5 L	1 L	TO15
LCSD1 for HBN 40091 [VOC/4236]	1047953	Lab Control Sample Duplicate	Air	0.5 L	1 L	TO15
MB for HBN 40091 [VOC/4236]	1047954	Method Blank	Air	0.5 L	1 L	TO15
NAS01	2030111401	Field Sample	Air	0.5 L	1 L	TO15
NAS02	2030111402	Field Sample	Air	0.5 L	1 L	TO15
NAS03	2030111403	Field Sample	Air	0.5 L	1 L	TO15
NAS03	1047960	Duplicate Sample	Air	0.5 L	1 L	TO15
NAS04	2030111404	Field Sample	Air	0.5 L	1 L	TO15
NAS05	2030111405	Field Sample	Air	0.5 L	1 L	TO15
NAS06	2030111406	Field Sample	Air	0.5 L	1 L	TO15
NAS07	2030111407	Field Sample	Air	0.5 L	1 L	TO15
NAS08	2030111408	Field Sample	Air	0.5 L	1 L	TO15
NAS09	2030111409	Field Sample	Air	0.5 L	1 L	TO15
NAS10	2030111410	Field Sample	Air	0.5 L	1 L	TO15
NAS11	2030111411	Field Sample	Air	0.5 L	1 L	TO15
ZZZZZZZZZZ	2030113601	Field Sample	Air	0.5 L	1 L	TO15
ZZZZZZZZZZ	2030113602	Field Sample	Air	0.5 L	1 L	TO15
ZZZZZZZZZZ	2030113603	Field Sample	Air	0.5 L	1 L	TO15
ZZZZZZZZZZ	2030110403	Field Sample	Air	0.1 L	1 L	TO15
ZZZZZZZZZZ	2030110403	Field Sample	Air	0.5 L	1 L	TO15

SECTION VI
Batch Summaries

Analysis Batch Summary
VOC
TO15

Analysis Batch ID: 40091 **Instrument ID:** VMSA **Analyst:** GBC

Sequence	Client Sample ID	Lab Sample ID	Analysis Date	Analysis Time	Sample Type	Analysis File ID	Sub-Batch ID
1	INSTRUMENT QC	1000	02/03/2003	10:33:00	GC/MS Tune	MA020302.D	0
2	INSTRUMENT QC	1423	02/03/2003	10:33:00	Continuing Calibration Check	MA020302.D	0
3	LCS1 for HBN 40091 [VOC/4236]	1047952	02/03/2003	11:32:00	Lab Control Sample	MA020303.D	0
4	LCSD1 for HBN 40091 [VOC/4236]	1047953	02/03/2003	12:31:00	Lab Control Sample Duplicate	MA020304.D	0
5	MB for HBN 40091 [VOC/4236]	1047954	02/03/2003	13:30:00	Method Blank	MA020305.D	0
8	NAS01	2030111401	02/03/2003	14:55:00	Field Sample	MA020306.D	0
11	NAS02	2030111402	02/03/2003	15:54:00	Field Sample	MA020307.D	0
13	NAS03	2030111403	02/03/2003	16:53:00	Field Sample	MA020308.D	0
14	NAS03	1047960	02/03/2003	17:52:00	Duplicate Sample	MA020309.D	0
16	NAS04	2030111404	02/03/2003	18:51:00	Field Sample	MA020310.D	0
18	NAS05	2030111405	02/03/2003	19:50:00	Field Sample	MA020311.D	0
20	NAS06	2030111406	02/03/2003	20:49:00	Field Sample	MA020312.D	0
22	NAS07	2030111407	02/03/2003	21:47:00	Field Sample	MA020313.D	0
24	NAS08	2030111408	02/03/2003	22:46:00	Field Sample	MA020314.D	0
26	NAS09	2030111409	02/03/2003	23:44:00	Field Sample	MA020315.D	0
28	NAS10	2030111410	02/04/2003	00:43:00	Field Sample	MA020316.D	0
30	NAS11	2030111411	02/04/2003	01:41:00	Field Sample	MA020317.D	0
32	ZZZZZZZZZZ	2030113601	02/04/2003	02:39:00	Field Sample	MA020318.D	0
34	ZZZZZZZZZZ	2030113602	02/04/2003	03:37:00	Field Sample	MA020319.D	0
36	ZZZZZZZZZZ	2030113603	02/04/2003	04:36:00	Field Sample	MA020320.D	0
37	ZZZZZZZZZZ	2030110403	02/04/2003	05:34:00	Field Sample	MA020321.D	0
38	ZZZZZZZZZZ	2030110403	02/04/2003	06:32:00	Field Sample	MA020322.D	0

State/Agency	ID #
Arkansas Department of Environmental Quality	
California Environmental Laboratory Accreditation Program / Waste Water/Hazardous Waste	2411
Connecticut Department of Health/Waste Water/Trade Waste, Sewage/Effluent, Soil	PH-0761
Kansas Department of Health and Environment / Solid and Hazardous Waste	E-10165
Louisiana Department of Environmental Quality, ELAP / Waste Water/Hazardous Waste/Air Emissions	30736
Montana Department of Environmental Quality/Petroleum Release Section	Participating Laboratory
New York State Department of Health /Waste Water/Hazardous Waste/Air	10915
North Carolina Dept. of Natural Resources & Community Development / Waste Water	302
Oklahoma Department of Environmental Quality/General Water Quality/Sludge	8720
South Carolina Dept. of Health & Environmental Control	82003
Texas(TNRCC)	Participating Laboratory
Texas Department of Public Safety/Precursor Chemical and Lab Apparatus	3039
Wisconsin Department of Natural Resources	999885260
US Air Force/AFCEE	Participating Laboratory
US Army Corps of Engineers (MRD,ACE)	Participating Laboratory
US Department of Agriculture / Restricted Soils Permit	S-42350
US Navy(NFESC)	Participating Laboratory

4.0 CONDITION OF BOTTLES/CONTAINERS VERIFIED BY: _____

Samples received match COC: ☐ YES ☐ NO Bottles received intact: ☐ YES ☐ NO

See additional discrepancies/comments section: ☐ YES ☐ NO Samples received from USDA restricted area: ☐ YES ☐ NO

VOA trip blanks included: ☐ YES ☐ NO ☐ N/A

5.0 ADDITIONAL DISCREPANCIES

Appears on COC		Appears on Label		
Sample ID	Date/Time	Sample ID	Date/Time	Comments

6.0 SHIPPING DOCUMENTATION

Air/freight bill is available and attached to COC: ☑ YES ☐ NO Air bill #: _____

Hand-delivered Carrier: _____ Date: _____ Time: _____

7.0 OTHER COMMENTS:

STL Sample Control tech documented Canister IDs in COC REMARKS section.

CORRECTIVE ACTION:

Client's Name: _____ Informed verbally on: _____ By: _____

Client's Name: _____ Informed verbally on: _____ By: _____

Sample(s) processed "as is" comments: _____

Samples(s) on hold until: _____ If released, notify: _____

REVIEW:

Client COC is "received"; i.e., signed and dated with time of receipt. ☐ YES

COC Addendum number is noted in the 'Comments' section of COC, as required for Horizon LIMS. ☐ YES ☐ N/A

Project Management: [illegible] for [illegible] Date: 1/24/03

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

SEVERN TRENT SERVICES

SEVERN TRENT LABORATORIES

2030114

No. 13510

CHAIN OF CUSTODY RECORD

CUSTOMER INFORMATION	PROJECT INFORMATION
COMPANY: EnSafe	PROJECT NAME/NUMBER: PLEASE CALL
SEND REPORT TO: MICHAEL SELF	BILLING INFORMATION
ADDRESS: 4545 FULLER DR.	BILL TO:
SUITE 230	ADDRESS: please call
IRVING, TX 75038	
PHONE: (972) 791-3222	PHONE:
FAX: (972) 791-0405	FAX: PO NO.:

LAB JOB NO.:

SAMPLE NO.	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	CONTAINER	PRESERV.	NUMBER OF CONTAINERS	ANALYSIS/METHOD REQUEST: T-015							REMARKS/PRECAUTIONS
NAS01	SUMMA - AIR SAMPLE	1/22/03	4 hrs	Air	Suma	—	1	X							RAZ189
NAS02															RAZ208
NAS03															RAZ161
NAS04															RAZ174 RAZ144
NAS05															RAZ120
NAS06															RAZ215
NAS07															RAZ512
NAS08															RAZ383
NAS09															RAZ118
NAS10															RAZ141

SAMPLER: M. Self

SHIPMENT METHOD:

AIRBILL NO.:

REQUIRED TURNAROUND: ☐ SAME DAY ☐ 24 HOURS ☐ 48 HOURS ☐ 72 HOURS ☐ 5 DAYS ☐ 10 DAYS ☑ ROUTINE ☐ OTHER

1. RELINQUISHED BY:	DATE	2. RELINQUISHED BY:	DATE	3. RELINQUISHED BY:	DATE
SIGNATURE: M. Self	1/22/03	SIGNATURE: Emily A. Bauer	1/22/03	SIGNATURE:	
PRINTED NAME/COMPANY: EnSafe	TIME 1500	PRINTED NAME/COMPANY: STL	TIME 1500	PRINTED NAME/COMPANY:	TIME
1. RECEIVED BY:	**DATE**	**2. RECEIVED BY:**	**DATE**	**3. RECEIVED BY:**	**DATE**
SIGNATURE: Emily A. Bauer	1/22/03	SIGNATURE: [illegible]	1/23/03	SIGNATURE:	
PRINTED NAME/COMPANY: STL	TIME 1500	PRINTED NAME/COMPANY: DANE WALCASEY STL-AUSTIN	TIME 0930	PRINTED NAME/COMPANY:	TIME

*RUSH TURNAROUND MAY REQUIRE SURCHARGE

SEE CH ADD #2-03-0030

SEVERN TRENT LABORATORIES
1733 N. Padre Island Drive
Corpus Christi, TX 78408
Phone: (361) 289-2673 / Fax (361) 289-2471

STL-8222-CC (0700)

No. 13503

SEVERN TRENT LABORATORIES

CHAIN OF CUSTODY RECORD

CUSTOMER INFORMATION	PROJECT INFORMATION
COMPANY: EnSafe	PROJECT NAME/NUMBER: please call
SEND REPORT TO: Michael Self	**BILLING INFORMATION**
ADDRESS: 4545 Fuller Dr Suite 230 Irving, Tx. 75038	BILL TO: please call ADDRESS:
PHONE: (972) 791-3222	PHONE:
FAX: (972) 791-0505	FAX: PO NO.:

LAB JOB NO.:

SAMPLE NO.	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	CONTAINER	PRESERV.	NUMBER OF CONTAINERS	ANALYSIS/METHOD REQUEST: TO15							REMARKS/PRECAUTIONS
NAS11	Summa Air Sample	1/22/03	4 hr	Air	Summa		1	x							RA2391
NAS12	↓	↓	↓	↓	↓		↓	↓							RA2336

SAMPLER: SHIPMENT METHOD: AIRBILL NO.:

REQUIRED TURNAROUND* ☐ SAME DAY ☐ 24 HOURS ☐ 48 HOURS ☐ 72 HOURS ☐ 5 DAYS ☐ 10 DAYS ☑ ROUTINE ☐ OTHER _____

1. RELINQUISHED BY:	DATE	2. RELINQUISHED BY:	DATE	3. RELINQUISHED BY:	DATE
SIGNATURE: M. Self	1/22/03	SIGNATURE: Emily A. Bauer	1/22/03	SIGNATURE:	
PRINTED NAME/COMPANY: EnSafe	TIME 1500	PRINTED NAME/COMPANY: STL	TIME 1500	PRINTED NAME/COMPANY:	TIME
1. RECEIVED BY:	**DATE**	**2. RECEIVED BY:**	**DATE**	**3. RECEIVED BY:**	**DATE**
SIGNATURE: Emily A. Bauer	1/22/03	SIGNATURE: [illegible]	1/23/03	SIGNATURE:	
PRINTED NAME/COMPANY: STL	TIME 1500	PRINTED NAME/COMPANY: Dave Wacasey STL-Austin	TIME 0830	PRINTED NAME/COMPANY:	TIME

*RUSH TURNAROUND MAY REQUIRE SURCHARGE

See Canada #2 03-0080

SEVERN TRENT LABORATORIES
1733 N. Padre Island Drive
Corpus Christi, TX 78408
Phone: (361) 289-2673 / Fax (361) 289-2471

STL-8222-CC (0700)

ATTACHMENT C

ROOM EVALUATION CHECKLISTS

CANISTER #RA 2189 (FLOW GAUGE QUESTIONABLE)

Figure 2-2 - Room Evaluation Checklist NAS 01

Room ID (From Figure 2-1) 8GC

Room Name (as known by CCAD personnel) Rm 258 - ARMB

Primary Function of room LARGE GAGING MACHINES (NUMEREX & ZEISS)

Ancillary Activities in room NO PERSONNEL PRESENT

List of chemicals routinely used in room NONE OBSERVED

Normal Hours of operation 0800 - 1700?

Activities in Adjacent rooms OFFICES, MACHINING AREA

Date of last carpet, paint, or new furniture installation UNK - NO CARPET & CANISTER SETTING ON TABLE

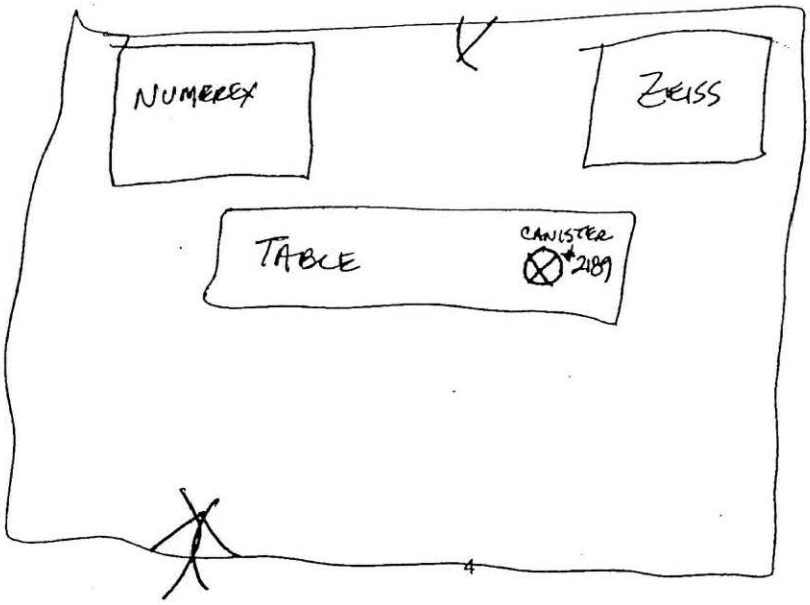
Sample Date 1/22/03

	Vacuum	Flow Rate	Time
Start			1024
End			1305 161 min.

Sketch Room to approximate scale. Show activity areas and canister position

FLOW CONTROL #A1~~8~~56

FILTER # ?



CANISTER # RA 2208

Figure 2-2 - Room Evaluation Checklist NAS02

Room ID (From Figure 2-1) 8GD

Room Name (as known by CCAD personnel) RR# 7 MEN'S

Primary Function of room RESTROOM

Ancillary Activities in room " PEOPLE GOING IN AND OUT THROUGHOUT THE DAY

List of chemicals routinely used in room CLEANERS; DETERGENTS

Normal Hours of operation —

Activities in Adjacent rooms SAME AS 8GC

Date of last carpet, paint, or new furniture installation N/A - UNK

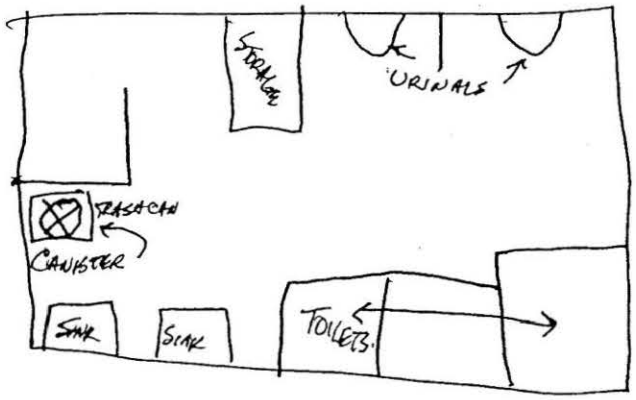
Sample Date 1/22/03

	Vacuum	Flow Rate	Time
Start			0849
End			1249 360 MIN.

Sketch Room to approximate scale. Show activity areas and canister position

FLOW CONTROL #
A 155250

FILTER #
AJ 78627



CANISTER # 2161

Figure 2-2 - Room Evaluation Checklist NAS03

Room ID (From Figure 2-1) 8GI

Room Name (as known by CCAD personnel) CONTROL RM #7

Primary Function of room ENTRY WAY TO ENGINE TEST CELL AREA

Ancillary Activities in room N/A - ENTRY WAY TO CONTROL RM - CANISTER ON THE FLOOR

List of chemicals routinely used in room N/A

Normal Hours of operation

Activities in Adjacent rooms CONTROL RM; ENGINE TEST AREA

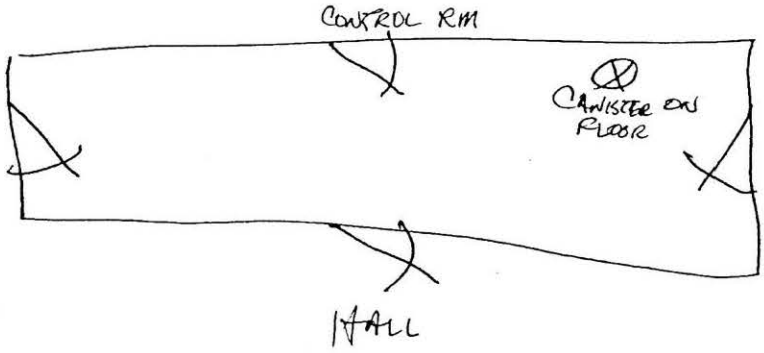
Date of last carpet, paint, or new furniture installation UNK

Sample Date 1/22/03

	Vacuum	Flow Rate	Time	
Start			1026	
End			1311	165 min.

Sketch Room to approximate scale. Show activity areas and canister position

FLOW CONTROL # A176633
FILTER #



CANISTER # RA 2244

Figure 2-2 - Room Evaluation Checklist NAS04

Room ID (From Figure 2-1) 8GK

Room Name (as known by CCAD personnel) RM. 282

Primary Function of room EMPTY ROOM

Ancilliary Activities in room NONE - NO EEs IN ROOM DURING REGULAR OPS. 2 EEs PRESENT INSTALLING ELEC. PANEL

List of chemicals routinely used in room N/A

Normal Hours of operation

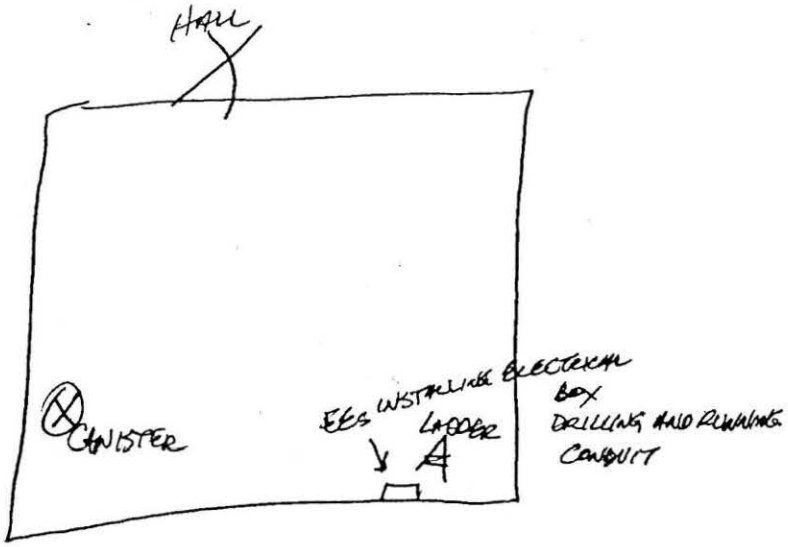
Activities in Adjacent rooms N/A

Date of last carpet, paint, or new furniture installation UNK - NO CARPET OR FURNITURE

Sample Date 1/22/02

	Vacuum	Flow Rate	Time
Start			1028
End			1317

Sketch Room to approximate scale. Show activity areas and canister position



FLOW CONTROL # A218796

FILTER # A178626

CANISTER # RA 2120

Figure 2-2 - Room Evaluation Checklist NAS05

Room ID (From Figure 2-1) BGL

Room Name (as known by CCAD personnel) GE 1700 INTEGRATION TEAM OFFICE

Primary Function of room OFFICES

Ancillary Activities in room N/A

List of chemicals routinely used in room TONER - INK - DRY ERASE CLEANERS

Normal Hours of operation

Activities in Adjacent rooms HALLWAYS; OFFICES; CONF. RMS

Date of last carpet, paint, or new furniture installation UNK - PRESS BOARD DESKS & CABINETS - TILE FLOOR COPIERS, PRINTERS; FAX MACHINE; COMPUTERS;

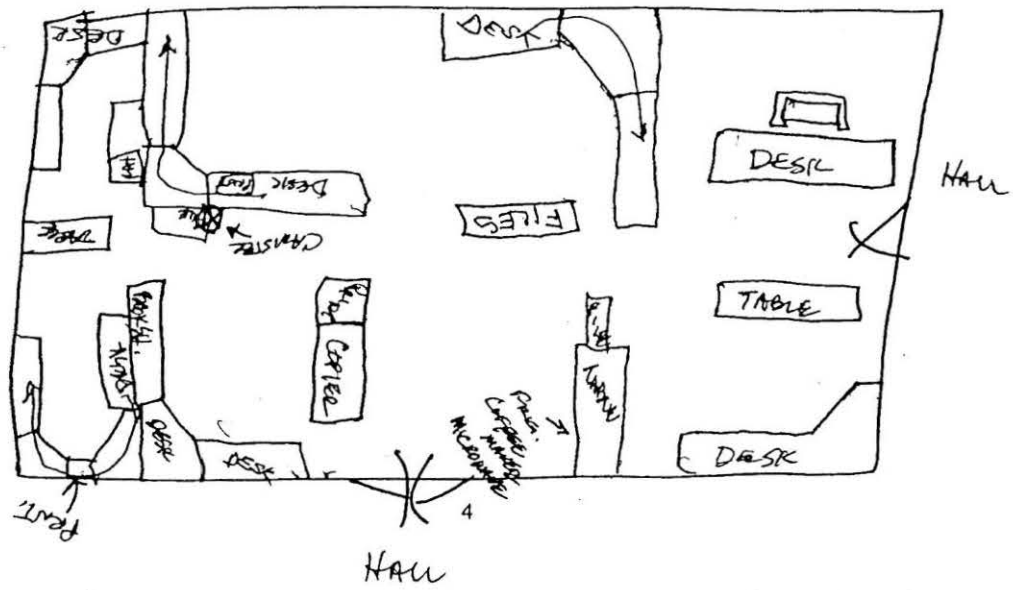
Sample Date 1/22/03

	Vacuum	Flow Rate	Time
Start			1030
End			1320 170 min.

Sketch Room to approximate scale. Show activity areas and canister position

FLOW CONTROL #

FILTER #



CANISTER# RA2215

Figure 2-2 - Room Evaluation Checklist NAS06

Room ID (From Figure 2-1) 8BB

Room Name (as known by CCAD personnel) AIRCRAFT ASSY LINE - MOCKUP TEST RM.

Primary Function of room TEST ROOM FOR ASSEMBLY

Ancillary Activities in room UNK.

List of chemicals routinely used in room UNKNOWN - NO PERSONNEL PRESENT DURING SAMPLE PERIOD

Normal Hours of operation

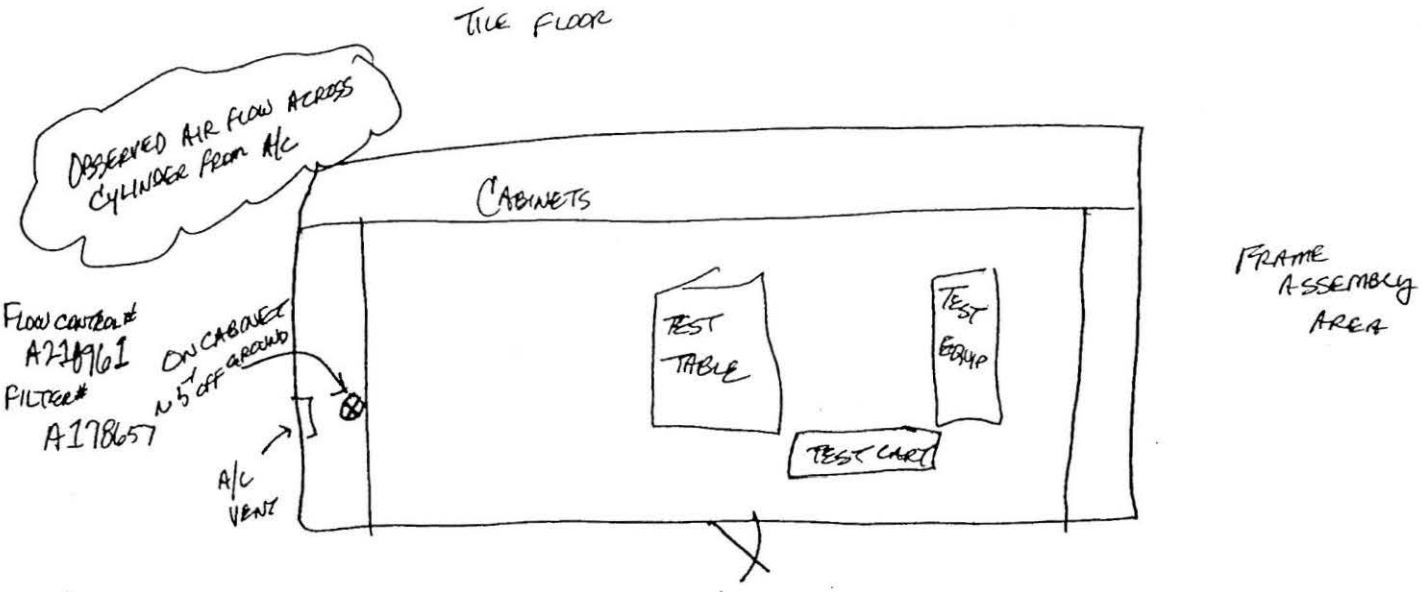
Activities in Adjacent rooms PRINTING; FAB; STORAGE

Date of last carpet, paint, or new furniture installation NO CARPET; METAL CABINETS; SOME FURNITURE

Sample Date 01/22/03

	Vacuum	Flow Rate	Time
Start			1035
End			1352 197 min.

Sketch Room to approximate scale. Show activity areas and canister position



CANISTER # RA2312 & RA2383 (DUPLICATE)

Figure 2-2 - Room Evaluation Checklist NAS07 NAS08

Room ID (From Figure 2-1) 8AP

Room Name (as known by CCAD personnel) [redacted] FOUNDRY AREA STORAGE RM

Primary Function of room STORAGE

Ancillary Activities in room N/A

List of chemicals routinely used in room STORAGE - ORGANIC CART; FOAM ROLLS (4' WHITE; 5' BLACK) SHELVES W/ MISC. METAL BLOCKS/BARS; CASTS; TOOLS

Normal Hours of operation

Activities in Adjacent rooms FOUNDRY

Date of last carpet, paint, or new furniture installation UNK. - NO CARPET, CONCRETE FLOOR; BRICK WALLS

Sample Date 1/22/03

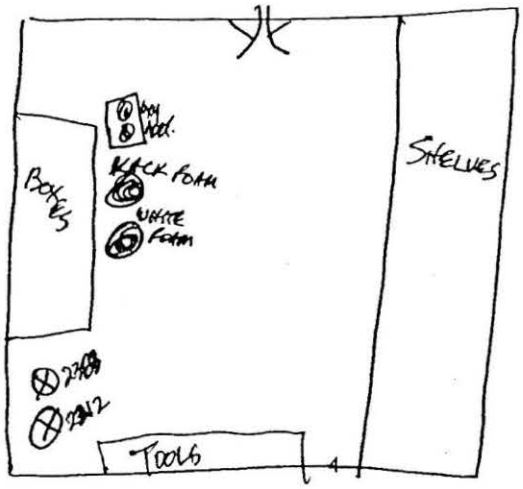
	Vacuum	Flow Rate	Time
Start			1041 [redacted]
End			1358 197 min.

Sketch Room to approximate scale. Show activity areas and canister position

CANISTERS ON THE FLOOR

FLOW CONTROL #
2312 A103432
2383 A155246

FILTER #
2312
2383 A178519



CANISTER# RA211B

Figure 2-2 - Room Evaluation Checklist NAS08

Room ID (From Figure 2-1) 8AR

Room Name (as known by CCAD personnel) HEAT TREAT SHOP CHIEF - TIM SMITH

Primary Function of room OFFICE

Ancillary Activities in room "

List of chemicals routinely used in room PRINTERS; FRIG.; FAXES

Normal Hours of operation 6 - 2:30

Activities in Adjacent rooms FOUNDRY; HALLWAY

Date of last carpet, paint, or new furniture installation UNK - NO CARPET; 1 METAL DESK; WOOD DESK

Sample Date 1/22/03

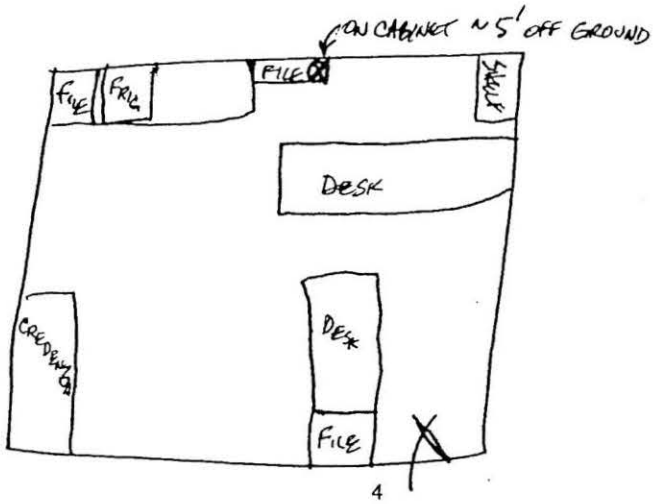
	Vacuum	Flow Rate	Time
Start			1040
End			1404 20' min.

Sketch Room to approximate scale. Show activity areas and canister position

A/C ROOM

FLOW CONTROL # A176658

FILTER#



CANISTER # RA 2141

Figure 2-2 - Room Evaluation Checklist NAS 0[redacted]

Room ID (From Figure 2-1) 8AN

Room Name (as known by CCAD personnel) HALLWAY BTWN. PARTS REPAIR & COWLING

Primary Function of room HALLWAY - VENDING MACHINES

Ancillary Activities in room

List of chemicals routinely used in room N/A - FLOOR CLEANERS

4 SEWER DRAIN COVERS; (1) DRAIN PT ~2' FROM CANISTER

Normal Hours of operation

Activities in Adjacent rooms PAINTING, MACHINING, GRINDING, SOLVENTS, ETC...

Date of last carpet, paint, or new furniture installation N/A

Sample Date 1/22/03

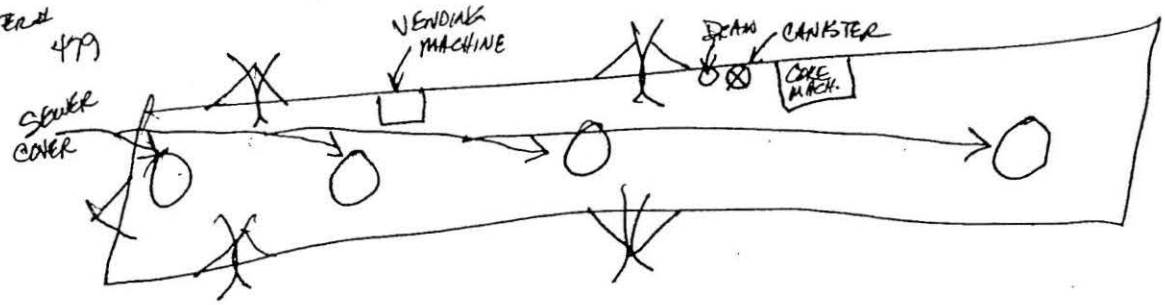
	Vacuum	Flow Rate	Time
Start			1043 [redacted]
End			1407 204 MIN.

Sketch Room to approximate scale. Show activity areas and canister position

HEAVY "PAINT" ODOR IN HALLWAY; AREAS SURROUNDING USING SPRAY PAINTS

FLOW CONTROL # A218997

FILTER # 479



CANISTER # RA2391

Figure 2-2 - Room Evaluation Checklist NAS/B

Room ID (From Figure 2-1) 8B6

Room Name (as known by CCAD personnel) AIRCRAFT QUALITY CONTROL DIV CHIEFS OFFICE

Primary Function of room OFFICE

Ancillary Activities in room

List of chemicals routinely used in room TONER; PRINTER INKS

Normal Hours of operation AIRFRAME 6-3

Activities in Adjacent rooms ASSEMBLY FLOOR

Date of last carpet, paint, or new furniture installation UNK - TILE FLOOR; WOOD FURNITURE; FRKS. COMPUTERS; MICROWAVE; PRINTERS; FAX PAINTED OVER 2 YRS. AGO

Sample Date 1/22/03

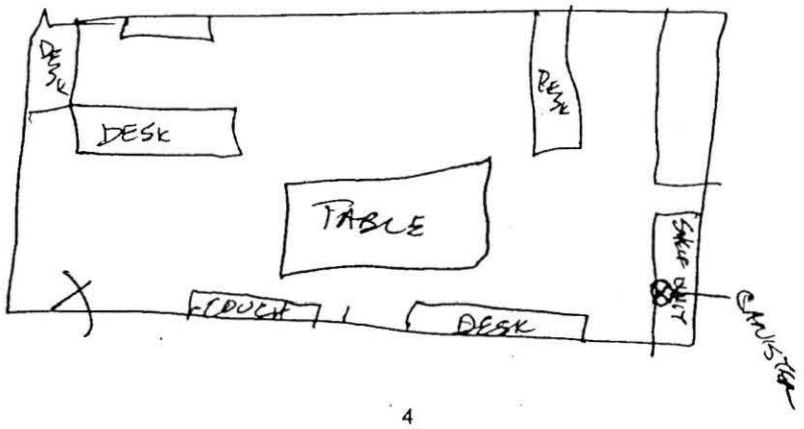
	Vacuum	Flow Rate	Time
Start			1049 [redacted]
End			1415 2Hr MIN.

Sketch Room to approximate scale. Show activity areas and canister position

FLOW CONTROL # A218962

FILTER #

LOTS OF WOODEN FURNITURE



Attachment 2
Table Comparing Indoor Air
Sampling Results to RBELs

Table A-1

Param	NAS01	NAS02	NAS03	NAS04	NAS05	NAS06	NAS07	NAS08	NAS09	NAS10	NAS11	RBEL
1,1,2,2-Tetrachloroethane	**0.178**	**0.135**	(0.202)	(0.325)	(0.195)	(0.188)	(0.081)	(0.213)	(0.185)	**0.15**	(0.227)	0.1
1,1,2-Trichloroethane	(0.0392)	(0.0397)	(0.2)	(0.322)	(0.193)	(0.186)	(0.0802)	(0.211)	(0.183)	(0.116)	(0.225)	0.469
1,1-Dichloroethene	(0.0435)	(0.0441)	(0.222)	(0.357)	(0.214)	(0.206)	(0.089)	(0.235)	(0.203)	(0.128)	(0.25)	0.203
1,2-Dichloroethane	(0.0396)	(0.0401)	(0.202)	(0.325)	(0.195)	(0.188)	(0.081)	(0.213)	(0.185)	(0.117)	(0.227)	0.388
1,3-Dichlorobenzene	(0.0392)	(0.0397)	(0.2)	(0.322)	(0.193)	(0.186)	(0.0802)	(0.211)	(0.183)	(0.116)	(0.225)	1.96
Benzene	**0.446**	**0.527**	**0.36**	**0.402**	**0.434**	**0.341**	**0.308**	**0.286**	**0.32**	**0.338**	**0.333**	1.6
Chlorobenzene	(0.04)	(0.0405)	(0.204)	(0.328)	(0.197)	(0.19)	(0.0818)	(0.216)	**0.24**	(0.118)	(0.23)	18.7
cis-1,2-Dichloroethene	**0.0718**	**0.065**	(0.202)	(0.325)	(0.195)	(0.188)	(0.081)	(0.213)	(0.185)	(0.117)	(0.227)	287
Methylene chloride	**2.42**	**1.98**	**2.06**	**0.342**	**2.62**	**0.719**	**0.351**	**3.02**	**5.25**	**7.46**	**1.9**	24.6
Trichloroethene	**1.21**	**1.02**	(0.207)	(0.333)	(0.2)	**1.15**	(0.0832)	(0.219)	**0.202**	**0.0664**	**0.202**	4.4
Vinyl chloride	(0.0392)	(0.0397)	(0.2)	(0.322)	(0.193)	(0.186)	(0.0802)	(0.211)	(0.183)	(0.116)	(0.225)	1.76

Note: All values are in ppbv. Values in parentheses are the detection limits for parameters not detected.